CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

RESPONSES TO WRITTEN PUBLIC COMMENTS ON THE NOVEMBER 2003 DRAFT STAFF REPORT FOR

AMENDMENTS TO THE WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS

FOR

THE CONTROL OF SALT AND BORON DISCHARGES INTO THE LOWER SAN JOAQUIN RIVER

July 2004

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Table of Contents

Introduction

The following provides staff's response to written comments regarding the staff report titled, *Amendments to the Water Quality Control Plan for the Sacramento River And San Joaquin River Basins for the Control Program for the Control of Salt and Boron Discharges into the Lower San Joaquin River.*

On 25 November 2003 a draft staff report for a Basin Plan Amendment for the control of salt and boron discharges to the Lower San Joaquin River was released for public review. The Regional Board staff agreed to provide written responses to significant written comments received by 20 January 2004. The Regional Board received comments on the draft basin plan amendment staff report from the interested persons listed in Table 1.

Table 1: Commenter List

Commenter #	Commenter
1	San Joaquin Tributaries Association
2	City of Modesto
3	San Joaquin County
4	San Joaquin Valley Drainage Authority
5	San Luis & Delta Mendota Water Authority
6	Turlock Irrigation District
7	Contra Costa Water District
8	Stockton East Water District
9	US Fish and Wildlife Service
10	Cities of Davis, Roseville, Vacaville
11	San Joaquin River Exchange Contractors
12	US Bureau of Reclamation
13	Patrick Porgans and Associates
14	Modesto Irrigation District
15	Oakdale Irrigation District
16	City of Turlock

The comments from interested persons are presented below. A two-part comment number has been assigned to each comment received. Starting from the left, the first part of the comment number corresponds to the commenter number assigned in Table 1. The second part of the comment number corresponds to each comment provided, in the order received in the individual comment letters. Each comment is followed by staff's response. Comments from interested persons are generally shown as direct quotes, however, in some cases formatting changes were necessary. This document incorporates the majority of comment material submitted to the Regional Board, but it is not all-inclusive. Regional Board staff has made its best efforts to identify, evaluate, and address all of the pertinent comments that were submitted. In most cases introductory and closing remarks have been omitted. Copies of the comment letters received from interested persons are provided on the Regional Board's website at the following URL:

http://www.swrcb.ca.gov/rwqcb5/programs/tmdl/salt_boron/index.html#AgDischarge

Comment Letter # 1: San Joaquin Tributaries Association

January 16, 2004

Re: City of Stockton Review Comments and Questions on the May 24 2004 Draft Final Staff Report and Basin Plan Amendments for the DWSC DO TMDL

Comment # 1.1
Criteria Used for Evaluating Implementation Options Is Flawed
In Section 4.4.4, the RWQCB identifies and explains the criteria it used for evaluating the 15 implementation options it developed. The six criteria identified are feasibility, cost to dischargers, cost to state, flexibility, time needed to implement and likelihood of success. The six identified criteria are incomplete, and fail to include two additional criteria that are at least as important, if not more so, than the six identified by the RWQCB.

The first missing criterion is the likelihood of meeting the water quality objectives. This is a criterion identified and used by the RWQCB when it considers its final four alternatives (See Section 4.4.7, p. 71), but it is not explicitly identified as a criterion at this point. Since the purpose of the implementation plan is to achieve attainment of the existing water quality objectives that apply to the LSJR at Vernalis (See p. 32), it seems obvious that the RWQCB must explicitly evaluate whether any of the options evaluated will meet such purpose.

While the likelihood of meeting the water quality objectives is not an explicit criterion, it is arguably an implicit one. In Section 4.4.5, particularly as part of the discussion of "feasibility," one of the six identified criterion, there is a mention of whether or not, or how likely, the proposed option would meet the water quality objectives. (See Options 5-12). This implicit inclusion seems inappropriate and unfair, however, since the explanation of the "feasibility" criterion provided by the RWQCB does not include consideration of whether or not the proposed option will achieve the water quality objectives.

According to the RWQCB, the evaluation of a proposed option's feasibility is based on (1) the technical feasibility, (2) the degree to which there is a clearly defined process, and (3) the degree to which any constraints or requirements associated with the implementation option is likely to be met. (See p. 42). If, as is suggested by the discussion of feasibility for each of the 15 options evaluated, the likelihood of meeting the water quality objectives is a consideration as to whether or not an option is feasible, the general explanation of feasibility on page 42 should clearly and unequivocally so state. Otherwise, when it is slipped in during the discussion of some, but not all, of the discussions for each of the various options evaluated, it appears that the criteria are being manipulated to ensure a particular outcome, rather than being evaluated on their face and having the outcome derive from the evaluation.

The second missing criterion is that of culpability or responsibility for the problem. The six identified criteria are completely neutral on their face as to whether or not the proposed option applies to the person, group or entity responsible for causing the water quality problems in the LSJR. (Arguably, the problem could be less in the establishment of the criteria for evaluating the

options and more in the selection of the options to be evaluated). The failure to have this criterion is particularly troubling since it has the effect, when combined with the application of the existing six criteria, and especially the "cost to dischargers" criterion, of making it more likely that the person, group or entity primarily responsible for causing the problem will avoid the primary responsibility for solving the problem.

For example, Option 8 considers a WDR for the CVP/USBR only. Facially, this makes sense since the RWQCB notes in several places that the operation of the CVP is the primary cause of the water quality problems to be addressed by the implementation plan. (See pp. 27, 38, and 39). However, this option does not get as high a score as other options, primarily because the cost to discharger and flexibility criteria are given a medium score of 3. (See p. 55). Indeed, the RWQCB notes in its discussion of the costs to discharger criterion that this option "could place increased responsibility on the USBR…" (Id.). This analysis, while perhaps correct, actually has the effect of working in the favor of the USBR/CVP, since the RWQCB apparently concludes that the cost to discharger would be too expensive when compared to other options, even though this is to be expected since the USBR/CVP caused the problem.

When discussing the criteria generally, the RWQCB notes that each criterion will be scored on a relative basis. (See pp. 42-43). This methodology would be fair if each option was focused on those responsible, since the final result would be the cheapest, most feasible and quickest to implementation. However, the failure to consider culpability or responsibility for causing the problem as either a criterion for evaluation or, in the alternative, in the development of the options evaluated, results in options that are focused on multiple parties, regardless of their responsibility, receiving higher scores when compared to those options focusing on fewer parties. Thus, for example, Option 11, which is the adoption of general WDRs to all public water agencies that discharge agricultural drainage into the LSJR, gets a low score of 4 for the cost to discharger criterion. The basis for this score, as explained by the RWQCB, is that there are 10 agencies that would be affected, and they could disperse the costs not only among themselves, but then again among their individual landowners, thereby diluting the costs over a larger number of parties than could be done in Option 8. Again, while this analysis may well be correct, it misses the point that not all, if any, of the 10 agencies or their landowners are the primary cause of the problem.

Unless culpability and responsibility for causing the problem is an explicit criterion (or drives the development of the options evaluated by the criteria currently used), factors such as flexibility and cost will favor options that affect a larger group of people, groups and entities, regardless of their responsibility for the problem. This will be true even if the RWQCB undertakes a phased approach, as is suggested in several options, that focuses first on high priority pollution sources. (See Options 6, 7, 8, 11).

Response:

The Regional Board staff's approach in developing the proposed control program was to initially evaluate a broad range of potential options that could be used to control salt and boron discharges. Staff used a screening level analysis to identify the most feasible control options and to limit the number of alternatives that were evaluated in detail. The screening analysis helped guide the development and selection of the 4 alternatives that are evaluated in detail. The criteria

used to evaluate the control options (feasibility, cost to dischargers, state costs, flexibility, time needed to implement, and likelihood of success) are appropriate and sufficient as described below.

Evaluating each control option for likelihood of meeting the water quality objectives was not practical or necessary because the individual control options do not necessarily need to be stand-alone programs of implementation. Control options can be combined with options or actions to form a control program (Alternative). Again, one purpose of the screening analysis was to limit the number of alternatives that were evaluated in detail. Evaluation of each control option's effect on water quality would require a detailed level of analysis, even for options that were determined to have a low feasibility. The likelihood of meeting water quality objectives, however, is an important criterion that was used to evaluate each of the four project Alternatives.

Staff agrees that analysis of the feasibility criterion needs to be uniformly applied to each control option. Staff has therefore revisited the evaluation and scoring of the feasibility criterion and have made appropriate modifications to the staff report.

Staff agrees that the CVP is one of largest sources of salt loading to the Lower San Joaquin River (LSJR); however, it is not the only source. The TMDL technical report places load allocations on all of the major controllable nonpoint sources of salt loading to the LSJR. The allocation framework that allocates loads is based on the area of nonpoint source land use from which a given discharge originates. This approach equitably distributes available loading capacity to all dischargers. Some discharges on the west side of the LSJR also receive a supply water credit to account for salts in their supply water. Additionally, the TMDL places a load allocation on the USBR that is equal to the volume of water they deliver at a salt concentration of 52 mg/L. The USBR is therefore responsible for any salt in their water supply that exceeds 52 mg/L. This is a significant level of responsibility that is commensurate with the impact of salt imports from the CVP.

The TMDL source analysis is used to identify all of the major sources of salt and boron loading to the LSJR. The level of responsibility assigned to each source is then assigned using TMDL waste load allocations and load allocations. The program of implementation lays out the actions that the Regional Board will take to implement the TMDL, however, the program of implementation does not affect the level of responsibility prescribed in the TMDL (as defined in the waste load allocations and load allocations).

Staff's approach in developing a program of implementation was to identify and evaluate all controllable sources of salt and boron that were identified in the TMDL source analysis. The USBR's level of responsibility is therefore not effected by the program of implementation.

Option 11 is actually for adoption of geographically focused general WDRs and not adoption of general WDRs for all public water agencies as indicated in the comments. In any case, based on the evaluation of control options, control options that focus on groups of dischargers (and specifically water districts) will generally be more effective than options that focus on individuals for a number of reasons including the following:

1. dischargers can pool resources and take advantage of water district expertise;
2. lower permitting and administrative costs (fewer permits required);
3. access to additional funding sources (e.g. grants, low interest loans); and
4. Regional Board's program would be more manageable

Staff disagrees with the main point of this comment, which is that criteria used for evaluating implementation options are flawed. It would be useful if the San Joaquin Tributaries Association could identify any additional control options that could be implemented by the Regional Board that were overlooked but should be evaluated, or identify any control option that was inappropriately "screened out" and not incorporated into one of the four project alternatives.

Comment # 1.2
Specific Evaluations Appear Flawed And Outcome Determinative
In Section 4.4.5, the RWQCB applies the six criteria discussed above to each of 15 options it developed to identify those options that are most likely to be successful. The evaluation results in a numeric score given for each of the five criteria, with the sixth criteria being the total score for each option evaluated. While the criteria themselves appear facially neutral, it appears that such criteria were manipulated in some instances.

The most glaring example of inconsistent and perhaps manipulative treatment of the scoring occurred for the time criterion. In the general description of this criterion, the RWQCB emphasized that the time at issue was not the time needed to achieve the water quality standards or to actually implement the prohibition, but rather the time needed to develop and implement an option, including the time to draft and adopt the necessary Basin Plan amendment language. (See p. 43). However, this general explanation was not always followed in the discussion of the various options evaluated.

The RWQCB estimated that the time for implementation would be one year or less for eight options (Options 1, 2, 3, 10, 12, 13, 14 and 15). However, not all of these options received the same score. Options 10, 12, 13, 14 and 15 all received a score of 5 (the best), while Options 1 and 2 received a score of 4, and Option 3 received a score of 1 (the worst). There does not appear to be any valid, logical reason as to why these options, each of which could be implemented in the same time period, would not receive the same numeric score. Option 3, which scored a 1, seems to be downgraded since the RWQCB would need to spend "a large amount of time and resources" to identify and address discharges not in compliance. (See p. 48). This explanation seems improper for two reasons. First, time and effort spent by the RWQCB is already covered in the "State cost" criteria for this option, which results in a score of 1. Second, the general explanation for time given by the RWQCB never mentions the time needed to identify and enforce noncompliance. If this is to be an aspect of the time criterion, it should be explicitly included in the general description. If not, the RWQCB should not be permitted to alter a score based upon this phenomenon.

Also of note among these eight options that could be implemented within 1 year is the fact that Option 10 is given the narrative score of "medium," followed by the numeric score of 5 (the best score). (See p. 58). This does not seem correct, as other options that received a narrative score of

"medium," be it for the time or other criteria, typically received something other than the highest possible score. (See Option 6 and 8, discussed below).

Three options, Option 6, 8 and 11, were estimated to be implementable in 1-2 years, and each was given the narrative score of "medium." However, Option 11 received a numeric score of 5 (the best), while Options 6 and 8 received numeric scores of 3. There is virtually no explanation given for either the narrative or numeric score given these options, and certainly nothing that distinguishes among them, explaining why Option 11 received the highest score despite taking longer than Options 1 and 2, each of which received a 4, possibly longer than Options 10, 12, 13, 14 and 15 which received the same score of 5, and taking the same amount of time as Options 6 and 8 that received a score of 3.

Finally, it should be noted that Option 7, which was estimated to be implemented in 1-3 years, received a narrative score of "low" (the best), and got a numeric score of 5 (the best). Again, this is despite the fact that it would take longer than almost all of the other options considered.

Simply put, there does not appear to be any rhyme or reason for the various scores, either numeric or narrative. To begin with, the explanation of the scoring system given by the RWQCB indicates that the options taking the longest time to implement will be given a 0, while the fastest will be given a 5. (See p. 43). However, this is not what occurred, as several options were given a score of 5, even though they were estimated to take longer to implement than other options considered. (Compare Option 7 with Option 3, for example).[1] Equally troubling is the unequal treatment among options that could be implemented in similar time periods (Compare Option 6 with Option 11).

This is important, since the unequal treatment affects the overall score of each of the various options evaluated. For instance, only eight options, numbers 2, 3, 4, 7, 8, 11, 12, and 13, were found to be consistent with existing laws and policies. (See p. 67). Of these, the total scores ranged from a low of 10 (Option 3) to a high of 24 (Option 13).

However, these scores would have been different had the time criterion been dealt with differently. Option 7 was the only one identified that might take as many as three years to implement. If it received a score of 1 based upon taking the most amount of time to implement, instead of the 5 it did receive, its score would have changed from 23 (the second highest) to 19 (third lowest). Similarly, had Option 8 received a 5, as did Option 11 (both of which were expected to be implemented in 1-2 years), Option 8's score would have gone from 19 to 21.

More important than the impact the disparate and unequal treatment of the score for the time component has on any one option is the suggestion that the document and analyses themselves, as a general matter, are untrustworthy.[2] The entire purpose of developing the amendment in a public process is to develop confidence in the process itself, even if certain groups or individuals are unsatisfied with the specific result. In this case, such confidence in the amendment as a whole can and will be undermined if it contains specific examples of disparate and unequal treatment that is neither in accordance with criteria established by the RWQCB nor adequately explained. The RWQCB's use of the time criterion in particular, but also all other criterion, must be reevaluated and applied in an even, straightforward manner that is at once in accordance with the

general guidelines established for that criterion and contains an adequate, reasonable explanation for differentiations in score for items with facially similar circumstances.

[1] Were the scoring system applied in strict accordance with the general description given on page 43, only Option 4, which would take no time to implement, should have received a numeric score of 5, since it could be implemented in the least amount of time.

[2] The time component was chosen as an example since the disparate treatment was so obvious. However, scoring for other criteria shares the same problem. For example, Option 12 scores a narrative "high" for feasibility, but gets a numeric 4, when all other options that received a narrative "high" received a 5. Also, Option 11 received a narrative score of "low" and numeric score of 4 for discharger cost, when all other options receiving a narrative score of "low" received a 5.

Response:
Staff agrees that there are inconsistencies in the scoring of control options, and as a result we have modified the scoring of control options as necessary. It's important to note, however, that numeric scoring is based on scale of 0 to 5, while the narrative generally ranks control options as low, medium, or high. An option that is narratively described as medium could therefore receive a score of 2 or 3 based on staff's assessment. The San Joaquin Tributaries Association will have the opportunity to review and comment on revisions included in the final draft Basin Plan Amendment staff report.

Staff disagree that the evaluation of the control options suggests that the document and analyses themselves, as a general matter, are untrustworthy. To the contrary, the screening of control options represents an extra step (not required) in the development of the proposed basin plan amendment that was used to help guide the development of project alternatives. The screening of control options creates a transparent process used to identify the project alternatives and provides an opportunity for reviewers to comment on this process. Staff also disagrees with the San Joaquin Tributaries Association's allegation that control option scoring was intentionally manipulated to reach a pre-determined outcome. As stated in the staff report, "[t]he evaluation of the implementation options is a subjective analysis used as a screening tool to identify the types of options that will be most effective. Its purpose was not to definitively select the single best option or to rule an option out entirely". The purpose of circulating a draft staff report is to consider, evaluate, and incorporate external points of view in the development of the Basin Plan Amendment. The fact that San Joaquin Tributaries Association has provided comments and the Regional Board is responding to those comments and revising the analysis is evidence that the Basin Plan Amendment process is trustworthy, open, and effective.

Comment # 1.3
Segue From Options to Alternatives Unclear
In Section 4.4.6, the RWQCB identifies the selection of four alternatives to be considered for implementation. While this Section explains that the alternatives developed were intended to incorporate a "combination of the most feasible and cost effective strategies," there is no specific reference back to any of the 15 options that were specifically considered, evaluated and scored in the previous Section. Given the obvious effort that the RWQCB undertook to identify, evaluate

and score the 15 options, it seems highly irregular that there is no further discussion of the role that the options and their scores played in the development of the four alternatives. Only by expressly relating the development of the four alternatives to aspects or combinations of the 15 options can the public have confidence in this process, and by extension in the outcome. As noted above, not everyone will agree with the outcome, but its success will depend in large part in the confidence of the public and those who will be subject to the plan finally adopted that the process was fair and not rigged or manipulated in any way.

Response:
Alternative 1 is the no project/no action alternative and does not originate from any of the control options, but is rather included for comparison and to satisfy the requirements of CEQA. Alternative 2 is a geographically based prohibition of discharge, which is primarily based on option 2 (geographically based prohibition of discharge). Alternative 3 is based on a combination of option 8 (adoption of waste discharge requirements for the USBR/CVP), option 10 (adoption of general waste discharge requirements for public water agencies), and option 11(adoption of geographically focused general waste discharge requirements). Alternative 4 relies on a combination of Waiver of WDRs, Focused General WDRs, and Management Agency Agreement (MAA) to address DMC discharges. Alternative 4 is primarily based on a combination of options 11, 12, 13, 15. Staff formulated the alternatives based on the evaluation of the control options.

A broad range of alternatives was selected based on consideration of the control options, but not every conceivable combination of options or every possible alternative was considered. This approach is consistent with Title 14 California Code of Regulations Section 15126.6(f) (CEQA guidelines) which states that:

> *" The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision making."*

The San Joaquin Tributaries Association should identify the alternatives that they believe were overlooked and/or state the reasons why the range of alternatives evaluated does not permit a reasoned choice.

Comment # 1.4
Consideration of No Project Alternative Is Flawed, Incomplete and Erroneous
The No Project alternative is described as continuing "to address salt and boron 6 discharges to the LSJR through the existing State Water Board and Regional Board Basin Plan policies. No change from the current level of regulatory oversight would occur." (p. 67). Later, the RWQCB explains that the No Project alternative "assumes that the provisions of the State Water Board's Water Right Decision 1641 will remain in effect." (p. 71).

The No Project alternative, like each of the four alternatives considered, is evaluated using four criteria: technical feasibility, likelihood of meeting water quality objectives, discharger cost to implement, and time needed to implement. (p. 70). Despite the fact that the RWQCB found that the No Project alternative "is technically feasible," "would be in effect immediately, " and would "require no additional discharger expenditure," the RWQCB does not recommend this alternative. (p. 71).

The RWQCB finds that this alternative is unlikely to meet the water quality objectives. (p. 72). It bases this finding on two grounds. First, that historical data shows that the Vernalis salinity standard has not been met at all times in the past, and second that modeling indicates that releases of dilution water from New Melones reservoir demonstrate that water quality exceedances will occur in the future. (p. 71-72). Both of these justifications are false are cannot withstand scrutiny.

The Historic Record Is Irrelevant to Current or Future Compliance Due To Recent, Significant Changes in Condition.

Prior to the SWRCB's adoption of D-1641, the USBR was required, as part of its permits for the New Melones Project on the Stanislaus River, to release water for water quality purposes measured at Vernalis. (D-1422, p. 31, condition 5). At that time (1973), the standard to be met was 500 ppm. However, the condition expressly required the USBR to use water from New Melones to meet any modification of that criterion.

D-1641 changed this. The SWRCB found that the "actions of the CVP are the principal causes of the salinity concentrations exceeding the objectives at Vernalis." (D- 1641, p. 89). As a result of this finding, the SWRCB amended all of the USBR's CVP permits, except for those at New Melones, making each conditioned upon the requirement that the Vernalis salinity standard be met.[3] (D-1641, p. 159-160). The USBR has, accordingly, been directed to "meet the Vernalis objective using any measures available to it." (D-1641, p. 89).

The reservoirs of the CVP have a total capacity of 12 million acre-feet. While it may well have been proper, before D-1641, for an analysis to focus on the USBR's ability to meet the salinity standards at Vernalis from New Melones, such focus is no longer appropriate. The USBR has a legal obligation, before diverting, storing or delivering any water by, at or through any facility of the CVP, to meet water quality at Vernalis. Whether or not it can do so solely using New Melones is simply no longer the sum total of the analysis that must be performed under the No Action alternative.

Thus, the RWQCB's reliance upon (1) the fact that the USBR has historically utilized "releases from New Melones Reservoir to dilute salt concentrations at Vernalis…," (2) modeling studies conducted for the 1995 Bay-Delta Plan, and (3) "historical water quality data indicates the LSJR frequently exceeds its water quality objectives during dry and critically dry year types…" (p. 71-72) is misplaced and irrelevant.[4] All of these items are based upon and/or analyze the USBR's use of New Melones only to meet the Vernalis salinity standard, and none analyze or consider the ability of the USBR to meet the Vernalis salinity standard using any or all of its other CVP

facilities as it is now required to do. The SWRCB's decision in D-1641 to condition the USBR's permits for all of its CVP facilities upon meeting the Vernalis salinity standard represents a changed condition that the RWQCB has not properly evaluated as part of its analysis of the No Action alternative.

[3] The permits for New Melones already required the USBR to meet water quality at Vernalis. D-1641 amended the USBR's permits for New Melones, but continued the requirement that the Vernalis salinity standard be met. (D-1641, p. 160-163).

[4] It is also not accurate. Recent testimony by Alexander Hildebrand and other Delta farmers before the U.S. District Court, Eastern District of California, indicates that the Vernalis salinity standard has not been violated since at least 1995. (CDWA v. USA, Case No. CV-F-99-5650 OWW DLB).

Proper Evaluation of No Action Alternative Will Show It to Be the Preferred Alternative.

Although the SJTA looks forward to a proper analysis of the No Action alternative that properly looks at the USBR's legal obligation to "meet the Vernalis objective using any measures available to it" (D-1641, p. 89), it does not seem too early to conclude that such an analysis should conclude that the No Action alternative is the preferred alternative and there is no need for further action by the RWQCB.

As noted above, of the four criteria used by the RWQCB to evaluate the four alternatives, the No Action alternative met three of them, with only the "likelihood of meeting the water quality objectives" criterion being found to not be met. However, this fourth criterion must almost certainly be found to be met since the USBR has the legal obligation to meet it. Absent a factual showing that the USBR simply cannot meet the standard utilizing its facilities of the CVP, the RWQCB must accept that the USBR will, in fact, comply with its legal obligation and meet salinity at Vernalis. The RWQCB has already acknowledged it must presume that a legal obligation to perform will be satisfied, as it properly relied upon the fact that the USBR will meet its legal obligation to provide drainage to the Grasslands Drainage Area, in part, to justify its findings under CEQA that the implementation of its proposed alternative will not have significant impacts to biological resources. (See p. 99). Indeed, the RWQCB concluded that while the USBR was evaluating three different options for providing drainage, whichever option it picks "will therefore result in a reduction of flow to Mud Slough and the LSJR…" The same can and must be said in this case. Whatever option the USBR picks to meet water quality at Vernalis, it will be met.

Response:
The State Water Board's D-1641 also directed the Regional Board to promptly develop and adopt salinity objectives and a program of implementation for the main stem of the San Joaquin River upstream of Vernalis. Additionally D-1641 recommended that the Regional Board evaluate a real-time water quality management program to regulate the timing of agricultural discharges to the San Joaquin River. Furthermore, the State Water Board's 1995 Water Quality Control Plan for the San Francisco/Sacramento San Joaquin Delta Estuary (Bay Delta Plan) indicates that *"[e]levated salinity in the southern Delta is caused by low flows, salts imported in irrigation*

water by the State and federal water projects, and discharges of land-derived salts, primarily from agricultural drainage. Implementation of the objectives will be accomplished through the release of adequate flows to the San Joaquin River and control of saline agricultural drainage to the San Joaquin River and its tributaries."(emphasis added). The Bay Delta Plan also directs the Central Valley RWQCB to continue it's load reduction program and to reduce annual salt loads discharged to the San Joaquin River. The State Board adopted D-1641, in part, to implement the flow related implementation components of the Bay Delta Plan. It is the responsibility of the Regional Board to implement the load or discharge based controls needed to achieve the Bay Delta Plan objectives.

The LSJR is on California's CWA Section 303(d) list of impaired waters due to elevated concentrations of salt and boron. The CWA requires states to develop TMDLs for all impaired waters. Water quality data indicates that the San Joaquin River frequently exceeds water quality objectives during the irrigation season. This is especially true during prolonged dry periods. The proposed TMDL and implementing basin plan amendment is needed to bring the LSJR into compliance with water quality objectives and to satisfy the Regional Board's Clean Water Act obligation. Staff acknowledges that the Vernalis salinity objective has been met since 1995, however, this period is not representative of the full range of climatic/hydrologic conditions that can occur. The last eight years have been relatively wet (4 wet years, 2 above normal, 2 below normal, and 1 dry) and it is unlikely that the standard will continue to be met under drier conditions.

The proposed salt and boron TMDL uses a phased approach because new or revised water quality objectives for salinity and boron are being developed to satisfy the State Water Board's directive. The first phase of the TMDL is focused on meeting the existing salinity objectives at Vernalis. The LSJR, however, is listed as impaired for salt and boron from downstream of the Mendota Pool to Vernalis (approx.130 river miles). In general, salinity concentrations in the river progressively increase moving upstream of Vernalis. The proposed TMDL and implementation framework will be used to carry out subsequent phases of the TMDL, and will eventually address the entire impaired reach. The no project alternative will therefore not meet the most basic objectives of the proposed project which including the following:

- assuring that the existing water quality objectives will be met on a consistent basis during all conditions;

- establishment of a program of implementation to control salt and boron discharges to meet the existing salinity objective for Vernalis and future objectives established for the LSJR upstream of Vernalis;

- fulfilling the intent of the 1995 Bay Delta Plan and the directives specified in D-1641; and

- fulfilling the Regional Board's Clean Water Act responsibility for developing TMDLs for 303(d) listed waterbodies.

Comment # 1.5

The Recommended Option is Fatally Flawed Since it Will Not Eliminate Violations of the Vernalis Salinity and Boron Standards.

The RWQCB expressly found that the "waste load allocations and load allocations presented in this TMDL are designed to meet salinity and boron water quality objectives in the LSJR at the Airport Way Bridge near Vernalis." (Id.; see also p. 1). Thus, according to the RWQCB, implementation of its preferred alternative should meet the salinity and boron standards at Vernalis.

Unfortunately, this is not the case. None of the alternatives considered by the RWQCB for implementation, including its preferred alternative, will meet the salinity and boron standards measured at Vernalis at all times and under all conditions. (See p. 77-78). Indeed, if the preferred alternative is implemented, it is expected that water quality violations will continue to occur in all but the wettest years. (See Fig. 4-1, p. 78).

The SWRCB was sued for regarding its implementation plan (D-1641) for the 1995 Water Quality Control Plan by parties that argued that the plan did not fully implement either the flow requirements at Vernalis or the narrative standard for the doubling of salmonids. (See State Water Resources Control Board Cases, Sacramento Superior Court Case No. JC 4118). In the judgment of the Superior Court in that case, the SWRCB's adoption of the San Joaquin River Agreement/Vernalis Adaptive Management Plan as an alternative and phased approach to meeting certain elements of the 1995 Water Quality Control Plan was inappropriate. The court found that the flow requirements identified in the 1995 Water Quality Control Plan were "legal minimum flow objectives that must be satisfied unless changed in an appropriate proceeding to modify the 1995 Plan itself." (May 5, 2003 Decision, p. 90).

The Sacramento County Superior Court's decision in this regard is the subject of an on-going appeal. Such appeal is based, in part, upon the fact that the SWRCB clearly intended the performance of the San Joaquin River Agreement/Vernalis Adaptive Management Plan to be a part of a staged implementation of the 1995 Water Quality Control Plan's objectives. (See D-1641, p. 24). While at first glance it appears that the RWQCB here is providing for a similar phased implementation, there is a key difference. As recognized by the SWRCB, the 1995 Water Quality Control Plan itself recognized that some of its objectives were based upon limited scientific information and specifically provided for a reevaluation of such objectives once additional information and evidence became available. (Id.). This does not appear to be the case here, where the RWQCB justifies its claim of phased implementation upon the fact that new or revised water quality objectives for salinity and boron "may be established…" (See p. 34)(emphasis added). This seems to be a crucial difference between the actions taken by the SWRCB regarding the 1995 Water Quality Control Plan and D-1641, and the actions taken by the RWQCB in this case.

Unless it can be stated with certainty that the water quality objectives for salinity and boron will be changed, amended or revised, it seems that such standards must be considered the legal minimums that must be met by any implementation plan adopted by the RWQCB. Since the RWQCB's preferred alternative will not result in an elimination of the violations of the salinity

and boron standards measured at Vernalis, it seems that adoption of the preferred alternative will be legally insufficient.

Response:
Staff acknowledge that implementation of the proposed TMDL may not result in attainment of the Vernalis salinity objective at all times. A combination of both salt load controls and flow modification is likely needed to meet the Vernalis Salinity objective under all conditions. The Regional Board, however, has no authority with regard to water rights. Issues related to water rights are the purview of the State Water Board, through its Division of Water Rights. Staff has, per State Water Board direction, developed a program that focuses on controlling discharges of salts to the LSJR. Based on this and other comments received to date, policy statements are included in the proposed Basin Plan requesting the State Water Board to continue to use its water rights authority to prohibit water transfers if they contribute to water quality impairments and to continue to condition water rights on the attainment of salinity water quality objectives when these objectives cannot be met through drainage controls alone. Such additional flows will continue to be needed to attain water quality objectives.

Comment # 1.6
CEQA Analysis Is Incorrect
The RWQCB proposes filing a Negative Declaration, finding that the adoption of its preferred alternative could not have a significant effect on the environment. (See p. 89). However, the analysis provided with the attached draft negative declaration strongly suggests that a negative declaration is inappropriate.

Response:
Pursuant to Section 21080.5 of the Public Resources Code, the Basin Planning process is a certified regulatory program. As such, documents prepared in connection with the Basin Plan Amendment may be substituted in lieu of an Environmental Impact Report (EIR). These documents must include either alternatives to the activity and mitigation measures to reduce any significant or potentially significant effect that the project may have on the environment or a statement that the project would not have a significant impact on the environment. Staff agrees that preparation of a Negative Declaration would be inappropriate since the Regional Board is exempt from preparing a Negative Declaration, or an EIR for that matter. The CEQA analysis contained in Section 6 of the Staff Report has therefore been updated and language indicating that the Regional Board intends to adopt a Negative Declaration has been removed. The Basin Plan Amendment staff report and supporting appendices are functionally equivalent to an EIR. The Basin Plan Amendment staff report includes alternatives and mitigation measures to reduce significant impacts. The revised staff report no longer contains a Negative Declaration.

Comment # 1.7
Agricultural Resources May Be Affected
The draft negative declaration indicates that the adoption of the preferred alternative will have "no impact" on agricultural resources. (See p. 90). The justification for this seems two-fold. First, the RWQCB argues that adoption of the alternative will not convert farmland directly, nor dictate any particular management practice. (See p. 97). Second, it argues that costs have been

"minimized." (See p. 98). These arguments seem to directly conflict with an earlier discussion of economics and impacts to agriculture contained in the amendment.

The RWQCB found that the adoption of the preferred alternative would increase costs to farmers of between $25 and $35 per acre per year, or perhaps between $14 and $19 per acre per year with the adoption of certain management practices. (See p. 85-86). The RWQCB notes that cost increase only seems relatively modest, and recognizes that "some of the major crops grown in the San Joaquin Valley are not profitable because costs often exceed revenues. Adding additional costs to marginally profitable or unprofitable agricultural operations **will be detrimental to agricultural interests** in the LSJR watershed." (See p. 86)(emphasis added).

The fact that the RWQCB claims to have minimized the costs to farmers is not a substitute for evaluating whether or not the costs will result in the conversion of agricultural land. From the analysis provided by the RWQCB on pages 85 and 86, at a minimum it seems that a more thorough analysis will need to be made to determine if the increased costs that are expected are such that they will likely make marginally profitable and/or unprofitable agricultural land be converted to non agricultural uses. The SJTA will not speculate as to what the results of such an analysis might show, but it seems clear that under CEQA such an analysis must be performed before determining whether or not a significant impact to agricultural resources will result from adoption of the preferred alternative.

Response:
The proposed control program does not cause a direct conversion of agricultural land. Entities affected by this control program have a number of means to comply with the proposed discharge limits. Additional economic analysis has been added regarding costs to agriculture. The analysis, however, does not speculate how entities will comply with the control program and does not speculate what, if any, agricultural land will be taken out of production. . For purposes of CEQA, economic impacts, by themselves, are not considered significant effects on the environment.

Comment # 1.8
Biological Resources Analysis Is Incomplete
Although the RWQCB finds that the adoption of the preferred alternative would have either "no impact" or a "less than significant impact" on biological resources (See p. 91), such conclusion again seems belied by the supporting analysis, which readily admits that the project would result in a reduction in flows and that "there are potential adverse impacts associated with reduced flows." (See p. 99). The RWQCB argues that these adverse impacts, which may accrue to such special status species as Giant Garter Snake, California Red Legged Frog, Western Yellow-Billed Cuckoo, Bald Eagle and Swainson's Hawk, will be "offset" by the benefit of removing salt and boron from the LSJR. (See p. 99-100). This argument is erroneous and improper.

Even assuming that the proposed project will reduce pollution, and that such reduction will be a benefit to the species that use the resource, such reduction does not by itself mean that the associated reduction in habitat will be mitigated or offset. Indeed, the RWQCB notes that the expected reduction in flows will "reduce the quantity of habitat for aquatic and riparian-dependent organisms." (See p. 98). How or why the RWQCB concludes that better water quality

somehow offsets the reduction in habitat is simply not clear. While it is possible that a thorough analysis would support this conclusion, no such analysis is provided. To the contrary, at first glance, it does not even seem that the two issues (habitat quantity and water quality) are even related for the identified species or any other species. There is no indication or discussion about how the reduction of salinity and boron will improve the quality of the habitat for any species even as it reduces the overall quantity of habitat.[5]

Moreover, from a strict CEQA analysis standpoint, the RWQCB must admit that there will be adverse impacts to biological resources as a result of the project. The pertinent question on page 91 asks whether or not the project would "Have a substantial adverse effect, either directly, or through habitat modifications, on any species identified as a candidate, sensitive, or special status species…" The analysis on pages 98-100 answers this question affirmatively. While the RWQCB may be able to argue that such impacts will be mitigated through the reduction in pollution, at a minimum it must admit the impact will be significant unless mitigated.

The RWQCB's treatment of the biological resources issue for CEQA is legally insufficient and intellectually dishonest.

[5] The RWQCB argues that the salinity TMDL was designed to restore beneficial uses, including fish and wildlife habitat. (See p. 100). This seems incorrect, at least for salinity. The salinity standard was adopted for the protection of agriculture in the Delta. The SJTA is not aware of any studies indicating that fish or wildlife are adversely impacted by the salinity levels of the LSJR.

Response:
The CEQA analysis contains a discussion that the project could result in a reduction in flows. This discussion acknowledges that certain actions taken by dischargers to comply with the control program could result in reduced flows. The CEQA checklist has been updated to acknowledge that the potentially significant impacts to biological resources could occur unless mitigation is incorporated. The CEQA analysis in Section 6 of the staff report has also been expanded to further explain the mitigation that has been incorporated into the project to reduce impacts to biological resources.

Staff analysis concluded that the proposed control program may have an affect on flow but the preferred alternative includes recommendations to the State Water Board to mitigate for any possible flow reductions. The revised draft staff report recommends that the State Water Board continue to condition water rights on attainment of Vernalis water quality objectives. Despite potential impacts to biological resources, the beneficial uses of the LSJR must be protected. The Regional Board is required to undertake these actions to comply with the statutory mandates contained in the Porter- Cologne Water Quality Control Act and the Clean Water Act. This control program balances the need to protect the beneficial uses of the LSJR versus the potential adverse environmental effect of reduced flows in the LSJR upstream of Vernalis

Comment # 1.9
Mandatory Findings Of Significance Improperly Treated
One of the mandatory findings of significance questions asks whether or not the project has "the potential to…reduce the habitat of a fish or wildlife species…" (See p. 96). As noted in the

discussion in Section F.2 above, the RWQCB clearly states that the adoption of the preferred alternative "could reduce the quantity of habitat" for a number of riparian and aquatic species. Despite using almost the same language to describe the impact as is used in the CEQA question, the RWQCB ironically and disingenuously finds that the project will not have any significant impacts, and fails to discuss the issue in the single narrative paragraph that discusses the mandatory findings of significance. (See p. 103). Clearly, the RWQCB must acknowledge that the project will reduce the available habitat for some aquatic and riparian species. Whether or not this adverse effect can be mitigated (and whether or not an EIR is required) is an analysis that simply is not provided and is legally required.

Response:

See response to Comment # 1.6 and Comment # 1.8.

Comment # 1.10
Adoption of TID Comments
The SJTA hereby adopts as its own and incorporates the comments, arguments and recommendations provided by the Turlock Irrigation District regarding the proposed Amendment.

Response:
The comments of the Turlock Irrigation District and those of the San Joaquin Tributaries Association are somewhat incongruent. The Turlock Irrigation District comments seem to acknowledge the need for the TMDL and propose an alternate concentration based approach. On the other hand, the San Joaquin Tributaries Association's comments indicate that the TMDL is not needed, since they recommend the no project/no action alternative as the most appropriate alternative. The following excerpts from the comments provided by the Turlock Irrigation District are illustrative of these fundamental differences:

> *"To effectively address salinity in the Lower San Joaquin River (LSJR), the Total Maximum Daily Load (TMDL) and Basin Plan Amendment (BPA) must accomplish two important objectives: 1) to comply with salt and boron concentration objectives throughout the segment, and 2) to transport salt out of the basin to avoid a net salt build-up and degradation of ground and surface waters." (TID comments dated January 20, 2004, Page1)*

> *"In their November 2002 written comments, the TID proposed a concentration-based approach to the TMDL, which would greatly simplify the TMDL and would address both aspects of the salinity problem - meeting water quality objectives and transporting salt out of the basin to maintain a long-term salt balance." (TID comments dated January 20, 2004, Page16)*

> *"Water quality objectives for salinity, to protect agricultural water supply use, are currently being exceeded in the San Joaquin River.". (TID comments dated January 20, 2004, Attachment I)*

> *"Salinity levels in the San Joaquin River over the last 15 to 20 years have ranged widely, from 200 to 1300 uS/cm. Historic monthly average EC levels measured at Vernalis during that time frame frequently exceeded the concentration objectives of 700 uS/cm and 1000 uS/cm (Figure 8), particularly during the low flow conditions of the late 1980's and early 1990's." (TID comments dated January 20, 2004, Attachment I)*

Staff have evaluated and responded to the comments submitted by the Turlock Irrigation District (see responses to commenter number 6).

Comment Letter # 2: City of Modesto

January 16, 2004

Comment # 2.1
In general, the City of Modesto is encouraged by the Regional Water Quality Control Board (RWQCB) staff's analysis and the overall flexibility of the proposed control plan. However, even as an acknowledged "small" contributor to the salt and boron loading into the San Joaquin River, the City of Modesto Wastewater Treatment Facility would be required to make unreasonable and expensive plant modifications to implement the proposed limits. Such modifications are difficult for the City to justify to its citizens and ratepayers since their sacrifices to build expensive plant modifications would not result in a detectable change in the River salinity.

Response:
WLAs are needed as part of overall salinity control program to reduce total salt loads in order to achieve consitent compliance with the existing salinity water quality objectives, which in turn are designed to protect the beneficial uses of the LSJR. Waste load allocations apply to point source discharges and there is no exemption for "small" point source discharges.

Comment # 2.2
Additionally, the City views the use of the downstream Vernalis water quality objectives as effluent limits as constituting new water quality objectives; new water quality objectives must be adopted pursuant to the Porter-Cologne Water Quality Control Act (Porter-Cologne).

Response:
The water quality objective for salt in the San Joaquin River is an existing objective. The proposed TMDL does not propose to revise the salinity objective. The proposed salt and boron TMDL does not include an amendment to a Basin Plan water quality objective, it only proposes to implement an existing objective.

Comment # 2.3
Finally, though the City is supportive of pollutant credit trading because it has potential to offer more environmental benefit per ratepayer resource as compared to plant modifications, a trading program is not in place and is not likely available as an alternative before the City renews its NPDES permit.

Response:
The proposed Basin Plan Amendment language allows and encourages pollutant trading and real-time management as way to reduce costs and make compliance with waste load allocations less burdensome. The scope of a pollutant trading system could be basin wide, regional, or even local. Staff agrees that development of these programs would require a significant effort and that there is no guarantee that these efforts will be successful.

The Regional Board has the authority and responsibility to set waste load allocations, however, the Regional Board cannot specify the method of compliance with waste load allocations. Implementation of real-time management and or pollutant trading is left up to the individual participants.

Comment # 2.4

City's inability to achieve objectives as effluent limits

When applied to the last few years of City effluent data, the proposed effluent limitations (700 µS/cm from April through September and 1,000 µS/cm from October through March) would have been achieved less than 5% of the time using the proposed 30-day rolling averages. Figure 1 below shows the proposed limits superimposed over the historical conductivity since the cannery segregation project came online (1999). The City effluent is typically just above 1,000 µS/cm, and is permitted to discharge to the river only during wet weather months (November through May) at a minimum dilution of 20:1. Because of the treatment process and the large volume of on-site storage, the conductivity variability is very low (std. dev. = 49 µS/cm) and is likely most heavily influenced by weather conditions. Under the proposed limits, the City would need to reduce the conductivity of the discharged effluent by 30 to 40% during April and May discharge periods. Conductivity reductions of this magnitude are not possible through source control measures alone, and would require the plant to upgrade to a reverse osmosis (RO) treatment train. RO treatment is expensive, energy intensive, and results in large volumes of brine that would need to be exported elsewhere at a very high ongoing cost.

The City has put in place a number of successful control programs including the cannery segregation project, which diverted a large fraction of the salt load out of the discharge effluent. The cannery segregation project has diverted approximately 10 million pounds of salt per year from the discharged effluent.1 Because the major cannery industries are now diverted, there are few remaining dischargers to target besides domestic sources. The City's water supply is both surface water and groundwater with more reliance on groundwater during warm weather periods of higher demand. Additional surface water is not currently available to reduce the overall conductivity of the source water. A City ordinance banning the use of self-regenerating water softeners would reduce the influent conductivity, but not to the levels necessary to comply with the proposed irrigation season effluent limit.

The treatment plant discharge is permitted only between November and May, which excludes the City from contributing salinity during the more critical summer irrigation periods. The discharge is also limited to a 20:1 river flow to effluent flow dilution. The large volume of storage and real-time management of discharge volume already in place is precisely the type of infrastructure and discharge management that the proposed amendments are asking for from many of the agricultural, non-point sources.

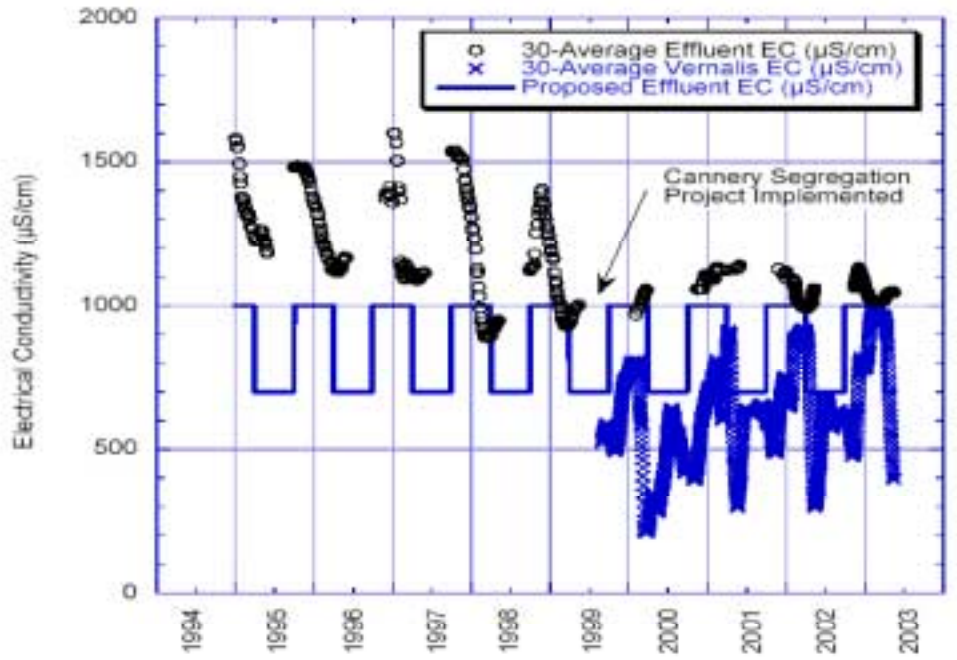


Figure 1. Historic Electrical Conductivity in Modesto WWTF Effluent and Downstream Receiving Water

Response:
Staff appreciates the Cities ongoing efforts to reduce effluent salinity concentrations. Staff believes that City will be able to meet water quality objectives if a combination of actions are implemented, including additional source controls, supply water quality improvements, plant modifications, pollutant trading and/or real-time management.

Comment # 2.5
Water quality objectives
Since the late 1960's, Delta salinity has been a major issue for the Central Valley Regional Board and the State Water Board. For the most part, the focus of the salinity objectives has been on the impact of diversions and flow on Delta salinity. While the salinity objectives for the Delta have been discussed, analyzed and evaluated since the 1960's, implementation of actions to achieve such objectives has primarily been reliant upon river flow and subsequent water rights decisions.[2] Over this forty-year history of developing salinity objectives and programs of implementation, municipal wastewater has never been identified as a major contributor to salinity in the San Joaquin River. Consequently, no program of implementation has been previously developed to apply these objectives to municipal wastewater treatment plants as end-of-pipe limitations. As a result, the Regional Board and the State Water Board have never subjected or evaluated such actions with regard to the public interest factors as required by Water Code section 13241 or the program of implementation requirements contained in Water Code section 13242.

As currently drafted, the basin plan amendment, TMDL, staff report and supporting documentation does not address or consider the cost of complying with the Vernalis water quality objectives for municipal dischargers. In fact, Appendix 4, which is the economic

analysis, is over 20 pages long and never once mentions or considers costs for municipal dischargers. The Regional Board's failure to consider costs and the other public interest factors associated with section 13241 is potentially a fatal flaw in the basin plan amendment and TMDL.

Although not controlling as a matter of law over the Central Valley Regional Water Quality Control Board, a recent Superior Court decision addresses the application of Water Code section 13241 to basin plan amendments that incorporate a TMDL and its program of implementation.[3] In its decision, the Court found that had the TMDL originally been part of the Basin Plan that it would have received economic considerations pursuant to section 13241. Consequently, it was reasonable to conclude that the same considerations should be made when amended into the Basin Plan. Based on the court's logic, the basin plan amendment being considered for this TMDL must also be analyzed pursuant to section 13241 of Porter-Cologne. That includes considering the cost to municipal dischargers to consistently comply with effluent limits that are set equal to the Vernalis Water Quality Objectives.

[2] Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, 95-1WR, (May 1995) at page 4; "Most of the objectives in this plan will be implemented by assigning responsibilities to water rights holders because the factors to be controlled are primarily related to flows and diversions. This plan, however, is not to be construed as establishing the responsibilities of water rights holders. Nor is this plan to be construed as establishing the quantities of water that any particular water rights holder or group of water rights holders may be required to release or forgo to meet objectives in this plan. The SWRCB will consider, in a future water rights proceeding or proceedings, the nature and extent of water rights' responsibilities to meet these objectives."

[3] *Cities of Arcadia, Baldwin Park, etc. v. State Water Resources Control Board*, Statement of Decision, Superior Court, County of San Diego, Judge Wayne L. Peterson, December 24, 2003.

Response:
The water quality objective for salt in the San Joaquin River is an existing objective. The proposed TMDL does not propose to revise that objective, so the Regional Board is not required to consider the factors in Water Code section 13241 in developing an implementation program to meet the objective. The water quality objective applies to the water body, not to individual dischargers; individual dischargers must be subject to requirements to meet the objective even if that requires meeting the objective at the end of pipe. In addition, 40 CFR section 130.2(h), the term "wasteload allocation" (WLA) is defined as the "portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs constitute a type of water quality-based effluent limitation." The definition of a WLA does not exclude municipal wastewater facilities from consideration in preparing a TMDL; to the contrary, existing and future point sources are included in the definition of WLA. There is no deminimis exemption in the definition of WLA.

Comment # 2.6
Pollutant trading
The proposed amendment document suggests that these conductivity limits could be met using a pollutant trading system. No pollutant trading system currently exists within the Central Valley

Region or California. Moreover, similar attempts at water quality based pollutant trading in California have stalled and have been highly contentious because of strong resistance from environmental and other interest groups. While the City of Modesto supports the concept and policy of pollutant trading, it is not appropriate for the Regional Board to deflect municipal cost considerations with such a program until it is viable. In addition, it is not feasible or reasonable to expect that such a system would be in place before the proposed effluent limitations are effective in the City's NPDES permit. Consequently, the Regional Board should not rely upon such an alternative in the implementation program until the framework for a pollutant trading system has been universally accepted

Response:
See response to Comment # 2.3

Comment # 2.7
Schedule of compliance
The proposed amendment identifies the City of Modesto effluent discharge as a low priority for compliance with a compliance schedule of 16 years (wet through dry year types) and 20 years (critical year type). While the City appreciates the Regional Board's generous time schedule for low priority dischargers, we are concerned that as currently drafted the language does not clarify that it supersedes other time schedule provisions within the Basin Plan. The City requests that the language be amended accordingly.

Response:
The compliance schedules in the proposed Basin Plan Amendment, if adopted, are the time schedules needed to comply with the SJR salinity control program. Time schedules may be shorter, if needed, to achieve compliance with other programs or permit conditions. The times presented are therefore a maximum allowable time for compliance.

Comment # 2.8
Dilution from Tuolumne and Stanislaus rivers
Finally, the proposed plan applies a downstream water quality objective to an upstream effluent discharge effectively creating a new water quality objective. Application of this downstream objective does not consider the significant effects of dilution provided by the Tuolumne and Stanislaus Rivers. Moreover, the RWQCB is in the process of developing upstream water quality objectives through the appropriate rulemaking process. Establishing a new water quality objective should consider the best scientifically defendable information and the economic impact for implementation. It is premature for the Regional Board to adopt this basin plan amendment and total maximum daily load (TMDL) until the Regional Board has completed its process of adopting upstream water quality objectives.

Response:
See response to Comment # 2.5 for comments pertaining to the application a downstream water quality objective to an upstream effluent discharge.

See response to Comment # 3.2 for comments regarding establishment of new water quality objectives.

Comment Letter # 3: San Joaquin County

January 22, 2004

Comment # 3.1
San Joaquin Flood Control and Water Conservation District and San Joaquin County (collectively ‘‘San Joaquin County’’ or the ‘‘County’’) are encouraged that the Regional Board is beginning to address the salinity problem of the lower San Joaquin River. However, the proposed Amendments to the Water Quality Control Plan for the Sacramento and San Joaquin River Basins for the Control of Salt and Boron Discharges into the San Joaquin River (‘‘Amendments’’) are not enough. The Regional Board must do more and has been directed to do more. The County provides the following comments to the Amendments.

Response:
Comment noted.

Comment # 3.2
The Amendments fail to establish salinity objectives upstream of Vernalis
The proposed Amendments implement a Total Maximum Daily Load (TMDL) for Salt and Boron in the Lower San Joaquin River. This TMDL is designed to meet the salt and boron water quality objectives established at Vernalis. The proposal is to further regulate discharges into the San Joaquin River, but the objective standard is still only set at Vernalis. For meaningful progress and improvement of the water quality to protect beneficial uses, salinity objectives must be set at additional locations on the San Joaquin River upstream of Vernalis in addition to a plan of implementation to meet the salinity objectives.

For many years the Regional Board has been working on a Basin Plan Amendment to establish salinity objectives on the San Joaquin River upstream of Vernalis. In 1999 the State Board directed the Regional Board in Decision 1641 to ‘‘promptly develop and adopt salinity objectives and a program of implementation for the main stem of the San Joaquin River upstream of Vernalis.’’ (Emphasis added.) The Regional Board is subject to the direction of the State Board and it is impossible to interpret the Decision 1641 other than meaning that the upstream standards should have been set. Since 1999, five years have passed. During the Regional Board Workshop on December 5, 2003, Regional Board staff indicated that staff is working on proposing objectives upstream of Vernalis. However, at this time, these proposals are not available. The Regional Board must establish such objectives immediately and the current Amendments should be implemented in coordination with the establishment of salinity objectives upstream of Vernalis.

The Regional and State Board have acknowledged the serious degradation of the San Joaquin River for many years. In the 1995 Bay Delta Water Quality Control Plan the Regional Board was directed to implement a plan to reduce the annual salt load in the San Joaquin River by at least 10%. During the 1999 Triennial Review staff indicated it was scheduled to propose a Basin Plan Amendment to include water quality objectives and an implementation plan for salinity and

boron by December 1999. In December 1999 the State Board in D 1641 directed the Regional Board to promptly adopt salinity objectives upstream of Vernalis. The Regional Board's April 2000 Staff Report stated that it was preparing the proposed Basin Plan amendment addressing salinity. In March 2001 Regional Board staff stated that progress on the Basin Plan Amendment and establishing objectives upstream of Vernalis had been halted. Then in September 2002 Regional Board Staff Workshop stated that a draft Basin Plan Amendment establishing salinity objectives upstream of Vernalis would be available in the fall of 2002. This did not occur. During the December 2003 Regional Board Workshop on the implementation plan for salt and boron Regional Board staff indicated the draft to establish salinity objectives upstream of Vernalis was still not available. The Regional Board must make progress and establish such standards. The State Board's direction to the Regional Board in 1999 was clear and precise. It cannot be construed to apply only to Vernalis.

Historically San Joaquin County has proposed that a salinity standard be set above the Merced River. There is a recent proposal to set and measure the applicable standard at the Newman Wasteway of the Delta Mendota Canal. This recent proposal is acceptable. It is urgent that a standard be set to protect beneficial uses upstream of Vernalis. This standard should be at least the same standard as the Vernalis standards in order to protect beneficial uses upstream of Vernalis.

Response:
Establishment of new water quality objectives was excluded from the initial phase of the TMDL by design so that significant improvements in water quality could be achieved without further delay. The Basin Plan Amendment staff report describes the phasing of this TMDL (Section 4.4.1). This section of the report explains that water quality objectives will be proposed as part of a Basin Plan amendment that is concurrently being developed. It further explains that methods adopted in this initial phase of the TMDL will be applied to implement these new objectives, when adopted.

Staff believes phasing is appropriate because establishment of water quality objectives for the upper reaches of the LSJR will be extremely difficult; this difficulty would likely result in delayed adoption of this TMDL. Such a delay may be unacceptable to downstream and environmental interests and the U.S. EPA. Establishment of water quality objectives for the upper reaches of the LSJR will be extremely difficult because of issues related to use attainability as defined in the Clean Water Act. In particular, hydromodifications that contribute to extremely low and no flow conditions make attainability of objectives established to protect beneficial uses potentially difficult or impossible. The Regional Board cannot afford to delay adoption of TMDLs while conducting a use attainability analysis, a process that could take three to five years. In the interim, the initial phase of this TMDL would provide the framework for how new water quality objectives would be implemented. The TMDL represents an important first step toward improving salinity conditions in the LSJR.

This first phase is consistent with D-1641 because the TMDL recognizes that U.S. Bureau of Reclamation (USBR) operations have significantly impacted salinity conditions in the LSJR and places full responsibility on the USBR for the salts imported to the LSJR watershed through the Delta Mendota Canal (DMC). The first phase is therefore "front-loaded" since water quality

impacts of the impaired water supply must be fully mitigated now. This, however, will not provide relief to the City of Stockton, Stockton East Water District, and others interested in a water supply from New Melones Reservoir, since the USBR could still use New Melones water to mitigate for their contribution to the salinity.

In response to comments, staff will make clear in the executive summary and proposed Basin Plan language, the phased nature of the TMDL and program of implementation. Also in response to comments, staff will develop a timeline for proposing new water quality objectives and include this timeline in the proposed Basin Plan amendment language.

Comment # 3.3
Amendments provide Bureau more years of delay
The Amendments provide that the Regional Board will ‘‘attempt to enter into a Management Agency agreement (MAA) with the State Water Resources Control Board and the U.S. Bureau of Reclamation’’ to address salt imports from the Delta Mendota Canal (DMC) to the lower San Joaquin River. It is unclear what this proposed MAA will address. The Bureau is currently not otherwise addressing salinity problems of the San Joaquin River and the Amendments provide the Bureau with at least two more years of delay. More delay on top of more than 40 years of delay should not be allowed.

In 1961 the County sought and obtained the passage of the San Joaquin River Protection Act (Wat. Code §§ 22000 et seq.) which ‘‘declared that a serious problem of water quality exists in the San Joaquin River between the junction of the San Joaquin River and the Merced River and the junction of the San Joaquin River and Middle River.’’ Wat. Code § 12230. The serious problem of water quality was recognized by the State as early as 1961.

In 1960 when the United States Congress authorized construction of the San Luis Unit of Central Valley Project (Act of June 3, 1960, Public Law 86-188, 74 STAT. 156) it provided that the construction of the San Luis Unit shall not be commenced until there were assurances for the drainage system for the San Luis unit. This was the out of valley drain, which has never been constructed. The Regional Board has identified the valley-wide drain as the only feasible long-term solution to the drainage problem. D-1641 p. 85. In Firebaugh Canal Co., et al. v. United States of America, et al., (9th Cir. 2000) 203 F.3d 568, the Ninth Circuit Court of Appeals required the Bureau to provide drainage service. Despite court orders, the Bureau continues to delay making meaningful progress on the out of valley drain. Other meaningful proposals have been considered to address the salinity problems of the lower San Joaquin River, including re-circulation and other controllable factors and real time management practices. However, no real progress has been made by the Bureau. The Bureau should no longer be allowed to control the timetable; the Regional Board must take charge.

The Amendments ‘‘encourage’’ the Bureau to enter into a Management Agency Agreement. There is no teeth to these Amendments. Based on the 40 years of history, the Bureau will not address the salinity problems facing the San Joaquin River until the Bureau is forced to do so by the Regional and State Boards. The Amendments must do more and the Regional Board must require the Bureau to address these problems immediately. We do not want two more years of endless negotiation.

Response:
The proposed control program identifies two broad mechanisms with which to implement the USBR's mitigation for their contribution to the problem. The proposed Basin Plan Amendment would require the USBR to Meet DMC load allocations or provide mitigation and/or dilution flows to create additional assimilative capacity for salt in the LSJR equivalent to DMC salt loads in excess of their allocation. The USBR's allocations are also specified in the proposed amendment. Additionally, the proposed amendment states that the Regional Board shall request a report of waste discharge from the USBR to address DMC discharges if an MAA is not established within 2 years.

If an MAA is the approach used to regulate the USBR, staff will need two years to develop the terms of this agreement. Additionally, the USBR will need time to develop the plan and build the infrastructure required to meet its load allocation. Such time will be needed even with immediate application of waste discharge requirements to regulate the USBR's discharge of salt in the basin. A two-year time frame to address this longstanding and complex problem seems fairly aggressive.

Comment # 3.4
Salinity of San Joaquin River impacts San Joaquin County

San Joaquin County has divergent interests but we have a common goal with respect to San Joaquin River water quality. It must be improved. The population of the County is nearing 700,000 with rapid growth underway, as it has become a bedroom community to both the San Francisco Bay Area and the Sacramento metropolitan area. In addition, as a result of high costs in the Bay Area, industry is relocating to San Joaquin County. Agriculture remains one of the County's most important industries. In 2002 the County's agriculture production was over 1.3 billion dollars. The availability of a water supply with adequate water quality in critical to the economic well-being of the County.

The salinity of the San Joaquin River, which flows through the western portion of the County, greatly impacts the water users of San Joaquin County. First, almost half of the San Joaquin-Sacramento Delta is within San Joaquin County. The southern Delta channels suffer from both water quality degradation and low water levels for periods of the year. The poor water quality of water within the Delta channels decreases agricultural production. Second, due to the poor water quality of the San Joaquin River the City of Stockton effluent treatment plant, located along the San Joaquin River within Stockton, must meet higher standards at great expense to the more than 300,000 people in the Stockton Metropolitan area. In addition, in order to meet the current water quality objectives at Vernalis substantial releases of fresh water from New Melones Reservoir along the Stanislaus River is used to dilute the San Joaquin River. These releases deprive the County of its area of origin water in the very area that is experiencing a significant groundwater overdraft and which in 1980 was designated by the California Department of Water Resources in Bulletin 118-80 as a groundwater basin subject to ''critical conditions of overdraft.'' (Bulletin 118-80 p.3.) The continued practice of using New Melones water for dilution results in a violation of the Watershed Protection Statute (Wat. Code § 11460).

The County is encouraged by the Regional Board's attempt to address salinity on the San Joaquin River. However, more meaningful progress must be made. This can be initiated by immediately establishing salinity objectives on the San Joaquin River upstream of Vernalis. The County is requesting all notices regarding the Salt and Boron TMDL and on the Amendments to the Basin Plan to establish salinity objectives upstream of Vernalis.

Response:
Comment noted.

Comment Letter # 4: San Joaquin Valley Drainage Authority

January 20, 2004

Comment # 4.1
Need for coordination with other programs
I would like to commend the effort to coordinate this regulation with others facing nonpoint dischargers. The selenium program, Ag Waiver, salt and boron, pesticide, dissolved oxygen and future programs need coordination to be successful. For example there is the danger that the salt and boron TMDL would encourage dischargers to hold all tailwater returns to the San Joaquin River with concentrations higher that 315 micromhos (Section 4.4.6, Discussion on Alternative 4a/4b) significantly reducing flows in the River. There is a need for Regional Board coordination of all the regulatory programs affecting specific areas like the Westside Coalition.

Response:
The regulations proposed for various TMDLs are being coordinated for these TMDLs and with other Regional Board programs. Entities must comply with the limiting elements of each TMDL and Regional Board program. Each TMDL is being designed so as not to have elements that are mutually exclusive with other TMDL control programs.

Comment # 4.2
Need for salt balance
I appreciate the fact that the staff report recognizes the necessity of a salt balance in the non-point source lands (Section 4.4.1, Discussion on Real-time Load Allocations). This is vital to maintain irrigated agriculture in the over 1 million acres subject to this regulation.

Response:
Comment noted.

Comment # 4.3
Control of groundwater accretions.
The staff report notes that at times groundwater accretion to the San Joaquin River may exceed objectives (Section 4.4.3). This points to the difficulty of final implementation and compliance.

Response:
Comment noted.

Comment # 4.4
Support for Real time option.
Clearly the only way the salt and boron regulation has a chance to succeed is through the real-time operation option designated as alternates 4a and 4b (Section 4.4.6). This is also identified as the least cost option although I am apprehensive about the difference between the costs of this option compared with others. It is listed as 70% to 80% less than other options.

Response:

Comment noted. Lower cost and greatest likelihood of success are reasons why real time management is the preferred alternative. The methods and assumptions used to develop costs estimates for each alternative are provided in Appendices 4 and 5. The major economic benefit associated with alternatives that rely on real-time management is largely a function of the increased ability to discharge salts (and drainage) under real-time management. If more drainage can be discharged then less drainage needs to be managed or treated, which in turn, reduces overall drainage treatment/management costs.

Comment # 4.5
Postage Stamp Allocations.

The proposed load allocations are on a postage stamp basis (Table IV-7). Our watershed coalition will facilitate trading and management of discharges within our watershed. We have experience from the selenium trading program.

Response:
Comment noted.

Comment # 4.6
Problem with monthly allocations
The minimal discharge allowance in certain peak summer months (Table IV-7), notwithstanding the relaxations is very restrictive and will need time and money to implement.

Response:
Staff agrees that the base load allocations are very restrictive. West side dischargers, however, have a supply water credit to account for salt in their supply water. The base load allocations are proposed in combination with the supply water credit and staff is not proposing to implement the base load allocations in isolation (i.e. w/out the supply water credit). Additionally, dischargers have been given the opportunity to operate under real-time load allocations instead of the fixed base load allocations. Real-time load allocations will provide greater flexibility to discharge in all but the most extreme conditions.

Comment # 4.7
Implementation period too short
The time for implementation (Table IV-6) is not consistent with other regulatory nonpoint processes. For example the selenium control program has a timetable of 15 years from adoption of the Basin Plan to complete compliance. The timetable in Table IV-6 for "high" priority areas is 8 to 12 years. Yet for Low priority areas the timetable is longer. It seems this is reversed from what should be the case, that is areas that will have the most difficult time meeting the load limits should have the longest time to implement. It appears that one component which has not been included is the time to educate the regulated community. I would recommend an implementation period for "High" priority areas be 15 years for Wet through Dry Year Types and 20 years for Critical Year Types.

Response:
The timelines are based on implementing the controls needed to achieve the greatest water quality improvements over the shortest possible, but reasonable, time. Time schedules associated with this control program are designed so compliance with salt load allocations will not be required until after the final load allocations for the Selenium TMDL are phased in. Shorter time schedules are assigned to higher priority sub-areas because high priority subareas represent the largest sources of salt load. The largest sources of salt should be addressed first to provide the greatest water quality benefit. Establishing compliance deadlines is the best way to ensure that load allocations are met in a timely manner and that implementation priority is placed on the largest sources of salt. Moreover, all of the high priority subareas are located on the west side of the LSJR. All irrigators on the west side receive supply water credits, which will facilitate compliance with load allocations. Lower priority subreas do not receive supply water credits; compliance in low priority subareas will therefore not necessarily be easier than in high priority subareas.

The salinity problem in the SJR has been ongoing and the TMDL development process started over three years ago. During this time, Regional Board staff has held numerous public workshops to educate the regulated community on the salinity problem, the sources of the problem, and the options for resolving the problem. The time schedule contained in the TMDL provides eight years from the effective date of the control program (which won't occur until the Regional Board adopts the proposed Basin Plan Amendment and the State Water Board, the Office of Administrative Law, and USEPA each issue their own approvals in succession) before the first load allocations need to be met. Though the proposed time schedule does not specifically include scheduling of time to educate the regulated community, it is not clear why this could not occur in the timeframes provided.

Comment Letter # 5: San Luis & Delta Mendota Water Authority

January 20, 2004

Comment # 5.1
Need for coordination with other programs.
I would like to commend the effort to coordinate this regulation with others facing non-point dischargers. The selenium program, salt and boron, pesticide, dissolved oxygen and future programs need coordination to be successful. For example there is the danger that the salt and boron TMDL would encourage dischargers to hold all tailwater returns to the San Joaquin River with concentrations higher that 315 micromhos (Section 4.4.6, Discussion on Alternative 4a/4b) significantly reducing flows in the River. There is a need for Regional Board coordination of all the regulatory programs affecting specific areas like the Grassland Drainage Area.

Response:
See response to Comment # 4.1

Comment # 5.2
Need for salt balance.
I appreciate the fact that the staff report recognizes the necessity of a salt balance in the non-point source lands (Section 4.4.1, Discussion on Real-time Load Allocations). This is vital to maintain irrigated agriculture in the over 1 million acres subject to this regulation.

Response:
See response to Comment # 4.2

Comment # 5.3
The Grassland Bypass Project has already resulted in reduced salt loading to the San Joaquin River. See annual reports for the Grassland Bypass Project.

Response:
Comment noted.

Comment # 5.4
Control of groundwater accretions.
The staff report notes that at times groundwater accretion to the San Joaquin River may exceed objectives (Section 4.4.3). This points to the difficulty of final implementation and compliance.

Response:
See response to Comment # 4.3

Comment # 5.5
Support for Real time option.
Clearly the only way the salt and boron regulation has a chance to succeed is through the real-time operation option designated as alternates 4a and 4b (Section 4.4.6). This is also identified as the least cost option although I am apprehensive about the difference between the cost of this option compared with others. It is listed as 70% to 80% less than other options.

Response
See response to Comment # 4.4

Comment # 5.6
Postage Stamp Allocations.
The proposed load allocations are on a postage stamp basis (Table IV-7). We have experience from the selenium trading program within our Drainage Area and prefer this postage stamp basis to allocations to individual subareas.

Response:
See response to Comment # 4.5

Comment # 5.7
Problem with monthly allocations
The minimal discharge allowance in certain peak summer months (Table IV-7), notwithstanding the relaxations, is very restrictive and will need time and money to implement.

Response:
See response to Comment # 4.6

Comment # 5.8
Implementation period too short.
The time for implementation (Table IV-6) is not consistent with other regulatory non-point processes. For example the selenium control program has a timetable of 15 years from adoption of the Basin Plan to complete compliance. The timetable in Table IV-6 for "high" priority areas is 8 to 12 years. Yet for Low priority areas the timetable is longer. It seems this is reversed from what should be the case, that is areas that will have the most difficult time meeting the load limits should have the longest time to implement. It appears that one component which has not been included is the time to educate the regulated community. I would recommend an implementation period for "High" priority areas be 15 years for Wet through Dry Year Types and 20 years for Critical Year Types.

Response:
See response to Comment # 4.7

Comment Letter # 6: Turlock Irrigation District

January 20, 2004

Comment # 6.1
To effectively address salinity in the Lower San Joaquin River (LSJR), the Total Maximum Daily Load (TMDL) and Basin Plan Amendment (BPA) must accomplish two important objectives: 1) to comply with salt and boron concentration objectives throughout the segment, and 2) to transport salt out of the basin to avoid a net salt build-up and degradation of ground and surface waters. Unfortunately, as currently drafted, neither objective will be accomplished. In fact, the fixed load TMDL will likely worsen existing salinity problems upstream of Vernalis. The real-time allocation approach, which has been offered as an alternative, is not well defined and has been left to the stakeholders to "make it work." If the real-time approach fails, the fixed load TMDL would have to be implemented, and yet Regional Board staff admit that the "SJR salinity problem is not conducive to establishment solely of inflexible fixed or seasonal monthly load allocations for nonpoint sources" (BPA page 34).

Response:
Staff agree that implementation of fixed base load allocations alone is not an appropriate long-term solution for salinity in the LSJR. That is exactly why staff has proposed real-time load allocations in addition to the fixed base load allocations. The proposed Basin Plan Amendment includes a method for calculating real-time load limits and a method for allocating these loads to nonpoint source dischargers. There is large incentive for dischargers to use real-time load allocations. The Regional Board, however, does not have the resources or the responsibility to develop and implement a basin-wide real-time water quality management system. The success of real-time management will therefore depend on buy-in and participation by the dischargers.

Between 1997 and 2002, the Regional Board participated in a multi-agency CALFED funded project to establish a real-time management demonstration project for the San Joaquin River. The real-time water quality management program successfully established the monitoring, communications, and modeling systems needed to provide water managers with much of the information necessary to mange their discharges on real-time basis. The program also demonstrated the utility of real-time management to maximize salt discharges and the potential to reduce water quality exceedances in the LSJR. With the exception of wetland managers in the Grassland watershed, the regulated community has shown little interest in real-time water quality management.

The base load allocations are conservatively designed to protect water quality at Vernalis at all times. The base load allocations also provide incentive for dischargers to develop a comprehensive real-time river management system that could be used to address salt, boron and a number of other constituents of concern in the LSJR. Staff agree that it is the responsibility of the dischargers to make real-time management work, however, we believe the proposed basin plan amendment provides the incentive to encourage real-time management and the flexibility to accommodate a stakeholder driven real-time management system.

Comment # 6.2
Rather than such a costly, complicated and untenable process, the TID proposes a concentration-based approach to the salinity TMDL that will effectively address many of the shortcomings and concerns of the current approach and will provide a simpler, more equitable, and more certain solution.

Response:
Comment noted.

Comment # 6.3
Because of the importance of agriculture to the local economy and the rest of the Central Valley and the implications of the salinity TMDL, the Turlock Irrigation District (TID) has committed considerable time and effort to provide meaningful input over the last two years. The TID staff and consultants from Brown and Caldwell have attended Regional Board workshops, met with Regional Board staff on several occasions, provided detailed comments on the draft TMDL in November 2002 and oral comments at the Regional Board workshop on December 5, 2003, and wrote a paper that has been published in the proceedings of the Water Environment Federation's (WEF's) National TMDL Conference in Chicago in November 2003. The TID's 2002 comment letter and the WEF paper are attached to provide historical context and more detailed discussion of the issues.

Although Regional Board staff has been courteous and willing to discuss the draft TMDL, the TID has not felt that its comments have been fully taken into account. Even early in the process, when the TMDL was in a preliminary draft format, staff did not seem willing to consider alternative approaches offered by the TID. It seemed that staff was set in their direction, even if flawed.

The TID appreciates the Board's responsiveness to comments made at the December 5, 2003 workshop, the recognition that the current version of the TMDL is not ready for approval, and the direction of staff to consider alternative approaches. The TID hopes that staff will give the proposed concentration-based approach the opportunity to work and to affect real water quality improvements.

Response:
Staff sincerely appreciates TID's involvement in the TMDL development process. We have carefully considered the comments provided by TID and have already made changes to the technical TMDL based TID's input. For example, we have changed the sub-area delineations for the East Valley Floor and Tuolumne River based on input from TID. Staff does not agree with all of the comments submitted by TID and therefore we have not incorporated all of your recommendations into the proposed TMDL and/or Basin Plan Amendment. Your comments are important and we look forward to continuing to work with TID.

Comment # 6.4
Default Base Load Allocation TMDL Has Serious Flaws
The TID has several specific concerns with the current version of the Salinity TMDL and particularly with the default fixed load allocation, as summarized below.

Limits Salt Export
Salinity in the San Joaquin River Basin presents a unique water quality problem, in that there are dual and somewhat divergent needs – to maintain sufficiently low concentrations to meet the concentration-based objective, and to transport sufficient quantities of salt out of the basin to maintain a salt balance. Any sustainable solution to the salinity problem will effectively achieve both needs. Regional Board staff has noted that fixed load allocations "would restrict the ability to export salt from the LSJR basin such that there would be a net salt buildup in the watershed and long-term degradation of ground and surface waters" (BPA, pages 2 and 34). Even with this acknowledgment, however, staff has presented fixed load allocations as the default TMDL to solve the problem.

Response:
Staff has always maintained that any long-term solution to the salt problem must work to achieve a salt balance in the watershed. It is not accurate, however, to describe the fixed base load allocations as the default TMDL. The proposed Basin Plan Amendment specifies four ways for dischargers to comply with the salt control program. Base load allocations are proposed for dischargers that do not wish to participate in a real-time program, however, no single option is considered the default. In fact, the more stringent base load allocations are proposed as a backstop in the event that dischargers do not choose to implement a real-time river management program.

Comment # 6.5
Not an Equitable or Viable Solution

The TMDL is not equitable. Currently, the TMDL requires various categories of discharges to meet very different salinity concentration objectives. Northwest Side and Grassland sub-areas are allowed to discharge flows at virtually any concentration (even in excess of the WQOs), with the currently proposed credit system. Point source dischargers are allowed to release discharges at the water quality objective - 700 and 1000 uS/cm EC for summer and winter seasons, respectively. Non-point source dischargers from East Side are not allowed to release any discharges that exceed a trigger value set at less than half of the in-stream objective (315 uS/cm).

The load allocation for non-point sources (i.e., agriculture) during the majority of the summer irrigation season is zero. This zero allocation directly affects the East Side, but the Northwest Side and Grasslands sub-areas have been given substantial credits that would offset the zero allocation. In contrast, the East Side is given no credits.

The credits to the Northwest Side and Grasslands sub-areas are substantial, totaling half of the salt that they divert in source water from the Lower San Joaquin River and the DMC. The credits appear to be excessive, as they would allow for fully half of the current salt load delivered to the West Side to be returned to the river, and can total 50,000 tons/month or more, greatly

exceeding the TMML itself. As noted in the Technical TMDL Report, the "50 percent salt return factor is based on the assumption that there will be a 30 percent return flow with some added salt to account for evapoconcentration and leaching of salt from prior years" (page 1-72). In addition, the TMDL does not include any allowance to revisit and reduce the credits as source water quality for the Northwest Side and Grasslands sub-areas improves with implementation of the TMDL.

The zero load allocation would require East Side agriculture to capture and store all return flows for extended periods of time (up to 5 months) and/or treat before discharging. Capturing and holding discharges of relatively high quality water from the East Side could require significant expenditures, with very limited water quality benefit. Without significant infrastructure modification, implementation of the TMDL would result in re-directed impacts to the eastside areas, including further concentration of salts in the groundwater (from reduced drainage), and surface water (while it is being stored). (Additional discussion on the impacts to East Side agriculture, including the anticipated infrastructure modifications needed should the proposed BPA be adopted, is included later in this document.)

Response:
The waste load allocations for point sources are concentration based and set equal to the existing water quality objectives. Staff agrees that proposed waste load allocations are less restrictive than the base load allocations for nonpoint source dischargers. The Waste load allocations were set at 700µS/cm for the irrigation season (applies April-August) and 1,000 µS/cm for the non-irrigation season (applies September-March) because point sources dischargers are a reactively small contribution to the LSJR's total salt load, and to be consistent with the current direction in NPDES permit requirements placed on wastewater facilities in the Central Valley. A concentration-based objective is proposed because municipal and industrial dischargers only represent approximately 2 percent of the LSJR's total salt load. In contrast, the east side contributes approximately 21% of the LSJR's total salt load (sum of east side tributaries and east valley floor sub areas) and about 9% of the anthropogenic salt load.

The Northwest Side and Grasslands Subareas receive a supply water credit to account for salts in their supply water. The supply water credits used in this TMDL were included, in part, to achieve an equitable allocation that accounts for the fact that west side water users have a degraded water supply. A supply water credit is not applied to the East side because in general the supply water on the East side is of exceptional quality.

Regional Board staff have considered applying a supply water credit to other entities such as east side agriculture and municipal and industrial dischargers, however, the supply water credit would need to be offset with allocations on water suppliers, as is the case with the proposed west side supply water credits. In this case it would mean that the farmers within TID would a get credit for salts in supply water and TID would be responsible to offset the credit. The west side supply water credit is used to account for a degraded supply. East side supply waters, for the most part, are very high quality and staff believes a supply water credit is not appropriate.

Staff agrees that significant infrastructure will be needed to implement the base load allocations or real-time load allocations. A description of the cost for the necessary infrastructure is included

in Appendix 4 (Economic Analysis), which indicates that cost will range from approximately $68 per acre to implement a full prohibition of discharge to approximately $27 per acre to implement a real-time water quality management program. It is likely that these costs can be reduced through re-operation of drainage and utilization of other implementation measures available to discharges (outside the Regional Boards direct authority). Its important to note that in establishing an agricultural control program the Regional Board is required only to provide "an estimate of the total cost of such a program, together with an identification of potential sources of financing" (water code Section 13141). This requirement has been fulfilled through the analysis in Appendix 4 of the Staff Report.

A zero load allocation for an extended period, however, would likely only apply if TID chooses not to participate in a real-time water quality management program. In an April 22, 2004 letter to the Regional Board staff, TID has indicated a willingness to participate in the newly formed San Joaquin River Water Quality Management Group (SJRWQMG). The group intends to develop a plan to meet the Vernalis water quality objective using various load-based and flow-related tools available to its members. Staff is encouraged with the level of basin-wide cooperation that this group promises and with TID's willingness to participate. The SJRWQMG and their ensuing plan could serve as a real-time management program consistent with the requirements of the proposed Basin Plan Amendment. Such a plan/program could allow for prescribed excursion from the four implementation paths specified in the proposed basin plan amendment, including the ability to discharge up to the water quality objectives, if it were beneficial to do so to meet the applicable water quality objectives.

Comment # 6.6
Overly Complex and Difficult to Measure Compliance
The current fixed load TMDL is extremely complex, with 65 different Total Maximum Monthly Loads (TMMLs) to cover several climatic conditions and allocations among 7 sub-areas, to produce a total of 455 TMMLs. As described above, the original TMMLs have also been modified by credits given to the Northwest Side and Grasslands sub-areas, which further confuse the result. Finally, the U.S. Bureau of Reclamation is given a separate allocation, which has no physical meaning and is not included in the TMMLs. The TMMLs are not summarized in a final form anywhere in the TMDL Technical Report, so it is not even clear what values will be applied to measure compliance. The TID views this level of complexity as untenable in a TMDL, and unnecessary in this case, and has offered an alternative simpler, concentration-based approach (see below).

It will be nearly impossible to measure compliance with the TMDL as it is currently written. The BPA Staff Report suggests several monitoring sites to measure compliance, but it would require significant investment in flow and conductivity monitoring devices at multiple sites within the sub-area and considerable effort to analyze the data to evaluate compliance against allowable monthly loads. It would seem prudent to focus efforts on actions that help to directly improve water quality rather than creating an overly complex system that requires major efforts to administer.

Response:
Staff agrees that the TMDL is complicated, however, the LSJR system is a complicated system and salinity in particular is a difficult pollutant to address. A complex solution may be appropriate given the complexity of the system and the desire to address unconventional salt sources (imported salts).

The values used to measure compliance are included in the proposed Basin Plan Amendment and depend on the method of compliance that an individual discharger selects. If a discharger chooses to be regulated by fixed base load allocations, then they would need to comply with the fixed base load allocations specified in Table IV-7 of the proposed amendments. If a discharger chooses to be regulated under waiver of waste discharge requirements, then they would need to comply with real-time load allocations, which would be determined through discharger assessment of the real-time assimilative capacity of the river. The method used to calculate real-time assimilative capacity is also included in Table IV-7, however, the real-time load allocations by their very nature cannot be predetermined.

Staff disagrees that compliance is difficult to measure because both EC and flow can be monitored/measured relatively easily at a relatively low cost. Monitoring site locations will depend on the scale at which dischargers choose to implement the TMDL. For example, if dischargers within the TID service area choose to comply at a district scale, then load allocations would be based on the area of non-point source land use within the district and monitoring would be needed at all points where drainage leaves the district. Only limited TDS data would need to be collected to develop Ratios of EC to TDS. This minimizes laboratory costs. EC would need to be monitored even if a concentration-based approach was used. From an overall water management and efficiency standpoint, TID should also be monitoring the volume of drainage and operational spills that are discharged from the district.

Comment # 6.7
TMDL Appears to be Overly Protective
With the extremely high level of complexity and convoluted nature of the current TMDL, it is very difficult to understand exactly what the outcome might be for water quality and whether the TMDL allocation is over- or under-protective. On repeated occasions, the TID has reviewed the details of the fixed load allocation TMDL carefully with Regional Board staff, and through this process, it appears that the TMDL continues to evolve as staff are still learning more about the ramifications of the fixed load allocation. This is also a good indication of the implications of an overly complex TMDL – it is very difficult to understand the implications.

For instance, the TID presented bar charts of the TMML allocations for two different flow conditions at the December 5, 2003, Regional Board workshop, using information presented in several tables in the TMDL Technical Report (i.e., Tables 4-12, 4-19, 4-22, and 4-23). At that time, the charts seemed to validate the conclusions of the BPA Staff Report that the TMDL would actually be **under-protective** and would not meet water quality objectives under critical low flow conditions (see "expected salinity WQO exceedance rates" shown in Figure 4-1, page 79).

However, after a detailed review of the plots by Regional Board staff, they have suggested two important adjustments: 1) to account for the losses associated with diversions from the Lower San Joaquin River, and 2) to remove the USBR allocation, because it has no physical significance and was used only to determine the USBR responsibility. The new calculations, which are detailed below and have been confirmed by Regional Board staff, indicate a vastly different conclusion from the BPA Staff Report – that the TMMLs are greatly under-allocated or **over-protective.** The TMMLs already include a significant margin of safety, given that they are based on the lowest flow on record for each flow condition. In other words, when actual implications for water quality are considered in detail, it appears that Regional Board staff seems to have greatly "overshot" the goal of achieving the water quality objectives and is imposing extreme restrictions on East Side nonpoint sources without cause.

As shown in the two examples presented below, the net TMML allocations are far below the allowable TMML, which leaves considerable salt load that could be re-allocated among other dischargers (e.g., nonpoint sources). In the August critical low flow condition, the net allocation, or difference between the allowable TMML and allocation, is actually negative (implying a negative salt load). This would leave approximately 34.5 thousand tons/month of excess allocation that could be distributed among other sources. In the June above normal flow condition, the under-allocated load totals 20.8 thousand tons/month.

In recent conversations, Regional Board staff has indicated that the USBR may not be required to achieve reductions fully equal to their responsibility, now that it has become clear that the TMMLs are quite over-protective. However, for some unknown reason, staff has not been open to re-considering the allocation to give some of the available load to nonpoint sources. So, the load allocation remains at zero, even though there is considerable load available, which is inequitable for East Side agriculture.

In further conversations with Regional Board staff, it appears that the reason for the discrepancy between conclusions drawn from the Technical TMDL Report and BPA Staff Report is that the modeling performed for the BPA did not account for any salinity reductions associated with the USBR responsibility, reportedly because of technical complications. It is not appropriate and is extremely misleading to ignore USBR salinity reduction responsibilities in the BPA Staff Report assessment. The result is a greatly over-protective TMDL.

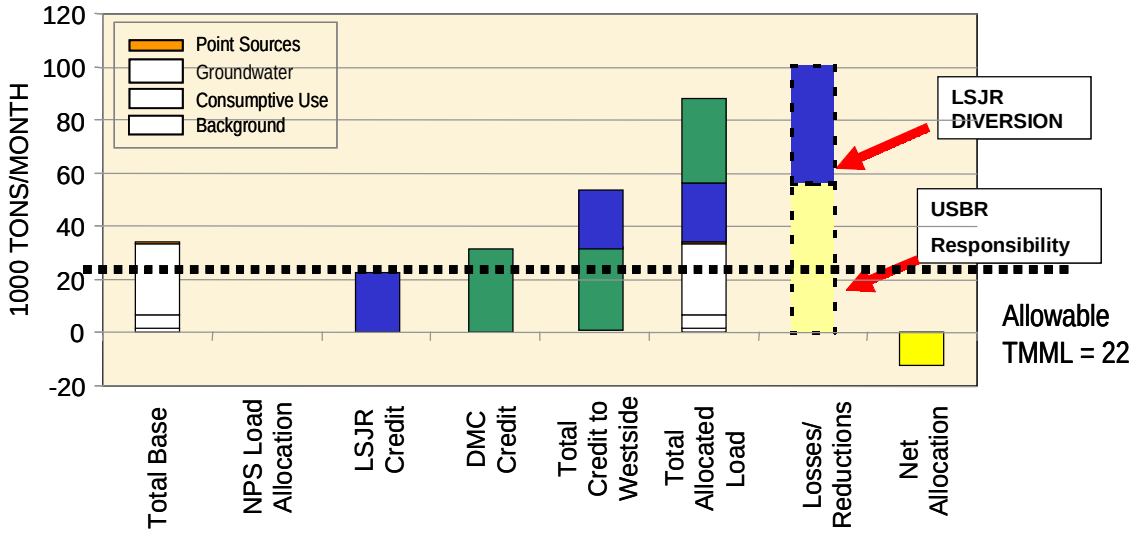
The examples presented below illustrate the over-protective and inequitable nature of the TMDL.

August critical low flow condition. As shown in Figure 2 (in units of thousand tons/month), the total allocated load (88.2) is offset by losses with the diversion of flow and associated salt from the Lower San Joaquin River (44.6) and reductions that are the responsibility of the USBR (56.1). The resulting net allocation is negative (-12.5), and well below the TMML at Vernalis (22). For the August critical low flow condition, the allocation overshoots the TMML considerably (34.5), and is greatly over-protective. The detailed calculations are reviewed below.

In the TMML allocation process, Regional Board staff has assumed that several types of sources, including background, groundwater, consumptive use, and point sources are always present,

creating a "baseline condition". Groundwater alone (27) and the baseline sources taken together (34.1) exceed the allowable TMML (22). Credits are provided to the Northwest Side and Grassland sub-areas for poor source water quality from the DMC (31.8) and Lower San Joaquin River (22.3), allowing for a considerable discharge of salt from the West Side (54.1). The USBR is given a salinity mitigation responsibility (56.1) that is set equal to the difference between existing USBR source water loads (approximated by two times the DMC credit or 63.6) and the USBR allocation (7.5). As noted in the Technical TMDL Report, "the USBR's responsibility for excess loads could be reduced or eliminated by improving supply water quality or through mitigation anywhere in the LSJR basin" (page 1-79 of Appendix 1). Non-point sources on the East Side are the only source category not given any allocation or credit.

Figure 2. Allocation for August critical low flow condition



Calculations used to create Figure 2 are as follows (units in thousand tons/month)**:**

TMML for August Critical Low Flow Condition = 22

Allocation Components
Baseline = Background + Consumptive Use + Groundwater + Point Sources
= 1.8 + 4.8 + 27 + 0.5 = 34.1

Other Allocations: USBR = 7.5 Load Allocation (Non-point Sources) = 0

Credits to West Side: DMC = 31.8 LSJR = 22.3

Total Allocated = Baseline + DMC + LSJR = 34.1 + 31.8 + 22.3 = 88.2

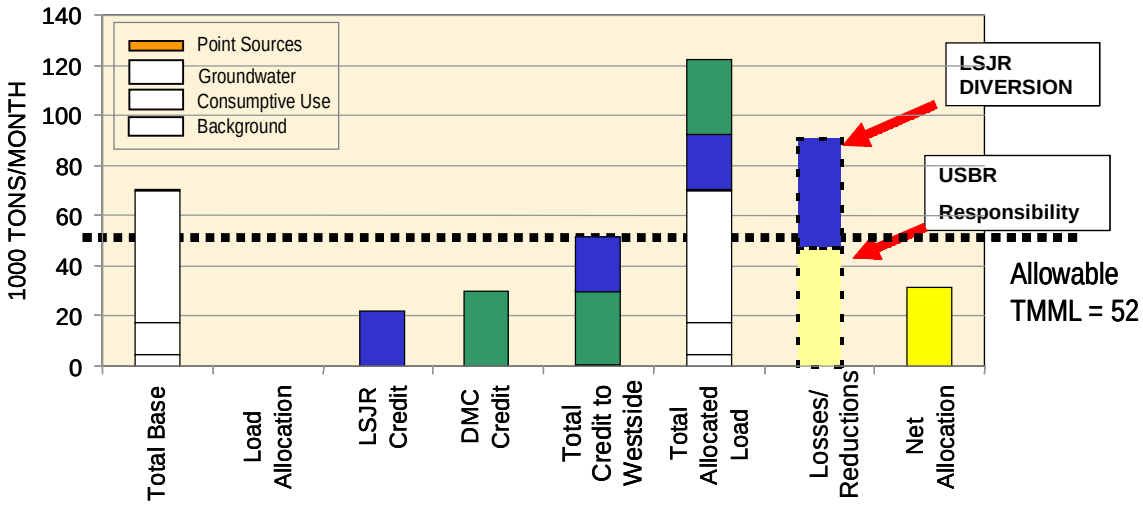
Losses/Reductions:
LSJR Diversion = 44.6
USBR Mitigation Responsibility = (2)DMC – USBR = (2)31.8 – 7.5 = 56.1

Net Allocation = 88.2 – 44.6 – 56.1 = -12.5

Unallocated Load = TMML – net allocation = 22 - (-12.5) = 34.5

June above normal flow condition. Similarly, Figure 3 shows that the June above normal flow condition is also over-protective. The allocated load (122.2) is offset by losses with the diversion of flow and associated salt from the Lower San Joaquin River (43.6) and reductions that are the responsibility of the USBR (47.4). The resulting net allocation (31.2) is well below the TMML at Vernalis (52) and overshoots the TMML considerably (20.8), again resulting in a greatly over-protective condition.

Figure 3. Allocation for June above normal flow condition



Calculations used to create Figure 3 are as follows (units in thousand tons/month)**:**

TMML for June Above Normal Flow Conditions = 52

Allocation Components
Baseline = Background + Groundwater + Consumptive Use + Point Sources
= 4.6 + 12.4 +53 + 0.5 = 70.5

Other Allocations: USBR = 12.4 Non-point Sources = 0

Credits to West Side: DMC = 29.9 LSJR = 21.8

Total Allocated = Baseline + DMC + LSJR = 70.5 + 29.9 + 21.8 = 122.2

Losses/Reductions:
LSJR Diversion = 43.6

USBR Mitigation Responsibility = (2)DMC – USBR = (2)29.9 – 12.4 = 47.4
Net Allocation *= 122.2 – 43.6 - 47.4 = 31.2*

Unallocated Load = TMML – net allocation = 52 – 31.2 = 20.8

Implications. The water quality implications of the TMDL and BPA, which are revealed through the detailed examples above, raise several important questions. First, are the greatly over-protective TMMLs justified? Are the zero load allocations, which primarily affect East Side agriculture, justified? What other adverse implications for the overall salt balance are associated with requiring East Side agriculture to hold water for several months at a time to meet the objectives? In other words, will the current concentration objectives allow sufficient salt export to maintain a sustainable salt balance in the valley, or will they contribute to a net salt build-up? If groundwater alone exceeds the TMML, shouldn't reductions in groundwater salinity also be considered? Given the confusion over the overly complex TMDL approach, should a substantially different way of accomplishing the TMDL should be considered (e.g., focus on salinity concentrations versus loadings)?

Response:
TID's initial assessment of the TMDL and the implications of the supply water credits on water quality conditions at Vernalis (as presented at the 5 December 2003 Regional Board Meeting) did not consider two important factors: 1) the LSJR diversion credit is more than offset by the removal of salt loads from the diversion itself; and 2) the USBR allocation should not count toward loading to the LSJR, since salts in DMC supply water are already accounted for by load allocations from DMC water users. No precise quantitative connection between the USBR's salt import to the basin and Vernalis water quality should be inferred by the USBR load allocation. Rather, the USBR load allocation is used to assess and assign responsibility for USBR's importation of salt to the LSJR Basin.

Staff agrees with the calculations presented above and the assessment that the load allocations as defined in the technical TMDL appear to be over protective because the level of responsibility assigned to the USBR often exceeds the need for that level of mitigation. The TMDL base load allocations are conservative because they are based on critical low flow conditions. The base load allocations are designed to achieve the Vernalis salinity water quality objective under all conditions. The west side supply water credits and the USBR's responsibility for loads in excess of their allocations are then layered on top of the base load allocations. The USBR's responsibility exceeds the supply water credits because the supply water credits are set equal to only half of the salt in supply water while the USBR is responsible for all salt in supply water that is above 52 mg/L.

As the comment indicates, use of methods developed in the TMDL sometimes result in a negative "net allocation." This is appropriate and necessary to keep the TMDL from becoming more complicated. The TMDL uses a consistent method of applying background loads, groundwater loads, and allocating base loads and supply water allocations. To remove all occurances of such negative net allocations would require further adjustment, and complexity, of base load allocations. Such an adjustment is not needed since this conservative aspect of the TMDL is offset by the allowance for, and recommendation to use, real time management as the

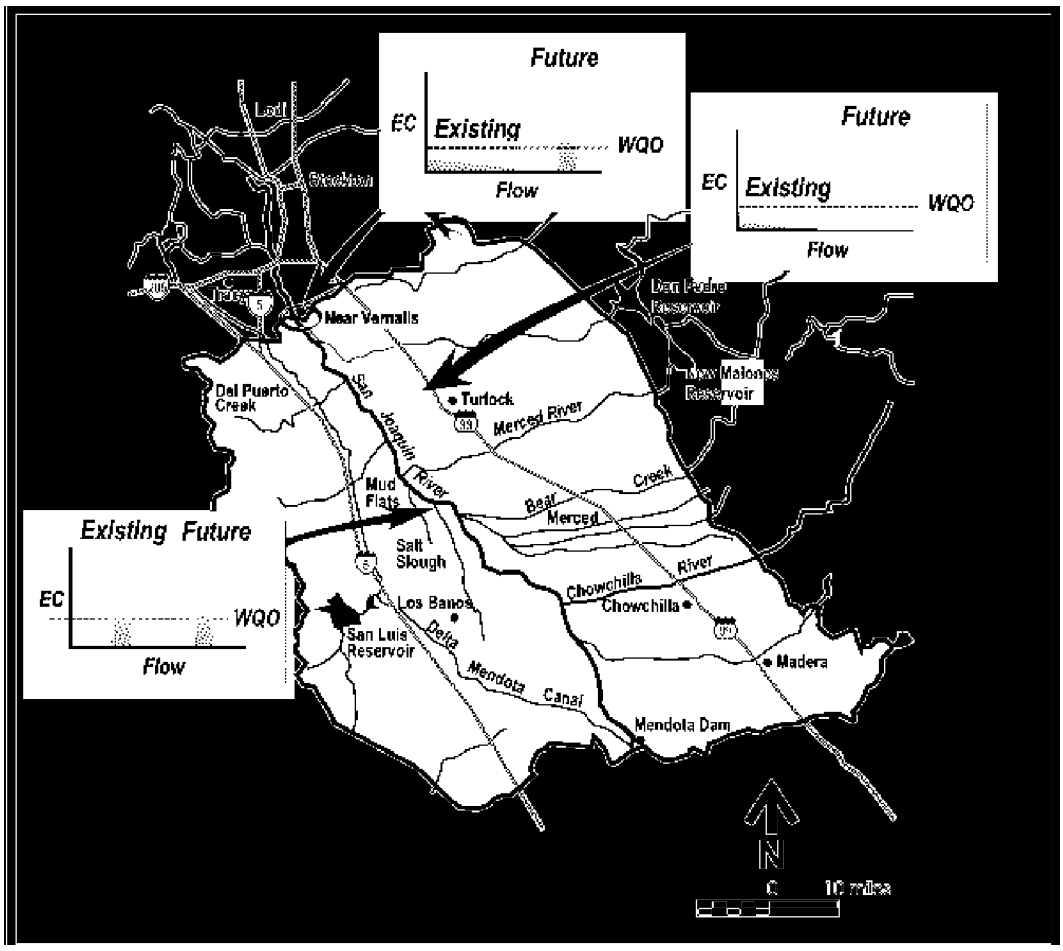
primary means of establishing allocations. Under base conditions and under real time management, the USBR's allocation and responsibility are clearly defined. Any remaining assimilative capacity under real time management is allocated to all nonpoint sources on an equal per-acre basis. The seeming overly restrictive aspects of the base load allocations provides: 1) assurance that loads will be sufficiently reduced if real time management is not employed; 2) incentive to participate in the preferred real time management program; and 3) front-loaded reductions in salt load and mitigation by the USBR that will be needed to comply with subsequent phases of the TMDL that incorporate salinity objectives in the SJR upstream of Vernalis.

Comment # 6.8

Produces Unintended Adverse Consequences

Allowing zero allocation for non-point sources from the East Side eliminates higher quality, lower concentration discharges that have historically diluted higher concentration discharges of salts from other sources. In effect, by removing the lower concentration discharges from the East Side while continuing to allow higher concentration discharges from the Northwest Side and Grassland sub-areas, the TMDL may lead to the unintended adverse consequence of reducing the overall salt load in the stream, but increasing the concentration. A very simplified illustration of this effect is presented in Figure 1. More detailed example calculations underlying this illustration are presented in the WEF paper (attached).

Figure 1. Simplified illustration of the effect of removing higher quality East Side discharges



Although the example is oversimplified, while it does not reflect the effects of other dilution flows, the point it demonstrates is still valid – the TMDL could reduce overall loads but actually increase downstream concentrations. As shown in Figure 1, current water quality conditions can exceed the objective at Vernalis. The existing salt load is made up of many sources, including West Side discharges, which can be as much as three times higher in concentration than East Side discharges. If the current fixed load TMDL were implemented and discharges from the East Side were no longer allowed, then the result would essentially be a loss of higher quality flows with a relatively small reduction in load, which could lead to an increase in overall salt concentrations. By focusing on salt loads rather than concentrations, the current version of the TMDL could, in fact, result in lower flows and loads, but higher concentrations.

Response:
Staff acknowledges that the TMDL could result in a reduction of relatively high quality water (above 315µS/cm) from the east side. Any reduction in discharge from east side tributary users, however, will be accompanied by reduced discharge from west side dischargers and/or mitigation by the USBR, so in the context of this TMDL a reduction of east side discharges should not adversely affect water quality in the LSJR. Moreover, a real-time management program could be designed to allow for discharges above 315µS/cm provided that the salinity water quality objectives would be met at Vernalis.

Staff expressed concerns with the example provided in the WEF paper prior to its submission and publication. No modifications to the paper were made to address staff's concerns. The examples provided in the WEF paper are overly simplified and misleading as they do not account for complicating factors present in the LSJR basin, nor do the examples accurately characterize the effect of implementing the TMDL (most notably-- supply water credits are applied to the west side but corresponding USBR load allocations are not imposed). Specific concerns with the example are discussed in response to Comment # 6.65 bellow.

The comment seems to avoid a fundamental question: Is it appropriate for east side water users that receive supply water at or below 85µS/cm to discharge water at 700 or 1,000µS/cm? By focusing on concentrations rather than salt loads, east side water users would have little or no responsibility for the salt that they contribute to the LSJR and almost all of the responsibility for salt load reductions would be shifted to dischargers on the west side of the San Joaquin River. State Water Board Resolution No 68-16, Statement of Policy with Respect to Maintaining High Quality of Water in California (Antidegration Policy), in part states that:

> *"The Regional Water Board will apply 68-16 in considering whether to allow a certain degree of degradation to occur or remain. In conducting this type of analysis, the Regional Water Board will evaluate the nature of any proposed discharge, existing discharge, or material change therein, that could affect the quality of waters within the region. Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State."*

Staff question weather the application of the existing salinity water quality objective to east side dischargers represents the best practicable treatment or control considering that TID indicates that "…concentrations in spills to the San Joaquin River and tributaries are often below the water quality objectives of 700 and 1000 EC…" (TID comments dated January 20, 2004, Page21).

Comment # 6.9
Will Not Meet Future Salinity Objectives
The proposed TMDL is short-sighted, and it does not provide for future salinity objectives upstream of Vernalis. The 1995 Bay Delta Plan and Water Right Decision 1641 require the Regional Board to "promptly" develop and apply objectives to the San Joaquin River at locations upstream of Vernalis. Many presenters at the December 5, 2003, Regional Board workshop, representing a range of environmental, South Delta, and East Side perspectives, echoed this concern and suggested that it only makes sense to address the problem comprehensively in the current TMDL process. The TID strongly encourages the Regional Board to incorporate upstream objectives into the TMDL process now, rather than starting over again once the new objectives are finalized.

Because the TMDL is currently built entirely around the aim of meeting targeted loads (TMMLs) at Vernalis and because it allows for a blending of discharges of widely varying salinity concentrations, it is unlikely that concentration objectives could be met at upstream locations. The current TMDL approach could actually worsen salinity problems upstream of Vernalis, while it allows for continued high concentration discharges from the Northwest and Grasslands sub-areas, through a credit system, and it prohibits higher quality, lower concentration discharges from the East Side.

Response:
Establishment of new water quality objectives was excluded from the initial phase of the TMDL by design so that significant improvements in water quality could be achieved without further delay. Section 4.4.1 of the Basin Plan Amendment staff report describes the phasing of this TMDL. This section of the report explains that water quality objectives will be proposed as part of a Basin Plan amendment that is concurrently being developed. It further explains that methods adopted in this initial phase of the TMDL will be applied to implement these new objectives, when adopted. Staff believes phasing is appropriate because establishment of water quality objectives for the upper reaches of the LSJR will be extremely difficult; this difficulty would likely result in delayed adoption of this TMDL. Such a delay may be unacceptable to downstream and environmental interests and the U.S. EPA. Establishment of water quality objectives for the upper reaches of the LSJR will be extremely difficult because of issues related to use attainability as defined in the Clean Water Act. In particular, hydromodifications that contribute to extremely low and no flow conditions make attainability of objectives established to protect beneficial uses potentially difficult or impossible. In the interim, the initial phase of this TMDL would provide the framework for how new water quality objectives would be implemented. The TMDL represents an important first step toward improving salinity conditions in the LSJR. To help alleviate concerns regarding the timeliness of developing the upstream water quality objectives, staff will include a time schedule for adoption of the upstream water quality objectives into the proposed basin plan amendment.

Comment # 6.10
Contrary to the Watershed Policy
In Appendix 3 of the BPA, there is a reference to the Watershed Policy, which "calls for focusing efforts on the most important problems and those sources contributing most significantly to those problems". The fixed load allocation would allow the West Side to continue discharging high salinity waters and, at the same time, would not allow the East Side to discharge relatively high quality water if it exceeds the 315 uS/cm EC trigger value. This approach seems to violate the Watershed Policy.

Given all of the flaws in the proposed fixed load allocation, it is not appropriate to apply it as the default technical TMDL approach for the BPA. The solution must be workable and must demonstrate reasonable assurance of success in meeting water quality objectives.

Response:
All nonpoint source dischargers are subject to the same base load limits and allocations—the same method is applied to high and low concentration discharges. A supply water credit, however, is provided to nonpoint source dischargers that receive high salinity supply water. Only west side nonpoint source dischargers fall into this category. Supply water salt load credits allocated to west side dischargers are more than offset by greater than an equivalent load reduction that is the responsibility of the USBR. Salts imported into the SJR Basin by the USBR are identified in the TMDL as one of the factors contributing most significantly to the salinity problem in the SJR.

The control program does in fact focus efforts on the most important problems and those sources contributing most significantly to those problems by prioritizing subareas (based on the unit area salt loading), and tying those priorities to a compliance time schedule that addresses the largest sources of salt first.

Comment # 6.11
Real-time Allocation Not a Viable Fallback
As the Regional Board staff recognizes, a real-time allocation approach "will require development of significant structural and organizational infrastructure." ("Buff Sheet", Item 19, page 2) The Technical TMDL Report (Appendix 1 to the BPA Staff Report) promises that "guidance for a real-time management framework will be included in the implementation plan for this TMML" (page 1-81). However, no guidance has been provided in either the BPA Staff Report or in any other subsequent document. Out of nearly 100 pages, the Technical TMDL Report dedicates only one page to explain the real-time allocation and little more detail is included within the Program of Implementation under the BPA. So, dischargers are left "holding the bag", being held responsible to create a real-time management program on their own and to provide the required notice of intent to participate within a short one-year time frame. As it is, the real-time allocation approach is so ill-defined that it is difficult to determine whether or how it might work. Given what is currently known, there are several concerns with the real-time approach, as described below.

Response:
Real-time loading capacity and allocations are defined in table IV-7 of the proposed Basin Plan Amendment language (Section 2 of the staff report). Details of the approach are not in the staff report and no additional details will be provided as part of this proposed amendment. The conditions of an acceptable real-time management program will be specified in a waiver that would have to be adopted by the Regional Board. It will be the responsibility of dischargers to propose, implement, and operate a Regional Board approved program of real-time management in order to take advantage of real-time assimilative capacity and allocations. Staff encourages efforts of the SJWQMG, who appear to on the way to developing a plan and program that would satisfy the requirements of a real-time management program. Staff have modify the proposed amendment language to ensure that requirements for real-time management are in accord with the efforts of the SJWQMG or any other group wishing to administer a river management program designed to comply with water quality objectives.

Comment # 6.12
Complex, Difficult and Costly to Implement
Though simple in theory, real-time allocation would be very complex in practice, even more complex than the fixed load allocation with its 455 TMMLs. A real-time approach would require real-time application of a detailed, multi-input model to predict downstream flows and salt concentrations and to determine in advance the appropriate TMMLs for each upcoming month. Another model would be required to translate the TMMLs into allowable loads for individual points of discharge and associated sources. The real-time approach would also require an extensive institutional and physical infrastructure capable of managing flows and salt discharges (allocating, effectively communicating, and implementing allowable loads) for over 30 public water agencies with jurisdiction in the area and over 9,000 individual farms (BPA Staff Report, page 39) on a real-time basis. The costs to administer this program would be significant, and there is no indication how these long-term operational costs would be addressed. Again, rather than expending major resources to administer the program, it seems better to focus more directly on addressing the problem and improving water quality.

Response:
Given the size of the watershed and the large number of saline discharge sources, any solutions will be complicated, difficult, and costly to implement. The economic analysis shows that a complete prohibition of discharge during periods of no assimilative capacity would be more costly than real time management, since much more drainage water would have to be stored and treated, rather than discharged to the LSJR. No sophisticated models would be needed to forecast SJR water quality since the water quality objective is in the form of a 30-day running average. Dischargers would need to respond only to current real-time condition, e.g. hold or release drainage. Significant additional monitoring would be required under real-time or any salinity control program. The facilities to store any excess drainage will be much less for real time than for alternatives that completely restrict discharge.

Comment # 6.13
Retains Many Underlying Problems
The real-time approach also suffers from several of the shortcomings noted above in the discussion on the fixed load approach. These concerns include inequities with varying

concentration objectives and a credit system that applies only to the West Side, and the inability to meet future objectives upstream of Vernalis.

Response:
The TMDL and basin plan amendment would be used as the framework to implement any salinity water quality objectives developed upstream of Vernalis.

See response to Comment # 6.5 and Comment # 6.9

Comment # 6.14
Does Not Maximize Salt Export
The real-time approach, though designed to increase net salt transport by allowing for higher real-time flows to be considered in lieu of the fixed load design flows (i.e., lowest flows on record), would still not take full advantage of the assimilative capacity of the river. It may be difficult to adjust the system quickly enough to take advantage of changing flows on a monthly basis. There could also be flow constraints downstream that would limit the ability to discharge stored flows under certain conditions. Finally, the real-time approach includes another margin of safety by allowing only 85% of the estimated flow to be used as the real-time design flow.

Response:
We agree that there are constraints that preclude the ability to use the full assimilative capacity of LSJR, however, even with these constraints staff believes that real-time management provides the best opportunity to maximize salt exports from the basin. The recommended approach would allow for the maximum amount of salt discharges while still maintaining salinity water quality objectives. Exports can be maximized to the extent that dischargers can successfully (and quickly) respond to changing conditions. This salinity control program cannot change any existing downstream flow requirements. Staff, however, does not know of any downstream flow constraint that would "limit the ability to discharge stored flows under certain conditions." The margin of safety must be large enough to account for uncertainty in accounting for all sources, so that water quality objectives are not exceeded. The MOS could be reduced if the dischargers demonstrate that real time management can operate successfully with no exceedances of salinity objectives at a smaller margin of safety.

Real-time management would allow significantly more salt exports than a purely concentration based approach, because high concentration discharges would always be limited by an upper concentration limit while real-time load based effluent limits would allow for discharge of concentrated salts when assimilative capacity is available.

Comment # 6.15
Taking Water Rights is Not the Solution
On a number of occasions, Regional Board staff has told the TID that their aim in giving a zero allocation to East Side agriculture was to force water use reductions and thereby increase discharges of Sierra source water directly to the San Joaquin River to dilute downstream salt. The BPA Staff Report briefly implies this same concept, saying that "agricultural water conservation could reduce pollutant loading from return flows back to the river potentially making water available for other beneficial uses" (page 37). Using the TMDL process and

creating a convoluted, inequitable TMDL to extract Sierra quality water from agriculture on the East Side is not appropriate.

Response
Staff has no intention of taking anyone's water rights. The statement that "agricultural water conservation could reduce pollutant loading from return flows back to the river potentially making water available for other beneficial uses" (Staff report Section 4.4.3) is consistent with Appendix F of TID's AB 3616 Water Management Plan that indicates that water conserved as a result of canal automation "would remain in the aquifer or in Don Pedro Reservoir for allocation to other beneficial purposes". The statement was intended to highlight one of the secondary benefits of water conservation.

Comment # 6.16
Concerns with TMDL Implementation and Estimated Costs
The BPA Staff Report includes an analysis of alternatives to implement the TMDL, which greatly underestimates the level of effort required to achieve either the fixed load or real-time allocation scenarios. The BPA Staff Report seems to view drainage re-operation as a relatively simple task, which "involves changing the timing of releases to the LSJR to coincide with periods of assimilative capacity by temporarily storing saline drainage" (page 2). However, it is not as simple as that. The BPA Staff Report also includes an estimate of $27 million to $38 million per year for capital and operational costs, which is significant, but may not be anywhere near adequate to cover the real costs.

Although the Regional Board staff has made an effort to analyze measures that may be needed to implement their proposed program, they do not appear to have a firm understanding of the local needs or facilities. The analysis neglects to evaluate the overall costs needed to maintain a salt balance in the region. Without significant infrastructure modifications, the proposed re-operation or rescheduling of releases would result in the concentration of salts in East Side areas. As a result, the analysis contained within the BPA implementation plan is not realistic, is oversimplified, and hugely underestimates the complexity of the solution and its associated costs.

The following comments describe: (1) the current irrigation facilities within the East Side area; (2) why the proposed modifications identified by the Regional Board would not be sufficient to meet the demands of the proposed TMDL in this area; and (3) an example of the types of modifications that would be needed, along with the associated costs.

Response:
The cost associated with real-time management and drainage re-operation would be less than the cost of implementing the base load allocations or a prohibition of discharge. Staff acknowledges that the costs would be reduced for the east side if east side dischargers could release discharges up to the water quality objectives (as proposed by TID). The cost savings realized by TID, however, could be shifted to other dischargers because total base load allocations would need to be reduced.

In concept drainage re-operation is relatively simple, but we realize that implementation of drainage re-operation would be complicated and costly. The cost of real-time management and

drainage re-operation would, however, be offset by the reduced need to treat or manage drainage on a permanent basis. The basis for the cost estimates used for implementation of each of the alternatives is described in detail in Appendix 4. As stated in Appendix 4, the cost estimates only represent one approach for addressing drainage and complying with the TMDL. Dischargers may choose to use a number of different methods to achieve compliance and therefore costs may vary.

All cost estimates were made on a basin-wide scale, therefore the cost for east side versus west side is not apparent from our analysis. It's important to note that the cost estimate for real-time management is 27 to 38 million dollars per year amortized over 20 years at a 6% interest rate. The total cost over the 20-year amortization period is therefore approximately 540 to 760 million dollars. It's also important to note that this is the cost estimate for real-time management without re-operation of drainage. In other words the basin-wide cost to comply with real-time load allocations without releasing stored drainage to the river. This cost includes conventional treatment such as drainage recirculation, evaporation, and landfill disposal of salts. If drainage recirculation were used to reduce the volume of drainage needing permanent treatment, then compliance costs would significantly be reduced.

Comment # 6.17
Irrigation Systems on the East Side
Eastside irrigation districts use gravity fed systems to deliver irrigation supplies to local growers. The irrigation facilities within the TID, for example, include over 250 miles of canals and laterals, 1,600 miles of pipelines and ditches that take water from the canal to the individual parcel, and 15 operational spill points where water spills out of the canal into a downstream waterway. In several cases, these operational spills flow into local drains, where spill water is combined with groundwater seepage, and tailwater return flows from local farms before flowing via gravity to the river.

Response:
Comment noted.

Comment # 6.18
Gravity fed canal systems
A gravity fed canal system operates in a manner similar to a river system. Once water is in the river, it continues to flow downstream unless it is held behind a dam, diverted or pumped out for other purposes. The same is true with a canal system. Once water is flowing in the canal, it will continue to flow downstream unless it is delivered to an irrigator or otherwise diverted from the canal.

The canal system is designed to be an "upstream controlled system." Canal levels must be held constant within a particular reach of the system to ensure water delivered to irrigators taking water in that location are measurable and consistent. To accomplish this, canal systems are divided into reaches by drop structures. Water upstream of a drop structure is held at a constant level by allowing water to spill slightly over the structure into the downstream reach. In order to ensure the last reach in the system has sufficient water to meet irrigation deliveries, the water

spills over the last control drop structure, and out of the canal system. This type of spill is known as an operational spill.

East Side irrigation districts typically use 15 to 20 cfs heads designed to efficiently flood irrigate local crops on sandy soils. A head of water is the rate of flow delivered to an individual grower. Irrigators order water as it is needed for their crops. Based on irrigation orders, surface water is brought into the system, supplemented as needed by groundwater pumping, to meet the irrigation demand. Deliveries to growers are then arranged by canal operators to minimize spills.

In addition, operational spills can result from fluctuations in canal flows as water delivery changes are made. For example, whenever water is transferred from one irrigator to the next some water is lost downstream since it is physically impossible to conduct a simultaneous "hand off" from one irrigator to the next due to the conditions involving time, distance and manual operation. A typical canal will have 20 to 30 of these "hand offs" in a 24 hour period.

Although adjustments in the canal operation are constantly being made to minimize these types of situations, the nature of the gravity irrigation systems will always result in operational spills. Recognizing this, gravity systems are typically designed with a 5-10% operational spill to account for these types of losses.

Response:
Comment noted.

Comment # 6.19
Water use
The types of crops grown in the East Side area are based on the local economy, as well as local needs. The irrigation systems used are determined by the grower based on their individual needs, crops and soil types. Approximately half the growers in the TID grow tree and vine crops, while the other half produces forage crops such as alfalfa, oats, and corn to support the local dairy industry. While advanced irrigation practices (e.g., drip and micro irrigation) work well on orchards and vineyards, they do not provide an effective means of irrigating forage crops. In addition, flood irrigation provides a practical means of utilizing nutrient water produced by the dairies to fertilize local crops.

It is also important to note that irrigation water is transported from the canal to the farm through over 1,600 miles of pipelines and ditches, many of which were built 50 to 70 years ago. These facilities are typically cast-in-place pipelines or ditches that have been lined. These types of facilities work well to provide for flood irrigation, but will not meet the demands of more advanced irrigation technologies, which require pressurized systems. Any large movement to advanced irrigation systems would require a costly new network of distribution lines from the canal system to individual parcels.

Due to the permanent nature of orchard and vine crops, and the built in market created by the dairy industry for local sources of forage crops, significant changes in irrigation practices or cropping patterns are not anticipated. As a result, the proposed sequential re-use of salty water on more salt tolerant crops is an unlikely alternative in this area.

Response

We acknowledge that implementation of the proposed control program may require modification to existing water distribution and irrigation infrastructure. This comment, however, seems to indicate that water use efficiency and drainage cannot be improved within TID because of the existing cropping pattern. Our analysis of DWR land use data indicates that there are about 70 thousand acres of forage crops within TID (approximately 17 thousand acres alfalfa, 37 thousand acres corn, and 15 thousand acres pasture). Although advanced drip and micro sprinkler technology may not be appropriate for these crops, there are other methods that could likely be employed to reduce drainage. For example, corn and alfalfa could be sprinkler irrigated during establishment when the root zone is relatively shallow, a practice that is used in other districts in the Valley. Even with flood irrigation in place, tailwater recovery systems could also be used to reduce drainage and the amount of water applied by reducing application time and increasing irrigation uniformity. It is therefore not clear why TID's cropping pattern precludes drainage reuse. Furthermore, sequential re-use of drainage water is only one potential implementation measure that could be used to comply with the proposed control program. TID has recently been awarded over 700 thousand dollars of Proposition 13 funding, in large part, to offset the cost of installing positive shutoff devices on drainpipes in an effort to control field discharges. Canal automation may be another means for reducing discharges to the San Joaquin River, since drainage water is typically pumped into the TID supply system.

Comment # 6.20

Need for drainage

On the East Side, there are areas where high groundwater levels require subsurface drainage to maintain agricultural production. Shallow clay layers that impede the downward movement of irrigation water create these perched water or high groundwater conditions. Within the TID, high groundwater areas cover up to half of the TID. Much of these areas are located in the western and southern portions of the TID. Without drainage, high groundwater levels can adversely impact crop production.

Historically the TID has provided a level of drainage through the use of TID owned drainage wells. These wells are utilized to lower shallow groundwater levels and supplement surface water supplies. Water pumped from drainage wells is discharged into the canal system where it is utilized as much as possible for irrigation purposes and is included in the groundwater pumping portion of the water supply described above.

In more recent years, private tile drains have been installed in some locations. These drains also typically discharge into the canal system, where the water is utilized as much as possible for irrigation supply.

The drainage water pumped into the canal is of a lower quality than the surface water supply. However, the re-use the TID currently practices is a form of the "sequential re-use" proposed by the BPA Staff Report because commingling drainage water in the lower reaches creates progressively more saline supplies. However, due to the nature of a gravity fed system, the TID does not see the "volume reduction" anticipated by the sequential re-use strategy proposed in the BPA Staff Report.

Response:
Comment noted (See response to Comment # 6.23)

Comment # 6.21
Needed System Modifications for TMDL Implementation
There must be a means of maintaining a salt balance both within the East Side areas and the rest of the river basin. The overall BPA must be developed with a means of ensuring that a salt balance will be maintained.

Within the East Side area, current practices facilitate a means of utilizing groundwater needed for irrigation, providing drainage, as well as transporting salt from the groundwater basin. Significant changes to local infrastructure, operation and management practices will be required in order to comply with the BPA, while continuing to: (1) provide irrigation water for local growers; (2) facilitate drainage needed to maintain agricultural production; and (3) maintain some type of a local salt balance.

The following section provides a discussion of some of the measures that may be needed, as well as the associated costs. The changes would result in a huge burden to the local economy disproportionate to the benefit to the river system realized by these measures.

If implemented, the BPA will require operational spills from the TID and other East Side districts be discontinued entirely, possibly up to 5 months at a time, as needed to meet water quality requirements in the river. Due to the nature and complexity of the existing East Side irrigation facilities (described above), it would be impossible to comply with the proposed BPA on the East Side.

Response:
Staff acknowledges the need to maintain a salt balance, as well as the competing need to consistently attain the salinity water quality objective that was set to protect the agricultural beneficial use. As stated above, opportunities to use a real-time load allocation have been incorporated into the Basin Plan Amendment with the goal of facilitating a salt balance and minimizing the burden to dischargers. We agree that significant changes to local infrastructure, operation and management practices will be required in order to comply with the Basin Plan Amendment, however, we disagree that compliance is impossible.

Comment # 6.22
Groundwater drainage
The existing wells used to provide drainage, as well as supplement surface water supplies, discharge salts into the canal system. However to maintain a salt balance, the salts can not continue to be re-circulated and discharged onto local lands without the ability to remove salts from the system. Without the ability to discharge salt to the river and transport it out of the basin, an alternative means of removing drainage water, like a large-scale tile drain system would be needed. Within the TID alone, such a facility will need to cover between 50,000 and 75,000 acres, including a separate transportation, storage, and disposal system.

From the experience of TID, installation costs associated with tile drains vary significantly depending on the spacing of the drain lines, and its proximity to the terminal discharge point. Costs ranged from $200/acre (excluding the sump, pump and discharge facilities) to $800/acre (for drains located a mile or so from the terminal discharge point). The costs are also higher due to the small parcel sizes in the area, resulting in more infrastructure (e.g. roads, buildings, etc.) that must be avoided when laying out the network of drain lines. The capital cost of installing a system for 50,000 to 75,000 acres could run between $30 to $60 million, not including the on-going operation and maintenance costs associated with such an endeavor.

Response:
It is not clear why the existing system of drainage wells would need to be replaced with tile drainage systems to comply with the TMDL. Switching from wells to tile drainage still produces drainage that would need to be managed in some fashion. It is staff's understanding that much of the groundwater underlying TID is a derived from TID's management of surface water. It may be more cost effective to isolate and manage only the poorest quality drainage that is pumped by wells and the tile drainage that is currently produced. The remaining higher quality well pumped water could continue to be discharged back into TID's supply system. Given the exceptional quality of TID's supply water, it is unlikely that this blending would be detrimental to the agricultural use. Perhaps groundwater lowering (drainage below crop root zone) could be accomplished through changes to water management, thereby reducing the need to provide drainage and pump shallow groundwater.

Comment # 6.23
Control of operational spills
To control operational spills, and compensate for the loss of supply from drainage wells, a recapture and re-use system would need to be designed and constructed to bring the operational spills back into the system. Such a system would likely include canal automation, upstream regulating reservoirs, and pump back systems on the lower reaches of the canals.

An estimate of the cost to install such a system is unknown at this time. However, capital costs could easily run into the tens of millions of dollars, if not more, not including the on-going operation and maintenance costs associated of such a system.

Response
Appendix B of TID's AB 3616 Water Management Plan (pages 4 and 5) indicates that operational spills from TID could be reduced from an annual mean of 45,000 acre feet per year to an annual mean of 8,000 acre feet per year at a cost of 18.3 million dollars (reconnaissance level cost estimate). This appears to be a cost effective method to reduce drainage to the LSJR, and these costs could likely be offset by the revenue generated from the 37,000 acre feet of water saved each year.

Comment # 6.24
Surface water drainage.
There is some surface water drainage, in the form of tailwater flow, that discharges into local drains and is transported via gravity to the river system. As a result, on-farm facility and operational changes would be needed to ensure that tailwater flows are not allowed to leave the

field and discharge to local drains. These changes would likely include a combination of tailwater return systems, control structures at the ends of fields, and modifications to irrigation practices.
The number or extent of the systems that would be needed is not known, so it is not possible to estimate the cost at this time. It should be recognized that these costs would be real and would have to be absorbed by the same growers that would also be paying for the costs to implement the other measures identified above.

Response
Comment noted.

Comment # 6.25
Overall costs
The overall costs would be significant for the TID area, much less the remainder of the East Side. For example, if the cost for improvements to the TID system totaled $100 to $150 million and was distributed over the entire 147,000 acres, the cost could be $700 to $1,000 per acre. This is a much larger amount than the $25 to $35 per acre estimate indicated in the Economic Analysis in Appendix 4.

Although there are some larger farming operations within the area, East Side parcels are predominately small family farms. For example, within the TID, the average parcel size is only 25-27 acres. The $1,000 per acre in capital costs, plus on-going O&M would be a significant burden for these small family farms.

It is also important to note that this burden is not proportional to the contribution of salt coming from the local area. The East Valley Floor Sub-area contributes only 4% of the overall salt load to the Lower San Joaquin River watershed (Technical TMDL Report, page 1-36). The above estimate includes only the costs that would be expected to implement measures within the TID area, which generates only a portion of the East Valley Floor Sub-area salt load. Therefore, rather than controlling a large percentage of the salts being discharged to the river, these significant, and extremely burdensome measures would be implemented to control an almost insignificant portion (less than 4%) of the overall salt load.

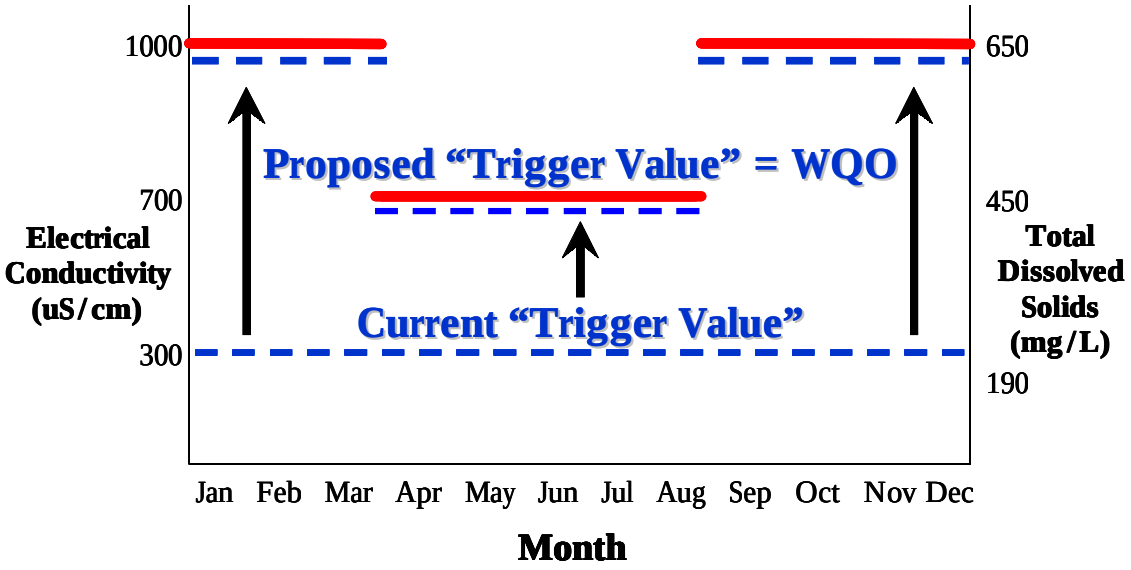
Response
It is not apparent where the cost estimate of 100 to 150 million dollars came from. The estimated range of costs to implement the real time TMDL (with no re-operation) is 27 to 38 million per year (amortized at 6% over 20 years), or $25 to 35 per acre per year for the 1.1 million acres of nonpoint source land use in the TMDL project area. The $100 to $150 million dollars cited by TID is a one time capital cost. Amortized over 20 years at 6 % this is a cost of $9 million to $13 million per year, which translates into a cost of approximately $58 to $88 per acre per year. This cost compares closely to staffs cost estimate of $63 to $88 per acre for implementation of Alternative 3 (base load allocations-TMDL).

Comment # 6.26
Concentration-based Approach Simpler, More Effective
In their November 2002 written comments, the TID proposed a concentration-based approach to the TMDL, which would greatly simplify the TMDL and would address both aspects of the salinity problem - meeting water quality objectives and transporting salt out of the basin to maintain a long-term salt balance. The proposed concentration-based TMDL would require that all discharges to the San Joaquin River be at or below the water quality objectives for salinity (i.e., 700 or 1,000 EC for the irrigation and non-irrigation seasons respectively).

In the concentration-based approach, the water quality objectives would be applied directly to surface water discharges as a first step in an adaptive management TMDL process. If warranted after implementing this first step, further reductions could be made in the future to offset any persistent higher concentration groundwater discharges. In taking a concentration-based approach, efforts would be focused on the highest concentration sources. The USBR mitigation responsibility could be applied directly to help offset West Side problems with high concentration discharges and the system would not have to be further complicated by the application of credits for lower quality source water.

The concentration-based approach is not very different from the "trigger value" concept in the current version of the TMDL, which allows for all high quality discharges below a given threshold level. The main difference is that the current TMDL has set the threshold level or "trigger value" at 315 EC, which is less than one-half to one-third the water quality objectives. The concentration-based approach, proposed by the TID, would essentially increase the trigger value to be equal to the water quality objectives of 700 and 1000, as shown in Figure 4.

Figure 4. Concentration-based approach similar to trigger value set at WOQs



The TMDL Technical Report briefly describes a basis for the selection of the trigger value (i.e., estimated as a function of salt concentration with a one-time usage, or "consumptive use allowance"). However, it seems to be a rather arbitrary determination and the value is not linked to meeting in-stream water quality objectives. The concentration-based approach, starting with a discharge limit equal to the water quality objective, would provide a more comprehensive solution to the salinity problem.

A concentration-based approach effectively solves many of the shortcomings of the current version of the TMDL as described below.

Response
The proposed TMDL already has a concentration-based element; all discharges below a trigger value of 315µS/cm electrical conductivity would be unrestricted. The primary difference between the TID proposal and draft TMDL is the trigger value at which discharges are unrestricted (not subject to the TMDL). Under the TID proposal the trigger value would be set equal to the seasonal salinity water quality objectives at Vernalis (700µS/cm April through August, 1000µS/cm September though March).

The trigger value contained in the TMDL is based upon the expected discharge water quality from a non-point source that receives excellent quality (low salt) supply water. Though a technical basis for the trigger value is provided in Appendix 1 of the staff report (Section 4.2 under subheading titled Consumptive Use Allocation), selection of an appropriate trigger value is ultimately a judgment call that will shape which dischargers will be affected by the TMDL. Raising the trigger value will, in general, provide less incentive to reduce water quality degradation because more entities will have discharges with concentrations below the trigger value. Conversely, lowering the trigger value will, in general, provide greater incentive to reduce water quality degradation because more entities will have discharge with concentrations above the trigger value. Selection of a trigger value at or just below the water quality objective provides little or no incentive to reduce non-point source loading from areas that receive high quality supply water. For example, dischargers receiving irrigation supply water below 85µS/cm would be allowed to discharge water at 700 to1000µS/cm. Setting the trigger value well below the water quality objective places responsibility on dischargers that use and degrade high quality water.

A purely concentration-based approach that allows discharge of unlimited salt loads, so long as the water quality objective is met, would have numerous adverse consequences. Allowing discharge of water that has a concentration equal to the water quality objective would also not be consistent with State Water Board Resolution No. 68-16 ("Statement of Policy With Respect to Maintaining High Quality Waters in California"), the so-called "anti-degradation policy." A concentration-based approach would shift the majority of the responsibility for reducing salt and boron loading to the west side of the San Joaquin River. Under this approach, drainage from much of the west side would be prohibited from discharging at all times. Such a prohibition of discharge would likely lead to a salt build-up and exacerbate groundwater salinity problems. Additionally, allowing unrestricted discharges of water below the water quality objective will not result in compliance with salinity water quality objectives because uncontrolled groundwater accretions exceed the water quality objectives. Mixing poor quality groundwater with water at

the water quality objective results in a quality that is above the water quality objective. Staff, therefore, disagrees with TID's recommendation to use a purely concentration-based approach.

Simplicity is certainly an attractive feature of a concentration-based approach, however, a concentration-based approach may not be as simple as is suggested. For example, how would the USBR mitigation responsibility be applied directly to help offset West Side problems as the comment states? It is likely that some kind of a load-based accounting mechanism would be needed to allocate responsibility to the USBR, since USBR dischargers are typically below the salinity water quality objective. Additionally, a purely concentration-based TMDL would entirely eliminate the ability to discharge from much of the west side, while a load based approach allows some level of west side discharge through base load allocations, real-time load allocations and supply water credits. A hybrid load and concentration-based approach is needed, because the purely concentration-based approach simply does not address the complexity of the factors that contribute to the salt impairment in the LSJR.

Comment # 6.27
Maximizes Salt Export
A concentration-based approach would facilitate much greater export of salt out of the Central Valley, as compared to the fixed load allocation approach. As shown in Figure 4 above, rather than limiting discharges to those with salt concentrations at or below 315 EC, the concentration-based approach would allow discharges up to 700 or 1000 EC, during the summer and winter seasons respectively. Instead of requiring the capture and storage of flows during most of the summer, the concentration-based approach would promote much greater discharge of relatively high quality flows into the San Joaquin River, which would help to dilute downstream salt and to maintain salt transport. The concentration-based approach would avoid the net concentration and build-up of salt that would occur with the fixed load allocation approach. By continuing to transport salts out of the basin, agriculture will be sustainable into the future.

Response
A concentration-based TMDL would allow greater salt exports than the fixed base load allocations, but far less salt exports than the real-time load allocations. Under the real-time load allocations salt discharge is only limited by the assimilative capacity available in the river (regardless of the concentration of the discharge). But under a concentration-based allocation, salt discharge is limited to those discharges that are below the objective. As mentioned above, a purely concentration-based approach would eliminate the ability to discharge from the most salt-impaired areas on the west side. These are the same areas that receive the greatest salt in supply water. How would a purely concentration-based approach promote salt export and/or achieve a salt balance? Even on the east side, a purely concentration-based approach would not allow as much salt export as the real-time load allocations, unless the concentration threshold value was set higher than the water quality objective.

Comment # 6.28
Meets Future Objectives Upstream of Vernalis
If all discharges were required to meet the salinity concentration objectives throughout the TMDL area, then the river would be much more likely to meet objectives at all points in the basin, including those upstream of Vernalis. A concentration-based approach would avoid the

need for in-stream blending of high concentration discharges from some areas to meet a downstream point of compliance. Taking a concentration-based approach would address concerns about water quality upstream of Vernalis immediately and avoid the need for a subsequent TMDL process. By improving water quality upstream of Vernalis, source water quality for agriculture on the West Side would also improve over time and lessen the need to treat or otherwise address high concentration discharges from those sub-areas. As source water improves, it is anticipated that the groundwater concentrations on the West Side will also improve, further reducing in-stream salt concentrations.

Response
A concentration-based approach that uses the Vernalis water quality objectives won't necessarily meet the Vernalis water quality objective, since high salt groundwater accretions will be mixed with surface discharges that are already at the objective. It is not clear how a concentration-based objective would meet future upstream water quality objectives as water quality gets progressively worse moving upstream. Additionally, water quality objectives have not yet been established so it is not possible to know if they can or will be attained.

Comment # 6.29
Provides Greater Equity
A simple concentration-based approach would apply the same standards (e.g., water quality objectives) directly to all dischargers. For those sub-areas with the highest concentration sources, the entity responsible for reducing the quality of source waters would directly participate in offsetting that impact through a mitigation responsibility.

Response
It does not seem equitable to hold everyone to the same discharge standard, given that some users receive a degraded supply and other users receive a high quality supply. TID appears to suggest resolving this inequity by holding the water supplier accountable for salts in supply water. Staff agrees with this approach and has already incorporated this concept into the TMDL using load-based supply water allocations. Using a concentration-based approach, it is not clear what mechanism would be used to offset the impact of high salt supply water.

Comment # 6.30
Enables Simple, Direct Measures of Compliance
Compliance with a concentration-based TMDL could be evaluated much more easily. Rather than having to incorporate flow measurements to calculate loads, compliance would be measured directly by salinity concentrations. EC measurements, which are relatively cost-effective to collect, could be evaluated for discharges into the system or at any point within the system to assess compliance.

Response
Staff agrees that it would be easier to measure compliance using a concentration-based approach.

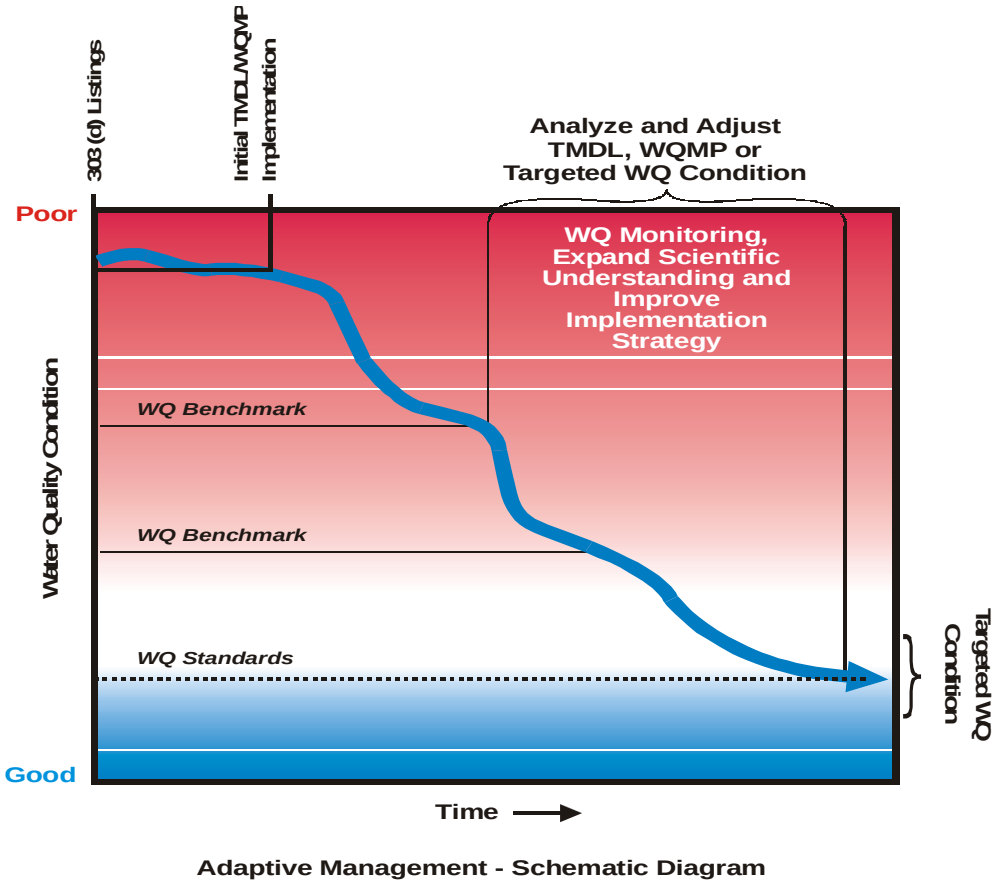
Comment # 6.31
More Cost-effective
Because it is very straightforward, a concentration-based approach would be much less expensive to administer. Rather than diverting critical resources to the TMDL implementation process, efforts could be applied directly to treat the salinity problem. The concentration-based approach would also focus the greatest attention on the highest concentration sources, so that expenditures on control strategies would yield greater net benefits. Focusing on the highest concentration sources also seems to be more in line with the Watershed Policy, referenced above.

Response
The proposed TMDL focuses on the most concentrated sources first, but eventually all sources are addressed. The proposed control program includes time schedules that focus compliance on the highest priorities first. This approach will allow staff and the regulated community to focus on the largest salt sources first. TID is considered a lower priority area and has the longest compliance time schedule, which allows 16 to 20 years for compliance with load allocations. Staff agrees that a concentration-based approach may be more economical to implement for the east side, however, on a basin-wide scale, a concentration-based approach is likely to be more costly than implementation of real-time load allocations.

Comment # 6.32

Provides a More Appropriate Phased Approach
The concentration-based approach provides great flexibility to adapt and phase in practices to improve water quality as needed over time. The TID has proposed that existing water quality objectives be applied as the initial targets, or first level of implementation for the concentration-based approach. As actions are taken to improve discharge quality to meet the objectives, adaptive management can be applied to monitor system response, refine the analysis, and consider other technologies as needed. As surface water discharges improve, groundwater concentrations are expected to improve as well, helping to reduce salinity concentrations throughout the entire system. If initial actions to reduce salinity in surface water discharges do not fully achieve the instream water quality objectives, then the targets can be reduced or other actions can be taken in an iterative or adaptive process, as depicted in Figure 5. Such adaptive management approaches have been very successfully applied in other significant, multi-party TMDLs (e.g., Snake River/Brownlee Reservoir and Upper Klamath Lake) because they support early progress toward water quality objectives and enable dynamic TMDLs that can effectively respond to complex system changes.

Figure 5. Illustration of Adaptive Management Approach (from Oregon DEQ, 2001)



Response

As stated above, the proposed TMDL and Basin Plan Amendment already include concentration-based elements. All discharges below the 315µS/cm trigger value are unrestricted and all waste load allocations for point sources are concentration-based, and set equal to the existing water quality objectives at Vernalis. The concept of allowing all discharges up to the water quality objectives could be explored and/or implemented through a real-time management approach, which is allowed by the proposed control program. Real-time management, by its very nature, is adaptive management. Moreover, the proposed basin plan amendment language states that the Regional Board will update the load allocations and waste load allocations every six years, providing additional opportunity to incorporate new scientific data and make course adjustments to the waste load allocations and load allocations if necessary. Additional flexibility is provided to east side dischargers through a 16 to 20 year schedule for compliance with load allocations.

Setting purely concentration based load allocations and waste load allocations, however, is not appropriate (see response to Comment # 6.26 trough Comment # 6.30). Additionally, groundwater quality will not necessarily improve as a result of implementation of the proposed concentration based approach.

Comment # 6.33
Concentration-based Approach Warrants Further Consideration

Unfortunately, Regional Board staff has not been receptive to the concentration-based approach to date. After checking the regulations, staff did acknowledge that the concentration-based approach is an allowable means to meet TMDL requirements (Oppenheimer conversation, 2003). The latest version of the TMDL was actually modified to apply the concentration-based approach to point sources. However, Regional Board staff has consistently rejected the TID's proposed concentration-based approach on the basis of two concerns: 1) that the approach would "let East Side agriculture off the hook," and 2) that the concentration-based approach may not meet the water quality objectives. The TID has the following responses to these two concerns.

Response
Staff has been and continues to be receptive to alternate approaches to the TMDL and Basin Plan Amendment. Staff has discussed the concentration-based approach at length with TID staff and TID has not adequately addressed staff concerns or come forward with a more "fleshed out" proposal. (See response to Comment # 6.5 and Comment # 6.58)

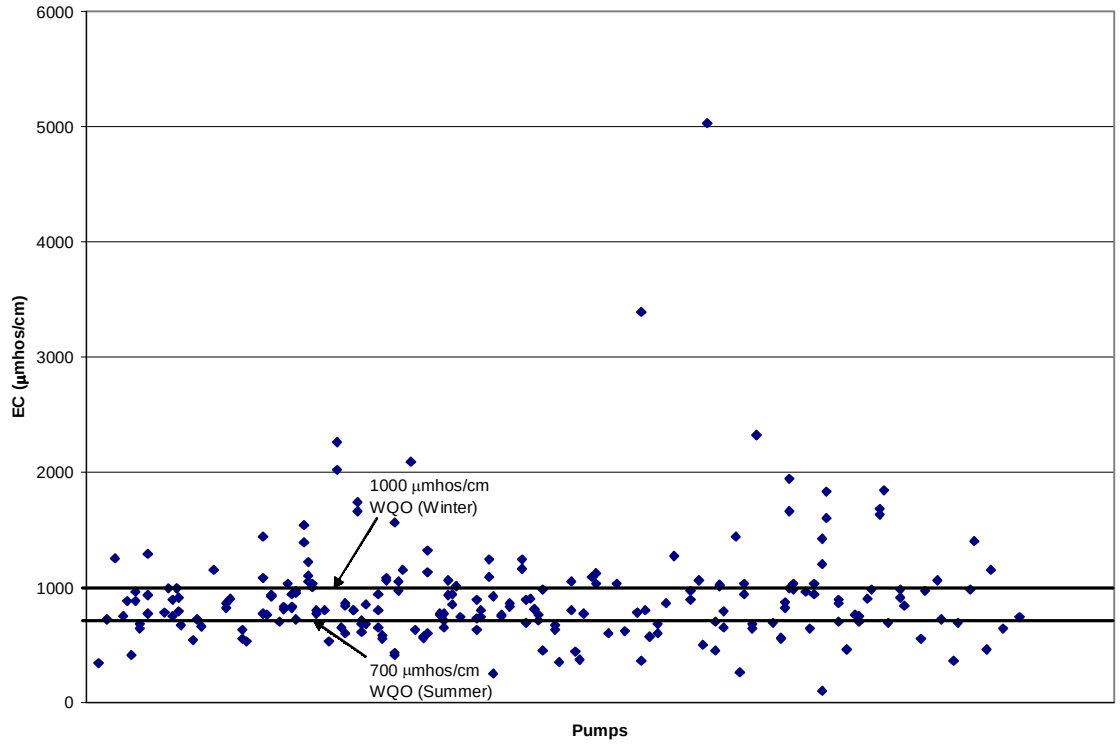
Comment # 6.34
East Side Agriculture Not "Off the Hook"
Although salts are not as much of a concern on the eastern side of the San Joaquin Valley as they are on the western side of the river, there are salt issues that will need to be addressed. Significant modifications will be needed to comply with proposed requirements while continuing to maintain a salt balance.

Response
Comment noted.

Comment # 6.35
Groundwater concentrations exceed surface water objectives.
As described earlier, East Side irrigation districts utilize a combination of groundwater and surface water for their supply. Groundwater pumped into the irrigation canals, blends with surface water supplies and is distributed to downstream irrigators. Surface water supplies are typically very good quality. However, groundwater can contain much higher salt levels. Groundwater and drainage water pumped into the canal system contain salts that impact the salt concentrations of operational spills discharged from east side areas into the San Joaquin River.

As shown in Figure 6 below, TID water quality analyses of groundwater samples from wells within the TID area have shown salinity concentrations ranging up to 2,000-5,000 EC (data collected in1999 and 2002), especially in the western or southwestern portions of the TID. The higher concentration groundwater in the western area of the TID may actually be coming from the West Side of the river. As noted in the Technical TMDL Report, the USGS found that "groundwater from the west side flows below the LSJR to the east side of the valley" (page 40). Due to high salinity levels, the TID has recently had to cease operation of some wells historically utilized to supplement irrigation supplies.

Figure 6. Salinity levels in groundwater within TID boundaries



The drainage pumping performed over the years within the TID has served the purpose of not only lowering groundwater levels but also removing salts and helping to limit the concentration of salts in the groundwater. Without these pumping and drainage practices, salt concentrations in groundwater would likely have increased to even higher levels over the years.

Response

It was our understanding that without these pumping and drainage practices, agriculture would not be viable in large portions of TID because of root zone saturation. Shallow groundwater is comprised of a combination of agricultural drainage and ambient groundwater, which appears to be contributing to TID's surface water degradation. Is shallow groundwater a result of irrigation practices, and if so, could the condition be improved through increased water application efficiency (less applied water)? In any case, dischargers should be held accountable for the agricultural drainage that they produce, regardless of its source.

Comment # 6.36

Surface water return flows exceed trigger value. Salinity concentrations of surface water return flow discharges to rivers from the East Side areas are generally much lower than groundwater concentrations, but can occasionally exceed water quality objectives. As shown in Figures 7 and 8, historic data exhibit concentrations above the objectives on several occasions for the Lateral 6 & 7 spill and at the mouth of the Harding Drain, both of which are located within the TID area. Though concentrations in spills to the San Joaquin River and tributaries are often below the water quality objectives of 700 or 1000 EC, they almost always exceed the trigger value of 315 EC currently proposed in the TMDL. One implication of the fixed load allocation and real-time TMDL would be to prohibit many discharges that are now occurring and effectively diluting

higher concentration discharges from other sources. As shown in Figures 6 and 7, spills from Lateral 6 &7 and the Harding Drain would not generally be allowed, when the non-point source allocation is limited, if the lower trigger value were in place. As the data indicate, even with a concentration-based approach, the TID would have to take steps to reduce salinity levels at key locations within their system to ensure consistent compliance with the water quality objectives.

Figure 7. Salinity levels and flow in Harding Drain above outfall to San Joaquin River

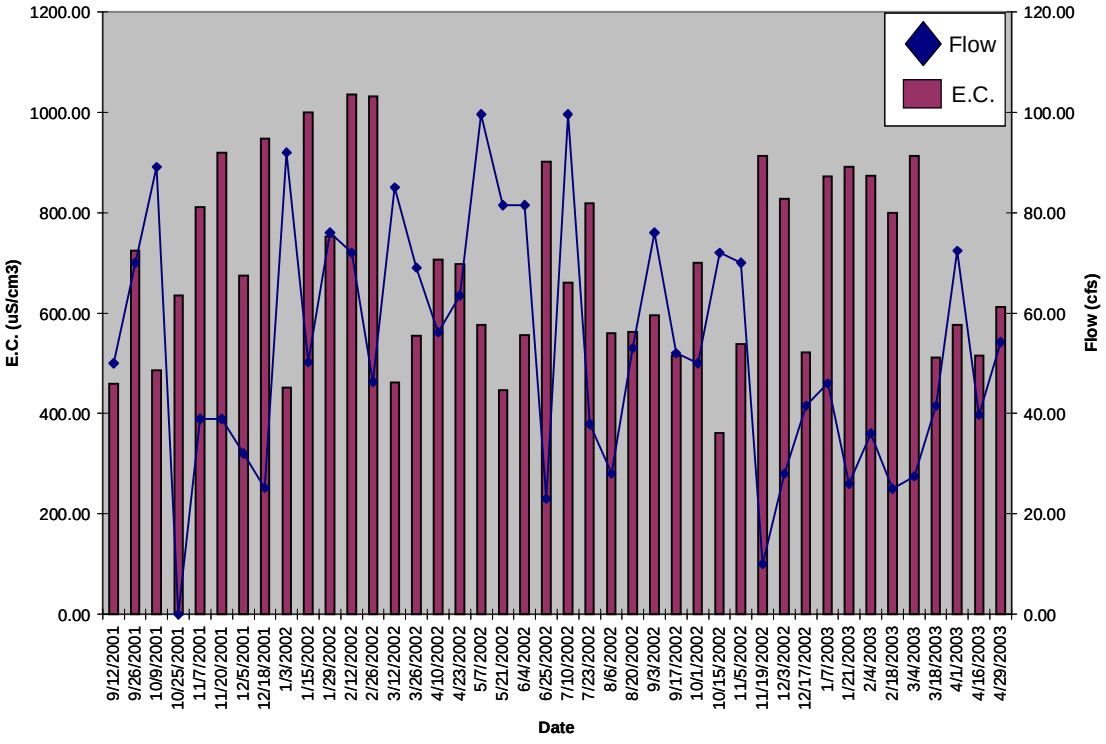
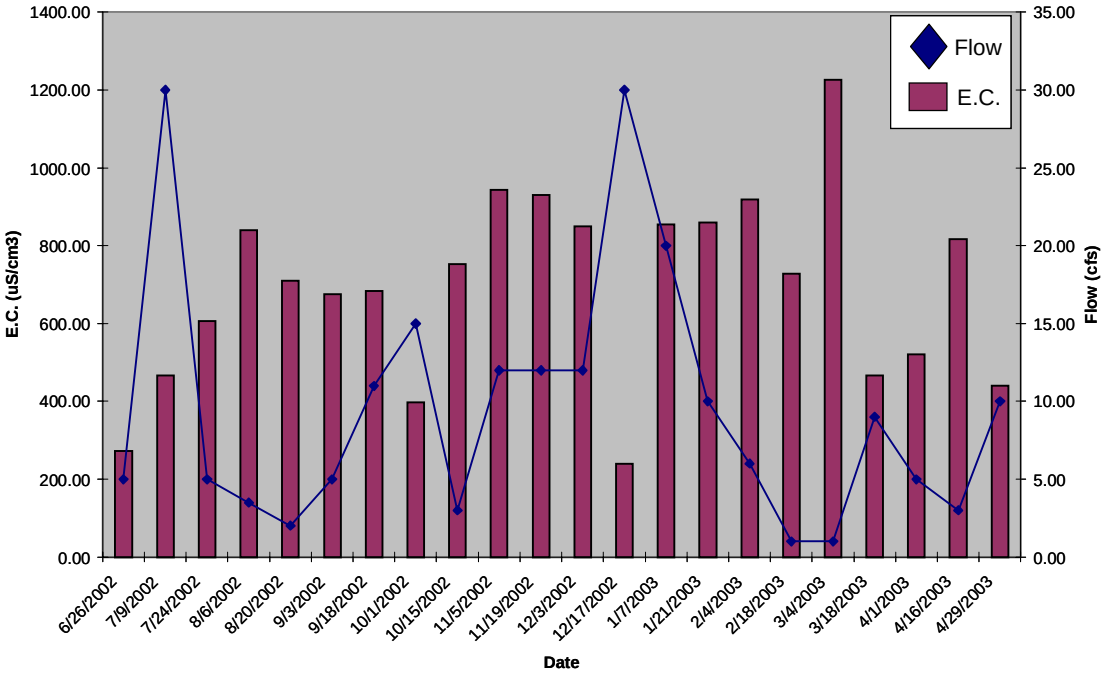


Figure 8. Salinity levels and flow in lateral 6 & 7 spill to the San Joaquin River



Response

It is important to note that spills from the Harding Drain include discharges from the City of Turlock's wastewater treatment plant. TID would not be responsible for wastewater treatment plant discharges; therefore, wastewater loading should be subtracted from total Harding Drain load to recalculate the salt load and EC attributable to TID. Figure 8 indicates that exceedence of the salinity objective only occurred on 3 dates (8/6/2002, 3/4/2003, 4/16/2004) and only when flow was below 5 cfs. The data also indicate that TID's discharge is often far below the existing salinity water quality objectives. Setting TID's load allocation at the existing salinity water quality would therefore allow for a further degradation of water.

Compliance with the proposed implementation program will limit but not eliminate TID's ability to discharge, since base load allocations and real-time load allocations provide opportunity to discharge water with EC above the 315µS/cm trigger value.

Comment # 6.37

Working with growers.

The TID has been a leader in working with growers to institute practices that protect water quality. The TID has long recognized that the quality of discharges into its canal system can affect the quality of water being provided to its customers and being discharged to the San Joaquin River and its tributaries. To protect water quality, the TID has established rules to require all discharges to meet pertinent water quality requirements and has established Revocable License Agreements with municipal and other agencies with known discharges to their system.

In addition, the TID has successfully applied for grant funding to support activities to improve water quality. In 2003, the TID was awarded a Proposition 13 grant to identify agricultural discharges within its service area and to develop a program requiring farmers to install positive shut-off devices on tailwater discharges. The TID program has been designed to give the growers the tools (e.g., an understanding of how to operate control structures to reduce flows and improve the quality of field runoff into drains) needed to assist in controlling the quality of agricultural discharges. The grant also contains an educational component to provide information to growers on practices to control tailwater discharges, and it includes some limited monitoring of flow and salinity to evaluate effectiveness of the program.

More recently, the TID has submitted a grant application to CALFED to perform a detailed assessment of the Harding Drain Watershed, which incorporates the largest portion of the TID system, including about 50,000 acres and acting as a significant tributary to the San Joaquin River system. If successful, the TID will work with stakeholders to hire a Watershed Coordinator, establish a Harding Drain Watershed Group, and develop a Watershed Management Plan to address water quality problems over the long term. As the TID has indicated in the past, the new Agricultural waiver requirements will also require steps to improve the quality of all agricultural non-point source discharges.

Response
Comment noted.

Comment # 6.38
Promoting water use efficiency.
The TID and other East Side irrigation districts have approved AB 3616 Agricultural Water Management Plans, which promote efficient irrigation practices within their districts in a variety of ways. The AB 3616 process requires agencies to continually review practices to identify additional measures that can be taken to ensure efficient water use.

Response
Comment noted.

Comment # 6.39
TMDL objective.
It is not appropriate to design a TMDL around a primary aim not to "let East Side agriculture off the hook." A TMDL and its associated implementation plan should start with the end in mind - effectively addressing the salinity water quality problem, and then develop a TMDL that best meets that need (e.g., a concentration-based TMDL). As demonstrated above, the TID is already actively pursuing means to improve water quality within TID.

Response
The primary goal of the TMDL is to meet the Vernalis salt and boron water quality objective.

Comment # 6.40

Concentration-based Approach Can Adapt to Meet Objectives Over Time

The second concern raised by Regional Board staff is that a concentration-based approach would not account sufficiently for high salinity groundwater discharges, which could ultimately cause the San Joaquin River to exceed the salinity objective, even if all surface water discharges were at or below the objective. However, this concern is addressed by a few important factors. First, significant reductions in surface water salinity will also lead to reductions in groundwater salinity over time. Second, if groundwater concentrations have not decreased sufficiently after a period of time, the TMDL can be re-opened and the concentration-based targets can be reduced to offset any persistent adverse impacts of groundwater discharges. The EPA strongly supports such adaptive management approaches, in which initial steps are taken toward improving water quality, monitoring and assessment of the system continues, and additional steps are taken as needed to reach water quality goals over time.

Response

Staff disagrees that significant reductions in surface water quality will result in reductions in groundwater salinity over time. If a concentration-based TMDL were implemented, discharge from large areas on the west side would be prohibited and ground water could become an even larger outlet for drainage and imported salts. East side groundwater loading could not significantly be improved through improvements in surface water quality, since east side supply water is already of an extremely high quality. It is more likely that east side groundwater loading to the LSJR could be reduced through increased efficiency.

Comment # 6.41

Legal Concerns Raised By Proposed TMDL and Basin Plan Amendment

In addition to the many technical concerns raised by TID, the proposed TMDL and Basin Plan Amendment raise many legal concerns. These issues are detailed below.

Inadequate Consideration of Economic Factors

The Regional Board is required to evaluate, among other things, economic factors. Water Code §§13241 and 13267. Although Appendix 4 to the Staff Report purports to have evaluated the costs to fulfill the requirements of this TMDL, that analysis is seriously flawed. By its own admission, the cost evaluation failed to consider the cost of salt disposal and site closure, (Appendix 4, pages 4-9 – 4-10), and it considered the cost of capturing mean flow, rather than peak flow (Appendix 4, page 4-5). Additionally, it failed to consider the true, substantial cost of infrastructure that will be required to comply with the TMDL, as detailed earlier in these comments. The report also recognizes these costs may very well be on top of many other control programs in the process of being implemented by this Regional Board, but does nothing to evaluate the cumulative impacts of all these regulatory programs. Further, the cost evaluation does not consider the cost impacts on agriculture of reducing groundwater drainage (impacting crop roots), or the agricultural productivity consequences of encouraging salt build up in the soil and groundwater. Neither does it consider the cost to convert established orchards and forage crops to more salt-tolerant plants, nor the consequences on agricultural production of imposing a zero-discharge regimen during the bulk of the growing season. In fact, the staff report admits, "the economic effects of potential changes in agricultural productivity have not been evaluated as part of this analysis" (Appendix 4, page 4-1).

Even where the assumptions made in the staff report are accurate, it does not adequately consider the economic consequences of those costs it concedes will be incurred. Even under the staff report's rosy scenarios, it predicts a 2% increase in the cost of production for growers (Staff Report, page 87). Even a 2% increase in cost of production can be a devastating blow to a farming operation that runs on a small margin. Although profit margin information for growers is hard to find, one study in 1995 showed profit margins for large Farm Labor Contractors in the Fresno area ranged from 1.8% to 3%, with an average profit margin of just 2.4%. [1] Adding 2% in production costs to a farm operating on a 2.4% margin leaves just 0.4% profit. Looked at another way, that 2% in increase in costs would represent over 80% of that farmer's income.

By comparing the cost of compliance to the total cost of agricultural production, rather than to the profit available to pay for these compliance costs, the staff report completely glosses over the devastating consequences this TMDL may have on many, many farmers in the region. This could very well be the proverbial "straw that breaks the camel's back" as competition from unregulated agricultural interests abroad increases. The full costs, and their impact on the viability of agricultural interest in the region, should be properly evaluated.

[1] http://are.berkeley.edu/APMP/pubs/sutterpubs/News.6.8.Dec95.html

Response

The proposed salt and boron TMDL does not include an amendment to a Basin Plan objective; rather it includes the adoption of an implementation program pursuant to Water Code section 13242. Water Code section 13241 applies only to the adoption of water quality objectives, not to the adoption of implementation programs or beneficial use designations. Water Code section 13267 is not applicable to the proposed action.

TID's comments indicating that economic analysis did not consider the cost of salt disposal and did not consider peak flows are wrong. The economic analysis did in fact consider the cost of salt disposal (Appendix 4, page 4-13, Figure D-1, Table D-4, and Attachment 1). The citation referenced above simply indicates that salt disposal was not considered as part of the cost for evaporation ponds. Salt disposal costs, however, were considered separately and are reflected in total cost estimates for implementation of Alternatives 2, 3,and 4. Additionally, the economic analysis did considered costs associated with peak flows (see Appendix 4, pages 4-14 and 4-15). Evaluating the proposed programs affect on agricultural productivity is beyond the scope of the economic analysis and beyond the requirements of water code Section 13141.

It is inaccurate to characterize staff's assessment of the economic costs to agriculture as "a rosy prediction" when the economic analysis clearly states that costs of compliance with this and other programs will be additive and that"[a]dding additional costs to marginally profitable or unprofitable agricultural operations will be detrimental to agricultural interests in the LSJR watershed." Agricultural profitability, however, depends on many factors that are not associated with the proposed control program. Moreover, agricultural productivity is extremely sensitive to commodity prices, which are beyond the scope and influence of the proposed Basin Plan Amendment. Nevertheless, we have strived to develop and recommend a program of

implementation that will result in attainment of water quality objectives and minimize costs by providing discharges with maximum flexibility and opportunity to discharge.

Comment # 6.42
Alternatives Have Not Been Considered
The Regional Board is required to consider reasonable alternatives, and may not approve a proposed activity if there are feasible alternatives that would substantially lessen any significant impact of the proposed action [Pub. Res. Code, § 21002; 23 CCR 3780]. The evaluation in the staff report entirely fails to consider several important alternatives, such as:

A concentration-based alternative, including allowing non-point source dischargers to discharge at the water quality objective, as point-source dischargers are allowed to do;

A more equitable allocation of burdens that does not try to balance the salt equation entirely on the East Side while allowing West Side to continue to discharge water that greatly exceeds the water quality objective; and

Reviewing and modifying the water quality objective itself.
With regard to this last point, no consideration has been given to performing a Use Attainability Analysis for the current Water Quality Objective.[1] As the recently published draft guidance from the State Board notes:

While in most cases the existing standards are appropriate and amenable to TMDL development, *in some circumstances, investigation during the development of a TMDL reveals that the standards may be inappropriate or imprecise,* thus rendering water quality attainment impossible through the TMDL process.

* * *
It would be inappropriate, for instance, to adopt stringent source reduction measures for the ostensible purpose of protecting a beneficial use that natural background levels of pollutants would prevent achieving, and thus some sort of standards action is the only appropriate regulatory response.

In current practice, there are two types of conditions under which the need for a UAA may arise: (1) when a waterbody is considered impaired (i.e., 303(d) listed) *but the use (and therefore, associated water quality objectives) may not be attainable,* and (2) when considering whether an upgraded or different use from that designated is appropriate. A change of the use is appropriate in either of these conditions.

[State of California S.B. 469 TMDL Guidance, *A Process for Addressing Impaired Waters in California,* Page 6-4 (SWRCB, Draft December 3, 2003)].

The TMDL establishes that the current Water Quality Objective is exceeded by background plus groundwater accretions alone in many instances (e.g., Staff Report, page 32). It seems likely that the Water Quality Objective can never be achieved consistently and may be inappropriate. It

should be reevaluated before the massive expenditures and potential social dislocation that may result from attempting to implement this TMDL.

1 UAAs are "a structured scientific assessment of the factors affecting the attainment of a use which may include physical, chemical, biological, and economic factors…" (40 CFR 131.10(g)). There are four types of situations in which a UAA may be considered: (1) when a waterbody is considered impaired (i.e., 303(d) listed) but the use (and therefore, associated water quality standards) appear to be inappropriate or the use does not exist; (2) when adopting subcategories of a use that require less stringent criteria; (3) when the use does not appear to be attainable; and (4) when meeting the use would likely result in substantial and widespread economic and social impact" (40 CFR 131.10(g)). State of California S.B. 469 TMDL Guidance, A Process for Addressing Impaired Waters in California, Page 6-4 (SWRCB, Draft December 3, 2003).

Response
The Regional Board staff has considered reasonable alternatives. See response to Comment # 1.3 regarding the range of alternatives that were evaluated and for consistency with the CEQA guidelines. Additionally, the recommended control program does include a concentration-based element, as it is proposed that all discharges below 315 µS/cm will be unrestricted. As discussed in response to Comment # 6.26, Comment # 6.27, Comment # 6.28, Comment # 6.29, and Comment # 6.32, allowing unrestricted discharges up to the water quality objective (as proposed by TID) has problems and many of the issues associated with TID's proposal remain unresolved.

The proposed control program is intended to implement an existing State Water Board water quality objective. Supporting information for the existing salinity objective is contained in the State Water Board's 1995 *Water Quality Control Plan for the San Francisco Bay/Sacramento San Joaquin Delta Estuary* (Bay Delta Plan). Furthermore, no evidence that the standard is inappropriate or imprecise has been identified through the TMDL development process. It is the responsibility of the State Water Board, through it's Triennial Review process, to modify their existing water quality objectives if it is determined that such modification is warranted. The Regional Board does not have authority to modify these objectives. While it may not be possible to achieve the Vernalis water quality objectives through discharge controls alone, staff does not agree that attainment of the objective is impossible if a combination of actions (including water rights actions) is taken to achieve the objective. It is therefore premature to consider a UAA for attaining Vernalis salinity objectives since they can be attained through a mix of load reductions proposed in this control program and additional flow that has been and can continue to be provided as a result of the State Water Board's conditioning of USBR's water rights and through future conditioning of other water rights if needed.

Comment # 6.43

Adverse Environmental Consequences have not been Considered and Mitigated

The Regional Board's Basin Planning process is exempt from the specific documentation requirements of CEQA because the Basin Planning process has a functionally equivalent process

in place [Public Resources Code §21080.5; 23 CCR §3782]. Thus, CEQA guidance and decisional authority is applicable to the Regional Board's Basin Planning actions.

There are numerous instances in the TMDL, Basin Plan Amendment, and Staff Report that raise serious concerns and demonstrate that the Regional Board has not yet complied with its obligations under CEQA. Potential adverse environmental consequences not considered include:

Increased salinity in the Lower San Joaquin River as a result of prohibiting flows of better quality water from the East Side (Appendix 5, pages A5-19). "The calculation of real-time load allocations did not consider the reduced assimilative capacity associated with removing flow along with the salt in the drainage water.");

Increased salt concentrations in groundwater (and in river water originating in groundwater) as a result of reduced or eliminated groundwater drainage and as a result of percolation from unlined retention and evaporation ponds (see Appendix 4, page 4-9 – the cost of geomembrane liner was not included, reflecting the TMDL's intent that evaporation ponds be unlined);

Loss of agricultural land and agricultural production to rising groundwater and increasingly saline irrigation water;

Recropping to accommodate more saline irrigation waters could result in loss of orchards (a loss of visual esthetics to the community, as well as causing serious economic disruption), and a loss of locally grown forage crops used to supply local dairies;

Recropping, in turn, could lead to an increase in transportation of feed from outside the area, increasing air pollution at a time when the Central Valley is struggling to reduce its reputation as producing the worst air in the United States, and increasing the cost of production for growers and dairies alike;
Significant social disruption that will likely result in the removal of land from active agricultural production, increasing the pressure to make the land productive by development instead; and
Noise, dust, and disruption to local communities while the extensive drainage, capture, impoundment, and treatment systems envisioned by the TMDL are installed.

In addition to failing to consider many potential adverse consequences, the TMDL Environmental Checklist identifies many potentially significant adverse environmental impacts, but fails to recommend further study. In particular, the Checklist identifies several potential impacts to biological resources (Staff Report, pages 99-100), which it describes as "potentially significant" (Staff Report, page 100). Instead of identifying and requiring the implementation of potential mitigation measures, the discussion then suggests that because there are several other stressors acting simultaneously on these same biological resources (including this Regional Board's own selenium TMDL), the cumulative impact of this new stressor can be ignored. In essence, the author is suggesting we simply write-off these endangered-species resources in favor of the greater good of reductions in salinity. This is contrary to CEQA's requirement that all cumulative impacts be evaluated and mitigated. Based on the Checklist's findings, an Environmental Impact Report is required to fully evaluate these potential impacts on biological resources and examine possible mitigation measures.

Response

The staff report sufficiently describes the possible effects of the control program on limits of regulated entities to discharge and reductions of flow in the SJR and tributaries (Staff Report Section 6.2). Such limits are routinely self-imposed now by much of the agricultural community when water is in short supply. The staff report does not ignore cumulative impacts, but rather identifies reasonably foreseeable feasible mitigation measures. Among the proposed mitigation measures are recommendations that the State Water Board continue to condition the USBR's water rights and that the State Water Board not allow more diversions of water from the Basin. Consistent with Public Resources Code section 21159(d), the Regional Board is not required to conduct project level analyses of future projects that could be proposed.

Comment # 6.44
Other CEQA Violations

The CEQA Environmental Checklist avoids evaluating the environmental impact of the TMDL by saying, "specific projects implemented to comply with the proposed regulations would need to be evaluated by the implementing entity, as necessary (Page 99). Again, in relation to possible impacts on managed wetlands, the Checklist states, "[t]he mix of habitat types within the wetland complexes may need to be changed to reflect changes in the timing of wetland draw down to meet load. Proposed changes to wetland operations or the construction of new facilities would be subject to a separate CEQA analysis by the appropriate lead agency" (Staff Report, page 101). This is classic segmenting or "piecemealing" of a project. "Project" is defined to include the "whole of an action" undertaken, supported or authorized by a public agency with the potential for physical change in the environment "directly or ultimately" [14 CCR. §15378 (a)]. The broad definition of the term "project" is intended to maximize protection of the environment, and CEQA requires that environmental considerations not be concealed by separately focusing on isolated parts and thus overlooking the cumulative effects of the whole action [14 CCR. §15378(a),(c)-(d), Bozung v. LAFCO, (1975) 13 Cal.3d 263, 283, 262; *Lexington Hills Assoc. v. State*, (1988) 200 Cal.3d 415]. CEQA prohibits a public agency from dividing a single project into smaller individual sub-projects to avoid responsibility for considering the environmental impact of the project as a whole [*Orinda Assoc. v. Board of Supervisors*, (1986) 182 Cal.3d 1145, 1171].

Additionally, the Regional Board is considering adopting a plan it knows will not work and which will potentially cause adverse environmental and social impacts. The TMDL holds out a promise of a "real-time management plan" that will cure all these ills, but the details of such a plan are completely absent. It is a violation of CEQA to approve a project "subject to" subsequently developed plans and studies *[Oro Fino Gold Mining Corp. v County of El Dorado* (1990) 225 Cal. App. 3d 872, 884-885]. "The CEQA process demands that mitigation measures timely be set forth, that environmental information be complete and relevant, and that environmental decisions be made in an accountable arena."

Response

When proposing Basin Plan Amendments to implement TMDLs and water quality standards, the Regional Board prepares a "Functionally Equivalent Document" for environmentally mandated projects. This is a type of "tiered" environmental review document whose procedures are described in Public Resources Code sections 21159 through 21159.4, and CEQA Guidelines 14 Cal Code of Regulations Section 15187.

Section 21068.5 of the Public Resources Code states that:

> *Tiering" or "tier" means the coverage of general matters and environmental effects in an environmental impact report prepared for a policy, plan, program or ordinance followed by narrower or site-specific environmental impact reports which incorporate by reference the discussion in any prior environmental impact report and which concentrate on the environmental effects which (a) are capable of being mitigated, or (b) were not analyzed as significant effects on the environment in the prior environmental impact report.*

(See also the legislative intent in PRC section 21156, and the statutes regarding "tiered" environmental review in sections 21093-21094.)

The Regional Board is not required to conduct a project level analysis for all conceivable projects that could be conducted to comply with the proposed regulation (under a first tier environmental review). Localities, however, may conduct second tier environmental review under PRC section 21159.2 and Guidelines 14 Cal Code of Regulations section 15189.

Comment # 6.45
The TMDL Fails To Meet the Requirements of the Clean Water Act

TMDLs must be established at levels necessary to attain and maintain the applicable narrative and numerical water quality objectives [Clean Water Act §303(d)(1)(C) and 40 CFR 130.7(c)(1)]. The proposed TMDL acknowledges it will not achieve the Water Quality Objective for salt, and it therefore does not establish "the levels necessary to attain and maintain" the applicable standard.

Response
As described in Section 4.6 of Appendix 1 and in Section 4.4.7 of the Basin Plan Amendment Staff Report, exceedences of the water quality objectives may continue to occur even with the proposed TMDL in place. Our analysis indicates that exceedances of the water quality objective could persist if any of the alternatives were implemented, including complete prohibition of discharge. Under the proposed control program, however, discharges will not be allowed to occur during times when water quality objectives are not being attained. Additionally, implementation of the TMDL is expected to result in significant improvements to LSJR salinity conditions. Additional flows may be required, however, in situations where salinity exceedances cannot be remedied through load reduction alone. The Regional Board does not have authority over determining water rights. In order to address this and other concerns, the proposed Basin

Plan Amendment language has therefore been revised to include the following recommendation to the State Water Board:

"*The State Water Board should consider the continued conditioning of water rights on the attainment of existing and new water quality objectives for salinity in the Lower San Joaquin River, when these objectives cannot be met through discharge controls alone."*

Staff does not believe that the limits of the Regional Boards authority in providing a guarantee that water quality objectives will be met 100 percent of the time is a legitimate reason for not completing a TMDL. Failure to develop a TMDL for a 303(d) listed waterbody is contradictory to the intent the Clean Water Act.

Comment # 6.46
Unconstitutional Taking of Private Property without Just Compensation
Both the State and the Federal Constitutions prohibit the taking of private property without just compensation. Adopting a TMDL with an ulterior motive of forcing those with rights to higher quality water to discharge that water to dilute the flow of others is an illegal taking. Moreover, there has been no evaluation of the impact on downstream water rights resulting from reduced flows as a result of forced retention of water or the consequential increase in salinity in the Lower San Joaquin River.

Response
No entity has the right to discharge polluted water. There is no requirement in this TMDL for water to be released for dilution purposes. There is no taking of private property. The proposed Basin Plan Amendment does, however, recommend that the State Water Board to consider conditioning water rights on attainment of water quality objectives.

Comment # 6.47
Adoption of this TMDL Would be an Arbitrary and Capricious Act
Alternative 4 (Real Time Management, with or without re-operation) is declared the preferred alternative (Appendix 5, page A5-21), yet the TMDL proposes to adopt the Base TMDL (Alternative 3), only allowing for the possibility of a real-time management system in the future. Failing to adopt the recommend alternative is arbitrary and capricious.

Furthermore, there is no rational basis for setting the "Trigger Value" at less than one-half the Water Quality Objective during summer months, and about one-third the Water Quality Objective during high-flow winter months, neither of which bears any relationship to meeting the Water Quality Objective. Adopting this "Trigger Value" approach is arbitrary and capricious.

Further, refusing to consider a concentration-based approach to regulate a constituent, the impact of which is concentration-based, is arbitrary and capricious.

Response
Real time management is the proposed alternative. That is why flexibility is provided in the proposed control program to operate using real time allocations. Alternative 3, with fixed load allocations, is proposed in parallel with real time allocations to provide clear limits for dischargers that chose not to participate in a real time management program. No alternate recommendations

for "trigger value" have been provided except for the recommendation to use the existing water quality objectives as the trigger value. Section 4.2 (subsection entitled Consumptive Use Allocation) of Appendix 1 provides the rational for the proposed trigger value. Response to Comment # 6.26, Comment # 6.27, Comment # 6.28, Comment # 6.29, and Comment # 6.32 describe why use of the Vernalis water quality objective is not an appropriate trigger value.

Comment # 6.48
This TMDL Violates the Administrative Procedure Act.
The Administrative Procedure Act requires regulations to be clear, consistent, authorized, and necessary [Government Code §11349.1(a)]. With over 445 different TMMLs, not counting the impact of credits, this TMDL fails the APA's tests of clarity. Until the Regional Board conducts a full review of all reasonable alternatives, the proposed Basin Plan Amendment will fail the test of necessity.

Response
The entire TMDL, including fixed base load allocations and formulas to determine real time allocations, is provided in table 4-24 of Appendix 1 of the staff report. This table is proposed to be included as table IV-8 of the Basin Plan. The complexity of the proposed control program is needed to provide flexibility to dischargers so that they can comply using a variety of methods. The Basin Plan Amendment is needed to bring the LSJR into compliance with it's existing water quality standards. A reasonable range of alternatives were evaluated in development of the proposed control program.

Comment # 6.49
Conclusions and Recommended Modifications

The TID appreciates the efforts of Regional Board staff in dealing with the very challenging problems of the salinity TMDL. However, the current version is not viable, because it will not meet salinity concentration objectives in the Lower San Joaquin River, nor retain a sustainable salt balance in the Central Valley. It is critical that whatever solution is developed provides a comprehensive means of resolving salt issues in the Central Valley and does not solve one problem (i.e., reducing surface water salt loads and meeting water quality objectives at Vernalis) and create other problems (i.e., net salt build-up in the Central Valley, increasing concentrations in groundwater, and potentially at points upstream of Vernalis).

Response
See response to Comment # 6.45. Real time management is proposed as the recommended alternative because it can result in attainment of water quality objectives while still allowing for flexibility to export salt loads from the basin, thereby avoiding a build-up of salts in the basin.

Comment # 6.50
Concerns with the Current TMDL
The fixed load allocation, which serves as the default TMDL, has several major shortcomings that make it untenable. The real-time allocation does not solve many of these shortcomings and introduces further complications and uncertainty. Key concerns with the existing TMDL are reiterated briefly below.

Limits Salt Export. The fixed load allocation would restrict the ability to export salt from the LSJR basin and would result in a net salt buildup in the watershed and long-term degradation of ground and surface waters (BPA Staff Report pages 2 and 34). In effect, a fixed load allocation could worsen existing salinity problems and make it even more difficult to reverse high salt concentrations in the future. Though designed to address this flaw, the real-time allocation still will not maximize salt export and will not take full advantage of the available assimilative capacity.

Response
See response to Comment # 6.14.

Comment # 6.51
Not an Equitable or Viable Solution.
The TMDL applies widely differing concentration endpoints for various categories of dischargers and allows for excessive credits to the West Side sub-areas, while allowing no credits for East Side sub-areas.

Response
See response to Comment # 6.5

Comment # 6.52
Overly Complex and Difficult to Measure Compliance. As demonstrated in the two example calculations, the fixed load allocation is extremely complex and convoluted, to the point that the actual outcomes for water quality are not clear. The 455 TMMLs will be difficult and very costly to administer and it will be nearly impossible to measure compliance. The real-time allocation approach would be considerably more complex and difficult to implement.

Response
See response to Comment # 6.6.

Comment # 6.53
Over-Protective.
The fixed load TMDL is greatly over-protective, resulting in negative net allocations under some conditions and leaving 10's of thousands of tons/month unallocated, while East Side agriculture is allowed zero allocation under many flow conditions. The real-time allocation would somewhat reduce the margin of safety associated with using the lowest flows on record to calculate TMMLs, but would still retain a 15% safety margin and would not address the issue of unallocated loads.

Response
See response to Comment # 6.7

Comment # 6.54

Produces Adverse Unintended Consequences. The TMDL is a load-based approach to solve a concentration-based problem. Because the TMDL focuses on reducing loads and is not tied to flows and concentrations, it is likely that current allocations will lead to a reduction in overall loads, while increasing concentrations - an adverse unintended consequence that only worsens salinity problems.

Response

The load reductions and mitigation prescribed in the TMDL will lead to significant improvements in LSJR river salinity conditions at Vernalis. By their very nature, loads integrate both flow and concentrations

Comment # 6.55

Will Not Meet Future Salinity Objectives.

As the BPA Staff Report acknowledges, the allocations may "need to be revised to reflect any new or revised water quality objectives" upstream of Vernalis (page 34). In fact, it is highly likely that the TMDL will not meet concentration objectives upstream of Vernalis and that the TMDL will need to be modified substantially.

Response

The TMDL will be modified and used as the implementation framework to meet any new water quality objectives upstream of Vernalis.

Comment # 6.56

Legal concerns.

There are several legal concerns with the TMDL, including the following.
Inadequate Consideration of Economic Factor
Alternatives Have Not Been Considered
Adverse Environmental Consequences have not been Considered and Mitigated
Other CEQA Violations
Unconstitutional Taking of Private Property without Just Compensation
Arbitrary and Capricious Act
Violates the Administrative Procedure Act.

Response

See response to Comment # 6.41 though Comment # 6.48.

Comment # 6.57

Recommended Modifications

TID strongly recommends that the Regional Board re-consider and substantially re-work the TMDL to reflect the comments presented here. Most notably, the TID asks that the concentration-based approach be given full consideration, that the overly protective allocation be revised (if a fixed load allocation is retained), and that inequities in the credit system be addressed.

Response
Comment noted.

Comment # 6.58
Apply concentration-based Approach.
The TID encourages the Regional Board to shift from a load-based to a concentration-based TMDL approach. The TID would be happy to work with Regional Board staff to consider the details of how the concentration-based approach might be applied in practice. Overall, the concentration-based approach would provide a simple, sustainable solution to salinity problems in the San Joaquin River Basin. Specifically, a concentration-based approach would overcome shortcomings of the current TMDL and offer several advantages, including the following.

Maximizes salt export
Meets future objectives upstream of Vernalis
Provides greater equity
Enables simple, direct measures of compliance
More cost-effective
Can apply adaptive management to meet objectives over time

Response

Staff has been open to considering a concentration-based TMDL where discharges below the Vernalis salinity objective would be unrestricted, however, we continue to have a number of concerns with this approach (see response to Comment # 6.26 through Comment # 6.33) that have not been adequately addressed. Staff expressed these concerns to TID staff at meetings held on 31 October 2002 and 12 March 2004, and during numerous phone conservations. On 29 April 2004 staff held a public workshop with the purpose of considering alternate approaches to the salt and boron TMDL and Basin Plan Amendment. Staff requested that TID provide a more detailed description of the their proposed concentration-based approach and explain how staff concerns could be addressed; however, TID did not provide any additional details regarding their concentration-based approach at the 29 April 2004 public workshop.

Comment # 6.59
Consider re-allocation of the TMDL. Even if the Regional Board is unwilling to consider a concentration-based approach, it should at least re-allocate the unallocated load so that the total allocated loads equal the TMMLs. Given that the West Side is already receiving substantial credits, the re-allocation should go to nonpoint sources on the East Side. The TMMLs already include a sufficient margin of safety in the very conservative flow assumptions and it is inappropriate to add any further margin of safety though unallocated loads.

Response
All available loading capacity is already equitably allocated in the TMDL. Supply water credits are provided in the TMDL only when an entity receives an impaired supply water. Areas within TID boundaries generally receive excellent quality supply water. If it is not receiving excellent quality supply water, it is because water quality has been degraded within TID boundaries. If that is the case, the entity or entities responsible for this impairment would be responsible for

mitigating the impairment. No supply water credit can be provided without some other entity being required to mitigate for their impairment of the supply, as the case with supply water credits provided to west side irrigators. Also see response to Comment # 6.7.

Note: comments 6-60 through 6-72 are from Attachment 1 of TID's comments. Attachment 1 is a copy of a paper that was submitted by Brown and Caldwell and TID for the Water Environment Federation's National TMDL Conference in Chicago in November 2003. Large portions of the paper are devoted to summarizing/paraphrasing the technical TMDL Report and were omitted from this response to comments. The omitted sections did not raise issue with the proposed TMDL or Basin Plan Amendment. Graphics and photographs were also omitted in most cases.

Comment # 6.60
ABSTRACT
Water quality objectives for salinity, to protect agricultural water supply use, are currently being exceeded in the San Joaquin River. The Central Valley Regional Water Quality Control Board has drafted a TMDL for salinity in the Lower San Joaquin River, which could actually lead to increases in salt concentrations in the future. Because the TMDL allocation is based on loadings versus concentrations, and because load reductions are achieved by eliminating lower-concentration sources, the end result would exacerbate existing salinity problems. The load-based TMDL would also concentrate salt within the Central Valley, rather than continuing to export sufficient quantities of salt needed to maintain a sustainable salt balance. An alternative approach, basing the TMDL allocation on salinity concentrations, has been proposed. A concentration-based approach would focus efforts on reducing the highest concentration sources of salinity throughout the watershed, would lead to real improvements in downstream water quality, and would be a more transparent, more directly monitored approach to comply with salinity objectives.

Response
See response to Comment # 6.7, Comment # 6.8, Comment # 6.27, Comment # 6.28, Comment # 6.30, and Comment # 6.31.

Comment # 6.61
Allocation Approach in the TMDL Staff Report
The proposed allocation of the 60 TMMLs is very complex. Initially, the RWQCB allocated the TMML among several categories, including the following:

- background load,
- "consumptive use allowance",
- groundwater load,
- wasteload allocation, and
- load allocation.

Load allocations for all nonpoint sources in the LSJR watershed have been calculated as the remaining assimilative capacity or unused TMML, after all other sources are accounted for. The

overall load allocation available for nonpoint source discharges is 0 tons for the months of June and July, regardless of the water-year type (i.e., even in wet years). In critically dry years, the load allocation also remains 0 tons for the months of April, May, and August. Thus, no discharges that exceed 193 mg/L TDS would be allowed for any nonpoint source throughout the San Joaquin valley during the entire irrigation season under the base load allocation.

Response
The comment incorrectly contends "no discharges that exceed 193 mg/L TDS would be allowed for any nonpoint source throughout the San Joaquin valley during the entire irrigation season under the base load allocation." This is not true since non point sources on the west side of the San Joaquin River receive a supply water credit that will provide significant opportunity to discharge even during the summer months in wet through critically dry years. Moreover, the irrigation season runs April though August, and base load allocation is available to all non point sources during this period. Base load allocations are in fact quite high during periods of April and May, when flows are being released pursuant to the Vernalis Adaptive Management Program (VAMP). It is correct that during June and July, under the base load allocations, east side discharges would be limited to those that are at or below the 193 mg/L (315 µS/cm) trigger value. The real-time load allocation approach that is available to all dischargers would allow for excursions from the base load allocations and greatly increase the east side's ability to discharge during the summer months (above and beyond the 193 mg/L trigger values).

Comment # 6.62
Real-Time Allocation
As an alternative to the base load allocation, the RWQCB has also introduced the concept of a "real-time load allocation." However, the viability of this alternative approach is questionable. The concept has not been developed. It has been left to the stakeholders in the nearly three million acre LSJR watershed to develop an "acceptable" real-time management program as a prerequisite for its use.

Response
See response to Comment # 6.1 and Comment # 6.5.

Comment # 6.63
Problems with a Load-Based TMDL
As noted above, instream salinity objectives have been developed to protect a concentration-based effect, primarily for agricultural water supply. However, the LSJR TMDL has been developed using a load-based approach to protect the concentration based effect. There are a number of serious inherent problems and unintended adverse consequences that will result from taking a load-based approach to attempt to reduce salinity concentrations in the San Joaquin River, not the least of which is the long-term build-up and concentration of salt in the upstream basin. A long-term build-up of salt in the watershed will make it even more difficult to meet downstream salinity objectives and would have a devastating effect on agriculture in the State of California. The TMDL Staff Report seems to recognize this concern by stating that "limiting discharges through static load allocations may be necessary for pollutants that bioaccumulate or have a cumulative effect on receiving water quality, however this approach is not appropriate for

salt and boron in the LSJR because it does not recognize the need to export salt." However, the base load allocation remains just that – a static load-based allocation.

Response
Staff agrees that base load allocation is a static allocation, however, the base load allocation represents only one available path to compliance with proposed control program. As mentioned above, the real-time management option allows dischargers with a flexible and dynamic means of complying with the proposed control programs. The Basin Plan Amendment language has, however, be modified to ensure that the efforts currently underway by the SJWQMG or another group could qualify as an acceptable real-time management program.

Comment # 6.64

Unintended adverse consequences of "trigger value" application
Though the stated intent of the consumptive use allowance is to "allow unlimited discharge of relatively high quality water," essentially the opposite will result. Relatively high quality discharges from the east side of the valley, with salt concentrations that generally exceed the 193 mg/L TDS trigger value but fall below the salinity concentration objective of 700 uS/cm or 450 mg/L TDS, will no longer be allowed to occur under most circumstances. At the same time, allocations resulting from credits on the west side of the valley will allow for the continued discharge of waters that exceed the 700 uS/cm concentration objective. Several adverse unintended consequences will result, as follows.

- Reduction of assimilative capacity – Application of the trigger value will reduce relatively high quality discharges, essentially reducing dilution flows that are currently helping to dilute higher concentration salt discharges and reducing the overall assimilative capacity or carrying capacity for salt in the LSJR.

- Concentration of salts – Allowing zero load allocation for the east side of the valley during much of the irrigation season will require long-term storage of agricultural return flows and/or recycling and reuse, which would lead to significant concentration of salts in the water and in the soil. High rates of evapotranspiration (50 inches per year) will only exacerbate the problem in the valley.

- Increases in groundwater concentrations – The retention of salt during the summer months and greater reuse of irrigation water will lead to higher salt concentrations in the groundwater, contributing to a higher groundwater salt load, which may be even more difficult to control.

- Expansion of salt impact area – By not allowing for any discharge of water from the east side of the valley during the irrigation season, the TMDL could eventually cause higher salinity levels in that part of the basin to the point where salt concentrations could consistently exceed water quality objectives, where they do not currently. The end result will be to effectively expand the area of salt impacts beyond the west side, where serious salt problems already exist.

Response

The potential for increases in groundwater concentrations and expansion of the salt impact area depends on the method used to control discharges. Lined solar evaporators, reverse osmosis, and landfill disposal of concentrated salts, for example, could be used without causing additional impacts to groundwater. On the other hand, practices such as drainage re-use could cause groundwater degradation. The salt impairment on the west side of the LSJR is primarily caused by irrigating naturally saline soils with supply water from the Delta that is relatively high in salt. These conditions do not exist on the east side, however, staff agree that retention of drainage could lead to incremental increases in the groundwater salinity on the east and west side. Based on the information provided by TID (see Comment # 6.35) continuation of current surface water management and irrigation practices will likely also lead to continued (and possibly increased) groundwater degradation. Less tile drainage and less pumped drainage would need to be retained if the groundwater elevations could be controlled through increased application efficiency (see response to Comment # 6.19and Comment # 6.22). Furthermore, if TID reduced the amount of poor quality tile drainage and well-pumped drainage that is discharged into its canal system, then spills from TID could potentially be reduced to below 315µS/cm EC, thereby reducing the need to retain drainage.

Also see response to comments Comment # 6.8, Comment # 6.14, Comment # 6.27, Comment # 6.40, and Comment # 6.61.

Comment # 6.65

Reduced salt loading, but increased salt concentrations

The currently proposed allocation may achieve an overall reduction in salt loading, but allows for higher salt concentration discharges which will translate to higher concentrations downstream at Vernalis. For illustrative purposes, consider the following scenario where the existing combined load is reduced by 50%, achieved through a 100% reduction of discharges from the east side – a scenario not dissimilar to the proposed TMDL allocation.

Existing condition. For illustrative purposes only, assume the following existing condition.

- East and west side dischargers are allowed equal loadings
- East side discharges are at a concentration of 600 uS/cm EC, or about 400 mg/L TDS, and a flow of 1500 cfs
- West side discharges are at concentration of 1800 uS/cm EC, or about 1200 mg/L TDS, and a flow of 500 cfs
- Conversion factor of 1/375 to convert (mg/L)(cfs) to tons/day

Using these assumptions, the downstream load and salt concentration can be calculated as follows.

Existing
Downstream Load = (QeastCeast) + (QwestCwest)

= (400 mg/L)(1500 cfs)/375 + (1200 mg/L)(500 cfs)/375

= 1600 tons/day + 1600 tons/day = 3200 tons/day TDS

Existing
Downstream Concentration = (QeastCeast) + (QwestCwest)
(Qeast + Qwest)

= (400 mg/L)(1500 cfs) + (1200 mg/L)(500 cfs)
(1500 cfs + 500 cfs)

= 600 mg/L TDS

Future condition. For illustrative purposes only, assume a future condition, where the load is reduced by 50%, through a 100% reduction of east side discharges, so the assumptions would change as follows.

- East side discharges are at a concentration of 600 uS/cm EC, or about 400 mg/L TDS, and a flow of 0 cfs
- West side discharges are at concentration of 1800 uS/cm EC, or about 1200 mg/L TDS, and a flow of 500 cfs

Using these assumptions, the downstream load and salt concentration can be calculated as follows.

Future
Downstream Load = (400 mg/L)(0 cfs)/375 + (1200 mg/L)(500 cfs)/375

= 1,600 tons/day

Future
Downstream Concentration = (400 mg/L)(0 cfs) + (1200 mg/L)(500 cfs)
500

= 1,200 mg/L TDS

For this illustrative example (Figure 12), the proposed TMDL allocation approach could lead to a scenario where the downstream load would be reduced by 50% to 1600 tons/day TDS, but the concentration would actually increase by 100% from 600 mg/L to 1200 mg/L TDS. This is only an iterative example, but this kind of result, where loads are decreased but concentration increase, is a very real possibility under the current allocation approach. Such a result would only serve to exacerbate the existing salinity concentration problems at Vernalis.

(Figure 12 not included due to formatting problem)

Response
The proposed allocations will not lead to higher concentrations at Vernalis. The example given in the comment is overly simplified and only considers implementation of part of the proposed

TMDL. The proposed TMDL does not prescribe load allocations that would result in the scenario given above. Most importantly, the example fails to consider the impact of the supply water allocations on downstream water quality. In the example, it appears that east side discharges are completely eliminated due to TMDL restrictions, and west side discharges are allowed to continue to occur (presumably though supply water credits). This results in reduced downstream water quality; however, according to the proposed TMDL, any supply water credit is accompanied by a supply water allocation that places mitigation responsibility on the USBR. The USBR can meet their load allocation through improving supply quality (in which case the supply water credit would be reduced), providing dilution, or reducing salt loading to the LSJR. Moreover, the example does not consider that LSJR is comprised of more than just agricultural discharges form the east side and the west side. Flow from the Merced, Tuolumne, and Stanislaus Rivers also contribute to the LSJR, and these flows are typically bellow 315 µS/cm, even during the summer months.

Comment # 6.66
Level of complexity.
The existing base load allocation approach is extremely complex, with hundreds of TMMLs to be applied throughout seven sub-areas. It is not at all clear how compliance will be measured, given that the compliance condition is a function of both concentration and flow being discharged throughout the entire sub-area. It is also not at all clear how the current allocation will be affected when concentration-based objectives are applied to points upstream of Vernalis, as the RWQCB is required to do in the very near future. It may be that the proposed TMMLs will not be sufficient to meet points of compliance at upstream locations, particularly because flow is a key factor.

Response
Water districts can choose to comply with the TMDL and/or measure compliance at a water district or sub-area scale, since the proposed Basin Plan Amendment includes a method for apportioning load allocations based on the acreage of nonpoint source land use from which a discharge originates.

Also see response to Comment # 6.6 and Comment # 6.13.

Comment # 6.67
Fatal flaw in load-based approach
Applying a load-based approach to solve salt concentration values carries an inherent contradiction. As shown in Figure 7 salinity concentrations are strongly correlated to flows - the higher the flow, the lower the concentration. At the same time, loads are very much a function of flows - the higher the flow, generally the higher the load. So, if the regulatory focus is on load only and not on the concentration of discharges, then the TMDL will likely produce an adverse outcome – higher concentrations.

Response
The proposed TMDL and Basin Plan Amendment do not call for the removal of high quality dischargers. The TMDL only limits agricultural drainage, wetland drainage, and discharges from

wastewater treatment facilities. High quality tributary inputs and nonpoint sources below 315µS/cm are not limited in any way by the proposed TMDL.

Loads are an important tool for evaluating the magnitude of different pollution sources. The proposed Basin Plan Amendment is designed to focus implementation efforts on the largest and most concentrated salt sources, by prioritizing implementation based on unit area loading from nonpoint sources (the nonpoint source loading per acre from a given source). Limiting agricultural drainage, as proposed in the TMDL, will not result in higher salt concentrations in the LSJR between the Merced River and Vernalis. Above the Merced River it is possible that implementation of the TMDL could result in higher salt concentrations, because ambient conditions are so poor that west side tile drainage can actually provide dilution. It is important to note, however, that west side tile drainage is one of the most concentrated sources of salt to the LSJR, and modeling studies indicate that removal of this tile drainage would result in vastly improved water quality downstream of the Merced River.

Comment # 6.68
Proposed Alternative Approach
A concentration-based approach has been proposed for the salinity TMDL as an alternative to the load-based approach. The concentration-based approach would regulate discharges, based on concentration, and would allow water that meets the concentration objectives to be released. The alternative, concentration-based approach would also focus control efforts on the most concentrated sources. Regulating concentrations versus loads would reduce the confounding effect of flow and enable more direct regulation of water quality to meet the concentration-based objective. A concentration-based TMDL would also avoid unintended adverse consequences that could occur with the existing proposed TMDL allocation. The proposed approach would move in the right direction, toward compliance with concentration objectives, while allowing for continued sustainable use of agricultural lands in the Central Valley.

Response
See response to Comment # 6.8 and Comment # 6.26.

Comment # 6.69
Concentration-Based Approach
A concentration-based approach could be much simpler and more transparent than the current load-based allocation, which is extremely complex and convoluted. Requiring all discharges to meet the water quality objectives of 700 and 1000 uS/cm EC, for irrigation and non- irrigation seasons respectively, would be a very simple starting point for the TMDL. Rather than applying a “trigger value” of 193 mg/L (or about 300 uS/cm EC), the TMDL should allow for all discharges that meet the concentration objectives at the point of discharge.

Response
See response to Comment # 6.8 and Comment # 6.26.

Comment # 6.70
Focusing on High-Concentration Sources
As noted in the TMDL Staff Report, the majority of the salinity load to the San Joaquin River comes from a few key sources. The Delta Mendota Canal is a major source having contributed nearly half of the LSJR's total salt load at Vernalis over the last 20 years or so. Groundwater accretions to the LSJR are also a major source of salinity, comprising approximately 30% of the mean annual salt load at Vernalis. Groundwater concentrations from the west side of the valley are particularly concentrated (1900 uS/cm) and are approximately three times the groundwater concentrations from the east side of the valley (630 uS/cm).

To improve water quality, it would make sense for the TMDL to focus efforts on the major sources, where reductions have the potential to achieve the greatest effects in terms of reducing overall salt contributions to the system and particularly high-concent ration discharges. It may mean that some relatively drastic measures would need to be taken on the west side and/or DMC to reduce salt concentrations, such as membrane treatment or elimination of return flows and removal of solids salts from the watershed. However, it would be more appropriate to focus such extreme measures in the areas where it can provide the greatest benefits. A separate process has already been initiated to consider significantly reducing, if not removing, discharges to the San Joaquin River of return flows from the Grasslands sub-area, which is known to have some of the highest concentration salt discharges.

Response
See response to Comment # 6.8, Comment # 6.26, Comment # 6.31, and Comment # 6.67.

Comment # 6.71
Means to Achieve Equity in the Valley
As noted previously, east side water supplies from the Sierra Nevada are relatively pristine as compared to west side supplies from the Delta, LSJR and groundwater high in salt due to the Coastal Range marine formation. This inequity in source water quality on the east versus west sides of the valley has created a real challenge in defining an equitable approach to allocation. The current TMDL Staff Report would have the east and west side dischargers "share equally in the pain," with limited water quality value. Both the east and west side would be required to take strong measures to improve water quality, but the east side would be held to a much higher standard. Considerably higher concentration discharges from the west side would be allowed while lower concentration discharges from the east side would be disallowed. By virtue of the east side having good quality source water, they would be required to comply with much lower load allocations with no allocation credits.

The current proposed approach is neither equitable, nor does it contribute to water quality improvements. A more equitable approach would be to hold both the east and west side dischargers to the same standard, as measured by the concentration of salinity of the water they are allowed to release. Management measures or treatment options could then be developed and implemented in the various areas for meeting the water quality objectives.

Response
See response to Comment # 6.29.

Comment # 6.72
An Iterative or Adaptive Management Approach
The TMDL Staff Report acknowledges the need for a "phased TMDL", but does not really apply this approach in practice. Rather than taking a stepwise or iterative approach, the TMDL starts with the most restrictive possible, "very conservative" allocation scenario, which is just not realistic for implementation in the Central Valley. Although there are considerable data on salts in the Lower San Joaquin River area, the TMDL Staff Report still reflects a significant degree of uncertainty because many sources have not been well characterized and because of the size and complexity of the system. In addition, technologies to control or reduce salinity levels are very much in a state of development and effects are uncertain. The implementation of various control strategies for the TMDL, including changes in the flow regimes and salt loads from surface water and groundwater sources, will themselves cause changes in how the system functions, so that the TMDL process will, by necessity, be an iterative process.

Response
The TMDL is initially focused on meeting the existing salinity water quality objective at Vernalis, and subsequent phases will focus on meeting new water quality objectives that are being developed. Staff agrees that the TMDL process will need to be adaptable and that future revision may be necessary. The base load allocations are conservative, however, the real-time management option is very flexible.

Also see response to Comment # 6.5, Comment # 6.8 and Comment # 6.11.

Comment # 6.73
Load-based Approach Will Not Produce Needed Water Quality Improvements
The draft TMDL recognizes the need to move salt out of the Lower San Joaquin River Basin to avoid a "net salt buildup in the watershed and long-term degradation of ground and surface waters" (pa ge 3). To maximize salt transport, while also meeting water quality objectives, the TMDL promotes the concept of "unlimited discharge of relatively high quality water" (page 3) into the San Joaquin River. This concept is key in providing salt movement out of the basin, avoiding long-term concentration of salts, and supporting longterm sustainable use of the agricultural lands in the Central Valley. The load-based approach currently proposed in the draft TMDL will not effectively achieve the dual objectives of salt transport and reduction of salinity concentrations at Vernalis.

Response
See response to comments Comment # 6.4, Comment # 6.14 and Comment # 6.63.

Comment # 6.74
Problems with a Load-based Approach
The draft TMDL takes a load-based approach to address salinity, but salinity is a concentration-based effect with a concentration-based water quality objective. The TMDL takes this approach even though it recognizes that the load-based approach is not appropriate for salt and boron. As the TMDL states "limiting discharges through static load allocations may be necessary for

pollutants that bioaccumulate or have a cumulative effect on receiving water quality, however this approach is not appropriate for salt and boron in the LSJR because it does not recognize the need to export salt"(page 80).

A load-based approach to the Salt and Boron TMDL will not produce the best results for water quality in the San Joaquin River. As it is currently proposed, the load-based approach will effectively prohibit the discharge of water with relatively low salt concentrations during the critical summer period, which will have several adverse effects.

Reduction in downstream dilution flows. Not allowing the discharge of relatively high quality water, which in many cases meets existing water quality objectives, will only exacerbate downstream salinity problems by reducing dilution flows and reducing assimilative capacity.

Concentration of salts. Allowing zero allocation during the summer months would require long-term storage of water and/or recycling and reuse, which would lead to significant concentration of salts in the water and in the soil.

Increases in groundwater concentrations. Retaining salts during the summer months and greater reuse of water will lead to higher salt concentrations in the groundwater, contributing to a higher groundwater salt load.

Expansion of the salt impact area. By not allowing for any discharge of East Side waters during the summer months, the TMDL could eventually cause higher salinity levels on the East Side, which will effectively expand the area of salt impacts beyond the West Side, where salt problems already exist.

Difficulty in measuring compliance. Compliance with the salinity objectives is measured directly by salt concentration, rather than salt load, which is largely a function of flow. Because load is so strongly tied to flow, it is misleading to focus on load. Concentration would provide for a direct, straightforward measure of compliance with the water quality objectives and the TMDL.

A load-based approach could actually lead to higher downstream salinity levels. As demonstrated in the conceptual figure below, salt load is strongly a function of flow so that a high concentration/low flow discharge might be allowed while a low concentration/high flow discharge would not be allowed under the current load allocations. The impacts on water quality would be a concentrated source of salt and a reduction in assimilative capacity to help dilute downstream sources. As shown in Figure 1, an equivalent load (the product of salinity concentration times flow) could produce two widely varying results in water quality concentration. In the first scenario, the load allocation for the West Side sub-area could allow a discharge that greatly exceeds the water quality objective of 700 us/cm, while meeting load restrictions in the draft TMDL. In the second scenario, an equivalent load would not be allowed from the East Side, even if the concentration were at the water quality objective. If the East Side discharge were not allowed, then the additional dilution flow and assimilative capacity would also be lost.

(Figure 1 not shown)

Response
See response to Comment # 6.1, Comment # 6.5, Comment # 6.6, Comment # 6.8, Comment # 6.61, Comment # 6.63, Comment # 6.64, Comment # 6.66, and Comment # 6.68.

Comment # 6.75
Proposed Changes to the Draft TMDL
Given that a load-based approach will limit salt movement out of the basin, it would be appropriate to shift to an alternative, concentration-based approach to the TMDL. A concentration-based approach would provide effective solutions to salinity problems within the San Joaquin River system. See next section for more detail.

A Concentration-based Approach Will Lead Directly to Improved Water Quality

A concentration-based approach to the salinity TMDL would provide a more reliable framework to achieve water quality improvements and to meet salinity objectives. The concentration-based approach could be applied to allow for all discharges of water with salt concentrations below the water quality objectives. Allowing all discharges at or below the water quality objectives can only serve to improve downstream water quality, diluting higher concentration groundwater and other sources and increasing the assimilative capacity of the river to carry salts

Concentration Threshold
The draft TMDL "trigger value", which is intended as a threshold for allowable discharges into the river, is currently set equal to less than half of the existing water quality objective for salinity (i.e., 193 mg/L TDS versus approximately 450 mg/L TDS, which corresponds to 700 uS/cm EC). The trigger value should be set equal to the water quality objective, rather than some arbitrary lower number.

The trigger value should also be applied in practice as a concentration threshold to allow for the discharge of any water with salt levels equal to or less than the threshold concentration. In conversation with RWQCB staff, we understand that the intent of the draft TMDL is to allow all discharges at or below the threshold value, but is not clear in the current draft (RWQCB, personal conversation). Additional language should be added to clarify this point.
In providing rationale for the proposed trigger value, the draft TMDL reaches a questionable conclusion that "selecting a trigger value at or just below the water quality objective provides no incentive to reduce non-point source loading from areas that receive high quality supply water" (page 63). As such, the TMDL fails to recognize that the Salt and Boron TMDL is not the only means to motivate action by agriculture. Currently, there are many other incentives for agriculture to address the quality of their discharges to the San Joaquin River system, including other ongoing TMDLs and upcoming changes in the conditional waiver for agricultural discharges. Agriculture recognizes the need to improve water quality in the
San Joaquin River and is working hard to cooperate through the TMDL and agriculture a waiver processes and to develop practical solutions to improve water quality.

Much of the water from the East Side of the Lower San Joaquin River is of relatively high quality, often meeting the existing salinity concentration objectives at the point of discharge into the river and diluting other high concentration sources. Many of the East Side discharges currently help to reduce salinity levels in the San Joaquin River at Vernalis. Discharge of these relatively high quality waters helps to solve downstream water quality problems and should be allowed to continue. If discharges are not allowed above 193 mg/L TDS, then relatively high quality waters will be held back and downstream problems will only be worsened.

Response
The Appendix 1 (technical TMDL report) of the Basin Plan Amendment staff report clearly states "*discharges below the trigger value will be unrestricted (not subject to LAs or WLAs)*". Additionally, the proposed Basin Plan Amendment language indicates that discharges from irrigated lands are in compliance if the discharge does not exceed 315µS/cm electrical conductivity.

We recognize and encourage the steps that agriculture has taken to improve LSJR water quality, however, Basin Plans must provide assurances that the implementation program will, to the extent possible, result in attainment of the applicable standard. See response to Comment # 6.8 and Comment # 6.26 with regard to raising the trigger value.

Comment # 6.76
Consumptive Use Allowance
The consumptive use allowance as it is currently applied in the draft TMDL, does not actually allow concentration-based discharges, but rather supports static consumptive use allocations. It appears that the draft TMDL applies the consumptive use allocation equally across all sources, regardless of the quality of the water being discharged. In fact, the consumptive use allowance could actually be applied to allow some very poor quality discharges, which could greatly exceed the water quality objectives. The consumptive use allowance has essentially been applied in the allocation process as part of the background loading in the TMDL, which is taken out of the allowable load, further reducing the remaining non-point source allocation.

The trigger value should be applied with its stated intention, to allow for unlimited discharge of relatively high quality water, and should be defined as the existing water quality objectives. The RWQCB should drop the consumptive use allowance entirely and apply the trigger value to allow for actual discharge of relatively high quality waters.

Response
The consumptive use allowance does allow unlimited discharge of high quality water below 315µS/cm EC. See response to Comment # 6.8 and Comment # 6.26 with regard to raising the trigger value.

Comment # 6.77
Proposed Changes to the Draft TMDL
The TMDL should be revised to a concentration-based approach. Trigger values should be set equal to the water quality objectives (e.g., approximately 450 mg/L TDS and 650 mg/L TDS for irrigation and non-irrigation seasons respectively). Unlimited discharges of water at or below

these trigger values should be allowed. The consumptive use allowance should be dropped entirely from the TMDL allocation process. High quality discharges should be allowed in lieu of a consumptive use allowance. The TMDL could include loads for information purposes, but the loads should not serve as the governing allocations. Concentrations would be governing and compliance should be measured on the basis of concentration, using water quality objectives to define allowable levels.

Response
Comment noted.

Comment # 6.78
Solving the Salinity Problem by Focusing on Key Sources
As noted in the draft TMDL, the majority of the salinity load to the San Joaquin River comes from a few key sources. The Delta Mendota Canal (DMC) is a major source having "contributed approximately 47% of the LSJR's total salt load at Vernalis between 1977 and 1997" (page 31). Groundwater accretions to the Lower San Joaquin River are also a major source of salinity, comprising approximately 30 percent of the mean annual salt load at Vernalis. Groundwater concentrations from the West Side are particularly concentrated (1900 uS/cm EC) and are approximately three times the groundwater concentrations from the East Side (630 uS/cm EC) (page 15).

To improve water quality, it would make sense for the TMDL to focus efforts on the major sources, where reductions have the potential to achieve the greatest effects in terms of overall salt contributions to the system. At one point in the unit loading analysis section, the TMDL seems to acknowledge the value of focusing on "areas with the greatest potential for unit-area load reductions" (page 51). However, in practice, the TMDL does not focus on key sources and seems to virtually ignore others. The TMDL should focus efforts on the areas of highest concentration. Precedent exists for this approach to deal with the highest concentration sources of salinity as a top priority (e.g., Colorado River Basin Salinity Control Forum).

Response
See response to Comment # 6.10 and Comment # 6.31.

Comment # 6.79
West Side Discharges and USBR Reductions
The West Side of the Lower San Joaquin River represents the greatest opportunities for load reductions. As indicated in the unit loading analysis in the draft TMDL, the North West Side sub-area has the highest salt yield, exceeding most other sub-areas by an order of magnitude (Table 3-9). However, the draft TMDL provides credits to the West Side that provide for discharges of water that exceed the water quality objective and which constitute significantly higher allowable loadings, as compared to the East side. These allocations are in place during the worst-case months (e.g., July and August), which can only worsen downstream water quality problems. At the same time, much higher quality discharges from the East Side are not allowed, given that the East Side has zero allocation during the worstcase months. Some discharges should be allowed from the East Side to help dilute discharges from the West Side that would be allowed under the current allocation credit scheme.

As currently drafted, the base load allocation includes significant "additional allocations", including "import water relaxations" and "LSJR diversion allocations", which are credited back to the Northwest Side and Grassland sub-areas to account for poorer quality supply water from the Central Valley Project and the San Joaquin River

Response
Supply water credits to the west side are combined with supply water load allocations to the USBR. The supply water credit to the west side is equal to 50% of the salt delivered from the DMC or diverted from the LSJR (less background salts of 52 mg/L allocated to the USBR). The UBSR supply water load allocations are equal to the volume of water delivered from the DMC at a background Sierra Nevada quality of 52 mg/L. The USBR is therefore responsible for all salts in supply water that exceeds 52 mg/L, and this more than offsets the DMC supply water credit. The LSJR supply diversion credit is offset by the diversion of salts from the river, since diverters only get credit for half of the salts in the diverted supply. When taken collectively, the supply water credits and the supply water allocations will result in a net improvement in water quality in all months and water year types.

Also see response to Comment # 6.61.

Comment # 6.80
Central Valley Project
The draft TMDL notes that the USBR is responsible for almost half of the total annual salt load at Vernalis via the CVP (page 79). The staff report also states that under the TMDL "the USBR would be responsible for any salt load in CVP deliveries to the TMDL project area that are in excess of their allocation" (page 79). The USBR CVP allocation is set equal to background Sierra Nevada water quality (i.e., 52 mg/L TDS) at delivery design flows (Table 4-17 and Table 4-18). The draft TMDL requires the USBR to meet their allocation "by improving supply water quality or through mitigation anywhere in the LSJR basin" (page 79). The expected reduction in salt load to be achieved when the USBR meets its allocation is not presented in the draft TMDL, and would be a useful addition, especially for comparison with proposed relaxations and credits.

The draft TMDL provides an additional allocation for the Northwest Side and Grassland sub-areas as a credit for the expected USBR reductions. There is currently no linkage in the TMDL between USBR reductions and the additional allocation, or "import water relaxation", which seems to have been arbitrarily set at 50 percent of the mean salt load imported to the sub-area during low-flow conditions (page 72). The import water relaxation associated with use of DMC water results in approximately 20,000 to 30,000 tons/month of load allocation for the Northwest Side and Grassland sub-areas during the critical irrigation season months (Table 4-19). At the same time, zero load allocations continue to apply to other sub-areas, such as the East Valley Floor, during critical summer months.

Response
The Regional Board has the authority and responsibility to develop the salt and boron TMDL and set load allocations, however, the Regional Board cannot specify the method of compliance with the load allocations. For informational purposes, methods that can be used to control salt

and boron discharges are described in Appendix 2 of the Basin Plan Amendment staff report. It is our understanding that USBR has tools that are available to improve CVP supply water (e.g. Franks Tract project), reduce salt loading to the LSJR (e.g. San Luis Feature Re-evaluation Project) and provide dilution flow to improve salinity conditions (e.g. New Melones water quality releases and DMC re-circulations).

The linkage between the supply water credits and the supply water allocation is described in response to Comment # 6.79. There is no direct linkage between the supply water credits/supply water allocations and the base load allocation. Instead, the supply water credits and supply water allocations are layered on top of the base load allocations.

Also see response to Comment # 6.7 and Comment # 6.61.

Comment # 6.81
Lower San Joaquin River Diversion Allocation
The draft TMDL makes an additional load allocation to the Northwest Side sub-area to account for degraded Lower San Joaquin River surface water supply (page 76), which is also based on an arbitrary 50 percent salt return factor (Table 4-22). The additional allocation provided to the Northwest Side subarea for LSJR diversions totals approximately 20,000 to 30,000 tons/month. Again, there is no linkage between this additional allocation and any expected reductions in the TMDL. The current allocation process provides specific benefit to users with the most junior water rights on the system to the detriment of senior water rights holders who had the foresight to develop high quality water sources. It is clear that the West Side faces unique challenges and that credits for poor source water quality are appropriate. But an equitable solution must also be considered for the East Side discharges, and the solution must adequately address the major sources of the problem to achieve real improvements in water quality.

Response
Comment noted.

Also see response to Comment # 6.79 and Comment # 6.80.

Comment # 6.82
East Side Discharges
Even through the East Side has relatively high quality source waters, salinity is still an issue. Regardless of the low salinity surface water sources, drainage of relatively high salinity groundwater remains a significant factor that affects discharges from the East Side. During most of the year, high groundwater is removed through drainage pumping or tile drain systems to keep the water table down and to maintain viable growing conditions for the agricultural lands on the East Side. In dry years, significant amounts of groundwater are also pumped for irrigation. In any case, the East Side will have to take some major steps to meet the existing concentration-based water quality objectives of 700 and 1000 uS/cm EC. Limiting East Side discharges that meet the water quality objectives, but do not meet lower limits (e.g., trigger value of 193 mg/L TDS), will worsen, rather than improve downstream salinity problems.

Response
Comment noted.

Also see response to Comment # 6.8.

Comment # 6.83
Groundwater
The draft TMDL currently treats groundwater salt load as separate from surface water quality and with no expectations for improvement. The TMDL takes estimates of monthly groundwater loads and subtracts them from the allowable loads in the allocation process to determine the remaining allocation for non-point sources. At the same time, the TMDL also acknowledges that agricultural land use practices "have had a significant impact on groundwater flow and quality" and that the " application of irrigation water causes salt and boron to be leached from the soil profile and discharged to the shallow aquifer" (page 39). So, the linkage between surface water quality and groundwater salinity is recognized, at least implicitly, in the draft TMDL. The TMDL should more explicitly recognize that groundwater salinity is affected by the application of both agricultural water and M&I wastewater and that impacts to groundwater can and should be addressed in the TMDL process.

It is imperative that measures taken to improve salinity levels in the river system do not result in increased concentrations of salts in the groundwater system. If successful, the TMDL should allow of the continued movement of salts from the valley, while maintaining appropriate salinity levels in the river. If this is accomplished, there should be improvements in the groundwater salinity over time as the quality of the surface water improves. The TMDL should provide for future reductions in the groundwater allocation to reflect this improvement.

Response
Staff acknowledges that groundwater is a significant source of salt loading to the LSJR. The proposed TMDL includes estimates of groundwater loading to the LSJR so that loading capacity for surface water discharges can be determined. Explicitly allocating loads to groundwater sources and developing a control program to meet such allocations through this TMDL, however, would be complicated and require much additional data and modeling of the LSJR Basin groundwater system. The difficulties in setting allocations for groundwater salt loads include: 1) anthropogenic salt; 2) identifying responsibility for groundwater that underlies large tracts of land under multiple ownerships and land uses; and 3) determining the linkage between application of water (and salt) to land, groundwater recharge, and groundwater pumping. The information needed to answer these questions is not currently available, and obtaining the needed information would delay adoption and implementation of this TMDL for many years. Recognizing the importance of groundwater control, staff the proposed Basin Plan Amendment language has been updated to include a schedule for developing a groundwater control program if surface water controls don't result in necessary water quality improvements.

Comment # 6.84
Municipal and Industrial Discharges
The TMDL appears to generally overlook municipal and industrial (M&I) sources, noting that the cities of Turlock and Modesto are the "only direct discharges to surface waters from

wastewater treatment facilities in the entire TMDL project area" (page 36). The TMDL also notes that loads from point sources "represent a small fraction of the total loads" (page 64). As a result, "initial load allocations for point sources in this phased TMDL are set at existing historical loads for all months and year types during which there is assimilative capacity" and at zero when there is no available assimilative capacity.

The municipal point source load to surface waters is relatively minor, when compared to the total load for the entire San Joaquin River basin. However, this generalization misses a number of points. In some sub-areas, municipal and industrial discharges make up a significant portion of the total salt load. In the East Valley Floor for example, the M&I load (25,000 tons/year) constitutes more than half of the total estimated load from the entire sub area (49,000 tons/year) (Table 3-8, page 50). A second point is that municipal and industrial loads to groundwater, via surface application of wastewater, seem to be entirely overlooked. Overall contribution to salt throughout the entire San Joaquin River system, including groundwater and surface water, needs to be considered. The draft TMDL acknowledges that the M&I load allocation may be reduced in future phases of the TMDL, but it seems appropriate to revisit the allocation and to account for the real impacts of M&I sources in the TMDL.

Significant expense could be required for municipal facilities to meet reduced salt allocations in the future, either through reverse osmosis treatment or long-term storage and release. However, all entities that contribute salt to the San Joaquin River system are responsible to help contribute to the solution. It is conceivable that M&I dischargers could contribute through some kind of watershed-based trading scheme to help meet downstream salinity objectives to achieve a more cost-effective means to meet their allocation responsibilities and avoid costly treatment like reverse osmosis.

Response

The proposed waste load allocations have been updated and are now concentration-based, set equal to the existing salinity water quality objective at Vernalis. Groundwater allocations are not proposed as part of this TMDL for the reasons given in response Comment # 6.83. Nonpoint source dischargers are not responsible for M& I loading. Staff agrees that all the entities that contribute salt to the San Joaquin River system are responsible to help contribute to the solution. Staff also agrees that pollutant trading is a valuable tool that can be used to help both point and nonpoint source dischargers meet load allocations. The proposed Basin Plan Amendment language encourages the use of pollutant trading.

Comment # 6.85

Equitable Approach Needed

The current allocation process provides a monthly load allocation for non-point sources as the remaining allocation, if any is available, after all other allocations (i.e., background loads, groundwater loads, consumptive use allowance, and point source loads) are removed from the total allowable load (Table 4-12). The proposed allocation approach results in little or no allocation for non-point sources during many months in critical low flow years, especially for sources without any allocation credits (e.g., other than the Northwest Side and Grassland sub-areas). Zero load allocations for agriculture are not realistic and could ultimately lead to widespread reduction in agricultural land use in the Central Valley if they were implemented.

The proposed allocation approach is not equitable and should be revised to provide a more fair allocation.

Response
Discharges below 315 µS/cm EC are unlimited. Dischargers have the opportunity to participate in a real-time management program instead of meeting base load allocations.

See response to Comment # 6.5.

Comment # 6.86
Proposed Changes to the Draft TMDL
The TMDL should be modified to include all significant groundwater and surface water sources more comprehensively. The ability to improve groundwater quality should not be overlooked, but rather future groundwater reductions should be expected to occur along with surface water reductions. The impacts of point source discharges, both surface and groundwater, need to be fully incorporated in the TMDL. Finally, the allocation process should focus on the highest concentration sources for reductions to achieve overall water quality improvements.

Response.
See response to Comment # 6.10, Comment # 6.31, Comment # 6.67, and Comment # 6.83.

Comment # 6.87
Proposed Allocation and Implementation Approaches are Not Realistic
The draft TMDL provides two sets of load allocation and implementation approaches to meet salinity water quality objectives at Vernalis: 1) base load allocations based on design flows, and 2) real-time allocations based on real-time river conditions (page 54). Water users throughout the San Joaquin River Basin, including agriculture, need to work together to reduce salinity levels in the river. However, neither of the proposed approaches provides a reasonable solution. The RWQCB should revisit the proposed solutions and make changes to provide a more reasonable baseline condition, or starting point for the TMDL. Specific concerns with both approaches are described below.

Conservative Base Load Allocation
As the draft TMDL acknowledges, the base load allocation for salinity is "very conservative", with essentially no allocation available for agricultural discharges throughout most of the irrigation season (page 3). The base load allocation reflects conservative baseline conditions, including design flows that represent the "lowest anticipated" flow conditions for the San Joaquin River and water quality objectives that are designed to protect the "most sensitive" downstream agricultural uses. Implementation of the base load allocation scheme could lead to other widespread, adverse effects both for water quality and the economy.

Response
Staff agree the fixed base load allocations are conservative, however, dischargers have the option to operate under a more flexible real-time management option in lieu of complying with base load allocations (see response to Comment # 6.5 and Comment # 6.61)

Comment # 6.88
Overly conservative design flows
The draft TMDL uses the "lowest anticipated" flows for design conditions, upon which to base the allocations. Design flows have been set equal to the lowest flow on record within each month/water-year condition (page 58), which is very conservative. It would be appropriate to recognize that the TMDL target already includes a margin of safety and apply more representative flows as the starting point for design flow conditions In addition, the use of more representative design flows, such as the median value, would be much more effective in transporting salt out of the basin.

Response
See response to Comment # 12.22.

Comment # 6.89
Concentration of salts and reduced dilution
To achieve the zero allocation conditions required by the current base load allocation, long-term storage of agricultural runoff under low-flow conditions will likely be required. Storage will concentrate salinity levels and make existing water quality problems worse. As it is currently drafted, the TMDL could require capture and storage of agricultural runoff for at least three months during the hottest time of the year (June, July, and August), when the majority of the annual evaporation occurs (i.e., evaporation of 50"/year in the Valley Floor). It has also been suggested that agricultural runoff be captured and recycled to a greater degree. Recycling agricultural runoff will concentrate salts in the water supply, in the soils, and in the groundwater below the areas being irrigated. The concentration of salts in storage ponds could also lead to other toxic conditions (e.g., concentrated metals from Sierra Nevada water), which would require higher levels of regulation and could ultimately cause secondary problems that would require remediation.

With either storage or recycling, eventually the salts will be released to the San Joaquin River, but in a much more concentrated state, likely well above the salinity concentration objectives. The stored water could also contain significant algae loads, which would adversely affect downstream dissolved oxygen conditions and adversely affect the ongoing dissolved oxygen TMDL for the Stockton Ship Channel. Capture and storage of relatively high quality water or recycling of water during the irrigation season will also reduce relatively high quality flows that have previously been available to dilute other downstream sources and to enhance assimilative capacity.

Response
Staff agrees that evaporation ponds and drainage re-use will evapoconcentrate salts. The purpose of drainage re-operation, however, is to change the timing of salt discharge to occur during periods of high assimilative capacity, which generally corresponds with high flow conditions in the LSJR. DO problems in the Stockton Deep Water Ship Channel typically occur during low flow conditions when residence time in the Stockton Deep Water Ship Channel increases.

It's acceptable if the drainage has higher salt content when it is eventually released to the LSJR, as long as the assimilative capacity is available and water quality objectives are met. Other

pollutants that are incidentally evapoconcentrated as a result of drainage reduction projects will have to be dealt with on a case-by-case basis. For example, tile drainage from the Drainage Project Area (Grasslands Subarea) is high in selenium, but selenium discharges are successfully regulated through separate Waste Discharge Requirements. If evaporation ponds or on-farm drainage management is used, salts and other trace elements could be landfilled instead of discharged to the LSJR. In TID's case, it would appear that most of the retained drainage could be used for irrigation rather than disposed of or discharged to the LSJR. Long-term storage is not always necessary or desirable. Drainage could much less expensively be captured and blended with supply water, as is frequently already done when water is in short supply. The analysis that considered storage and evaporation ponds for excess drainage water was conducted to evaluate a worst-case, most expensive outcome of needing to capture and treat all drainage water.

Comment # 6.90
Cost of compliance
The TMDL does not address cost implications. As currently drafted, compliance costs could be extreme and could have significant adverse effects on agriculture in the San Joaquin River Basin.

Response
A detailed economic analysis was completed as part of the proposed Basin Plan Amendment staff report. See Appendix 4: Economic Analysis for a Control Program For Salt and Boron Discharges to the Lower San Joaquin River.

Comment # 6.91
Real-time Water Quality Management
To offset the very stringent base load allocation approach, the TMDL proposes a fallback strategy – "real-time water quality management." There are substantive concerns with the proposed real-time management approach. The TMDL recognizes that "development of an acceptable real time management program is a prerequisite to use of real-time allocations" (page 3). It would be very difficult to achieve real-time management on a practical level. There is currently no overarching organization or authority to manage such real-time releases and it will be a major challenge requiring significant time and effort to organize the numerous agencies and water districts throughout the basin. Real-time water quality management would be extremely complex to implement and would require an extensive, very sophisticated and expensive system to monitor and control. It would be a tremendous challenge for all of the agencies responsible for water use in the San Joaquin River Basin to attempt a comprehensive real-time management system and could require decades and significant expenditures to achieve. Given that San Joaquin River Basin is currently so far from achieving a real-time solution, it is not appropriate to rely so heavily on it as the only reasonable approach.

Real-time management may never be a viable solution. There are many unknowns with a real-time approach, too many to rely on it as a solution to the TMDL. Real-time management is largely untested and it is not at all clear that the approach will work. Relying on a real-time management approach represents a huge risk for responsible entities if it not successful, especially given the very conservative nature of the default base load allocation. The real-time

approach must be further tested and evaluated before full-scale implementation is attempted. The adaptive management approach, described below, provides an alternative approach.

Response
See response to Comment # 6.5, Comment # 6.11, and Comment # 6.12.

Comment # 6.92
Proposed Changes to the Draft TMDL
The TMDL base load allocation should be modified to be less conservative and more achievable (e.g., use median flows for design conditions, allow unlimited discharge of high quality waters). An even better solution would be to apply a concentration-based versus a load-based approach to the TMDL, using existing concentration-based salinity objectives to define allowable concentrations. A real-time approach could be considered for future application, but it should not be relied upon as the default strategy at the current time. See adaptive management section below for more details.

Response
Comment noted.

Comment # 6.93
Adaptive Management Provides a Workable Framework for Phased TMDL
The draft TMDL acknowledges the need for a "phased TMDL" in a few different contexts; first in a phased development of wasteload allocations for point sources (page 64) and second in a phased approach to address salinity objectives at Vernalis and future objectives upstream of Vernalis (Implementation Framework Workshop, September 16, 2002). The Salt and Boron water quality objectives will need to be achieved in stepwise manner, but in a different context. A phased TMDL will be required to address the unknowns and complexities of the system and the magnitude of the controls required to achieve improvements.
Although there are considerable data on salt concentrations and flows in the Lower San Joaquin River, the Draft TMDL still reflects a significant degree of uncertainty because of the size and complexity of the system. In addition, the implementation of various control strategies for the TMDL, including changes in flow regimes and salt loads from surface water and groundwater sources, will themselves cause changes in how the system functions, so that the TMDL process will, by necessity, be an iterative process.

Due to high degree of complexity and need for stepwise implementation, the Salt and Boron TMDL warrants an "Adaptive Management" approach, which the TID has described generally in previous comments to the RWQCB (see comments on the draft San Joaquin River Diazinon and Chlorpyrifos TMDL Report, dated July 2002). It would be appropriate to introduce an adaptive management framework within the TMDL now to allow for future flexibility in implementation and to allow for future refinement of the TMDL as needed.

A reasonable first phase for the TMDL would be to require discharges to meet the salinity water quality objectives of 700 uS/cm and 1000 uS/cm, for irrigation and non-irrigation seasons respectively. Naturally high concentrations of salinity in much of the groundwater in the area may require additional mitigation to ultimately meet water quality objectives, but achieving this

first phase would be a significant improvement. For some sub-areas where salinity levels are extremely high, watershed-based trading programs (e.g., USBR credits for the West Side) could be applied to provide more cost-effective solutions.

Response
Comment noted.

Comment # 6.94
Proposed Changes to the Draft TMDL
The TMDL should follow a phased approach, starting with a first step that allows unlimited discharge of waters that meet the existing salinity concentration objectives. For sub-areas that face unique challenges in meeting the objectives, like the West Side, a trading scheme could be applied. Watershed-based trading could be applied to trade credits for improvements associated with USBR responsibilities and allow for some higher concentration discharges, while still achieving overall objectives downstream. Achieving this first step, where all regulated discharges meet concentration objectives, either directly or through trade credits, would be a significant accomplishment. As the first phase of improvements is implemented, additional data can be collected and evaluated to measure progress towards the water quality objectives. If salinity obectives are not met downstream after implementation of the first phase, then additional steps could be considered to further reduce sources (e.g., groundwater). A real-time strategy could also be tested for broader application in an adaptive management framework.

Response
See response to comments Comment # 6.26 through Comment # 6.33.

Comment # 6.95
Water Quality Objective
The salinity water quality objective of 700 uS/cm for the irrigation season (April through August), which was recommended in the August 1987 State Water Board Order No. 85-1 Technical Committee Report titled *Regulation of Agricultural Drainage to the San Joaquin River*, includes an implicit margin of safety. As the draft TMDL notes, this criterion was intended to "fully protect all crops on all soil types in the LSJR basin and the southern Delta, if adequate drainage is provided" (page 24). The crops most sensitive to salinity are beans, strawberries and carrots (ASAE, 1980). According to the California Department of Water Resources, no significant quantities of carrots or strawberries were planted north of Vernalis in the Delta area (ASAE, personal conversation, 2002). Dry beans are planted in a small portion of the area, about 5 to 10 percent. The impacts on a few farmers growing beans in a relatively small portion of the Delta area, would be dwarfed by the economic impacts of the TMDL on the other farmers in the San Joaquin River Basin who will be required to comply with zero salt allocations to meet the objective. Others have also noted that salt-sensitive crops are now grown successfully with DMC water which frequently exceeds the salinity objective, so practical experience demonstrates that the objective may be overly conservative. The TMDL should recognize the level of conservatism incorporated in the TMDL target and the associated implicit margin of safety.

Response

Different interested parties have argued that the standard is both under and overprotective. In any case, changes to the Vernalis salinity objective are under the purview of the State Water Board and not the Regional Board. The State Water Board's *1995 Water Quality Control Plan for the San Francisco Bay/Sacramento San Joaquin Delta Estuary* (Bay Delta Plan) established the existing salinity water quality objectives for the LSJR at the Airport Road Bridge near Vernalis. The legal, policy and technical justification for the existing salinity water quality objective at Vernalis are contained in the 1995 Bay Delta Plan. Water quality standards set by the State Water Board supercede any conflicting standards set by the Regional Board. (Wat. Code §13170). The Regional Board, therefore, does not have the authority to change the Vernalis salinity water quality objective. Water Code section 13240 requires that water quality control plans be periodically reviewed. The State Water Board is currently in the periodic review process for the Bay Delta Plan and contemplating the need, if any, to amend the Bay Delta Plan. Proposed changes to the Vernalis salinity water quality objectives would need to be considered through the periodic review process conducted by the State Water Board.

The existing and potential beneficial uses of the LSJR are designated in the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan). The most salt sensitive beneficial uses of the LSJR include drinking water, irrigated agriculture, and industrial use. The existing salinity water quality objective was set to protect the most sensitive beneficial uses of water in the LSJR. The proposed Basin Plan amendment is intended to result in attainment of the existing water quality objectives that apply to the LSJR at the Airport Way Bridge near Vernalis. No changes to existing water quality objectives are proposed as part of this Basin Plan amendment

Federal law requires establishment of a TMDL for waters not attaining standards. The LSJR is currently identified as not attaining standards for salt and boron, necessitating development of a TMDL. The salt and boron TMDL sets the load allocations (limits) necessary to meet the existing water quality objectives for the LSJR at the Airport Bridge near Vernalis. Current USEPA regulations do not require TMDLs to include implementation plans; however *"Federal Law states that a TMDL, upon EPA approval, be incorporated into the state's water quality management plan. California's water quality management plan consists of the Regional Board's basin plans and statewide water quality control plans. State Law, in turn, requires that basin plans have a program of implementation to achieve water quality objectives"* (Written com., Attwater, 1999). Thus the TMDL must be designed to achieve the existing water quality objectives.

Comment # 6.96

East Valley Floor Area Delineation

The East Valley Floor (Sub-area V) is not correctly delineated, which results in an overestimate of the acreage that drains directly into the San Joaquin River (Figure 3-4, Table 3-1, and pages 35-36). One source of error comes from the approach used by RWQCB staff to estimate East Valley acreage, which actually includes portions of several other tributary basins. According to staff, any area downstream of the last flow gaging station for the Tuolumne, Merced and Stanislaus River basins has been lumped into the East Valley area, which results in an overestimate of acreage (Oppenheimer, personal conversation). It also appears that the RWQCB

has included drainages from areas that actually flow to other tributaries and not actually to the Harding Drain or directly to the San Joaquin River. These areas include Mustang Creek which drains into the Merced River, an area to the northeast of Highline canal which drains to the Merced River, and areas east of Turlock Lake which drain into the Tuolumne River. The Turlock Irrigation District has met with RWQCB staff to review maps and work together to accurately delineate the drainage routes for lands in that area. The delineation of the East Valley Floor and other sub-areas is important not only for the Salt and Boron TMDL, but also for other ongoing efforts, such as the OP pesticide TMDL.

Please also note that Figure 1-2 in the draft TMDL identifies the Harding Drain as "TID Lateral #5", which is incorrect. Lateral #5 is one of several lateral canals that drain into the Harding Drain and it is confusing and incorrect to refer to them interchangeably. The Harding Drain begins just downstream of Lateral #5 and the Ceres Main Canal and flows approximately 6 miles to the San Joaquin River.

Response

Staff agrees that any land that drains to the Stanislaus, Tuolumne, or Merced Rivers downstream of their major gaging stations has been included in the East Valley Floor Subarea. This seems appropriate considering load estimates contained in the TMDL for these three Sierra Nevada tributaries are based on discharge from these gaging stations. Any drainage reaching the LSJR downstream of the major gaging stations on the Stanislaus, Tuolumne, or Merced Rivers is therefore attributed to the East Valley Floor Sub area. This seem reasonable, considering the topography, drainage mechanisms, and land use in the areas in question are more typical of the East Valley Floor than the Sierra Nevada Tributaries. The most important factor is that the loading values accurately represent the drainage area for which they are calculated.

Staff met with TID staff and we made significant modifications to the East Valley Floor Subarea based on TID input. TID staff was a valuable resource in helping to better delineate the East Valley Floor Subarea and we appreciate your help. It is our understanding that the East Valley Floor Subarea is now delineated to TID's satisfaction, with the exception of the issue regarding inclusion lands that drain below the major gaging stations on the Sierra Nevada tributaries (described above).

According to the USGS topographic map for the "Crows Landing" quadrangle, we have correctly identified Lateral No. 5 on Figure 1-2 Appendix 1 (technical TMDL report). The USGS does not identify lateral No. 5 as the Harding Drain.

Comment # 6.97

Unit Area Loading Approach

As noted in the draft TMDL, the unit area loading approach produces an "anomalous" salt yield for the Tuolumne River that is much greater than either the Stanislaus or Merced Rivers (page 52). The estimated salt yield of 0.58 lb/acre of agricultural land does not seem to be supported by any unique agricultural conditions in the Tuolumne River drainage area. Other historical conditions could be part of the problem. Abandoned gas wells located in the Tuolumne River had historically high salt levels and could also be a factor contributing to the salt load (D. Liebersbach, personal conversation). Apparently the wells were sealed about 20 years ago, but if

the seals are failing, the gas wells could serve as a significant source of salt. RWQCB staff should investigate this issue further to determine if the abandoned gas wells are contributing to the anomalously high salt load estimates for the agricultural lands in the Tuolume River basin.

Response
The unit area salt loading for the Tuolumne River Subarea has been revised downward to 0.51 tons/acre/year. This value is still relatively high compared to the unit area loading from the Merced River Subarea (0.14 tons/acre/year) and from Stanislaus River Subarea (0.27 tons/acre/year).

Comment # 6.98
Municipal and Industrial Loads
There appears to be a major discrepancy in the salt load reported for the cities of Turlock and Modesto. In the section on sources for East Valley Floor Sub Area, the load is reported as 8,100 and 33,000 tons, respectively (page 36). Later, in the summary section, the combined mean annual load for the cities of Turlock and Modesto is reported as 25,000 tons (Table 3-8, page 50). Also, as discussed previously, the current assessment of M&I sources does not include the full range of M&I impacts to the overall salt balance in the LSJR Basin, by ignoring impacts on groundwater.

Response
The discrepancy in Appendix 1 (Section 3.4) has been corrected. Salinity loads associated with groundwater loading was assessed in Appendix 1 Section 3.4-II. Only limited data were available to assess groundwater impacts, however, and the data did not permit dis-aggregating groundwater loading by source type. An estimate of potential groundwater loading from M&I sources, and a detailed description of the methods used to calculate salt loading from M&I sources is included in Appendix C (Estimates of Municipal and Industrial Salt Loads). Appendix C includes a summary of all of the major M&I sources of salt loading. The total salt loading from all sources (including those that discharge to land) is estimated to be approximately 47 thousand tons of salt per year. The maximum salt loading from groundwater attributable to M&I discharges is therefore estimated to be approximately 24 thousand tons per year, since 23 thousand tons of salt are discharged to the LSJR through surface discharges.

Comment # 6.99
Background and Groundwater Loads
The TMDL allocation relies on accurate estimates of background and groundwater loads, given that both of these sources are subtracted directly out of the allowable load to determine remaining allocations for other sources. However, due to data limitations, the estimates for groundwater and background loads are rough at best. The TMDL should reflect the limitations of the data in the accuracy of the estimates and should adjust the estimates as appropriate to reflect real-world knowledge, even with limited data.

Response
Staff developed the groundwater loading estimates with the best data and information that was available. Appendix 1 indicates "*limited data was available to develop groundwater salt load*". We are not aware of any additional information or "real world knowledge" that was overlooked.

The TMDL source analysis indicates that salt loading from groundwater accretions is a significant contribution to the LSJR's total salt load. Without accounting for background loading or groundwater loading, the load allocations would substantially overshoot the available assimilative capacity in the LSJR.

Comment # 6.100
Background loads
The estimate of background loads is important, because background loads are subtracted directly out of the allowable load in the TMDL allocation process. The estimate of background salinity loads, described in Appendix D, was based on a rough determination method, presumably because actual data on background water quality was limited. It would be better to rely directly on real water quality data upstream of anthropogenic impacts if possible. Use of real data would exclude a number of potential sources of error contained in the current TMDL background estimate.

Another concern about the background load estimate is that background salinity levels are assumed to be the same under low and high flow periods. This is probably not a good assumption, as salinity is generally diluted under high flow conditions. A better approach would be to reduce background salinity levels during high flow conditions to some reasonable percentage of low flow salinity levels. This percentage could be drawn from correlation analysis of salinity as a function of flow.

Response
A detailed description of the methods used to calculate background salt and boron loading is contained in Appendix D (Estimates of Background Salt and Boron Loads). As stated in Appendix D, background salt and boron loads are the loads passed through a sub-area from upstream sources. Background loads include the loads associated with natural runoff from areas upstream of the agricultural areas within each sub-area, and loads associated with releases from the major reservoirs upstream of the TMDL project area. Background load estimates were based on 21 years of monthly flow data from the Stanislaus River, the Tuolumne River, the Merced River and the LSJR upstream of Salt Slough. The method used to calculate background loading assumes that background TDS concentration is similar to the river's concentration during high flow periods. This is a reasonable assumption, given that the vast majority of the flow coming into the Merced, Tuolumne, and Stanislaus River sub-areas originates from upstream reservoirs. Additionally, Friant Dam releases account for most of the flow into the LSJR upstream of Salt Slough during high flow events. Background concentration is therefore similar to the reservoir concentration. These assumptions are reasonable for the intended purpose: to estimate the salt and boron loading entering the LSJR from upstream areas (rim flows) and not to estimate native conditions in the LSJR itself.

Comment # 6.101
Groundwater loads
Groundwater accretions are assumed to remain constant for all flowyear types, which is not an accurate assumption. During critically dry years, there will be less rainfall and may be less applied irrigation water and/or greater pumping of groundwater, both of which could result in lower groundwater levels and smaller accretions to the river. A similar effect is seen in the

seasonal variation of groundwater accretions and could also be applicable in dry versus wet years.

The assumption of constant groundwater accretions likely leads to groundwater allocations that are over-estimated for low-flow years. The implication of this overestimate is significant. During dry years, estimated groundwater loads comprise most, if not all of the total allowable load, leaving no remaining allocation for any other sources (see Table 4-12). In the months of June and July, the estimated groundwater loads exceed the allowable load for all water-year types, except a wet year.

Response
See response to Comment # 12.43.

Comment Letter # 7: Contra Costa Water District

January 20, 2004

Comment # 7.1
CCWD has a long history of participation in salinity issues in the Sacramento – San Joaquin Delta and would support solutions that reduce salinity in the San Joaquin River without redirecting those impacts to municipal water suppliers downstream. CCWD has a long-standing opposition to the construction of an out-of-valley San Joaquin Valley drain which would deliver highly saline water to the vicinity of CCWD water supply intakes.

Response
Comment noted.

Comment # 7.2
Drinking water quality in the Delta is most impaired in the late fall months (October through the first seasonal rains), and often requires releases from upstream reservoirs to meet governing standards. This is the same period of time when the Proposed BPA assumes the most "real-time assimilative capacity" in the San Joaquin River. CCWD requests that the Regional Board coordinate with the State Water Resources Control Board on this issue, and consider using the status of the Delta as a trigger for real-time management so that Vernalis salinity is not allowed to increase when the Delta is in balance under SWRCB Decision 1641 (D-1641).

Response
Comment noted.

Comment # 7.3
There is little to no discussion of other activities within the Delta and their relationship to this TMDL. For example, the California Bay-Delta Program's Drinking Water Quality Program's goal is to improve drinking water quality in the Delta (including salinity reduction) over the life of the program, it is not clear how the use of real-time load allocations, which degrade the water quality of the Delta, impacts the ability to achieve this goal of continuous improvement. D-1641 also requires the study of recirculation as a means to reduce the salinity of the lower San Joaquin River. CCWD encourages the Regional Board to adopt a Basin Plan Amendment which will result in the permanent reduction of salinity and boron in both the San Joaquin River and the Delta.

Response
Implementation of real-time management would allow for the shifting of loads in time, but water quality objectives would need to be maintained at all times. This load shifting will result in higher salinity of San Joaquin River and Delta water during certain months. Occasional prolonged periods of limited assimilative capacity, however, will result in the permanent diversion of some salt loads, resulting in a decrease in loading. Prolonged periods of additional assimilative capacity may encourage additional discharge of salts, resulting in an increase in salt

loading. The effect on net salt loading to the Delta is unknown at this time. The affect on net salt loading will depend on how real time management is implemented. Staff will consider adding a recommendation that conditions in the Delta be considered (e.g. no additional salt loading when Delta is in balance) as a trigger for real-time management. The primary trigger, however, will continue to be attainment of water quality objectives at Vernalis.

Comment # 7.4
CCWD is also encouraged that the Regional Board intends to establish additional water quality objectives upstream of Vernalis. These compliance locations will lead to better identification and control of the significant sources of contamination and facilitate improvement in water quality along the full length of the San Joaquin River, not just Vernalis.

Response
Comment noted.

Comment Letter # 8: Stockton East Water District

January 20, 2004

Comment # 8.1
Background
SEWD has a 1983 contract with the United States Bureau of Reclamation (Bureau) for 75,000 acre-feet of water from the Stanislaus River, stored in New Melones Reservoir. Yet, SEWD has yet to see any significant deliveries under this contract due to the Bureau's releases of New Melones water for environmental purposes, including releases to satisfy the salinity objective at Vernalis. Even in light of the State Water Resources Control Board (SWRCB) finding that the Stanislaus River basin contributes only a de minimus amount to the salinity problem in the San Joaquin River, the Bureau has released **in excess of 650,000 acre feet for water quality purposes from New Melones** to dilute the highly saline water in the San Joaquin River in the past 9 out of 13 years. The Bureau has released **an average of 113,238 acre-feet of water annually** during the last three years from New Melones to dilute the highly saline water in order to meet the Vernalis salinity objective. Exhibit A is a chart of the historic releases from New Melones to meet the Vernalis objective.

While SEWD continues to receive little to nothing under its CVP contract, CVP contractors south of the Delta have received an average of 72% of their contractual entitlements. In sum, the water deliveries to the Westside of the San Joaquin Valley that have created the salinity problem in the San Joaquin River have continued, while CVP water deliveries to the Eastside of the valley, namely SEWD, have never materialized due to the need to dilute the salty discharge that drains from these Westside lands. While this disproportionate impact to valley irrigators is primarily due to the Bureau's own decisions, these decisions have been, and continue to be driven by the Regional Board's inaction in developing and implementing meaningful salinity objectives upstream of Vernalis.

It is against this backdrop that SEWD submits these comments. While the district firmly believes that the salinity problem in the San Joaquin River can only be solved with upstream objectives, and an out-of-valley drain, the district understands that the current implementation plan is also part of the long-term solution.

Response
Comment noted.

Comment # 8.2
The proposed implementation plan provides no incentive for the Bureau of Reclamation to reduce salt load because it can continue to dilute salt with fresh flows from New Melones Reservoir.

The proposed implementation plan allocates load via a formula that uses the Lower San Joaquin River (LSJR) flow at Vernalis. In the formula, load and flow are directly related so that increased

flows at Vernalis allow for increased load discharges into the river upstream. If this flow variable includes New Melones releases made for water quality purposes, then there is no incentive for the USBR to actually work to reduce salt loading of the river, rather it can just release more water from New Melones.

Loading Capacity (LC) = Q * WQO * .8293 * .85

where Q = SJR flow at Airport Way Bridge near Vernalis
WQO = salinity water quality objective
.8293 is a conversion factor and .85 represents a 15% safety factor

The LC is then allocated to point and non-point discharges. If Q increases, then the LC increases, and each discharger is allowed to discharge more salt.

It may be that staff intends to calculate the assimilative capacity of the river by excluding certain releases from New Melones, however, this is not detailed in the report. Since New Melones releases are the primary method the Bureau uses to address this problem, they should be discussed in detail in the staff report so that it is clear how these releases are being accounted for in the implementation plan.

Response
Load limits proposed in the TMDL should reduce, but not eliminate, the quantity of water that would be needed to meet the Vernalis water quality objective through dilution of SJR water. The Regional Board cannot require use of any specific methods to comply with effluent limits. Similarly, the Regional Board cannot exclude the use of any proposed method to comply with the load allocations, so long as the methods do not contribute to degrading water quality. The State Water Board's Decision-1641 assigns the USBR full responsibility to meet the Vernalis salinity objective in the southern Delta. This amendment will propose to add to the Basin Plan language that encourages the State Water Board to continue to condition the USBR's water rights if water quality objectives cannot be met through load reductions alone.

Comment # 8.3
It is misleading to state that the recommended alternative "exports salt out of the basin" when in fact the salty water is simply diluted with fresh water from the Stanislaus River and then re-circulated into the basin through the Delta Mendota Canal

Staff's presentation to the Regional Board emphasized that it chose Alternative 4 because it "exported salt out of the basin." This is misleading. Only an out-of-valley drain would actually export salt out of the basin. The plan chosen by staff simply allows salt to continue to be discharged into the LSJR as long as it is sufficiently diluted at Vernalis. However, this diluted water is then re-circulated back into the basin via the state and federal pumping facilities, with only a portion of the salt actually flowing out to the ocean.

Response
The current hydrology of the Delta does allow for significant recirculation of San Joaquin River water into the basin via the Delta Mendota Canal. Changes to the "plumbing"of this system are beyond the scope of this TMDL and Basin Plan Amendment. The recommended alternative, however, will allow for the largest discharges of salt during periods of high flow, such that less salt is likely to be re-circulated into the basin. During periods of high flow, more of the San Joaquin River's salt load is conveyed to the Central Delta and beyond, and is therefore not recirculated directly to the Delta Mendota Canal via South Delta channels.

Comment # 8.4
Real Time Monitoring should be further evaluated to determine if it will result in the release of additional flows from New Melones Reservoir to meet the Vernalis salinity objective at times of the year when there historically has not been a need for these releases AND if it result in the release of additional flows from New Melones Reservoir to meet the February through June flow objectives established in the 1995 Bay-Delta Water Quality Control Plan.

The proposed plan suggests that as part of the "real time monitoring solution" dischargers might retain high salt water so that it may be released into the LSJR at times when the assimilative capacity is greater. Again, if the assimilative capacity is calculated in a manner that includes water quality releases from New Melones, this simply means that these releases will be extended to more months out of the year than they currently are - to the further detriment of New Melones contractors. This also suggests that LSJR river flow will be reduced when dischargers are holding back salty water, which could cause the need for additional releases to be made from New Melones to meet the February through June flow objectives established in the 1995 Bay-Delta Water Quality Control Plan which are tied to the Bureau's water right permits. The impact that the load allocation and real time monitoring methods will have on flow needs to be fully analyzed.

Response
The Regional Board cannot specify methods to comply with effluent limits. Continued provision of dilution flows will likely be needed to attain the salinity objectives when the objectives cannot be met through load reductions alone. Load reductions required by others in the basin under this TMDL and Basin Plan Amendment, however, will reduce the need for the USBR to provide dilution flows. For example, salinity water quality objectives at Vernalis have been attained in recent years exclusively through release of New Melones water. Under this TMDL, less New Melones water would need to have been released since load reductions would have been required to comply with allocations. Evaluation of flows needed from New Melones Reservoir to meet the February through June flow objectives established in the 1995 Bay-Delta Water Quality Control Plan is beyond the scope of this TMDL and Basin Plan Amendment.

Comment # 8.5
The proposed plan violates the Board's anti-degradation policies and the policy to encourage construction of an out-of-valley drain.

The staff report reviews the consistency of the implementation plan with various regional and state board water quality policies and concludes that it is consistent. Pages 25-30. We must strongly disagree - particularly with the policies that require maximum beneficial use of the state's good quality water supplies, and the anti-degradation policies. Due to the lack of any established salinity objectives upstream of Vernalis, and the fact that the load allocation is directly linked to flow at Vernalis, the implementation plan actually encourages the use New Melones water for dilution of salinity and effectively makes this otherwise high quality water unavailable for beneficial uses in San Joaquin County.

Staff also concludes that the implementation policy is "neutral" with respect to the board policy to encourage the construction of the drain. Again, we would strongly disagree since the proposal expressly allows dischargers to meet the load allocations through modification of the timing of releases and through dilution flows. These two solutions simply shift the burden of the salinity problem to the New Melones contractors who will have to forgot deliveries because their water is released to meet the Vernalis objectives. The proposed plan removes any incentive for the Bureau to construct an out of valley drain.

Response
The proposed amendment to the Basin Plan does not include striking existing language that encourages construction of an out-of-valley drain. Construction of an out-of-valley drain, in fact, would be consistent with the load reductions and salt and water management encouraged by this TMDL and Basin Plan Amendment. Upstream water quality salinity impairments will be addressed in a subsequent phase of this TMDL.

Comment # 8.6
The implementation plan should be enacted simultaneously with an upstream salinity objective on the San Joaquin River.

The implementation plan states that the Regional Board has been directed to adopt salinity objectives upstream of Vernalis, but simply declines to do so. Much of SEWD's concerns would be remedied if this were simply made a priority because it would require the Bureau to find another solution to the salinity problem, other than New Melones flows.

Staff has suggested that it has not proposed an upstream objective yet, because it is taking one step at a time. Respectfully, the proposed implementation plan puts the cart before the horse. The actions that will likely be undertaken by the Bureau to meet the goals of this plan (primarily the use of dilution flows) will not be useful in meeting upstream salinity objectives that are established at a later date. Conversely, if the upstream objectives (and an implementation plan to meet them) came first, the Bureau would be forced to take meaningful actions to solve the salt problem in the river BEFORE it gets to Vernalis, obviating the need for much of this implementation plan.

Response
See response to Comment # 3.2.

Comment # 8.7
The implementation plan should require Bureau compliance in a shorter term.

The timing of the implementation plan is troubling. It gives the Bureau 2 years to enter into an "agreement" to try and meet the objectives – with no actual commitment to do so. It also anticipates an 8-20 year compliance schedule to implement the load allocations. This seems far too long.

Response
The USBR will need time to develop the plan and build the infrastructure required to meet its load allocation. Such time will be needed even with immediate application of waste discharge requirements to regulate the USBR's discharge of salt in the basin. The proposed control program identifies two broad mechanisms with which to implement the USBR's mitigation for their contribution to the problem. If an MAA is the approach used to regulate the USBR, staff will need two years to develop the terms of this agreement.

Setting appropriate time schedules for compliance with TMDL load allocations requires striking a balance between providing adequate time for dischargers to plan, finance, and implement effective water quality controls, and ensuring that water quality improvements occur as soon as possible. Under the proposed compliance schedule, high priority sub-areas (those with the greatest salt loading) would be required to meet load allocations in eight to12 years, medium priority sub-areas would be required to meet load allocations in 12 to16 years, and low priority (low threat) sub-areas would have 16 to 20 years to meet load allocations. Staff believes that the compliance time schedules proposed are achievable and that it is important to focus initial efforts on achieving compliance in the highest priority areas-- those that contribute the greatest salt loads. This approach has the added benefit of delaying implementation that would potentially reduce discharge of relatively higher quality water (one of the concerns of east side agriculture). This provides additional time to study the effect of reducing the volume of such discharges.

Staff concedes that a 16 to 20 year implementation time frame is long, but that the extended time schedule is warranted given the complexity and magnitude of the salinity problem, and given that the economic analysis indicates that substantial capital expenditure will be required to meet load allocations.

Comment # 8.8
The Regional Board should implement this TMDL in part through petitioning the SWRCB to modify the Bureau's water right permits.

The proposed regulatory enforcement of the implementation plan is also troubling. The staff mention the power the state board has to condition water right permits, but make no mention of the fact that the "interim" solution used by the SWRCB to meet water quality goals was to require releases of fresh water for dilution from New Melones. If the Regional Board is actually going to implement a load allocation program consistent with board water quality objectives,

they should reopen the Bureau's permits to require that the Bureau meet the water quality objectives OTHER THAN with dilution flows from New Melones.

Response
The Regional Board as no authority with regard to water rights. Issues related to water rights are the purview of the State Water Board, through its Division of Water Rights. Staff has, per State Water Board direction, developed a program that focuses on controllable discharges to the LSJR. Control of salt and boron discharges alone, however, will not result in achievement of water quality objectives at all times. Based on this and other comments received to date, we are proposing to add policy statements to the Basin Plan requesting State Water Board to continue to use its water rights authority to prohibit water transfers if they contribute to water quality impairments, and to continue to condition water rights on the attainment of salinity water quality objectives when these objectives cannot be met through drainage controls alone.

Comment # 8.9
A concentration based waste discharge requirement, rather than a load allocation, should be further evaluated.

The Regional Board should consider, especially for eastside agricultural drainers, utilizing a concentration based waste discharge requirement rather than a load allocation because reductions strictly based on load will likely reduce drainage of “good quality” water from the east side tributaries users (Stanislaus, Tuolumne and Merced rivers). Currently, agricultural users return flows from these east side tributaries provide dilution flow, a strict requirement on load may reduce this drainage which will have an adverse affect on the quality of water in the LSJR.

Response
See response to Comment # 6.26 through Comment # 6.33.

Comment Letter # 9: US Fish and Wildlife Service

January 20, 2004

Comment # 9.1
The Service does not agree with inclusion of wetland discharges as one of the sources of the salinity problem in the San Joaquin Valley. Historically, the wetlands gathered flood and rainwater and slowly released them back to the river. The remaining wetlands in the valley are a natural part of the ecosystem and are managed, under the severe constraints of limited water quantity, less than ideal quality, and significantly altered hydrology, as near to the natural flooding cycles as possible in this highly altered and effluent dominated system. These remnant wetland discharges, which contribute only 9 percent of the salt load to the river according to the staff report, should be considered more as background than a regulated discharge in the context of total maximum daily loads.

Response
Staff recognizes the important roles that wetlands play in the San Joaquin River Valley Ecosystem. We disagree, however, that discharge from managed wetlands should not be considered as one of the sources of the salinity problem in the San Joaquin Valley. As the comment notes, managed wetlands comprise approximately 9 percent of the LSJRs total salt, and all significant controllable sources of salt must be addressed to effectively solve the LSJR salinity problem.

Comment # 9.2
Wetlands are substantially different from agriculture in purpose, management practices, and most importantly in their effects on the aquatic contamination problems in the Central Valley. In the last 150 years over 90 percent of the wetlands in the Central Valley have been diked, drained, and converted to agricultural and urban uses. Throughout the Central Valley, the intensive management conducted on these remnant wetlands is essentially mitigation for the massive loss of wetlands that has taken place over the course of time. Wetlands are managed to accomplish mandated habitat and resource conservation, restoration, and protection. Water is applied and withdrawn in a manner that will suppress invasive non-native plant species and promote the growth of native wetland and moist-soil species that are important as forage for waterfowl and an incredible diversity of other wetland-dependent wildlife species. The remaining 5 to 10 percent of the wetlands are expected to sustain the maintenance and restoration of resident and migratory birds and other wildlife of regional and national significance that depend on this habitat. Up to one million waterfowl, over one-quarter million shorebirds, and 20 threatened and endangered species use these important habitats. To include these wetlands collectively with other dischargers in the valley as part of the problem is an inaccurate description of the functions of wetlands.

Response
Comment noted.

Comment # 9.3
Water allotments for wetlands within the San Joaquin Basin total approximately 265,000 acre-feet; however, water allotments for agricultural use total roughly three to four million acre-feet. The typical location of Central Valley wetlands is at the "bottom of the pipe" leading to management of wetlands with water discharged from municipal and agricultural sources. The net effect of wetlands is to serve as contaminant buffers that, in general, ameliorate contaminant problems in waters of the Central Valley.

Response
Wetland users are entitled to the same supply water credits that are provided for agricultural water users on the west side. If wetland water supplies include salt from upstream agricultural drainage, these salts should be attributed to the agricultural users and not the wetland users. Wetlands are not effective in reducing salinity concentrations or salt loads. In fact, wetlands tend to evapoconcentrate salts and leach salts form the soil profile. Wetlands may, however, be useful for shifting the timing of salt discharges to the LSJR (i.e. real-time management).

Comment # 9.4
The implementation of the Grasslands Bypass Project (GBP) and the Central Valley Project Improvement Act (CVPIA) has provided the San Luis National Wildlife Refuge Complex (San Luis NWRC) and other wetlands access to increased water supplies that are of higher quality. This has improved the overall water quality of wetland discharges from the San Luis NWRC and other wetlands in recent years. The Regional Board staff report notes that water quality data collected during water years 1986 to 1998 indicate that the non-irrigation season salinity objective of 1,000 µS/cm (applies 1 September - 31 March), was exceeded 11 percent of the time and the irrigation season salinity objective of 700 µS/cm (applies 1 April - 31 August) was exceeded 49 percent of the time at Vernalis; however, the most recent data in the report (1994 to 1998) are significant (see Appendix 1, Figure 1-3: EC for LSJR at Vernalis, 1986-1998). Since the CVPIA and GBP have been implemented the exceedence rates appear to be significantly lower. Also, the report does not consider data from 1999 to 2002 which would likely show a continuing lower trend of exceedences. This improvement of water quality since 1998 should be quantified and more prominently noted by the Regional Board.

Response
Staff acknowledge that the Vernalis salinity objective has been met during the more recent past, however, this period is not representative of the full range of climatic/hydrology conditions that can occur. The last eight years have been relatively wet (4 wet years, 2 above normal, 2 below normal, and 1 dry) and it is unlikely that the standard will continue to be met under drier conditions.

Comment # 9.5
Although the quality of water delivered to wetlands in the Grassland sub-area is better, there is much room for improvement. Monitoring of the three primary sources of water for the San Luis NWRC in 2002 show that electrical conductivity (EC) readings average 852 µS/cm, C-canal; 1,469 µS/cm, San Luis Canal; and 1,395 µS/cm, Santa Fe Canal (range for all sources, 616 - 3,710 µS/cm). Thus, source water to the San Luis NWRC is already above the San Joaquin River standards at Vernalis (700 µS/cm summer, 1,000 µS/cm winter). The highest EC readings

for supply water occur during February, March, and April. During the December 5, 2003 workshop one east side San Joaquin River discharger recommended using EC measurements as the regulating tool rather than allocating loads to each discharger. Considering the above data this tool would not be practical for those dischargers that have no control over the quality of their supply water. As with salt, boron in San Luis NWRC supply water is also above San Joaquin River standards. Boron concentrations from the three water sources average 0.335, 1.12, and 1.54 µg/L (range 0.31 – 2.2 µg/L).

Response
Comment noted - Also see response to Comment # 9.3

Comment # 9.6
The Service recognizes that many wetlands in the San Joaquin Valley are intimately connected to their irrigated neighbors. To that end, the Service and other wetland managers are working with Lawrence Berkeley Laboratories on real-time management to identify operational changes that can be made to assist the Regional Board and others in improving the water quality of the San Joaquin River. It is too early in this process to know how any changes in management regimes will affect the salt and boron objectives for the river or the impacts to management objectives of the wetlands. The Service is willing to consider these changes so long as it does not impact the short and long-term goals of the San Luis NWRC.

Response
Staff appreciates the USFW's and other wetland managers' proactive efforts in evaluating the potential to use real-time management.

Comment # 9.7
Some attention has been focused on the concept of holding wetland water until it can be released during a period of time when the assimilative capacity of the River is higher. This concept is essentially identical to the focus of a Bureau of Reclamation study conducted in the late 1980's, during a drought period. This "off-stream storage" study, or experiment, was conducted in the North Grasslands. That effort resulted in three negative results: 1) the salts were significantly concentrated while the water was being held, with some areas actually experiencing salts encrusting on the surface of the soil; 2) waterfowl were attracted to nest in these areas due to the water being held into the late spring, and when the areas were finally drawn down, waterfowl broods were left high and dry; and, 3) the late drawdown and concentration of salts damaged waterfowl food plant production. It should be noted that CVPIA, Level 4 water supplies delivered to wetlands in late spring and early summer are used for brood ponds and wetting soil for certain wetlands plants. For the most part this water is not discharged from the wetlands.

Response
Through the proposed TMDL and Basin Plan amendment process, the Regional Board will specify the waste load allocations and load allocations necessary to protect the beneficial uses of water in the LSJR. The Regional Board, however, cannot specify the method of compliance with the waste load allocations and load allocations. Appendix 2 includes a description of some of the methods that can be used to control salt and boron dischargers, including real-time water management. The methods described in Appendix 2 are provided for informational purpose only

and dischargers will need to use discretion in selecting implementation practices that meet their individual needs. Consideration for wetlands and wildlife protection will need to be included in the planning for any drainage reduction practices that dischargers choose to implement. Proposed changes to wetland operations, or the construction of new facilities would be subject to a CEQA analysis by the appropriate lead agency.

Comment # 9.8
The Regional Board staff report discusses the management options of improved water supply quality and increased flows from upstream to improve the water quality in the lower San Joaquin River. The Service recognizes these options as being critical to reaching the salt and boron objectives in the river and will support the Regional Board and others in efforts to identify ways to make these options viable. These options are also critical for meeting dissolved oxygen standards in the Stockton ship channel and flow needs for salmonids.

Response
Comment noted.

Comment # 9.9
The Grassland sub-area imports 423,000 tons of salt from the DMC and discharges 400,000 tons while the Northwest Side sub-area imports 90,000 tons from the DMC and discharges 330,000 tons of salt (see Appendix 1, Table 3-2: DMC Salt Contributions by Sub-area 1977-1997). We assume the increase in salt load discharged by the Northwest Side sub-area is from other water supply sources such as ground water use or diversions from the lower San Joaquin River. The Regional Board staff gives credit to those two sub-areas for the salt load in the DMC over which they have no control. The Northwest sub-area also receives credit for the salt load in water diversions from the lower San Joaquin River since this water is impaired from discharges upstream. A similar additional credit should be given to some water users in the Grassland sub-area since supply waters are often commingled with other discharges resulting in supply water that is already above San Joaquin River standards (see above).

Response
See response to Comment # 9.3.

Comment Letter # 10: Cities of Davis, Roseville, Vacaville

January 20, 2004

Comment # 10.1
This firm is special counsel to the Cities of Davis, Roseville and Vacaville and the Sacramento Regional County Sanitation District. On behalf of these agencies, we appreciate the opportunity to provide comments on the proposed total maximum daily load (TMDL) for salts and boron in the San Joaquin River, as described in the November 2003 Public Review Draft and at the December 5, 2003 regional board workshop. While none of these agencies discharge to the San Joaquin River, and thus are not directly affected by the proposed Basin Plan amendment, each of the agencies has an interest in ensuring that TMDLs and water quality objectives are reasonably achievable and are adopted in accordance with applicable law.

Response
Comment noted.

Comment # 10.2
With regard to the proposed Basin Plan amendment, the water quality objectives serving as the TMDL target must be evaluated pursuant to Water Code section 13241 before being applied as targets. Water Code section 13241 sets forth factors to be considered by a regional board in establishing water quality objectives. Among these factors are "water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area" and "economic considerations." (Wat. Code §13241.) The Water Code also requires the development of a program of implementation for the objectives. (Wat. Code §13242.) A California court recently held that these factors are to be considered whenever a Basin Plan is amended, regardless of whether a new objective is proposed. (*City of Arcadia, et. a. v. SWRCB, et al, San Diego Superior Court case No. GIC803631* (December 24, 2003).) The court ruled that adoption of a TMDL constitutes implementation of an objective, requiring an analysis of the section 13241 factors.

Response
The court decision does not apply to this matter and is not correct. The court decision is not a final ruling and it does not apply to the Central Valley Regional Board. The proposed salt and boron TMDL does not include an amendment to a Basin Plan objective; rather it includes the adoption of an implementation program pursuant to Water Code section 13242. Water Code section 13241 applies only to the adoption of water quality objectives, not to the adoption of implementation programs or beneficial use designations.

Comment # 10.3
There is no question that Delta salinity has been a significant issue for the Central Valley Regional Board and the State Water Resources Control Board for nearly 40 years. The focus of the salinity objectives has traditionally been on the impact of diversions and flow on Delta salinity. While the salinity objectives for the Delta have been discussed, analyzed and evaluated

since the 1960's, implementation of actions to achieve such objectives has primarily been reliant upon river flow and subsequent water rights decisions. "Most of the objectives in this plan will be implemented by assigning responsibilities to water rights holders because the factors to be controlled are primarily related to flows and diversions." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, 95-1WR, (May 1995) at page 4.) During this long history of developing salinity objectives and programs of implementation, municipal wastewater has never been identified as a major contributor to salinity in the San Joaquin River, nor has a program of implementation been developed that would apply these objectives to municipal wastewater treatment plants as end-of-pipe limitations. In the numerous analyses prepared regarding salinity control in the Delta, neither the State Water Board nor the Regional Board have ever analyzed the use of the salinity objectives as the basis for end-of-the-pipe effluent limits as part of the program of implementation. As such, the Regional Board and the State Water Board have never analyzed such actions in light of the public interest factors set forth in Water Code section 13241.

Response

The water quality objective for salt in the San Joaquin River is an existing objective. The proposed TMDL does not propose to revise that objective, so the Regional Board is not required to consider the factors in Water Code section 13241 in developing an implementation program to meet the objective. The water quality objective applies to the water body, not to individual dischargers; individual dischargers must be subject to requirements to meet the objective even if that requires meeting the objective at the end of pipe. In addition, 40 CFR section 130.2(h), the term "wasteload allocation" (WLA) is defined as the "portion of a receiving water's loading capacity that is allocated to one or its existing or future point sources of pollution. WLAs constitute a type of water quality-based effluent limitation." The definition of a WLA does not exclude municipal wastewater facilities from consideration in preparing a TMDL; to the contrary existing and future point sources are included in the definition of WLA. There is no deminimis exemption in the definition of WLA.

Comment # 10.4

Nor does the staff report for the draft basin plan amendment evaluate the application of the Vernalis water quality objectives to municipal wastewater pursuant to section 13241. The proposed application of a downstream water quality objective to an upstream effluent discharge establishes a new water quality objective, applicable to those waters for the first time.

Response

The water quality objective applies to the water body, not to individual dischargers. Discharges of salt upstream of Vernalis impact the area downstream of Vernalis, so it is appropriate to evaluate the load of such discharges based on the water quality objective downstream of Vernalis. In addition, discharges that cause or contribute to violations of the objective must be required to meet discharge limitations to assure compliance with the objective. The proposed TMDL establishes the load with respect to municipal discharges, which are point sources and within the definition of those sources to be included in a WLA. Municipal wastewater is not excluded from the definition of WLA.

Comment # 10.5

The proposed application of this downstream objective ignores the significant effects of dilution from the Tuolumne and Stanislaus Rivers. This is especially troubling, given that the regional board is in the process of developing upstream water quality objectives through the appropriate rulemaking process. This is a classic case of "the cart before the horse." It is premature for the Regional Board to adopt this basin plan amendment and TMDL until the Regional Board has completed its process of adopting upstream water quality objectives. These new water quality objectives, which should be adopted after considering the best available technical information and carefully analyzing the economic impacts, should serve as the target for the TMDL.

This analysis is a critical component of any proposed Basin plan amendment. We urge the regional board staff to conduct the requisite analysis of the proposed amendment and fully disclose the potential impacts on municipalities prior to seeking regional board approval.

Response

See response to Comment # 3.2.

Comment Letter # 11: San Joaquin River Exchange Contractors

January 19, 2004

Comment # 11.1
We believe a fundamental component missing from the TMDL is a recognition that this, and other similar water quality standards and objectives, should focus on a watershed basis. As stated by EPA, the watershed approach to achieving and maintaining water quality is "a coordinating framework for management that focuses public and private sector efforts to address the highest priority water-related problems within geographic areas, considering both surface and ground water flow." (U.S. EPA Nonpoint Source Guidelines, 68 Fed. Reg. 205).

Response

The proposed TMDL and Basin Plan Ammendment use a watershed approach to address salt and boron impairment in the LSJR. The TMDL source analysis identifies and quantifies the sources of salt and boron loading to the LSJR. The TMDL waste load and load allocations specify the load limits necessary to achieve compliance with existing water quality objectives. The time schedules in the proposed Basin Plan Amendment prioritize implementation of waste load allocations and load allocations such that the largest sources of salt and boron are addressed first.

The EPA Nonpoint Source Guidelines cited above are "*primarily directed towards nonpoint source management programs and grants administered by State lead nonpoint source agencies designated under Section 319 of the Clean Water Act*" (U.S. EPA Nonpoint Source Guidelines, 68 Fed. Reg. 205). TMDLs, however, have their foundation in Section 303 of the CWA, which essentially requires Sates to develop a prioritized list of the waterbodies that are not meeting standards, and develop TMDLs for those listed waters. The LSJR is on California's CWA Section 303(d) list of impaired waters as high priority for TMDL development due to elevated concentrations of salt and boron. The proposed TMDL and Basin Plan Amendment is consistent with U.S. EPA's Nonpoint Source Guidelines, as the TMDL does focus on a high priority pollutant in a 303(d)-listed waterbody. The EPA Nonpoint Source Guidelines clearly recognize the importance of TMDL development and call for directing 319(h) grant funding toward development and implementation of TMDLs for 303(d)-listed waterbodies.

Comment # 11.2
In developing or reviewing a plan for improving water quality in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, the RWRCB should be guided by broad policy considerations. These policy considerations cannot be forgotten when developing and implementing individual water quality control programs such as total maximum daily loads for target constituents to protect beneficial uses.

Two examples of broad policy considerations that we believe should be revisited and re-emphasized in this review are (i) regional economic impacts and (ii) historic water rights. In order to develop a logical plan that benefits the people of the state, regional economics must be

considered. If a water quality control program disrupts the economy of an entire region, the general public will not support the effort and it will fail as a cooperative program. As a non-cooperative program, it will require extensive regulatory administrative civil liability procedures to mandate compliance.

Response:
The staff report already includes an extensive economic analysis, expanded for the current version of staff report. It is beyond the scope of this economic analysis to assess all regional economic impacts. Water rights is not a factor that must be considered with respect to allowing for continued discharge of pollutants.

Comment # 11.3
A specific example where these broad policy considerations may conflict with a specific water quality control effort is in the process of developing and implementing water quality objectives for the San Joaquin River. Over sixty years ago, the federal and state governments made the decision to build the Central Valley Project (CVP). One of the key components of the CVP was Friant Dam. Friant Dam provided a firm water supply that allowed over 1 million acres in the San Joaquin Valley to prosper. Friant water and the water imported by the Delta Mendota Canal (DMC) are the backbone of the economy of the San Joaquin Valley. Families, businesses and communities have been built based on this joint federal-state policy decision. It is only prudent that the state of California and the federal government acknowledge their prior decisions and accept that the entire San Joaquin Valley has relied upon those decisions. This reliance cannot be forgotten when the RWRCB develops and implements water quality objectives for the San Joaquin River. Please recall that the SWRCB in 1959 rendered Decision 935 in which it specifically balanced the needed water supply for the Friant Division of the CVP and approved the Bureau of Reclamation permit that resulted in the exchange of water by which the Exchange Contractors received their water by the DMC in lieu of their San Joaquin River water right water. Given this approval, the RWRCB should also recognize that the Bay/Delta Estuary water quality was, and remains, affected by the removal of this large increment of mainstem San Joaquin River flow.

Response
The proposed Basin Plan Amendment is intended to implement a TMDL and an existing water quality objective that was established by the State Water Resources Control Board in the 1995 *Water Quality Control Plan for the San Francisco/Sacramento San Joaquin Delta Estuary* (Bay Delta Plan), and no new water quality objectives are being proposed. The proposed TMDL is based on the current hydrology of the LSJR, therefore, the effects of LSJR water projects have been considered. Prior decisions regarding construction and operation of water development projects, however, do not obviate the Regional Board's responsibilities under the CWA and the Porter Cologne Water Quality Control Act, including the need to protect the beneficial uses of water in the LSJR and in the Delta.

Comment # 11.4
One specific decision that must take into account these prior decisions is the establishment of water quality standards and objectives to protect agricultural beneficial uses in the Delta region and the Westside of the San Joaquin Valley. The Federal and State Government's decision to

build the CVP has fundamentally changed the achievable water quality in most segments of the San Joaquin River. Segments of the river that are most clearly impacted by these prior decisions are those segments that are dry or nearly dry as a result of the CVP and SWRCB's Decision 935. California and the United States understood certain segments of the San Joaquin River would be dry after the completion of the CVP. They also understood that water flowing into other sections of the river would be limited to seepage and return flow water. The decision to build Friant Dam was the right decision, and the region's reliance on that action must be considered when establishing water quality standards and objectives to protect agricultural and other beneficial uses. Ignoring prior decisions when addressing current societal concerns will result in illogical and inequitable policies.

The SWRCB, the San Joaquin River stakeholders, and society as a whole must look at the larger issues when attempting to improve Bay/Delta Estuary water quality. If we acknowledge these broad policy considerations and the impacts on achievable water quality by our previous decisions, we can make appropriate, scientifically-based water quality improvements in a logical and effective manner. The federal and state government's decision to impose manmade hydro-modifications upon the San Joaquin River, and the entire region's reliance on that decision cannot be ignored.

Additionally, historic water rights must be respected in order to recognize and protect the property rights represented by California's system of water rights. If we do not acknowledge these broad policy considerations, we will not be able to develop a plan that is in the public interest.

With this background and hopefully agreed underpinning, there are some specific areas where we believe that the TMDL should be modified.

Response
Comment noted.

Comment # 11.5
Coordinating The Salt TMDL With The Necessity Of Drainage Measures In The San Joaquin River Watershed

Salinity entering the Bay Delta Estuary through the San Joaquin River whether expressed in terms of exceeding the Vernalis salinity standards or in terms of TMDL for salt and boron or in terms of selenium loads or concentrations at locations entering the San Joaquin River or its tributaries are a result of an incomplete water resources development plan. The SWRCB recognized this in Decision l64l when, after finding that the regional water quality problems on the Westside of the San Joaquin Valley were caused by the Bureau of Reclamation's operation of the Central Valley Project, it required the Bureau to develop and submit its plan to provide for drainage as a condition of it water right permits. The Central California Irrigation District and Firebaugh Canal Water District, along with other interested parties, caused the 9th Circuit Court of Appeals to recognize this breach of the Bureau's obligation to provide drainage as required by the San Luis Act in Firebaugh v. United States (2000) 203 F.3d 568 when the Court stated that the United States must move forward to choose and implement a drainage solution. It makes no

sense for the RWQCB to set water quality standards without recognizing that only completion of the water resources development plan will improve water quality.

Response
Again, the proposed Basin Plan Amendment does not seek to establish new or revised water quality objectives or changes to the designated beneficial uses of the LSJR. Establishing a TMDL (or new water quality objectives for that matter) in no way precludes the completion of the water resources development plan. Establishment of the proposed TMDL should actually provide additional incentive to the USBR to fulfill its obligation to provide drainage, since the proposed TMDL establishes load allocations for the USBR which could be satisfied, in part, through completion of the water resources development plan (i.e. implementing any of the alternatives described in the San Luis Drainage Feature Re-evaluation Project). We disagree that only completion of the water resources development plan will improve water quality. Salt and boron water quality improvement in the LSJR can be achieved through one or more of the following methods:

1) Reducing salt and boron loads imported to the LSJR watershed in supply water
2) Increasing the assimilative capacity of the LSJR by providing dilution flow
3) Reducing salt and boron loading from point and/or nonpoint sources
4) Increasing the amount of salt exported from the LSJR watershed, including through re-operation of drainage and real-time water quality management or through the use of an out-of-valley drain

Comment # 11.6
The San Joaquin River Exchange Contractors and other interested San Luis Unit Bureau Contractors have developed a plan that can manage drainage conditions and provide for treatment of and physical removal of salts from a portion of the water entering the San Joaquin River and South Delta. The cost is estimated at $l28 million and implementation over 8 years with eventual treatment at a cost of approximately $700 per acre foot of concentrated drainage flows. Hopefully the treated water would have a market value to offset a portion of these treatment costs. One can only ask how a l995 Water Quality Control Plan review can be realistic and useful unless it examines implementing measures such as these in light of the failure of the Bureau to provide for a comprehensive drainage project for the Westside of the San Joaquin Valley. Moreover, dealing with, achieving and maintaining water quality is, according to U.S. EPA "a coordinating framework for management that focuses public and private sector efforts to address the highest priority water-related problems within geographic areas, considering both surface and ground water flow." (USEPA Non-Point Source Guidelines, 68 Fed. Reg. 205). Only a regional plan such as that developed by the Exchange Contractors and others can hope to achieve improved water quality conditions in the San Joaquin River watershed and the Bay-Delta Estuary.

Response
Comment noted- See also response to Comment # 11.1 and Comment # 11.5.

Comment # 11.7
Use Of Flawed Data

The Draft Basin Plan Amendment set out the proposed implementation program for the control of salinity and boron in the Lower San Joaquin River. The Technical TMDL Report, Appendix 1, constitutes a methodology for achieving salinity and boron objectives on the Lower San Joaquin River. The actual salinity objective may not be technically part of the Basin Plan Amendment or the technical TMDL development process; however, the objective is the basis for the ultimate load allocations; and, consequently, we feel that it is necessary to briefly address the appropriateness of the salinity objective for Vernalis. According to the Technical TMDL report (page 21), one of the bases for the 700 mS/cm objective is the August 1987 State Water Board Order No. 85-1 Technical Committee Report titled Regulation of Agricultural Drainage to the San Joaquin River. The report recommended a 700 mS/cm criterion between April 1 and August 31 to fully protect irrigated agriculture. This recommendation has serious scientific flaws.

The 700 mS/cm criterion was established to protect crops such as beans, one of the most salt sensitive crops in the delta; however, this criterion seems to be arbitrary in that it does not take into account all the factors that influence a crop's water quality needs. The water quality needed to grow a crop is a function of the total applied water, the water quality and the crop's soil salinity needs. This relationship is described in detail in Water Quality for Agriculture by R.S. Ayers and D.W. Westcot (Ayers & Westcot, 1989), a 1989 Food and Agriculture Organization of the United Nations irrigation and drainage paper.

According to Ayers & Westcot, in order to meet a crop's water needs, additional water can be applied to offset the increased salinity of the applied water. This is known as a leaching requirement. The inherent inefficiencies of customary irrigation techniques in the delta allow for increased salinity of applied water above the 700 mS/cm criterion. Additionally, Ayers & Westcot state that rainfall must be considered in estimating the leaching requirement and water quality needs of a crop. Rainfall will leach salts from the soil and help maintain suitable soil salinity. Furthermore, Ayers & Westcot determined that the timing of leaching is not critical provided the crop tolerance is not exceeded for extended or critical periods of time. The 700 mS/cm criterion does not take into account the beneficial effects of leaching from normal irrigation or rainfall. Additionally, the current criterion does not consider naturally occurring variations in water quality over multiple years that will leach the soil and maintain proper soil salinity.

Not only does scientific research indicate that the current criterion is flawed, but practical experience does not support the 700 mS/cm criterion. Delta Mendota Canal water that often has a higher EC than 700 mS/cm is successfully used to grow beans, lettuce, almonds, and numerous other salt-sensitive crops. This real-world experience is good evidence that the 700 mS/cm criterion is not appropriate and that we should consider revising the salinity objective for Vernalis. The current objective is lower than necessary to protect beneficial uses in the Delta and it prevents upstream water rights holders from maintaining a salt balance on their land. As the TMDL staff report is primarily a methodology for achieving an objective, and this methodology can be applied to any future Vernalis salinity objective, we will reserve more detailed comments on the objective for a different forum and focus our remaining comments on the proposed TMDL.

Response
See response to Comment # 6.95.

Comment # 11.8
Water Rights Priorities Must Be Respected

While the Technical TMDL is not intended to interfere with water rights priorities, it will impact water rights if it is not revised. The connection between water rights and water quality improvement efforts is undeniable. The State Water Resources Control Board recognized this connection in D-1641 when it assigned responsibility to the Central Valley Project (CVP) for meeting the Vernalis water quality objective. Unfortunately, this TMDL does not recognize junior appropriators' responsibility to fully mitigate water quality impacts. According to D-1641, the CVP is the principal cause of degraded water quality at Vernalis. Without the latter in time appropriations, there would be more flow in the river and the total salinity load discharged into the river would be less. A load-based system is not the appropriate method to improve water quality while recognizing water rights. We believe that water rights priorities should be respected and that junior appropriators should be held responsible for the problems that they created. Specifically, the findings of D-1641 should be followed and the CVP should be held primarily responsible for meeting Vernalis salinity objectives.

If it were essential to establish a load based system, it would be necessary to develop a methodology that equitably allocates the responsibility for water supply loads and recognizes that applied water will mobilize some salt. The proposed TMDL attempts to incorporate these concepts by including a Consumptive Use Allowance and a Supply Water Relaxation. We applaud the staff for including these components but we believe that both the Consumptive Use Allowance and the Supply Water Relaxation must be refined. Our proposed revisions are explained below. Although we are offering suggestions to improve this TMDL, we believe that a load-based system is not appropriate for a river with as many man caused hydrologic modifications as the San Joaquin River.

Response
The Regional Board has no authority with regard to water rights. Issues related to water rights are the purview of the State Water Board, through its Division of Water Rights. Staff has, per State Water Board direction, developed a program that focuses on controllable discharges to the LSJR. Under the proposed TMDL and Basin Plan amendment all dischargers, including the USBR, are held accountable for their contribution of salt loads to the LSJR. Load reductions alone may not full remedy the salinity impairment in the LSJR, but load reductions will certainly contribute to water quality improvement, especially when taken in combination with the actions prescribed by the State Water Boards D-1641. The State Board adopted D-1641, in part; to implement the flow related implementation components of the Bay Delta Plan. It is the responsibility of the Regional Board to implement the load or discharge-based controls needed to achieve the Bay Delta Plan objectives. Staff therefore disagree that a load-based system is not the appropriate method to improve water quality while recognizing water rights.

Comment # 11.9
The Proposed Compliance Schedule
The proposed Basin Plan Amendment establishes implementation priorities for sub-areas based upon the historical salt loading per acre in the sub-area. It proposed that those areas with the greatest unit area salt loading be given the highest priority. The premise seems to be that the Regional Board should focus its efforts on the most significant sources of salt and boron discharges to the river. This rational makes sense if applied to allocating resources to help implement solutions to the salt loading problem. If society focuses resource on the area with the largest problem they will likely get the most water quality improvement for the resources invested. Those areas with the largest historical salt discharges per acre have the most difficult problem and need the most financial and technical assistance to help solve the problem.

The proposed Basin Plan Amendment inappropriately uses these priorities to establish a compliance schedule. Although the analysis recognizes that certain sub-areas have a significantly greater salt loading problem than other sub-areas the compliance schedule gives the least amount of time to solve the problem to those areas with the greatest problem. It is not logical or equitable to require those areas with the most difficult problem to solve it in the least amount of time. The compliance schedule for high priority areas should be extended to 20 years for all water year types.

Sub-areas with the greatest problem need adequate time to develop and implement discharge control technologies to solve inherent problems. The problems associated with maintaining a salt balance in the soil and meeting current water quality objectives for salt and boron will certainly be extraordinarily expensive and may turn out to be insurmountable. Although it would be nice if we could magically solve the salinity problem on the west-side of the San Joaquin Valley by simply adopting a compliance schedule, everyone recognizes that the problem is significantly more complicated. Given the magnitude and complexity of the problem it is unrealistic to require high priority regions to meet objectives in as little as eight years. A twenty-year compliance schedule will prove to be an enormous challenge.

Response
The time schedule was based on what can reasonably be done in available time, with an emphasis placed on first reducing loads from the source areas contributing the largest unit area salt lads. The selenium control program has compliance dates that will occur before dates in this control program. Compliance with dates in the selenium control program will achieve much of what is required in the high priority areas such as the Grassland Subarea. Additionally, throughout the LSJR Basin, agricultural dischargers already achieve much of what is required under the proposed control program when water is scarce and drainage water recycling is high, such as is occurring in the dry summer of 2004.

Also see response to Comment # 4.7.

Comment # 11.10
The Management Agency Agreement With The USBR Should Be Aggressively Pursued
The State Water Resource Control Board, the Central Valley Regional Board and the federal courts all understand that the United State Bureau of Reclamation (USBR) have to become

actively engaged in the solutions to San Joaquin River water quality problems. For decades, the Exchange Contractors have been attempting to motivate the USBR to implement projects to solve this problem. Over the years, the USBR has shown its unwillingness to engage in this process. By giving the USBR two years to enter into a Management Agency Agreement (MAA), the proposed Basin Plan Amendment allows the USBR two more years to drag their feet. This delay is unnecessary and unwise. The MAA deadline should be revised to reflect the deadline in D-1641. That deadline is December 2004.

Response
See response to Comment # 3.3.

Comment # 11.11
Technical TMDL Methodology
The TMDL attempts to incorporate two basic goals that are essential to an equitable and effective salinity TMDL for the San Joaquin River. The first goal is maintaining a salt balance in the region. The San Joaquin Valley is one of the most productive agricultural regions in the world. Agriculture drives the economy in the Valley and must remain viable in order to maintain the local communities. History has proven that if agricultural land does not maintain a salt balance it will become unproductive and the dependent economy will collapse. California and the entire nation cannot afford to lose the agricultural resources of the San Joaquin Valley.

The second essential element of this TMDL is the acknowledgement of the Central Valley Project's (CVP) contribution to the water quality problems on the San Joaquin River. The impacts of the CVP are primarily due to the reduced flows on the River and the increased salt load imported to the region in CVP water. If the TMDL did not recognize these impacts it would place an inequitable burden on parties that are not truly responsible for the problem. These CVP impacts are significant and must be recognized not only in any TMDL development and implementation plan but also in the process of setting beneficial uses and water quality objectives on the San Joaquin River.

While both the need for a salt balance and the CVP's contribution to the problem are acknowledged in this TMDL, neither idea is fully addressed. The following comments will outline the deficiencies in the approach taken in this TMDL to adequately address these and other concerns.

Response
Comment noted.

Comment # 11.12
Base Load Allocation Design Flow
While one of the goals of the TMDL is to maintain a salt balance, the design flow does not recognize this goal. The lowest historic flows are used as the design flows in order to satisfy an appropriate margin of safety. This margin of safety is excessive. The chosen design flows are based on the lowest flow of the given month for the 73-year period from 1922-1994. By using this design flow, salt discharge limits will be over restrictive in almost every month. This conservative approach is unwarranted and will result in the region not achieving a true salt

balance. Delta agriculture, the limiting beneficial use in this TMDL, does not require such a restrictive allocation because the impacts from salt result from longer exposure than one month in a 73-year period. Since the design flows do not allow for a true salt balance, they should be revised to reflect the true needs of the beneficial use they are intended to protect.

The design flow is used to predict future flows in the river. These historic low flows are accepted as a given but there is very little discussion in the TMDL about the reasons for these historic flows. The CVP, as well as many regional water projects, have impacted the current flows at Vernalis. This TMDL does not attempt to assign responsibility to the many projects that have reduced flows in the river and exported water out of the basin. While the CVP is allocated some responsibility for meeting salinity objectives due to their imported salt neither the CVP nor parties like the City of San Francisco are held responsible for their impacts on water quality due to out of basin exports. This oversight results in an inequitable allocation of responsibility in that it does not take into account the relative priority of water rights among the parties. It is essential that the effort to meet water quality objectives does not ignore the water right priority system. All out of basin exports of water impact water quality on the San Joaquin River, therefore they share in the responsibility curing their share of the problem.

Response

Staff agrees the TMDL base load allocations are based on conservative design flows and that these base load allocations are not conducive to maintaining a long-term salt balance in the LSJR. For this reason, the proposed Basin Plan Amendment provides dischargers with an alternative to the conservative fixed base load allocations. Opportunities to operate under real-time load allocations instead of fixed base load allocations have been incorporated into the Basin Plan Amendment, with the goal of facilitating a salt balance and minimizing the burden on dischargers. The real-time load allocation allows dischargers to maximize their salt loading to the river to the extent that assimilative capacity is available, thereby maximizing salt discharge (and working toward a salt balance) while maintaining water quality in the LSJR. There is no way to establish a design flow that could allow for more loading than the proposed real-time load allocations and still protect water quality.

The design flows are not based on historical conditions; instead they are based on the existing conditions of the LSJR. In order to consider changes that have altered hydrologic patterns, design flows for the TMDL were based on results of DWR's DWRSIM model output for DWR Study 771, instead of using historical data. DWRSIM study 771 superimposes the current level of hydrologic development (e.g., existing dams, diversions, and operational rules etc.) on historical unimpaired flows. The model therefore calculates historic flows as if the system was historically operated the same way it is operated under current conditions and with the existing infrastructure in place.

Staff agree that the proposed TMDL does not include allocations of responsibility for reduction in flow caused by diversion of water, nor does it take water rights priority into account. This TMDL focus on salt loading to the LSJR is a factor for which the Regional Board had the authority to control. Water Rights and flow control are the purview of the State Water Board. Staff has, per State Water Board direction, developed a program that focuses on controllable discharges to the LSJR. Based on this and other comments received to date, we will likely add

policy statements to the Basin Plan requesting State Water Board to continue to use its water rights authority to prohibit water transfers if they contribute to water quality impairments, and to continue to condition water rights on the attainment of salinity water quality objectives when these objectives cannot be met through drainage controls alone.

Also see response to Comment # 1.4 and Comment # 12.22.

Comment # 11.13
Consumptive Use Allowance
The Consumptive Use Allowance calculation is based upon a 73 percent seasonal application efficiency (SAE). This SAE is an on-farm value and not a district or regional value. Most districts reuse water and therefore the SAE district wide would be much greater than 73 percent. Use of a field SAE is not appropriate. A district or regional SAE should be used to determine the trigger value for the consumptive use allowance.

Response
The consumptive use allowance recognizes that water is used consumptively in the LSJR basin, and is used to allow unrestricted discharge of high quality water below a predefined trigger value concentration. The consumptive use allowance, however, is not intended to correspond to actual on the ground efficiency or provide credit/incentive for improving irrigation efficiency.

The method used to calculate the trigger value is given in Section 4.2 of Appendix 1 (subheading titled Consumptive Use Allocation). The trigger value is based on a high quality supply water (52 mg/L) and a seasonal application efficiency of 73 percent, which is based on a Department of Water Resources estimate that statewide average seasonal application efficiency will reach 73 percent by the year 2020. Using these assumptions the trigger value has initially been set at 193 mg/L (315 µS/cm EC). Raising the seasonal application efficiency would have the effect of raising the trigger value, for example, using a seasonal application efficiency of .83 yields a trigger value of 306 mg/L (500µS/cm EC). Increasing the consumptive use allowance, however, will result in a decrease in the base load allocations because consumptive use allowance loading is subtracted from the available loading in the calculation of the TMDL.

Supply Water Relaxation
The Exchange Contractors, consisting of Central California Irrigation District, San Luis Canal Company, Firebaugh Canal Water District and Columbia Canal Company, irrigate approximately 240,000 acres on the west side of the San Joaquin Valley between Mendota in the south and Crows Landing in the north. They have a pre-1914 right to divert water from the San Joaquin River.

The United States, in 1939, purchased water from the Exchange Contractors' predecessors, Miller and Lux. Also in 1939, the Exchange Contractors' predecessors and the United States entered into the first Exchange Contract with the Bureau of Reclamation. Under the Exchange Contract, they agreed not to exercise their pre-1914 water right to divert water from the San Joaquin River so long as the Bureau provides them their water – approximately 840,000 acre feet a year – from the Sacramento River watershed delivered by the Central Valley Project's Delta pumps through the Delta Mendota Canal (DMC) instead of from the San Joaquin River.

Since 1951, the Exchange Contractors have been receiving their water from the DMC rather than from the San Joaquin River. Under the Exchange Contract with the Bureau, the Exchange Contractors agree not to exercise their pre-1914 water rights so long as the Bureau provides them substitute water delivered by the CVP's Delta pumps through the DMC. The DMC water has a much higher salt content than San Joaquin River water by several orders of magnitude.

For example, San Joaquin River water above Friant Dam is generally thought to have a quality of 25 to 50 parts per million Total Dissolved Solids (TDS). Compare the substitute water delivered to the Exchange Contractors which has the following water quality parameters set forth in the Exchange Contract:

800 TDS	Mean daily water quality
600 TDS	Mean monthly water quality
450 TDS	Mean annual water quality
400 TDS	Five-year average water quality.

Compare the quality of this delivered water with the Vernalis water quality standard –

462 TDS	April through August
654 TDS	September through March

-- and it is easy to see how the Exchange Contractors cannot possibly meet the water quality standards contemplated by the salt and boron TMDL being considered by the Regional Board.

The Supply Water Relaxation (SWR) is an essential component of the TMDL. The Regional Board proposes to give the Exchange Contractors approximately a 50% salt load relaxation, and while we understand that number is an arbitrary figure, we appreciate the accommodation. However, the 50% relaxation is based upon the Bureau agreeing to enter into the Management Agency Agreement proposed in this TMDL, and that may be a problem because the Bureau may refuse to do so. Responsibility for the salt imported into the region above background loads is properly allocated to the ultimate importer. Although this responsibility is assigned to the salt importer, the water user is relieved of only 50 percent of this salt load. The stated rationale for this disconnect is the need for an additional margin of safety. This additional margin of safety is unwarranted. The SWR is based upon the minimum historical deliveries for each month/water year type. The use of the minimum deliveries is an implicit margin of safety. Imposing an additional margin of safety is unwarranted and illogical.

If it were reasonable to assume that an additional margin of safety is needed, a 50 percent margin of safety is excessive and arbitrary. The water user that receives this imported salt is the party that is burdened with the additional salt load therefore the same water user should be relieved of the entire imported salt load that is in excess of the background loads. If this connection is not made parties that are not impacted by the poor quality imported water will receive an unintended benefit at the expense of the truly impacted parties.

The State Water Resource Control Board found in D-1641 that the actions of the CVP are the principal causes of salinity concentrations exceeding water quality objectives at Vernalis. The parties that receive excessive salt loads in their supply water realize the full impacts of those salinity loads. They must discharge those salts in order to maintain a salt balance on their lands. The parties that receive those loads should be given full credit for the imported salt. The 50% reduction in the current TMDL places an undue burden on the lands that are receiving the excess salt loads. If an additional margin of safety is needed that margin of safety should be provided by the USBR. The USBR is the party responsible for importing the salts therefore they should be held accountable for the impacts associated with that importation, including any margin of safety. An appropriate margin of safety could be added to the USBR's responsibility above the salt loads imported to the region.

Response
TMDL implementation would not result in attainment of the existing salinity objective if the supply water credits are provided to the west side and the USBR allocations/mitigations are not implemented. It is therefore imperative to link provision of supply water credit to USBR actions that will offset the credit.

The UBSR's supply water load allocations are equal to the volume of water delivered from the DMC at a background Sierra Nevada quality of 52 mg/L. The USBR is therefore responsible for all salts in supply water that exceed 52 mg/L, placing significant responsibility on the USBR for excess salts imported through the DMC.

Water users are not given full credit for all of the salt in supply water, because not all of the salts in supply water are discharged to the LSJR through surface outfalls. Some of the imported salt is discharged through uncontrolled groundwater accretions or stored in the groundwater and soil. Moreover, some quantity of naturally-occurring salts would be present even in the exchange contractor's original SJR supply. It is not appropriate to give west side dischargers credit for this salt since it is included in the USBR's load allocation (52 mg/L TDS). A better scientific understanding of site-specific drainage mechanisms (i.e. fate and transport of salts in supply water) is needed to refine the supply water credit. This information, however, is not currently available. The 50% percent supply water credit is a conservative estimate based on professional judgment.

Comment # 11.14
Real-Time Relaxation
Given the overly conservative design flows of this TMDL, the real-time component is imperative. Unfortunately, the real-time program is not well developed. Significant effort is needed to develop an effective real-time management program. Implementation of this overly restrictive TMDL without a well-developed real-time program will impose significant economic impacts on society without any real benefits. Furthermore, a real-time program will protect beneficial uses of water in the San Joaquin Valley.

Regional Board staff acknowledges the necessity of an effective real-time management program. They recognize that limiting discharges to fixed load allocations could result in a net salt build-up in the LSJR watershed because salts would continue to be imported into the watershed in

supply water but salt exports would be significantly restricted. Regional Board staff also acknowledges that implementation of the real time management program will require a coordinated effort among the dischargers in the LSJR watershed. The technical TMDL states that dischargers will need to develop and maintain the necessary operational and facilities infrastructure to provide accurate forecasts of assimilative capacity and to manage discharges to coincide with real-time conditions. The proposed Basin Plan Amendment requires that dischargers must participate in an approved real-time management program in order to be able to utilize real-time load allocations. The technical TMDL report states that development of a proven real-time management framework will be a prerequisite to the utilization of the additional real-time load allocation. (Appendix 1 page 81)

Throughout the proposed Basin Plan Amendment and staff documents the language seems to indicate that the only way a discharger can participate in the real-time management program is through the conditional waiver program. The Amendment seems to require all discharges operating under waste discharge requirement to meet the fixed base load allocations. The real-time management option should be available to dischargers operating under waste discharge requirements as well as the conditional waiver program.

We agree that an effective real-time program is essential to meet the challenge of achieving salinity objectives on the LSJR. However the proposed compliance schedule does not take into account the complexity of the problem and the time and money necessary to develop a proven real-time management program. A minimum of twenty years will be needed to develop and fully implement an effective real-time management program for the Grassland sub-area.

Response

Use of waivers of WDRs is intended to be an incentive for participation in a real-time management program, since the majority of dischargers seem to prefer regulation through waivers of WDRs, as opposed to actual WDRs.

If a discharger is operating under a WDR for another reason/pollutant than salt (e.g. Grassland Bypass Project WDR for selenium) they would not be precluded from participation in a real-time management program for the control of salt. WDRs can be customized to require compliance with TMDL base load allocations, and in some circumstances for compliance with real-time load allocations.

Also see Response to Comment # 6.1, Comment # 6.11, Comment # 6.12 and Comment # 11.9.

Conclusion

The Exchange Contractors are convinced that California can protect water quality, maintain viable agriculture, and respect water rights priorities. However, we must continue to look at the broader policy concerns when implementing specific programs. Implementation of this overly restrictive TMDL without reasonable modifications, including logical water quality objectives, a fully developed real-time program, and a well developed plan to coordinate all TMDLs in the basin, will not maintain a salt balance in the valley. Without a salt balance, agriculture will ultimately be eliminated from many regions. The economic and societal impacts of not maintaining viable agriculture in the Valley will be far reaching. The basic assumptions of the

TMDL need to be sound, consistent with prior State Board decisions, and equitable. Society must not create larger problems than those they are attempting to solve. The changes we have suggested in this TMDL will help achieve society's goal of equitably protecting water quality. We look forward to working with the Regional Board and its staff on water quality issues in the Central Valley.

Response
Comment noted.

Comment Letter # 12: U.S. Bureau of Reclamation

January 20, 2004

Comment # 12.1
The Bureau of Reclamation, (Reclamation), Mid-Pacific Region, Regional Water Quality Coordination Program, has reviewed the subject report. Reclamation continues to hold the position that the draft Basin Plan Amendment and technical supporting documents require major revisions due to the many assumptions made throughout the report (see enclosed Comments). Some major concerns are: The use of 52 mg/L concentration for the Delta Mendota Canal background is unreasonable and not based on sound science.

Response
Salinity of 52mg/L (approximately 85 µS/cm) is used throughout the staff report to represent background salt loading attributable to high quality surface water sources from the Sierra-Nevada Mountains. It is based on long-term historic electrical conductivity records for high flow conditions in the Merced, Stanislaus, and Tuolumne Rivers.

The 52 mg/L concentration is also used to represent the salinity of the SJR downstream of Friant Dam. This is the approximate water quality that would have been delivered to downstream agriculture if the Central Valley Project had not been constructed. The USBR's DMC load allocation (allowable salt import) has therefore been set equal to the volume of water delivered to the LSJR watershed at a water quality of 52 mg/L. The effect of using background salinity higher than 52 mg/L would be to decrease the responsibility of the USBR for the impact of DMC imports on SJR water quality. The USBR has not proposed an alternate concentration or provided sufficient information stating why the 52 mg/L value is not appropriate.

Comment # 12.2
A salt and water budget needs to be developed that includes a reasonable estimate of all parameters and these parameters need to be applied consistently basin-wide. The water balance would need to include both surface and ground water.

Response
The TMDL includes all of the required elements, and all significant sources of salt and boron loading have been identified and considered.

Staff acknowledges that groundwater is a significant source of salt loading to the LSJR. The proposed TMDL includes estimates of groundwater loading to the LSJR so that loading capacity for surface water discharges can be determined. If the USBR has information from the Central Valley Project service area that could assist Board staff in assessing the extent to which project drainage affects groundwater and salinity accretions to the river, this information should be submitted to staff. If this information is not available, Board staff would be interested in knowing how long it would take the Bureau to develop this information and the costs involved.

Staff is proposing that the basin plan amendment include a schedule for groundwater control, and any information submitted by the Bureau would be considered in establishing this schedule.

Comment # 12.3
The East-side water projects are not identified for their impacts of modified timing, degraded water quality, and reduced flow to the San Joaquin River. The cost estimates to dischargers need further analysis. The water users will ultimately pay for Reclamation's mitigation cost per Reclamation law.

Response
No load allocation or responsibility is placed on any water user for their impact on reduced or re-operated flows under the proposed TMDL framework. The USBR's allocation is intended to address their contribution of salt to the LSJR basin, not their impact on reduced flows. The TMDL addresses the impact of water quality degradation attributable to the use of water by the east side water projects as load allocations for east side agriculture, and waste load allocations for east side municipal and industrial sources.

The cost estimates were developed for basin-wide compliance with the TMDL, regardless of who pays the costs.

Comment # 12.4

There are many redirected effects from other TMDLs. The Regional Water Quality Control Board should consider bundling all pollutants on the 303(d) list on the Lower San Joaquin River. Developing a unified water shed approach would be more effective than a piece-meal approach.

Response
Staff agrees that the evaluation of corrective actions should consider impacts of control programs for other pollutants and TMDLs. The salt and boron and other TMDLs are being developed with consideration of the potential redirected effects. The proposed programs of implementation are designed to not be mutually exclusive. If the USBR has identified specific implementation actions that have been proposed for the salt and boron TMDL that will adversely affect other water quality problems, information regarding these impacts should be submitted to staff.

Comment # 12.5
Recommendations in the Basin Plan may place Reclamation's responsibilities beyond our legal authority.

Response
Comment noted.

Comment # 12.6
Page 1-31, fourth paragraph: "The DMC supplies a volume of water that is roughly equal to the average water delivered to the exchange contractors. . ." . This statement is misleading and needs revision. The DMC provides water for exchange contractors, water to wetlands, other agricultural lands, and other users in the basin.

Response
Staff agrees with the comment and the cited paragraph has been revised to include the following sentence: *"In Addition to providing water to the Exchange Contractors, the DMC also provides water to other agricultural and wetland users."*

Comment # 12.7
Page 1-31, last paragraph: The Regional Board used the1977 to 1997 period to develop the TMDL. This 20-year period of record was abnormally dry and not representative of the normal hydrograph. The 20-year period also did not include the implementation of the Grassland Bypass Project, which improved water quality in the Grasslands area and the San Joaquin River. We suggest the period of record to include the 1998-2002 timeframe. The Regional Board has daily salt and boron data for the San Joaquin River at Crows Landing from October 1, 1996 through October 31, 2003 posted at http://www.swrcb.ca.gov/rwqcb5/programs/agunit/bypass/stc504s97.htm. Using the most recent data that reflects current hydrological management of the region could allow more salt to be discharged during high flow periods and should give more monthly separation of the low values shown in Table 4-2.

Response
The 1977 to 1997 data set was used to develop the TMDL source analysis and does not affect the load allocations that govern the amount of salt that can be discharged during high flow periods pursuant to the proposed TMDL. Table 4-2 is based on DWRSIM output for WYs 1922 though 1994. Model output from DWRSIM CALFED Study 771 was used for establishing design flows in this TMML because it represents current conditions by simulating historic flows with the existing infrastructure and operational policies imposed. Use of historic gaged flows would be flawed, because it would not consider the physical and operational changes that have affected LSJR hydrology over time. Additionally, use of the most recent data alone would not be representative of long-term climatic conditions and the broad range of flows observed over an extended time frame.

Comment # 12.8
Page 1-32, Table 3-2, "DMC Salt Contributions by Sub-area 1977-1997": The table indicates 423 and 90 tons/year of salt is imported to the Grasslands and Northwest areas, respectively. Are the numbers corrected for pre-development salt loads? If not, they should be adjusted appropriately.

Response
Table 3-2 shows the amount of salt delivered from the DMC to the Northwest Side and Grasslands subareas, and compares imported salt loads to the amount of salt discharged to the LSJR from all sources within these sub areas. It is unclear what is meant by "corrected for pre-development salt loads".

Comment # 12.9
Page 1-32, Table 3-2: Based on the information in Table 3-2, a substantial salt load comes from the Northwest side. How much of this loading is from pre-development? It appears unusual that the Grasslands area retains salt (423 thousand tons imported/400 thousand tons emitted) while the Northwest side releases a larger salt load (90 thousand tons imported/320 thousand tons emitted).

Response
Based on our calculations it appears that salt is being retained in the Grasslands Subarea. Salt may be being stored in the soils and underlying groundwater. The assertion that "Northwest side releases a larger salt load" is not necessarily accurate, because there are other sources of salt to the Northwest side besides the DMC. These sources include groundwater and LSJR diversions. Available data do not permit calculation of pre-development salt loading from these Subareas.

Comment # 12.10
Page 1-32: Table 3-2 states that the DMC imports 423 k-tons of salt to the Grasslands area. There must be a calculation error for salt carried by the DMC to the pool. The DMC provides 210 k ac-ft to the Mendota Pool each year (see Table 3-5, Page1-47 for volume to Grasslands) and has a salinity of 317 mg/L (see Table 3-4, Page 1-44). Therefore salt from DMC delivery to the pool is:

$$(210 \text{ k ac-ft}) \times (1.23 \times 106 \text{ L/ac-ft}) \times (317 \text{ mg/L}) \times (1.1 \times 10\text{-}9 \text{ tons/mg}) = 90 \text{ k-tons}$$

Response
The 210 TAF from Table 3-5 is the volume of water discharged from the Grasslands sub-area, not the volume of water delivered from the DMC.

Comment # 12.11
When analyzing the data presented in Tables 3-3, 3-6, and 3-7, there are inconsistencies in the salt loads. It appears the controllable salt and boron loads presented in Table 3-7 are too high, particularly when considering the uncontrollable load from the Deep-Coast Range ground water presented in Table 3-3. The TMDL report concludes that if the irrigation of agricultural crops in the valley continues in the future, controllable loads would be significantly less than what is presented in the report. However, agricultural surface return flows and subsequent salt loads (most feasible for reducing salt loads) might be reduced through improved water management and extensive conservation efforts in the valley. Conversely, this may not always be the case. By reducing surface return flows, the salinity concentrations might increase. When computing salt loads, it could be higher or lower, depending upon site-specific conditions. This could have either a negative or positive affect on salinity concentrations in the SJR. It should be noted that improved water management and/or conservation efforts to reduce surface water return flows could result in an increase in salinity concentrations and salt loads from the sub-surface drainage systems (shallow ground water).

Response
The footnote on Table 3-7 states that anthropogenic loads include loads from agriculture, managed wetlands, groundwater and municipal sources (essentially everything but background

loading). For illustrative purposes, the effect of removing deeper coast range groundwater from Northwest side unit-area nonpoint source loading was evaluated in Section 3.6 of Appendix 1 (subheading titled Unit Area Salt and Boron Loading).

Staff acknowledges that water conservation can increase the concentration of return flows –see Basin Plan Amendment staff report Section 4.4.3 and Appendix 2. Nonetheless, water conservation may have an application in the LSJR basin.

Excerpt from Staff Report
"Agricultural water conservation could reduce pollutant loading from return flows back to the river potentially making water available for other beneficial uses. Conversely, such increased efficiency may reduce the assimilative capacity of the San Joaquin River by reducing the quantity of higher quality return flows or through transfers of "saved" water to out of basin users."

Excerpt from Appendix 2
"*High conservation rates reduces the volume of water that moves below the root zone as deep percolation and can result in buildup of salts in soils, shallow groundwater, and/or deep groundwater.*"

Comment # 12.12
Table 3-3 indicates that total estimated groundwater accretions and salt contribution to the SJR are 148,000 acre-feet per year, and 320,000 tons of salt per year respectively. The salt contribution shown in this table from the Deep Coast Range (lower aquifer under the SJR) is approximately 279,200 tons per year. It is not apparent how groundwater from the lower or Deep Coast Range aquifer is discharged into the SJR. Previous studies show the deep coastal aquifer separated from west and east side materials and the upper aquifer by a Corcoran clay layer, at depths up to 600 feet. Significant artesian pressure is required to cause large quantities of groundwater to be discharged into the SJR from the deep coastal aquifer. If the salt quantities shown in Table 3-3 are not coming from groundwater aquifers beneath the SJR, the question is: "where does 320,000 tons of salt per year originate?" Also, previous studies indicated deep coastal aquifer water is better quality than the aquifer above the Corcoran clay, which does not agree with Table 3-3. The soil salt balance effort through leaching would impact the shallow groundwater and not the confined deep coast aquifer. The deep coast aquifer should be considered natural background salt loading to the LSJR.

Response
Table 3-3 provides estimates of the percentage and quantity of groundwater salt load and inflow from three parts of the unconfined flow system and not from below the Corcoran Clay.

Comment # 12.13
1-43 last paragraph: *"This should be considered a minimum estimate of salt loading to the LSJR from the managed wetlands, as this analysis does not account for salt leaching from wetland soils and/or wetland derived groundwater accretions to surface drainage."* The Regional Board should consider developing a complete water and salt budget for the wetlands. Using the numbers in the report, there is an additional 64,009 tons of salt entering the SJR from ground water accretions. (0.667 Ft seepage * 54,720 acres in ponds * 1,290 mg/l GW Quality (1590

mg/l average TDS groundwater – 300 mg/l average flow weighted TDS DMC) * 0.0013595 multiplier). There still would be additional groundwater inflow from the remaining 116,000 acres of non-flooded wetland.

Response
Good comment- however, this phase of the TMDL does not include groundwater allocations. Also see response to Comment # 6.83.

Comment # 12.14
Table 3-4, Wetland Flow and Loads: Where does the CVRWQCB account for the consumptive use of the vegetation on the wetland? Evaporation of a water body can be used to predict evapotranspiration but in this case the evaporation is only during September through April.

Response
Consumptive use of the vegetation is accounted for in the mean evaporative loss variable in Table 3-4 of Appendix 1, which is based on mean annual CIMIS ETo data for September through April for WY's 94, 95, and 96. The September through April period was used to represent the period when wetlands are typically flooded up to provide habitat and then eventually drawn down to promote seed germination.

Comment # 12.15
Page 1-47, Section 3.6 Summary and Evaluation, first paragraph: The TMDL report indicates the total average annual salt load from the Northwest and Grasslands sub-areas contribute 66% of the total salt load in the SJR at Vernalis. However, how these salt loads were determined is not apparent. A component of the total salt load imported from the Delta via DMC. If water imported from the Delta had a zero salt load, the Northwest and Grassland sub-area contribution would remain significant due to continued leaching of salts from irrigated soils in these two sub-areas. Prior to the construction of Reclamation project facilities in this area, significant quantities of salt were deposited in these soils due to the use of high salinity groundwater from the deep coastal aquifer. Salt leaching is necessary for the sustained irrigation of lands in the San Joaquin Valley, and would endure assuming agriculture continues in the Valley. Therefore, Reclamation should not be responsible for all salt load reductions to the LSJR.

Response
See Appendix 1 (Table 3-5). Sixty-six percent is equivalent to the sum of the mean annual salt loading from the Northwest Side (330 thousand tons) and Grasslands (400 thousand tons) subareas divided by the total salt load at Vernalis (1,100 thousand tons). The methods used to calculate salt loading from each sub-area and total salt loading at Vernalis are documented in Appendix A: Methods and Data Sources.

Staff agrees that if water imported from the Delta had a zero salt load, the Northwest and Grassland Subarea contribution would remain significant, due to continued leaching of salts from irrigated soils. On the other hand, if water imported from the Delta had a zero salt load, long term drainage water quality would likely be greatly improved compared to current conditions. Leaching requirements are, in part, dependant on source water quality. If the source water quality was improved, the leaching fraction could be reduced. West side soils have been

receiving DMC water long enough to leach pre-project salts from the root zone. At this point, they should be able to limit the amount leached to the amount of salt delivered. What we are seeing is displacement of high salt groundwater.

Under the proposed TMDL, the USBR is responsible for the salts imported as a result of USBR operations, and not for all salt load reductions to the LSJR.

Comment # 12.16
Page 1-48: Table 3-6. The values listed in the table are based on years 1977 to 1997. The salt load from the Grasslands Ag drainage is listed as 160 k-tons. The Grasslands Bypass Program started in October 1996 with the goal to reduce agricultural subsurface flows. The salt load has steadily decreased each year and was 116 k-tons in WY 2002. (Source- quarterly Grassland Bypass Program Quarterly Data Report, VQ303.1)

Response
The San Luis Drain discharged an average of approximately 160 thousand tons of salt per year for WY's 1997 through 2000. This period represents conditions after the commencement of the Grassland Bypass Program (GBP). The available data does, however, seem to indicate a decreasing trend in salt loads from the GBP after WY 2000, but it may be premature to assume that this trend will continue or that water year 2002 is indicative of future conditions.

Comment # 12.17
Page 1-48, Table 3-6: Using the values listed in Table 3-6, the LSJR transports 1,100 k-tons of salt to Vernalis in 3,670 k acre-ft of water each year. Therefore, salinity at Vernalis is calculated to be 221 mg/L or 362 us/cm using the 0.61 TDS/EC Vernalis ratio.

Response
Staff agrees with this comment. The mean annual TDS concentration at Vernalis was approximately 221 mg/L for WY1977 through WY 1997. This concentration value integrates a range of conditions, including extremely high flow, low concentration flood events, which tend to drive the mean annual concentration down. Water quality exceedances still occur due to seasonal variability.

Comment # 12.18
Page 1-50: Table 3-8 "Mean Annual Loading of Sub-area and Major Source Type 1977-1997". The total sub-area totals for boron on the North West Side should be 350 tons. The Category Total also needs to be corrected.

Response
Comment noted and the report has been corrected.

Comment # 12.19
Page 1-50: Second to last paragraph. "The project area also contains approximately 130 thousand acres of urban area, however, the majority of the salt loads generated from urban land uses are accounted for in the municipal and industrial discharges." This isn't totally correct, as the TMDL should account for the deep percolation and consumptive use from landscape

irrigation where the water is supplied from the municipal utility. Also, the land application of treated wastewater will increase the eastside groundwater salinity and thus increase the salt discharge from the shallow groundwater system. This needs to be accounted for in the salt load allocations.

Response
Deep percolation and consumptive use are not allocated a load for any source type including agriculture. Groundwater controls are not being included in this phase of the TMDL.

Comment # 12.20
Page 1-56, Second Paragraph: The report states DWRSIM output from DWR Study 771 was used in determining critical design flows. What operation does DWRSIM depict? The version of DWRSIM used for this analysis includes a simplistic operation of the San Joaquin River, which was not approved by Reclamation. The SJR operation included in the DWRSIM version contained a set of fixed operations for the middle and upper SJR, and only the Stanislaus River was operated in the model. This does not provide an adequate representation of return flow sites and return flow quantities to use in an analysis, such as the TMDL development. This mode representation is only useful for gross mass balances in long-term water supply studies. It was never intended to provide a level of detail sufficient for TMDL analysis. Reclamation strongly urges the RWQCB to re-run the TMDL analysis using CALSIM 2 output instead of DWRSIM output. Also, the assumptions for the model run must be studied closely to guarantee they represent an appropriate level of development for use in the TMDL study.

Response
The proposed TMDL method relies on the use of design flows for determining LSJR assimilative capacity during different months and water years. The design flows for this TMDL are based on results of the California Department of Water Resources (DWR) DWRSIM model output for CALFED Study 771. Model output from DWRSIM CALFED Study 771 was used for establishing design flows in this TMML because it represents current conditions by simulating flows with the existing infrastructure and operational policies in place. Assumptions used in DWRSIM study 771 are available from the DWR.

The CALSIM2 studies needed for this TMDL, however, were not available at the time these analyses were conducted, necessitating use of DWRSIM. CALSIM2, however, did not make major changes to the methods used to generate SJR hydrology so differences in model output between the two models are likely small. A comparative analysis of DWRSIM Study 771 and CALSIM2 (benchmark study released September 2002) was provided to USBR staff on 13 November 2002. The comparison of DWRSIM and CALSIM2 output indicate that the use of CALSIM2 for developing TMDL design flows would not result in large differences from the proposed TMDL. Furthermore, the CALSIM2 model is still under development, and recent technical reviews have identified a number of concerns with the model. The proposed TMDL is consistent with State Water Board Decision 1641 which also relied on the use of DWRSIM.

Comment # 12.21
Page 1-56: DWRSIM is a lump based modeling approach, which does not adequately represent flow in the watershed. Reclamation suggest the CVRWQCB use a physically based distributed model to determine flows and load in the watershed.

Response
Comment noted.

Comment # 12.22
Page 1-59: Table 4-2 "Design Flows at Vernalis and Descriptive Statistics for Month/Water-Year Type Groupings With VAMP Pulse Flows (taf)". Table 4-2 appears to satisfy Item 8 of the requirement list. However, using the mean or median value for the design flow as opposed to the low-value would be better. It is understood that by using the low value, an implicit MOS is created. Could the mean or median value be used as explicit MOS (say20%)? The ratio of the mean value to the low value can range from over 4.0 to slightly above 1.0 for the range water year types and months. The same holds true for the ratio of the median value to the low value. It appears the design flow for some months and year-types (using the low-flow value) is too conservative. For example, for a wet year for the month of January, the mean flow is 477 TAF/mo, while the critical design flow is 101 TAF/mo, giving a ratio of 4.7. By setting the design flow so low, the load allocations would be overly restrictive for that month.

Response
Use of the mean or median flow would result in load allocations that exceed water quality objectives approximately 50 percent of the time. A TMDL designed to result in exceeding water quality objectives 50 percent of the time is not appropriate and unlikely to be approved by the U.S. EPA. Instead, the TMDL includes opportunities to use real-time load allocations in lieu of the conservative fixed base load allocation, in order to provide relief to discharges and maximize the amount of salt that can be exported from the basin while still meeting water quality objectives. This approach establishes a stringent base load allocation that will protect water quality and, as an alternative, offers a relaxed real-time load allocation to dischargers that have the ability to adaptively manage their discharges.

Comment # 12.23
Page 1-60: Groundwater Loads. "According to Equation 4-2, salt loads attributable to groundwater accretions must be removed from the total assimilative capacity of the LSJR to determine the loads that is available to be allocated among point and NPS of pollution." This is not hydrologic reality, if we ignore groundwater, we eliminate the potential to reduce groundwater accretions, which directly increase poor quality water into the SJR. Options such as reducing groundwater deep percolation need to be included in potential solutions. So both point and non-point sources need to account for groundwater accretions.

Response
See response to Comment # 6.83.

Comment # 12.24
Page 1-61: Background Loads. Reclamation disagrees with the use of 52 mg/l concentration for natural runoff from the coastal range. The assumption that the east side background water quality conditions are identical to the west side is inappropriate. Geological conditions differ substantially between the Sierra Nevada and Coast Range. For example, marine deposits found in the Coast Range (west side) have high salt concentration with background salt sources not found on the east side. The natural flows from the coast range (west side) have a much higher TDS than the Sierra Nevada runoff.

Response
Background salt loading for the Northwest Side Subarea (Coast Range) was estimated using flow and water quality data from Orestimba Creek (see Appendix D, page D-3). Background salt loading does not affect the USBR's level of responsibility as set forth in the proposed TMDL. Salinity of 52mg/L (approximately 85 µS/cm) is used throughout the staff report to represent background salt loading attributable to high quality surface water sources from the Sierra-Nevada Mountains. The 52 mg/L concentration is also used to represent the salinity of the SJR downstream of Friant Dam; this is the approximate water quality that would have been delivered to downstream agriculture if the Central Valley Project had not been constructed.

Comment # 12.25
Page 1-61: Background Loads. Has the Regional Water Quality Control Board considered background loading from non-point sources, such as groundwater used for irrigation, natural coastal range runoff, and wetlands prior to Delta-Mendota Canal development? These background or pre-CVP development conditions do not appear to be included in the salt balance, and would substantially change load allocations. Large detention dams have been constructed on Los Banos and Little Panoche Creeks, which contribute to the Grasslands inflow. Historically, large wetland areas have concentrated salt through consumptive use, and groundwater irrigation occurred in the study area prior to CVP development.

Response
The proposed TMDL is designed to meet water quality objectives under the existing level of development. The USBR is only responsible for salt imported as a result of USBR operations.

Comment # 12.26
Background Loads: Reviewing background load methods in Appendix D, background salt concentrations were determined by measuring flood flow concentrations with assumed resultant salinity concentrations between 51 and 79 mg/l as background conditions. This assumption is incorrect when determining pre-development conditions, as historic low flow events would have substantially higher concentrations.

Response
The background loads are not meant to represent pre-development conditions, rather they represent the non-anthropogenic component of salt loading that is occurring under existing conditions.

Comment # 12.27
Page 1-62, Consumptive Use Allocation: Reclamation understands the CVRWQCB's efforts to adapt the Total Maximum Monthly Load (TMML) methodology when addressing the inherent problems associated with its application to naturally occurring elements in a complex and variable system. Salinity impairment of the San Joaquin River is a function of both load and flow. In the absence of all factors being considered (in the technical report) regarding the Basin's contribution to impairment, is a consumptive use allowance an appropriately applied "remedy"?

Response
The consumptive use allowance recognizes that water is consumptively used in the LSJR basin, and provides water users with the ability to discharge relatively high quality water that will improve in-stream water quality conditions. By design, any salt discharged through the consumptive use allowance will be discharged with it's own assimilative capacity, plus some additional assimilative capacity, since the trigger value is set below the water quality objective. In this regard, the trigger value inherently accounts for both load and flow.

Comment # 12.28
Page 1-71, Central Valley Impacts: The report identifies impacts of out-of-basin water exports and salt imports from out-of-basin. However, only Reclamation's development receives load allocations. Why does the state account for salt brought into the basin by Reclamation and not consider the dilution factor that is provided by Delta water.

Response
Although some DMC water is directly discharged to the LSJR at the Mendota pool, the majority of this water is diverted back out of the river for agricultural use at the Mendota pool and/or Sack Dam. DMC water does not provide dilution, because DMC water is applied to crops (used for irrigation) prior to being returned to the LSJR. If the USBR were to discharge DMC water to the LSJR for the purpose of providing dilution to the river, then they could get credit for the assimilative capacity created from this water.

Comment # 12.29
Page 1-71, Central Valley Impacts: Why are other water developments excluded from the salinity and boron TMDL? East-side water projects such as Don Pedro and Hetch Hetchy are not identified for their impacts to the San Joaquin River due to modified timing, degraded water quality, and resultant loss of dilution flow.

Response
No load allocation or responsibility is placed on any water user for their impact on reduced or re-operated flows under the proposed TMDL framework. The USBR's allocation is intended to address their contribution of salt to the LSJR basin, not their impact from reduced flows. The TMDL does address the impact of water quality degradation from the use of water from the east side water projects. Load allocations are placed on east side agriculture and waste load allocations are placed on east side municipal and industrial users.

Comment # 12.30
General Comment: An allowance for future growth was not mentioned. Future growth could be analyzed through output from the CALSIM2 model, which has present (2001 level) and future (2020 level) land use.

Response
Comment noted.

Comment # 12.31
Page 1-79, Second paragraph: Setting Reclamation's load allocation based on Sierra Nevada water quality is inappropriate and does not take into account for impacts from Reclamation lands and facilities, but allocated loading that is a result of activities on private lands. Reclamation's loading should be calculated by adding any pickup in salt and boron that occurs on Reclamation lands. This would include inflows that are allowed into the Delta-Mendota Canal and any changes in water quality that has resulted from DMC water entering the groundwater system on Reclamation lands. In addition, Reclamation should be held accountable for water brought into the basin that exceeds water quality objectives, and not the agricultural concentrating effects of the water use. The farmers should be responsible for salt increases due to agricultural uses.

Response
Under the proposed framework the USBR is responsible for salts that are imported as a result of USBR operations, and farmers are responsible for salt increases due to agricultural uses. Staff disagrees that the USBR should only be responsible for salts that are added into the DMC. In addition to the salts picked up along the DMC, the USBR is also responsible for the salts imported from the Delta that are in excess of the USBR's allocation.

Comment # 12.32
In the document you have presented the results as loads of salt in tons and boron in lbs. In order to do this you had to have a discharge rate and a contaminant concentration. It would be helpful to show the concentrations used to calculate the loading. This would give a better feel of how much the concentrations need to be reduced to meet the water quality objectives for salinity and boron.

Response
Comment noted.

Comment # 12.33
Appendix E, Alternate Methods For Calculating Salt Loading From The Northwest Side Sub-area Peer Review Draft, Tables E-3 and E-4: Table E-3, Column A, Lower NWS (April-Dec), the acres should be 124,811 as shown in Table E-2. This would result in an Area-Ratio of 18.1, not the 19.5 given. This error is carried over to Table E-4 where the load should be 110,084 tons instead of 118.084 tons given in the table. This gives a total salt load of 162,594 tons instead of the 171,109. This agrees much closer to the 162,695 listed in the text just above Table E-4. Correct the Tables.

Response
Thank you for the comment-the report has been revised.

Comment # 12.34
Page E-14, VI. Results, First Sentence: The 1,000 tons/year needs to be changed to 171,000 tons/year to make it consistent with Table E-12. The natural or non-anthropogenic salt load is not separated for the irrigation induced salt load. This needs to be done to better quantify the salt load that needs to be controlled from the NWS due to man's activities.

Response
Thank you for the comment-the report has been revised.

The purpose of appendix E is to provide some verification for the mass loading from the Northwest Side subarea, and not to differentiate natural from anthropogenic salt load, which is evaluated in Section 3.6 of Appendix 1 in the text following Table 3-9.

Comment # 12.35
The Economic Analysis report does not mention the potential benefits of meeting the water quality standard. The report summary states that implementation of a control program for salt and boron will require significant expenditures from farmers and wetland operators. Further, the report states that adding additional costs to marginally or unprofitable agricultural operations will be detrimental to interests in the LSJR watershed. Given the magnitude of these costs, justification should have been addressed in the form of benefits of improved water quality.

Response
Water code section 13241 requires consideration of economics for adoption of new water quality objectives. Additionally, state law requires that basin plans indicate estimates of the total cost and identify potential sources of funding of any agricultural water quality control program prior to its implementation (water code section 13141). A cost/benefit analysis is not required and beyond the scope of our analysis.

Comment # 12.36
The Economic Analysis report does not address the costs or impacts of not meeting the water quality standard. There is no reference of what would happen if the discharger violated the water quality standard for salt and boron or was unable to meet his responsibility according to one of the alternatives.

Response
The cost of not meeting a water quality objective is potential failure to fully protect a beneficial use of the LSJR. The Regional Board is not required to analyze the economic cost of not meeting a water quality objective. The consequence of non-compliance with the proposed control program will be determined on a case-by-case basis.

Comment # 12.37
The Economic Analysis report does not address the potential economic impacts of a re-operation of Friant Dam. If Exchange Contractors are required to restrict or "clean up" their irrigation discharges of DMC water, then it may be economically justified for them to exercise their right to San Joaquin River water, thus requiring Millerton Reservoir to be re-operated. Under this scenario, water that is currently diverted into the Friant-Kern Canal will be released into the San Joaquin River, thus allowing the Exchange Contractors to divert from the San Joaquin. There would be significant economic impacts of taking water away from the Friant-Kern water users.

Response
Again this is beyond the scope of our analysis and beyond what is required by state law. Staff has provided cost estimates for four alternative implementation strategies. The Regional Board has no authority over the Exchange Contract, and is not required to evaluate the economic implications of changes to how the exchange contract is administered.

Comment # 12.38
The development of Real Time Management costs appears arbitrary. The Economic Analysis report summary alludes that the Real Time Management alternative is the most viable in that it is the least expensive. However, there appears to be uncertainty in the number of monitoring systems needed, as well as the cost analysis itself whereby the cost estimates and monitoring systems are being based on unreferenced professional judgment.

Response
Staff agrees the cost estimates for constructing individual real-time management systems and the anticipated number of systems needed are based on professional judgment--staff attempted to be conservative with these estimates. Staff is willing to update the cost estimates for real-time management if better information becomes available. It is important to note, however, that the costs associated with the Alternative 4 (real-time management) are more sensitive to the volume of drainage needing treatment than to the cost of the real-time management infrastructure. In other words, the economic advantage of real-time management stems from the ability to release more drainage to the river when compared to other methods of compliance. The majority of the costs associated with Alternative 4 are associated with the conventional treatment/implementation measures used for Alternatives 2 and 3 (e.g. drainage re-use, re-circulation, evaporation ponds, and landfill disposal). These costs are documented in Appendix 4. The total cost estimate for Alternative 4 is approximately 28 million dollars per year. The real-time management system component of this cost is approximately 1.4 million dollars per year, which represents about 5 percent of the total implementation cost for Alternative 4. The volumes of drainage needing treatment using real-time management were modeled and discussed in Appendix 5.

Comment # 12.39
The Economic Analysis report does not show how the profitability of a water user may change as a result of implementing the alternatives. Significant costs to the discharger are indicated in implementing a salt and boron program and some of the major crops grown in the LSJR are not profitable because costs often exceed revenues. Yet, the report stops short in showing how these discharger costs will affect farm profitability throughout the region.

Response
Agricultural profitability depends on many factors that are not associated with the proposed control program, and is extremely sensitive to commodity prices. The Economic Analysis has been updated to include discussion and an example of factors that effect agricultural viability but are beyond the Regional Board's authority.

Comment # 12.40
If the salinity and boron TMDL was to be implemented as written, the only method to reduce salinity at the source water to a background concentration of 52mg/L is to construct a de-salting plant. The construction of this facility would be 20 times larger than the largest desalination facility in the US (Yuma Desalter - 100 MGD). The sub-appraisal level cost to treat the water is estimated at a capital cost of $1.791 billion with an annual O&M cost exceeding $125 million. Approximately 12% of the canal water would be lost in the treatment process. The cost to dispose of the concentrate using evaporation ponds is estimated at $3.1 billion and would require approximately 100 mi2 of land. The cost to install a pipeline for the disposal of concentrate to the ocean, if possible, would be less expensive than evaporation ponds. Cost estimates were developed using the USBR WaTER (Water Treatment Estimation Routine) program and other internal programs.

Response
Staff disagrees that the only method to comply with the proposed TMDL is to reduce salinity at the source water to a background concentration of 52mg/L. As described in the Basin Plan Amendment staff report, the USBR can comply with the TMDL by providing mitigation and/or dilution flows to create additional assimilative capacity for salt in the LSJR, equivalent to DMC salt loads in excess of their allocation.

Comment # 12.41
Page 18: Action #12. Supply water Load Allocation are established for salts in irrigation water imported to the LSJR Watershed from the Sacramento/San Joaquin River Delta. The DMC was developed to reuse water coming down the Sacramento/San Joaquin River that had acceptable water quality to meet additional beneficial uses in the upper SJR basin. Establishing load allocation to water collected downstream of Vernalis based on pristine Sierra Nevada water quality and of better quality then state water quality objectives at Vernalis effectively requires Reclamation to clean up loading from all upstream polluters. Reclamation finds this totally unacceptable and encourages the board to find a more equitable solution.

Response
Staff believes that the proposed load allocation framework is equitable and consistent with the State Water Board's Water Rights Decision 1641, which found that the "actions of the CVP are the principal causes of salinity concentrations exceeding water quality objectives at Vernalis." The proposed TMDL places load allocations on dischargers as well as the USBR; therefore, the USBR is not responsible to clean up loading from all upstream polluters.

Comment # 12.42
Page 20: The background loading is calculated using the EC value of 85 µS/cm. The January 2002 Staff Report Appendix D describes that "The average base TDS concentration for the Merced, Tuolumne, and Stanislaus Rivers was determined to be approximately 52 mg/L and the average base TDS concentration for the LSJR above Salt Slough was determined to be approximately 79 mg/L. This value is based on the concentrations in the contributing reservoirs in these rivers during high flows periods." High flow and flood periods are not constant events, the historical high flow periods may not reappear in the future. This calculated (or observed) concentration does not accurately represent current and future background loading. In addition, the anthropogenic load should not be excluded from the background load calculation due to the development of the upper watershed in the recent decades.

Response
As stated above, the background loading estimates are intended to represent the non-anthropogenic component of salt loading that is occurring under existing conditions. Staff believes that estimates given in the staff report and referenced above are reasonable, as they are based on a 21-year data set encompassing WY's 1977 though 1997. We will, however, evaluate any information brought to our attention that disagrees with these estimates. The purpose of the estimated background loading is the identification of salt loads from natural sources and from inflows to the TMDL project area that are not controllable, and to set these loads aside (not allocate them) (see Appendix 1, Section 4.1). The background concentration of 52 mg/L is also used to represent the salinity of the SJR downstream of Friant Dam; this is the approximate water quality that would have been delivered to downstream agriculture if the Central Valley Project had not been constructed. If anthropogenic loads were included in the background loading then the waste load allocation and load allocations would be reduced and in many cases eliminated, furthermore, the TMDL would not result in compliance with load allocations.

Comment # 12.43
Page 21: Table IV-7, The Monthly groundwater Loading (LGW) Table assumes that "groundwater accretions remain constant for all year types." The Table should reflect that groundwater tables fluctuate seasonally and varies according to different water years. During wet years, the water table will be replenished but for the dry years the water table will diminish. Also, the deep percolation and leakage from groundwater is not accounted for in the table. The groundwater load calculation needs further evaluation.

Response
The groundwater estimates do include seasonal variability, however, the available data did not permit the imposition of water-year type variability. The groundwater estimates are largely based on work conducted by the USGS (water resources investigations report 91-4019).

Comment # 12.44
Page 23: Supply Water Allocations. Reclamation disagrees with method used for allocating load from the DMC. Reclamation should be held accountable for increases in loading that are a direct result of Reclamation's actions. This would include increases in salinity and boron from Tracy to the Mendota Pool, any seepage into the groundwater system from Reclamation owned canals and laterals, and water diverted that does not meet water quality objectives at Vernalis.

Response
Comment noted, however, staff disagrees that the USBR's responsibility should be limited to these impacts.

Comment # 12.45
Page 50, Evaluation of Option 8: The dischargers cost analysis of "Medium" is understated. Reclamation's administrative costs would be high due to the number of discharge points Reclamation would need to monitor. The cost of compliance would be very high if Reclamation had to reallocate or purchase additional water for dilution flows at Vernalis. The economic and physical affects of reallocating the loads to high flow periods could cause wide spread disruption in the agricultural marketplace in the San Joaquin Valley. Surface storage of selenium-tainted drain water may be cost-prohibitive, and underground storage may cause economically irretrievable losses to the soil profile resources. Many wells on the west side of the valley are prohibited by Reclamation from discharging into Reclamation facilities (DMC), due to the high boron concentrations. This ground water pumping is outside of Reclamation's control and will be problematic during a "normal" water year. During a drought year, i.e. low water allocation, ground water pumping will increase substantially and will create an undue hardship on Reclamation, if Reclamation is primarily responsible to meet the Salt and Boron TMDL on the Lower San Joaquin River.

Response
Costs of storing and treating drainage are estimated in the economic analysis (Appendix 4). Costs for all possible means of reducing impacts of salt loads are not included in the economic analysis. The USBR may use the most effective means of mitigating for salt loads in excess of their allocation. Costs of much of the drainage control needed for control of selenium are already being borne to comply with existing water quality control programs, and will therefore result in less additional costs to comply with this program.

Comment # 12.46
Page 67, Summary of Implementation Option Evaluation. General Comments. Reclamation agrees with method of evaluating the cost to dischargers, state cost, flexibility, time to implement, likelihood of success and consistency with state and federal law. On the options that involve Reclamation we would encourage the state to work directly with Reclamation on developing impacts on the evaluation criteria. For example, it does not appear that the state considered Reclamation law when determining consistency with State and Federal laws.

Response
The USBR should identify specific concerns so staff can address those concerns directly.

Comment # 12.47
Page 69, Alternatives. When looking at alternatives there is not enough detail to accurately assess the effectiveness of the individual alternatives. The use of focused prohibition of discharge and general and individual waste discharge requirements could have an adverse effect if surface water was intentionally allowed to infiltrate into the groundwater system to meet permitting requirements. Reclamation recommends that the state target at least one alternative

toward reducing inflows into the groundwater system. Also, it appears that the state is assuming that a reduction in salt load from one portion of the basin will equate to an equivalent reduction at Vernalis. With the vast amount of salt in storage in the San Joaquin we do not believe that this will be the case.

Response
Comment noted.

Comment Letter # 13: Patrick Porgans and Associates

January 20, 2004

Note: The comments submitted from Patrick Porgans and Associates included the following two attachments:

1. 14 November 2002 Correspondence to U.S. Fish and Wildlife Service, State Water Resources Control Board, and Central Valley Regional Water Quality Control Board regarding violation of the selenium objectives in wetland channels; and
2. 27 February 2003 correspondence to Kirk Rodgers, Regional Director, USBR regarding USBR's 31 January 2003 public scooping meeting on the San Luis Drainage Feature Re-evaluation Plan Formulation Report.

These attachments have been entered into the record.

A scanned copy of the comments (including attachments) are available on the Regional Board's Website at the following URL:

http://www.swrcb.ca.gov/rwqcb5/programs/tmdl/salt_boron/index.html#AgDischarge

Comment # 13.1

This fax transmission is in response to the CVRWQCB's request for public comments for the *"Draft Basin Plan Amendment Staff Report ad Technical TMDL for the Salt and Boron Discharges into the San Joaquin River."* As stated during our telephone conversation on January 15, 2004, Porgans & Associates (P&A) had not received the information package sent out by the Regional Board pertaining to this matter. Apparently, P&A were inadvertently dropped from the mailing list. Needless to say, the late notification will severely limit our comments, as time does not permit us to do so. Albeit, the record will support the fact that P&A has been actively involved in the agricultural drainage/runoff, water quality impairment, and salt banking and loading in the valley and the related impacts to the trust resources of the State. (Please refer to Attachments and Refer to CVRWQCB and SWRCB files.)

Response

Comment noted.

Comment # 13.2

TMDL should propose water quality objectives upstream of Vernalis

Initial Response: Not just establish, but enforced. How about enforcing the existing standard already in place downstream of Vernalis.

Response

The main purpose of the proposed salt and boron TMDL is to implement the existing salinity standard at a Vernalis.

Also see response to Comment # 3.2.

Comment # 13.3
Use of New Melones Reservoir for dilution is unreasonable use of water

Initial Response: Use of the public's water to irrigate lands without adequate drainage facilities and/or with known drainage problems should be the focus of what constitutes unreasonable use of water; however, this is an issue that P&A has repeatedly petitioned the State to deal with, but to no avail.

Response
The State Water Board's D-1641 assigns the USBR full responsibility to meet the Vernalis salinity objective in the southern Delta. D-1641 provides the USBR with latitude in meeting the Vernalis salinity water quality objective, however, the USBR has, to date, used New Melones water as the only mechanism for meeting the Vernalis water quality objective. Load limits proposed in the TMDL will reduce, but not eliminate, the quantity of water that would be needed to meet the Vernalis water quality objective through dilution of SJR water. The Regional Board cannot require use of any specific methods to comply with effluent limits. Similarly, the Regional Board cannot exclude the use of any proposed method to comply with the load allocations, so long as the methods do not contribute to degrading water quality. Furthermore, the Regional Board has no authority with regard to flow or water rights. Issues related to flow and water rights are the purview of the State Water Board, through its Division of Water Rights.

Comment # 13.4
TMDL should consider groundwater control

Initial Response: Concur. We will provide specific comment in the future.

Response
See response to Comment # 6.83.

Comment # 13.5
Technical basis is not sound (source analysis, models, etc.)

Initial Response: The record indicates that ALL of the "responsible contributors to the SJR self-imposed drainage dilemma have had decades to resolve all of the technical and related issues of concern." Simply stated, they willfully neglected to obtain the needed technical information, and focused more on how to justify the irrigation of lands that are not sustainable

Response
Comment noted.

Comment # 13.6
Proposed implementation lacks specificity

Initial Response: This tactic should not come as a revelation to any party remotely familiar with the CVRWQCB's and the drainer's modus operandi. In fact, it is consistent with their creation

of a crisis syndrome and then an at "ground zero" attempt to assuage the public into believing that they are finally going to "manage" the self-imposed crisis.

Response
Comment noted.

Comment # 13.7
Options identified for implementing U.S. Bureau of Reclamation's load allocations are inappropriate

Initial Response: P&A concurs. We will provide additional comments at a future date. [Refer to attached letters.]

Response
Comment noted.

Comment # 13.8
Timeline for implementation is unreasonable

Initial Response: The "ballpark" timeline which Mr. Grober alluded to, during our telephone conversation, is conservatively between eight (8) and twenty (20) years to meet the load limits – REALLY!!! In light of the fact that California acknowledges that it has and had a drainage problem in the SJV in the 1890s, which was repeatedly referred to prior to and subsequent to the development of the State's two major water projects: i.e., the federal Central Valley Project and the State Water Project. The only thing that may be unreasonable about the timeline is that it is several decades behind schedule, the loads got beep on doubling every five years. The deplorable condition of the SJR is the direct result of the CVRWQCB and the State Water Resources Control Board blatant failure to fulfill their respective "public trust duties" to protect the waters of the State. Instead they chose to serve the political vested interest – major agricultural consortium who rule the valley.

Response
See response to Comment # 8.7.

Comment # 13.9
Timely Completion of TMDLs

Initial Response: At this point timely completion is not possible in my lifetime.
Staff Report – Item 20 on page 10:

> *Delayed adoption of this and other TMDLs could put the Regional Board at risk of losing funds that support TMDL development. TMDLs, when developed and adopted, fulfill the State's obligation to implement the Clean Water Act; completion also facilitates the improvement of water quality in waters of the State. Use of federal money to develop TMDLs therefore assist the State in protecting water quality.*

Lack of information, uncertainty, and partial solutions are not adequate justifications for delaying completion and adoption of TMDLs. The Clean Water Act requires that TMDLs be developed with the best information available and that they can be phased, if necessary.

Initial Response: Now, that there is a potential threat of the CVRWQCB losing Clean Water Act funding, the Regional Board contends that there is no more room for time delays, with the exception of the eight to twenty years.

Please enter P&A comments into the record, and keep us apprized as this "process" continues. Thank you.

Response
Comment noted.

Comment Letter # 14: Modesto Irrigation District

January 16, 2004

Comment # 14.1
The Modesto Irrigation District (MID) recognizes that salinity is a major problem in the San Joaquin River. However, in order to improve salinity in the river, the Total Maximum Daily Load (TMDL) and Basin Plan Amendment (BPA) must provide a workable plan to: 1) meet salt and boron concentration objectives, and 2) to transport salt out of the basin to avoid a salt build-up in valley ground and surface waters. Unfortunately, the Draft Plan does neither. As drafted, the fixed load TMDL will likely worsen existing salinity problems in the river.

Response
This comment is unsubstantiated. Staff disagrees that the proposed control program "will likely worsen existing salinity problems in the river".

Comment # 14.2
It is clear that an agricultural drain that would convey saline agricultural water to the Bay or Pacific Ocean would be the best solution for both agriculture and the environment. Both the State Water Resources Control Board (SWRCB) and the Central Valley Regional Water Quality Control Board (Regional Board) have taken this position in the past. It is also fairly certain that such a drain will not be constructed in the near future. Therefore, some other solution must be found.

Response
Comment noted.

Comment # 14.3
The Draft Base Load Allocation TMDL Plan (Draft Plan) that is being proposed by the Regional Board staff is seriously flawed. MID agrees with the comments submitted by the Turlock Irrigation District (TID) and the San Joaquin Tributaries Association (SJTA) and will not repeat the details of those comments in this letter. In summary, the MID agrees that the criteria used to evaluate the Draft Plan is flawed and, as drafted, the Draft Plan:

- Will cause significant degradation to the agricultural land in the San Joaquin Valley in that it limits salt export out of the Valley.
- Is overly complex and would be impossible to implement.
- Is not even close to being an equitable solution to the problem.
- Produces unintended environmental and physical consequences.
- Will cause conditions that will frequently not meet the Vernalis salinity objectives.
- Will cause conditions that will not meet future anticipated salinity objectives.
- Will frequently cause a cessation of the discharge of high quality water from Eastern San Joaquin Valley districts while allowing poor quality water from Westside districts to continue.
- Will allow current problems to continue, rather than leading to a solution.

- Will cost significantly more than reported in the economic analysis.
- Does not direct the solution of the problem toward the major cause of the problem, and that is the operation of the Central Valley Project.

Response
See response to Comment # 1.1 through Comment # 1.10 (response to comments submitted by San Joaquin Tributaries Association) and Comment # 6.1 through Comment # 6.101 (response to comments submitted by the Turlock Irrigation District).

Comment # 14.4
In addition, it appears that the Draft Plan is also being used to extract good quality water from the owners of senior water rights on Eastside tributaries to the San Joaquin River. The MID believes that such tactics are not only extremely poor policy, but in fact, illegal. On several occasions, the SWRCB has stated, "the use of high quality in-stream flows to dilute polluted water is not a beneficial use of the high quality water".

Response
The proposed control program is not intended to extract good quality water from the owners of senior water rights on Eastside tributaries to the San Joaquin River.

Comment # 14.5
The MID supports the Concentration-based approach outlined by the TID as being easier to implement, more cost effective, less complicated, and more solution directed.

Response
See response to Comment # 6.26 through Comment # 6.33.

Comment # 14.6
The MID will continue to work with the Regional Board in its efforts to resolve the San Joaquin River salinity problems. However, MID cannot support the Draft Plan currently being proposed by the staff of the Board.

Response
Comment noted.

Comment Letter # 15: : Oakdale Irrigation District

January 16, 2004

Comment # 15.1
The Oakdale Irrigation District (OID) has read and concurs with the comments submitted by the Turlock Irrigation District and those of the San Joaquin Tributaries Association, of which we are a member. As an irrigation district within the San Joaquin River Basin we have very similar concerns with the amendments proposed in the Water Quality Control Plan for the control of salt and boron. Unfortunately our technical staff, which is one (1) in number, has been overwhelmed in meeting the NPDES permit for aquatic pesticides deadlines; preparing to meet the Conditional Ag Waiver requirements for the April 1 deliverables and now this, the salt and boron issue and associated Basin Plan Amendment.

Regrettably we have little to offer beyond what has been prepared by the aforementioned agencies. We respectfully request that you give full consideration and weight to the issues raised in their submittals.

Response
Comment noted.

Comment Letter # 16: City of Turlock

January 20, 2004

Comment # 16.1
The City is located in the East Valley Floor Sub-area, and accounts for less than one to two percent of the total salt load of the lower San Joaquin River. See Staff Report at 81 (East Valley Floor Sub-area, characterized as a "low" priority for compliance with a control program for salt and boron in the lower San Joaquin River) and compare Staff Report at 49 ("the Cities of Turlock and Modesto only account for approximately 2 percent of the total salt load of the San Joaquin River") and Appendix 1 at 1-48 at Table 3-6 (municipal and industrial discharges in entire East Valley Floor Sub-area constitute one (1) percent of the salt load). Within the East Valley Floor Sub-area, municipal and industrial discharges comprise only one (1) percent of the total discharge flow, and have a lower concentration of salinity than other discharges in the region. See Appendix 1 at 1-48 at Table 3-6. The predominant source of salt and boron in the lower San Joaquin River originates from the west side of the San Joaquin River (Grasslands and Northwest Side Sub-areas). See Appendix 1 at 1-2. Regional Board staff admit that salt and boron loads from point sources, such as the City, represent a "small fraction" of the total loads in the TMDL project area. See Appendix 1 at 1-64. Nonetheless, the unfortunate effect of the Salt/Boron TMDL as currently proposed is to place a staggering and disproportionate economic and environmental burden upon the City to construct advanced treatment facilities (i.e., micro-filtration and reverse osmosis) in order to comply with prescribed proposed current and future waste load allocations, where the Salt/Boron TMDL suggests that such compliance would have no real effect on the "impaired" status of the Lower San Joaquin River at the Airport Way Bridge near Vernalis. Imposing such a disproportionate burden upon the City is illogical and a senseless waste of scarce public funds. The Regional Board has failed to demonstrate or address the necessity of the prescribed waste load allocations and the expected water quality benefit to be derived from imposition thereof, and has failed to consider the detrimental economic and environmental impacts of the City's compliance with the prescribed requirements in violation of the Clean Water Act (requiring economic factors to be considered in identifying municipal treatment controls needed to achieve water quality goals) and the Water Code. *See,* e.g., 33 U.S.C. §§1288, 1315(b) and Water Code §§13000 and 13241; see also Statement of Decision, *Cities of Arcadia, et al. v. State Water Resources Control Board,* et al., San Diego County Superior Court, Case No. GIC 803631 (December 24, 2003) (finding that a Regional Board must conduct a cost/benefit analysis and consider economic and environmental factors before adopting a TMDL into a Basin Plan).

Response
WLAs are needed as part of overall salinity control program to reduce total salt loads in order to achieve consitent compliance with the existing salinity water quality objectives, which in turn are designed to protect the beneficial uses of the LSJR. An evaluation of costs to municipal and industrial discharges has been added to the economic analysis (see Appendix 4 Section IV). Waste load allocations for wastewater treatment plants could be achieved through a number of means, including source control, pollutant trading, application of treated wastewater to land,

improvements in municipal supply water, and through upgrades to wastewater treatment plant systems.

Comment # 16.2
The Method for Calculating and Assigning Waste Load Allocations To the City is Vague and Ambiguous, Leaving Uncertainty as to the Requirements That Will Be Imposed On the City Based on the Salt/Boron TMDL.

A TMDL document must describe the relationship between the numeric target and identified pollutant source (in this case, the City's municipal discharge). See, e.g., Guidance for Water Quality-Based Decisions: the TMDL Process, U.S. EPA (1991). In this case, however, it is unclear what the Regional Board intends the numeric target, or "wasteload allocation" ("WLA") to be. Appendix 1 (the technical TMDL report) states that *"[i]n this first phase . . ., the WLAs are concentration based and set equal to the salinity water quality objectives at Vernalis. Salt and boron loads from point sources therefore should not contribute to exceedances of water quality objectives.*" See Appendix 1 at 1-64 (Emphasis added); see also Appendix 1 at 1-2. Based on this statement, the City would expect WLAs of 700 and 1000 uS/cm (30-day running average for electrical conductivity ("EC")) during the irrigation (April – August) and non-irrigation (Sept. – March) seasons, respectively. The duration of such WLAs is unclear, however, since the Regional Board fails to define the "first phase" of the TMDL, although it is suggested that the first phase relates to the period of time before any new or revised water quality objectives are adopted for the Lower San Joaquin River upstream of Vernalis. See Staff Report at 34 and further discussion of the Regional Board's adoption of "new or revised" water quality objectives below.

Subsequently, in Appendix C, without explanation, the WLAs for the City are defined as "*set equal to the historic monthly loading from each municipality*." See Appendix C at C-2. (Emphasis added). This approach to WLAs differs substantially from the approach taken in Appendix 1, as the WLA is not simply a concentration–based limit set equal to the water quality objectives at Vernalis as stated in Appendix 1, but rather, is an unspecified concentration calculated based upon the City's "historic mean monthly flow, mean monthly concentration data, and a conversion factor." Id. If the approach in Appendix C is the method by which the City's "first phase" or "final" WLA is calculated, the City will be required to maintain a wholly different concentration of EC than the water quality objectives at Vernalis. As described in Table C1 at Appendix C-3, after proceeding through the described Steps 1-4, the mean monthly concentration of EC[1] that must be obtained (shown incorrectly in Table C1 as the "Mean FWA"), varies between a 844 uS/cm (January) and 941 uS/cm (May).

The City is also concerned that when the City's NPDES permit is re-opened or renewed to include some form of WLAs, the Regional Board will ignore the statements in the TMDL that the WLAs are meant only to be "concentration-based" and will impose a companion mass-based limit (a function of concentration multiplied by flow), as has become customary in newly issued NPDES permits. For this reason, the City requests that the Regional Board clarify in the Salt/Boron TMDL that a duplicative mass-based limit is unnecessary to impose.[2] See, e.g., 40 C.F.R. §122.45(f)(2).

The primary concern regarding the inclusion of any companion mass-based limit based on "historic" flows[3] is that such a mass-based limit would result in a requirement for the continual reduction of concentration in order to comply as the City increases flow – flow within the City's permitted flow limits - due to industrial, commercial, or residential growth in its service area. No such continual reduction, as a result of a historic flow, mass-based limit calculation, is contemplated by the Salt/Boron TMDL. If such continual reduction is the Regional Board's intent, the Regional Board must specifically state this intent, and in doing so, comply with the mandates of 33 U.S.C. sections 1288, 1315(b) and Water Code sections 13000 and 13241.

Further complicating the issue of pinpointing what will be expected of the City in order to comply with the Salt/Boron TMDL is the fact that the Regional Board is "currently in the process of preparing a Basin Plan Amendment intended to address salinity and boron impairment [accredited to agricultural discharges] in the Lower San Joaquin River upstream of the Airport Way Bridge near Vernalis." See Appendix 1 at 1-18. This is the reach of the Lower San Joaquin River into which the City discharges.[4] Regional Board staff anticipate that the "Basin Plan Amendment, once adopted, will contain revised water quality objectives for salinity and boron." Absent new or revised salt and boron water quality objectives for the Lower San Joaquin River upstream of Vernalis, "the existing monthly mean salt and boron water quality objectives at the San Joaquin River at the Airport Way Bridge near Vernalis are used as the salinity numeric target in the Salt/Boron TMDL." See Appendix 1 at 1-24. However, "additional numeric targets will be applied to reaches upstream of Vernalis when the Regional Board adopts new water quality objectives." Id.

It is unclear from Regional Board staff statements whether the Regional Board plans to amend the existing Salt/Boron TMDL when the "new or revised salt and boron water quality objectives for the Lower San Joaquin River upstream of Vernalis" are adopted, or whether separate TMDLs may be prepared and adopted for these reaches of the San Joaquin River. See Staff Report at 34 ("the methods used in the salt and boron TMDL to develop allocations will be applied to calculate load allocations based upon new or revised water quality objectives;" however, the Regional Board does not specify the how this recalculation will occur). Further, the Regional Board does not clearly indicate whether compliance with the existing Salt/Boron TMDL for the Lower San Joaquin River at Airport Way Bridge near Vernalis will constitute compliance with any "new or revised water quality objectives" upstream of Vernalis prior to any re-calculation that may occur. If not, the Regional Board may be placing the City in the position of having to plan for and take exceptionally difficult and costly actions to comply with the current Salt/Boron TMDL, while also facing uncertainty as to measures potentially needed to address additional water quality objectives and/or TMDLs subsequently adopted for the reach of the Lower San Joaquin River to which the City actually discharges.

If compliance with the existing Salt/Boron TMDL requires actions different than those required by any future Basin Plan amendments and/or TMDLs, the Regional Board's existing Salt/Boron TMDL placed an unreasonably severe burden on the City, especially given the fact that the City's discharge (existing or as modified pursuant to the Salt/Boron TMDL) does not and will not likely affect the impaired status of the Lower San Joaquin River at Airport Way Bridge near Vernalis. For this reason, the City requests that it be removed from regulation under the current Salt/Boron TMDL as a de minimus discharge. Instead, the City's discharge would be considered

and included in the subsequent amended or stand-alone Salt/Boron TMDL adopted to address any impairments in the Lower San Joaquin River upstream of Vernalis. This action will reduce any potential conflict between current and future TMDL requirements, and will eliminate the necessity of expending public funds to comply with potentially competing regulatory documents.

[1] For purposes of comparison to the water quality objectives for EC at Airport Way Bridge near Vernalis set forth in the Salt/Boron TMDL, the City is using EC here rather than TDS. The TDS values set forth in Table C1 were converted to EC using a .65 conversion factor.

[2]Of course, if the Regional Board imposes WLAs based on Appendix C, the Regional Board has already taken into account mean loads. See Appendix C, Steps 1-4.

[3]The City would expect the Regional Board to, at the very least, calculate any mass-based limit using the City's permitted design flow of twenty million gallons per day ("mgd") rather than historic or current (approximately 11.4 mgd) flows.

[4]The City questions the listing of the Lower San Joaquin River upstream of Vernalis as impaired for salt (electrical conductivity) and boron where no water quality standard currently exists in order to determine impairment. See 33

Response

As specified in the Basin Plan Amendment Staff report and Appendix 1, the waste load allocations for point sources are concentration based and set equal to the existing water quality objectives. Accordingly, the waste load allocations are set at 700µS/cm for the irrigation season (applies April-August) and 1,000 µS/cm for the non-irrigation season (applies September-March). These proposed waste load allocations are generally less restrictive than the load allocations established for nonpoint sources because point sources dischargers are a relatively small contribution to the LSJR's total salt load. Concentration based waste load allocations are also proposed to be consistent with the current direction in NPDES permit requirements placed on wastewater facilities in the Central Valley. In this case, there are specific numeric water quality objectives that applies to the receiving water. In most NPDES permits recently adopted where TDS limits were included, the limit was based on a narrative objective. Application of narrative water quality objectives requires consideration of information as stated in the Basin Plan's "Policy for Application of Water Quality Objectives". The inconsistencies in Appendix C (stating that waste load allocations are load based) have been corrected.

A timeline for proposing and adopting Water quality objectives upstream of Vernalis has been added to the proposed control program. The TMDL will be revised to incorporate these new Water quality objectives. This timeline is during the first two years of the control program proposed for the first phase of the TMDL. This will provide adequate time to consider the infrastructure changes needed to comply with existing and new Water quality objectives given that the proposed schedule for compliance with waste load allocations ranges from 16 to 20 years from

The data and calculations in Table C1 are correct, however, the narrative describing the calculation procedure has been clarified.

Also see response to Comment # 2.5.

Comment # 16.3
The Regional Board Has Failed to Demonstrate the Necessity of Requiring the City to Strictly Comply with the Water Quality Objectives At Airport Way Bridge near Vernalis In Order for the Lower San Joaquin River to Attain Water Quality Standards.

No constituent-specific water quality objectives exist for salt and boron in the Lower San Joaquin River upstream of Vernalis, where the City discharges. However, for purposes of the Salt/Boron TMDL, waste load allocations are proposed for the Cities of Turlock and Modesto wastewater treatment plants that are "concentration limits set equal to the electrical conductivity water quality objectives for the Lower San Joaquin River at the Airport Way Bridge near Vernalis."[5] See Staff Report at 34; see also Appendix 1 at 1-64.

The Regional Board is applying the Vernalis water quality objectives to the City's discharge without demonstrating the necessity of requiring the City to strictly comply with these water quality objectives in order for the Lower San Joaquin River to attain and/or maintain water quality standards. No assimilative capacity and/or fate and transport studies (demonstrating the actual impact of the City's discharge on the Lower San Joaquin River at Airport Way Bridge near Vernalis) have been performed or referred to that would justify the application of the Vernalis water quality objective to the City's discharge. The stark omission of any such analysis and justification is contrary to federal and state law, especially in light of prior admissions that the City's discharge is such a "small fraction" of the salt load to the Lower San Joaquin River. See 40 C.F.R. §§130.4(a) & (b) and 130.7; Water Code §§13000, 13241.

Without conducting the proper studies and presenting associated analysis and need, the Regional Board is simply applying the Vernalis water quality objectives out of expedience, based on speculation and unsupported conclusions. See Appendix 1 at 1-64 (simply concluding that by imposing WLAs equal to the salinity water quality objectives at Vernalis "[s]alt and boron loads from point sources therefore should not contribute to exceedences of water quality objectives"). Agency action not supported by findings, or findings not supported by the evidence, constitute an abuse of discretion. See, e.g., 40 C.F.R. §124.8(b)(4); *Topanga Association for a Scenic Community v. County of Los Angeles*, 11 Cal.3d 506, 515; California Edison v. SWRCB, 116 Cal. App. 751, 761 (4th Dt. 1981). For this reason, the City requests the Regional Board to reconsider the actual impact of the City's discharge on attainment of water quality objectives in the Lower San Joaquin River at Airport Way Bridge near Vernalis, and re-assess the necessity of strict application of downstream water quality objectives to the City's end-of-pipe discharge based on such analysis.

[5] For purposes of this section, based on statements made in the Staff Report and Technical TMDL Report referenced above, the City assumes that the Regional Board will require strict compliance with the electrical conductivity water quality objectives for the Lower San Joaquin River at the Airport Way Bridge near Vernalis in the City's NPDES Permit. The City makes this

assumption for purposes of discussion and without admitting that this is the appropriate interpretation of the requirements of the Salt/Boron TMDL discussed in Section 1 of this letter, which we have noted are troublingly ambiguous.

Response
Though the contribution from municipal sources is currently low, the TMDL must provide a waste load allocation so that a comprehensive plan is proposed for attaining water quality objectives. The waste load allocation, based on an effluent limit, is set at the Vernalis water quality objective. This load limit is generally larger than that provided to nonpoint sources, which at times limit discharges to 315µS/cm electrical conductivity under base load allocations. This was done to provide assurance that cities will not contribute to an exceedance of the Vernalis salinity objectives, as they grow (and discharges potentially increase). At the same time this provides cities with certainty regarding their ability to discharge. Reassessment of these load limits will face a challenge of equitability with regard to other sources of salt in the basin that already have more restrictive load limits.

If municipal and industrial discharges do not exceed the water quality objectives it is reasonable to conclude that they will not contribute to water quality exceedances.

Also see response to Comment # 2.5.

Comment # 16.4
Pollutant Trading Is Not a Panacea for Municipalities Seeking to Comply With the Requirements of the Salt/Boron TMDL.

Instead of facing the very real consequences of strict application of downstream water quality objectives at Vernalis to the City's end-of-pipe discharge, the Regional Board casually states that "[p]oint source discharges may also have opportunities to increase their WLAs through pollutant trading with other point or non-point source dischargers." See Appendix 1 at 1-64. While pollutant trading has been a topic of much debate at both a national and state level for the past decade, no advances have been made towards development of a state policy for pollutant trading. Given the logistical issues and the effort needed by the State Board in order to reach consensus on a statewide pollutant trading policy, it is careless for the Regional Board, at this point, to rely on pollutant trading as a panacea for municipalities and other point sources to comply with the requirements of the Salt/Boron TMDL. Furthermore, no method is included in the Salt/Boron TMDL to account for pollutant trading among point sources, should such practice be sanctioned by the state in the future, leaving a de minimus point source such as the City with an inappropriately severe burden to attempt to pioneer an acceptable trading arrangement. For this reason, the Regional Board should either eliminate the reference to pollutant trading or revise the statement to include a specific commitment by the Regional Board to reopen the Salt/Boron TMDL by a date certain to develop a method to account for pollutant trading should such practice be approved of by the state in the future. In the present Salt/Boron TMDL, the burden of the TMDL on the City should not be considered to be lessened by the prospect of pollutant trading.

Response
The proposed TMDL encourages cities and all other dischargers to participate in load trading and a real time management program as means of reducing overall costs of compliance. Dischargers will need to work together to develop specific rules for pollutant trading and real time management that work to reduce overall costs and that are acceptable to the Regional Board.

Also see response to Comment # 2.3

Comment # 16.5
The Regional Board Should Consider Providing the City with A Source Water Credit Similar to the Credit Provided to Users of the Delta-Mendota Canal.

Even though the Grassland and Northwest Side Sub-areas are identified as the predominant source of salinity in the Lower San Joaquin River (See Appendix 1 at 1-2), a supply water credit is provided to irrigators in the Grassland and Northwest Side Sub-areas that receive water from the Delta-Mendota Canal ("DMC"), since the DMC supply water credit is equal to 50 percent of the salt load delivered to the Grassland and Northwest Side Sub-areas. See, e.g., Staff Report at 22 (setting forth Supply Water Credit language to be incorporated into Basin Plan). Similarly, the City's supply/source water, derived from local groundwater, which by the express terms of the Salt/Boron TMDL is being addressed separately, is a predominant source of salinity in the City's final discharge to the Lower San Joaquin River. See Appendix C at C-6 (identifying Source Water Electrical Conductivity as 510 uS/cm [6] and Wastewater Effluent Electrical Conductivity as 810 uS/cm); see also Appendix 1 at 1-59 through 1-61. The City requests that the Regional Board investigate and provide a source water credit for municipal point sources, so that the City is not unduly penalized for groundwater salinity not generated by the City or its sewer users. Such a credit could obviate the need for the construction of additional advanced treatment facilities for the City's relatively minute contribution of salinity. Given the City's extremely minor contribution of salinity to the Lower San Joaquin River, a source water credit would comport with the Clean Water Act's watershed principles for addressing impaired water bodies and the Water Code's mandate for reasonable regulation.

[6] The City would like to correct the source water figure set forth in Appendix C. The City's source water averages 280 uS/cm, with a maximum detection of 489 uS/cm. The variation is due to the fact that the City derives its source water from twenty-two different groundwater sources, all with varying levels of salinity. Even with this correction, the City's source water constitutes at least a third, if not more than half, of the salinity in the City's discharge.

Response
Regional Board staff have considered applying a supply water credit to other entities such as east side agriculture and municipal and industrial dischargers, however, the supply water credit would need to be offset with allocations on water suppliers, as is the case with the proposed west side supply water credits. No such credit is therefore allowed in the TMDL for those entities that have responsibility for and control over their water supply. Municipal and Industrial discharges could, however, reduce salt discharges by improving the quality of their supply water (e.g. to the extent feasible switching form ground water to surface water sources).

Comment # 16.6
The Regional Board Has Failed to Consider the Social, Economic, and Environmental Impacts of the Salt/Boron TMDL in Violation of the Water Code.

The Regional Board acknowledges the applicability of Water Code section 13241, requiring the consideration of economic, social, and environmental effects of the Regional Board's actions, in adopting the Basin Plan amendment and Salt/Boron TMDL provisions. See Staff Report at 7. However, the limited economic analysis provided by the Regional Board in the Staff Report and Appendix 4, which purport to address "discharger cost to implement" the TMDL, fails to address the exorbitant costs the City will incur in order to ensure consistent compliance with the Salt/Boron TMDL. Specifically, in the Staff Report, the Regional Board states that the cost of compliance for point source dischargers regulated by existing NPDES permits, such as the City, is "*Low*." The Regional Board supports this ranking by stating, "*Permitting costs are already incurred by the dischargers and changes to the permits would not require any significant increase in the administrative costs or fees associated with existing permits. Costs to implement will depend on the discharger ability to use pollutant trading to meet waste load allocations.*"[7] See Staff Report at 50. (Emphasis added). In Appendix 4 (the appendix that sets forth the Regional Board's consideration of the economic cost to comply with the Salt/Boron TMDL), no mention is made of the cost to municipal or industrial point sources of complying with the waste load allocations prescribed in the Salt/Boron TMDL. The Regional Board's obvious disregard of, and failure to consider, actual implementation costs violates Water Code section 13241.[8]

The Regional Board is well aware that the City will be unable to consistently comply with WLAs derived from the methods described in either Appendix 1 or Appendix C with the City's current treatment technology. See Appendix C, Attachment 5 (City of Turlock Daily Wastewater Discharge Monitoring). Industrial source control efforts will only minimally reduce the concentration of salinity in the influent, given the type of industry that resides within the City's service area (food manufacturer and milk processors that must utilize a fair amount of salt in their processes in order to generate the product and, more importantly, to comply with USDA sanitation requirements). Furthermore, reducing salinity concentration in residential waste (through the ordinance-based control of self-regenerating water softeners or voluntary efforts encouraged through public outreach programs) will not likely result in a steep enough reduction of salinity in the influent,. Therefore, the City cannot rely solely on source control as a method for reducing salinity in the City's influent to levels that will result in compliance with WLAs prescribed in the Salt/Boron TMDL. For these reasons, the most effective method for achieving consistent compliance with the WLAs (from either Appendix 1 or Appendix C) is the construction of micro-filtration and reverse osmosis ("MF/RO") or coagulation and filtration plus high lime, granular activated carbon, and reverse osmosis advanced treatment facilities.

While MF/RO or other advanced treatment facilities may provide a greater level of pollutant removal than secondary or tertiary treatment facilities in some cases, these facilities are exorbitantly expensive and may have detrimental environmental consequences, neither of which were considered by the Regional Board as required by Water Code section 13241. The capital cost of MF/RO is estimated at approximately $70 million dollars, and the installation of MF/RO advanced treatment facilities will severely increase annual operation and maintenance costs by approximately $8 million dollars.[9] The capital cost of installing coagulation and filtration plus

high lime, granular activated carbon, and reverse osmosis is estimated at approximately $100 million dollars, with annual operation and maintenance costs increasing by approximately $12 million dollars.[10] These cost estimates dwarf the Regional Board's estimated annual cost for compliance for all dischargers presented in the Salt/Boron TMDL. See, e.g., Staff Report at 78 and 86.

From 1996 to 2006, the City will have already raised sewer user fees over 150% to comply with new requirements imposed by the Regional Board. This has caused residential user fees to increase from $11.00 per month to $29.00 per month, and small industrial user fees to increase from $5,000 per month to $12,500 per month. If the City is required to install advanced treatment facilities, sewer user fees will again increase by at least 250 %.

If this information was considered by the Regional Board as part of the Salt/Boron TMDL, the Regional Board might conclude that this staggering increase in sewer user fees is not justified by the City's relatively minor contribution of salinity to the Lower San Joaquin River. However, by failing to address the actual economic burden, the Regional Board has abdicated its responsibility and violated Water Code sections 13000 and 13241. For this reason, the City requests the Regional Board to reconsider the WLAs prescribed for point sources in the Salt/Boron TMDL in light of the overwhelming economic burden that will be placed on the City for little to no net environmental benefit.

[7] See Section 3 above regarding the City's objection to the Regional Board's use of "pollutant trading" as a compliance solution.

[8]The City also notes that the Regional Board failed to properly consider other factors set forth in Water Code section 13241 (i.e., water quality conditions that could reasonably be achieved, the need for developing housing within the region, etc).

[9] See April 5, 2001 comments on the City's tentative NPDES Permit.

[10] The City is already in the process of installing coagulation and filtration, which explains the slight reduction in the cost estimate for coagulation and filtration plus high lime, granular activated carbon, and reverse osmosis as compared to the City's April 5, 2001 comments referenced above.

Response

The economic analysis (Appendix 4) has been revised to include a cost estimate for municipal and industrial discharger compliance with the proposed control program. Not enough information has been provided to support the assertion that "source control will only minimally reduce the concentration of salinity in the influent". Just because connected industries require the use of salts does not mean that high salt generating industries cannot be separated from the municipal waste stream and treated (e.g. evaporation and disposal, small scale reverse osmosis etc.).

Comment # 16.7
The Regional Board Has Failed to Comply with CEQA By Failing to Consider the Detrimental Environmental Impacts Associated with Implementation of the Salt/Boron TMDL.

In order to comply with the California Environmental Quality Act ("CEQA"), the Regional Board sets forth an Environmental Checklist Form to "assist in identifying potential impacts and outlining mitigation measures," followed by a brief discussion of each of the 17 categories of impact set forth in the Checklist See Staff Report at 87. The Regional Board's analysis is flawed from the start, as the Regional Board utterly fails to include any analysis of the environmental impacts of compliance methods expected to be implemented by point source dischargers (i.e., the detrimental environmental impacts of MF/RO or other advanced treatment technology, described more fully below), and admits that management technologies that may be used by other dischargers (i.e., agricultural and wetland dischargers) were not considered since the "extended compliance schedule" provided is believed to "allow sufficient time to develop management schemes that would minimize impacts." Id. at 88. For this reason, the Regional Board is abdicating its responsibility under CEQA to analyze, without segmenting the project into discrete, non-controversial components, the actual and/or expected environmental impacts of implementing the Salt/Boron TMDL. Nonetheless, the Regional Board determined that the Proposed Project COULD NOT have a significant effect on the environment and a negative declaration will be prepared. Id at 90.

As noted above, the only method identified by the City that will ensure consistent compliance with the WLAs prescribed in Appendices 1 and C, is the installation of advanced treatment facilities. As the Regional Board is aware, given past discourse before and between the Regional Board and State Water Resources Control Board, significant environmental impacts are associated with the installation and operation of advanced treatment, which may actually result in the Salt/Boron TMDL creating a net environmental loss in the context of point source dischargers. Operation of the identified advanced treatment facilities is extremely energy intensive, requiring additional natural resources to be devoted to energy production. Further, a highly concentrated brine is produced by the operation of advanced treatment facilities (due to the much higher level of filtration). The disposal of these brines is highly problematic for a non-coastal City (no ability to construct a brine line to the ocean, if even such a brine line is environmentally acceptable), and would likely require transportation of the brines to a hazardous waste landfill via hundreds of truckloads a day/week, thereby increasing air pollution.

These issues should have been considered by the Regional Board as part of its CEQA analysis. If considered, the Regional Board might have modified the WLAs for point source dischargers (i.e., by providing a source water credit that would obviate the need for advanced treatment facilities or otherwise modifying the numeric target to achieve the same result). For these reasons, the City requests the Regional Board to reconsider the potential significant environmental impacts associated with implementation of the Salt/Boron TMDL, and take appropriate action to mitigate such potential impacts.

Response

The CEQA analysis contained in Section 6 of the Staff Report has been updated and language indicating that the Board intends to adopt a Negative Declaration has been removed (see response to Comment # 1.6). Also see response to Comment # 6.44.