

December 5, 1995

California Regional Water Quality Control Board
Central Valley Region
3443 Rautier Road, Suite A
Sacramento, Ca. 95827-3098

RE: Grassland Watershed

Dear Sirs:

Most of California farm land has been in production less than 150 years: so why are they saying production is down when European farms have been producing since the Middle Ages and still produce today. I believe California farmers are either cultivating land that would not grow sagebrush in the 1940's or they are using chemicals that damage their land. If the latter is the case they should stop using damaging chemicals to protect their land and settle for a lower yield or install tile drainage systems on their own property to dispose of their agricultural residue and not pollute California water ways. NO ONE or NO THING can live without water. If one water district is granted the right to dump residue into our water ways other districts will want equal rights. If they are cultivating bad land, sorry that is their error and the rest of the state should not have to pay for their error. Being a native Californian I've seen alot of land cultivated that wouldn't grow weeds in a wet year in the 30's and 40's.

In recent drought years, municipal water districts along the Delta ran daily water test results in local papers followed by "If you have a health problem do not drink the local water". Like many of my friends I have high blood pressure and my doctor told me not to drink local water. All Californians are entitled to the same quality water from the same source; therefore the ground rules need to be set now. In those rules it needs to be written that the peripheral canal will never be constructed by that name or any other name.

Northern Californians have worked hard to clean up their waterways. So much water has been diverted South that salt water has intruded the Delta to Antioch or above. We do not need toxics shipped into the Delta from other areas compounding our water problems. Government Agencies advise people not to eat the fish they catch in the Delta.

Thank you for considering all people of California not just the Central Valley.

Sincerely,

Cecelia Ambach
1401-D Bel Air Dr.
Concord, Ca. 94521

Received @ 12/7/95 meeting



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By fax and mail

October 2, 1995

Karl E. Longley, Chair
Central Valley Regional Water Quality Control Board
3443 Rautier Road, Suite A
Sacramento, CA. 95827-3098

RE: SAN JOAQUIN RIVER BASIN PLAN STAFF REPORT

Dear Mr. Longley,

This letter is submitted as the comments of the Bay Institute of San Francisco on the August 1995 Staff Report on the Water Quality Objectives and Implementation Plan To Be Used For The Regulation of Agricultural Subsurface Drainage Discharges In The San Joaquin River Basin* (Staff Report).

The Bay Institute supports the Staff Report's recommendation that the Central Valley Regional Water Quality Control Board (Board) adopt regulatory requirements to control the discharge of agricultural subsurface drainage in the San Joaquin River basin. Although the Staff Report proposes a number of revisions to improve the regulation of drainage discharges, however, we find the recommendations regarding specific water quality objectives and implementation plan measures to be deficient in a number of critical areas.

Overview

We support the proposed adoption by the Board of regulatory requirements to control the discharge of agricultural subsurface drainage in the San Joaquin River basin. Such action would not only be welcome but long overdue, considering the ongoing violation of water quality standards in the basin and the failure to achieve implementation of the recommendations of the San Joaquin Valley Drainage Program (SUDP) 1990 Management Plan on a voluntary basis. The absence of adequate regulatory requirements in the past has impeded the thorough implementation of best management practices to date, and we concur with the Staff Report's recommendation that "a

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more appropriate role for the Regional Board might be to provide the necessary regulatory incentive to ensure water quality goals are met," and that these incentives should be provided as "effluent limitations, in the form of WDRs [Waste Discharge Requirements]" (page C-4). (Support for effluent load limitations is not intended to imply that action to preclude the supplying of water to areas discharging contaminated drainwaters in the basin may not also be an appropriate, necessary, and complementary measure to meet water quality goals.)

We are concerned, however, that the water quality goals and the regulatory incentives to meet them proposed in the Staff Report are deficient in a number of critical areas.

The proposed water quality standards for selenium are not stringent enough to protect beneficial uses in the basin. Concentration-based standards do not adequately account for the bioaccumulative properties of selenium. As the Staff Report notes (page 24),

Bioaccumulation is of concern...even if the selenium concentration is low. Recent data...shows that selenium bioconcentration can be significant even at selenium concentrations below the existing federal water quality criteria.

Implementation of concentration-based standards for selenium assumes an assimilative capacity in receiving waterbodies that overlooks selenium's bioaccumulative properties and relies on presumed dilution benefits. The Board should require that concentration-based water quality standards for selenium be met exclusively through reductions in mass loading, including effluent load limitations. This is consistent with the State Board's guidance in its Pollution Policy Document for the San Francisco Bay/Delta estuary to reduce pollutant loads where bioconcentration in sediments and biota degrades beneficial uses.

Even if a concentration-based standard for selenium were presumed to be protective in and of itself, the extensive evidence compiled by the U.S. Fish and Wildlife Service, the U.S. Environmental Protection Agency (EPA) and others strongly indicates that adverse effects to beneficial uses occur in the range of 2 to 5 parts per billion (ppb). A 5 ppb standard for Mud Slough and the San Joaquin River will not therefore prevent selenium enrichment of the food web, potentially contaminating waterbirds and other sensitive wildlife species. The Board should adopt 2 ppb as the appropriate water quality goal for selenium throughout the basin.

The schedule for compliance with water quality objectives proposed in the Staff Report is grossly inadequate. Allowing a period of twenty to twenty-five years for compliance violates the federal Clean Water Act by permitting continued and increased degradation of water quality for fish and wildlife resources is already impaired (the San Joaquin River) and in waters of a federal and state wildlife refuge complex that are also degraded below existing standards (Mud Slough). Even if discharge of selenium is capped at historical average annual loads, as proposed in the Staff Report, degradation will increase as a result of continued long-term discharge because of selenium's bioaccumulative properties and persistence in the environment; in the words of the Staff Report, "the longer organisms are exposed to selenium, the greater the opportunity for bioaccumulation" (page 24). The proposed schedule also overlooks that the fact that

unacceptable water quality conditions resulting in degradation of beneficial uses -- including frequent exceedences of the current water quality standards -- are not recent events but were prevalent before and have prevailed since the adoption by the Board of the previous amendments to the Basin Plan in 1988 (during which time best management practices have not been thoroughly implemented and irrigated acreage has actually expanded in the draining areas). Instead of establishing a phased schedule that results in timely compliance, consistent with the "Mass Emissions Strategy" approach of the State Board's Pollution Policy Document for the San Francisco Bay/Delta estuary, however, the Staff Report proposes to defer the formulation of a schedule for loading reduction milestones to the issuance and periodic review of WDRs over the 20 to 25 year period for compliance.

We strongly urge the Board to establish in the Basin Plan a preset, phased, aggressive schedule for achieving selenium load reduction milestones in order to discharge its obligations under the federal Clean Water Act and achieve full compliance with water quality standards for selenium in a timely manner (i.e., a period no longer than five to seven years). There is no excuse for the Board not to seek vigorous compliance with state and federal mandates for water quality protection.

Specific comments

Page 8 - Water Quality Conditions That Could Be Reasonably Achieved

The Staff Report states here that "water quality objectives in the Grassland watershed can only be met by conveying the subsurface drainage in an isolated facility."

Water quality conditions could also be reasonably achieved if drainage discharges as a result of uses of water that constitute WASTE and unreasonable uses were ceased. The Staff Report proposes protection of water quality in the Grassland wetlands and wetland water supply channels as the Board's highest priority. If the Board determines that water quality goals in these high-priority areas cannot be achieved in a timely manner through conveyance of subsurface drainage in an isolated facility because of impacts on water quality conditions in other parts of the basin, then the Board should act to preclude the supplying of water to areas that discharge to Grassland wetlands and wetland water supply channels as a waste and unreasonable use of water. The Board could also prohibit discharges to the Grassland watershed without necessarily identifying an alternative disposal method. Short-term prohibition is likely to have little effect on long-term viability of agricultural production in the draining areas.

Page 10 - Protection Of Aquatic Life Beneficial Uses

We disagree with the Staff Report's statement that EPA's promulgation of its own standard "left the Regional Board without a water quality objective..." While the Regional Board should adopt a new objective consistent with the federal promulgation, EPA's selenium criteria has been and continues to be implementable and enforceable by the Board. We also recommend that the 2 ppb selenium standard for Salt Slough and the Grasslands channels be adopted for the basin as a whole (see general comments on concentration-based standards).

Page 18, Table 6 - Policy B

The Staff Report proposes to revise the language of Policy B from prohibition to discouragement of activities that increase the discharge of poor quality agricultural subsurface drainage. However, the proposed revision is completely contradicted in the discussion of this policy on page 20, in which the Staff Report concludes that "a policy which prohibits any increase is still valid" and should be expanded to include the entire Grassland watershed. Furthermore, as alluded to in the Staff Report on page 20 and in Table B-4, the importation of additional surface water supplies and the expansion of irrigated acreage in the draining areas have allowed the amount of poor quality drainage to increase even while other activities (drought, conservation, etc.) have led to decreases. As a result, activities that increase poor quality drainage have neither been discouraged nor prohibited. We do not support changing the words "are prohibited" to "will be discouraged" in this policy.

Page 18, Table 6 - Policy E

Any linkage between out-of-basin export and protection of beneficial uses of the San Joaquin River must be rejected. Since beneficial uses of the River are impaired by selenium accumulation even when water quality objectives are met (see discussion on page 22), the total load of selenium that is discharged to the River should be reduced to safe levels regardless of the ultimate resolution of the valley's salt disposal problem. This policy should be deleted for this reason and for the reasons discussed below regarding Policy F.

Page 18, Table 6 - Policy F

This policy should be deleted as unnecessary. The STYDP concluded that the actions recommended in its 1990 Management Plan would provide adequate management of salts and other drainage constituents for fifty years or more, allowing time to develop more permanent solutions, and in any event "would be required as the first phase of any out-of-valley export system" (Management Plan, page 121). The STYDP was also unable to identify economically or environmentally feasible options for export of salts.

Not only is a valleywide drain unnecessary, it is premised on the export of drainage-related water quality problems to other, perhaps more critical environments. We agree with the Staff Report's finding that discharge of agricultural subsurface drainage to the Bay/Delta estuary would result in its "probable degradation" (page A-2). The estuary is a unique biological resource of global significance, and we strongly oppose any drainage discharge option that increases pollutant loading to the Bay/Delta ecosystem, even if water quality standards are being met. The same concerns are likely to apply to nearshore coastal waters which support ecologically and commercially important biological resources, or other candidate areas.

Page 18, Table 6, Policy G

Policy G "allows for short-term degradation of individual waterbodies, if the overall watershed is enhanced. Long-term protection of individual water bodies is still required under this policy" (page 23). First, this policy appears to generally violate the federal Clean Water Act's anti-degradation requirements. Second, this Staff Report's proposed deferral of compliance over a long-term period (20-25 years) and absence of preset, phased loading

Reduction milestones gives us no confidence that the adoption of the proposed policy will result in "long-term" protection of Mud Slough and the San Joaquin River, given selenium's bioaccumulative properties and persistence in the environment. This degradation would be particularly devastating in Mud Slough, which remains an important wildlife habitat area even with current levels of degradation. Even if it were legal under Federal law, a policy allowing short-term degradation could only be justified by accompanying requirements that degradation will be reversed in a timely and vigorous manner. The application of Policy G in the Staff Report fails the test in every way. This policy should be deleted unless the anti-degradation concerns raised here can be resolved.

Page 24 - Selenium Load Reductions

We agree with the emphasis here on the need for selenium load reductions. The conclusion that "it is critical to minimize the total amount of selenium to which...organisms are exposed" and that "the longer organisms are exposed to selenium, the greater the opportunity for bioaccumulation" is essential to successfully designing a protective drainage control strategy. These findings explain why the Staff Report's assumptions elsewhere regarding the "assimilative capacity" of the San Joaquin River (i.e., pages 37 and D-1) and the use of a historical load maximum to prevent degradation (pages 32-33) and justify a long-term period of noncompliance with water quality standards are erroneous.

Page 25, Table 7 - CWRWQCB, #5

We strongly support the use of WDRs containing effluent load limits as a mandatory control action for agricultural subsurface drainage.

Page 26, Table 7 - CWRWQCB, #6

This potential control action is grossly inadequate and should be replaced with a schedule to achieve timely compliance (i.e., no longer than a period of five to seven years) with water quality standards using predetermined, phased selenium load reduction milestones. See comments on short-term degradation (page 18), selenium load reductions (page 24), general comments, and elsewhere.

Page 27, Table 7 - SWRCB, #1

This potential control action should be stated more strongly, i.e.:

If water quality goals are not met in a timely manner through the use of WDRs to control drainage discharges from certain lands, or if it is determined that these goals cannot be met other than through the cessation of discharge from certain lands, then the State Water Board should use its water rights authority to preclude the supplying of water to those lands.

Page 28, Table 7 - Others, #4

The impact on water quality of relocating the existing discharge point for contaminated drainwater is less only if an assimilative capacity of receiving waterbodies is assumed and the bioaccumulative properties and persistence of selenium overlooked. Water quality protection should be

accomplished by reducing pollutant loads. This potential control action should be deleted.

Page 28, Table 8 - Prohibition A

This prohibition should be retained. We are concerned, however, that the Board does not appear to be interested in enforcing it. Importation of additional surface water supplies and expansion of irrigated acreage in the draining areas have increased the discharge of contaminated drainwater even as other activities have decreased it.

Page 28, Table 8 - Prohibition B

The second sentence concerning the waiver should be deleted. Since the Staff Report identifies protection of Grassland wetland water supplies and water supply channels as the highest priority, this prohibition should be enforced regardless of whether the bypass channel project is implemented.

Page 29, Table 8 - Prohibition D

The prohibition of selenium discharge from the Grassland watershed in excess of the average annual historical maximum will not prevent further degradation of beneficial uses, because of selenium's bioaccumulative properties and persistence in the environment. A prohibition on selenium discharge based on an aggressive schedule to achieve timely compliance with water quality standards through phased selenium load reductions should be substituted.

Pages 32-37 - Aquatic Life Protection In The San Joaquin River Downstream Of The Merced River Inflow

See our comments on Prohibition D, above.

The major reductions in selenium loading essential to protect water quality in the River and its tributaries must not only be initiated now to prevent further degradation of beneficial uses, but they are also achievable now using a combination of institutional, technological and economic tools (for examples of reduction strategies, see Environmental Defense Fund, "Plowing New Ground," July 1994; Natural Heritage Institute, "Legal And Institutional Structures For Managing Agricultural Drainage In The San Joaquin Valley," September 1990). Where dischargers are unwilling or unable to use these tools to meet a timely schedule of load reduction milestones, discharge should be prohibited and/or the supplying of water precluded.

Pages 37-38 - Aquatic Life Protection In Effluent Dominated Natural Channels Of The Grassland Watershed And The San Joaquin River Upstream Of The Merced River Inflow

Relocating the existing discharge point for contaminated drainwater to the River to increase compliance with water quality objectives assumes an assimilative capacity in the River that overlooks selenium's bioaccumulative properties and persistence in the environment. Beneficial use protection of the River and its tributaries must be achieved by reducing pollutant loads to minimize exposure of organisms, regardless of the point of discharge and the potential for dilution.

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Page A-2 - Table A-2

The Staff Report eliminated prohibition of discharge from further consideration as a control option. We believe that prohibition continues to be an option where dischargers cannot or will not meet water quality requirements in a timely manner. In addition, short-term prohibition of discharge does not necessarily result in long-term loss of viability. Westlands Water District, which ceased discharge in 1986, continues to be economically viable, to say the least.

Page B-9 - Table B-4

Despite the existing prohibition on activities that increase the discharge of 'poor quality drainage,' the historical perspective demonstrates that the expansion of irrigated acreage in the draining areas, in conjunction with the importation of additional surface water supplies, has allowed the amount of contaminated drainwater to increase. Because other activities (drought, conservation, recycling, etc.) have led to decreases in the generation of drainage discharge per acre, the result is an state of equilibrium in selenium loading levels. In addition, the major reduction in drainage volume has come from tailwater, not tilewater, probably reflecting recycling of tailwater rather than reduction in deep percolation. These facts should be taken into account when adopting policies, control actions, and prohibitions.

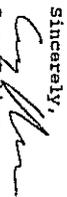
Page D-1 - Appendix D

Appendix D's discussion of 'two basic ways of limiting the selenium load to meet the water quality objective' is premised on the assumption that the San Joaquin River has an assimilative capacity to absorb selenium up to the maximum legal concentration. As we have seen, however, assumptions concerning the assimilative capacity of receiving waterbodies do not account for selenium's bioaccumulative properties and persistence in the environment, and the Staff Report acknowledges this fact at numerous points elsewhere in the text (i.e., pages 22, 24, 25). Unfortunately, this understanding is not reflected in the discussion of effluent load limits in Appendix D.

It is of primary importance that the total load of selenium in discharge to the River and its tributaries be reduced, in order to reduce the exposure of organisms to bioconcentration. Therefore, it is clear that static effluent limits are vastly more protective than dynamic effluent limits, because 'progress toward compliance is based on whether effluent loads are being reduced, rather than on whether the receiving water happens to provide enough dilution water' (page D-1). We encourage the inclusion of static effluent load limits in WDRs as an action required in the basin plan to control the discharge of subsurface drainage.

Thank you for your consideration of these comments. We look forward to working with the Board to improve the regulation of agricultural subsurface drainage discharges in the San Joaquin River Basin.

Sincerely,


Gary Bobker
Policy Analyst

THE BAY INSTITUTE OF SAN FRANCISCO
ENVIRONMENTAL DEFENSE FUND
NATURAL RESOURCES DEFENSE COUNCIL

July 6, 1995

BY FAX AND BY MAIL

Karl E. Longley, Chair
Central Valley Regional Water Quality Control Board
3443 Router Road, Suite A
Sacramento, Ca. 95827-3098

Re: Beneficial Uses and Water Quality Criteria for the Regulation of
Agricultural Surface Drainage Discharges in the San Joaquin Basin

Dear Mr. Longley,

This letter is submitted as the comments of The Bay Institute of San Francisco (TBI), the Environmental Defense Fund (EDF), and the Natural Resources Defense Council (NRDC) concerning the June 1995 staff report of the Central Valley Regional Water Quality Control Board (Regional Board) on beneficial uses designation and water quality criteria to be used in a basin plan amendment for regulation of subsurface agricultural drainage discharges in the San Joaquin Basin.

We appreciate the Regional Board's intention to revise portions of the San Joaquin Basin Plan pertaining to the Grasslands watershed. Although promulgation of more stringent criteria by the U.S. Environmental Protection Agency in 1992 remedied some of the defects of the current plan, the continuing failure to achieve existing water quality objectives in the Basin, uncertainty as to the Regional Board's intention to enforce these objectives, and concerns as to the adequacy of existing objectives, contribute to a situation clearly requiring further action by the Board.

TBI, EDF and NRDC have a long-standing interest in resolution of this issue. TBI has co-sponsored four symposia on selenium and agricultural drainage, published several reports on contamination of wildlife and water supplies by drainwaters, and commented on numerous matters affecting the regulation of drainage. EDF was represented on the public advisory committee to the State Water Resources Control Board's 85-1 Technical Committee; developed detailed recommendations for innovative management of subsurface agricultural drainage, contained in the 1994 report, "Plowing New Ground"; and has commented on previous Basin Plan amendments. NRDC has testified before the State and Regional Water Boards and congressional committees concerning agricultural drainage issues on numerous occasions; submitted comments on related federal and state water quality standards; and has been involved federal and state litigation on drainage matters since the mid-1980s.

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July 6, 1995
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These comments discuss additional beneficial uses appropriate for designation in the Grassland watershed, and expand on the discussion of selenium criteria contained in the staff report.

I. Beneficial uses

Preservation of Biological Habitats of Special Significance (BIOS)

The staff report proposes designation of BIOS for Salt Slough but not for Mud Slough (north), because the latter does not supply wildlife refuges or management areas in the form of water supply deliveries. However, under higher flow conditions Mud Slough, which traverses Keasterson National Wildlife Refuge and China Island State Park, can inundate significant portions of these protected areas. Therefore, we recommend that the Regional Board designate BIOS for Mud Slough (north).

Preservation of Rare and Endangered Species (RARE)

The staff report does not propose designation of RARE for any areas within the Grassland watershed. In contrast, the 1987 State Board technical report on beneficial uses found that all listed sections of the San Joaquin River and its tributaries -- including Mud Slough (north) and Salt Slough -- serve as habitat for threatened and endangered plant and wildlife species. These species include the Aleutian Canada goose, listed as threatened under the federal Endangered Species Act, which winters primarily in the western Grasslands.

Cold Freshwater Habitat (COLD), Migration of Aquatic Organisms (MIGR), and Spawning, Reproduction and/or Early Development (SPWN -- cold)

In recommending against designation of COLD, MIGR and SPWN (cold) for Mud Slough (north) and Salt Slough, the staff report states that although Chinook salmon stray into Salt Slough, "this is an aberration due to lack of appropriate habitat and environment for egg development (pre-spawning), spawning, juvenile development, and migration of smolts" (page 17). According to the California Department of Fish and Game (CDFG) and the U.S. Fish and Wildlife Service (USFWS), however, "when water flows are sufficient salmon... frequently enter Salt and (probably) north Mud Slough" (State Water Resources Control Board [SWRCB], 1987, Regulation of Agricultural Drainage to the San Joaquin River: SWRCB Order No. WQ 85-1 Technical Committee Report; Appendix B). The 1987 State Board technical report appendix on beneficial uses observed that although "it is unlikely that spawning by cold-water fish can ever take place in Salt and north Mud Slough" (under current conditions), nevertheless "yearly salmon migrations occur regularly" (SWRCB, 1987).

The staff report also notes that maximum temperatures for the salmon migration period are exceeded in the sloughs. The 1987 State Board technical report concluded, however, that "an absence of cold water within a channel does not necessarily preclude its use (as a transportation artery) by migratory species which normally occupy coldwater habitat" (SWRCB, 1987).

Rec'd 7/10/95

The current unsuitability of sloughs in the Grassland watershed as spawning habitat for coldwater species may not be indicative of their use by such species during wet water year conditions in the past. While finding that successful spawning by coldwater species is currently unlikely within the lower San Joaquin River reaches due to warm water temperatures or unsuitable substrate, the 1987 State Board technical report also observed that "were cold water flows from Friant Dam to increase, spawning by coldwater species might take place."

Because of the potential use under high flow conditions of Mud Slough (north) and Salt Slough as habitat for chinook salmon, as well as the possibility that flow releases from Friant Dam will be increased and other measures undertaken in the future to help restore anadromous fisheries to the San Joaquin River, we recommend that COLD, MIGR and SPWN (cold) be proposed as potential beneficial uses of Mud Slough (north) and Salt Slough.

Warm Freshwater Habitat (WARM)

The staff report states (page 16) that "it is not known...if removal of agricultural discharges would result in an enhancement" of beneficial uses of Mud Slough (north) and Salt Slough by warmwater species, because of consequent reduction in flow. We note, however, that the beneficial uses of these sloughs by warmwater species preceded their current discharge-dominated condition. Moreover, reductions in selenium loading from agricultural discharges to the sloughs (whether from removal of these discharges or from attainment of adequate water quality criteria) would be expected to enhance the beneficial uses. For instance, elevated levels of selenium can adversely affect reproduction in typical warm water species historically found in the sloughs, such as bluegill sunfish and largemouth bass.

We support the designation of WARM and the other beneficial uses identified in the staff report. We also believe that further investigation may be necessary in order to identify if additional beneficial uses should be designated for Mud Slough (north) and Salt Slough, in order to restore water quality conditions and environmental values of these areas which existed prior to their current status as effluent-dominated waterbodies.

II. Water quality criteria

The existing federal ambient water quality criterion for selenium (5 parts per billion (ppb)) is clearly not sufficient to protect beneficial uses in the Grassland watershed. This criterion does not adequately account for the bioaccumulative properties of selenium, nor was it designed to protect fish and wildlife uses of selenium-enriched environments. The available scientific literature, including those sources surveyed in the staff report, strongly indicates that selenium concentrations in water at levels greater than 2 to 5 ppb are likely to bioaccumulate to levels in the food chain that adversely affect reproduction and other processes in fish and wildlife.

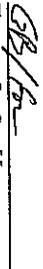
Given that protective criteria should be set well below the demonstrated adverse effect level, therefore, even the Regional Board's 2 ppb monthly

mean selenium objective for wetland waters may not be sufficient to adequately protect wildlife beneficial uses in the Grassland watershed. Accordingly, we recommend that ambient water quality criteria for selenium be proposed for the Grassland watershed below the demonstrated adverse effect level of 2 to 5 ppb.

Thank you for the opportunity to comment on the staff report.

Sincerely,


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December 7, 1995
Karl E. Longley, Chair
Central Valley Regional Water Quality Control Board
3443 Roulter Road, Suite A
Sacramento, Ca. 95827-3098

RE: COMPLIANCE TIME SCHEDULE FOR REGULATING SAN JOAQUIN RIVER BASIN AGRICULTURAL SUBSURFACE DRAINAGE DISCHARGES

Dear Mr. Longley,

This letter is submitted as the comments of The Bay Institute of San Francisco, the Environmental Defense Fund (EDF) and the Natural Resources Defense Council (NRDC) on the November 1995 Staff Report on the Compliance Schedule to Be Used For The Regulation of Agricultural Subsurface Drainage Discharges in The San Joaquin River Basin. (Staff Report).

The Bay Institute, EDF and NRDC have previously commented on the broad range of issues involving the adoption of water quality standards and an implementation plan to control the discharge of agricultural subsurface drainages in the San Joaquin River Basin by the Central Valley Regional Water Quality Control Board (Board). We continue to support proposed amendments to the Basin Plan that represent a coherent strategy for managing drainage discharges, including the adoption of Waste Discharge Requirements which establish enforceable effluent load limits; the formation of a regional entity with authority and responsibility for drainwater management; and the use of economic incentives to reduce drainwater pollutant loads. Our additional comments here are limited to issues involving the compliance time schedule discussed in the Staff Report.

The Staff Report proposes revisions to the time schedule for achieving compliance with water quality standards which was proposed by Board staff in August 1995. We support several of these proposed revisions, specifically:

- o the deletion of the proposed 20 - 25 year period for compliance with water quality standards in the San Joaquin River and Mud Slough (north); and

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o the use of effluent load limits as implementation milestones toward full compliance with water quality standards.

Despite these improvements to the proposed Basin plan amendments, we find the revised compliance time schedule deficient in a number of areas:

- o compliance with water quality standards for selenium in the San Joaquin River and Mud Slough (north) in a shorter timeframe than the proposed 10 - 15 year period is both legally necessary and technologically feasible;
- o selenium wasteload allocations (load caps) are more appropriate interim implementation measures than scientifically unjustified interim water quality performance goals, and should be adopted as performance requirements during the interim period; and
- o the use of selenium load caps as implementation measures toward full compliance with water quality standards should include enforceable monthly as well as annual wasteload allocations.

Compliance time schedule

Compliance with water quality standards for selenium in the San Joaquin River and Mud Slough (north) should be achieved in a shorter timeframe than the proposed 10 - 15 year period in order to fully discharge the requirements of federal and state law. More timely compliance is also feasible using currently available technologies and management strategies.

It is unjustifiable and without precedent to defer compliance with water quality standards for a period of 10 to 15 years. The requirements of the federal and state Clean Water Acts are intended to achieve immediate compliance with water quality criteria. Certainly, it is not the intention of these statutes that serious water quality degradation be permitted to occur for extended periods (in this case, equivalent to 3 - 5 triennial reviews or waste discharge permit reevaluations). Nor should compliance with discharge permit conditions in order to meet water quality criteria be unduly constrained by uncertainties regarding technological feasibility. Rather, it is the adoption of clear regulatory requirements which forces the development of new technologies and management strategies to control pollutant levels in discharges.

In this case, moreover, we believe that currently available technologies and management strategies allow for more timely compliance with the proposed water quality standards. According to the August 1995 Staff Report (Table B-1), combining improved irrigation on 37,000 acres with land retirement on 3,000 acres can limit selenium loads to 4,760 pounds annually. Both of these options are implementable immediately. More aggressive implementation of both options can decrease loading even further.

It should also be noted that a substantial amount of time has elapsed during which efforts to progress toward achieving compliance with water quality protections for the Basin's waters and reducing selenium loads have not been undertaken by the Grasslands Area drainers. Nor has remedial action been pursued by the Board. Although adverse impacts to beneficial uses of the Basin's waters from agricultural subsurface drainage discharges began to be identified from 1983 on, new water quality objectives were not

Issued by the Board until 1988. Neither significant, sustained decreases in selenium loading nor compliance with state and federal water quality criteria for selenium have been subsequently achieved. Furthermore, this state of affairs will continue for many years, since the Report proposes to allow continued loading at historical maxima, up to an annual selenium load cap of 8,000 pounds, until 1 October 2002. Even the agreement between the U.S. Bureau of Reclamation and the Grasslands Area Grazers on interim use of the San Luis Drain contemplates only two years (1996-7) at status quo loading levels and three years (1998-2000) with phased reductions in allowable selenium loading. At the very least, the Board should require additional reductions in selenium loads through more stringent load caps at the close of the five year period of interim use of the San Luis Drain.

Interim performance goals and requirements

During the interim period leading to full compliance with the 5 ppb, 4-day average water quality standard for selenium, the Report proposes to use different selenium concentrations as performance goals to measure progress toward compliance. If these performance goals are not achieved, annual wasteload allocations (selenium load caps) will apply.

The 5 ppb monthly mean (for wet years) and 8 ppb monthly mean (for dry years) objectives, previously adopted by the Regional Board, are not adequate to protect beneficial uses of the Basin's waters. The U.S. Environmental Protection Agency disapproved the 8 ppb objective in 1989 and replaced the 5 ppb monthly mean objective with a 5 ppb, 4-day average standard in 1992. Because there is no adequate scientific or regulatory basis for continuing to use these objectives, the Board has no justification for adopting them as performance goals.

The selenium wasteload allocations (load caps) function as the appropriate performance requirement during the interim period leading to full compliance with water quality standards. It is the failure to achieve the 5 ppb, 4-day average water quality standard during the interim period, not any alternative and unjustified objectives, which necessitates the imposition of these load caps. Furthermore, load caps, and not any alternative water quality objective, represent the most important gauge of progress toward achieving full compliance, since "control actions which result in selenium load reduction are most effective in meeting water quality objectives" (Table 2(7)2). Requiring the imposition of load caps as an implementation measure during the interim period is also consistent with the proposed application of the initial 8,000 pound annual load cap "regardless of compliance with performance goals or water quality objectives" (page 2). We recommend that the Board adopt load caps as enforceable performance requirements, not selenium concentrations as performance goals, during the interim period leading to full compliance with water quality standards.

We continue to be concerned that even the proposed 5 ppb, 4-day average, water quality standard for selenium is not fully protective of beneficial uses of the Basin's waters. As the August 1995 Staff Report noted (page 24),

Bioaccumulation is of concern...even if the selenium concentration is low. Recent data...shows that selenium bioconcentration can be

significant even at selenium concentrations below the existing federal water quality criteria.

Because of selenium's bioaccumulative properties, the Board should adopt concentration-based standards below the 2 to 5 ppb threshold for adverse impacts to fish and wildlife species, and only in combination with mass emission reduction strategies which do not rely primarily on dilution benefits from the presumed assimilative capacity of receiving waterbodies.

Monthly wasteload allocations

Enforceable monthly as well as annual wasteload allocations (selenium load caps) should be used as implementation measures toward full compliance with water quality standards. During the interim period leading up to full compliance with water quality standards, a monthly wasteload allocation for selenium loading represents the only ecologically protective requirement for regulation of agricultural subsurface drainage. Compliance only with annual wasteload allocations (proposed as selenium load caps in Table 3(8) of the Report) will not prevent toxic effects to fish and wildlife species from load pulses in drainage discharges to Mud Slough and the San Joaquin River.

The monthly waste load allocations contained in Table 5A (Dry Year) and Table 5B (Wet Year) should be adopted as part of its amendments to the Basin Plan by the Board as enforceable selenium load caps under the Table 3(8) prohibitions. Adoption of monthly allocations need not and should not be deferred because of potential future changes in flow patterns, as suggested in the Report (page 15), since both interim and final effluent load limits will be subject to periodic review by the Board. The time schedule for compliance with both monthly and annual wasteload allocations should also be revised to allow for more timely implementation, as discussed above.

Thank you for your consideration of these comments. We look forward to the Board's adoption of timely measures to reduce and eliminate the adverse impacts to beneficial uses of the San Joaquin River Basin which result from agricultural subsurface drainage discharges.

Sincerely,


Gary Bobber
The Bay Institute of San Francisco


Terry F. Young, Ph.D.
Environmental Defense Fund


Hal Candee
Natural Resources Defense Council



September 26, 1995

Paul E. Jepperson
Supervising Engineer
Calif. Regional Water Quality Control Board
3443 Roubier Road, Suite A
Sacramento, CA 95827-3098

Subject: Comments relating to the Water Quality Objectives and the Implementation Plan to be Used in a Basin Plan Amendment for Regulation of Agricultural Subsurface Drainage in the Grassland Area

Dear Mr. Jepperson:

As you know, Broadview Water District has been very active in irrigation and drainage water management. Our farmers have made significant improvements in irrigation water management which has also reduced the production and discharge of drainage water. While it is obvious that we have not "solved" our drainage problem, we have learned that a significant portion of drain water production is out of our control.

The Staff Report identifies that the Grassland Basin Drainers are attempting to use the San Luis Drain to bypass Grassland and other wildlife areas. As part of the agreement with the Bureau of Reclamation, we have tentatively agreed to certain drainage discharge targets concerning selenium loads. While we have committed to try to meet these targets, from experience, I know of only two ways to meet them. They are: 1) reuse of subsurface drainage water and 2) turning off the drainage sump pumps. These actions will improve water quality but they will also cause land to eventually go out of production due to increasing soil and water salinity levels. It is only a matter of time. Because of the low selenium load discharge targets and the general lack of water supply, the salt can not be leached from the soil, as purported in the staff report. Under the proposed targets, the assimilative capacity of the San Joaquin River during high flows can not be used for leaching.

The question must come to your mind, "If we believe this is true, why are we agreeing to the selenium load targets." The answer is, "We have no other option since the RWQCB is setting the selenium level for Grassland channels at 2 ppb which will terminate the discharge of subsurface drainage water."

Basically, the Staff Report identifies (page 5) 4 actions that will be required in the waste discharge requirements to reduce selenium loads by 60-70% in order to meet water quality objectives. They are:

1. irrigation improvements.
2. treatment.
3. land retirement.
4. reuse.

We have made significant improvements in irrigation water use and management. Additional improvements are possible and appropriate but they will have diminishing returns.

Treatment is questionable at best. To date, a cost effective treatment process has not been identified.

Land retirement sounds like a good idea but it is rather simplistic. Which land is the drainage problem: the land with the tile system or land upslope? We have some tile systems that discharge significant quantities of drainage water even when they are not farmed. Do we retire 50% of the land to reduce 60-70% of the selenium load? Doesn't sound very cost effective.

We submitted a land fallowing proposal to the Bureau of Reclamation last year to help determine what land will yield the greatest drainage reduction when it is fallowed. This was part of a District water supply project. Apparently they were not interested in answering this question.

Reuse of drainage water is extensively covered in the Staff Report. Broadview has the capability to reuse all drainage water and not discharge it to the San Joaquin River. From past experience, we know that the reuse of drainage water required to attain the 60-70% reduction in selenium load will cause land to go out of production. The statement on page 21, "...the reuse must be done in a manner that does not aggravate an existing toxic trace element problem or create a long-term problem." Because leaching of accumulated salts can not occur under the 8,000 lbs/year selenium objective and the proposed target levels, it is my opinion that the long-term prognosis is terminal.

Specific comments concerning the Staff Report are as follows:

- Page 10 - Economic Considerations: How do you go to higher value crops when soil salinity is increasing?
- Need to Develop and Use Recycled Water: The SIVDP Final Plan recommendations were only temporary measures to help manage the drainage problem, not solutions.

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Page 18 - Table 6 Policies, item f: The use of the word "feels" is inappropriate.
Use the word "believes."

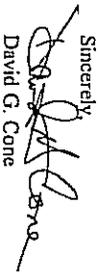
Page 22 - item 6, 2nd paragraph: The use of the word "feels" is inappropriate.
Use the word "believes."

Page 28 - Table 8 Prohibitions, item a: What are the activities that increase the discharge of poor quality agricultural subsurface drainage?

Page 32 - item b: It is inappropriate to use an estimate for the years 1975-1985.
What is the basis of that estimate? Do you have any selenium levels for that period?

In closing, the economic impacts to Broadview Water District in order to comply with the target levels established to use the San Luis Drain and to comply with the water quality objectives will be significant. In my opinion, based on working with the drainage problem for over 8 years, there will be significant impacts on soil salinity in the short-term and for the long-term, the future looks rather hopeless under a requirement to reduce selenium discharges by 60-70%.

Sincerely,



David G. Cone
Manager

ENCLOSURE



December 8, 1995

Dennis W. Westcott
Environmental Program Manager
California Regional Water Quality Control Board
Central Valley Region
3443 Router Road, Suite A
Sacramento, CA 95827-3098

Subject: Compliance Schedule for the Grassland Watershed
Staff Report November 1995
December 7, 1995

Dear Mr. Westcott:

When the CRWQCB adopted Resolution Number 88-195 in 1988, Broadview Water District took the decision seriously and began an aggressive water management program for source control of subsurface drain water. The program has been successful in encouraging our water users to improve irrigation efficiency and effectiveness. As a result, subsurface drain water has been reduced significantly but we have not "solved" our drainage problem.

I, along with Dennis Wichelns, have made many presentations concerning our water management and drainage reduction program. Broadview is never individually criticized as a drainer. When people refer to the Grassland Drainers, they say that the draining districts have done nothing to reduce drain water discharges. The hearing on December 7, 1995, is a good example. When I have approached these people on this generalization, they respond by saying that they were not referring to Broadview.

At the Workshop, the Board discussed the tradable permit program described in EDF's proposal "Plowing New Ground". While the concept is workable and appropriate in some situations, its application in the Grassland Basin is questionable.

I have done some analysis of the selenium load caps we have agreed to in the Consensus Letter. The Drainers will be allocating the total load among districts. Since we have not yet negotiated the load allocation, I have calculated Best Case and Worst Case Scenarios. Even with Broadview's reductions in subsurface drain water (and selenium load), there is no room for any trading, even under my Best Case Scenario. In addition, all discharges

and trading of load must always be in the context of maintaining salt balance. I have attached a graph illustrating my point.

Several people at the Workshop suggested that technology is available to solve the drainage problem. They never identify the technology or verify that it is economically feasible. To the best of our knowledge, an affordable technological solution is not yet available.

It is unfortunate that most of the persons commenting about drain water reduction have no field knowledge concerning subsurface drain water. They have never taken the time to learn about drainage from the field perspective. Such knowledge, would not solve the drainage problem, it would add some credibility to their criticism.

In summary, I believe that the selenium loads we have agreed to will cause us significant economic impacts. However, Broadview Water District is committed to reducing selenium loads under the Consensus Letter and we recommend the approval of the revised compliance schedule. While we have made significant improvements in drain water reduction at significant costs to our landowners and water users, we will continue to implement meaningful water management and drain water reduction projects.

Finally, there seems to be significant concern about pesticides in the drain water from the the swamps and in tail water from the Grassland Basin. It is my understanding from your staff that pesticides in the San Joaquin River are not from the Grassland Basin. In addition, the level of selenium concentrations in the lower San Joaquin River are near or at natural background levels. These data need to be specifically addressed in the final staff report.

I look forward to the final adoption of a reasonable time schedule so we can spend our time and energy working on the problem. I wish to thank you and your staff for the efforts you have put into understanding this problem and trying to protect the water quality of the San Joaquin River and its tributaries while recognizing the economic impacts. Please call me if you would like clarification on any of my comments.

Sincerely,

David G. Come
Manager

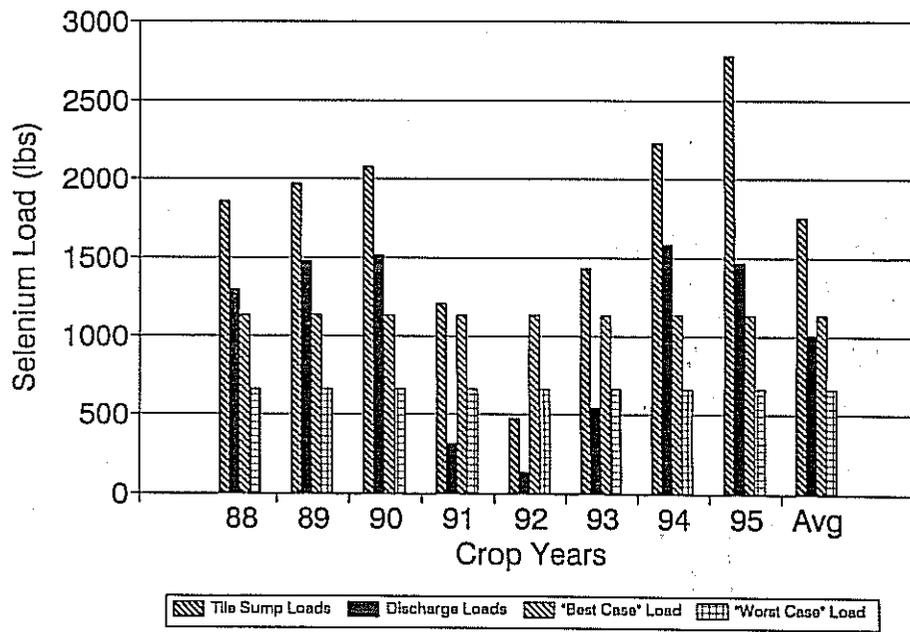
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SACRAMENTO
CYRANWOOD
OFFICE

Attachment

RWC0202.WPS

P.O. BOX 95 • FIREBAUGH, CALIFORNIA 93622
(209) 659 - 2004 FAX (209) 659 - 3526

Broadview Water District Selenium Loads





California Farm Bureau Federation
 1601 Exposition Boulevard • Sacramento, CA 95815 • Telephone (916) 924-4000

July 6, 1995

Mr. Paul E. Jepperson
 Supervising Engineer
 Central Valley Regional
 Water Quality Control Board
 3443 Router Road, Suite A
 Sacramento, California 95827-3098

Re: Proposal to Amend Basin Plan for Regulation of Agricultural Subsurface Drainage
 In the Grasslands Area

Dear Mr. Jepperson:

Thank you for the opportunity to provide input on the Regional Board's above-mentioned proposal. The California Farm Bureau Federation ("Farm Bureau") has concerns not only with the specific proposal for the Grasslands area, but also with the precedent that may eventually affect other areas of the state with similar circumstances. Our comments on behalf of our over 70,000 member families are intended to be constructive in nature and will hopefully prove useful to the Regional Board.

First, we question the advisability of designating either Salt or Mud Sloughs for wildlife habitat if, as your June 95 staff report states, on page 18, suitability depends on elimination of subsurface drainage discharges to the sloughs. The report does not propose another alternative method of discharge. The same problem is incurred when WILD and B/DL are proposed for Grasslands wetland channels (page 24). A solution might be to condition the designation as having a priority below the use of the channels for subsurface agricultural drainage discharge.

Additionally, subsequent discussion in the staff report indicates that the most sensitive designated beneficial use would govern the limits of selenium concentration permitted in the waterways. This factor would make future use of the channels questionable for discharge of subsurface agricultural drainage.

At the workshop held June 23, testimony was given by B.J. Miller et al., which indicated that present selenium standards for this particular area may not be based on the best scientific evidence available, due to differences in the toxic effects of selenium being different depending on the background levels of sulfur. Because of that testimony, and concerns for lack of presently available alternative methods of root zone salt disposal from irrigated lands, we

Mr. Paul E. Jepperson
 July 6, 1995
 Page 2

recommend that when the Regional Board adopts beneficial use designations for the Grasslands area, requirements for meeting the regulations not be imposed on the discharge of subsurface drainage until practical alternative means of discharge are available.

We recognize the impracticality of imposing regulations which would be intended to convert Salt Slough and Mud Slough (north) into habitat for coldwater fish. We agree that removal of subsurface drainage as a water supply for these sloughs would decrease the water supply, probably decreasing the habitat value for warm water species and not achieving the objective of developing additional habitat for cold water dependent species. In addition, such designation as cold water habitat would exacerbate an already hazardous situation regarding disposal of subsurface agricultural drainage water.

It is obvious to us that the public does not understand the absolute necessity for salt removal from crop root zones. This creates a political problem of great proportion, but would not justify the economic and social cost of denying irrigated agriculture its access to the San Joaquin River for salt disposal until a better means of transport is available.

Finally, exclusion of subsurface drainage would likely result in higher temperatures in the summer, because summer subsurface drain water is colder than surface runoff generally. Part of the purpose of the exclusion would therefore be frustrated.

Thank you for the opportunity to provide our comments. If you have any questions, please feel free to call me at (916) 446-4647.

Sincerely,

 William I. Dubois
 Consultant
 Natural Resources

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 REGIONAL BOARD
 SACRAMENTO, CALIF.



CENTRAL DELTA WATER AGENCY
 235 East Weber Avenue • P. O. Box 1461 • Stockton, CA 95201
 Phone 209/465-5883

September 29, 1995

DIRECTORS
 George Bagg, Jr.
 Rudy Mussi
 Alfred R. Zuckerman
COUNSEL
 Diane John Nemesini
 Thomas M. Zuckerman

Paul E. Jepperson

2

September 29, 1995

dilution are appropriate measures to reduce the adverse impacts of added salt loading pending completion of the "Valley Drain" or other salt removal facilities.

Placing the burden of the salt loading to the San Joaquin River from the CVP service areas squarely upon the CVP exports with a timetable for measured improvement is long overdue. There is no justification for further delay and no justification in transferring the burden to others.

Paul E. Jepperson
 Supervising Engineer
 California Regional Water
 Quality Control Board
 Central Valley Region
 3443 Router Road, Suite A
 Sacramento, California 95827-3098

Re: Water Quality Objectives and the Implementation Plan to be Used in a Basin Plan Amendment For Regulation of Agricultural Subsurface Drainage in the Grassland Area

Dear Sir:

The Central Delta Water Agency urges that a salinity objective be established for the San Joaquin River upstream of Vernalis. A measuring point above the confluence with the Merced River but below Mud Slough would appear appropriate. The objective at such location should be a maximum salinity of 500 ppm TDS year around. Without such a measuring point and objective the burden for dilution of the salts entering the San Joaquin River from the west side of the San Joaquin Valley unfairly and unlawfully falls upon the downstream tributaries. Without construction of the "Valley Drain" which was intended by Congress to be a pre-requisite to contracting CVP water from the San Luis Unit, the CVP water exported from the Delta will continue to be evaporated upon and leach salts from the west side lands thereby adding to the salt load of the San Joaquin River. The impact of the CVP salt loading to the river has been aggravated by the replacement of the natural upper San Joaquin River flow with water exported from the Delta. If CVP exports from the Delta for delivery into the portion of the San Joaquin Valley which drains to the San Joaquin River are to continue, then it is appropriate that the burden for dilution and/or reducing such added salt load should fall upon the CVP exports. Our proposed salinity objective upstream of the Merced is essential to assure that the burden is not unfairly placed upon others. Dilution of San Joaquin River salts with water from San Luis or Friant rather than with water from New Melones or other downstream tributary sources would better conform to the legal principles established in the Delta Protection Act (Water Code 12200 et seq.), Watershed Protection Act (Water Code 11460, et seq.) and San Joaquin River Protection Act (Water Code 12300 et seq.). Land fallowing and/or

Yours very truly,

 DANTE JOHN NOMESINI
 Manager and Co-Counsel

DJN:ju
 cc: CDWA Directors
 CDWA Advisory Committee
 Thomas M. Zuckerman
 Alex Hildebrand
 Karina Hattigfeld
 John Pulver
 Ed Steffani
 Jeanne Zolezzi
 John Herrick
 Reid Roberts
 Norris Allen
 Virginia Cahill

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(510) 779-7050

Mr. William Crooks
December 11, 1995
Page Two

December 11, 1995
Re: Grasslands Bypass
Monitoring Schedule
for Selenium

Mr. William Crooks,
Executive Officer
Central Valley Region
Water Quality Control Board
3443 Roulter Road, Suite A
Sacramento, CA 95827

Dear Mr. Crooks:

This letter is a follow up to the workshop held December 7, 1995, regarding the compliance schedule for achieving selenium water quality objectives in the San Joaquin River associated with agricultural subsurface drainage discharges in the grassland watershed.

The City of Antioch, serving drinking water to a population of approximately 75,000 people, is very concerned about the reopening of a portion of the San Luis Drain to benefit a few farmers and the grasslands wildlife at our expense.

The drain has been sitting for about ten years, and the new flow will wash selenium laden sediments out into Mud Slough and in turn to the San Joaquin River. Has this initial volume of selenium been included in the proposed 15 percent farm reduction of selenium drainage to be disposed of annually?

Does anyone know the actual measured volume of selenium now being disposed of into the grassland so that we can actually determine a 15 percent reduction?

Based on what I heard at the December 7th meeting, the monitoring plan is based on assumed numbers rather than factual measured quantities, and that the Regional Board has neither the staff nor the budget to get better numbers. I think you can see how this would make us very skeptical of Regional Board ability to monitor the proposed plan and provide the information necessary to control the farm area discharge or terminate the drain use after 2, 5, or even 10 years.

The San Francisco Bay Regional Board is controlling selenium discharge from industry at great expense to the industry, with substantial fines for violations. Why can't the Central Valley Board invoke the same standards for river discharge requirements with the same penalties for the farming industry?

People don't drink the Bay water, but people do drink Delta water. Which water quality is more in need of protection now, not 2, 5, or 10 years in the future? We obviously don't understand the State's priorities.

I believe the citizens of the Delta want zero selenium discharge even if that means no irrigated crops in the problem areas, and any solution other than zero discharge is unacceptable no matter how it is or is not monitored.

Thank you for the opportunity to provide our comments.

Very truly yours,

STAMFORD E. DAVIS, P.E.
Director of Public Works

SED/sml
cc: David D. Rowlands, City Manager
William R. Galstan, City Attorney

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CITY OF GUSTINE

P.O. Drawer 16 • Gustine, California 95322-0016 • (209) 854-6471 • Fax (209) 854-2840

Mark D. Melville
City Manager

December 6, 1995

Mr. Dennis Westcott
Environmental Program Manager
Regional Water Quality Control Board -
Central Valley Region
3443 Roubier Road, Suite A
Sacramento, CA 95827-3098

Subject: Comments on November 1995 Staff Report re. Regulation of Subsurface
Drainage Discharges in the San Joaquin River Basin

Dear Mr. Westcott:

The City of Gustine would like to take this opportunity to provide comments on the subject staff report. We provide these comments because the proposed control actions included in this report will have a major detrimental impact on the City's efforts to comply with its wastewater NPDES permit. Specifically, the City is proposing to construct a year-round wastewater reclamation project with winter discharge of subsurface drainage. Such a discharge would not be allowed under the RWQCB proposed program (see Table 3 Prohibitions) to regulate agricultural subsurface drainage discharges. If this program is approved as proposed, the City would be obligated to select another wastewater treatment and disposal alternative at higher cost and less environmentally compatible than the reclamation project. With this in mind, the City respectfully request that the Board modify its proposed program to allow the discharge of subsurface drainage from wastewater reclamation projects in the Gustine area.

We believe there are a number of issues that need to be taken into consideration as the Board addresses the proposed control actions. First, is the apparent conflict between the Board's policy to encourage wastewater reclamation and the regulation of agricultural subsurface drainage. For our situation, the City is proposing to reuse its wastewater but, in doing so, the City will need to install tile drains to preclude the long-term build-up of salts in the soils. To accommodate the concern of salt loads to the San Joaquin River, the tile drains would be operated to discharge in the winter months when there is higher flow in the receiving waters.

Gustine has spent considerable amount of resources to carefully evaluate various wastewater management alternatives before selecting the reclamation project. This effort was initiated in 1990 and has just recently culminated in an approved Wastewater Treatment Facilities Master Plan. A draft Environmental Assessment has been prepared and is presently being finalized. The proposed project has already received approval from EPA and SWRCB for grant funding through a modification/replacement grant. In selecting the reclamation alternative, the City addressed many issues including environmental, engineering, social, economics, and regulatory. Regarding the regulatory issue, the City considered the Board's policy supporting wastewater reuse. The

Mr. Dennis Westcott
December 6, 1995
Page 2

other regulatory issue that the City considered was the likelihood that water quality criteria similar to those proposed in the Inland Surface Waters Plan would eventually be applied to the City's discharge. For small communities in the Central Valley, the most logical and cost effective wastewater management alternative that addresses such criteria is land treatment (i.e. reclamation). Gustine in anticipation of more stringent regulatory requirements opted to eliminate its discharge to receiving waters. The Board's proposed action, unless modified, would effectively require the City to throw out all of its planning work and approvals and go back to the drawing board.

Another issue that we would like the Board to consider is that the proposed actions are directed at the control of selenium loadings in the entire Grassland watershed. However, in our situation, selenium levels in the groundwater and water supply in the Gustine area have been determined not to be a concern (see RWQCB's "Beneficial Use Assessment per State Water Resources Control Board Order WQ 87-3", January, 1998). Thus, we have a situation in which the proposed prohibitions to reduce selenium loadings are applied to an area that has no documented problem with selenium.

A similar and parallel issue regarding subsurface drainage is the discharge of salts. As noted previously, we are proposing to remove salts that build-up in the soils from extended application of wastewater through the use of the drains. However, it should be noted that for a given design flow, the total quantity of salts discharged to the San Joaquin River is the same with either the City's present surface water discharges or the proposed subsurface drainage. The difference between the two discharges is that one is accomplished during the winter (and high river flow conditions) and one year-round (during both low and high river flow conditions).

In closing, we ask that the Board modify its proposed control actions for selenium in the San Joaquin River basin. Specifically, we ask that discharges from subsurface drainage associated with the reclamation projects used for wastewater treatment be excluded from the prohibitions listed in Table 3 of the staff report. We believe such an exclusion is consistent with the Board's stated policy regarding wastewater reuse and will not lead to net difference in selenium or salt loadings to the San Joaquin River. While we support this exclusion, we do realize that the City will need to comply with Waste Discharge Requirements associated with the proposed subsurface drainage. We thank you for your consideration in this matter.

Yours truly,



Mark D. Melville
City Manager

cc: Jose Angel, RWQCB (Fresno)
Darrin Polhemus, SWRCB
Elizabeth Borowicz, EPA
Malcolm Walker, Larry Walker Associates

Community
Development
Department

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851 Pine Street
4th Floor, North Wing
Martinez, California 94553-0095

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(510) 646-4194

Contra
Costa
County



Harvey E. Dragdon
Director of Community Development

October 4, 1995

Mr. Karl Longley
California Regional Water Quality Control Board
Central Valley Region
3443 Router Road, Suite A
Sacramento, CA 95827-5098

Dear Mr. Longley:

We are writing to you today regarding the Central Valley Regional Water Quality Control Board's Staff Report on the Water Quality Objectives and Implementation Plan to be used for the Regulation of Agricultural Subsurface Drainage Discharges in the San Joaquin River Basin. Contra Costa County has a vested interest in the management of agricultural wastes from the San Joaquin Basin as county residents depend on the San Joaquin River and Delta, the receiving waters for valley discharge, for drinking water, recreation, and tourism. We have a number of concerns with your staff report as it relates to the maintenance of downstream water quality, and we are pleased to have this opportunity to address our comments to you.

While this report contains many innovative and valuable recommendations, we believe that it could be improved by incorporating the following suggestions:

- eliminate policy statements which endorse a valley-wide drain to the Delta
 - accelerate compliance with water quality objectives
 - strengthen implementation measures to guarantee water quality improvements
- These suggestions are explained in greater detail below.

Valley-wide Drain: Contra Costa County fundamentally opposes construction of an isolated drain to the Delta and we are disturbed by statements in your report advocating such a facility. Policy (f) on page 13 specifically endorses a valley-wide drain as "the best technical solution to the water quality problems of the San Joaquin River and Tulare Lake Basins." We strongly disagree. Constructing a valley-wide drain does not solve a water quality problem, it simply transfers that problem somewhere else. Since the Delta remains the only plausible site for a drain terminus, and since Delta waters are pollution-impacted, ecologically fragile, and relied upon by large portions of the state for drinking water, we believe that policy (f) advocates a particularly ill-advised means of dealing with the agricultural drainage problems of the San Joaquin Basin.

Further justification for challenging the Regional Board's policy on a valley-wide drain can be found within the staff report itself. Table A-2 in Appendix A lists "Discharge to the San Joaquin Delta" as an option for the Grasslands watershed which was eliminated from further consideration because of low acceptability, high cost, and "probable degradation of the delta." Likewise, the calculations presented in Appendix B demonstrate that source control measures, passive water table management, and land retirement can reduce selenium discharge loads to levels below what is required to meet water quality objectives in the San Joaquin River and thus would make a drain unnecessary. We also believe that endorsement of a valley-wide drain contradicts policy (g) on page 18 which states that "the optimization of beneficial uses on a watershed basis will guide the development of actions to regulate agricultural subsurface drainage discharges." We are not satisfied that water quality concerns in the Delta portion of the San Joaquin watershed were given adequate consideration in the decision to advocate a valley-wide drain and do not believe that discharging wastes from the Tulare Lake Basins to the Delta would be consistent with a watershed approach to drainage management. Finally, if the effluent from the proposed drain had the reduced level of toxicants mandated by policy (f), then we believe there is no justification for building a drain at all.

Compliance with Water Quality Objectives: While we are pleased that your staff report recommends tightening many of the numerical standards for selenium in the San Joaquin Basin, we believe that postponing mandated compliance with the standards for the San Joaquin River (which are only marginally different from the standards that should have been enforced in 1991) 20 or 25 years will not generate the swift improvements in water which are both possible and necessary. We believe that Potential Control Action 6 on page 26 should be rewritten with much earlier compliance dates that reflect the San Joaquin River's history of poor water quality as well as the current availability of drainage management strategies which could generate rapid improvements. An assessment of drainage strategies in Appendix B predicts that drainage effluent from the Grasslands watershed could be reduced to levels below those necessary to meet water quality objectives if a system of improved irrigation, passive water table management, and land retirement were implemented. The calculations presented there indicate that only 12% of the total tile-drained lands in the watershed would be retired or dedicated to water table management--an amount that is slightly less than the amount of land within the entire watershed (drained or not) which is fallowed during a drought.

We also recommend adjusting the 8,000 lbs./year limit for selenium from the Grasslands (Prohibition (d), page 29) to match the 7,096 lbs./year limit which the draining parties have agreed to in their plan to use a portion of the San Luis Drain.

Implementation Measures: We welcome the adoption of the Waste Discharge Requirement as well as many of the other proposed changes to the implementation element of the Basin Plan, but we do have a number of specific concerns. We believe that the implementation plan must address the provision of Policy (e) on page 18 which states that "the San Joaquin River may continue to be used to remove these salts from the basin so long as water quality objectives are being met." Water quality objectives in the river are not being met at the present and the proposed load reductions assigned by Waste Discharge Permits will not achieve compliance with water quality objectives for 20 or 25 years. The implementation plan must address this violation of Basin Plan policy.

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Additionally, we feel that 5 year review schedule for Waste Discharge Requirements described in Potential Control Action 10 is too long. We believe that a yearly review of the WDR would be more appropriate considering that some management strategies are experimental and that the current poor quality of water in the San Joaquin River demands immediate progress towards the water quality objectives.

Finally, we believe that the implementation plan must make the penalties for exceeding the load reduction schedules in the Waste Discharge Requirements explicit. Likewise, we would like the Regional Board to describe the specific circumstances under which it would request the withholding of irrigation water, as per Potential Control Action 1 on page 27.

Thank you for providing us with this opportunity to respond to the provisions of this staff report. If you have any questions regarding our comments, please call John Kopchik at (510) 646-4194.

Sincerely,

Charles A. Speltz
FOR
DIRECTOR

Harvey E. Bragdon
Director of Community Development



CONTRA COSTA
WATER DISTRICT

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October 4, 1995

Mr. Karl Longley
California Regional Water Quality Control Board
Central Valley Region
3443 Roubier Road, Suite A
Sacramento, CA 95827-3098

Subject: **Water Quality Objectives and Implementation Plan**

Dear Mr. Longley:

The Contra Costa Water District ("District") appreciates the opportunity to submit comments on the "Water Quality Objectives and Implementation Plan to be Used for the Regulation of Agricultural Subsurface Drainage Discharges in the San Joaquin River Basin" as outlined in the August 1995 staff report. I attended your September 22, 1995 workshop in Sacramento but had to leave before having a chance to present oral comments.

The District supplies water pumped from the Delta to approximately 400,000 people in central and eastern Contra Costa County, and has a vital interest in protecting the quality and reliability of its water supply. The District has historically opposed any drain that would convey valley drainage to the Delta and contaminate our water supply. The District recently joined with the Natural Resources Defense Council, the San Francisco Bay Institute, Contra Costa County Water Agency and Contra Costa County in intervening in the Summer Peak Ranch, Inc. versus Bureau of Reclamation and Firebaugh Canal Company and Central California Irrigation District versus United States lawsuits to protect the interests of the Contra Costa Water District.

Regional Board Policy Statements

The District has major concerns about the proposed changes to the Board policies outlined in the August 1995 staff report (Table 6 on page 18 of the staff report). Our concerns are with policies (e) and (f), namely:

- e. *Export out of the basin of accumulated salts due to agricultural irrigation and wetlands management is the favored disposal option. The San Joaquin River may continue to be used to remove these salts from the basin so long as water quality objectives are met.*

Mr. Karl Longley
Comments on San Joaquin Water Quality Objectives and Implementation Plan
October 4, 1995
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- f. *A valley-wide drain to carry salts out of the valley remains the best technical solution to the water quality problems of the San Joaquin River and Thlare Lake Basins. The drain would carry wastewater high in salt and silt for reuse that is generated by municipal, industrial, agricultural and wetland management activities.*
- The Regional Board, at this time, feels that a valley-wide drain will be the only feasible, long-range solution for achieving a salt balance in the Central Valley. The Regional Board favors the construction of a valley-wide drain under the following conditions:*
 - *All toxicants would be reduced to a level which would not harm beneficial uses of receiving waters.*
 - *The discharge would be governed by specific discharge and receiving water limits in an NPDES permit.*
 - *Long-term, continuous biological monitoring would be required.*

The District strongly opposes the concept of exporting drainage problems from their source to another location. Pollution must be curtailed at its source not exported to other areas, particularly when the receiving water is the already environmentally sensitive Delta. It is inconsistent for the Regional Board to be advocating export of contaminants from the valley and supporting a valley-wide drain when real efforts are being made to implement source control measures for agricultural drainage.

It is also inconsistent for the Regional Board to state there is a need to exporting drainage from the valley when the same policy requires that the toxicants in this water be reduced to a level that is harmless to the beneficial uses of the receiving waters. One of those beneficial uses is the drinking water that the Contra Costa Water District diverts at its Mallard Slough intake under License #10514 (dated August 12, 1975) and Permit #19856 (dated July 3, 1986) and its Rock Slough under its water supply contract with the Bureau of Reclamation. In addition, the District will soon be diverting water for municipal and industrial uses at its new Old River intake near Highway 4. If the water to be put into this valley-wide drain is of a quality good enough to protect the District's beneficial uses of Delta water (in other words, substantial source control programs have been successfully implemented), then this good quality water should be discharged into the San Joaquin as far upstream as possible to provide much needed fish flows. If, as policy (f) suggests, these water quality conditions will be met, it would be difficult to justify building a valley-wide drain.

There is a long history of violations of water quality objectives in the San Joaquin River and its tributary sloughs. The policies of the Regional Board should focus on source control to reduce the discharge of salts, selenium, and other contaminants and on strictly enforcing Federally-approved water quality standards.

The District recommends that policies (e) and (f) be deleted completely from the revised list of Regional Board policies (Table 6 on page 18 of the staff report).

Grassland Bypass Channel Proposal

At the September 22, 1995 Regional Board workshop, Regional Board and U.S. Environmental Protection Agency staff described the proposed use of a 28-mile section of an already existing portion of the San Luis Drain for conveying Grassland Basin drainage. The District is in the process of deciding whether or not to oppose this Grassland Bypass Channel proposal. As outlined in our September 29, 1995 letter to Ms. Penny Howard of the Bureau of Reclamation, our ultimate decision will depend on a number of factors including assurances that this Field Experiment will produce significant and permanent water quality improvements in Mud and Salt Slough and the San Joaquin River, and that the Field Experiment will not be extended beyond five years unless the Grassland Basin Drainers agree to comply with Federally-approved concentration limits. The District also recommends that the Drainage Incentive Fees proposed by the Bureau of Reclamation and other interested parties on September 14, 1995 be at least doubled to provide a real incentive to comply with the specified annual and monthly selenium load targets. The District is also concerned that we have not been provided with any details regarding the detailed monitoring plan that is an integral part of the Grassland Bypass Channel proposal.

The District recognizes this proposal to use the Grassland Bypass Channel for a Field Experiment has a number of potentially important benefits such as improved water quality in the Federal and State wildlife refuge areas and private wetlands, and a real-time monitoring program to allow detailed assessment of the reductions in pollutant loadings that will result from the planned source control measures. Collecting the drainage into a single conveyance system, instead of allowing it to flow through the many wetland area channels will allow better management of the drainage. The proposal sets an important precedent for regulation of agricultural drainage through Waste Discharge Requirements and associated compliance goals and fines.

If the District chooses not to oppose this Grasslands Bypass Channel proposal, this in no way diminishes the District's historical, long-held and unwavering opposition to any attempt to move forward with any extension of the San Luis Drain. The District wants assurances that this Field Experiment will not set a precedent for long term use of the Drain or extension of the existing San Luis Drain.

Extension of the Existing Drain Beyond the Confluence of the Merced River

As discussed above, the District has historically strongly opposed any extension of the existing San Luis Drain. The District is, therefore, concerned that any use of the Drain, interim or otherwise, might lead to future requests to extend the Drain, either to the San Joaquin River beyond the confluence of the Merced River, or to the Delta. The District is, therefore, particularly concerned that Regional Board staff, at the September 22, 1995 workshop, recommended that Phase II of the interim use of the San Luis Drain be an extension of the San Luis Drain beyond the confluence of the Merced and San Joaquin Rivers. The aim of this Field Experiment is to monitor drainage, study the effect of different source control and drainage management methods, and develop methods for permanent reduction of selenium loads to the San Joaquin River. The Grassland Basin Drainers are committing to a good faith effort to control drainage at its source and eventually reduce selenium loads to the San Joaquin River. If this Field Experiment is successful, it will establish that it is possible to use source control to meet the Federal water quality standard of 5 ppb selenium in the northern 6 miles of Mud Slough. If the Field Experiment fails, it will be because the Drainers have failed to adopt sufficient source control programs. Neither case, success or failure of the Experiment, would justify any extension of the existing San Luis Drain.

As discussed above, the District will oppose this Field Experiment if this Grassland Bypass Channel proposal sets a precedent for long term use of the Drain or extension of the San Luis Drain.

Selenium Water Quality Objectives and Compliance Time Schedule

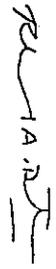
Table 11 on page 39 of the August 1995 staff report lists selenium water quality concentration objectives consistent with Federal standards. However, the compliance dates for these objectives are up to 25 years into the future. The Regional Board needs to take a leadership position in solving the problems of agricultural drainage in the valley. There have been enough studies and reports on methods for source control and drainage management; it is now time to require that these methods be implemented. The District recommends that all the selenium concentration limits in Table 11 be enforced and complied with as of October 1, 2000. This coincides with the end of the proposed 5-year Field Experiment.

The Grassland Bypass Proposal calls for selenium load reductions of 15% over the final three years of the Use Agreement. The enforceable selenium load target in the final year is 5661 lbs/year. The Drainage Problem Area target in Table 11 on page 39 should be reduced from 8,000 lbs/year to a value of 5,000 lbs or less to reflect the need to meet Federal standards.

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Comments on San Joaquin Water Quality Objectives and Implementation Plan
October 4, 1995
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I would appreciate your serious consideration of our concerns. If you have any questions, please contact me at (510) 674-8187.

Sincerely,



Richard A. Denton
Acting Water Resources Manager

cc: Roger Patterson (USBR)
Dan Nelson (San Luis Delta-Mendota Water Authority)
Roberta Goulart (Contra Costa County Water Agency)



**CONTRA COSTA
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December 7, 1995

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Mr. Karl Longley
California Regional Water Quality Control Board
Central Valley Region
3443 Router Road, Suite A
Sacramento, CA 95827-3098

Subject: Compliance Time Schedule for Agricultural Subsurface Drainage

Dear Mr. Longley:

The Contra Costa Water District ("District") appreciates the opportunity to submit written comments on the "The Compliance Schedule to be used for the Regulation of Agricultural Subsurface Drainage Discharges in the San Joaquin River Basin" as outlined in the November 1995 staff report.

On October 4, 1995, the District submitted written comments to the Regional Board on the August 1995 staff report on "Water Quality Objectives and Implementation Plan to be Used for the Regulation of Agricultural Subsurface Drainage Discharges in the San Joaquin River Basin." These comments noted the District's historical opposition to any drain that would convey valley drainage to the Delta and contaminate our water supply. The comments also noted that the District has intervened in the Summer Peck Ranch, Inc. versus Bureau of Reclamation and Firebaugh Canal Company and Central California Irrigation District versus United States lawsuits and is appealing Judge Wanger's decision requiring the U.S. Bureau of Reclamation to pursue completion of the San Luis Drain.

There has been a long history of violations of water quality objectives in the San Joaquin River and its tributary sloughs. The Regional Board should focus on source control to reduce the discharge of salinity, selenium, boron, molybdenum and other contaminants and on strictly enforcing Federally-approved water quality standards.

Compliance Time Schedule for Selenium Objectives

The District appreciates that the Regional Board staff have been responsive to comments on the April 1995 staff report and have reduced the compliance time schedule by as much as ten years. However, the new proposed compliance schedule date to bring the

Mr. Karl Longley
Comments on Compliance Time Schedule for Agricultural Subsurface Drainage
December 7, 1995
Page 2

San Joaquin River above the Merced River confluence and Mud Slough (north) into compliance with Federal standards is still 15 years. This is too long. According to Alydda Mangelstorf (U.S. EPA)'s presentation at the Regional Board workshop of December 7, 1995, EPA has never approved a compliance schedule longer than 10 years.

As noted in the District's October 4, 1995 comment letter, the District believes that there have already been enough studies and reports on methods for source control and drainage management. The Field Experiment using the Grassland Bypass Channel, if successful, will provide up to five more years of valuable data. The District is still in the process of deciding whether or not to oppose the use of an existing section of the San Luis Drain for this Field Experiment. Our ultimate decision will depend in part on whether this Field Experiment will result in significant and permanent water quality improvements in Mud and Salt Slough and the San Joaquin River and fulfill a number of potentially important benefits such as improved water quality in the Federal and State wildlife refuge areas and private wetlands.

The District requests that the Regional Board reduce the selenium water quality objective compliance periods in Table 1A of the November 1995 staff report even further to ensure compliance in the shortest possible time.

Regional Board staff apparently developed the schedule in Table 1A by extending the selenium load reductions in the Grassland Bypass Use Agreement beyond 1 October 2000. The District believes that the 15% reduction over last three years of the Use Agreement is not sufficient, and the Regional Board should require a much higher rate of load reduction once the Field Experiment ends.

The Regional Board should at least shorten the compliance period to require compliance with the objectives for the San Joaquin River below the Merced River by 1 October 2002, and compliance with the objectives for the San Joaquin River above the Merced River and Mud Slough (north) by 1 October 2005. This shorter compliance schedule (shown below as a revision of Table 1A) would allow some additional time to implement techniques in source control and drainage management learned from the Grassland Bypass Channel Field Experiment, but not unnecessarily prolong the exposure of beneficial users of the San Joaquin River and the Delta to unacceptable concentrations of selenium.

The District also recommends that the Regional Board use selenium load limits rather than interim performance goals to drive performance toward meeting the concentration performance goals. These interim selenium load limits should be based on monthly as well as annual targets in a manner similar to that outlined in the Grassland Bypass Channel Use Agreement.

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COMMUNICATIONS SECTION
CONTRA COSTA WATER DISTRICT

**Revised Table 1A SUMMARY OF SELENIUM WATER QUALITY OBJECTIVES
 AND COMPLIANCE SCHEDULE**

Selenium Water Quality Objectives (in bold) and Interim Selenium Load Limits (in italics)

Water Body/Year Type	1 October 1996	1 October 2002	1 October 2005
Salt Slough and Wetland Water Supply Channels	2 µg/L monthly mean		
San Joaquin River below the Merced River; Above Normal and Wet Water Year types	<i>Selenium load limits</i>	5 µg/L 4-day avg.	
San Joaquin River below the Merced River; Critical, Dry, and Below Normal Water Year types	<i>Selenium load limits</i>	5 µg/L 4-day avg.	
San Joaquin River above the Merced River and Mud Slough (north)		<i>Selenium load limits</i>	5 µg/L 4-day avg.

Extension of the Existing Drain Beyond the Confluence of the Merced River

As discussed in the District's October 4, 1995 comments, the District has historically expressed strong opposition to any extension of the San Luis Drain. The District is, therefore, concerned the November 1995 staff report on page 18 continues to advocate extension of the existing San Luis Drain beyond the confluence of the San Joaquin and Merced Rivers. As noted in the November 1995 staff report, success in accomplishing the load reduction goals and protection of the northern section of Mud Slough will depend on the aggressive development and implementation of cost effective load reduction technologies. The District believes that these goals must be achieved to protect both the beneficial uses of Mud Slough and downstream users such as the 400,000 raw water and treated water customers of the Contra Costa Water District. Because these goals must be achieved there is no justification for extending the existing San Luis Drain.

Water Quality Objectives for Salinity, Boron, and other Contaminants

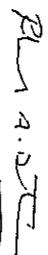
The Regional Board at this time appears to be focussing its efforts on first regulating selenium. The District is concerned that this has resulted in a delay in the Regional Board's efforts in seeking the reduction in other contaminants such as salinity and boron. As part of the California State Water Resources Control Board's Bay-Delta process, the District and many others have highlighted the need to reduce the salt load to the Delta from the San Joaquin Valley. The District also requests that the Regional Board increase its efforts to regulate pesticides such as diazaron which have been found in the Delta in concentrations that cause 100% mortality to fish. The District encourages the Regional Board to assist the State Board in meeting its goals of improving water quality and fisheries habitat in the Delta by requiring significant reduction in these other contaminants.

Prohibition of New Subsurface Drainage to the San Joaquin River or Tributaries

The District supports proposed action (a) on page 10 of the November 1995 staff report that prohibits discharge of new subsurface drainage to the San Joaquin River or tributaries from any tile or open drainage system. The staff report defines new drainage as drainage begun after 1 January, 1996. As was shown in Table B-5 of the August 1995 staff report, the total cropped area increased from 72,084 acres in 1986 to 82,604 acres in 1994 and the area in production similarly increased during this period. To meet the proposed selenium water quality objectives will require an aggressive program of load reduction, drainage management and source control by the draining parties. Any further increase in irrigated acreage or additional discharges would be counterproductive toward meeting the water quality goals.

I would appreciate your serious consideration of our concerns. If you have any questions, please contact me at (510) 688-8187.

Sincerely,



Richard A. Denton
 Water Resources Manager

cc: Roger Patterson (USBR)
 Dan Nelson (San Luis Delta-Mendota Water Authority)
 Roberta Goulart (Contra Costa County Water Agency)



October 4, 1995

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Via Fax and Mail

Mr. Karl Longley, Chair
California Regional Water Quality Control Board
Central Valley Region
3443 Router Road, Suite A
Sacramento, CA 95827-3098

Dear Chairman Longley:

Please find enclosed the comments of the Environmental Defense Fund in the matter of Water Quality Objectives and the Implementation Plan to be Used in a Basin Plan Amendment for Regulation of Agricultural Subsurface Drainage in the Grassland Area.

Sincerely,

Terry F. Young, Ph.D.
Senior Consulting Scientist

TFY/pf

cc: Ms. Felicia Marcus, EPA
Mr. Roger Patterson, USBR
Mr. John Caffrey, SWRCB
Mr. Bill Crooks, RWQCB, Central Valley Region

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ENVIRONMENTAL DEFENSE FUND

COMMENTS OF THE
ENVIRONMENTAL DEFENSE FUND
ON
THE WATER QUALITY OBJECTIVES AND IMPLEMENTATION PLAN
TO BE USED FOR THE
REGULATION OF AGRICULTURAL SUBSURFACE DRAINAGE DISCHARGES
IN THE SAN JOAQUIN RIVER BASIN
OCTOBER 4, 1995

The proposal currently before the Regional Water Quality Control Board, Central Valley Region (the "Board") has a long history. As early as 1987, the State Water Resources Control Board accepted the recommendation of its "85-1 Technical Committee" that a pollution control program should be initiated for the Grasslands region in order to reduce the levels of subsurface drainage discharges. At the same time, water quality objectives (including an objective of 5 ug/l selenium as a monthly average) were recommended for adoption for the San Joaquin River.

The Board adopted these objectives for all but critically dry years in 1988, with an implementation date of October, 1991. Since that time, the selenium objective has been violated routinely, as has been pointed out in numerous staff reports over the years. The more stringent standard subsequently adopted by the Environmental Protection Agency (which is currently in force) also has been routinely violated.

Because the implementation approach initially chosen by the Board, consistent with the state's Nonpoint Source Management Plan, did not appear likely to achieve water quality objectives, the Environmental Defense Fund (EDF) undertook a study of other implementation options. Specifically, EDF investigated the feasibility of using economic incentives to control agricultural pollution in the region. The results, presented in detail in EDF's Plowing New Ground,¹ demonstrate that using economic incentives to achieve the drainage reduction required to meet water quality objectives is not only feasible, but advisable. Specifically, we propose the use of tradable discharge permits among water districts and tiered water pricing (combined with limited drainage recirculation) within water districts. To initiate this program, the Board would be required to issue and enforce a regional effluent load limit, which would then be subdivided among water districts by the Board (or a regional drainage district, if formed). If implemented, this program would both meet effluent load limits set by the Board and provide flexibility to farmers to choose

¹ EDF has already provided copies of Plowing New Ground to Board staff. Copies of the Executive Summary are attached for the Board's convenience.

their own methods of drainage reduction. It also would achieve region-wide effluent limits (regardless of the specific limits chosen) at the lowest cost of any of the alternatives investigated.²

It is from this perspective that we offer the following comments on the Board's proposed program. In a nutshell: we agree with the need to set specific limits on the discharge of selenium, but strongly recommend that these limits be incorporated as enforceable effluent limits in a Waste Discharge Permit; we agree that the Board staff's "Total Maximum Monthly Load" calculation is the best method to use to derive these effluent limits; and we support the Board's attempts to encourage the formation of a regional drainage district. Each of these components is not only consistent with the program proposed in Plowing New Ground, but also consistent with the obvious need to make farmers and districts in the region specifically accountable for their pollution discharges.

Creating this accountability also requires, however, the adoption of the selenium objective (of 3 ug/l as a four-day average not to be exceeded more than once every three years) effective immediately and not, as proposed by staff, with a compliance date of 2015 -- twenty-four years after the compliance date first set by the Board for the monthly average standard. The approach proposed by staff is incompatible with the Environmental Protection Agency's requirements. It would also effectively reward noncompliance. The record does not indicate that dischargers in the region have been moving aggressively to attempt to comply with even the old objective. Selenium loads from the region during the past two years are comparable to the load discharged in 1989, just after the Board first adopted its earlier implementation program, despite a preponderance of expert opinion that drainage reduction is both achievable and effective at reducing selenium discharges. Accordingly, we recommend that the Board choose a compliance date concurrent with the adoption of the standard, and issue a compliance schedule that requires the achievement of the monthly drainage loads calculated by Board staff's Total Maximum Monthly Load for a one-in-five-month exceedance rate within five years.

EDF offers these recommendations based on the belief that they can form the foundation for an environmentally protective and cost-effective program. It is also from this perspective that we encourage the Board to refrain from promoting a valley-wide drain as the ultimate solution to this problem. Reliance on the future promise of some "magic bullet" to solve problems currently caused by the toxic trace elements in drainage discharges simply diverts attention from the progress that is achievable today. Similarly, the Board should make it clear that no new evaporation ponds will be allowed to receive drainwater whose selenium concentrations exceed 2 ug/l. And last, we point out that the control action that proposes to place responsibility on a host of state and federal agencies

for the implementation of a "wetlands bypass" is misplaced -- the recipients of pollution discharges should not be required to provide pollution management.

EDF has provided the Board with numerous other comments on this issue, that we include as attachments to these comments and incorporate by reference. These include, in addition to Plowing New Ground:

EDF's Presentation to the Board dated September 22, 1995;

EDF's letter of December 8, 1994 regarding the previous Basin Plan Amendment; and

Letter from EDF and others to Mr. Carlos Madrid dated September 14, 1995.

² If implemented as proposed, moreover, the program would include refunds of the water districts' net proceeds from tiered water prices to the farmers on a per-acre basis. This system would potentially provide a financial benefit to those farmers who are most efficient and defray the costs of irrigation efficiency improvements.

ENVIRONMENTAL DEFENSE FUND

Presentation to the Central Valley Regional Water Quality Control Board
Regarding Water Quality Objectives and Implementation Plans for the Grassland Area
22 September, 1995

** EDF supports the Regional Board's proposal to assign a Waste Discharge Requirement with specific effluent limits to the draining entities while allowing the dischargers flexibility to determine the most effective method of compliance.

** The Waste Discharge Requirement should contain enforceable, numeric effluent limits.

** We recommend that the Regional Board encourage the dischargers to use economic incentive programs to assure compliance. Regional and district programs should reward farmers who are most successful at reducing drainage.

** The results of EDF's analysis in Plowing New Ground indicate that this approach will result in the most cost-effective, flexible, and environmentally protective program.

** EDF supports the Regional Board's focus on selenium load reductions as a mechanism both to secure compliance with concentration-based water quality objectives and to protect aquatic life and wildlife against the adverse effects of bioaccumulation.

** The Regional Board's TMMI is the best tool currently available to implement this approach because it maximizes allowable discharges while still protecting water quality.

** The proposed compliance period (20 years) is unjustifiable.

** The Basin Plan should clearly state that the proposed water quality objective for selenium in the San Joaquin River (below the Merced) is effective immediately. The dischargers have been out of compliance for six years. It is not in the interest of the Regional Board or the environment to reward the lack of progress demonstrated thus far.

** Even the analysis of the Regional Board staff shows that the loads associated with a "1-in-5-month" exceedance rate are achievable with current technology. Additional load reductions can be achieved using additional, currently available technology not included in the analysis. Costs can be defrayed by aggressive use of water marketing.

** EDF supports the Regional Board's proposal to encourage the formation of a regional entity that has the authority to control drainage flows.



ENVIRONMENTAL
DEFENSE FUND

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December 8, 1994
Page 2

December 8, 1994

Mr. Karl E. Longley, Chair
California Regional Water Quality Control Board
Central Valley Region
3443 Router Road, Suite A
Sacramento, CA 95827-3098

Dear Chairman Longley:

Thank you for this opportunity to comment on the Regional Water Quality Control Board's (Regional Board's) proposed amendment to update the Water Quality Control Plan for the Sacramento River (5A), Sacramento-San Joaquin Delta (5B), and San Joaquin River (5C) Basins. In this letter, we focus on the proposed water quality objectives for the San Joaquin River and its tributaries and the associated implementation plan for controlling agricultural drainage discharge.

In brief, we urge the Regional Board to adopt, rather than simply reference, the currently-applicable water quality standards (promulgated by the Environmental Protection Agency¹) for the San Joaquin River and its tributaries (including, but not limited to, Salt Slough and Mud Slough). Delaying the inclusion of these standards in the Basin Plan creates unnecessary conflict with both the Environmental Protection Agency and the Bureau of Reclamation, and it invites further delay in the negotiation of terms for use of the San Luis Drain and timely implementation of drainage reduction programs.

We would also urge the Regional Board to set a firm date for action on the drainage control requirements necessary to implement these objectives.

¹ Environmental Protection Agency, Rulemaking: Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants; States' National Rulemaking Process, 57 Fed. Reg. 60848, December 22, 1992.

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Background. In 1985, the State Water Resources Control Board (State Board) acknowledged the seriousness of the selenium contamination of the San Joaquin River and nearby wetlands and convened a Technical Advisory Committee to recommend appropriate water quality objectives and an associated implementation plan. The recommendations of the Technical Advisory Committee¹, which were accepted by the State Board in 1987,² were partially incorporated into the Regional Board's Basin Plan in 1989.³

The provisions of this Basin Plan Amendment included a 5 ug/l (monthly mean) selenium objective for the San Joaquin River; the compliance date for this objective was October, 1991. The Basin Plan Amendment, consistent with the State Board's Nonpoint Source Management Plan, envisioned a program of voluntary compliance, to be supplemented with Waste Discharge Requirements if water quality objectives were met. The Basin Plan Amendment also included more lenient water quality objectives, along with a longer compliance period (October 1993) for Salt Slough, Mud Slough and the San Joaquin River segment north of the Merced.

Several elements of the 1989 Basin Plan Amendments were disapproved by the Environmental Protection Agency, including the water quality objectives listed above. In a subsequent action, the Environmental Protection Agency promulgated water quality criteria for the San Joaquin River, Mud Slough and Salt Slough (including a criterion of 5 ug/l selenium as four-day average). These standards are referenced, but not adopted, in the currently-proposed Amendment. Notably, the State Board's Inland Surface Water Plan, which was intended to supersede the Basin Plan, also adopted the 5 ug/l, four-day average selenium standard for the San Joaquin River (from the mouth of the Merced River to Venalis).

Neither the standards in the current Basin Plan, nor the legally-applicable (and slightly more stringent) standards promulgated by the Environmental Protection Agency have been met in any year since 1989. San Joaquin River objectives have been consistently violated since the Basin

¹ see SWRCB Order No. W.Q. 85-1; Technical Committee Report, "Regulation of Agricultural Drainage to the San Joaquin River," August 1987.

² Resolution No. 87-78.

³ Regional Board Resolution No. 88-195, adopted December 8, 1988.

Plan's compliance date in 1991 and since the effective date of the federal standards. The same is true of Salt Slough and Mud Slough. Moreover, continued violation of the standards has been accompanied by increases in selenium loads during the past two years. During this time, the Regional Board has taken no formal compliance action of which we are aware.

Recommendations Regarding the Proposed Amendment. In the face of clear direction from both the State Board and the Federal government that the water quality objectives should be made more stringent, the proposed Amendment does not do so; the proposed changes' instead indicate that the Regional Board is unwilling to take the steps necessary to comply with state and federal law and policy. In the absence of adequate state standards, the EPA-promulgated standards are in effect and must be implemented by the Regional Board. See 33 U.S.C. Section 1313(a)(3)(c); 40 CFR Section 131.21 (EPA-promulgated standard supersedes state standard).

In addition to acting on the federally-promulgated standards, the Regional Board must respond more aggressively to the continuing violations of water quality standards. The proposed Amendment states that "the Regional Water Board is currently in the process of updating and revising the implementation plan to control agricultural subsurface drainage." EDF applauds the apparent intent to take action, but suggests that a specific hearing schedule be noticed as part of this proceeding.

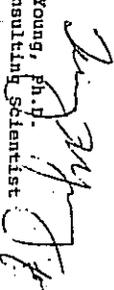
It is our strong belief that implementation of a reasonable and practical program for controlling drainage can begin immediately. A detailed plan for implementing such a program was recently published by EDF; "Plowing New Ground" incorporates the Total Maximum Monthly load model produced by the Regional Board staff and analyzes the most cost-effective program for implementing the discharge goals defined by the model.

¹ See Table III-1. The proposed Amendment deletes the current objectives for Mud Slough, Salt Slough and the San Joaquin River segments above the Metcalf, but does not replace them with a specific objective. While the federal standards are listed, they are not adopted as part of this proceeding for any of the stream reaches.

Several copies of the report, "Plowing New Ground", have been provided to the Regional Board.

Water quality violations are continuing; pollution discharge to the River is increasing; both the technology and a practical program for implementing the standards are available. We urge the Regional Board expeditiously to begin the process of enforcing these standards.

Sincerely,


John Krautkraemer
Senior Consultant
Scientist
Senior Attorney

cc: Mr. Bill Crooks
Ms. Felicia Marcus
Mr. Roger Patterson
Mr. Roger James
Mr. Gary Bobker



Grassland Water District

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October 4, 1995

Via Facsimile
(916) 255-3015

Mr. William H. Crooks, Executive Officer
California Regional Water Quality Control Board
Central Valley Region
3443 Roulter Road, Suite A
Sacramento, CA 95827-3098

Subject: Comments on the Staff Report on the Water Quality Objectives and the Implementation Plan to be Used in a Basin Plan Amendment for Regulation of Agricultural Subsurface Drainage in the Grassland Area

Dear Mr. Crooks:

The Grassland Water District (GWD) appreciates the opportunity to comment and provide input to the Regional Board's Basin Plan Amendment process.

The comments offered herein — as were the comments we made at the September 22, 1995 workshop — are limited to the proposed objectives for the Grassland wetland water supply channels.

These channels, as is stated in the staff report, currently serve a dual role in that they are used to convey wetland water supplies and, at alternate times, agricultural drain water containing elevated levels of selenium.

As the report also states, since the enactment of the Central Valley Project Improvement Act of 1992 the private and public wetlands within the Grasslands have received increased supplies of Central Valley Project water. Because of the increased demand on the system the presence of drainwater puts these supplies at risk from contamination. At the very least the presence of drainwater has periodically caused critical delays in the delivery of water to Grasslands and the refuges.

We therefore concur with the staff recommendation as presented in the report and urge the adoption of the 2 ppb selenium objective for the Grassland wetland water supply channels as defined in Tables 2 and 4 of the June, 1995 staff report on Beneficial Use Designations.

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We also agree that, at least at the present time, it is not possible for the upslope draining entities to meet the 2 ppb selenium objective without implementing the wetland bypass project incorporating the use of the San Luis Drain. The GWD actively supports this project and urges the Regional Board to do so as well.

With this in mind we must take strong exception to the position taken in Table 8 paragraph b of the report, which states:

"The discharge of agricultural subsurface drainage water to wetland water supplies and wetland water supply channels within the Grassland watershed is prohibited after 1 October 1996 unless water quality objectives are being met. This prohibition may be waived (emphasis added) if third party interests prevent the implementation of the wetland bypass."

Although we believe the bypass project as presently proposed can and will be successfully implemented it seems disingenuous to set out to protect the beneficial uses of the wetland channels as vigorously as the staff report does and then waive that protection if a single action, or project, fails to be implemented without identifying an alternative implementation plan (or plans) and an alternative compliance schedule. Moreover, if the bypass plan fails to be implemented we cannot assume that the status quo will be maintained, i.e. that wetland water supplies will be at least nominally protected by continuing to alternate drainage and wetland water flows in the Grassland system.

In actuality there is a strong possibility that wetland water supplies will be immediately impacted if the Drain project is not allowed to proceed. This is because in addition to the aforementioned alternating of flows in the South Grasslands, the protection of the Grassland wetlands has depended upon an existing bypass channel - the Santa Fe Canal/Mud Slough Bypass - which currently diverts agricultural drainwater around the North Grassland water supply channels.

Initiated as a 5 year interim project in 1985, the operation of this facility has been allowed to continue for twice that length of time based on the on-going assumption that the more comprehensive bypass project, i.e. the use of the San Luis Drain, would soon be implemented thus eliminating the need for the Santa Fe Canal/Mud Slough Bypass. If the San Luis Drain project is not implemented and there is no backup implementation plan and compliance schedule for removing the contaminated drain water from the GWD system on the horizon there is a very real possibility those entities affected by the operation of the Santa Fe Canal/Mud Slough Bypass, specifically the San Luis Canal Company and the Department of Fish and Game, will be forced to foreclose on it's continued use thereby immediately contaminating the water supply and adversely affecting the beneficial uses of approximately 23,000 acres of public and private wetlands in the North Grasslands.

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We therefore urge the Regional Board to remove the language providing for a waiver of the proposed 2 ppb selenium objective in the absence of the wetland bypass project. In its stead we request that alternative implementation plans and compliance schedules be identified. To leave the issue open-ended and unanswered will do nothing to address the protection of beneficial uses within the Grassland wetlands and could, in fact, lead to a counteractive degradation of those beneficial uses.

Sincerely,



Don Marciochi, General Manager
Grassland Water District

DM:mnc

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Statement of Congressman George Miller
before the
California Regional Water Quality Control Board
Central Valley Region
December 7, 1995

I thank the Regional Water Quality Control Board for providing this opportunity for public input on the compliance schedule for selenium water quality standards in the San Joaquin River and its tributaries. The public deserves every opportunity to provide input on the importance of these water quality standards for human and environmental health. However, I would urge the board not to use this workshop or this process as an excuse for further delay in the imposition of water quality standards.

The serious downstream problems resulting from irrigation drainage from the San Joaquin Valley have been recognized for decades. Even before the San Luis Unit was authorized, critics raised vigorous concerns about the drainage problem. At that time, no decision was made to make significant efforts to control the production of drainage wastes. Instead, irrigators planned a master drain to transport the contaminated wastes away from their land and to dump it into one of the most fragile and economic significant estuaries in the world: the Sacramento-San Joaquin Delta and San Francisco Bay.

The consequences of that decision continue to haunt us today, decades later, with the specter of the Keseterson disaster hanging over everyone who attempts to brush off this problem.

Throughout the decade since the Keseterson Reservoir was closed, proposals and initiatives to resolve the drainage problem have yielded little but studies, studies and more studies. The plan for reducing irrigation drainage from the San Joaquin Valley has never been fully implemented, and selenium-rich drainage continues to flow into the San Joaquin River after first contaminating other lands, including refuges. Throughout this decade of delay, other polluters in the Central Valley and Delta have worked to clean up their discharges and meet water quality standards, while selenium flows unabated from the Drainers.

The farmers and irrigation districts who produce selenium-laden drainage have offered no long-term solutions to solve this water quality crisis, except to export their wastes to the Delta or the Pacific Ocean. They have hired the best attorneys and lobbyists money can buy to ensure that they will never have to pay for the past costs of cleaning up their mess of drainage water and agricultural waste. They have fought long and hard against new government laws or policies that would require them to fix their agricultural drainage problems. And they have sued the federal government to force transport of drain water to the Delta.

It is time for that irresponsible behavior to stop. It is time to impose tough standards on those who generate the drainage discharge, and it is time for them to realize that the solution to their problem is not to dump their wastes into our backyards.

I opposed the Bureau of Reclamation's agreement for interim use of the San Luis Drain, and I continue to believe it was the wrong decision; those who produce pollution must be held responsible for cleaning it up.

The agreement signed by the Bureau does contain several provisions that, properly enforced, could give us the first real hope for reductions in the selenium loads entering the San Joaquin River. This will be the first time that the Bureau of Reclamation has conditioned its approval of drainage discharges based on many significant environmental commitments, including actions by this Regional Water Quality Control Board.

1. The Board must adopt and implement a basin plan for water quality that considers the impacts of drainage.
2. The Board must issue meaningful Waste Discharge Requirements for the Drain, including enforceable selenium effluent limitations
3. Monitoring of discharges and possible environmental impacts will be a conducted in an aggressive and scientifically defensible manner.
4. The Drainers and the federal and state agencies will work in a cooperative manner with downstream water users, including Contra Costa Water District, to coordinate discharges from the Drain.
5. Drainage incentive fees will provide additional incentive for reductions in selenium loads. These provisions are significant because, for the first time, the Board may impose penalties for violations of water quality limits. The requirements also link the recommendations of the San Joaquin Valley Drainage Study Program to real-time performance in reducing drainage contributions.

6. Creation of a regional drainage entity and planning for long-term drainage management by the Drainers are also required.

The draft Use Agreement specifies that the agreement will be terminated if selenium discharges exceed certain limits. Specific, numerical limits on selenium discharges need to be set by this Board. If the Board does not act on the limits stated in the Use Agreement and the proposed letter to the Board (Appendix 4), then all this work will be wasted and the right to use Drain will be voided.

This Board must now exercise a leadership role in establishing compliance schedules for water quality improvements and eventual compliance with water quality standards. A schedule for enforcement of water quality objectives and performance goals must be adopted. I believe the interim stages of enforcement in this plan are too lenient. The schedule waits until the year 2010 before water quality objectives in the San Joaquin River and Mud Slough will be met. This additional fifteen years of delay fails to recognize the past 6 years during which the Drainers have been on notice that their selenium loads must be reduced, and is inconsistent with the arguments and commitments of the Drainers themselves in entering the Interim Use Agreement with the Bureau.

The Drainers have argued that they need to use the San Luis Drain in order to get a complete picture of the amount and concentration of selenium contained in their drain water. They then argue that they will be able to improve drainage management. The Interim Use Agreement takes this purpose into account by requiring no drainage reductions for two years, but then requiring annual reductions in selenium loads, until the agreement terminates in 2000.

The Board's selenium standards should track these commitments. Annual selenium reduction should begin in 1997. At the very least, load reductions should be imposed by 2000, rather than waiting for 2002. In addition, it is hard to understand what the Board anticipates will happen between termination of the agreement in 2000 and final selenium reductions in 2010. There is no justification for granting the Drainers an additional 10 years to meet water quality objectives when they have no definite prospect for use of the Drain. It appears that the Drainers will simply obtain the right to pollute our rivers and our Delta for another decade.

I urge the Board to reconsider this schedule and impose more stringent requirements for reducing selenium loads in the San Joaquin River and Mud Slough. As history shows us, every time we postpone dealing with this poisonous irrigation drainage, the irrigators take the opportunity to find further loopholes and opportunities for delay.

Thank you for your consideration of these comments.



4 PAGES

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October 4, 1995

Mr. Karl Longley, Chairman
California Regional Water Quality Control Board
Central Valley Region
3443 Roulter Road suite A
Sacramento, CA 95827
FAX: (916) 255 3015

Dear Mr. Longley:

In regard to the Regional Board Staff Report on Water Quality Objectives and Implementation Plan to be used for the Regulation of Subsurface Agricultural Drainage Discharges in the San Joaquin River Basin: Thank you for the opportunity to comment on the proposal. However, I must protest. The proposal to build a valley-wide drain as the "best technical solution to the water quality problems of the San Joaquin River and the Tulare Lake Basin" is unacceptable. Clearly, the best technical, financial and environmental solution is to CURTAIL THE SOURCES OF POLLUTION. It is a totally unreasonable solution to propose sensitive areas. Unfortunately, for the last 9 years, your Regional Board has failed in its duty to enforce water quality standards protecting the beneficial uses of the San Joaquin River. This was and is an obligation required by law.

As for the proposed reopening of a portion of the San Luis Drain by the Delta Mendota Water Authority and the Bureau of Reclamation, I enclose a copy of my comments on that proposal. For your information, I am opposing the project, unless there can be assurances that 1. Prior to any new discharge, the existing Luis Drain proposed for use, 2. Immediate waste load reductions by the drainers to protect the San Joaquin River from the additional "lost" load (estimated to be as much as 25%) formerly absorbed by the Grasslands, 3. Immediately have USGS develop a credible monitoring program, 4. The Regional Board to give assurances that they will enforce the load limit standards of 8,000 down to the Federal target of 5,000, over the 5 years of the program.

Sincerely yours,

Carla Bard, former Chair, Pacific Region Water Law Assoc Corporation
Sana Clara St. 94001 PO Box 130 Ventura, CA 93002 (805) 643-6616 TELEX 69-1729 FAX (805) 633-6335



To: Penny Howard, Environmental Officer
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Mid-Pacific Region
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Sacramento, CA 95025
FAX (916) 979 2139

October 3, 1995

RE: PROPOSAL TO REOPEN THE SAN LUIS DRAIN
Revised Comments

My name is Carla Bard. I am the former Chairwoman of the State Water Resources Control Board and I am representing Patagonia Inc, headquartered in Ventura, California. I am here to strongly oppose the Bureau of Reclamation plan to reopen the San Luis Drain. The plan was conceived, contrary to law, in secret meetings between the regulators and the regulated - San Luis / Delta Mendota drainers of toxic wastewater, the Environmental Protection Agency, the Regional Water Quality Control Board, an environmental organization and the Bureau. The plan was announced in haste. The Environmental Assessment issued by the Bureau indicates serious, unmitigated, environmental damage will occur. Yet the time allotted for written comment and independent scientific review is ridiculously short and the so-called public meetings were clearly formatted to prevent adequate public participation. The whole process is a disgrace.

In 1985, the San Luis Drain and the Kesterson Wildlife Refuge were ordered closed by the State Water Resources Control Board because of documented and devastating environmental damage from selenium faced, toxic drainwater coming from the Westside of the San Joaquin Valley. Both the Drain and the Refuge are known to contain enormous amounts of selenium and other contaminants. The Drain has never been cleaned up. In the nine years since the Drain was closed, toxic drainage has continued to flow unchecked, now dumping into the San Joaquin River. In that same 9 year period, neither the Regional Board nor the State Board have acted to obey the law and enforce the protection of the San Joaquin River. They have allowed what was once one of California's finest rivers to deteriorate into a state of degradation unparalleled in a modern, developed nation.

Impaction of lands for agricultural crop production in many areas on the west side of the San Joaquin Valley is an unsustainable practice and directly causes water quality degradation and fish and wildlife contamination in the San Joaquin River. The law requires the attainment of full water quality protection for fish and wildlife resources in the San Joaquin River. The proposal by the Bureau to reopen the drain allows the devastation to the San Joaquin River to continue and worsen. Contrary to the Bureau's claims that the proposed reopening will improve the environment by removing the

drainwater from the Grasslands, the shocking fact is that the Bureau's own Environmental Assessment shows, on Pages 25 - 32, that along with the current 8,044 lbs. of selenium per annum presently entering the San Joaquin River, there will be an ADDITIONAL 15,000 LBS. OF SELENIUM during the next six years. As written, the Bureau's plan is a prescription for disaster and should be frightening to any agency with responsibility to protect the public and its resources.

In addition to damage to the San Joaquin River and its habitat, the proposed plan will allow continuing major impacts on the Bay/Delta region because the San Joaquin River runs north. It will also allow continuing danger to Southern California drinking water customers of the Metropolitan Water District. Reopening the drain will divert toxic drain water, formerly run across the Grasslands and Salt Slough, straight through Mud Slough to the San Joaquin River. Most people don't know that during the summer months - by the State Water Board's own testimony - ALL of the San Joaquin River flows consist of San Joaquin Valley toxic drainwater. Some of this drainwater is pumped south in the State Aqueduct to the Metropolitan Water District, stored in Pyramid Lake and distributed to MWD's customers. Some is reused in the Central Valley. The rest goes to the Bay/Delta.

In 1985, the Stockton Record called the San Joaquin River "The State's lower colton". That article also said: "The polite call it a drain and the direct call it a flowing cesspool". One might ask: Why are Southern Californians drinking agricultural sewage from the Central Valley? Following this revelation, MWD completely revamped its water monitoring program but never sampled fish or bottom sediments and biota in Pyramid lake for selenium which bioaccumulates. Many low income people fish in Pyramid Lake.

A Fresno Bee article revealed serious contamination of fish tissues in Aqueduct samples taken by the California Department of Water Resources. Following the story, DWR quietly dropped the sediment and fish tissue monitoring, went back to "grab" water samples and thereby avoided the whole problem. Many low income people fish along the California Aqueduct.

The remaining salmon of the San Joaquin River will not escape the impacts of the proposed reopening of the drain. Under the plan, toxic drainage flows to the San Joaquin River will not be reduced for at least 2 years - perhaps 5 years. If the waste flows are not reduced - and soon - the last remnant salmon, far from being restored, may well be totally destroyed by the time the so-called "test" reopening is completed. There will be toxic "slugs" of drainwater entering the San Joaquin River. The Bureau's Draft Environmental Assessment admits this on page 41. It then suggests that upstream San Joaquin River water users be advised not to use the water when such "slugs" come their way. The Bureau does not suggest a way to inform the fish and wildlife that new toxic "slugs" are coming their way.

There may need to be an interim drainage program, using the San Luis Drain, while we work towards waste load reduction and land retirement - the adopted, long term solutions called for in the Central Valley Improvement Act and the San Joaquin Valley Drainage Report. We may need to temporarily reopen a 28 mile segment of the San Luis Drain with a 2 year test of discharge. However, we must protect the public trust resources, which belong to all the citizens of California. That protection requires AT LEAST the following assurances prior to the first discharge.

1. Clean out and properly dispose of the sediments that are already in the San Luis Drain to provide a relatively clean playing field for monitoring future discharges.
2. Include assurances of enforceable, reduced waste discharge loads, starting immediately and continuing on a phased basis.
3. Develop a credible monitoring and enforcement program. Credibility is critical. Sadly, the Regional Board does not have a record of credible monitoring or enforcement. The United States Geological Survey has an unblemished monitoring record and is willing to monitor. Enforcement must be guaranteed by the Regional and State Boards, backed up by the EPA.

4. Hold properly noticed, widely advertised public hearings, giving real opportunity for citizen participation and scientific peer review. The Environmental Assessment document and the FONSI were issued September 14, 1995. They were made available Friday, September 15 and were not received by interested parties until at least Monday, the 18th. The documents are inadequate under NEPA. While I have not had an opportunity to review it, it is my understanding that a CEQA Negative Declaration was issued by the Delta Mendota Water Authority. This would be in error. Under California law, a project of this magnitude clearly requires an EIR. To date, there has been almost no publicity about the proposal. While the Bureau has mailed out a number of notices, it is also the obligation of the Bureau to seek more publicity. There has clearly not adequate public notification on an issue of such vital public importance as the reopening of the San Luis Drain.

Finally, we must be prepared to pursue whatever litigation is required to obtain these assurances. This may include actions under CEQA, NEPA, Waste and Unreasonable Use and Public Nuisance.



Patagonia

Porter Fax Note	7871	San	12/19/95	1:48
To	VALLEY REGIONAL WATER CONTROL BOARD	From	CHOLET 86480	
Subject	RE: COMPLIANCE TIME SCHEDULE	On	PATAGONIA	
Phone #	916 225 3015	Phone	805 647 4563	
Fax #	916 225 3015	Phone	805 643 1648	

December 5, 1995

Karl E. Longley, Chair
 Members of the Board
 Central Valley Regional Water Quality Control Board
 3443 Roubler Road, Suite A
 Sacramento, CA 95827-3098
 FAX # (916) 255 3015

RE: Compliance Time Schedule San Joaquin River Basin Staff Report

Dear Mr. Longley and Members of the Board:

Thank you for the opportunity to comment on the amended November 1995 staff report on the compliance time schedule for the San Joaquin River Basin.

GENERAL COMMENTS

Staff is to be commended for reducing the time frame of salt loading/selenium compliance to 15 years instead of 25, however, the implementation plan is still grossly inadequate. After the 10 years of flagrant water quality violations permitted by your Board, in no way does the current plan result in timely, acceptable conditions in the San Joaquin River Basin. Those members of the public (citizens of Stockton, rate payers of the Contra Costa Water District and the Metropolitan Water District, for instance) who derive all or part of their drinking water from the San Joaquin River and who depend on your Board to provide assurance of immediate, acceptable water quality standards in the San Joaquin River have been betrayed again. The valleywide drain continues; to be your staff's recommendation as the favored solution to the problem of toxic agricultural drainage. Contrary to NEPA and CEQA, your staff continues to recommend this draconian project without the analysis required by law. Nor does staff present any serious discussion of land retirement or precluding water delivery to areas discharging contaminated drainwaters. For your Board to recommend the transfer of a San Joaquin Valley pollution problem to another environmentally sensitive area is clearly not consistent with your obligations under Porter Colagne or the Federal Clean Water Act.

What purports to be a report on a "compliance time schedule" actually moves away from real water quality standards or regulation towards goals and voluntarism and "There are now "goals" instead of "water quality objectives" and enforcement appears to be largely voluntary. Having served as Chairwoman of both the Los Angeles/Ventura County Water Quality Control Board and the State Water Resources Control Board, I am as well aware as your Board, that "goals" are in no way a

"compliance schedule". The so-called "Compliance Time Schedule for the San Joaquin River Basin" is in essence a two year permit for unabated toxic drainage into the San Joaquin River, followed by a period of 13 years of continuing water pollution with at best, a 15% maximum improvement during that whole 15 year period. After 10 years of egregious toxic pollution of the San Joaquin River, sanctioned by the inaction of your Board, this is not acceptable.

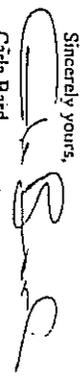
SPECIFIC COMMENTS

Despite a great deal of respondent comment on the subject of selenium bioaccumulation, the bioaccumulative properties of selenium are still not taken into account in the assimilative capacity in receiving waters.

The language of your Staff's comments on the last paragraph of page 17 and page 18 is totally unclear and makes it impossible to determine what action, if any, your Board intends to take should full compliance not be in place by the year 2010 in Mud Slough north and the San Joaquin River downstream of Mud Slough, north to the Merced River. As for costs, the report refers to a bypass extension at a cost of \$16M to \$18M dollars, presumably taxpayer dollars. I also quote the last sentence on page 18, "Depending on the cost of load reduction technologies, an extension of the wetlands bypass may require financing from sources outside of the drainage problem area". Taxpayer costs again. This mention the need for outside funding as a contingency of compliance could easily be interpreted as an escape clause for full compliance after 2010. It is pertinent to note that statements on the need for outside funding directly contradict the assurances, made with emphasis by the Penny Howard of the U.S Bureau of Reclamation when she chaired the Bureau meetings held to discuss the reopening of the San Luis Drain in September and again in November 1995. She said "You can rest assured that the drainers are going to pay all the costs of this project". Either she did not know or your Board failed to tell her that the drainers had already applied for and received endorsements for two enormous grants of EPA money funneled through the State Board and your Regional Board. Now, your staff presents the possibility that even more public funds will probably be needed in the future. This is unconscionable.

The Use Agreement between the Delta Mendocino Water Authority and the U.S. Bureau of Reclamation clearly calls for a maximum total selenium load of 6,000 pounds with the option of a 20% increase should certain circumstances apply. This would allow over 8000 lbs of selenium to be dumped into the San Joaquin River. Your compliance schedule does not note the 6,000 lbs, only (page 2) 8,000 lbs. for all water years. Since your Board staff was actively involved in all the secret negotiations leading to the agreement to reopen the San Luis Drain, this discrepancy should have been but is not yet resolved.

I respectfully urge your Board to direct staff to make the substantive changes required to make it compliance schedule an environmentally acceptable document - one that protects water quality in the San Joaquin River Basin, not just to suit agribusiness but for all Californians who depend on you.

Sincerely yours,

 Cañia Bard

PATRICK J. PORGANS
Government Regulatory Specialist

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Tuesday, October 3, 1995
Karl Longley, Chairperson
California Regional Water Quality Control Board
Central Valley Region
3443 Rountier Road, Suite A
Sacramento, CA 95827-3098

Fax Number (916) 322-3015

RE: Comments on the Basin Plan Amendment and the Reopening of the San Luis Drain, AKA
Grassland Bypass -- Item 3: Central Valley Regional Water Quality Control Board, September
22, 1995, Workshop on the Water Quality Objectives and Implementation Plan to be Used for
the Regulation of Agricultural Subsurface Drainage Discharges in the Grassland Area,
Merced County, California

PLEASE READ BEFORE INCORPORATING MY COMMENTS

Members of the Board:

This letter contains my written comments and are supplemental to the oral comments I made before the Board at its September 22, 1995, Workshop, which it held in the State Capitol. To begin, I will reiterate my absolute opposition to the so-called amendment for the "regulation of agricultural subsurface drainage discharge in the Grassland area and submit these comments as a means to exhaust the administrative remedy.

In addition, for the record, I want to state my objections to the manner in which the Board conducted the workshop. Although the public notice for the workshop did not expressly state that the Board intended to devote most of the time on the pending Grassland Bypass agreement, which was predominately orchestrated by the drainers in conjunction with the other "stakeholders," that is precisely what transpired. I took strong exception to how well orchestrated the line up for the speakers was set up at the workshop on the Basin Plan amendment, which allowed for all of the stakeholders to make their pitch for the Grassland Bypass, with little or no emphasis on the actual amendment other than how it played a role in facilitating the bypass agreement. As soon as the stakeholders made their pitch then the Board's executive officer Mr. Crooks asked that the Board confine all further testimony from workshop participants to the Basin Plan and not allow additional testimony on the Grassland Bypass agreement. The Board's action was absurd and Mr. Crooks request amounted to a gag order.

Comments:

The staff report on "the Water Quality Objectives and Implementation Plan to be Used for the Regulation of Agricultural Subsurface Drainage Discharges in the San Joaquin River Basin" is composed and written in the typical Crooks' Team fashion. It is vague, fragmented and misleading, and is premised upon half-truths, distortion of facts, and biased in favor of the polluters. It does

Tuesday, October 3, 1995
Karl Longley, Chairperson
RE: Comments on the Basin Plan Amendment and the Reopening of the San Luis Drain

not provide the public with any "real" assurances that its waters and or public trust resources will be protected. There are so many flaws in the plan/report that it would be virtually impossible for me to address all of them in this forum.

This report (Basin Plan amendment) amounts to just another stall tactic by the Crooks' Team and the Board to placate the drainage issue and to allow business (pollution and destruction of the waters of the state) as usual; however, with one apparent fundamental difference in the Board's customary modus operandi. That is to say, in the past the Crooks' Team and the Board substituted more research in lieu of regulatory action as the primary stalling tactic, now the new stalling strategy is much more deceptive and damaging because the Board is giving the public the illusion that it is embarking on a regulatory enforcement action program, when in fact it is not. The Board is simply setting an ambiguous compliance schedule that is essentially a moving target. It is similar to the compliance schedule that was contained in the S.F. Regional Water Quality Control Board's Order No. 91-026 for selenium for Shell Oil Company, Union Oil Company of California, and Exxon Company, U.S.A. The original compliance date of July 12, 1993, was ordered by the S.F. Board in 1991. A revised compliance schedule of July 31, 1993, was adopted by the S.F. Board in November 1993, only a month before the original compliance date was supposed to go into effect. Furthermore, if July 31, 1993, rolls around and it is determined by the S.F. Board that the oil companies have demonstrated a good faith effort to comply, but have nonetheless failed to comply, then another extension of the final compliance date will be considered. I believe that it is safe to conclude that based on the S.F. Board's track record an additional extension undoubtedly would be approved.

A similar compliance schedule was a product of the State Water Resources Control Board's (SWRCB) WD 85-1 for the regulation of subsurface drainage, which included selenium, for the San Joaquin River; final compliance date stated in their order was 1993.

Here again, the Board is trying to deceive the public by obtusation of the real intent for amending the Basin Plan, which amounts to nothing less than pseudo regulatory compliance; AKA endless discharge requirements (WDRs), which would include load reductions, for the drainers in the Grassland areas until the Basin Plan amendment is approved. Approval of the plan could happen within nine months to a year. Once the plan is approved then the Board could go forward with issuing the waste discharge requirements and that could take another year or so. Full compliance with water quality objectives has been tentatively scheduled for the year 2015; however, there are provisions for extensions and additional delays if they are warranted. I should remind the Board that it took almost five years to approve the waste discharge requirements for the evaporation pond operators in Tulare Lake Basin, which I and other have under appeal before the SWRCB, because they are grossly inadequate. While all of these delays are being sanctioned the waters of the state will continue to be degraded and water quality violations will continue. It is for the aforementioned and following reasons that it has become obvious that the amendment to the plan and the Grassland Bypass are ineffectual in protecting the waters of the state. It is also important to note that your staff recommended WDRs in the 1988 Basin Plan as an alternative for Grassland; however, the Board requested that staff look at other alternatives; subsequently, the 1988 Basin Plan did not include WDRs.

According to Dennis Westcott, another member of your staff, the current amendment to the Basin Plan will help to lay out policy and actions for the Board to deal with nonpoint source and water quality objectives as a procedural step. The water quality objectives that the Board adopted in its December 1988 Basin Plan have been superseded by the water quality standards that the U.S.

Tuesday, October 3, 1995
Karl Longley, Chairperson
RE: Comments on the Basin Plan Amendment and the Reopening of the San Luis Drain

Environmental Protection Agency promulgated. Essentially, the Board would have to reorganized EPA's standards or adopt its own standards. Although the Board could issue WDRs for Grassland area drainers, it does not have a current water quality standard adopted for the drainers to meet.

It is equally important that we not lose sight of the fact that in the Board's 1988 Basin Plan selenium reduction was given the highest priority. However, the record shows that selenium loads are equal to historical levels, despite selenium's priority status and the different management practices that were employed, including, but not limited to, maximization of irrigation efficiency and best management practices (BMPs) to regulate selenium. The Board's records show that selenium violations between 1988 and 1992 were at about 82 percent, and in 1993 and 1994 have increased to greater than 90%, (eleven out of twelve months the standards were violated). The Board's initial attempt to "regulate selenium" was a failure, and I could have told you that back then. Now I am going to provide you with advanced notification of the Board's next failure-in-the-making -- The Crooks' Team et al Grassland Bypass Plan and the Basin Plan amendment, which I adamantly oppose.

Based on my experience, it is difficult for me to place any degree of faith in the Board and "its plan or its ability to enforce the provision of a waste discharge requirement. Regrettably, I have to take everything the Crooks' Team and the Board says with a "grain of salt." In the case of the drainage dilemma in the San Joaquin Valley, I should say with a ton of salt, in keeping with the relative order of magnitude. In an attempt to simplify my comments I will focus on three issues or phases of the Board's so-called progress leading up to the impending plan.

Phase I: Planning the Basin Plan Failure

The premise upon which the plan is based is fundamentally flawed. The "over-ly(ing) theme" in the plan implies that it will provide a better water quality by certain revisions of water quality objectives and implementation program to meet water quality objectives, i.e. load reduction, drainage management plans, and some regional designated entity to manage the situation. In turn it would not only meet water quality objectives it would also provide usable water for wetlands and wildlife.

And I quote: (CVRWQCB's Summary Statement, page 2, paragraph 2.)

"The program goal is to optimize beneficial use on a watershed basis with regulatory action focused on consolidation of drainage flows (Grassland Bypass) and sediment load reduction."

However, the Board also stated in the report on page 42, under the "Studies" section, paragraph 2:

"In 1985, little was known about the location and concentrations of selenium, molybdenum and other trace elements and toxics that occur in subsurface agricultural drainage water. In a short period of ten years, we have gained a great deal of insight. Our knowledge, however, does not allow us to feel confident that a system of load reductions by water conservation or other best management practices (BMP) will meet water quality objectives."

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RE: Comments on the Basin Plan Amendment and the Reopening of the San Luis Drain

Furthermore, the report also states on page 4:

"To meet water quality objectives, staff estimate that a 60-70 % reduction in annual selenium load will be needed along with adjustments in the timing of discharge. Actions which lead to extensive load reductions and timing changes will need to go beyond relying solely on irrigation management which has been the focus over the last 6 years. Other actions, including treatment, reuse and land retirement may be needed to meet water quality objectives on a consistent basis."

The approach also allows for additional "flexibility" and further allows the dischargers to "design their own methods of compliance and to apportion this load among themselves." Past experience proves unequivocally that the drainers have failed to effectively provide adequate solutions to meet water quality requirements.

Earlier staff reports also stated that "load reduction" does not lead to water quality improvement due to the fact that irrigation efficiency has been maximized. In fact, failure may be due to the fact that more agricultural land is in production now leading to increased loads and thus increased violation in the San Joaquin River.

It is also important to point out that the staff has not published any public report defining the accuracy to which existing loading and or load reduction can be measured, and whether this is within the limits of the proposed interim load limits proposed for the use of the San Luis Drain to meet water quality objectives. The historical load levels can have a margin of error up to 30 percent.

Furthermore, the elevated "unnatural background" levels due to build up of drainage (selenium, boron) since drainage management options have not been regionally implemented, may affect primary and secondary wetland supply channels to the extent that these waters, in the absence of discharged drainage loads, could exceed 2 ppb selenium. This "unnatural seepage" has been inadequately defined by the Board. Increased leaching of those "unnatural background" levels at various unregulated times of the year may lead to exceedances of aquatic criteria in wetland supply channels, even if the Basin Plan amendment is adopted and the Grassland's Bypass is authorized.

The Missing Selenium:

In addition, U.S. Bureau of Reclamation (USBR) and CVRWQCB data apparently showed "load attenuation" in Grassland -- 3000 pounds of selenium "lost" because of uptake of selenium in the biota and unlined wetland channels. The USBR did conduct further studies in the Grasslands, which left one with the impression that the channels and biota were not showing a large uptake of selenium, indicating that there were NO BENEFITS to wetlands and the project became a drainage management only project. However, the U.S. Fish and Wildlife Service (USFWS) released data showing 77% of fish samples from Mud Sough to have selenium levels in the level of concern range (4-12 ppm) and 85% of fish samples from Salt Slough in the level of concern. Then the USBR said it had data to show uptake and load attenuation in Grassland. Notwithstanding, the General Manager, Don Marciocch for Grasslands recently told the Fresno Bee that the drainage in Grassland canals doesn't appear to hurt the wetlands but his system would simply work better if

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The used irrigation water went through part of the San Luis Drain.¹ These conflicting statements/findings by government agencies raise serious doubts about the "benefits" and "real motives" of the reopening of the San Luis Drain (SLD), AKA, Grassland Bypass.

Phase II: Beyond Sound Science

Recent events indicate that the Board is beyond the scientific research phase. It has apparently ceased funding any future objective and/or unbiased scientific studies, which, in the past, although expensive and extremely costly to the taxpayers, bought the Board and its constituents valuable time to stall; however, the general public did receive some further scientific understanking.

Discrediting Existing Research Based on Scientific Fact:

When it seems profitable for the Board and the Crooks' Team to promote the "status quo" agenda, it will selectively discredit scientific studies when these studies fail to suite the Board needs. This component of the planning process seems to have been effectively replaced with objectives and conclusion determined by "political science" that is dictated by the vested interests and facilitated by the Crooks' Team and the Board.

Phase III: Now The Board Is In the Pseudo Regulatory Mode

This phase is unquestionably the most intriguing phase of all, because it appears that the Board is "finally" going to undertake some regulatory action to protect the waters of the state, but in reality it has only set a compliance schedule, with the understanding that the date is so far in the future that may it out dates the youngest living person on the planet. Phase III essentially leave the drainage issue open ended, and eliminates the need for the Board to search for new solutions other than the Valley Wide Drain.

Water Rights -- Beneficial Use -- Impaired: Public Trust Violation

If the Board is interested in protecting other beneficial uses and users of water, than I respectfully suggest that it take the necessary regulatory actions to protect the waters of the state. This Board, in conjunction with the USBR, Department of Water Resources (DWR) and the drainers are responsible for the impairment of other senior water rights holders. For example: The U.S. Fish and Wildlife Service (USFWS) has senior appropriate water rights on Salt Slough that permits it to divert up to 19,910 acre-foot of water, if and when it is available, onto the San Luis National Wildlife Refuge (NWR) during any given year. However, according to the USFWS officials² the Service has not been able to exercise its water right under SWRCB License 10120 (Permit 72632) and License 10741 (Permit 7252) because of agricultural drainage contamination, and has duly notified the State Water Resources Control Board (SWRCB).

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RE: Comments on the Basin Plan Amendment and the Reopening of the San Luis Drain

*The U.S. Fish & Wildlife Service decided to discontinue using Salt Slough water in 1985 due to selenium contamination greater than 2 ppb. When clean water is available again in Salt Slough, the Service would use its full allotment. In 1988, 1989, & 1990, San Luis used 14,835; 13,620, and 15,022 acre-foot of water respectively which was delivered by the San Luis Canal Company.³ See attached letter for details.**

Furthermore, under the provisions of both the DWR and USBR water right permits, and as is stated in the State Water Resources Control Board's (SWRCB) Water Right Decision D-1485, no water is to be exported by these entities until all of the reasonable needs of the Delta are met. Conversely, these agencies have and continue to export water from the Delta in violations of the terms and conditions of their respective water right permits and in conflict with the provisions of the Watershed Protection Act and the County and Area of Origin requirements. In addition, water deliveries from the State Water Project (SWP) and the federal Central Valley Project (CVP) have and continue to irrigate lands that have know drainage problems that have and continue to degrade and impair the waters of the state, and are deleterious to other beneficial uses and/or uses in the Delta proper, which can be construed as an unreasonable use of water. The failure of your Board and the SWRCB to take corrective actions to abate the aforementioned violations, and your support of the Grassland Bypass have essentially sanctioned these injustices.

In conclusion, it is extremely difficult to comprehend how this amendment/plan/project benefits wildlife species or why there should be a partnership between U.S. Environmental Protection Agency (EPA), USFWS, and the USBR to push for the Grassland Bypass. The only species that will benefit from this plan/program is the corporate species. In the absence of sound science and common sense I am left with no alternative but to oppose both the Basin Plan amendment and/or the Grassland Bypass. I will consider filing an appeal with the SWRCB should you approve the plan and or Grassland Bypass proposal.

Respectfully,


Patrick Forgan
PP:sp FN: C-1/W/P5/SLD.DRA

cc: Interested Parties

¹ Report of License For 1985, 1989 and 1990, submitted to the State Water Resources Control Board, by Gary Zahn, Refuge Manager, San Luis NWR, USFWS, January 28, 1991.

² U.S. Fish and Wildlife Memorandum, To: Regional Director (AWR, R/CA) Portland, Or., From: Gary Zahn, Project Leader, San Luis NWR Complex, Las Bajas, CA., Subject: A Contaminated Salt Slough and Associated Ramifications, Date: 5/29/85.

³ Closed canal at San Luis may reopen, Hearings expected on using 28-mile portion of drain in Merced County, The Fresno Bee, reporter Marc Grossi, Tuesday, September 12, 1993, pp. 1 and A10.

⁴ Patrick Forgan's Telephone Conversations with Gary Zahn, Refuge Manager, San Luis NWR Complex, (209) 836-3508 and Steve Moore, USFWS's Portland Office, (503) 231-6177, Monday, September 18, 1995.

PATRICK J. PORGANS
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Friday, December 8, 1995

Karl Longley, Chairperson
California Regional Water Quality Control Board
Central Valley Region
3443 Router Road, Suite A
Sacramento, CA 95827-3098

HAND-DELIVERED

RE: Written Comments Pertaining to the Board's December 7, 1995, Workshop on the Compliance Time Schedule to be used for the regulation of Agricultural Subsurface Drainage Discharges into the San Joaquin River and Grassland Areas, Merced County.

To All Members of the Board:

Please be advised that I am submitting the following comments on my own behalf, and at the request of my clients, H.F. Brennan and Associates, Marine Surveyors.

Background Data:

Historically, the introduction of irrigated agriculture to arid areas has presented drainage problems. The California Department of Water Resources noted in 1974 that:

"The salt management problem in the San Joaquin Valley is not a unique one; the problem has plagued irrigated agriculture in all arid and semi-arid areas of the world since the beginning of recorded history. Many flourishing civilizations fell principally because of an inability to understand and cope with salt balance and drainage problems. The Tigris and Euphrates river valleys in ancient Mesopotamia became mostly desert because of the accumulation of salts in the surface soil layers. Relics of abandoned irrigation systems, alkali areas, and salt accumulation extending from the Sahara Desert through ancient Persia show that a lack of proper drainage eventually resulted in the physical and economic ruin of vast agriculturally productive areas." (DWR, Bulletin 127-74.)

There is an as old saying which read "Those who do not understand the past are doomed to repeat it." To wit, I respectfully submit that this board, in conjunction with the California Department of Water Resources (DWR), the U.S. Bureau of Reclamation (USBR), and the agricultural drainers are promoting the "Mesopotamian syndrome" at the taxpayers expense and to the degradation and impairment of other water rights holders in the areas of origin and to the destruction and demise of public trust resources, in its attempt to justify subsidized unsustainable agriculture production on certain lands which government reports indicate should not have been irrigated.

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On numerous occasions, since the 1970s, I have appeared before the Central Valley Regional Water Quality Control Board (CVRWQCB) and the State Water Resources Control Board to express my concerns over their collective failure to deal with the agricultural drainage problems. The record will show that I have been actively involved in participating in the CVRWQCB's "updated" draft Water Quality Control Plan (WQCP) for the Sacramento-San Joaquin Valley Region. I submitted written comments in October 1994, and made an oral presentation before the CVRWQCB at its December 1994 hearing on the adoption of the draft WQCP. I made an oral presentation before the SWRCB at its December 1994 hearing on the adoption of the draft WQCP for both the San Francisco Region and the San Diego Region. In addition, I provided oral and written comments before the SWRCB at its January 1995 hearing when it adopted the CVRWQCB's amended Basin Plan. Furthermore, I made a presentation before the CVRWQCB at its January 1995, hearing on the adoption of staff reports which contained data that documented the high loads of agricultural drainage from the Grasslands that have and continue to adversely impact the San Joaquin River, water right holders, and public trust resources. I testified at that meeting and expressed my concerns to the board regarding its apparent failure to include the accumulative impacts of drainage on the San Joaquin River and Bay/Delta Estuary from other agricultural drainers, such as the Westland Water District. The accumulative load, or "total loading" is a critical issue that the board needs to assess, because it could have a significant impact on the viability of the Grassland Bypass Project and the selenium target loads contained in the Bypass Plan.

The staff reports, presented at the January meeting, also proved that the toxic drainage loads in the San Joaquin River had actually increased in the last two years, and that the plan to reduce toxic loads by better agricultural irrigation practices failed to meet its intended goal to reduce toxic loads.

The record will also reveal that I have appeared before this board and the SWRCB expressing my concerns, orally and in writing, on numerous issues relative to agricultural drainage, water quality, protection of public trust resources and the reasonable use of the public's water resources, i.e., the Bay Delta Water Quality Control Plan, SWRCB Resolution 68-16 "maintaining high quality water in California"; SWRCB Resolution 92-49 "policies and procedures for investigation and cleanup and abatement water quality limited segment zones"; Federal anti-degradation policy 40 CFR 131.12; I petitioned both the CVRWQCB and the SWRCB on agricultural drainage problems associated with the Tulare Lake Basin evaporation ponds (that petition is still pending a decision before the SWRCB), and I participated in the Kesterson hearings before the SWRCB, and the list goes on. (Please refer to Exhibit 1.)

I mentioned my involvement for the record, and I will consider my past comments pertinent to this agricultural drainage issue appended to the board's workshop record. On October 3, 1995, I submitted written comments to this board on the matter before it today, which I will briefly reiterate for the record:

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TO THE BOARD
RECEIVED

1 Except taken from the State Water Resources Control Board ORDER MAINTAINING

Friday, December 8, 1995
Karl Longley, Chairperson

RE: Written Comments Pertaining to the Board's December 7, 1995, Workshop on the Compliance Time Schedule to be used for the regulation of Agricultural Subsurface Drainage Discharges into the San Joaquin River and Grassland Areas, Merced County.

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Karl Longley, Chairperson

RE: Written Comments Pertaining to the Board's December 7, 1995, Workshop on the Compliance Time Schedule to be used for the regulation of Agricultural Subsurface Drainage Discharges into the San Joaquin River and Grassland Areas, Merced County.

The *Staff Report on the Water Quality Objectives and Implementation Plan to be Used for the Regulation of Agricultural Subsurface Drainage Discharges in the San Joaquin River Basin* is written in typical "Crooks'-team" fashion. It is vague, fragmented, and misleading. Key statements and numbers in the report are premised on half-truths, distortion of facts, and calculated guesstimates. In addition, certain portions of the report are more reflective of science fiction, as opposed to sound science. In addition, the board has failed to provide the public with any "real" assurances in any of the relevant reports, that the respective amendment will improve the water quality in the San Joaquin River or significantly reduce the destruction of public trust resources dependent on this river system. There are so many flaws in the planned amendments and related reports that it would be extremely difficult to address them all, given the time constraints imposed by the board. I am forced to keep my comments brief.

To begin with, the only alternative we can support in the proposed amendment is Alternative 1:

*1) an immediate prohibition of discharge of agricultural drainage from the drainage problem area.*²

We are opposed to Alternative 2 and 3 because they do not address the impending impacts of agricultural drainage water on downstream water users and public trust resources in a reasonable time period. Furthermore, Alternatives 2 and/or 3 assures the continued demise of the San Joaquin River and sanctions water quality violations well into the twenty-first century, essentially allowing the violator another 10- to 25- year grace period to comply, when they already spent 20 years to delay taking responsibility for their drainage problem. This extension of time will be primarily at the expense of taxpayers and to the demise of public trust resources and downstream water right users.

We are also opposed to "constructing a separate conveyance system downstream of Merced River confluence (\$16-\$28 million)" as stated on page 1:6 of the aforementioned report.

Moreover, my clients and I are adamantly opposed to the proposed Grassland Bypass Plan, the reopening and or use of the San Luis Drain. This opposition was stated in two letters to Roger Patterson, Regional Director, U.S. Bureau of Reclamation. Those letters are attached as Exhibit 2, please include them in the record.

² CVRWQCB's Nov. 1995. *Staff Report on the Compliance Time Schedule to be Used for the Regulation of Agricultural Subsurface Drainage Discharges in the San Joaquin River Basin*, Appendix 1: 1-1.

A great deal of emphasis has been placed on the need to provide suitable water quality to the wetlands in the grassland area. Meeting the 2 ppb selenium is key to both the Basin Plan amendment and the recently consummated Use Agreement between the USBR and the San Luis & Delta Mendota Water Authority (WA) as is the proposed selenium target loads and related load reductions.

To that end, I have asked all of the government agencies involved in the bypass scheme to provide me with specific scientific data that qualifies and quantifies the assertion that 2 ppb will be attainable and that the actual and projected target loads contained in government reports are scientifically defensible. To date, I have not been furnished that data by my government, which leaves me with no alternative, at this time, but to acknowledge that such data may not exist.

Please be advised that I found the information in Appendix B and Table B-4 (Historical Perspective) to be highly suspect, difficult to interpret and somewhat misleading. It is with all due respect for Mr. Karkoski that I make the following comments: My initial assessment of the numbers contained in Table B-4 is that they are based on limited monitoring data, numerous assumptions, questionable calculations, and guesstimates.

More important, as stated at the workshop, the "Concentration of Se in Tail Water = 2 ug/L" (2 ppb) in the text of Table B-4, according to Mr. Joe Karkoski, a staff engineer for the board, it is not a measured value. Furthermore, when asked, Mr. Karkoski admitted that the 2 ppb selenium was representative of "supply" water and "not" tail water. As you may recall, when Mr. Karkoski confirmed my suspicions about the source of the 2 ppb, and as I reiterated to the board during my presentation, that number was not representative of tail water and it was a bogus number.

Mr. Karkoski stated to me that the data contained in Table B-4 represents a "screening level analysis" and he conceded that they are based on limited data and that additional data would be required to make more accurate calculations.

I was so perplexed by some of the numbers and assumptions contained in the board's November staff report; in particular, Table B-4, page 9: (Exhibit 3) which appears to be a key component, if not the linchpin of meeting the plans load requirements and the success of the USBR/WA Use Agreement for the San Luis Drain - aka Grassland Bypass that I took the liberty to request the U.S. Geological Survey (USGS) to conduct an initial assessment of the board's numbers, to determine if the numbers and the assumptions which they are based on could be defensible from a scientific perspective.

You will find a copy of the letter that I sent to USGS in Exhibit 4. It may interest this board to know that USGS essentially agreed with my initial finding and concerns, pertinent to the data contained in Table B-4. In its initial assessment, USGS stated:

We are unable to assess the validity of the calculations in the report because

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documentation is inadequate for assumptions concerning 1) flow quantities (acre-feet and acre-feet/acre) and 2) selenium concentrations in tail water (2 ppb) and tile drain water (120 ppb or 150 ppb). As stated in the assumptions, present estimates of flow and concentrations in tile drainage and tail water appear not to have been recently updated to reflect varying conditions. For example, the CVRWQCB's measured mean selenium concentration for sumps in the Grasslands drainage area is given as 211 ppb, with a median of 134 ppb; no measured value is given for tail water. However, a base case set of assumptions (120 ppb Se in tile drainage and 2 ppb Se in tail water) are used throughout the time period 1986 to 1994 for all load reductions calculations with brief justification.

Inadequate documentation of data and calculations also make it difficult to assess the validity of the methodology used to make the calculations. The information given in Appendix B does not comprehensively encompass the natural and man-made changes that the San Joaquin Valley has undergone since the drainage program "surfaced" and management of drainage was studied by the San Joaquin Valley Drainage Program.

The need for comprehensive study of selenium distribution and mean concentration is further demonstrated by your question regarding the concentration of selenium in Westlands drainage relative to that in Grasslands drainage. (End of USGS comments.)

What Table B-4 (Exhibit 4) does imply is that the drainers:

- Increased acreage in the problem drainage area;
- No agricultural lands have been retired because of drainage problems;
- Have nearly maxed-out on the drain construction;
- Have reduced the amount of water they need to use, saving money, increasing profits; and
- Increased the concentration of selenium in drainage water, thus created the potential for increasing the water quality problems to downstream water users and cost for treating water for domestic consumption.

Table B-4 does not provide specific data on actual percentage of salts - selenium in tail water or tile water or the residual salts-selenium in the soils, which could increase total salt - selenium concentrations over time.

I can calculate the total drainage ppb -- 51 through 81 ppb etc; however, I have serious questions about the validity and accuracy of assumptions upon which these numbers are based and find it extremely difficult to accept that tile water has been 120 ppb during the time period 1986-1994 and tail water has been 2 ppb during the same time period.

Undoubtedly, one could proportion the pounds of selenium based on those numbers for tile and tail water and get the column named total drainage ppb selenium, but the question is what do those numbers really mean?

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There are no actual measured water quality data for the tail water coming off the fields to validate the 2 ppb selenium purported in Table B-4; rather as pointed out by Mr. Karkoski, the 2 ppb selenium represents water supplied and applied to the land.

B-4 does not appear to account for the amount of tile water recirculation and blended with tail water, which in Firebaugh Canal WD is estimated to be 30-40%, (Calpoly 1994, final report, Exec. Sum: 1-7).

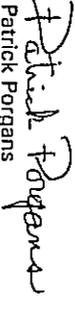
All of the Firebaugh Canal Water District lift pumps take tail water and tile water (blended) and discharge it back to the distribution system (recycled water). The main problem for growers just north of the lift sumps discharging into the 2 lift canal (d-5 through d-9) these sumps have the potential to significantly increase the EC of the delivered water supply especially at low flows.

The 120 ppb in tile water is an "estimate" based on assumptions, which is based on limited data. Therefore, it is reasonable to assume that the calculations contain an inherent margin of error, and that margin of error is multiplied as more and more calculations are made. Accordingly, the accuracy of the data in B-4 is in question, as is the validity of some of the key numbers.

In view of the aforementioned statements, and the serious questions pertaining to the validity of the selenium numbers and target loads, I respectfully request that the board not take any action on the proposed amendment to the WQCP until it has a "round table" workshop to further explore the source and or accuracy of the selenium numbers contained in its staff report and those contained in the USBR Use Agreement. The board has an obligation and a duty to provide the public with accurate information and data that are based upon scientific fact. A failure on the board to provide such information could be construed as a breach of its duties and public trust responsibilities.

Please advise me if the board will honor my request for such a workshop as soon as possible. Furthermore, please be advised that we have every intention of exhausting the administrative remedy, either by petition or appeal, if the board fails to address the issues we raised. Thank you for your time and interest.

Respectfully,


Patrick Porgans
PP:sp FN: C/1 WP5/BASINP7

cc: H.F. Brennan and Associates
Contra Costa Board of Supervisors
Senator John Najeddy
State Water Resources Control Board
CNN - San Francisco News Bureau
No California Love Canal - Citizens for Safe Drinking Water

MINASIAN, MINASIAN, SPRUANCE, BABER, MEITH & SOARES

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October 2, 1995

WILLIAM C. PARRIS, III
MICHELLE DICASTRO

Mr. Paul E. Jepperson, Supervising Engineer
California Regional Water Quality Board
Central Valley Region
3443 Routler Road, Suite A
Sacramento, CA 95827-3798

Re: Comments of the San Joaquin River Exchange Contractors
In the Matter of Water Quality Objectives and
Implementation Plan To Be Used in a Basin Plan
Amendment for Regulation of Agricultural Subsurface
Drainage in the Grassland Area

Dear Mr. Jepperson:

These comments are submitted on behalf of the San Joaquin River Exchange Contractors (Exchange Contractors). The Exchange Contractors consist of Central California Irrigation District, San Luis Canal Company, Firebaugh Canal Water District and Columbia Canal Company. For purposes of dealing with water quality objectives and regulation of agricultural subsurface drainage in the Grassland area, these comments are particularly focused on Firebaugh Canal Water District and 6,000 acres of CCID, referred to as Camp 13.

As the Board is aware, the Exchange Contractors hold pre-1914 and riparian water rights on the San Joaquin River. These water rights go back to Miller & Lux and form the basis of an Exchange Contract with the United States Bureau of Reclamation pursuant to which the Exchange Contractors agree not to exercise their rights to take water from the San Joaquin River so long as the Bureau of Reclamation provides them with substitute water from the Central Valley Project.

Valley Wide Drain:

The Exchange Contractors commend the Board staff's gutsy position which continues to recommend a valley wide drain as necessary to solve the drainage problems which exist in the San Joaquin Valley. We note that staff's recommendation does not specify a drain to the Delta as some commentators argue to you. We urge the Board to put aside unhelpful and meaningless rhetoric involved with revisiting Kesterson issues. We urge the Board to

Mr. Paul Jepperson, Supervising Engineer
California Regional Water Quality Board
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work with the Water Resources Control Board and the Bureau of Reclamation to establish waste discharge requirements and policies necessary to implement a valley wide drain.

The Board is undoubtedly aware of the recent federal district court order in which the court ruled that the Bureau of Reclamation has an obligation to provide drainage to the San Luis Unit of the Central Valley Project and can provide such drainage to adjacent lands affected by irrigation practices within the San Luis Unit. We urge the Board to take a leadership role in assisting the Bureau of Reclamation and the Water Resources Control Board move forward to conduct such hearings, perform necessary studies and adopt waste discharge requirements necessary to clear the way for construction of a valley wide drain while protecting public trust resources.

Regional Control of Subsurface Drainage:

The Exchange Contractors also commend the Board staff for its recognition that control of subsurface drainage must be taken regionally and not in a piecemeal fashion. We agree that drainage dischargers are not the same entities as those actually generating drainage. We urge the Board to work with the Bureau of Reclamation to identify those federal water service contracting entities that are causing or adding to drainage discharged by Firebaugh Canal Water District and Camp 13 area of CCID.

San Luis Drain Use Agreement:

The Board has been briefed on the status of the use by Grassland draining entities of a portion of the San Luis Drain. Firebaugh Canal Water District and the Camp 13 area of CCID account for approximately 28,000 acres of the 93,000 acre drainage area which will be discharging into the wetland bypass and San Luis Drain. Of those entities discharging into the drain pursuant to the Use Agreement with the Bureau of Reclamation, only Firebaugh and Camp 13 are water right holders with historic drainage rights through the area which is now the Grassland Water District. Consequently, we must disagree with the comments of Mr. Don Marchionni regarding the prohibition of subsurface discharge into the wetland supply channel on October 1, 1996 as provided in the draft water quality plan. We believe that this prohibition is a terminal sanction which is inappropriate vis a vis water right holders with historic drainage rights unless such a sanction is tied to specific identification and control of those upstate entities which cause or add to drainage as contrasted with the downstate entities which, due to their location, are those which are the ultimate dischargers into the sloughs and river.

Mr. Paul Jepperson, Supervising Engineer
California Regional Water Quality Board
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The Exchange Contractors fully support the position of the drainers in regards to embarking on a study to determine the appropriateness of the 5 ppb selenium standard promulgated by the EPA. As we have stated to you in previous hearings, we believe that recent findings demonstrate that the 5 ppb selenium standard is inappropriate for the waters in the San Joaquin Valley and the standard should be increased to a higher number which is representative of the area. The exact number will have to be determined through further studies in which the drainers would co-participate with the RWQCB and EPA.

The Exchange Contractors disagree with the notion of using "loads" as a basis which the RWQCB would use to meet the 5 ppb selenium standard at Crows Landing. One of the reasons is that the water which Exchange Contractors receive from the Delta-Mendota Canal often exceeds 5 ppb selenium. If the Exchange Contractors are "allocated" a certain load that they can discharge in any particular month and their receiving water has a "load" that matches or exceeds that load, then we set ourselves up for automatic failure. Unless the RWQCB can adequately and fairly address the effects of receiving water loading and upslope loading, we must recommend that selenium load allocation is an improper method to use to achieve selenium standards in the San Joaquin River.

Thank you for the opportunity to provide these comments. If the Board or its staff has any questions, please do not hesitate to contact either Steve Chedester, Executive Director, San Joaquin River Exchange Contractors, P.O. Box 2115, Los Banos, CA 93635, Telephone: (209) 827-8616, or the undersigned.

Very truly yours,

MINASIAN, MINASIAN, MINASIAN,
SPRUNCE, BABER, MEITH & SOARES

BY 
MICHAEL V. SEXTON

MVS:dr

cc: Steve Chedester/Exchange Contractors

July 6, 1995



William H. Crooks, Executive Officer
California Regional Water Quality Control Board
Central Valley Region
3443 Router Road, Suite A
Sacramento, CA 95827-3098

Subject: Comments Regarding Beneficial Uses and Water Quality Criteria to be Used in the Basin Plan for Regulation of Agricultural Subsurface Drains in the Grassland Area, Merced County

Dear Bill:

We are hereby transmitting written comments on the above subject as requested in the Notice for the June 23, 1995 workshop. As you are aware, we gave verbal comments at the meeting and these written comments are intended to present in more detail those comments. We have attached four specific items:

1. Comments regarding beneficial uses.
2. Comments on the applicability of EPA's 5 ppb national water quality criteria for selenium to the San Joaquin River.
3. Comments regarding economic impacts of the proposed beneficial uses and water quality criteria.
4. Copy of our preliminary draft (May 8, 1995) of the Regional Management Plan for Maintaining Water Quality in the San Joaquin River.

Items 1 through 3 stand on their own. Item 4, the Regional Management Plan, is our initial draft of taking local control and responsibility for management of the drainage water. The Regional Management Plan has two phases. Phase One would be the formation of the regional drainage entity (which has been previously requested by the Regional Board) under the umbrella of the San Luis & Delta-Mendota Water Authority. All of those drainage entities which discharge subsurface drainage water would be a member of this regional entity.

Phase One also would include the appointment of a regional drainage coordinator which would be the person responsible for and oversee this local drainage management program and a real time monitoring system.

Also a part of Phase One would be a wetlands bypass project that would remove drainage water from conveyance canals within the Grasslands area and provide substantial beneficial improvements. Part of this project would be to utilize a portion of the San Luis Drain for conveyance of the drainage waters. Phase One would provide the management tools that would complement and are needed in order for Phase Two to proceed.

Phase Two would be implementation of drainage control measures to reduce drainage amounts to meet adopted water quality standards. It should be noted that this is a draft document and the local entities are in the process of providing more detailed guidance between Phase One and Phase Two.

We appreciate the opportunity to comment on a coordinated basis from the Grassland basin drainers on this first workshop regarding the Basin Plan Amendments. We also stated at the meeting that we are willing to work together during this process with the Regional Board and the Environmental Protection Agency to develop an implementation program that is both locally acceptable and meets the requirements of federal and state law. We are willing participants in such a process.

We would also like the opportunity to have access to Regional Board staff to keep our member agencies up to date on what is happening. In the past, your staff has been available for such meetings and briefings, and we assume this will continue.

Very truly yours,

Daniel G. Nelson
Daniel G. Nelson
Executive Director

Enclosures

DGN/mv

842 SIXTH STREET

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105 BAHNS, CA

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DEPARTMENT
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July 4, 1995, GRASSLAND/BENEFUSE 705

Comments regarding Beneficial Uses
June 23, 1995, Workshop on Beneficial Uses and Water Quality Criteria
Grassland Area, Merced, County

1. It was indicated that the Board may hear comments on the need to consider beneficial use designations on a watershed basis rather than on an individual water body basis. This method may be appropriate because the grassland watershed has been completely altered by land use practices and activities within the watershed. The channels in the grassland basin are effluent dominated water bodies, without the presence of ag drainage could dry up at times during the year and were often constructed for specific purposes that may be in conflict with the proposed beneficial uses. The proposed beneficial uses may not be consistent with appropriate use in the watershed.
2. It was also indicated that the Board may hear comments on the need for alternate approaches to beneficial use designation that recognize the differences in the level of beneficial use that can be attained when these channels are ephemeral, constructed for a specific purpose or are effluent-dominated water bodies. The conventional method of beneficial uses, water quality objectives and implementation not applicable in this situation. An alternate approach may be needed for beneficial use designation because of the altered nature of the channels within the watershed. Beneficial uses are dependent on land use and activities in the watershed. If land uses change then beneficial uses could also change.
3. There are currently no beneficial natural flows in the watershed. There are natural flows that reach and pass through the watershed. A case in point is the recent March storm events. High flows from the westside foothills created flooding problems and also discharge high selenium concentrated waters into the watershed. It should be noted that agricultural users with subsurface tile systems cannot control these flows.
4. The watershed approach is being investigated in other forums also such as the recent Inland Surface Water Plan technical committees.
5. One option in implementation in a watershed basis could be the issuing of variances in cases where beneficial uses cannot be met.
6. Should designate Mud Slough and Salt Slough as having the current use of Subsurface Ag Drainage like the channels within the Grassland Wetlands.
7. It may not be possible to meet a high level of expectations for the beneficial uses in these channels. Beneficial uses and subsequent water quality criteria should not be locked in at this time but should be flexible for future considerations.

8. Clean Water Act language talks about Use Attainability Analysis but it is not clear how this is done to the approval of EPA.

9. Comments on specific proposed beneficial uses:

Limited AGR for Mud Slough (North) does not seem appropriate because the entire length of Mud Slough is now adjoined by State and/or Federal refuges.

WARM for Salt Slough and Mud Slough (North) should be modified to include only limited uses as included for the Grassland Channels.

SPWN should also be modified to include limited wording as in the wording for the Grassland Channels.

WILD for both sloughs should be modified to include limited uses. Current uses include conveyance of ag drainage which precludes their use for this beneficial use.

BIOL for both sloughs should be modified to include limited uses as above for WILD.

COMMENTS ON THE APPLICABILITY OF EPA'S 5 PPB
NATIONAL WATER QUALITY CRITERION FOR SELENIUM
TO THE SAN JOAQUIN RIVER

MONGAN/MILLER
June 27, 1995

SUMMARY

- I. Application of EPA's 5 ppb National Water Quality Criterion (NWQC) for selenium to the San Joaquin River is not scientifically justified. EPA essentially established the NWQC for selenium based on a site-specific situation at Belevs Lake, North Carolina. The resulting 5 ppb criterion does not account for lower selenium uptake by organisms in high-sulfate environments like the San Joaquin Valley.

In 1988, the SWRCB presented data on bioaccumulation of selenium by San Joaquin Valley fish. These data are consistent with more recent experimental data on lower uptake of selenium by other organisms in high sulfate waters characteristic of the San Joaquin system. The SWRCB analysis indicates that a site specific objective of 10 ppb, as a long term geometric mean, will prevent bioaccumulation of selenium in fish to levels above 1 ppm in the San Joaquin Valley. This will keep selenium concentrations below levels needed to protect aquatic life and below the DHS maximum allowable level.

- II. Site-specific water quality objectives above 5 ppb in the San Joaquin Valley are appropriate, because harmful effects of selenium at levels currently found in Valley streams have not been identified.

In addition, information presented by Williams et al (1994) indicates that selenium levels around 10 ppb in San Joaquin Valley streams are not likely to harm birds:

1. Selenomethionine (the essential amino acid methionine with sulfur replaced by selenium) causes the selenium-associated reproductive impairment observed in birds and fish;
2. The threshold for reproductive impairment in birds occurs when the average selenomethionine content of food is 4-8 ppm.
3. Birds, and invertebrate or vertebrate food organisms, cannot make selenomethionine.
4. Selenomethionine is created in algae and enters the food chain when algae are consumed by vertebrates and invertebrates.
5. Selenomethionine levels in birds, or food organisms, are likely to be less than or equal to selenomethionine levels in algae;
6. At the same water concentration of selenium, selenomethionine content of algae is lower in higher sulfate waters.
7. At sulfate levels of only 33 mg/L (lower than observed in San Joaquin Valley streams), selenomethionine levels in algae at the base of the food chain have fallen to 4 ppm, below the dietary threshold of selenomethionine for reproductive impairment in birds.

- III. EPA's suggested methods for establishing site-specific water quality objectives are not applicable to substances like selenium that cause harm by bioaccumulating through the food chain.

EPA's suggested methods for establishing site-specific water quality objectives relate to directly toxic contaminants. New methods must be developed to identify site-specific objectives for contaminants like selenium that cause harm by bioaccumulating through the food chain. These methods must recognize that background levels used to develop site-specific objectives must be site-specific background levels in the west side of the San Joaquin Valley, and not national or global background levels.

INTRODUCTION

The Central Valley Regional Water Quality Control Board (CVRWQCB) is reconsidering their Water Quality Objective for selenium in the San Joaquin River. The CVRWQCB objective states that monthly average selenium concentrations must not exceed 5 ppb in the San Joaquin River downstream of the confluence with the Merced River, or 10 ppb in Mud and Salt Sloughs and the San Joaquin River above the confluence with the Merced. The CVRWQCB objective was disapproved by the U.S. Environmental Protection Agency (EPA) because it conflicts with EPA's National Water Quality Criterion (NWQC). The EPA NWQC for selenium states that the four-day average concentration of selenium should not exceed 5.0 ug/L (5 ppb) more than once every three years on the average (USEPA, 1987).

Selenium standards in the San Joaquin River have an important effect on farms served by the San Luis & Delta-Mendota Water Authority (SLDMWA). Therefore, SLDMWA reviewed EPA's NWQC to see if its application to the San Joaquin River is scientifically justified.

COMMENTS

1. Application of EPA's 5 ppb National Water Quality Criterion (NWQC) for selenium to the San Joaquin River is not scientifically justified. EPA essentially established the NWQC for selenium based on a site-specific situation at Belevs Lake, North Carolina. The resulting 5 ppb criterion does not account for lower selenium uptake by organisms in high-sulfate environments like the San Joaquin Valley.

The State Water Resources Control Board (SWRCB, 1988) presented data collected by Saki (1986) on bioaccumulation of selenium by San Joaquin Valley fish. These data are consistent with more recent experimental data, discussed below, on lower uptake of selenium by organisms in high sulfate waters characteristic of the San Joaquin system. SWRCB's regression analysis of the site-specific data from the San Joaquin Valley yields the following equation describing bioaccumulation of selenium by Central Valley fish:

$$x = 10^{0.996 + 1.49 \log y}$$

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where x = selenium concentration in water in parts per billion (ppb), and

y = selenium concentration in fish tissue (wet weight) in parts per million (ppm).

This equation suggests a site-specific water quality objective for selenium in San Joaquin Valley waters of about 10 ppb as a long term geometric mean (SWRCB, 1988), based on either:

- SWRCB's estimate of the levels necessary to protect aquatic life (1.1 ppm no effect concentration in fish tissue), or
- the California Department of Health Services maximum allowable residue level of 1 ppm in fish.

In other words, based on the SWRCB analysis, a site specific objective of 10 ppb will prevent bioaccumulation of selenium in fish to levels above 1 ppm in the San Joaquin Valley.

Using site-specific bioaccumulation data, a Technical Committee composed of State Water Resources Control Board and Central Valley Regional Water Quality Control Board staff members recommended a monthly average selenium objective of 10 ppb for Mud and Salt Sloughs (SWRCB, 1987, pg. VIII-12). In contrast, EPA's NWQC for selenium is based primarily on the observation that selenium concentrations of 10 ppb in Belevs Lake, North Carolina, severely depressed the fish population, whereas the portion of the lake with less than 5 ppb selenium had a healthy fish population (Stephan, 1994). Belevs Lake is a reservoir that received selenium-contaminated fly ash effluent from a coal-fired power plant.

Basically, EPA inappropriately established a national standard based on a site-specific situation at Belevs Lake. In particular, EPA's 5 ppb NWQC for selenium does not take account of the long known (USEPA, 1987; Shrift, 1954), and experimentally documented (Williams et al, 1994; Hansen et al, 1993; Knight, 1995, personal communication), lower uptake of selenium by organisms in high-sulfate environments. Belevs Lake is in a low sulfate environment in the piedmont region of North Carolina that contrasts sharply with the high concentrations of sulfates in San Joaquin Valley waters. 50th percentile sulfate concentrations in the Roanoke Basin downstream from Belevs Lake are 8 mg/L, while 50th percentile sulfate concentrations in the nearby Yadkin and Cape Fear Basins are 5 and 6 mg/L, respectively (L. Ausley, 1995, personal communication). For comparison, the minimum sulfate concentration measured in the San Joaquin River at Crows Landing Road (11 miles downstream from the mouth of the Merced River) during 1992-1994 was 74 mg/L. At Airport Way near Yermalis, the minimum sulfate concentration measured in the San Joaquin River during 1992-1994 was 54 mg/L (CYRWQCB, 1995).

It is clearly unreasonable to assume that environmental effects of low levels of selenium will be the same in the low sulfate environment of Belevs Lake and in high sulfate environments like the San Joaquin Valley. Aquatic ecosystems with low ambient sulfate

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levels (e.g. Belevs Lake) "may be particularly susceptible to selenium contamination," with toxicity occurring at selenium levels lower than for systems with higher sulfate levels, such as the San Joaquin Valley (Williams et al, 1994). However, EPA did not consider the effects of sulfate concentration on selenium uptake when establishing their National Water Quality Standard, even though the first page of the Criterion document explicitly recognizes that sulfate can affect the toxicity of selenium.

Scientific studies of the effects of sulfate levels on selenium uptake have focused on food chain organisms because "bioaccumulation through the food chain is the primary cause of observed impacts" of selenium on aquatic ecosystems (Mair and Knight, 1994). Accordingly, Williams et al (1994) demonstrated that selenate uptake by the green alga *Selenastrum capricornutum* is considerably reduced by increased sulfate concentration. Uptake from water with 10 ppb Se and 33 mg/L sulfate was about 1/4 of the uptake from water with 10 ppb Se and 3.3 mg/L sulfate. Uptake from water with 100 ppb Se and 33 mg/L sulfate was about 1/14 of the uptake from water with 100 ppb Se and 3.3 mg/L sulfate.

Hansen et al (1993) demonstrated that "Increasing sulfate concentrations significantly reduced the accumulation of" selenium by important San Joaquin Valley food chain organisms, the midge *Chironomus decorus* and the cladoceran *Daphnia magna*. The test waters had high concentrations of selenium, ranging from 7 ppm to 6 ppm. Mair and Knight (1993) note that "The midge *C. decorus* is a benthic invertebrate common in the Central Valley of California where it is a major component of aquatic food chains." Midges are the most numerous of the larger insects in wetlands throughout the world (Horne and Roth, 1989), and Alamo et al (1994) reference Connely and Chesmore (1980) and Ivey (1987) to state that "Chironomid (midge) larvae have been reported as the most important animal food item in San Joaquin Valley American cool and northern pintail diets."

Appropriate selenium water quality objectives for a region must take into consideration natural background levels of selenium in the region, and natural background levels of selenium frequently exceed EPA's 5 ppb NWQC in ephemeral streams draining into the west side of the San Joaquin Valley. CYRWQCB (1991) studied 1191 square miles of drainages in the Coast Range west of the San Joaquin Valley and north of the Panoche Creek drainage. Streams draining 14% of this area had 75th percentile selenium concentrations in excess of the 5 ppb EPA NWQC (i.e., 1/4 of the measurements were above 5 ppb). This represents natural background in the streams, because there was no irrigated agriculture in the drainage basins upstream from the sampling points. The 75th percentile selenium level was also 5 ppb in Panoche Creek, but this may have resulted from agriculture in Panoche Valley. Later, the California Department of Water Resources studied floodwater inflows to the California Aqueduct (San Luis Canal) that runs down the west side of the San Joaquin Valley (DWR, 1995). The median selenium concentration of floodwater inflows to the Aqueduct between milepost 50 and milepost 170 was 6 ppb, in excess of the EPA 5 ppb NWQC.

A scientifically appropriate water quality objective for selenium must take account of sulfate levels and natural background selenium levels in the affected ecosystem.

2. Site-specific water quality objectives above 5 ppb in the San Joaquin Valley are appropriate, because harmful effects of selenium at levels currently found in these water have not been identified.

No studies indicating harmful effects resulting from selenium levels presently occurring in Mud and Salt Sloughs and the San Joaquin River were located, although 50th percentile selenium concentrations in Mud and Salt Sloughs in water years 1985 through 1994 ranged from 1 to 20 ppb (CVRWQCB, 1995a). In particular, the diversity of fish species in Mud and Salt Slough is similar to other locations in the San Joaquin Valley (CVRWQCB, 1992b).

Experts from the California Department of Fish and Game (DFG) have conducted Selenium Verification Studies for the State Water Resources Control Board (SWRCB) since 1986. In 1991, DFG experts measured selenium levels in 254 tissue samples from eight species of fish collected in Mud Slough, the San Joaquin River and San Joaquin River backwater areas (California Department of Fish and Game, 1994). They found that:

- no species contained selenium at levels of concern for human health;
- few tissue samples even approached levels where toxic effects in fish might begin to appear; and
- selenium concentrations were lower in fish taken from backwater areas than in fish taken from the streams, showing that selenium is not being selectively concentrated in backwater areas.

Only 0.8% (2 out of 254) of the fish samples taken by DFG in 1991 exceeded levels where toxic effects in fish might begin to appear. These samples, collected in the San Joaquin River above and below the confluence with the Merced, only exceeded the level of concern by 10% and it is highly doubtful that these two sample results provide a statistically significant indication of any adverse effects on fish. Earlier DFG studies of selenium levels in muscle and livers of catfish taken from Mud and Salt Sloughs found selenium levels far below toxic levels; no adverse effects and no threat to human consumers (SWRCB, 1990, pages vi, 5 and 8).

In addition, information presented by Williams et al (1994) indicates that selenium levels around 10 ppb in San Joaquin Valley streams are not likely to harm birds:

1. Selenomethionine (the essential amino acid methionine with sulfur replaced by selenium) causes the selenium-associated reproductive impairment observed in birds and fish;
2. The threshold for reproductive impairment in birds occurs when the average selenomethionine content of food is 4-8 ppm.
3. Birds, and invertebrate or vertebrate food organisms, cannot make selenomethionine.

4. Selenomethionine is created in algae and enters the food chain when algae are consumed by vertebrates and invertebrates.
5. Selenomethionine levels in birds, or food organisms, are likely to be less than or equal to selenomethionine levels in algae;
6. At the same water concentration of selenium, selenomethionine content of algae is lower in higher sulfate waters.
7. At sulfate levels of only 33 mg/L (lower than observed in San Joaquin Valley streams), selenomethionine levels in algae at the base of the food chain have fallen to 4 ppm, below the dietary threshold of selenomethionine for reproductive impairment in birds.

In contrast, SWRCB's 1987 analysis of water concentrations of selenium needed to protect waterfowl (suggesting an objective around 1 ppb) is inappropriate for San Joaquin Valley streams because it:

- does not account for the effects of San Joaquin Valley sulfate levels on selenium concentrations in food organisms; and
- assumes that birds subsist entirely on food taken from waters with elevated levels of selenium.

3. EPA's suggested methods for establishing site-specific water quality objectives are not applicable to substances like selenium that cause harm by bioaccumulating through the food chain.

EPA's suggested methods for establishing site-specific objectives, set forth in "Interim Guidance on Determination and Use of Water-Effect Ratios for Metals" (EPA-823-B-94-001, 1994) are designed for substances that are directly toxic. The Water Effects Ratio procedure employs bioassays to determine the difference in toxicity observed in site waters and in the reference water used to establish the national water quality criterion. The Water Effects Ratio (WER) is the concentration that causes toxic effects in site water divided by the concentration that causes toxic effects in the reference water used to establish the national standard. The resulting site-specific objective is

$$\text{Site-specific objective} = \text{WER} \times (\text{EPA national objective})$$

Bioaccumulation through the food chain, not direct toxicity, is the main issue with respect to selenium (Kaiser and Knight, 1994). In this case, the Water Effects Ratio approach cannot be used (C. Stephan, EPA, personal communication). New methods must be developed to identify site-specific objectives for contaminants like selenium that cause harm by bioaccumulating through the food chain. These methods must recognize that background levels used to develop site-specific objectives must be site-specific background levels in the west side of the San Joaquin Valley, and not national or global background levels.

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Economic Considerations In Choosing Beneficial Uses And Water Quality Criteria

The assignment of beneficial uses and the selection of water quality criteria in the Grassland Area will generate benefits and costs for the residents of California. The best set of beneficial uses and criteria will achieve the proper balance of public benefits and public costs.

Benefits include the protection of water quality, while costs include the reductions in economic activity that will occur, if agricultural production declines, due to increased recirculation of saline drainage water. Reductions in farm-level production will cause further reductions in the sales of firms that provide inputs to farms, and in the income of households that are employed directly in agriculture and in the supporting industries.

The net economic impact on local communities and on the value of agricultural output in California is, in part, a function of the beneficial uses and the water quality criteria that are selected for the Grassland Area. The appropriate economic criterion, to maximize the net public benefits of water quality objectives, is to match the incremental gain in the values achieved in selecting policy parameters with the incremental reduction in economic activity.

The Grassland Basin Drainers are developing economic information that can be used to evaluate the net public benefits generated by agricultural production and natural resources in the region. That information will include estimates of the economic value of crops produced each year, and the revenues that are generated by industries that provide inputs to farmers. The number of jobs provided by agriculture and the impact of agriculture on household income and expenditures will also be estimated.

The Drainers are also preparing an economic analysis of the long-term impacts of water quality objectives on agricultural production. Increased recirculation of subsurface drainage water will cause soil salinity to increase, over time, causing reductions in the yield of salt-sensitive crops. Those crops are often more profitable than salt-tolerant crops, and they provide greater public benefits per acre-foot of irrigation water. Water quality criteria that enable farmers to maintain salt balance will ensure that the public benefits generated by the production of salt-sensitive crops can be sustained, in the future.

Farmers and districts in the Grassland Basin have implemented many improvements in water management practices, in recent years, to maximize the value of limited water supplies and reduce the volume of drainage water discharged to the San Joaquin River. They have also invested significant resources in experiments to evaluate alternative methods of removing selenium from drainage water, before it is discharged to the River. All of these investments, which generate both private and public benefits, are made possible by the net returns generated in crop production. The optimal set of beneficial uses and water quality criteria will enable farmers to continue making these investments that promote long-term productivity and enhance environmental quality.



October 4, 1995

Mr. William H. Crooks, Executive Officer
California Regional Water Quality Control Board
Central Valley Region
3443 Router Road, Suite A
Sacramento, California 95827-3098

Subject: Comments on the Staff Report on The Water Quality Objectives
and Implementation Plan to be Used for the Regulation of
Agricultural Subsurface Drainage Discharges in the San Joaquin
River Basin

847 SIXTH STREET

SUITE 7

Dear Bill,

Enclosed are written comments prepared by the San Luis & Delta-Mendota
Water Authority, in response to the Regional Board Staff Report dated
August 1995. These comments expand upon the concepts and analysis that
we presented, very briefly, at the Regional Board Workshop on
September 22. In general, the Water Authority and the Grassland Basin
Drainers support the approach taken by staff regarding water quality
objectives in the San Joaquin River Basin.

P.O. BOX 2157

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We would like to include with these comments, by reference, the written
material we submitted to the Regional Board on July 6, 1995. That

209 224-5698

material was prepared in response to the Workshop on Beneficial Uses and
Water Quality Criteria to be Used in the Basin Plan Amendment. The
July 6 comments include important discussion of beneficial uses and the
methods used to select a selenium water quality objective for the San
Joaquin River, Mud Slough, and Salt Slough.

The San Luis & Delta-Mendota Water Authority plans to work with the
Regional Board and the Environmental Protection Agency to determine the
most appropriate water quality objectives for the San Joaquin River and
Sloughs, using the best scientific and economic data available. It is
possible that site-specific water quality objectives may protect
beneficial uses at a lower cost to the public. At this time, however, we
are moving forward aggressively with efforts to achieve the proposed
water quality objectives and selenium load targets. Therefore, we are
not presenting new information regarding the appropriateness of the
proposed water quality objectives at this time.

The Staff Report on the Water Quality Objectives and the Implementation
Plan addresses many important issues regarding the selection and
achievement of water quality objectives in the Grassland Area. We
appreciate the effort put forth by your staff in preparing a thoughtful
and pertinent report that describes both the current water quality
conditions in the Grassland Area and the challenges that remain in
reducing selenium loads that are generated largely by nonpoint sources.

Our comments address selected statements and analysis in the Staff Report
that under-estimate the potential economic impacts of the proposed
objectives. The report states correctly that despite significant efforts
to reduce drain water volume and selenium loads in recent years, selenium
concentration objectives in the region are still exceeded in some months.
Further knowledge is required about the relationship between irrigation
activities and drainage water volume and selenium loads. In addition,
farmers and districts will need to make even greater investments in new
and existing irrigation technologies, and in selenium removal methods, to
achieve water quality objectives.

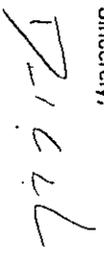
We appreciate this opportunity to provide detailed comments regarding material presented in the Staff Report. We have also developed cost estimates for some of the activities described in the Staff Report, such as improving irrigation technologies and treating drainage water to remove selenium. We describe, very briefly, the Regional Management Plan that is being implemented by the Grassland Basin Drainers to achieve selenium load targets. A copy of that Plan was submitted to the Regional Board with our July 6 comments:

The Grassland Basin Drainers have analyzed the potential economic impacts of the recirculation of drainage water that may be required to achieve selenium load targets. We are including with these comments our estimates of the potential impacts of the Total Monthly Maximum Load targets prepared by Regional Board Staff and the load targets that are included in the Tentative Use Agreement for the Wetlands Bypass. We are also transmitting with these comments a report that describes the economic model used for that analysis.

The magnitude of the potential economic impacts on agriculture and on local communities, and the experience needed to identify and implement cost-effective measures for achieving water quality objectives provide a strong case in support of the long-term compliance schedule proposed in the Staff Report.

Thank you for this opportunity to provide comments on the Staff Report. Please let me know if any additional information from the San Luis & Delta-Mendota Water Authority would be helpful, at this time.

Sincerely,



Daniel G. Nelson
Executive Director

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Comments Regarding Water Quality Objectives and an Implementation Plan for the San Joaquin River Basin

Prepared by the San Luis &
Delta-Mendota Water Authority

October 4, 1995

These comments pertain to the "Staff Report on the Water Quality Objectives and Implementation Plan to be Used for the Regulation of Agricultural Subsurface Drainage Discharges in the San Joaquin River Basin," August 1995. That report was prepared by the California Regional Water Quality Control Board for the Central Valley Region.

Comments Regarding Water Quality Objectives and an Implementation Plan for the San Joaquin River Basin

The Regional Board Staff Report on the Water Quality Objectives and the Implementation Plan addresses many important issues regarding the selection and achievement of water quality objectives in the Grassland Area. The Regional Board Staff has put forth considerable effort in preparing a thoughtful and pertinent report that describes both the current water quality conditions in the Grassland Area and the challenges that remain in reducing selenium loads that are generated largely by nonpoint sources. The report states correctly that despite significant efforts to reduce drain water volume and selenium loads in recent years, selenium concentration objectives in the region are still exceeded in some months. Further improvements in irrigation technology, water management, and selenium removal methods will be needed to achieve water quality objectives.

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Specific Comments On the Staff Report

Compliance Time Schedule

The water quality objectives presented in the Staff Report include a 2 µg/L selenium objective (monthly mean) for wetland supply channels and Salt Slough, and a 5 µg/L selenium objective (4-day average) for the San Joaquin River and Mud Slough (North). The compliance time schedule presented in Table 11 of the Report (page 39) includes a compliance date of October 1, 1996 for the wetland supply channels and Salt Slough, October 1, 2015 for the San Joaquin River downstream of the Merced River, and October 1, 2020 for the San Joaquin River upstream of the Merced River and Mud Slough (North). The Water Authority strongly supports this time schedule, though it has reservations about the October 1, 1996 date for the wetland supply channels and Salt Slough.

Specifically, the Grassland Basin Drainers will need an alternate route for subsurface drainage water in order to achieve the selenium concentration objective for the wetland supply channels by October 1, 1996. The Wetlands Bypass program will certainly increase the likelihood that the 2 µg/L selenium objective can be achieved in the wetland channels. If the Wetlands Bypass program does not go forward, the 2 µg/L selenium objective will not be achievable.

The proposed compliance dates for the San Joaquin River and Mud Slough (North) provide more time for developing the technologies that will be required to achieve the selenium concentration objectives. The additional time is appropriate, given our incomplete knowledge regarding irrigation and drainage relationships, the inherent uncertainty that describes the drainage water volume and loads observed in the region, and the large expenditures that will be required to generate better information and to develop cost-effective technological solutions.

The proposed compliance schedule will enable farmers, districts, and state and federal agencies to collect and analyze data describing the potential impacts of selenium on water quality and beneficial uses in the San Joaquin River and Mud Slough (North). At present, the potential biological impacts of selenium in these waterways are not known with certainty. It is possible that higher concentrations of selenium will not have a negative impact on beneficial uses in the San Joaquin River and Mud Slough. If this is the case, then the overall public benefits generated by water resources in the Grassland Basin will be enhanced by allowing higher concentrations of selenium. The proposed compliance schedule

will enable researchers and policy makers to address this issue more completely, at the appropriate time.

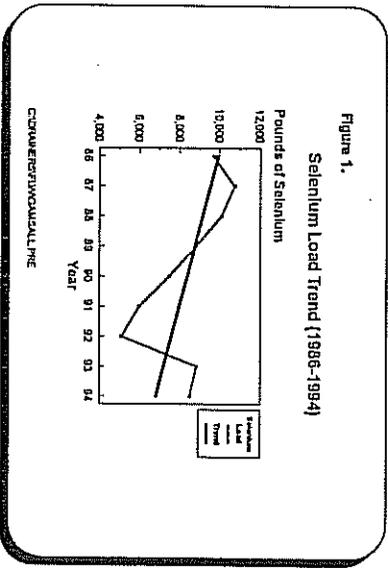
Some of the oral comments presented at the Regional Board's September 23 Workshop suggested that the proposed compliance schedule allows too much time for the Grassland Basin Drainers to achieve selenium concentration objectives. It was suggested that the Regional Board implement a more restrictive compliance schedule, in order to prevent degradation of the San Joaquin River. Some of the comments also alluded to the time that has elapsed since 1983, when selenium was first identified as a problem at the Kesterson National Wildlife Refuge. Some also suggested that farmers and districts in the Grassland Basin have made little effort to improve water management practices and to reduce drainage water volume and loads in recent years.

The San Luis & Delta-Mendota Water Authority and the Grassland Basin Drainers believe the Regional Board should retain the proposed compliance time schedule, because the public will benefit from the time provided to develop cost-effective methods for reducing selenium loads in subsurface drain water. Agricultural production in the Grassland Basin generates significant private and public benefits. Water quality in the San Joaquin River is also an important public resource and beneficial uses in the River should be protected. A policy that enables farmers to continue producing agricultural products, while protecting water resources, is clearly in the public's interest. The monitoring program described in the Staff Report will ensure that water quality is not degraded in the San Joaquin River, while farmers, districts, and researchers develop appropriate methods for reducing selenium loads sufficiently to achieve concentration objectives.

Efforts to protect water quality in the San Joaquin River should not be compared to the problems caused by selenium at Kesterson. Those problems were caused by very high concentrations of selenium in a set of drainage water holding ponds. Over time, as the drainage water evaporated, the concentration of selenium increased to levels that were many times greater than those observed in the San Joaquin River, which is a flowing system in which water is not ponded or allowed to evaporate. Biological problems like those observed at Kesterson have never been reported in the San Joaquin River, and it is very unlikely that such problems will occur in the future.

Farmers and districts in the Grassland Basin have made substantial investments in irrigation technology and improvements in water management practices in recent years. As a result, drainage water volume and loads were reduced significantly during 1990 through 1992. The volume and loads increased somewhat in 1993 and 1994, but the long-term trend remains downward-sloping (Figure 1). In

addition, farmers and districts have already implemented most recommendations of the San Joaquin Valley Drainage Program. Remaining recommendations are now being implemented as part of a Regional Management Plan developed by the Grassland Basin Drainers. These improvements and the associated reductions in drainage water volume and loads reflect the gains that can be achieved with existing technology. Sustained reductions in drainage water volume and loads, beyond those observed to date, will require greater adoption of existing technologies and development of new techniques for minimizing deep percolation and removing selenium from subsurface drain water.



The potential economic impacts of selenium load restrictions are presented later in this document. That analysis suggests that if a Total Maximum Monthly Load program is implemented immediately, to achieve a 5 µg/L selenium concentration objective, the total value of crop production would be reduced by \$41.4 to \$65.3 million during a five-year period. Most of that decline would be caused by decreases in crop yields due to rising soil salinity, as recirculation is increased beyond the level that can be sustained while maintaining salt balance. The California Water Code enables the Regional Board to consider such economic impacts, when evaluating the potential benefits and costs of its water policy decisions.

The compliance time schedule proposed by the Regional Board will limit the total load of selenium discharged from the Drainage Problem Area to 8,000 pounds per year, beginning on October 1, 1997. This restriction is designed to prevent degradation of the San Joaquin River during the time in which farmers, districts, and researchers develop new technologies for achieving concentration objectives. Although it will be difficult and costly to achieve the 8,000 pound limit, we

believe this method of implementing water quality objectives is appropriate in this case. The selenium load restrictions should protect water quality in the San Joaquin River, while enabling agricultural production to be continued in the region.

Studies to be Conducted

The Staff Report includes a list of nine studies that should be undertaken to develop better information for refining water quality objectives and the Regional Board regulatory program (pages 42-44). These include development of a groundwater model, analysis of the costs and benefits of actions to achieve water quality objectives, and examination of site-specific impacts of trace elements in subsurface drain water. In addition, the Report notes that better drainage reduction technologies must be developed and transferred to the farm level. Regional storage of salts and the impacts of a valley-wide drain should also be examined. The impacts of recirculating drainage water on soil resources and crop yields, and the role of upslope contributions to subsurface drain water volume and loads should also be investigated. The San Luis & Delta-Mendota Water Authority agrees with the need to study all of these issues and we believe the time required to conduct these analyses is further justification for the proposed compliance time schedule.

Results of these studies will provide information regarding the most appropriate selenium concentration objectives and the best methods for achieving those goals. It is clear that very large investments will be required to achieve water quality objectives in the Grassland Basin. The knowledge that will be gained from further research and near-term efforts that are currently underway to reduce selenium loads will be essential in identifying and implementing appropriate investments.

Drainage Reduction Scenarios

The Staff Report includes a discussion of alternative drainage reduction scenarios to demonstrate the feasibility of achieving selenium load reduction goals (Appendix B). While the general intent of that analysis is valid, some of the key assumptions are over-simplified and the results give an incorrect impression that selenium load reductions can be achieved with little effort and minimal cost by farmers and districts. Readers of the Staff Report may be given the impression that significant reductions in selenium loads can be achieved very quickly if farmers and districts would simply improve irrigation practices on 45,700 acres of drained land, remove selenium from 1,530 acre-feet to 3,150 acre-feet of

concentrated drainage water, retire 3,000 acres of land from production, and plant another 3,000 acres in eucalyptus trees.

Key assumptions that must be examined in this analysis include the 1,400-pound reduction in selenium load achieved by retiring 3,000 acres of land that are served by drainage systems producing the most selenium load. Land retirement has not yet been implemented in the Drainage Problem Area. Therefore, there are no data to verify or predict the actual reduction in selenium load that may be achieved by retiring 3,000 acres of land. It is possible that some of the selenium collected in the targeted drainage systems will be collected by other drainage systems on land that is not retired. If this occurs, then the reduction in selenium load will be less than the assumed 1,400 pounds.

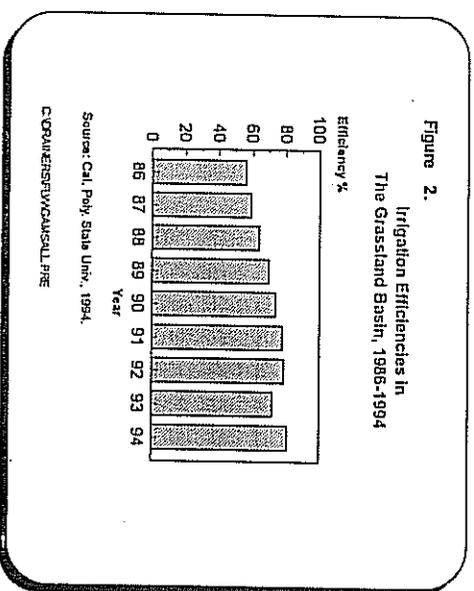
A successful land retirement program will require voluntary participation among farmers and landowners. Therefore, it is not clear that districts will be able to retire precisely the land that is served by drainage systems producing the most selenium. If this cannot be accomplished, the reduction in selenium load will be less than the assumed 1,400 pounds. In addition, it is possible that terminating drainage service on selected parcels of land will have a negative impact on adjacent parcels that are "effectively drained" by drainage systems on the retired parcels. If this occurs, monetary compensation or drainage service may be required by farmers or landowners of the adjacent parcels. If drainage service is provided to those lands, the actual reduction in selenium loads achieved through land retirement will be less than expected.

The analysis presented in Appendix B of the Staff Report assumes that improvements in irrigation practices will reduce deep percolation by 0.35 acre-feet per acre on land that is effectively drained by subsurface drainage systems. Therefore, irrigation improvements on 45,700 to 49,000 acres of land are expected to reduce selenium loads by 4,240 pounds to 5,300 pounds, each year. This assumption is optimistic, given that we have not observed sustainable reductions of this magnitude, in recent years. Selenium loads were reduced from 10,700 pounds in 1987 to 5,160 pounds in 1992 (a reduction of 5,540 pounds), but this reduction was not sustained in 1993 and 1994 (Figure 1).

Much of the reduction in selenium loads observed since 1987 may have been caused by a lowering in the high water table, following several years of persistent drought conditions in the region. In addition, many farmers and districts recirculated large volumes of saline drainage water in 1991 and 1992 to augment limited water supplies. However, the recirculation observed in those years cannot be sustained, over time, while maintaining salt balance.

In many physical and engineering problems, the initial efforts to achieve a specific goal generate greater gains than efforts undertaken at a later time. In the

Grassland Basin, many farmers have already implemented the most affordable improvements in water management practices and they have achieved impressive reductions in drain water volume and selenium loads. Irrigation efficiencies achieved during 1991 through 1994 are approaching the maximum efficiencies that may be attainable in the Grassland Basin (Figure 2). Further improvements in water management will be more expensive and they will generate smaller reductions in drain water volume and selenium load, per dollar invested in the effort. It is probable that further improvements in water management practices will not reduce deep percolation by 0.35 acre-feet per acre, because most farmers have already reduced deep percolation by a significant portion of that amount.



The analysis in Appendix B also assumes that eucalyptus trees on 3,000 acres of land in the Drainage Problem Area will remove 3,920 pounds of selenium. Like land retirement, this policy will require voluntary participation among farmers and landowners willing to dedicate a portion of their land to producing eucalyptus trees using saline drainage water. The potential difficulty in marketing eucalyptus products and the potential increase in soil salinity that will occur on the land when saline drainage water is recirculated for many years will be significant deterrents to participation. In addition, there are limited data available for predicting the reductions in drainage water volume and selenium loads that will occur by planting eucalyptus trees.

The summary section of Appendix B in the Staff Report includes the statement that the "selenium load reductions required to meet a 5 µg/L 4-day average selenium objective in the San Joaquin River in a dry year are technically achievable." This statement may be conceptually valid, but it avoids the empirical realities described above, and it fails to report any of the potential economic impacts of implementing the scenarios described in Appendix B. In brief, it is "technically feasible" to reduce pollutant loads below current levels in most cases of pollution in the United States. However, the cost of achieving further reductions in pollutant loads often exceeds the expected benefits. It is necessary to consider both the costs and the benefits of feasible solutions, in order to determine the optimal strategy.

The costs of implementing the scenarios described in Appendix B can be estimated using average total revenues for crop production in the Drainage Problem Area and the cost of treating drainage water presented in the Staff Report. The cost of improving water management practices is not included in this discussion, because these improvements are appropriate and will be required in any scenario that is successful in achieving water quality objectives. The estimated cost to retire 3,000 acres of land from production is \$4.5 million, provided that land can be purchased for an average price of \$1,500 per acre. This cost will double if a regional entity or a federal agency purchases 3,000 additional acres for planting eucalyptus trees. The cost of constructing a treatment plant to remove selenium from 1.2 to 2.8 million gallons of drainage water, per day, may exceed \$1.0 million. Therefore, the estimated fixed cost of implementing the scenarios in Appendix B ranges from \$5.5 million to \$10.0 million, net of the costs of improving irrigation practices.

The estimated annual costs of treating 1,530 acre-feet to 3,150 acre-feet of drainage water will range from \$0.5 million to \$0.9 million, using the cost estimate of \$300 per acre-foot presented in the Staff Report. That estimate is based on expert testimony in litigation, and it may underestimate the true cost of removing selenium from drainage water. At present, there are no selenium removal methods that are known to be successful and cost-effective. The true cost of a viable removal technology could exceed \$300 per acre-foot, when it becomes available.

Removing 6,000 acres of land from crop production (including the 3,000 acres of eucalyptus trees) will reduce total revenue in the region by an estimated \$7.7 million, using an average total revenue of \$1,280 per acre. Sales by industries that provide inputs to agriculture and expenditures by households employed in farming and in the supporting industries will decline by an estimated additional \$8.6 million. Therefore, even when using assumptions in the Staff Report, the estimated annual reduction in economic activity that will result if the scenarios in

Appendix B are implemented will be from \$8.1 million to \$16.2 million. An economic analysis prepared for the Grassland Basin Drainers indicates that the potential reductions in economic activity could be much greater if recirculation is the primary method of achieving selenium load reductions.

Costs of Implementing Improvements

The Staff Report notes that the Regional Board estimated the annual cost of implementing the 1988 regulatory program for subsurface drainage to be from \$17.00 to \$67.00 per acre (page 10). The Report also notes that the San Joaquin Valley Drainage Program estimated the annual cost of implementing its recommended plan to be \$81.00 per acre. Current estimates of the costs required to implement farm-level improvements in water management practices and district-level improvements in drainage water management, and to construct and operate selenium treatment plants are greater than earlier estimates.

The amortized annual capital and maintenance cost for a sprinkler system large enough to irrigate a 150-acre field is \$73.45 per acre, while the amortized annual capital and maintenance cost for a siphon tube system is just \$2.96 per acre. Therefore, the annual fixed cost of irrigation rises by \$70.49 per acre when farmers switch from siphon tubes to sprinklers.

The variable cost (labor, water, and energy) of using sprinklers to pre-irrigate cotton fields is slightly less than the variable cost of using siphon tubes, because the value of water saved offsets the higher labor cost of using sprinklers.

However, the estimated variable cost of using sprinklers for all summer irrigations on cotton fields is \$194.58 per acre, while the estimated variable cost of using siphon tubes is \$109.96 per acre. Therefore, farmers using sprinklers for all summer irrigations on cotton will spend \$84.62 per acre more for labor, water, and energy than farmers using siphon tubes. The higher variable cost of using sprinklers during summer irrigations is the principal reason that most farmers prefer using sprinklers only for pre-irrigation, while using siphon tubes for summer irrigations of cotton. The total cost of irrigating cotton fields with sprinklers (including both the fixed and variable costs) is \$155.11 per acre greater than the total cost of using siphon tubes.

Many farmers in the Grassland Basin have begun using sprinklers for germination irrigations on tomatoes, even though the cost is significantly higher than using siphon tubes. The estimated variable cost of using sprinklers for germinating tomato fields is \$77.44 per acre, while the estimated variable cost of using siphon tubes is \$58.24 per acre. Therefore, farmers germinating tomatoes with sprinklers will spend \$19.20 more per acre for labor, water, and energy than

farmers using siphon tubes. The total cost (fixed and variable) of germinating tomatoes with sprinklers is \$89.69 per acre greater than the total cost of using siphon tubes. Farmers using sprinklers for the first or second seasonal irrigations on tomatoes will incur even higher variable costs.

The Regional Board's estimated cost of implementing the 1988 regulatory program and the San Joaquin Valley Drainage Program's estimated cost of implementing its recommendations can be compared to these estimated costs of improvements in irrigation practices, after adjusting for inflation. The adjusted cost estimates, in 1994 dollars, are \$21.30 to \$83.93 per acre for the 1988 regulatory program and \$91.85 per acre for the SJVDP recommendations. It is interesting to note that the cost of switching from siphon tubes to sprinklers for all cotton irrigations is actually greater than the estimated cost of implementing either of these programs. The estimated cost of replacing siphon tubes with sprinklers for germinating tomatoes is greater than the estimated cost of implementing the 1988 regulatory program and is almost as great as the cost of implementing the SJVDP recommendations.

The Staff Report includes a statement that the costs of implementing solutions to the drainage problem "might be offset if crop yields increase in response to improved irrigation management or if cropping patterns change to higher value crops (page 10)." It is true that improvements in irrigation distribution uniformly and better scheduling of irrigation deliveries can generate improvements in crop yield that may partially offset the higher costs of owning and operating sprinkler systems. However, it will be difficult to maintain or improve crop yields in districts where a significantly larger proportion of the total subsurface drain water volume must be recirculated to achieve necessary reductions in selenium loads.

The electrical conductivity of water delivered to farm turnouts will rise when districts increase the proportion of subsurface drain water that is recirculated and blended with fresh water supplies. This can become a serious problem for farmers using sprinklers, because most plants are susceptible to foliar injury from salt in irrigation water. Higher salinity of irrigation water will also limit the planting of higher value crops because farmers will not want to absorb the risk of crop damage on fruits and vegetables, which require higher planting and investment costs. Therefore, the feasibility of using sprinklers and planting higher value crops will be diminished in districts that must reduce selenium loads significantly by recirculating drain water. In addition, higher salt loads in delivered water will cause soil salinity to increase more rapidly, over time. Higher salinity in both water and soil resources may offset the potential yield increases that would otherwise result from improvements in water management practices.

Potential Economic Impacts of Selenium Load Restrictions

Conceptual Framework

Policy makers seeking the best water quality objectives and implementation plan for the Grassland Basin should consider several economic concepts when evaluating pertinent tradeoffs and opportunities. These concepts include the incremental costs and benefits generated by implementing water quality objectives, the uncertainty that exists regarding farm-level irrigation activities and the selenium concentrations and loads observed in the San Joaquin River, and the role of exogenous events, such as rainfall, that cannot be controlled by farmers or irrigation districts. The optimal set of water quality objectives will maximize the net public benefits generated by water resources in the region. The best implementation plan will include concentration objectives that ensure protection of water quality and beneficial uses, while maintaining agricultural production.

The Grassland Basin includes large areas of wetlands and waterways that provide significant value to the residents of California. The Basin also includes some of the most productive farmland in the state. The per-acre yields of cotton, cantaloupes, tomatoes, and other fruits and vegetables are among the highest in California. In a typical year, farmers irrigating more than 90,000 acres of farmland in the Grassland Basin produce more than 100,000 bales of cotton, 200,000 tons of tomatoes, and 3,000,000 cartons of cantaloupes. These products are shipped to markets throughout the United States and to many other countries.

Agricultural production in the Grassland Basin generates both private and public values. The total revenue received for crops is one estimate of the total private value earned in crop production. However, consumers of farm products receive benefits that exceed the prices paid for these products. This occurs because agricultural commodities are sold in competitive markets. For example, most Californians are able to purchase fruits and vegetables at prices that are lower than what they would actually be willing to pay for these products. The difference between what they are willing to pay, and what they actually pay in the marketplace, represents an economic surplus to consumers. The total value of this consumers' surplus generated in the Grassland Basin each year would be measured in the millions of dollars.

Agriculture in the Grassland Basin also generates positive economic values for local firms and communities. The expenditures for farm inputs generate revenue

for companies that provide equipment and supplies. Agriculture also provides income to households employed directly in farming and in the supporting industries, and the revenue base for most local communities is heavily dependent on agricultural production and processing. International trade accounts are also strengthened by agriculture, which generates a large proportion of the commodities exported from California to countries throughout the world.

The total value of crops produced in the Grassland Basin each year is about \$113 million. This generates about \$38 million in annual expenditures for inputs such as seed, fuel, and fertilizer. Households employed in farming and in the supporting industries spend about \$88 million per year for goods and services. Therefore, the total value of economic activity generated by agriculture in the Grassland Basin is about \$239 million per year. In addition, more than 4,000 persons are employed as a result of agricultural production in the region.

The appropriate public policy for the Grassland Watershed is to maintain agricultural production, and the private and public values generated by that activity, provided that water quality objectives are achieved in the San Joaquin River. The goal is to achieve the correct balance among the benefits gained by implementing water quality objectives and the costs imposed on agriculture. These costs will include direct expenditures and investments to reduce drain water volume and selenium loads, and indirect losses in revenue caused by declining crop yields and the changes in cropping patterns that will occur when salts accumulate in the region's soils. Salts will accumulate when farmers and districts increase their re-use of saline drainage water to achieve significant reductions in selenium loads. Both the direct and indirect costs imposed on agriculture will be measured in the millions of dollars per year.

Most of the selenium entering the San Joaquin River from the Grassland Basin is generated by nonpoint sources that include thousands of acres of irrigated farmland. The precise relationship between irrigation water management and drainage volume and loads is not completely understood and reductions in selenium concentrations and loads cannot be predicted with certainty. A large amount of information and experience has been gained since the mid-1980s, but much remains to be learned, regarding the impact of improvements in irrigation practices on sustainable reductions in selenium loads. The Regional Management Plan to be implemented by the Grassland Basin Drainers provides a unique opportunity to increase our knowledge regarding irrigation and drainage relationships.

Over time, we have learned that large rainfall events, and other exogenous factors which have not yet been explained, have a significant effect on drain water volume and selenium loads in some years. When these events occur,

selenium loading to the San Joaquin River increases, despite efforts of farmers and districts to reduce drain water volume and loads. We must continue efforts to gain a better understanding of all factors that contribute to selenium loads.

Farmers and districts in the Grassland Basin are currently implementing improvements in water management practices and constructing drainage management facilities, despite the inherent uncertainty regarding irrigation and drainage relationships. Evidence of this commitment is provided by the expenditures that are being made by farmers and districts in this effort. For example, the estimated cost of implementing the Regional Management Plan is more than \$500,000 per year, in addition to the expenditures by farmers and districts for improvements in source control and for construction of district drainage water facilities. The initial cost of a sprinkler irrigation system large enough to irrigate a typical 150-acre field is about \$49,000. Many farmers have purchased one or more sprinkler systems in recent years to manage irrigation water more effectively.

Irrigation and drainage districts have also begun investing in facilities to improve their ability to blend drainage water with fresh water supplies for delivery to farm fields. One relatively small water district has recently invested about \$1.8 million in a new drainage water recycling system. The amortized cost of this system is \$50.54 per acre, assuming a 10-year loan period and a 4% real rate of interest. Farmers and landowners in the Grassland Basin are making these expenditures and investments with the outlook that a long-term solution to the drainage problem will be developed.

The long-term outlook remains positive, even though the cost of discovering and implementing components of the solution will be very expensive. The Grassland Basin Drainers believe that current load reduction efforts that include farm-level source control measures and regional drainage water management will be augmented in the future by a reliable and affordable method for removing selenium from drainage water. The Drainers have examined many possible methods for removing selenium, in recent years, and these research efforts will continue in the future.

It is essential that we develop a comprehensive and cost-effective program for achieving water quality objectives in the Grassland Basin. A rapidly expanding world population will place increasing demands on the production of food and fiber in the 21st century. Farmers in California's San Joaquin Valley will play a significant role in meeting those demands. Our goal must be to maintain the soil and water resources required to support increased production in the future, while also maintaining and even enhancing the environmental amenities that Nature has provided.

Empirical Estimates

The Grassland Basin Drainers have examined the potential economic impacts of selenium load restrictions, using an economic model of crop production in the region. The model simulates the impact of recirculating saline drainage water to achieve selenium load reduction targets. Over time, soil salinity increases when districts recirculate a larger proportion of their saline drainage water. The yields of salt-sensitive crops, such as tomatoes and other vegetables, decline when soil salinity increases, causing reductions in total revenue. These crops are no longer produced when yield reductions cause the net revenue to decline below the net revenue generated by producing salt tolerant crops. In some scenarios, the increase in soil salinity is sufficient to cause yield reductions in cotton and other salt-tolerant crops, causing further reductions in total revenue.

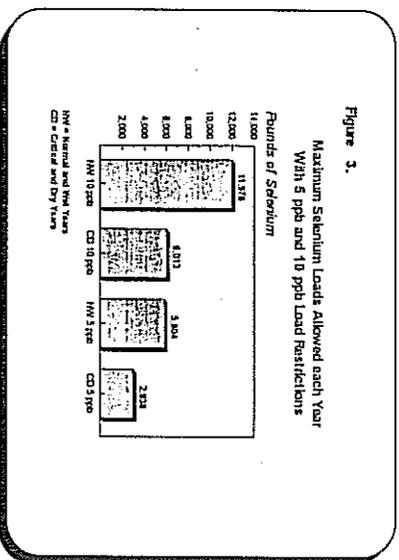
Reductions in agricultural output cause reductions in economic activity among companies that sell productive inputs to farmers and among households employed directly in farming or in the supporting industries. Estimates of these indirect and induced economic effects are developed using input/output multipliers provided by the U.S. Department of Agriculture. These estimates provide an overview of the potential regional economic impacts of achieving selenium load reduction targets.

The Regional Board staff has circulated a proposed Total Maximum Monthly Load (TMMML) program for achieving selenium concentration objectives in the San Joaquin River (Karkoski, 1995). That program includes specific selenium load restrictions to achieve selenium concentration objectives with acceptable rates of exceedance. Implementing a TMMML program in the Grassland Basin will be very difficult, because water flow in the San Joaquin River is quite variable from year to year, and from month to month, in most years. Therefore, the selenium load targets required to achieve the desired concentration exceedance rate are much lower than the selenium loads actually discharged to the River in most years. Reducing those loads to comply with the TMMML program will cause significant reductions in economic values.

The Grassland Basin Drainers have estimated the potential economic impacts of two TMMML programs: 1) to achieve a 5 µg/L selenium concentration objective, and 2) to achieve a 10 µg/L selenium concentration objective. The Drainers have also estimated the potential economic impacts of achieving the selenium load targets that are currently included in the draft Use Agreement for the Wetlands Bypass. That document is being circulated, at this time, by the U.S. Bureau of Reclamation for comments from the public.

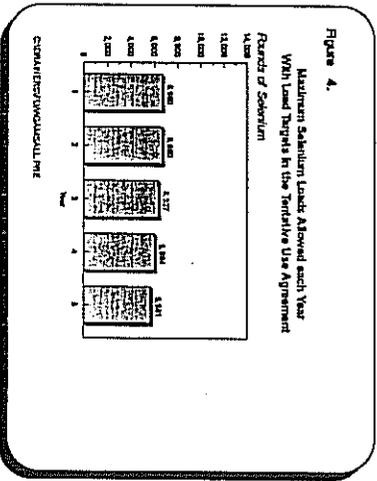
The TMMML programs and the Tentative Use Agreement include selenium loads that are specified for each month of the year. The Tentative Use Agreement also has annual selenium load targets that are less than the sum of the monthly selenium load targets. The TMMML programs include a single set of monthly selenium load targets that would be implemented in normal and wet, or in critical and dry years. The annual and monthly load targets in the Tentative Use Agreement decline, over time, to achieve a 15% reduction in selenium loads by the fifth year of the Use Agreement.

The 10 µg/L TMMML program would allow irrigation and drainage districts in the Grassland Basin to discharge 11,978 pounds of selenium during normal and wet years and 6,013 pounds of selenium during critical and dry years (Figure 3). The average load of selenium discharged by districts during 1986 through 1994 is about 8,000 pounds, with a maximum load of 10,700 pounds in 1987 and a minimum load of 5,160 pounds in 1992. The maximum annual selenium loads permitted in the 5 µg/L TMMML program would be 5,804 pounds in normal and wet years, and 2,938 pounds in critical and dry years. The 10 µg/L TMMML program would require significant reductions in selenium loads during critical and dry years, while the 5 µg/L TMMML program would require significant load reductions in all years.

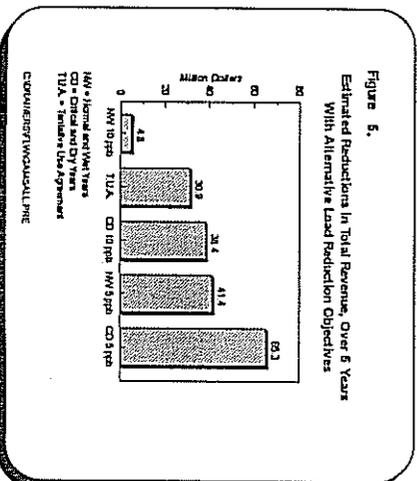


Selenium load targets in the Tentative Use Agreement begin with 6,660 pounds in the first two years and decline to 5,661 pounds in the fifth year (Figure 4). The potential economic impacts of these targets will be similar to those imposed in the 5 µg/L TMMML program during normal and wet years, and the 10 µg/L TMMML program during critical and dry years. However, some of the monthly load

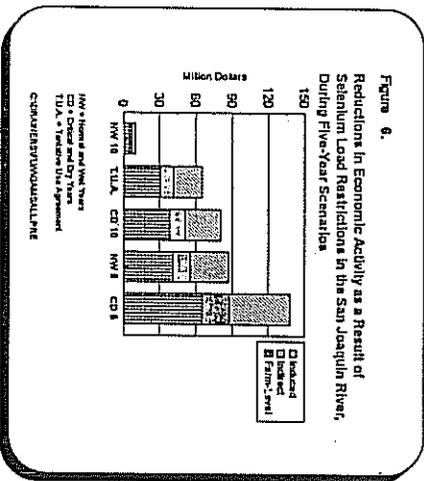
targets are less restrictive than those in the TMMML programs. Therefore, the potential reductions in crop yields and revenues caused by the Tentative Use Agreement will be less severe than with either of the TMMML programs.



The estimated reductions in total revenue during a five-year period range from \$4.8 million for the 10 µg/L TMMML program during five normal and wet years, to \$65.3 million for the 5 µg/L TMMML program during five critical and dry years (Figure 5). The estimated reduction in total revenue with the Tentative Use Agreement is \$30.9 million. The estimated indirect and induced effects range from \$5.4 million for the 10 µg/L TMMML program to \$72.5 million for the 5 µg/L TMMML program. The estimated indirect and induced effects of the Tentative Use



Agreement are \$34.3 million. Therefore, the estimated total economic impacts during a five-year period range from \$10.2 million for the 10 µg/L TMMML program to \$137.7 million for the 5 µg/L TMMML program (Figure 6). The estimated total economic impact of the Tentative Use Agreement is \$65.1 million.



Estimates presented in the previous paragraph do not include any investments in water management technologies and facilities, or in selenium treatment plants, that will be required to achieve the selenium load targets. The goal of this analysis is to depict the most likely reductions in the agricultural revenue and regional economic activity when soil salinity rises and causes changes in crop yields and cropping patterns.

The Regional Management Plan

The potential economic impacts of reducing selenium loads to comply with either of the TMLL programs or the Tentative Use Agreement are significant, and they provide a clear economic incentive for developing new technologies to reduce drain water volume and to remove selenium from subsurface drain water. Given the economic values generated by agriculture, it is clearly in the public's interest that we develop a comprehensive solution to the drainage problem that protects water quality and beneficial uses, while maintaining a vibrant agriculture in the Grassland Basin. An aggressive, regional approach to managing drainage water is the first step in developing that solution.

The Grassland Basin Drainers are currently implementing a Regional Management Plan that includes the re-routing of drainage water from channels in the Grassland Water District to the Wetlands Bypass. The Plan also includes the hiring of a Regional Drainage Coordinator who will assist districts and farmers with efforts to reduce the drainage water volume and selenium loads. We look forward to full implementation of the Regional Management Plan, and we are hopeful that a coordinated, regional approach to drainage water management will provide new information regarding specific activities that will reduce selenium loads in the Grassland Basin. A copy of the draft Regional Management Plan was submitted to the Regional Board with testimony from the San Luis & Delta-Mendota Water Authority, on July 6, 1995.

The Regional Management Plan will become the centerpiece of efforts to reduce drain water volume and selenium loads during the next five years. The information and experience gained by implementing the Plan will be used to develop specific components of a comprehensive long-term program for maintaining water quality in the Grassland Basin. The compliance time schedule proposed in the Staff Report provides the necessary framework for developing an appropriate solution to the drainage problem. The San Luis & Delta-Mendota Water Authority and the Grassland Basin Drainers look forward to working with the Regional Board, State Board, and the Environmental Protection Agency in developing and implementing the long-term plan.

References

- California Polytechnic State University, 1994. Grassland Basin Irrigation and Drainage Study. Final Report to the California Regional Water Quality Control Board, Central Valley Region, Contract Number 1-078-150-1, Sacramento.
- California Regional Water Quality Control Board, 1995. Staff Report on the Water Quality Objectives and Implementation Plan to be Used for the Regulation of Agricultural Subsurface Drainage Discharges in the San Joaquin River Basin, 45 pp.
- Karkoski, J., 1994. A Total Maximum Monthly Load Model for the San Joaquin River, Staff Report of the California Regional Water Quality Control Board, Central Valley Region, Sacramento, 86 pp.



December 11, 1995

Mr. Bill Crooks, Executive Director
California Regional Water Quality Control Board
for the Central Valley Region
3443 Router Road, Suite A
Sacramento, CA 95827-3098

Dear Bill:

Enclosed are the comments prepared by the San Luis & Delta-Mendota Water Authority, pertaining to the November 1995 Staff Report on the "Compliance Time Schedule to be Used for the Regulation of Agricultural Subsurface Drainage Discharges in the San Joaquin River Basin."

The comments include discussion of the likely farm-level and regional economic impacts of the proposed Compliance Time Schedule, and the expenditures and investments required to achieve water quality objectives. We also compare the expected economic impacts and costs of concentration-based performance goals with those of load-based performance goals. The Water Authority prefers that the Regional Board retain the concentration-based performance goals in the Compliance Time Schedule, while using selenium load targets only as a backstop measure if the concentration objectives are not achieved. Concentration-based performance goals will protect beneficial uses in the San Joaquin River at much lower cost to farmers and local communities than would load-based performance goals.

We also discuss the need to begin a formal process for developing a site-specific selenium concentration objective for the San Joaquin River. As you know, we believe the EPA national water quality criterion for selenium is more restrictive than necessary to protect beneficial uses in the River. We are eager to work with the Regional Board, EPA, and other agencies in conducting the research needed to determine a more appropriate water quality criterion.

The proposed Compliance Time Schedule imposes the EPA national water quality criterion for selenium on October 1, 2005, during Above Normal and Wet water years. The Water Authority requests that the Regional Board include a Re-Opener Clause in

Mr. Bill Crooks, Executive Director
December 11, 1995
Page 2

the Basin Plan Amendment, to review the appropriateness of the EPA criterion, before it is implemented. This would provide an opportunity for the Board to consider an alternative set of water quality objectives for protecting beneficial uses in the San Joaquin River.

We appreciate the opportunity to submit these written comments and we would be happy to meet with you or your staff, at any time, to provide further information describing any of the analyses we conducted in preparing this material.

Sincerely,

Daniel G. Nelson
Executive Director

DGN/slm

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**Comments Regarding the Compliance Time Schedule
For Regulating Agricultural Subsurface Drainage
Discharges in the San Joaquin River Basin**

**Prepared by the
San Luis & Delta/Mendota
Water Authority**

December 1995

These comments pertain to the "Staff Report on the Compliance Time Schedule to be Used for the Regulation of Agricultural Subsurface Drainage Discharges in the San Joaquin River Basin, November 1995. That Report was prepared by the California Regional Water Quality Control Board for the Central Valley Region.

**Comments Regarding the Compliance Time Schedule
For Regulating Agricultural Subsurface Drainage
Discharges In the San Joaquin River Basin**

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A. The Proposed Compliance Time Schedule

The Grassland Basin Drainers agree, in principle, with the Compliance Time Schedule presented on Page 2 of the November Staff Report. However, the Drainers are concerned that several components of that Schedule may not be technically feasible at this time, or in the near future. Therefore, we are requesting that the Compliance Time Schedule be modified as shown in Table 1. We are also requesting that the Regional Board include a Re-Opener Clause in the Basin Plan Amendment to determine the appropriateness of the 5 ppb, 4-day average concentration standard, before that standard is implemented.

Table 1. Suggested Revision of the Compliance Time Schedule Presented in the November 1995 Staff Report

Water Body/Year Type	Oct 1 1996	Oct 1 2002	Oct 1 2005	Oct 1 2010
Salt Slough and Wetland Water Supply Channels	2 ug/l Monthly Mean			
San Joaquin River Below the Merced River: Above Normal and Wet Water Year Types		5 ug/l Monthly Mean	5 ug/l Monthly Mean	5 ug/l 4-day Average
San Joaquin River Below the Merced River: Critical, Dry, and Below Normal Water Year Types		8 ug/l Monthly Mean	8 ug/l Monthly Mean	5 ug/l 4-day Average
San Joaquin River above the Merced River and Mud Slough (north)				5 ug/l 4-day Average

Our specific comments regarding the Compliance Time Schedule include the following:

1. The 2-ppb monthly mean selenium objective for Salt Slough and Wetland Water Supply Channels cannot be achieved if the Use Agreement regarding the Wetland Bypass does not go forward. At this time, we are constructing the facilities needed to use the Bypass, and to remove agricultural drainage water from Salt Slough and the water supply channels. We are planning to begin moving drainage water into the Bypass in early 1996.
2. The 5-ppb and 8-ppb monthly mean concentration objectives that will be implemented on October 1, 2002 are appropriate performance goals. We will work to achieve those goals on schedule, using a combination of regional drainage water management activities, real-time monitoring, further improvements in farm-level irrigation practices, and other source reduction efforts.
3. We accept the use of annual load targets as a backstop measure to ensure that concentration objectives are achieved from October 1, 2002 through September 30, 2009. However, we do not believe that annual load targets should be used as the primary performance goal. The cost of achieving annual load targets is much more expensive (please see Section G of these comments) than the cost of achieving concentration-based performance goals.
4. Some members of the public suggested using annual or monthly load targets for performance goals, beginning on October 1, 2002. As noted above, the cost of achieving annual load targets is significant, and the cost of achieving monthly load targets would be prohibitive. In addition, monthly load targets would severely limit efforts to manage drainage water volume regionally. For example, potential trading of selenium load allotments among districts will be less likely to occur if trades cannot be defined over more than one month.

5. The technology required to achieve the 5-ppb, 4-day average selenium concentration standard on October 1, 2005 is not yet available. That standard will require that most selenium in agricultural drainage water is removed by a treatment process, prior to releasing the drainage water into the San Joaquin River. Scientists have proposed several possible methods for removing selenium, in recent years, but a cost-effective method is not yet available. The estimated cost of potentially feasible selenium removal methods ranges from \$368 to \$2,368 per acre-foot of drainage water (Table 2). Deep well injection, though cheaper, may not be environmentally acceptable.
6. In recent years, the Grassland Basin Drainers have supported several studies and pilot projects investigating alternative selenium removal methods. These efforts will continue in the future, but there is no guarantee that a cost-effective method will be developed by the year 2005.
7. We request that the Regional Board delay implementation of the 5-ppb, 4-day average selenium concentration in the San Joaquin River, below the Merced River, during Above Normal and Wet Years, from October 1, 2005 until October 1, 2010. This will permit additional time to develop a cost-effective treatment technology and to re-consider appropriate selenium concentration objectives for the San Joaquin River. In its place, we request that the Regional Board continue to implement the 5-ppb monthly mean concentration objective from October 1, 2005 through September 30, 2010.
8. We also request that the 8-ppb monthly mean selenium concentration objective for the San Joaquin River, below the Merced River, during Critical, Dry, and Below Normal Years be extended through the period October 1, 2005 through September 30, 2010. The 5-ppb monthly mean objective included in the proposed Compliance Time Schedule cannot be achieved during dry years, without significant investments in treatment technologies that are not yet cost-effective (Table 2).
9. The Compliance Time Schedule includes a 5-ppb, 4-day average concentration objective for the San Joaquin River, above the Merced River, and Mud Slough (North), in all water year types, beginning on October 1, 2010. It will not be possible to achieve that standard unless an alternative route for moving

Table 2. Estimated Costs of Alternative Selenium Treatment Processes

Process	Development State	Estimated Cost	Estimated Treatment And Disposal Costs (1994 dollars)	
			(\$/AF)	(\$/AF)
Bacterial (Binnle)	Pilot prototype	150 to 225	447 to 526	
Iron Filings	Pilot prototype	120 to 285	416 to 589	
Iron Hydroxide	Pilot mini-batch	100 to 150	395 to 447	
Algal/Bacterial	Pilot mini-batch	75 to 150	368 to 447	
Ion Exchange	Laboratory bench	300	605 to 289	
Reverse Osmosis	Pilot prototype	980 to 1,220	1,321 to 1,574	
with Waste Pond		1,650 to 2,250	1,737 to 2,368	
Vapor Compression				
Evaporation		2,000	2,105	
Deep Well Injection		189	199	

Notes:

- (1) Costs are based on a 10 million gallon per day plant (30 AF per day or 10,800 AF per year).
- (2) Iron exchange cost is based on Yuma estimates. The cost of operating smaller sized plants for selenium removal would possibly be much higher.
- (3) Disposal cost ranges between \$50 and \$500 per acre-foot. An average cost of \$275 per AF was used for this analysis.
- (4) Adjusted to 1990 dollars using the CPI from Detailed Report, US Department of Labor, Bureau of Labor and Statistics, April 1995, Table 24, pg 64.

Source: Bainbridge, David A., 1990. "Selenium in California, Volume 2, Critical Issues," A report to the State Water Resources Control Board, 90-9-WQ, Sacramento CA, 111 pp.

drainage water from the Grassland Basin to the San Joaquin River, below the Merced River, is developed. The estimated cost of building that facility is about \$16 million, and many permits will be required before construction could begin. We request that the Regional Board acknowledge the need for this new facility, and include language in the Basin Plan Amendment noting that it may not be possible to improve water quality in Mud Slough (North) until that facility is constructed.

B. Site-Specific Objectives

1. The Grassland Basin Drainers are concerned that the scientific information supporting EPA's national water quality criterion for selenium is not adequate for imposing that standard in the San Joaquin River. The 5-ppb, 4-day average concentration standard was developed using data from Belkows Lake in North Carolina, where ambient sulfate concentrations are much lower than those in the San Joaquin River. There is good reason to believe that the higher sulfate concentrations in the San Joaquin River may prevent selenium from harming aquatic wildlife (Please see the comments submitted to the Regional Board by the Water Authority, dated July 6, 1995).

2. It is quite possible that a water quality objective that allows selenium concentrations in excess of 5 ppb will protect beneficial uses of water in the San Joaquin Valley, for the following reasons:

- a) Field studies by the California Department of Fish and Game have not reported toxic levels of selenium in fish found in streams with selenium concentrations ranging from 10 ppb to 20 ppb (Cal. Dept. of Fish and Game, 1994).
- b) Selenium objectives that protect fish in the San Joaquin Valley will probably protect birds in the region (Skorupa, 1995).

3. We request that the Regional Board, as part of its Basin Planning Process, implement a formal procedure to develop a site-specific selenium concentration objective for the San Joaquin River and Mud Slough. You will recall that in the Consensus Letter signed by USBR, EPA, and the Grassland Basin Drainers, we described the need to examine this issue in the near

future (Consensus Letter, 1995, p. 3). Given the expected difficulty and expense of achieving the current EPA national standard, it is imperative that we determine if that standard is appropriate, as soon as possible. The Drainers are ready to work with the Regional Board, EPA, and other agencies to begin that process.

4. We suggest that the Regional Board retain Statement Number 14 on Page 6 of the November 1995 Staff Report, which states that "the Regional Board staff will coordinate with US EPA and the dischargers on a study plan to support the development of a site-specific selenium water quality objective for the San Joaquin River and other effluent dominated waterbodies in the Grassland watershed."

5. We request that the Regional Board initiate the site-specific review process as soon as the Basin Plan Amendment is adopted. As noted in our verbal comments on December 7, the Water Authority is willing to support this effort financially, and we will need time to generate the necessary resources and conduct the investigation. We wish to begin discussions regarding this process and develop an appropriate time schedule, in order to define the site-specific criterion, prior to the year 2002.

C. A Re-Opener Clause

1. We request that the Regional Board include a Re-Opener Clause in the Basin Plan Amendment, to enable re-evaluation of water quality objectives in the San Joaquin River before the 5-ppb, 4-day average concentration standard is imposed during wet or dry years. Information and knowledge gained during 1996 through 2000 will be valuable in assessing progress made in reducing selenium loads and concentrations in the Grassland Basin during years in which the Use Agreement for the Wetlands Bypass is in place. In addition, the Drainers will have implemented a real-time monitoring system and other innovative measures for managing drainage water throughout the region. The Re-Opener Clause would enable the Regional Board to consider whether the environmental or biological benefits gained by imposing the 5-ppb, 4-day average concentration standard exceed the costs imposed on farmers and local communities, before that standard is imposed.

D. Use Agreement for the Wetlands Bypass

1. The Regional Board has received a Consensus Letter dated November 3, 1995 from parties that participated in discussions regarding use of the Wetlands Bypass and other activities involving the regulation of agricultural drainage water. The Consensus Letter was signed by the San Luis & Delta-Mendota Water Authority, the U.S. Bureau of Reclamation, the U.S. Environmental Protection Agency, and the U.S. Fish and Wildlife Service. The Water Authority and the Grassland Basin Drainers are committed to the terms of this letter agreement, which include significant reductions in selenium loads discharged to the San Joaquin River.
2. The Grassland Basin Drainers are implementing a Regional Management Plan that represents an opportunity to achieve reductions in selenium loads in the region, and to manage drainage water volume and loads to achieve concentration objectives. Regional management will enable farmers and districts to coordinate individual and district efforts to reduce drain water volume in a manner that maximizes the probability of achieving water quality objectives.
3. Natural variation in rainfall and river volume will always complicate efforts to achieve water quality objectives in the San Joaquin Valley. The Consensus Letter recognizes the impact of natural events on drainage water volume and loads by incorporating a formal review process to determine the degree to which selenium load exceedances are caused by natural events and irrigation activities. The review process is appropriate to prevent farmers and districts from being held responsible for the nature-induced component of drainage water volume and loads, while encouraging reductions in the irrigation-induced component.
4. A principal feature of the Regional Management Plan that is being implemented by the Water Authority is a Real-Time Monitoring Program that will enable districts to manage drainage water volume and loads according to ambient water quality conditions. The load reduction targets in the Consensus Letter will ensure that water quality in the San Joaquin River is not degraded during the term of that Agreement, while the Grassland Basin Drainers are developing and implementing a Real-Time Management Program.

The Drainers will use that program, in conjunction with significant reductions in selenium loads, to achieve selenium concentration objectives in the River.

5. The 5% annual reductions in selenium load contained in the Consensus Letter should not be extended beyond the term of the Use Agreement, because further reductions would be inconsistent with efforts to utilize Real-Time Management to achieve selenium concentration objectives. The goal of that effort is to utilize assimilative capacity in the River, in order to minimize the economic impact of maintaining water quality objectives. Further reductions in selenium loads will occur, when necessary, to achieve concentration objectives. However, performance goals based on loads, rather than concentrations, would be punitive in nature and would reduce the incentive to develop an innovative Real-Time Management Program, while not providing significant improvements in water quality.

E. Selenium Concentrations vs. Loads

1. At the December 7 Regional Board Workshop, several members of the public requested that the Regional Board implement load-based performance goals, rather than the concentration-based goals that are currently in the proposed Compliance Time Schedule. This would greatly increase the cost of achieving the performance goals, without generating significant water quality benefits. In 1988, the Regional Board proposed a 5-ppb monthly mean selenium concentration objective for Above Normal and Wet Years, and an 8-ppb monthly mean objective for Critical, Dry, and Below Normal Years, to protect beneficial uses in the San Joaquin River. We are working to achieve those goals by October 1, 2002. We compare the economic impacts of concentration-based and load-based performance goals, below.
2. Several individuals also called for monthly load performance goals, rather than annual loads. Monthly load restrictions would seriously limit our ability to manage drainage water regionally, and to maximize the value of our investment in real-time monitoring.

3. The original Regional Board selenium concentration objectives have been achieved in most months of most years, during 1988 through mid-1995 (concentration data are not yet available for late 1995). As shown in Figure 1, there have been only 4 exceedances of the 5-ppb monthly mean selenium concentration objective during the most recent 20 months of years classified as Above Normal or Wet. In all four cases of exceedance, the monthly mean concentration was less than 10 ppb.
4. Due to persistent drought conditions in California, six of the most recent eight years have been classified as Below Normal, Critical, or Dry. As shown in Figure 2, there have been only 17 exceedances of the 8-ppb monthly mean selenium concentration objective during the 72 months recorded during 1988 through 1994, with the exception of 1993, which was not a dry year. In 15 of the 17 cases of exceedance, the monthly mean concentration was less than 12 ppb, and in the remaining two cases of exceedance, the mean monthly concentration was less than 14 ppb.

5. The Water Authority and the Grassland Basin Drainers are investing significant resources in efforts to achieve selenium concentration objectives in all months of wet and dry years. We believe it is essential that the concentration-based performance goals included in the Compliance Time Schedule for implementation on October 1, 2002 be retained as presented in the November Staff Report. It is not appropriate to replace these concentration-based objectives with selenium load restrictions, and the additional cost of achieving further load reductions will not be offset by additional improvements in water quality.

F. Brief Review of Historical Data

1. The Grassland Basin Drainers have accomplished significant reductions in drainage water volume and loads in recent years. As shown in Figure 3, the volume of drainage water discharged from the Grassland Basin was reduced each year from 1987 through 1992. A similar pattern is evident for the selenium load discharged from the Grassland Basin (Figure 4). Both the volume and load have increased, somewhat, in 1993 and 1994, but the long-term trends are downward-sloping. A large component of the reduction in drainage water volume observed during 1987 through 1992 is the surface runoff that was

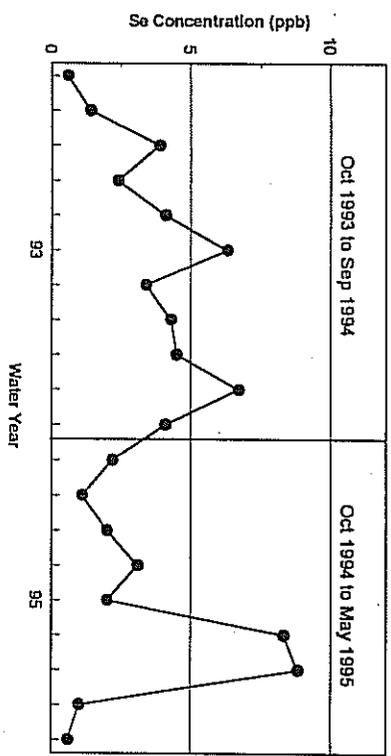


Figure 1. Monthly Mean Selenium Concentration At Crows Landing for Above Normal and Wet Years

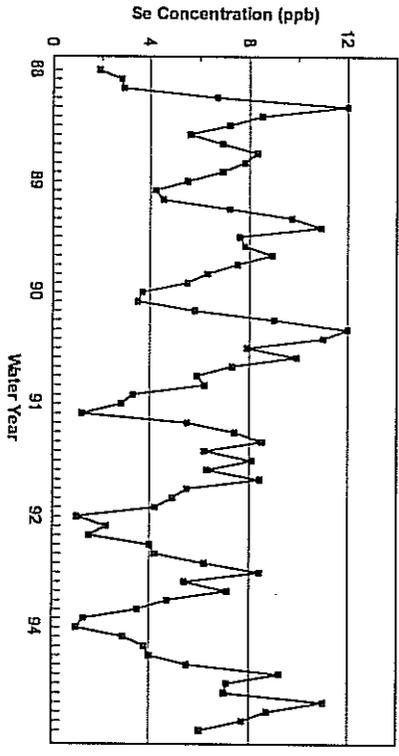


Figure 2. Monthly Mean Selenium Concentration At Crows Landing for Critical, Dry and Below Normal Years

Figure 3. Volume of Drainage Water Discharged From the Grassland Basin, 1986 to 1994

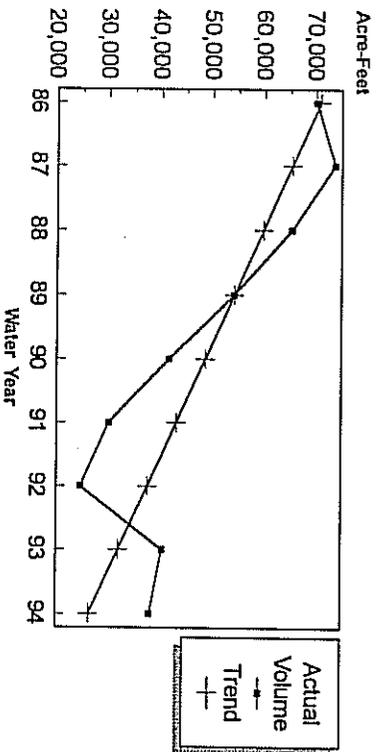
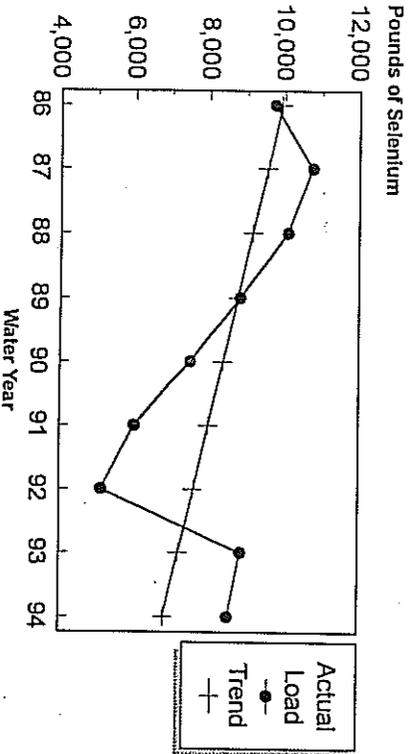


Figure 4. Selenium Load From The Grassland Basin, 1986 to 1994



2. The volume of drainage water released each month from the Grassland Basin varies with irrigation activities and exogenous events, such as rainfall and major storms. As shown in Figure 5, the volume of drainage water released each month begins to increase in January and February, when farmers pre-irrigate cotton and melon fields. The volume increases again in June and July, during the summer irrigation season of cotton. A similar pattern is observed for monthly loads of selenium (Figure 6).
3. The impact of exogenous events can be seen in Figures 5 and 6, where the monthly volume and load of selenium discharged from the Grassland Basin was quite large in March, 1995. This increase in volume and load was caused by heavy rainfall and storm water flows from the coastal foothills, through Panoche and Silver Creeks, into the Grassland Basin. These flows were generated by the same storm system that damaged portions of the California Aqueduct and destroyed a bridge on Interstate Highway 5, near Coalinga. Most cotton and melon fields had already been pre-irrigated before this storm occurred. The heavy rainfall occurred when the soil profile was saturated, causing a surge in the volume of water discharged from subsurface drainage systems. It is possible that this event caused an increase in drain water volumes and loads throughout the irrigation season.
4. The monthly volume and load data depict the variation that occurs in these parameters in the Grassland Basin. Some of this variation can be reduced by further improving irrigation practices and by implementing a regional management program. However, a significant component of the variation is due to exogenous events that are beyond the control of farmers and districts in the Grassland Basin.
5. Farmers and districts have made substantial investments in irrigation technology and improvements in water management practices in recent years. As a result, district-average irrigation efficiencies have increased from about 50% to more than 80% in recent years (Cal Poly, 1994). In addition, most of the recommendations of the San Joaquin Valley Drainage Program (USBR, 1990), for the Grassland Basin, have already been implemented or are being

Figure 5. Monthly Volume of Drainage Water Discharged From the Grassland Basin, October 1986 to May 1994

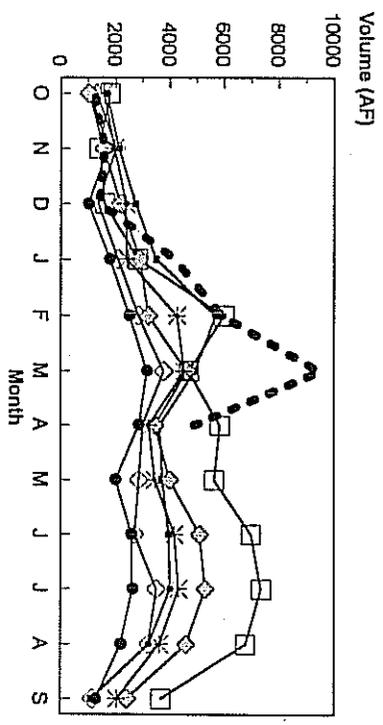
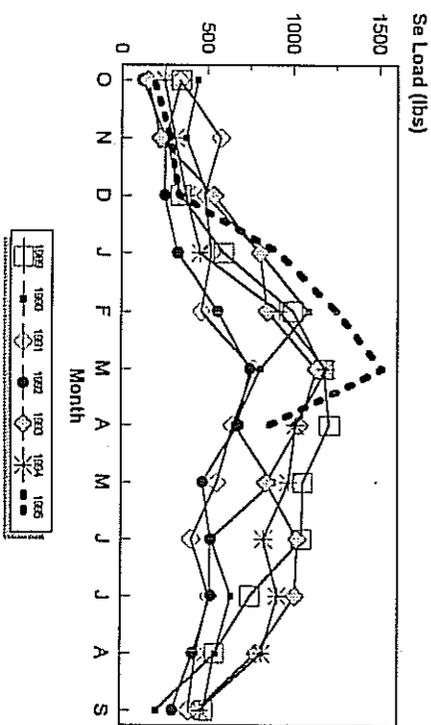


Figure 6. Monthly Selenium Load From the Grassland Basin, October 1986 to May 1995



implemented as part of the Regional Management Plan described elsewhere in these comments. Despite all of these improvements, it appears that further reductions in selenium loads are required to achieve concentration objectives.

6. The analysis in Appendix B of the August 1995 Regional Board Staff Report suggests that the necessary reductions in selenium loads can be achieved through further improvements in irrigation practices, and by retiring 3,000 acres of land, and planting 3,000 acres of eucalyptus trees or treating drainage water to remove selenium. While the general intent of that analysis is valid, some of the key assumptions are over-simplified and the results give an incorrect impression that further selenium load reductions can be achieved with little effort and minimal cost by farmers and districts. We have already described some of our concerns with Appendix B. In the comments we submitted to the Regional Board on October 4, 1995 (pages 5-9). The goal in re-stating our concerns at this time is to counter the comments of the individuals who suggested in their oral comments on December 7, that technological methods to achieve dramatic reductions in selenium loads are already available. Unfortunately, cost-effective measures are not yet available, but the Grassland Basin Drainers are continuing to invest in research and development efforts.

G. Estimated Costs of Achieving Water Quality Objectives

1. We have estimated the investments and expenditures that will be required during 1996 through 2015 to achieve the water quality objectives presented in the Compliance Time Schedule. We compare these costs with estimates for two alternative scenarios that include the 5-ppb and 8-ppb monthly mean selenium concentration objectives, beginning in 2002, and in all years thereafter. The purpose of this analysis is twofold:

- A. To compare the costs of achieving the proposed Compliance Time Schedule, which includes the 5-ppb, 4-day average concentration standard, with scenarios that do not include that standard, and
- B. To compare the costs of concentration-based and load-based performance goals in scenarios that include the 5-ppb and 8-ppb monthly mean selenium concentration objectives.

2. The three scenarios are the following:
 - A. Compliance Time Schedule, with load-based performance goals, and the 5-ppb, 4-day average concentration standard is imposed in 2005 during Above Normal and Wet Years, and in 2010 during Critical, Dry, and Below Normal Years.
 - B. A modified Compliance Time Schedule, with the 5-ppb and 8-ppb monthly mean objectives imposed as load-based performance goals, beginning in 2002. The 5-ppb, 4-day average concentration standard is not imposed.
 - C. A modified Compliance Time Schedule, with the 5-ppb and 8-ppb monthly mean objectives imposed as concentration-based performance goals, beginning in 2002. The 5-ppb, 4-day average concentration standard is not imposed.
3. Drainage water recirculation facilities are constructed in all three scenarios, so that districts can recycle an estimated 29,000 acre-feet of drainage water, each year, during 1996 through 2001. Districts also implement the Regional Management Plan and sponsor further research on selenium removal methods (except in Scenario C), during these years. Farmers invest in improved irrigation practices in all three scenarios. The estimated annual cost of these efforts during 1996 through 2001 is \$16.46 per acre in Scenarios A and B, and \$14.40 per acre in Scenario C.
4. A selenium removal plant is constructed in the year 2001 in Scenarios A and B, so that districts can achieve the TMLL selenium load constraints. These constraints are the same in these two scenarios, because both are based on the 5-ppb and 8-ppb monthly mean concentrations. Districts treat an estimated 19,600 acre-feet of drainage water each year, during 2002 through 2004, while recycling an estimated 5,200 acre-feet of drainage water. In this analysis the estimated cost of treating drainage water, to reduce the selenium concentration by 50%, is \$400 per acre-foot. A selenium removal plant is not required in Scenario C, but districts recycle an estimated 14,500 acre-feet of drainage water to achieve the concentration objectives. The estimated annual cost of these efforts during 2002 through 2004 is \$90.11 per acre in Scenarios A and B, and \$8.19 per acre in Scenario C.
5. The volume of drainage water recycled and treated is increased during 2005 through 2015 in Scenario A, in order to achieve the TMLL loads associated with the 5-ppb, 4-day average concentration standard. Districts recycle an estimated 8,800 acre-feet of drainage water and treat an estimated 45,500 acre-feet of drainage water, each year, in Scenario A. The recycling and treatment program does not change in Scenario B, because the EPA standard is not imposed. Similarly, districts continue to recycle 14,500 acre-feet of drainage water in Scenario C, during 2005 through 2015. The estimated annual cost of these efforts is \$197.29 per acre in Scenario A, \$90.11 per acre in Scenario B, and \$8.19 per acre in Scenario C.
6. Estimated investment costs include the cost of constructing recycling facilities, building a selenium removal plant, and extending the Wetlands Bypass to the San Joaquin River. The extension will be required in all three scenarios, if water quality objectives are imposed in Mud Slough, beginning in 2015. The amortized costs of these investments are \$8.37 per acre for the recycling facilities, \$44.86 per acre for the selenium removal plant, and \$27.05 per acre for the Bypass extension. As noted above, the selenium removal plant is not required in Scenario C.
7. The sum of the present value of expenditures and investments during 1996 through 2015 is \$211.7 million for Scenario 1, \$145.2 million for Scenario 2, and \$35.8 million for Scenario C (Table 3). These results suggest that farmers will need to invest an estimated \$2,138 per acre, over the 20 years during 1996 through 2015, in order to achieve the TMLL loads included in the Compliance Time Schedule and the EPA 5-ppb, 4-day average standard. The total investment is an estimated \$1,497 per acre for Scenario B, in which the 5-ppb and 8-ppb concentration standards are implemented using TMLL loads. The total investment declines to \$369 per acre if the 5-ppb and 8-ppb concentration objectives are implemented as monthly mean concentration objectives.
8. These results suggest that if the Compliance Time Schedule is implemented using load-based performance goals and including the EPA 5-ppb, 4-day average standard, agricultural land values in the Grassland Basin may be reduced to zero. Land that is valued at \$2,000 per acre cannot support a present value of expenditures and investments of \$2,138 per acre.

Table 3. Estimated Sum of the Present Value of Expenditures and Investments Needed to Achieve Alternative Selenium Load and Concentration Objectives, During 1996 through 2015

Scenario	Sum of Present Value of Expenditures and Investments	
	Total	Per Acre
A. Compliance Time Schedule With TMMML Loads beginning in 2002 And EPA Standards beginning In 2005	(Million Dollars) 211.7	(Dollars) 2,183
B. Compliance Time Schedule with 5 ppb, and 8 ppb TMMML Loads beginning in 2002 And No EPA Standards	145.2	1,497
C. Compliance Time Schedule with 5 ppb and 8 ppb Concentration Objectives beginning in 2002 And No EPA Standards	35.8	369

9. The 5-ppb and 8-ppb concentration objectives will also cause significant reductions in land values, if they are implemented as a load-based program. Some of the farmland in the Grassland Basin will not be able to support a present value of expenditures and investments of \$1,497 per acre.
10. The costs of achieving the 5-ppb and 8-ppb concentration objectives can be supported by current land values and production opportunities, provided that the EPA standards are not imposed in 2005.

H. Potential Reductions in Economic Activity

1. The selenium load restrictions included in the Compliance Time Schedule will cause significant economic impacts on farmers and local communities, if selenium load reductions must be achieved through further improvements in irrigation practices and by increasing the re-use of saline drainage water. As shown in Figure 7, the selenium load target for Above Normal and Wet Years, beginning in 2002, will require significant reduction in typical selenium loads. Further reductions will be required, beginning in 2005. A similar pattern is observed for Dry and Below Normal Water Years in Figure 8. Achievement of these load reductions will require better management capability and technology than are currently available.
2. The load restrictions depicted in Figures 7 and 8 were developed using a Total Maximum Monthly Load approach to maintaining concentration objectives in the San Joaquin River. That approach minimizes the probability of exceeding concentration objectives by selecting load limits that would achieve the objectives during periods when the volume of water in the River is the lowest volume observed in recorded history. As such, the TMMML approach is extremely restrictive and will result in ambient water quality conditions that often exceed the levels required by concentration objectives. As described above, significant investments and expenditures will be required to achieve the load reductions depicted in Figures 7 and 8. In addition, the yields of salt-sensitive crops will be reduced. The analysis presented below provides an estimate of the economic impacts that will occur if the TMMML loads are imposed as performance goals.

Figure 7. Actual Selenium Loads and Maximum Loads in the Compliance Time Schedule For Above Normal and Wet Years

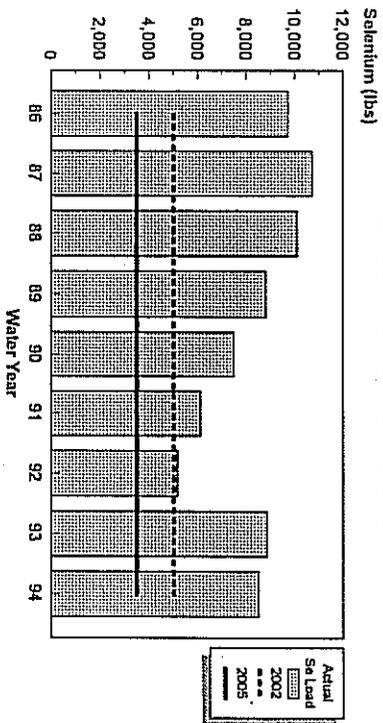
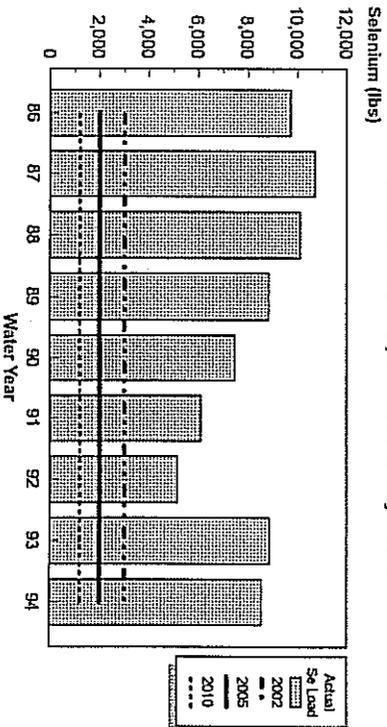


Figure 8. Actual Selenium Loads and Maximum Loads in the Compliance Time Schedule For Below Normal, Critical and Dry Years



3. The Grassland Basin Drainers have examined the potential economic impacts of selenium load restrictions, using an economic model of crop production in the region. The model simulates the impact of recirculating saline drainage water to achieve selenium load reduction targets. Over time, soil salinity increases when districts recirculate a larger proportion of their saline drainage water. The yields of salt-sensitive crops, such as tomatoes and other vegetables, decline when soil salinity increases, causing reductions in total revenue. These crops are no longer produced when yield reductions cause the net revenue to decline below the net revenue generated by producing salt tolerant crops, causing further reductions in total revenue. A complete description of the economic model is provided in Wichelns and Houston (1995).
4. Without a cost-effective process for removing selenium from drainage water, efforts to achieve water quality objectives in the Compliance Time Schedule will consist largely of further improvements in farm-level irrigation practices, increased recirculation of saline drainage water, and regional coordination of drainage water volume and loads. We estimate that the proposed Compliance Time Schedule will cause significant reductions in farm-level revenues, regional economic activity, and employment. If load-based performance goals and the EPA 5-ppb, 4-day average concentration standards are imposed. In particular, we estimate that the following economic impacts will occur, over time, as soil salinity increases:
 - A. The sum of the present value of total revenues earned during 1996 through 2015 will be reduced by an estimated \$324.7 million.
 - B. The sum of the present value of direct (farm-level), indirect (support industries), and induced (household expenditure) effects of agricultural production, during 1996 through 2015, will be reduced by an estimated \$684.9 million.
 - C. The number of jobs supported by agricultural production in the Grassland Basin will be reduced by an estimated 1,130 persons in the year 2005 and by an estimated 1,457 persons in the year 2015.
5. Several individuals and agencies involved in drainage issues have suggested that a land retirement policy could be implemented in the Grassland Basin, to assist in reducing drainage water volume and loads. However, a land retirement policy would actually exacerbate the economic impact of the

proposed Compliance Time Schedule. We have estimated the potential impact of a policy that would require 20% of farmland in the Grassland Basin to be retired during 1996 through 2015, in conjunction with the proposed Compliance Time Schedule. The estimated economic impacts are the following:

- A. The sum of the present value of total revenues earned during 1996 through 2015 would be reduced by an estimated \$463.9 million.
- B. The sum of the present value of direct (farm-level), indirect (support industries), and induced (household expenditure) effects of agricultural production, during 1996 through 2015, would be reduced by an estimated \$978.5 million.
- C. The number of jobs supported by agricultural production in the Grassland Basin would be reduced by an estimated 1,281 persons in the year 2005 and by an estimated 1,612 persons in the year 2015.

The land retirement policy causes the present value of total revenue to decline by an additional \$139.2 million, when compared with the decline induced by the Compliance Time Schedule. The sum of direct, indirect, and induced effects is reduced by an additional \$293.6 million when the land retirement policy is imposed. Total revenue is reduced because farmland is fallowed before it becomes too saline to support profitable agricultural production. In later years of the Compliance Time Schedule scenario, the 20% land retirement policy does not generate a binding constraint on crop production because increasing soil salinity causes a similar reduction in irrigated area.

I. References

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October 4, 1985

California Regional Water Quality Control Board
Central Valley Region
3443 Router Road, Suite A
Sacramento, CA. 95827-3098

Dear Sir:

Re: Water Quality Objectives and the Implementation Plan to be
Used in a Basin Plan Amendment for Regulation of Agricultural
Subsurface Drainage in the Grassland Area.

These comments in brief were presented at the September 22, 1985
meeting.

In 1983 I held in my hands the first deformed migratory bird, an
American Coot chick found at Kesterson NWR evaporation ponds.
This changed my life. I am very disappointed at the lack of
meaningful action and continued inaction by this Board over the
past 10 to 12 years regarding the Selenium / agricultural drainage
and wastewater issue.

In 1983 the Kesterson fiasco started to unfold as U.S. Fish and
Wildlife Service researchers surfaced a complex and deadly element
of this witch's brew of agricultural pollution (drainage and
wastewater) in the San Joaquin Valley. Dead and deformed young
and embryos of nesting migratory birds found at Kesterson NWR, the
then terminuses of the San Luis Drain. Several populations of
fish were also eliminated from the ponds. This agricultural
pollution (drainage and wastewater) contained elevated
concentrations of many elements including selenium, boron,
molybdenum, and numerous chlorides and sulfates. The trace
element selenium, however, posed substantial ecotoxicological risk
to fish and wildlife and their habitats. Selenium toxicity was
determined to be the cause of what has become known as the
Kesterson syndrome.

In 1984, Mr. Robert James Claus, the owner of a duck club in the
Grasslands, appeared before a hearing of this Regional Board which
is governed by local folks, requesting it to take enforcement
against the discharger of agricultural drainage and wastewater
questionable quality. This Board had no problem with the emerging
water quality situation at Kesterson. In fact it looked the other
way. Mr. Claus had to fight his way over the Regional Board's
failure to take action, in order to get a hearing before the State
Board. By that time, pictures on television and the front page of
newspapers showing dead and deformed young of migratory birds with
grotesque heads, bulging brains, without legs or eyes and the
knowledge that populations of fish in the Kesterson ponds had
already been eliminated, could no longer be ignored.

State Board Action and Order WQ 85-1.

The State Board held a hearing in October 1984 and took many hours
of testimony. The Board issued its Order No. WQ 85-1 on February
5, 1985. This Order set some instream standards, sent several
research activities into action and made notice of many concerns
including "If the Bureau closes Kesterson Reservoir and continues
to supply irrigation water to Westlands Water District without
implementing an adequate disposal option, continued irrigation in
the affected area of Westlands Water District could constitute an
unreasonable use of water". No action has been taken by this
Board on this issue.

Some recent historical data from the National Pesticide Monitoring
Program regarding Selenium in fish taken from the San Joaquin
River tributary Mud Slough at the Los Banos WMA showed that the
Selenium residues in whole body fish from the Sacramento and San
Joaquin River were about the same in 1972 and 1973. However by
1985 the Selenium residues in fish taken from the same Mud Slough
at the Los Banos WMA sampling site increased almost 9 times over
the 1973 residues.

The period of 1973 and 1977, with its 5 fold increase in Selenium
loading of fish tissues, must be the time frame of significant
loading of Mud Slough / Salt Slough system. The Department of
Fish and Game estimated pre-1985 selenium loading from the
grasslands at 2600 pounds annually. However from a review of the
fish tissue data from the National Pesticide Monitoring program,
it is very possible that the pre-1985 selenium loading of the San
Joaquin River (1950 to 1975) was considerable less than the 2,600
pounds estimated by the CDFG.

Another interesting note is that the State Board in its Water
Quality Monitoring Report No. 82-1 TS (July 1982) did not report
Selenium present at San Joaquin River sampling locations for
either water year 1980 or 1981. Did the Board test for Selenium?
Did it fail to find minimal concentrations? Trace amounts were
found in the Tuolumne and Stanislaus Rivers.

Comments to Regional Board Concerns:

Is watershed approach appropriate? Source control must be the
guiding light for all discharges in the watershed. The Selenium
problem of the Grasslands watershed must be solved within that
watershed. Dilution of Salt Slough outflow by the Merced River
flows, is not a logical solution to Selenium pollution in the San
Joaquin River or South Delta. Protecting resources, uses and
values covered by the State's public trust mandates must be the
first order of business.

Economic implications. Pollution control and the protection of
trust values must be a cost of doing business, just as is the
price of water, the wages paid to farm hands and the cost of fuel
to run equipment. The urban or industrial water user must pay the

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cost of water delivery as well as clean up as a household cost or a cost of doing business. So should agricultural users of water.

Should the Regional Board adopt other policies or prohibitions? It is long past due for the Regional Board or State Board to investigate the misuse or unreasonable use of water and any public nuisance caused by inconsiderate land use and water management which has resulted in contaminate laden wastewater and drainage being dumped or discharged into waters and tributaries to Salt and Mud Sloughs and the San Joaquin River. Such actions have impacted public and private lands under the general management of various migratory acts and applicable laws (San Luis NWR complex and Federal wetlands easement lands), lands under the management of the California Dept of Fish and Game, lands and waters under the general control of the State Lands Commission, and resources, uses and values, and other beneficial uses of water protected by the public trust.

The State Board in its Agricultural Water Management Guidelines for Water Purveyor's, dated September 1984, states "Failure to take appropriate measures to minimize excess application, excess incidental losses, or degradation of the water quality constitutes unreasonable use of water". Therefore by definition, if a use of irrigation water degrades or destroys the beneficial uses of the water, or causes a public nuisance, that particular water use is beyond the reasonable and beneficial use provisions of Article 10 Section 2 of the State Constitution.

Documentation that the public's fish and wildlife resources, their associated uses and ecological values; private and public beneficial uses of water have been unreasonably impacted by the wastewater and drainage generated by the delivery and use of Federal irrigation water supplied to irrigate soils containing high levels of chlorides, sulfates, boron, Selenium and several other salts or trace elements, is replete in scientific papers and reports from many sources that are in the files of the Regional Board, State Board and other State and Federal agencies.

Alternate water quality standards or other strategies that the Regional Board should implement.

The 2 ppb should apply to all waterways and channels of the Grasslands and the San Joaquin River.

There is no single best management solution or practice for all situations. Any overall corrective action will require a mix of several actions. However Land Purchase / Land retirement is an important first step that must be acted upon by this Board. This effort at source control can have quick and positive results and many public benefits.

Purchasing or otherwise retiring lands containing significant levels of selenium or other toxic materials would have only a one time cost. There would be little if any maintenance costs. Lands

not needed for conservation purposes such as to help restore native grasslands and related fauna of the San Joaquin Valley, could be sold, with title restrictions, for selected compatible uses such as dry land farming, grazing, etc. Within the Westlands W.D. problem soils have been estimated at 100,000 to 275,000 acres (Alternatives Descriptions Report USBR, April 1991).

The majority of the land within the San Luis Unit sold for \$100.00 to \$350.00 per acre pre-project. Lands in the Tulare Basin costs about the same. At a cost of \$1,000.00 per acre it would cost \$100,000,000.00 to retire 100,000 acres. Lands acquired should be purchased at or near pre-project adjusted prices and today's realities. The reasoning being that the land had values which justified its price, i.e. grazing \$50.00 to \$100.00/acre; dry land farming \$100.00 to \$300.00/acre, irrigated \$400.00 to \$1000.00/acre, based on pumping the limited or poor ground water and extensive alkali problems. Any value added to the price of land based on speculation, or on the expectations of cheap, Federally subsidized water being delivered to the Westside and Southern end of the San Joaquin Valley, or on the construction of a Federal drainage facilities should not be included in determining market value. In addition problem soils without water are just about worthless.

For each acre not irrigated or otherwise retired, there would be commensurate saving of about 3.5 to 4.5 acre feet of water per acre or about 350,000 to 450,000 acre feet for each 100,000 acres taken out of irrigation. This water would be firm yield water. In addition for each acre not in production there would be a reduction of 20 to 60 pound of pesticides (active ingredients) plus 80 to 250 pounds of carrier materials, (soils, etc.) not applied to the soils. In addition there would be a reduction of the amount of drainage and wastewater generated of about .6 to .8 acre feet per acre of land retired or 60,000 to 80,000 acre-feet for each 100,000 acres of land retired. There would be a saving in electrical energy by not having to pump the 350,000 to 450,000 acre-feet from the Delta. There should be benefits to fish resources and associated fisheries as 350,000 to 450,000 acre-feet less would have to be pumped from the Delta. The water savings could be used to restore or otherwise benefit fish resources and fisheries throughout the waters of the Bay-Delta and watershed.

Is compliance schedule appropriate? NO! The 2 ppb should apply to all waterways and channels of the Grasslands and the San Joaquin River. The 5 ppb in the San Joaquin River does not prevent the bio-accumulation of selenium in the downstream biota to levels which could be chronic or outright toxic to some of the more sensitive aquatic organs. Protecting only part of the public trust resources is not resource protection in the public interest.

A 5 to 7 year implementation / compliance schedule is reasonable with a Selenium loading down to 2000 pounds or less. However, a program that extends the total period out to 15 to 20 years is out

of the question. The Selenium problem has gone on for almost 20 years. The people do not need it for another 15 to 20 years.

Enforcement of laws and regulations. The people or corporations responsible for this pollution, via their drainage and wastewater, must be held accountable. In this situation the administrators of USBR, Westlands Water District and those of other irrigation or drainage districts receiving Federal water, such as Broadview Water District, Firebaugh Canal Water District, Pacheco Water District, Panoche Drainage District, Central California Irrigation District, Charleson Drainage District, and the farm operators irrigating selenium soils or otherwise causing drainage problems, are known or can be quickly identified. They all must be held accountable for their actions. Penalties should include the loss of irrigation water supply, forfeiture of water rights, clean-up costs, jail time and incentive fees, or a combination of these. The time to take enforcement action is long over due.

Are the proposed objectives and plan consistent with State and Federal regulations and policies?

The non-degradation language of the Federal Water Pollution Control Act of 1972 (Clean Water Acts) as amended, and its criteria fishable and swimmable water quality by 1985, has been violated for years in the San Joaquin River. This plan insures at least another 20 years of the same Selenium pollution.

The Staff desires to move a source of agricultural pollution from one location to another. The Staff wants to "legalize" Selenium pollution in the San Joaquin River by Grassland watershed irrigators / drainers by up to 8000 pounds annually. A new outlet for the Drain would be constructed sometime in the future (by 2020) to below the confluence of the Merced River, in order to take advantage of its inflow / dilution properly.

- * This action is inconsistent with the purpose and intent of the Federal Water Pollution Control Act of 1972, as amended.
- * The Staff's baseline reference dates are to restrictive. Use of the 1986 to 1994 baseline rewards the drainer / polluters and short changes the protection of the public trust. The Staff or Board should consider using the average Selenium loading of the San Joaquin River 1950 to 1975 as the historical time frame or reference rather than the 1986 to 1994 period.
- * Models can only present what we think we know about Selenium and not what our ignorance level is about Selenium.
- * The total loading of a system with a substance that bio-accumulates i.e. Selenium, threatens the entire food chain and the renewability of resources utilizing the receiving waters.

* The aquatic ecosystem can not absorb the Total Maximum Concentration Load of all substances (such as chlorides, sulfates, Selenium, Boron, Molybdenum, diazinon, Arsenic, Mercury, etc.) and maintain beneficial uses. The bio-accumulative aspect of Selenium and its safe window is far too critical and has too many unknowns for such a concept of total maximum concentration loading to be endorsed.

* The Total Maximum Concentration Load of an ecosystem ignores the synergistic effects of the various chemical components that are already in or that are being added on a daily bases.

* The Staff's idea that the people must accept as a given that waterways in agricultural communities need a lower standard of water quality in order to protect historical agricultural uses and local discharge customs, is not protecting the public trust, is not in the long term public interest of sustainable agricultural or aquatic ecosystem renewability.

* Using the assimilation capacity of receiving waters provides false security to the general public who expect a quality aquatic environment and that associated resources, uses and values will be protected; that fish and wildlife are healthy and fit to eat; and to the landowner or water manager who would like certainty and longevity of investments and a water supply based on protection standards, not on the uncertainty of dilution..

* While it is reasonable that not all freshwater of the State be of High Sierra spring water quality, The public trust mandates that all freshwater should be of sufficient quality to protect public health, beneficial uses, and potential or actual water supplies; support healthy and diverse fish and wildlife populations, and other interests, uses and values covered by the public trust.

* Present and future resources, present and future uses and opportunities, and ecological values located downstream from the point of discharge should not be foregone for the immediate benefits of dispersers located upstream or on the dilution capability of inflow.

The Staff Report indicates that the Drain and its contents (mud and liquid) would be under the control of a local authority. The San Luis and Delta Water Authority comes to mind.

* What State authorities and trust responsibilities would be transferred to the managing body? If monitoring is included, this would be like letting the fox guard the hen house.

* This local body is another layer of government that the public must wade through in order to get the various water quality laws and regulations enforced and corrective action taken.

* History has shown that local bodies are best for issuing special favors for special interests. To say it in a different way, although the laws and regulations are in the people's favor, those who implement them all too frequently aren't.

* Since the State has failed, for what ever reason, to enforce the applicable laws and regulations to protect water quality, --why are the people to believe that a local body like a Canal Authority, will carry out and enforce those same laws and regulations?

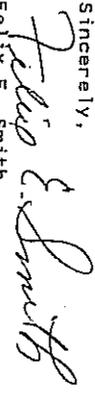
* Where is the monitoring program. Any monitoring must include the waterways of the Grasslands, the Drain and that reach of the San Joaquin River between the Mendota pool and its confluence with Salt Slough. Any monitoring program must be reviewed by the public and be conducted by a recognized inventory or research entity, i.e. USGS, etc.

Selenium in the agricultural drain and wastewater contaminated the aquatic environment of the Grasslands and which caused the death and deformities of migratory birds and wiped out populations of fish at the Kesterson NWR evaporation ponds, is a public nuisance, and is in direct response to the waste and unreasonable use of subsidized irrigation water.

The State, as trustee of its waters and its fish and wildlife resources, has the implied powers to do everything necessary to protect the continued viability and stewardship of trust interests and resources. (See City of Long Beach v. Mansell, 91 Cal Rps 23, 37; 3 Cal 3d 462, 482 - 1970, People v. California Fish Co. 166 Cal 576, 138 Cal Rps 79, 87, 88 - 1913. All it takes is the will of the Regional or State Board to do so.

I expect a reply as to what actions the Regional Board intends to taking regarding my comments within 30 days. No meaningful reply will be equated to no action.

Sincerely,


Felix E. Smith
4720 Talus Way
Carmichael, CA. 95608

cc: Carla Bard, 235 S. Padre Juan, Ojai, CA. 93023

Jack Hug, at Cotchett & Pitre, San Francisco Airport Office
Center, 840 Malcolm Rd, Suite 200, Burlingame, CA. 94010

cc: interested parties

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10/ 2/95

Mr. William Crooks - Executive Officer
Regional Water Quality Control Board -
Central Valley Region
3443 Roulter Road, Suite A
Sacramento, Ca. 95827-3089

Fax 255-3015

December 14, 1995

Dear Mr. Crooks:

Subject: Proposed Basin Plan Amendment - Control programs related to pesticides, agricultural drains, and other constructed water bodies. Nov. 1, 1995 Notice of Public Workshop.

Throughout out the Central Valley natural water courses have been greatly altered or modified to both deliver water to and drain the land. At one time of the year these waterways deliver water or move water from one parcel to another and from one farmer to another. These waterways contain irrigation water, agricultural spillage and wastewater. At some locations the water is used and reused meeting agricultural needs and the beneficial uses of fish and wildlife in state waters and on public and private preserves. At other locations these waterways carry water that has been infused with various agricultural chemicals, trace elements, sodium and sulfate salts and / or sediment quickly rendering once useable water supplies unusable or impaired for many beneficial uses.

Sacramento Valley

Rice culture is a major water quality concern with its baggage of applied chemicals, temperature and silt additions to the Sacramento river.

Retention time requirements for several chemicals applied to rice have increased significantly since first instituted in 1984 (CWRCB 1990). No obvious fish kills have been observed since that time. Chronic impact to selected fishes and food chain organisms may have occurred, but documentation is lacking. Such chemicals as DDT, toxaphane, etc, because of persistence and bioaccumulation abilities were taken off the market long ago. The registration of Genacron based chemicals was cancelled in 1989 because of groundwater contamination. Most of the discussion about fish and wildlife exposure to rice culture chemicals has been through the water column. This could underestimate actual exposure if food chain organisms have been contaminated by chemicals or trace elements.

Methyl Parathion. There is concern about continued use of Methyl Parathion. More information is needed regarding the influence of Methyl Parathion on the acute and chronic mortality to

invertebrates and to egg, embryo, and larval striped bass (Finlayson et al, 1993).

Parathion. Parathion is a very toxic chemical. It usually loses biological activity in 2 to 4 weeks; however, it does bioconcentrate in aquatic organisms. Applied to water, it persisted for 690 days. In a laboratory experiment when Parathion contaminated tadpoles were fed to mallard ducklings, all ducklings died after consuming a single meal of tadpoles, and brain cholinesterase was severely depressed. Because of its extreme toxicity and sublethal affects to birds and mammals, the continued use of Parathion on rice instead of less toxic insecticides should be critically evaluated before application (Smith 1987).

Carbofuran. Carbofuran is very toxic to soil organisms. Primary productivity is the basis of the food chain in most aquatic environments. The sublethal effects of Carbofuran to earthworms and other soil organisms should be further studied to better understand its risks to soil fauna and environment (Anton et al, 1993a). It is important to ascertain if there are chronic/sublethal affects to algal growth (Anton et al, 1993b). There is some knowledge of the additive toxicity of some pesticides, however, the synergistic affects of several pesticides and metals is either unknown or has not been reported.

Carbofuran has a low soil adsorption coefficient, relatively long half-life, and is very water soluble. Therefore very mobile and likely to be found in drains, surface waters, and sediments, from treated lands. Such properties account for the long-lasting occurrence of Carbofuran in agricultural drains containing rice tailwater (Hancock and Gray 1992).

Because of Carbofuran's toxicity, moderate persistence, and toxic degradation products, wildlife exposure, even at recommended application rates, should be avoided (Smith 1987). Ingestion of this material by eating killed organisms has impacted mammals and migratory birds. Carbofuran has killed waterfowl, passerines, hawks and eagles in California and several other states. The secondary poisoning of animals, both raptors and mammals, by Carbofuran has occurred and is very disturbing (Williams 1993).

Other pesticides. Molinate and Thioencarb have been identified in tissues of fish and other food chain organisms. See table 3-6, page 11-21 CWRCB 1990. The toxic effects of Molinate and Thioencarb are cumulative in juveniles of Chinook salmon, steelhead trout, white sturgeon, striped bass, channel catfish and Menidia. There was also some bioconcentration of these materials in muscle of selected fish. 5 ppm for Thioencarb and 2 ppm for

Hollinate. Higher residue levels would be expected in lipid-rich tissues such as ovaries.

Toxic materials that accumulate in eggs could have adverse impacts on embryonic development and thus on successful reproduction. Work done with Thibencarb and Molinate indicates that Thibencarb was 15 times more acutely toxic than Molinate to larval striped bass. For juvenile fishes the difference in acute toxicity between Thibencarb and Molinate are 11 times for striped bass, 15 times for steelhead trout, 17 times for chinook salmon and 19 times for channel catfish (Finlayson and Faegella 1984 in CWR9C 1990). Both Molinate and Thibencarb showed appreciable toxicity to 25 day-old white sturgeon fry. Molinate appears to have a greater propensity for cumulative toxicity (Bailey 1985 in CWR9C 1990, Appendix F-4).

Molinate and Thibencarb have been detected in sediment samples from the Sacramento River. The soils of rice producing fields should be tested for these and other materials. Information on the persistence, mobility, metabolites, residues, and other aspects of the fate of rice chemicals at the field level is apparently unknown. Data are needed on the availability and toxicity to benthic organisms and on the effects of such chemicals on the basic food chain starting with phytoplankton.

Sublethal impacts. Impacts of pesticides on the immune system are now being discussed in the literature. Under laboratory conditions, test animals are usually well cared for and in good health. Tests are conducted under controlled conditions. In the wild, the life stages most affected are eggs, larvae, and young. The aged, sick, pregnant or otherwise stressed. Carbofuran has been associated with reduced immunoglobulin levels, decreased lymphocytes and bone marrow cells in mice. This can contribute to morbidity and premature mortality. Increased mortality occurred after a challenge by *Salmonella typhimurium* bacteria. methyl parathion has been shown to cause immune system impairment, and to increase death rates in mice exposed to *Salmonella typhimurium* (Eisler 1985, Olson 1986).

The potential exists for serious damage to aquatic ecosystems via food chain organisms contaminated by immunotoxics. A negative impact to planktonic forms could reduce primary productivity of an aquatic system. The process by which ricefield chemicals move through the aquatic ecosystem could also have an impact on fish and wildlife populations, be they in a seasonal wetland, the inner Sacramento River or the San Francisco Bay Estuary.

Other Impacts. Temperature. There is a significant heat budget associated with the discharge of ricefield drainwater that must be absorbed by the fish and other aquatic resources of the Sacramento River. The temperature of the rice-field discharge water during the first half of the 1984 rice season, April 27 to July 5, varied

between a mean minimum of 51.3 to 72.1 F to a maximum of 80.2 to 93.5 F (CWR9C 1990 Appendix I). This spill and wastewater coupled with rice chemical residues could have an adverse impact on aquatic food chain organisms plus selected anadromous species, white sturgeon embryos and larvae, striped bass eggs, embryos, and larvae, chinook salmon and steelhead trout juveniles and rice all utilize the reach of the Sacramento River impacted by rice spillage and wastewater. Silt is a constant visual esthetic problem for recreational uses of the Sacramento River.

Coincidental Aquatic Habitat

Many of the ditches and channels that carry rice spillage and wastewater could be called "Coincidental Aquatic Habitat" during the dry summer season. However they are also part of the drainage pattern during fall discharge and during wet periods. Any definition of "Coincidental Aquatic Habitat" must include being isolated from any surface or ground-water connections. The best management practice to protect against rice chemical, temperature, and silt degradation, may be a no discharge - water retention and recirculation system. A system of retention reservoirs may be necessary to adequately hold and detoxify selected chemicals and control silt. These reservoirs could be used to store water for fall flood-up after rice harvest to help decompose rice straw.

SAN JOAQUIN VALLEY

The irrigation of saline, seleniumiferous soils and the resultant drainage and wastewater has impacted water and its beneficial uses and has contaminated habitats (waters, waterways, wetlands and their respective biota) for a long time. Contamination of groundwater and surface water supplies and ecological values of the grasslands, its wetlands, waterways and on to the San Joaquin River (Barnes 1985) and continues today.

A most critical concern is the trace element selenium, its toxic effects and, long term impacts to the aquatic ecosystem and its biota. On going investigations document that considerable agricultural drainage and wastewater continues to enter San Joaquin valley groundwaters and surface waters. Salt Slough and Mud Slough (north) are major carriers of agricultural pollution, accounting for 57% of the salt load, 71% of the boron load, and 85% of the selenium load per year entering the San Joaquin River during water years 1993 and 1994 (CWR9C-CVR 1995). Also during water years 1993 and 1994 the mean monthly selenium concentration standard of 5 ppb (Federal EPA Standard) in the San Joaquin River was violated 21 of the 24 months of record or 87% of the time (CWR9C-CVR, January 1995). No enforcement action has been taken by the Regional Board or the Attorney General regarding such violations. During the years 1985 to 1994 the actual poundage of selenium entering the San Joaquin River varied between 3,300 and 11,150 pounds per year (CWR9C-CVR 1995).

In 1992 and 1993 over 77 percent of the fish sampled from Mud Slough and 85 percent of the fish sampled from Salt Slough had selenium residues 4 to 12 ppm, levels of toxic concern. Over 3 percent in Mud Slough and 2 percent in Salt Slough were above the toxic level i.e. over 12 ppm (Henderson, et al USFWS 1995).

Today's research indicates that waterborne selenium of 2 parts per billion (ppb) or greater is considered hazardous to the aquatic ecosystem and to the health and long-term survival of fish and wildlife populations because of bioaccumulation of selenium in food-chain organisms. The extremely narrow margin between "safe" and "toxic" selenium levels in tissue, along with the propensity for it to accumulate in the aquatic food web, underscores the biological importance of even slight increases of selenium in the environment (Lemly 1993). The most sensitive indicators of selenium toxicity in fish and aquatic birds is partial or complete reproductive failure. Such failure can occur with little or no mortality or visible symptoms in adults (Lemly et al 1993). The subtle effects of reduced or failed reproduction has devastating long term consequences for aquatic biota (LeBlanc 1995).

The dietary toxicity threshold for selenium in fish and wildlife is only 3 ppm. Because of this food chain organisms containing 3 ppm dry weight or more should be viewed as potentially lethal to fish and aquatic birds that consume them (Lemly 1993).

Continuing research has demonstrated that aquatic ecosystems and associated fish and wildlife are more sensitive to selenium and other substances of concern in subsurface drainage and wastewater than previously believed. Water quality criteria must protect aquatic ecosystems rather than specific species. This would indicate a selenium concentration in state waters of 2 ppb or less (Lemly 1993, Maier and Knight 1994).

Today, about 29 miles of Mud and Salt Sloughs and the lower 100 miles of the San Joaquin River are impaired in quality (GSWR/CB-DWO 1990). This reach of the San Joaquin River is the defacto San Joaquin Valley drain. It is a witch's brew of agricultural chemicals, trace elements, chloride and sulfate salts and colloidal material (clays) carried by drainage and wastewater. Elevated concentrations of many elements and salts including selenium, boron, molybdenum and chloride and sulfate salts are commonly observed. The pesticides DDT, chlordane and toxaphene were added long ago and still are found in aquatic life including fish. Recent and new agricultural pesticides such as diazinon and methidathion have been added to this witch's brew (Kulivilla and Fee 1995). The impacts to the aquatic ecosystem by diazinon and methidathion must be better understood. Impacts could extend to Delta and San Francisco Bay ecosystems.

What should be the Regional Board's next step

The legality of disposing wastes and other debris (including wastewater) into waters and waterways was clarified by case law over 100 years ago. The California Court stated in People v. Gold Run Ditch and Mining Co. (4 Pac Rpt at 1152 -1884) that mining companies do not gain a right through custom or common practice to continue dumping their hydraulic mining wastewater and related debris into streams and waterways of the State.

The Court indicated that the material being dumped into rivers constituted a nuisance. The Court stated that public trust rights held by the people are paramount and controlling over the dumping of wastewater and other debris into the State's waters and waterways. The disposal of mining debris was found to be an invasion of public rights and a public nuisance, therefore unlawful. The act of disposing of mining debris was enjoined. The ruling was against the entire hydraulic mining industry. Each company could continue to mine, but could not dump or allow their wastewater and other debris to enter the waters and waterways of the state.

In a similar case, People v. Elk River Mill and Lumber Company (40 Pac Rptr 486 - 1895) the pollution and destruction of beneficial uses was alleged by downstream users of Elk River. The State Supreme Court ruled that if the conformation of the defendant's land is such that he can not operate a dairy without putting or allowing manure and associated filth to flow into Elk River, then he must find some other use for the land.

In People v. Truckee Lumber Co. (116 Cal 397, 48 pac 374 -1897) the action was to enjoin a nuisance. Truckee Lumber allowed saw mill wastes (shavings, dust, edgings and other wastes) to enter the Truckee River. The material was polluting the river and destroying aquatic life, killing trout and other aquatic life and was destroying a trout fishery. The Court recognized the public trust nature of the various properties being impacted. The court stated "it is well established principle that every person shall so use and enjoy his own property, however absolute and unqualified his title, that his use of it shall not be injurious to the equal enjoyment of others having an equal right to the enjoyment of their property nor injurious to the rights of the public."

Dumping of mill wastes in the Truckee River was found to violate the rights of the people and a public nuisance. This finding was based on the people's ownership of the fish resource, the water and the quality of that water, and the fishery of the Truckee River. The Court also indicated that the State Attorney General can on his own information maintain an action to enjoin a public nuisance.

It is unlawful to deposit any substance into the waters of the state deleterious to fish, plant life or wildlife or which results in contamination, pollution or a nuisance. The management of any agricultural chemical and wastewater can impact the viability of drainage, spillage and wastewater can impact the viability of aquatic ecosystems. Drainage and wastewater resulting from irrigating saline, selenium soils is a pollutant and was ruled a nuisance at Kesterson. Selenium drainage continues to move through the soil and into the groundwater and to the surface water causing new and continuing damage each day creating a nuisance. The resultant contamination, because of toxic effects of selenium and its ability to bioaccumulate in biota, is expressly prohibited by at least 3 state statutes, Fish and Game Code section 5550 at section: Health and Safety Code section 5410 et seq. and Water Code section 13000 et seq.

The Gold Run, Elk River and Truckee Lumber cases make it clear that as a matter of law, one must exercise his or her rights or use his or her property so as not to interfere with the rights, interests or properties of others and that holders of water rights are entitled to the natural flow of the water undiminished in quality.

The public trust doctrine also provides a principled common law theory for protecting water quality, especially against non-water polluters. Protecting fish and other aquatic resources necessarily implies protecting water quality. Irrigation that causes pollution presumably can be regulated under the theory that the term "beneficial use" means both beneficial to the appropriator and not harmful to the public trust interests.

The essence of the rulings and findings made over 100 years ago fit the contemporary needs of today's people concerned and interested in protecting resources, uses, ecological values and water quality for all beneficial uses. In order to protect the greater public interest, it is time for the State Board or the Attorney General to take the appropriate enforcement action.

Sincerely,

Felix E. Smith
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Paul E. Jepperson, Supervising Engineer
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Dear Paul,

It appears that conflicting commitments will preclude our attendance at your September 22 workshop on the Water Quality Objectives and Implementation Plan regarding Subsurface Drainage Discharges. We are, therefore, submitting these written comments for consideration at the workshop.

We believe that addressing the selenium problem without also addressing the river salinity problem may result in adopting measures for selenium control that may have to be revised, with resulting further cost, in order to be economically and physically compatible with salinity and boron control in the river. We are also skeptical of using selenium load control as a surrogate for achieving the required selenium concentrations in the river. Furthermore, measures to reduce the discharged load of either selenium or salt may actually increase their concentration in the river. The assumed availability of dilution water may not be as forecasted in different year types. The CVP-TA and the new Bay/Delta Control Plan and other water use shifts may substantially alter recent historical flows, particularly in regard to seasonal distribution. Furthermore, the load approach precludes potential quick solutions such as providing dilution by circulating water from the DMC to the river with recapture in the Delta for return to the canal. The emphasis on annual load also inhibits achieving the desired concentration by controlling the time of drainage release to coincide with fish releases, power releases, etc.

The salinity and toxic ion problems in the river are almost entirely due to the CVP's operations. They did not exist prior to 1950. Downstream riparians and senior appropriators from the Merced down through the South Delta must not be expected to wait another twenty years for the impact to be mitigated. The selenium is largely leached from westside soils, but the salt and

boron are largely imported via the DMC and then concentrated by water consumption.

It would be disingenuous to pretend that westside agriculture can continue in the long run without either a salt removal system direct to the Bay or ocean, or ruinous discharges to the Delta via the river. Yet Table A-2 appears to say that direct discharge is eliminated from consideration because it is unpopular and costly, and Table II proposes to take twenty years to resolve the selenium problem in the river. It does not even address the salinity and boron problem in the river. We agree that there should be a watershed approach. However, the watershed includes the entire river and South Delta. Furthermore, a piecemeal approach to controlling components of water quality may be as bad as a piecemeal approach to the watershed.

We realize that the Regional Board is under pressure to address the selenium problem, and that it is expedient to give less attention to downstream water quality problems and to the long term survival of agriculture, both in the drainage area and downstream. However, we believe you should not allow these considerations to deter you from addressing this complex matter in a manner that is expeditious and which encompasses the entire scope of dissolved solids and the entire affected watershed.

Thank you for your consideration.

Sincerely,



Alex Hildebrand

cc Cliff Wisdom

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October 4, 1995

October 4, 1995
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SOUTH DELTA WATER AGENCY'S COMMENTS TO WATER QUALITY OBJECTIVES AND IMPLEMENTATION PLAN FOR THE REGULATION OF AGRICULTURAL SUBSURFACE DRAINAGE DISCHARGES IN THE SAN JOAQUIN RIVER BASIN

The SOUTH DELTA WATER AGENCY ("SDWA") continues to believe that the current water quality objectives and implementation plan for subsurface drainage are inadequate because of their failure to address and control high salinity discharges into the San Joaquin River. There are and will be no objectives and policy of implementation for salinity control if the Regional Board continues to address the issue by stating that an out-of-valley drain is the best solution. Since the Regional Board is not actively working to get the drain, is not implementing any salinity objectives for the upper San Joaquin in the interim, and is not proposing any plans to decrease salt discharges into the San Joaquin River, the Regional Board is ignoring the problem. The recent history of this issue is that the Regional Board failed to adopt any water quality standards for its salinity in its Basin Plan wherein it recommended "other agencies" should act on this problem. Then the State Board:

also failed to act but asked the Regional Board to address the issue. Now that the ball is back in the Regional Board's court, it is once again being kicked under the table.

Every time upstream discharges exceed the Vernalis salinity standard, the San Joaquin River is being degraded in violation of Water Code § 12232. This, in turn, forces the burden of dilution of this poor quality water on other, mainly downstream users. Every time downstream water is released to dilute this water, a downstream user is deprived of the ability to put that water to beneficial use. At the same time, the water users in between the poor quality water and the dilution water (and in fact users below the point of dilution), are forced to use the poor quality water.

All of this is coupled with the unfortunate fact that the USBR (the entity charged with meeting the Vernalis standard) has traditionally failed to meet this standard on a regular basis. Even today the Bureau is determining how much water to allocate for dilution based on availability, not on need. Hence, not sending discharge goals and limits is ignoring the problem even when it is now known that the one existing protection is inadequate.

It is then disingenuous to state a policy that the San Joaquin River may be used to remove salts from the Basin so long as water quality objectives are met (Staff Report at p. 4).

The Regional Board's Staff Report should include a survey of when and how often the Vernalis standard has not been met, a survey of what water may be available for dilution purposes, and a survey of current and proposed actions (i.e., spring fish flows, water purchases, Grassland/San Luis Drain Project) which will exacerbate the salinity problem. Such an approach would show the problem is getting worse and force the Board to act to control discharges.

In its justification for giving selenium control first priority (Staff Report at p. 19), staff states there are several significant salinity sources in the Basin besides agricultural subsurface drainage. This statement does not appear to be supported by the facts. The only significant discharges into the San Joaquin River that exceed the Vernalis standard come from surface and subsurface agricultural drainage. If each is now to be used as a reason why the other need not be addressed at this time, the problem will never be resolved.

It is interesting to note that the Regional Board favors more restrictive conditions to the (eventual) out-of-valley drain than it does for the San Joaquin River. Under the current proposals, the river will continue to transport excess salts to the Delta, regardless of the salt concentrations at the point of discharge, while the drain should only be built if "[A]ll toxicants would be

reduced to a level which would not harm beneficial uses of receiving waters" (Staff Report at p. 22).

What the Regional Board has failed to do is to address the issue of salinity control in the Basin. Any deadline for limiting discharges of water with salt concentrations above the Vernalis standard would be a step in the right direction and force the persons and entities causing the quality problems to correct or mitigate their adverse effects. No deadline, however, ensures continued degradation of the San Joaquin River not only to the river's detriment, but also to that of the downstream users.

BREWER, PATRIDGE, GRIFFITHS & HERRICK
Attorneys at Law

By John Herrick
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JH/tb

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BOURN DELTA WATER AGENCY'S COMMENTS TO STAFF REPORT ON COMPLIANCE TIME SCHEDULE FOR THE REGULATION OF AGRICULTURAL SUBSURFACE DRAINAGE DISCHARGES

The South Delta Water Agency ("SDWA") would like to reaffirm its earlier comments submitted on September 12, 1995, and on October 4, 1995. Although pressure is being exerted to first deal with the selenium issue, the Regional Board should not separate this issue from other important ones. To do so runs the risk of exacerbating other problems or making it more difficult to address those other problems in the future.

As stated earlier by Mr. Alex Hildebrand of our Agency, we believe that using selenium load controls does not appear to be the appropriate way of achieving water quality goals. Actions instituted to limit loads can actually increase concentrations resulting in even worse river quality at various times of the year.

As evidence of this, one need only look to the Grasslands Bypass Project. That Project's Supplemental Environmental Assessment continually refers to the fact that it will not increase salt loads in the San Joaquin River, and so the Project will not affect downstream quality. However, the Project separates the "good" water from the "bad" water and reuses the good. The effect of this is to have a smaller amount of drainage with a higher salt concentration being discharged in the San Joaquin River. Hence, even if the load into the river from this area is maintained, the river and downstream users are damaged by the higher concentrations. Having the (hoped for) better water offset this later in the year is of no help to agricultural diversers.

Dennis W. Westcott
December 7, 1995
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The salinity problem has existed since the operation of the CVP began nearly 45 years ago. To date, the only action taken to address this problem has been to require the USBR to release fresh water from New Melones to dilute the contamination. The SDWA and other entities have for many years requested that both the State and Regional Boards take action to begin to correct this problem, but to no avail. At this time, the good quality water of New Melones is being dedicated to alleviating the problems caused by other areas and thus depriving the Stanislaus water shed from the beneficial use of that water.

Currently, at least three different projects or programs (1995 Bay-Delta Fish and Wildlife Objectives, the USBR's Interim Water Acquisition Program, and the Grasslands Bypass Project) will result in either less dilution water available in the summer months or a worse quality of water in the river during those same summer months. Yet, at every step in the process (the Basin Plan, the Water Quality Control Plan, Amendments to the Basin Plan, and water permit change applications), both the State and Regional Boards agree there is a salinity problem and then take no step to address it. This current step appears to simply reaffirm that the Regional Board will allow projects such as the Grasslands Bypass Project to worsen San Joaquin River quality.

Concurrently with the investigation of the selenium problem, the Regional Board should face up to its statutory responsibilities and address the salinity problem. By not even examining the issue at this point, the Regional Board's actions will probably make it more difficult and more expensive to cure the salinity problem when and if that issue is ever addressed.

In the short term, coordination of releases of bad quality discharge water with other flows for dilution purposes, or prohibiting certain high concentration discharges, appears to be the only reasonable alternatives for salinity control. In the long run, an out-of-valley discharge of the salts and toxic ions appears to be the only practical solution.

The SDWA encourages the Regional Board to address the salinity problem at this time so that the downstream users who continue to be harmed by upstream CVP operations do not have to wait another 20 years before they begin to see the light at the end of the tunnel.

Very truly yours,

By 
JOHN HERRICK

JH/dd
cc: Karna Harrigfeld, Esq.
Jeanne Zolezzi, Esq.
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Mr. Dennis Westcott
July 7, 1995
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July 7, 1995

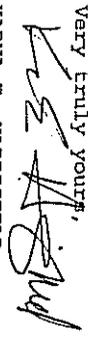
PROGRAM OF IMPLEMENTATION:

When the Regional Board prepares its program of implementation for achieving the water quality objectives, it is essential to include a compliance time schedule which will ensure that the objectives are met in a timely manner.

We thank you for allowing us to comment on this preliminary report, and look forward to participating in the development of the water quality objectives and program of implementation for the Basin Plan amendment.

Should you have any questions or concerns, please feel free to contact me.

Very truly yours,


KARINA E. HARRIGFELD
Attorney-at-Law

KEH:cjm
cc: Edward M. Steffani

Mr. Dennis Westcott
Senior LMU Analyst
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
3443 Routier Road, Suite A
Sacramento, California 95827-3098

Re: Comments to the Staff Report on Beneficial Use Designations and Water Quality Criteria for the Regulation of Agricultural Subsurface Drainage Discharge in the San Joaquin Basin (5C)

Dear Mr. Westcott:

On behalf of Stockton East Water District ("Stockton East"), we would like to provide the Regional Board with the following brief comments to the Staff Report on Beneficial Use Designation and Water Quality Criteria for the Regulation of Agricultural Subsurface Drainage Discharge in the San Joaquin River Basin (5C).

CONTROL OF SALINITY IN THE SAN JOAQUIN RIVER:

Of critical concern to Stockton East is the impact on water quality in the San Joaquin River caused from agricultural drainage discharges, and in specific, the effects of increased concentrations of salinity in the river. We recommend when amending the Basin Plan for regulation of agricultural drainage discharges that a salinity water quality criteria be developed to protect the beneficial uses of the San Joaquin River.

As you know, all water that flows out of the Grassland Basin goes into the San Joaquin River. It is essential to control the concentration of salinity entering the river. By establishing a measurable criteria for salinity, the water quality of the San Joaquin River will be enhanced.

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October 4, 1995

VIA TELEFAX AND U.S. MAIL

Paul E. Jepperson
Supervising Engineer
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Re: Water Quality Objectives and Implementation Plan
for Regulation of Agricultural Subsurface
Drainage in the Grasslands Area

Dear Mr. Jepperson:

On behalf of Stockton East Water District ("Stockton East"), we would like to provide the Regional Board with the following comments to the Staff Report on Water Quality Objectives and Implementation Plan to be Used in a Basin Plan Amendment for Regulation of Agricultural Subsurface Drainage in the Grasslands Area.

WATER QUALITY OBJECTIVES FOR THE SAN JOAQUIN RIVER:

Stockton East believes that it is critical to establish water quality objectives for salinity for the entire San Joaquin River, not simply at Vernalis. While the focus of the staff report is the establishment of water quality objectives for selenium, we believe that it is essential to do the same for salinity to fully attempt to resolve the problems plaguing the San Joaquin River.

The salinity problem has been an issue since the 1970's. Volumes of studies have been conducted which identify salinity as a major contributing factor to poor water quality in the San Joaquin River, but to date that information has been ignored.

Discharges of agricultural drainage water results in a significant degradation of the water quality in the San Joaquin River. The result of the degradation of the water quality directly impacts Stockton East because releases of water are required to be made from New Melones Reservoir to dilute the pollution caused from the agricultural discharges. These releases for water quality purposes have prevented Stockton East from receiving the water

Paul E. Jepperson
October 4, 1995
Page 2

entitled to it under its contract with the Bureau of Reclamation and must not be tolerated by the Regional Board.

As Stockton East is particularly concerned with the effects of increased concentrations of salinity in the San Joaquin river, we specifically request that the Basin Plan amendment include the establishment of water quality objectives for salinity to protect the beneficial uses of the San Joaquin River. By establishing a water quality objective for salinity on the San Joaquin River, the water quality of the San Joaquin River will be enhanced.

PROGRAM OF IMPLEMENTATION:

While we are encouraged that the Regional Board is contemplating requiring non-point source dischargers to obtain waste discharge requirements which will impose effluent limitations for selenium, we once again believe that similar effluent limitation must be imposed for salinity.

Furthermore, the staff report is silent on what would happen prepares if the waste discharge requirements are not met. We have seen from past practice that when a water quality objective is not met, agricultural drainage simply continues without any type of enforcement action being taken. We request that strict the program developed for achieving the water quality objectives include a strict compliance schedule which will ensure that the objectives are met in a timely manner.

We thank you for allowing us to comment on this staff report, and look forward to participating in the development the Basin Plan amendment.

Very truly yours,

Handwritten signature

KARNA E. HARRIGFIELD
Attorney-at-Law

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cc: Edward Steffani

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December 8, 1995

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Re: Water Quality Objectives and Implementation Plan
for Regulation of Agricultural Subsurface
Drainage in the Grasslands

Dear Mr. Jepperson:

On behalf of Stockton East Water District ("Stockton East"), I would like to reiterate our concerns with the Regional Board and its Staff Report on Water Quality Objectives and Implementation Plan to be Used in a Basin Plan Amendment for Regulation of Agricultural Subsurface Drainage in the Grasslands Area.

While we are encouraged by the Regional Board's stepping up of the compliance schedule for meeting the selenium water quality objectives, Stockton East strongly urges the Regional Board to establish water quality objectives for salinity for the entire San Joaquin River, not simply at Vernalis. We believe that to truly resolve the multitude of problems facing the San Joaquin River salinity water quality objectives must be established on the entire river.

For nearly three decades, the salinity levels in the San Joaquin River have been a major contributing factor to poor water quality in the San Joaquin River, but to date nothing has been done to remedy this situation, except for releasing water from New Melones to "dilute" the pollution. These releases for water quality purposes have prevented Stockton East from receiving the water entitled to it under its contract with the Bureau of Reclamation and must not be tolerated by the Regional Board.

Furthermore, the re-opening of the San Luis Drain has been approved by the Bureau even though the environmental documents show that there will be a significant impact on

Paul E. Jepperson
December 8, 1995
Page 2

San Joaquin River water quality by re-opening the drain. The increase salinity which will be caused by this discharge into the San Joaquin River makes it imperative to establish water quality objectives for salinity.

As Stockton East is particularly concerned with the effects of increased concentrations of salinity in the San Joaquin river, we specifically request that the Regional Board amend the Basin plan to include the establishment of water quality objectives for salinity to protect the beneficial uses of the San Joaquin River.

We thank you for allowing us to comment on this staff report, and look forward to participating in the development the Basin plan amendment.

Very truly yours,

J. S. Zolezzi
JEANNE M. ZOLEZZI

JEANNE M. ZOLEZZI
Attorney-at-Law

JMZ/KEH:tlw
cc: Edward Steffani

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Memorandum

Dennis Westcott
Central Valley Regional Board (S)

Date: OCT 6 1995

Walt Pettit
Walt Pettit, Chief
Division of Water Quality
STATE WATER RESOURCES CONTROL BOARD
901 P Street, Sacramento, CA 95814
Mail Code G-8

COMMENTS ON STAFF REPORT FOR DRAFT BASIN PLAN AMENDMENT FOR
REGULATION OF SUBSURFACE AGRICULTURAL DRAINAGE DISCHARGES IN
THE SAN JOAQUIN RIVER BASIN

This memorandum responds to Paul Japperson's request of
September 5, 1995 for comments on the proposed Basin Plan
amendment. We have reviewed the staff report and have the
following comments.

1. You are proposing to revise Policy b in Table 6 (p. 18) to discourage rather than prohibit activities that increase the discharge of poor quality drainage water. This seems inconsistent with the discussion of this policy on pages 19 and 20 (which seems to support a prohibition) and with the prohibition in Table 8 (p. 28).
2. Policy g (Table 6, p. 18) appropriately takes a watershed perspective on the problems in the Grasslands. It recognizes that watersheds are complex systems, that it may not be possible to support all beneficial uses in all water bodies at every location, and that compromises may be necessary. We fully support this approach.
3. As you know, the San Joaquin Valley Drainage Program ceased to exist after the publication of their final report in 1990. References to this group in Table 7 (p. 28) therefore probably refer to the San Joaquin Valley Drainage Implementation Program.
4. Large load reductions will be necessary to meet water quality objectives for selenium. At this time these reductions may not be attainable except by large scale land retirement. Without a valley drain to export salt and/or a breakthrough in the development of a cost-effective treatment technology, there appears to be no other option but to take lands out of production.

Dennis Westcott

OCT 6 1995

You have recognized this difficulty by allowing up to 20 years to meet objectives (with milestones). This compliance schedule was subject to some criticism at the recent workshop as being too long. While 20 years appears to be realistic under these circumstances, you may want to consider this an upper limit, not subject to revision in the event that management measures are not effective or that a permanent solution is not found. On the other hand, it may be appropriate to accelerate the compliance schedule if a solution or even partial solutions are forthcoming. This would include development of a suitable treatment technology, implementation of a drainage export program, or extension of the discharge point to a location below the Merced River.

5. There are advantages to the use of static effluent limits which you point out in Appendix D. This method is probably appropriate at this stage of the regulatory program; however, given the difficulty which is expected in meeting the objectives, a dynamic system should be investigated which will take full advantage of the increased assimilative capacity of the river during high flows.

6. The setting of effluent limits and the issuance of WDRs represents a substantial change in the regulation of subsurface agricultural drainage discharges. As you point out in Appendix C, this amounts to a progression from Tier Two to Tier Three of the Nonpoint Source Management Strategy. It is unfortunate that Tier One and Tier Two were not successful in achieving water quality goals. However, as you point out, issuing WDRs can provide the regulatory incentives to ensure water quality goals are met. It also demonstrates that the Regional Board is serious about its water quality protection program and hopefully will encourage other nonpoint source pollutant dischargers to do what is necessary to make Tiers One or Two successful.

We will be following the implementation of the Basin Plan with great interest and hope that it is successful.

If you have any questions, the staff person most knowledgeable on this subject is Walt Shannon, and he can be reached at 657-1027. You may also call Jack Hodges, Chief of the Nonpoint Source Ag Unit, at 657-0682.

cc: Walt Pettit, EXEC
John Ladd, DMQ

95 OCT 10 PM 1:11



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

14 July 1995

William Crooks, Executive Officer
California Regional Water Quality Control Board
Central Valley Region
3443 Roulter Road, Suite A
Sacramento, CA 95827-3098

Subject: San Joaquin Basin Plan Amendment

Dear Mr. Crooks:

Thank you for the opportunity to both review the staff report on *The Beneficial Uses Designations and Water Quality Criteria to be Used for the Regulation of Agricultural Subsurface Drainage Discharges in the San Joaquin Basin (SC)* and attend your staff's presentation of the report at the June 23, 1995 Regional Board workshop. Both the report and the presentation were highly informative.

As you may know from our comments on the advanced draft staff report and our conversation with your staff on June 14, 1995, we are very impressed with the thoroughness and thought which you and your staff have given to developing the proposed beneficial uses for the Grasslands watershed area. In particular, we are glad to see the attention the Regional Board staff has given to the wetland channels as part of its beneficial use identification process.

As you also may know, the Regional Board is in the process of amending its Basin Plan at the same time that the San Luis Delta-Mendota Water Authority is in the process of negotiating with the U.S. Bureau of Reclamation for its reuse of the San Luis Drain for conveyance of agricultural drainage waters out of the Grasslands area wetland channels and to the San Joaquin River via Mud Slough. You may recall that a similar proposal in 1991 resulted in the development of an Environmental Assessment and a Finding of No Significant Impact which outlined the process by which environmental commitments would be made a part of the agreement to reuse the drain. Most specifically, the 1991 FONSI proposed to rely on the Regional Board to adopt as part of its Basin Plan Amendment, load reduction targets and a schedule for reductions which would apply to use of the drain. The Authority's 1995 proposal is identical to its 1991 proposal in this regard.

It has long been EPA's opinion that use of the drain has environmental costs which must be mitigated by a commitment on the part of the Authority to reduce contaminant loads

to the San Joaquin River over time. The costs include acute and chronic levels of toxicity in Mud Slough and increased contaminant loads to the San Joaquin River. While using the Basin Plan Amendment as the vehicle for establishing the appropriate load reduction targets and schedule is most appropriate, it is the less than perfect timing of these two events which is somewhat worrisome (i.e., the Authority would like to sign a Use Agreement by August 1, 1995; the Basin Plan Amendment is scheduled to go before the Board in December 1995 with State Board approval in 1996). We hope to engage you and your staff in more regular dialogue on this subject over the next several months to ensure that the two processes are coordinated as best as is possible.

Specifically regarding the staff report on beneficial uses, we have four general comments to offer. Other more specific comments are included as an attachment. First, as above, we believe the Basin Plan Amendment should more clearly acknowledge the presence and potential reuse of the San Luis Drain as an important and complex component of drainage management in the Grasslands area.

Second, it is EPA's view that the Regional Board has an obligation to designate appropriate beneficial uses and water quality objectives for all waters of the state. Even if perceived as a benefit to the watershed as a whole, the quality of one waterbody can not be traded for the quality of another waterbody through the beneficial use setting process. The watershed protection approach can be used to rank priority issues for cleanup within each watershed. These priorities can best be reflected in a flexible implementation plan which provides extended time frames for addressing lower priority problems. Ultimately, though, it is EPA's opinion that each waterbody must meet designated uses or have uses reviewed through a use attainability analysis.

Third, as a reminder, federal regulations are very clear on the subject of waste transport as a designated use of waters of the United States. The 40 CFR 131.10 says:

"In no case shall a State adopt waste transport or waste assimilation as a designated use for any waters of the United States."

While the staff report does not propose as part of Table 2, waste transport as a designated use, it does identify as part of Table 3, subsurface agricultural drainage as a current use of many of the wetland channels. While the draft staff report does not appear to conflict outright with the regulations, we thought it appropriate to highlight the above subsection of the regulations for your consideration in the finalization of the Basin Plan Amendment. You may find that clarification of this point in the Amendment is warranted.

As a final matter, the staff report provides a literature review of selenium investigations which establishes a range of potential water quality objectives for selenium. Unlike the beneficial uses, however, the staff report does not make specific recommendations regarding an appropriate selenium objective. We would be happy to work more closely with you and your staff in the event that further technical discussion would be useful to you in developing a final recommendation.

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Thanks again for the opportunity to review the draft staff report. We look forward to discussion and review of the implementation plan, including a schedule and load reduction targets, when such a plan is available for comment. As with the water quality objectives, we would be happy to work more closely with you and your staff on this subject, if additional technical discussion would be viewed as helpful. Please feel free to contact me or Alydda Mangelsdorf of my staff at (415) 744-2015.

Sincerely,

Maria C. Rea

Maria Rea, Chief
Northern California and Hawaii Watershed Section

Attachment

cc: Mike Delamore, Bureau of Reclamation
John Ladd, SWRCB
Dan Nelson, Delta-Mendota Water Authority
Steve Schwarzbach, USFW
Terry Young, EDF
Department of Fish and Game

U.S. EPA Region IX Comments regarding
The Staff Report on
*The Beneficial Uses Designations and Water Quality Criteria to be Used for the
Regulation of Agricultural Subsurface Drainage Discharges in the
San Joaquin Basin (5C)*

1. The staff report does not present the public health risks associated with subsistence fishing, egg gathering and other foraging in and around the Grasslands watershed area. The risks associated with these activities may disproportionately affect ethnic and low-income communities. To ensure environmental justice, the Basin Plan Amendment must provide a mechanism for protecting this current use.
2. The staff report proposes that Mud and Salt Sloughs should not be protected for cold water migration. Reasonable arguments are made to support this proposal. However, the staff report does not fully contemplate the current incidental migration of cold water fishes. Nor, does it contemplate the increased incidental migration of cold water fishes which is likely to occur as a result of increased flows in Mud Slough following the reopening of the San Luis Drain, should that occur. The Basin Plan Amendment must more fully address this issue.
3. The staff report proposes that the wetland channels should be protected as limited warm water habitat. The Basin Plan Amendment must better define the "limited" warm water habitat use and whether some distinction from a "full" warm water habitat use is intended.
4. The staff report proposes that the wetland channels should not be protected for contact recreation (i.e., swimming). Reasonable arguments are made to support this proposal. However, several drownings are reported in the wetland channels every year suggesting that swimming does currently exist as a use. The Basin Plan Amendment must more fully address this issue.
5. The staff report proposes that Mud Slough should not be protected for the preservation of biological resources of special significance. Reasonable arguments are made to support this proposal. However, the staff report does not fully contemplate the association of Mud Slough with Kesterson National Wildlife Refuge and the potential for over flows from Mud Slough (i.e., stormwater flows). This is of particular importance given the increased flows and constituent loads to Mud Slough which will be experienced should the San Luis Drain be reopened. The Basin Plan Amendment should more fully address this issue.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

NOV 22 1995

William Crooks
Regional Water Quality Control Board
Central Valley Region
3443 Router Road, Suite A
Sacramento, CA 95827-3098

Subject: Staff Report on Water Quality Objectives and Implementation Plan to be Used for the Regulation of Agricultural Subsurface Drainage Discharge in the San Joaquin River Basin

Dear Mr. Crooks:

This letter contains the U.S. Environmental Protection Agency's (U.S. EPA) general comments on the above referenced staff report dated September 1995. As you know, representatives of U.S. EPA participated in the Regional Board workshop on the staff report held on September 22, 1995 and provided comments regarding the nexus between the proposed Basin Plan Amendment and the consensus process begun during the summer of 1995 regarding use of the San Luis Drain. Since the Regional Board workshop, the Regional Board has issued a revised staff report dated November 1995 which we are still in the process of reviewing. A letter commenting on the revised staff report will be forthcoming and will include more specific comments.

In general, the U.S. EPA is supportive of the approach the Regional Board staff has proposed as a means of better controlling subsurface agricultural drainage discharges in the San Joaquin River Basin. We specifically support the Regional Board staff's proposal to: 1) encourage the development and operation of a Regional Entity for basin-wide management of agricultural drainage in the Grasslands Basin, 2) issue a Waste Discharge Requirement with effluent limits for selenium discharges, and 3) require the development of an interim- and a long-term plan by which the Drainage Entity, individual drainage and irrigation districts, and individual farmers will better control selenium discharges so as to reduce selenium loads and meet water quality objectives. In fact, these are the same recommendations which the San Luis Drain consensus discussions arrived at after debate amongst many of the interested parties, including: U.S. EPA, U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, the Environmental Defense Fund, and the San Luis & Delta-Mendota Water Authority.

We would, however, like to raise two issues which concern us regarding the September 1995 staff report: 1) the length of the proposed compliance schedule and 2) the lack of commitment towards implementing the Total Maximum Daily Load (TMDL) model.

COMPLIANCE SCHEDULE

Regarding the compliance schedule, U.S. EPA does not believe that a basin plan amendment allowing for a 20 or 25-year compliance schedule would be approvable by U.S. EPA in its review under the Clean Water Act. Nationwide, U.S. EPA has maintained that water quality standards should be achieved as soon as possible, and U.S. EPA has not previously approved compliance schedules longer than 10 years. U.S. EPA believes that the compliance schedule should be modified to ensure that the water quality standards are achieved in a more timely manner.

TOTAL MAXIMUM DAILY LOAD

Regarding the TMDL, section 303(d) of the Clean Water Act requires that States develop TMDLs for their water quality-limited waters where technology-based effluent limitations or other legally required pollution control mechanisms either do not exist or are not sufficient or stringent enough to implement the water quality standards applicable to such waters. The San Joaquin River was targeted for TMDL development in 1994 with an expected completion date of March 1995. We understand that the Regional Board staff has essentially completed the development of a TMDL for the water quality-limited segment of the San Joaquin River. The Regional Board or Executive Officer should adopt the TMDL, submit it for U.S. EPA review and approval, and then implement it.

The Basin Plan Amendment offers an excellent opportunity to establish the means by which the TMDL will be implemented, including the incremental phases in which it will be applied. However, the September 1995 staff report only proposes to base the final selenium load limits on the TMDL model and remains silent on the actual TMDL adoption and interim implementation plan. We believe that to be approvable the Basin Plan Amendment should provide more clarity on the issue of TMDL adoption and better flesh out the interim phases of TMDL implementation.

As mentioned above, we will be forwarding comments on the November 1995 revisions to the staff report as soon as possible. If you have any questions regarding these comments please contact me at (415) 744-2125 or Alydda Mangelsdorf of my staff at (415) 744-2015.

Sincerely,


Alexis Strauss, Director
Water Management Division

NOV 27 1995

cc: Terry Young, EDF
Gary Bodker, Bay Institute
Hal Candee, NRDC
John Ladd, SWRCB
Penny Howard, USBR
Steve Schwarzbach, USEFW
Dan Nelson, SL & DMWA



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901 ...

JAN 08 1996

William Crooks
Regional Water Quality Control Board
Central Valley Region
3443 Roulter Road, Suite A
Sacramento, CA 95827-3098

Subject: Proposed Basin Plan Amendment for the Regulation of Subsurface Drainage
Discharges in the San Joaquin River Basin

Dear Mr. Crooks:

Thank you for the opportunity to comment on the staff report entitled "The Compliance Time Schedule to be used for the Regulation of Agricultural Subsurface Drainage Discharges in the San Joaquin River Basin" dated November 1995. Since this most recent staff report modifies proposals of previous staff reports, we have attempted to review the portions of the three staff reports which have been prepared on this subject and which represent the new proposed basin plan language. Enclosed are comments which reflect this more comprehensive review.

You and your staff are to be commended for the extraordinary effort which is represented by the proposed basin plan to control subsurface drainage. In general, the plan represents a very aggressive and precedent-setting application of water quality tools to the problem of non-point source pollution. Our comments are crafted as recommendations which we believe will more greatly perfect this plan.

A summary of our recommendations is as follows:

1. We recommend that all existing and potential beneficial uses be identified for the San Joaquin River Basin, including: REC-2 and MGR on Mud and Salt Slough, BIOL on Mud Slough and COMM on the San Joaquin River.
2. We recommend that both the narrative and numeric water quality objectives be adopted to apply to the entire delineated San Joaquin River watershed area, including the wetland channels, Mud Slough, Salt Slough, and the San Joaquin River including that portion of the river from the Mendota Pool to Sack Dam.

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3. We recommend that the Regional Board wait to consider amendments regarding salinity until it has prepared a thorough staff report evaluating the subject.
4. We recommend that the Regional Board make more clear the long-term commitments which will be required of Grassland Basin drainers to achieve the goals of the basin plan.
5. We recommend that the Regional Board adopt the staff's Total Maximum Monthly Load model and submit it to EPA for approval. In addition, we recommend that the primary interim control measures be load-based measures derived from the TMML model. The proposed concentration-based Performance Goals should be viewed as a companion tool to the TMML, rather than the guiding principle. Regardless of whether the primary interim control measures are load- or concentration-based, however, we recommend that they be designed to improve water quality throughout the watershed, not just within specific waterbodies.
6. We recommend that the numeric water quality objective for selenium go into effect immediately upon adoption of the plan.
7. We recommend that the Regional Board reconsider the feasibility of compliance with the water quality objectives in less than the proposed 15 years. Further, we recommend that the Regional Board staff revise the implementation plan to provide only the authority to grant a compliance schedule, for non-point source discharges, of up to 10 (or 15) years. The Basin Plan itself should not establish a specific compliance schedule, thereby automatically deferring compliance with the water quality objectives. Instead, compliance schedules may be included in a State Waste Discharge Requirement, which the staff report indicates will be issued for discharges of agricultural subsurface drainage. Minimum required improvements should then be established for each 5 year permit period. The permit writer, however, should be given discretion to apply a more stringent compliance schedule than the maximum authorized by the Basin Plan, if one appears warranted.
8. Finally, we recommend that the Regional Board staff consider expanding the watershed boundaries to include the upstate area defined by Tanoche-Silver Creek.

Thank you for consideration of the enclosed comments and recommendations. If you have any questions, please contact Alydda Mangelsdorf of my staff at (415) 744-2015.

Sincerely,

Wendy C. Lee

for Amy Zimpfer, Chief
Watershed Protection Branch

cc: Joe Karkoski, RWQCB

Mike Delamore, USBR

Penny Howard, USBR

Dan Nelson, SL&D-MWA

Joe McGahan, Summers Engineering

Michael Morse, USFW

Sieve Schwarzbach, USFW

Terry Young, EDF

Gary Bobker, Bay Institute

Mary Dunne, DFG

Scott Fraser, USFW

U.S. EPA Comments on Basin Plan Amendment
Staff Report dated November 1995
December 14, 1995

BENEFICIAL USES

1. **Table 2: Designated and Proposed Beneficial Uses.** REC-2 (Canoeing) is designated as a use of the San Joaquin River but not Salt and Mud Slough. Boating is an occasional use of Mud and Salt Sloughs. As such, we recommend that REC-2 be adopted as a beneficial use of Mud and Salt Slough.
2. **Table 2: Designated and Proposed Beneficial Uses.** COMM (Commercial and Sports Fishing) is proposed as a beneficial use for Salt and Mud Slough but is not proposed for the San Joaquin River or the wetland channels. Fishing is an activity that occurs on the San Joaquin River. As such, we recommend that COMM be adopted as a beneficial use of the San Joaquin River.
3. **Table 2: Designated and Proposed Beneficial Uses.** MIGR (Warm and Cold Water Species) is proposed as a beneficial use for the San Joaquin River but not for Mud Slough, Salt Slough or the wetland channels. MIGR is defined as "use of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish." Anadromous and other fish engage in "temporary activities" in Mud and Salt Slough. As such, we recommend that MIGR be adopted as a beneficial use of Mud and Salt Slough.
4. **Table 2: Designated and Proposed Beneficial Uses.** BIOL is proposed for Salt Slough and the wetland channels but not for Mud Slough. Kesterson Wildlife Refuge borders Mud Slough. As such, we recommend that BIOL be adopted as a beneficial use of Mud Slough.

WATER QUALITY OBJECTIVES

5. **Table 1: Narrative Water Quality Objectives for the San Joaquin River, Mud Slough (North) and Salt Slough.** Under "Chemical Constituents" the Regional Board staff propose that Maximum Contaminant Levels (MCLs) be incorporated by reference as the concentration limits applicable to the San Joaquin River. While MCLs may be quite low for many constituents, they may nonetheless not be fully protective of some ecological receptors. As such, we recommend that the Regional Board staff provide greater scientific justification for their proposal to establish MCLs as the criteria appropriate for protecting both human and ecological health.

In addition, we recommend that specific criteria for chemical constituents be identified for Mud Slough, Salt Slough and the wetland channels--or adopted for these waters by tributary rule.

6. Table 1. Under "H" the Regional Board staff propose that "in determining compliance with the water quality objective for pH, appropriate averaging periods may be applied provided that beneficial uses will be fully protected." There is no explanation for what "appropriate averaging periods" might be. We recommend that the Regional Board staff provide an explanation of the range of averaging periods which it is proposing as appropriate.

7. Table 1. Under "Pesticides" the Regional Board staff propose a series of narrative and numerical objectives. The numerical objectives include:

- a. Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the San Joaquin River, Mud Slough or Salt Slough in detectable quantities.
- b. The San Joaquin River shall not contain concentrations of thibencarb in excess of 1.0 ug/l.
- c. The San Joaquin River shall not contain concentrations of pesticides in excess of MCLs.

We recommend that the Regional Board adopt the numerical criteria to apply to the San Joaquin River, Mud Slough, Salt Slough, and the wetland channels.

There are many pesticides commonly found in the waterways associated with agricultural regions in California. Sufficient information exists to adopt numerical criteria for pesticides other than those listed here. As such, we recommend that the Regional Board staff develop numeric criteria for the other pesticides commonly found.

The narrative criteria evoke the standards of "adverse effects," "antidegradation," and "technically and economically achievable" to apply to the San Joaquin River, Mud Slough and Salt Slough. We recommend that the Regional Board staff define the term "adverse effects" to include: acute and chronic toxicity, bioaccumulation, and significant population and food web changes. Further, we recommend that the Regional Board adopt the narrative standards to apply to the wetland channels, in addition to the other listed waters.

8. Table 1. Under "Sediment" the Regional Board staff propose that adverse changes in suspended sediment load be prohibited. There is no discussion regarding the current condition of the Grasslands Basin as regards suspended sediments. As such, we

recommend that Regional Board staff provide greater clarity on the issue, confirming that current suspended sediment levels do not cause adverse affects requiring sediment loading reductions.

9. Table 1. Under "Temperature" the Regional Board staff propose that the San Joaquin River never be increased more than 5 degrees Fahrenheit above natural receiving water temperature. There is no discussion, in this section, of the salmon protection objective adopted for the San Joaquin River and Sacramento/San Joaquin Delta which requires that "water quality conditions with cold water MGR beneficial uses be maintained sufficient to achieve a doubling of natural production of chinook salmon from the average production of 1967-1991." As such, we recommend that the Regional Board staff provide greater scientific justification to demonstrate that an increase of 5 degrees Fahrenheit is consistent with the goal of doubling salmon production.

10. Table 1. Under "Turbidity" the Regional Board staff propose that the San Joaquin River, Mud Slough and Salt Slough be free of turbidity that causes nuisance or adversely affects beneficial uses. Specific numeric limits are proposed which are based on the natural turbidity of the water body. Regional Board staff proposes to use "appropriate averaging periods" when determining compliance with this objective. Further, Regional Board staff proposes that a zone of dilution will be defined for any dredging activity. Within the zone of dilution, violation of the standard would be allowed. We recommend that the Regional Board staff provide an explanation of the range of averaging periods which it is proposing as appropriate. Further, we recommend that the Regional Board staff develop language which limits the extent of the violation allowed within the zone of dilution.

11. Table 5: Revisions to Numeric Water Quality Objectives Applicable to the San Joaquin River and/or Mud Slough (North) and Salt Slough. The Regional Board staff proposes to adopt two sets of boron objectives for the San Joaquin River from the mouth of the Merced to Vernalis—one which applies from March 15 through September 15 and one which applies from September 16 through March 14. They are 2.0 ppm and 2.6 ppm as maximum concentrations, respectively or 0.8 ppm and 1.0 as a monthly mean, respectively. Regional Board staff proposes a critical year monthly mean for Salt Slough, Mud Slough and the San Joaquin River from Sack Dam to the mouth of the Merced. A footnote indicating that an alternate set of objectives will provide for better water quality in Salt Slough and the San Joaquin River and a longer compliance period for Mud Slough should the San Luis Drain be opened has been stricken. Given the imminent opening of the San Luis Drain, we recommend that the Regional Board staff provide greater scientific justification for the proposed boron

term degradation of Mud Slough which will occur so as to gain benefits in Salt Slough and the wetland channels, may be justifiable only if degradation will not cause irreversible harm or significant environmental impacts and will be temporary in nature. We recommend that the Regional Board adopt language which ensures that its implementation plan protects against irreversible harm and significant environmental impacts anywhere in the watershed and ensures full compliance with water quality objectives in the long term.

15. Table 6, Policy 6.e and 6.f state that disposal of salts is the Regional Board's favored option and that a valley-wide drain to carry the salts is the best technical solution. Greater technical and scientific justification for this position is required. As such, the Basin Plan Amendment proposed for development in mid-1996 on the subject of salts is the better place to articulate and support these policies. We recommend that the Regional Board not adopt these amendments but reserve them for consideration in their salinity amendment.

16. Table 2 (7): Potential Control Actions. Item #1. Regional Board staff propose that the regulatory priority system for the Grasslands be based on "the sensitivity of the beneficial use to selenium" and "the environmental benefit expected from the action." We recommend that the Regional Board staff define these terms.

17. Table 2 (7). Item #3. Regional Board staff propose that the regulatory program be conducted as a series of short-term actions that are designed to meet long-term water quality objectives. Selenium control in Grasslands will require an increasingly greater capital investment on the part of farmers and drainage/irrigation districts. As such, the required actions will increasingly be long-term in nature, rather than short-term. Reliance on short-term actions will almost certainly not result in the next phase of long-term investment which will be required to solve the selenium problem. We recommend that the Regional Board staff develop language which makes clear the long term investments which are likely to be necessary to control selenium discharges.

18. Table 2 (7). Item #4. Regional Board staff propose that Performance Goals, in the form of concentration limits, be used to measure progress towards achieving water quality standards. Only in the event that the Performance Goals are exceeded will loading requirements kick in. This approach is in conflict with both the Regional Board's conclusion that load reduction is the best way of achieving water quality standards and the results of its TMAVL, which identify the exact load limits necessary to meet water quality standards. Interim performance goals in the form of concentration limits offer a fine comparison tool to load limits, but all available information suggests that only by progressively reducing selenium loads will water

quality standards be achieved and the environment adequately protected. We recommend that the Regional Board staff present the TMAVL to the Board for adoption. Further, we recommend that the Regional Board staff revise its implementation plan to use the selenium load limits derived from the TMAVL as the primary selenium control mechanism. These selenium control mechanisms should apply throughout the entire watershed area, not just in individual streams.

19. Table 2 (7). Item #5. Regional Board staff propose boron compliance dates of 1991 and 1993. The boron standards are not currently being met. We recommend that the Regional Board staff develop a control strategy for boron and any other constituent whose standard is regularly exceeded.

20. Table 2 (7). Item #6. Regional Board staff propose that (unidentified) selenium load reduction milestones will be incorporated into WDRs. Staff have eliminated a statement from Item #6 which was contained in the September 1995 staff report and which stated that load limits would be established to ensure that "the selenium water quality objective in Mud Slough (north) and the San Joaquin River upstream of the Merced River inflow is achieved..." We recommend that the Regional Board staff revise the language to ensure that load limits are designed not only to meet water quality standards downstream of the Merced, but throughout the watershed.

21. Table 3 (8): Prohibitions. Item b prohibits the discharge of agricultural subsurface drainage water to Salt Slough and wetland water supply channels with a WILD beneficial use designation. It appears that the channels proposed for protection are a subset of those formerly proposed. We recommend that the Regional Board staff identify on a map the specific channels it does and does not intend to be included.

22. Table 4 (10): Estimated Percentage Change in Selenium Load within Each Month for Various Water Year Types to Meet a 5 ug/L 4-day Average Selenium Water Quality Objective Based on One in Three Year Rate. The table presented in the November 1995 staff report is notably different from the one presented in the September 1995 staff report with no corresponding explanation for the changes. We recommend that the Regional Board staff provide an explanation for the changes to the table as well as a general explanation of the method by which the table was derived.

23. Table 11: Summary of Selenium Water Quality Objectives and Compliance Time Schedule. Regional Board staff propose a 8,000 lbs/year selenium load limit as a maximum limit for the whole drainage problem area. This number varies from the number proposed by the drainers, EPA, USBR, and USFW which is 6,660 lbs/year. We believe that 6,600 lbs is the appropriate maximum load limit and has been agreed

upon by many of the stakeholders. Further, the Regional Board staff proposes that this limit not go into effect until 10/97 while the many involved stakeholders agreed that 6,660 lbs would go into effect immediately upon use of the drain. We recommend that the Regional Board staff revise its proposed maximum load limit to be 6,600 lbs. of selenium annually. Further, we recommend that the Regional Board staff revise its implementation date to be immediately upon adoption of the plan.

24. The proposed Basin Plan Amendment language and accompanying staff report are not very clear on the subject of when the 5 ppb selenium standard would go into effect. We recommend that the Regional Board staff propose language which make clear that the 5 ppb selenium objective will go into effect immediately upon adoption of the plan.

TMMML

25. The proposed Basin Plan Amendment is not very clear regarding the Regional Board staff's Total Maximum Monthly Load (TMMML). The TMMML is designed as a tool for controlling selenium discharges by establishing allowable selenium load limits. EPA has accepted the general method proposed by Regional Board staff. However, specific load numbers have never been proposed for adoption and use. In our view, the TMMML is precisely the tool which the Regional Board should adopt and implement as part of its selenium control strategy. As above, both selenium load limits and interim concentration limits could be put into effect as companion tools to promote water quality compliance. We recommend that the Regional Board staff propose that the Regional Board adopt the TMMML. Further, we recommend that the Regional Board adopt the TMMML for establishing the selenium load limits which will incorporated into the implementation plan.

COMPLIANCE SCHEDULE

26. The Regional Board staff propose that they establish a compliance schedule of 10 years for wet years and 15 years for dry years. This is a reduction of 10 and 5 years from their previous proposed schedule, respectively. EPA has never before approved a compliance schedule of longer than 10 years believing that 5 years is generally sufficient. Further, the analysis contained in the staff report appears to indicate that all of the selenium control mechanisms, except unproven treatment technologies, are immediately available for implementation. To accomplish the goals of water quality protection, the water authority, irrigation districts, drainage districts and farmers must begin a coordinated effort to implement, on a broad scale, these selenium control techniques. As regards the unproven technologies, it is our experience that an

aggressive compliance schedule acts as a tool to promote diligent technology development. As such, a compliance schedule which is shorter than the one currently proposed appears to be feasible and advisable.

Therefore, we recommend that the Regional Board staff revise its proposed compliance schedule to better account for the comments above. Further, we recommend that the Regional Board staff revise the implementation plan to only provide authority to grant a compliance schedule of up to 10 (or 15) years. The Basin Plan should not guarantee a specific compliance schedule, thereby automatically deferring compliance with the water quality objectives. While minimum required improvements should be established within the Basin Plan for each 5 year permit period, the permit writer should be given discretion to apply a more stringent compliance schedule if one appears warranted. Finally, should the Regional Board staff maintain its current proposal, we recommend that the staff provide greater scientific justification for the extended schedule, given the immediate availability of many load reduction tools.

WATERSHED DELINEATION

27. The Regional Board staff have delineated the San Joaquin River Basin watershed to include the wetland channels, Mud Slough and Salt Slough of the Grassland Basin and the San Joaquin River from the Mendocina Pool to below the confluence with the Merced River. As you know, the EPA, Regional Board and numerous other parties have been involved in a Coordinated Resource Management and Planning effort in the Panache-Silver Creek area. This area is the geologic source area for the Panache alluvial fan which contributes the majority of selenium-tainted drainage water to the Grasslands and lower San Joaquin River. As was seen last spring, Panache Creek continues to transport large quantities of selenium to the alluvial fan and the San Joaquin River (via the Mendocina Pool). We recommend that the Regional Board staff consider re-delineating the watershed boundary to include the Panache-Silver Creek upslope areas and to more formally engage all watershed stakeholders in the development and implementation of a selenium control strategy. We recommend that the Regional Board apply all of its tools, both regulatory and cooperative, to better coordinate a true watershed approach to this water quality problem.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

San Luis National Wildlife Refuge Complex

P.O. Box 2176
Los Banos, California 93635
(209) 826-3508

December 12, 1995

Mr. William Crooks
Executive Director
Central Valley Regional Water Quality Control Board
3443 Router Road, Suite A
Sacramento, California 95827-3098

Subject: Water Quality Objectives and Implementation Plan to be Used for the Regulation of Agricultural Subsurface Drainage Discharges in the San Joaquin River Basin. December 7, 1995 workshop for review of revised schedule for implementation.

Dear Mr. Crooks:

The U.S. Fish and Wildlife Service's San Luis National Wildlife Refuge Complex (San Luis NWRRC) appreciates the opportunity to provide comments to the Central Valley Regional Water Quality Control Board (Regional Board) on the revised implementation time schedule to be used for the regulation of Agricultural Subsurface Drainage Discharges into the San Joaquin River and Grassland Area, Merced County, California.

We are pleased that your staff has responded favorably to the comments previously provided. Shortening the implementation time-frame for compliance and establishing an effective enforcement program for the San Joaquin river and tributaries is an action many entities have long awaited. The San Luis NWRRC will continue to be directly affected by all of the agricultural drainage effluent discharged from the San Luis drain (SL DRAIN) while used as the Grassland bypass. We support the reuse of the San Luis Drain as the Grassland bypass because this operation improves the

distribution of high quality water supplies (CVPRA and water rights) to refuge lands from Grassland Water District canals and Salt Slough.

The implementation schedule reflected in table 1A on page two can still be improved by reflecting current agreements that have been signed by all necessary parties. The reuse of the SL Drain is going to be regulated by Waste Discharge Requirements (WDR) issued by your Regional Board. The reduction in selenium load that is required to continue use of the SL Drain should be reflected in table 1A. We realize that concentration levels in Mud Slough will not meet accepted water quality standards for some time. However, it is important to reflect upon the improvements that are expected and have already been agreed to by all the agencies involved. Again we must state opposition to the fifteen year time frame presented in the most recent report. Allowing the continuation of discharges of agricultural drainage water to Mud Slough (north) without specific goals for improvement is unacceptable.

The stated 2ppb Se objective for Grassland waterways and Salt slough are very significant, especially if you adopt the Basin amendment plan with immediate oversight and, if necessary, enforcement actions. Without such action, the expected improvements may just raise false hope for many affected parties. The water quality standards that will be phased in over time should be adopted effective immediately with the stated compliance periods.

Scott Frazer
Scott Frazer
Refuge Operations Specialist

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Mr. William Crooks

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Loading in the Grassland area is very well summarized by Figure 2 of the Regional Board's staff report on the beneficial uses of the Grassland area. The difference between the drainage channel loads and the loads in Salt and Mud Sloughs is likely due to selenium being removed from the water column via numerous processes such as sedimentation, bioaccumulation, and even volatilization as the water travels through 70 or more miles of channels. If this drainwater is sent a shorter distance through the San Luis Drain and Mud Slough, the selenium removal process will not be as great, thus the loading to the San Joaquin will increase unless other control measures are implemented. The Regional Board's recent reports on selenium loading in the San Joaquin River show that improvements in irrigation efficiency alone will not control selenium. This reaffirms the San Joaquin Valley Drainage Program's initial recommendations that no one management action will solve the drainwater problems of the San Joaquin Valley. Other actions will need to be implemented to control selenium loading into the San Joaquin River.

In conclusion the Service recommends:

Criteria for Salt Slough and associated channels should be 2 ug/l to fully protect the use of this water for wetlands.

Criteria for Mud Slough should be 5 ug/l at all times to protect the freshwater aquatic resources. A phase-in period will likely be needed pending completion of the drain to the confluence of the Merced and San Joaquin.

Criteria for both segments of the San Joaquin River should be no greater than 5 ug/l at all times to protect the aquatic resources.

Selenium loading into the San Joaquin River via Mud Slough and Salt Slough should not exceed 8,000 pounds per year, with phased reductions highly desirable.

Selenium concentrations should be determined on a total recoverable basis rather than dissolved as total selenium concentrations correlate best to impacts observed in fish and wildlife (Skorupa and Ohlendorf, 1991).

Again, the Service appreciates this opportunity to comment on the beneficial uses and water quality objectives for the Grassland area. We will continue to work closely with the Regional Board on these issues and hope to provide additional comments on sulfate based selenium criteria once we are able to review any recommendations the Regional Board may receive on this subject. If you have any questions please contact Tom Maurer or Steve Schwarzbach of my staff at (916) 979-2110.

Sincerely,

Debra G. Davis
for Joel A. Madlin
Field Supervisor

Enclosure

cc: ARD-ES, Portland, OR
Refuge Manager, San Luis NWR Complex
CDFG, Region IV

References:

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
Sacramento Field Office
2800 Cottage Way, Room F-1803
Sacramento, California 95825

In Reply Refer To:
FWS/EC95-0084

October 4, 1995

Mr. William Crooka
Executive Director
Central Valley Regional Water Quality Control Board
3443 Roulter Road, Suite A
Sacramento, California 95827-3098

Subject: Water Quality Objectives and Implementation Plan to be Used for the Regulation of Agricultural Subsurface Drainage Discharges in the San Joaquin River Basin

Dear Mr. Crooka:

The U.S. Fish and Wildlife Service (Service) offers the following as comments on continuing effort to revise the Basin Plan amendment addressing agricultural drainage from the Grasslands area of the San Joaquin Valley. The Service previously commented on the Regional Board's first report on beneficial uses and water quality criteria for the Grasslands area on July 11, 1995. This letter provides comments on the Regional Board's second staff report on water quality objectives and the implementation plan. The Service also provided a verbal summary of these comments during the September 27, 1995 workshop held by the Regional Board.

In the short-term, the Service has four priorities regarding agricultural drainage in the Grasslands area.

1. Remove agricultural drainage flows from over 90 miles of Grassland channels, including Salt Slough, so as to free them for delivery of freshwater to Refuges made available pursuant to the CVPIA.
2. Specific monthly and annual load targets which assure that within two years of opening the drain, a drainage entity or individual drainers will implement actions to reduce selenium loads to the River by at least 5% per year through September 30, 2000 and beyond.
3. Commitment by the drainers to a long-term regional drainage management plan which incorporates the recommendations of the San Joaquin Valley Drainage Program (SJVDP) and the Environmental Defense Funds (EDF) report "Plowing New Ground".
4. Adequate monitoring to document the effectiveness of drainage control actions and to assess impacts to the natural resources of the area and downstream.

The Service agrees that waste discharge requirements are appropriate and can be a tool to establish a compliance schedule for achieving the above priorities. We have concerns, however, about the Regional Board's proposed time schedule for meeting water quality objectives in the San Joaquin River and the valley-wide drain as discussed in the most recent report. In general the proposed amendment does not provide adequate incentives and promotes marginal progress towards meeting objectives. Specific comments are below.

Compliance Schedule

The Regional Board's extended schedule to meet selenium water quality standards in the San Joaquin River and Mud Slough by the year 2020 is extremely and unacceptably protracted. The degradation of the San Joaquin River, Mud Slough, and Salt Slough has been ongoing for over 20 years. The drainage from the Grasslands area has been out of compliance with current objectives for 7 years. Given the volume of data, the significance of the resources being impaired, lack of incentives, and 7 years of inadequate enforcement of regulations, the time frame for compliance is too long and falls to promote the necessary measures for meeting water quality objectives in a timely way.

As seen in the data provided in the two Regional Board staff reports, best management practices and lack of incentives have done little to resolve drainage problems in the Grasslands area. A close look at the data presented in the staff report (Tables B-4 and B-5) reveals that the water conservation efforts by the growers did have a positive effect on the amount of selenium coming from the area in production. The pounds of selenium per acre of land in production dropped from a high of 0.161 lbs/acre in 1987 to 0.078 lbs/acre in 1992 and in 1994 was 0.107 lbs/acre. This improvement was negated, in part, by an increase in the acres put into production which reached a high of 79,700 acres in 1994, up from a low of 66,300 acres in 1992. Individual actions such as halting water deliveries, land retirement, a valley-wide drain, or water conservation are either inadequate, too expensive, or unpalatable by themselves, but combinations of these actions will be more acceptable, less expensive, and will work effectively if the proper incentives are provided.

The Service believes that full attainment of beneficial uses can be reached using currently available control actions in a shorter period of time than the Regional Board is proposing. With a 5% reduction per year starting at the 6,600 lbs/yr level (as outlined in the proposed Bureau of Reclamation use agreement) and the extension of the bypass to below the Herrod River, compliance could be met in all water bodies in 10 years.

Valley-wide Drain

The language proposed by the Regional Board on the valley-wide drain (VWD) now includes municipal and industrial dischargers when the Regional Board has yet to adequately address the agricultural drainage problem. The report lacks discussion of location of the VWD and impacts it will have on the receiving body(ies). Specific comments regarding the VWD proposal are difficult to develop because the receiving water remains unidentified, the effluent is vaguely defined, cost estimates are unavailable, and the facility lacks any specific design. What is the anticipated volume of sales and effluents to be exported? What are the potential receiving waters? If they can not be identified, due either to political or technical considerations, how can this be considered a viable option? What will such a drain cost? Who will build and pay for this drain? Obviously a separate amendment, workshops, and hearings addressing a valley-wide drain are needed to put the issue into the proper perspective. The Service recognizes the need for the Regional Board to support the idea of a VWD in its Basin Plan, but discussion of a generic, unproven, ill-defined policy in a proposed amendment that deals with the Grasslands area confuses the issue and continues to promote a "wait and see" attitude. Therefore, the Service suggests the Regional Board delete all referenced changes to the Basin Plan regarding the VWD and concentrate on the Grasslands issues at hand.

Numeric Objectives

The Service agrees at this time with water quality objectives of 2 ug/l for

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Salt Slough and 5 ug/l for San Joaquin River (Sack Dam to Vernalis) and North Hud Slough. An overwhelming amount of data on selenium toxicity and bioaccumulation points to at least a 5 ug/l or lower criteria to protect waterfowl and fishery resources.

In addition to the water quality and loading objectives the Service recommends setting numeric and/or narrative objectives for the San Joaquin River, Hud Slough and Salt Slough that utilize mean selenium concentrations in fish (whole body) and food chain organisms (invertebrates) based on the ecological risk guidelines proposed by the San Luis Drain Re-use Technical Advisory Committee. Mean fish whole body selenium concentrations should be less than 4 ppm and mean animal food chain organism concentrations should be less than 3 ppm. If these mean concentrations exceed the toxicity thresholds of 12 and 7 ppm respectively then immediate actions would need to be taken to improve water quality in the affected area. Attached is a copy of a draft Service report on biota monitoring in Salt and Hud Sloughs which describes the risk guidelines and the status of biota in these sloughs from 1992 to 1993.

Based on concentration and toxicity data collected in recent years by the Regional Board and the U.S. Geological Survey the Regional Board should consider settling a diazium objective for the San Joaquin River.

Underlying principles of the implementation program.

In general the Service agrees with the underlying principles of the program to control agricultural subsurface drainage but the Regional Board should add the principle of reasonable and beneficial use of water as defined in state and federal laws. Does the use of irrigation water on land that creates a toxic discharge constitute a reasonable and beneficial use?

Policies proposed for adoption.

The policy statements in Table 6 are identified by letters but the text on the following pages uses numbers to identify each policy statement. This is confusing and should be corrected.

Statement a(1). Se should be the first priority, but boron, overall salinity, and ionic imbalance are also significant issues especially to downstream water users (Delta farmers, municipalities, etc). A policy statement should address these drainwater constituents also.

Statement b(2). The phrase "are prohibited" is changed to will be discouraged but the text on page 19 keeps the "are prohibited" and does not specifically say whether the change is recommended. The Service feels the statement "are prohibited" should remain and its definition expanded beyond installation of new subsurface drainage facilities.

Statement d(4). What kinds of actions that would limit or prohibit reuse is the Regional Board referring to in this statement?

Statement e(5f6). Without providing technical information or data the Regional Board proposes to add wetland management as part of the San Joaquin Valley drainage problem. The Service takes exception to the inclusion of wetland management as one of the sources of the problem of salt management in the San Joaquin Valley. The remaining wetlands in the valley are a natural function of the ecosystem and are managed, under the constraints of limited water quantity and less than ideal quality, as near to the natural flooding system as possible in this effluent dominated system. Currently the wetland system of channels in the Grasslands removes ~25% of the selenium from the drainwater. Obviously wetland management is intimately tied to the drainage issue and will be involved in the solution, but to include them collectively with other dischargers in the valley as part of the problem is similar to suggesting that trees pollute the air. Boron may be a problem on certain

properties in the south Grasslands area, but much of that may be attributed to having received tainted drainage water over the years. Unless the Regional Board can be more specific as to what managed wetlands are part of the problem, the Service requests that reference to wetland management be removed from the policies table and all other areas of the report that implicate it as part of the problem.

Statement f(5). See our comments above regarding the valley-wide drain, but in summary the VMD should be a separate Basin Plan amendment. Actions to protect the Grasslands area and San Joaquin River can be addressed in this amendment without confusing references to a VMD.

Statement h(8). This statement can be improved by discussing the important fish and wildlife resource that will benefit from reduced loading to the San Joaquin river and Delta such as the Delta smelt, winter-run Chinook salmon, the Sacramento splittail, the giant garter snake, and other fish populations.

An additional policy should state that actions taken will not increase degradation of any body of water.

Elements of a regulatory program.

Additional elements of a regulatory program that should be considered are:

- Discourage increasing acres in production and limiting double cropping until objectives are met.

- Investigate whether illegal diversions or discharges that increase drainage occur in the area.

- Develop more useful information on loading from individual sumps and discharge points to assess the impacts of control actions.

- Recommendations to limit water deliveries under reasonable and beneficial use laws if compliance schedules are not met.

Potential control actions.

Action 566. This page reflects the lack of action thus far and is proposed to continue. Long past-due dates are deleted from action 5 and new extended dates are added in action 6. The proposed milestone dates are not 5 yrs, not 10 years, but 25 years into the future.

Action 7. Is the October 1, 2000 date for compliance by individual drainers, if no regional entity exists, correct? If the Regional Board thinks individual drainers should be in compliance by the year 2000 then why should the group as a whole be given another 20 years to comply? The Service believes the compliance time frame can be tighter and other incentives to maintain a regional drainage entity can be used?

Action 8 - How will this be enforced?

Action 9 - We agree that wetlands management will be part of the solution but again this suggests, without providing technical information or data, that wetland management is part of the problem.

Action 10 - The Service feels that review by the Regional Board must be more frequent than 5 years and suggests a review period of 2 or 3 years.

Action 11 - The management plans must be of sufficient detail to address the effectiveness of control actions the individual district or farm level. Data from proper monitoring can address questions as seen with the water conservation efforts where per acre loading reductions were negated when

Increased cropping occurred and claims are made that water conservation did not work.

Action 13 - This suggests evaporation basins can be constructed as a potential control action, but Appendix A, Table A-2 identifies evaporation ponds as being eliminated from further consideration as a viable option. Which does the Regional Board propose? The Service recommends elimination of evaporation ponds from consideration as proposed in Appendix A.

Action 15 - When will the Regional Board establish salinity standards?

State Water Resource Control Board Potential Control Actions.

Action 1 - After 25 years, if the drainers have yet to meet objectives, the Regional Board will only "consider" requesting the State Board to take action. After seven years of not meeting objectives the Regional Board should request the State Board to begin using its water rights authority and incrementally restrict water supplies as drainers do not meet load reductions.

Deleted Action 24 - Why have all references to water conservation efforts been removed from this section?

Potential control actions by others.

Action 4 - This statement is not clear as to whether it suggests a valley-wide drain or just an extension of the San Luis drain to a point downstream of the Merced River. Such statements confuse the issue and promotes a move to ignore short-term actions and go directly to WVD concept.

Action 5 - The Refuge Complex has been trying to survive in the effluent dominated ecosystem of the San Joaquin Valley by working cooperatively with local interests. The Service accepts the responsibility of caring for the trust resources of the area and will participate in developing and implementing corrective actions.

Deleted Action 4 - Reference to water conservation is removed. Is water conservation no longer being considered as part of the solution? Has Bureau funding for such programs been eliminated?

Prohibitions.

Prohibition a. The Service agrees with this prohibition. See above comments on Policies Statement b(2).

Prohibition b. The waiver for exceeding the 2 ppb standard in the Grasslands channels, should the grassland bypass not be implemented, is not supported by the Service. The standard of 2 ppb is the appropriate standard for protection of fish and wildlife for this water body and the Refuge has water rights that are being violated. The Regional Board should develop strong alternatives such as stopping discharges via regulation of individual drainers as stated in Control Action 7.

Prohibition c. We support the prohibition on installation of new subsurface drainage facilities or the expansion of existing facilities which could exacerbate the water quality problems due to discharges of agricultural subsurface drainage. How will this be monitored and enforced?

Prohibition d. The Regional Board should mirror proposed use agreement goals and noncompliance fees or penalties as developed by the interested parties. There are a start up goal of 6,800 lbs/yr with short-term allowable but fineable loads of up to 20k over this goal (which is about 8,000 lbs/yr). If discharges are greater than 8,000 or if drainers do not meet load reduction

targets over time, or fish and food chain organism mean concentrations are above toxicity thresholds the State Board should exercise its water rights authority to evaluate the reasonable use of water for irrigating contaminated soils. The Service believes that full attainment of beneficial uses can be reached using currently available control actions in a shorter period of time than the Regional Board is proposing.

Other comments on the Regional Board's staff report are as follows:

Page 4 - para 2

It is obvious that other actions are needed to meet water quality objectives not may be needed as stated.

page 9 - Other factors considered in ... water quality objectives:

The statement "evidence continues to suggest that the selenium level ... for waterfowl habitat is lower than the U.S. EPA... criteria" should also include "and fishery habitat" after waterfowl habitat. The latest evidence as mentioned in our July 11, 1995 letter points to a fishery protective value lower than the current EPA criteria.

The statement "the Grassland watershed is a primary waterfowl habitat" needs to include giant garter snake habitat while the San Joaquin River and Delta area is splittail and Delta smelt habitat.

page 10 -

See comments above on the compliance schedule.

Page 11, para 3 -

Prohibition of discharges to Grassland channels should be maintained to protect the beneficial uses. See above comments on Prohibition b.

Page 12 -

Para 3 - Continued degradation of the San Joaquin River and Mud Slough is expected but this should be carefully monitored and be viewed not as an interim condition (i.e. 5 years). The Regional Board should not allow the continued degradation of this slough beyond the year 2000.

Para 6, Actions needed b. - See comments for compliance and prohibitions above.

Page 35 -

Para 3 - The Service agrees that in the absence of a regional entity the WDAs should be applied to individual districts or farms but the prohibition of discharges to the Grassland channels must be maintained to protect the beneficial uses.

Page 36 -

Para 1 - See previous comments on compliance schedule above.

Page 37 -

As one of the actions, the Service recommends the extension (that fully meets objectives) of the Grasslands channel bypass to a point below the Merced River confluence. An extension will protect the beneficial uses of the 11 miles of waterway most severely contaminated by discharging into Mud Slough. This extension should be constructed in the near term (by the year 2000) thus improving the conditions in Mud Slough and the

San Joaquin above the Merced much sooner than current proposals. This extension should be considered a separate issue from the concept of a valley-wide drain (see comments above).

Page 42 -

Item 4. Why has any reference to water conservation been removed from actions for the State Board to take? Such monitoring should be on a district or farm level to truly address effectiveness of control actions. See comments on control actions above.

Studies - Sufficient information is available to address drainage issues in the Valley and to determine sound water quality objectives.

Page 43 - The Service agrees that the USGS needs support to finish studies.

Appendix B -

Page B-4. The Regional Board assumes 3,000 acres of retired land, but is not clear as to where. The Regional Board goes on to propose that land draining to the 5 top selenium producing sumps in each district be retired which would be a total of 30-35 sumps. But it is not clear whether the Regional Board is trying to even the impact across districts or truly taking the land contributing the greatest to the loading problem out of production. This method of retiring land would show limited success, as in the results of the water conservation efforts (see above). The next sentence says just 5 sumps are to be retired. Is it 5 sumps from each district or 5 sumps total for the Grasslands area?

We appreciate the opportunity to comment on the Regional Board's proposed amendment to the Basin Plan and will continue to work closely with your staff on the numerous technical issues at hand. If you have any questions please contact Dr. Steve Schwarzbach or Mr. Tom Hauzer of my Environmental Contaminant staff at 916-979-2110.

Sincerely,

for
Robert A. Pinn
Joel A. Hedlin
Field Supervisor

Enclosure

cc: ARD-ES, Portland, OR (w/o encl)
Refuge Manager, San Luis NWR (w/o encl)
CDFG, Region IV (w/o encl)
U.S. EPH, Region IX (w/o encl)



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
Sacramento Field Office
2800 Cottage Way, Room E-1803
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In Reply Refer To:
FWS/EC95-0099

December 7, 1995

Mr. William Crooks
Executive Officer
Central Valley Regional Water
Quality Control Board
3643 Houtler Road, Suite A
Sacramento, California 95827-3098

Subject: Beneficial Uses and Water Quality Criteria Amendment for
Agricultural Drainage in the Grassland Area

Dear Mr. Crooks:

This letter responds to the notice from the Central Valley Regional Water Quality Board that it will hold an additional workshop on December 7, 1995, on the compliance schedule and interim measures for achieving selenium water quality objectives in the San Joaquin River and Mud Slough. We commend the Board and staff for their responsiveness and offer the following additional comments.

The previously proposed compliance date for the San Joaquin River below the Merced River confluence was October 1, 2015 and 2020, for above the Merced confluence and in Mud Slough. In our letter dated October 4, 1995, we noted the proposed compliance schedule was unreasonably long and the zone of greatest ecological risk from selenium, i.e., the reach of the San Joaquin River above the Merced confluence and the last 6 miles of Mud Slough were the last to be protected. We commend the staff recommendation to shorten implementation timeframes, however, the revised proposal still leaves the highest risk areas unprotected until the year 2010. We believe this timeframe could be shortened with a more aggressive mix of water quality management strategies including land retirement, irrigation efficiency improvements, treatment and extension of the San Luis Drain to the confluence of the Merced and the San Joaquin River, per the recommendations of the San Joaquin Valley Drainage Management Plan. The mix of strategies and their relative aggressiveness in dealing with the problem will be driven by the actions the Board takes. We, therefore, support the staff report recommendation to use effluent limits rather than simply a regulatory encouragement of Best Management Practices to achieve water quality objectives, but we would prefer still more aggressive implementation schedules both above and below the Merced River confluence.

The staff report notes that a 22-year record of historical flows (1970-1991) at Crocs Landing were used to derive effluent limits and goes on to suggest it would be inappropriate to base the actual waste load allocation on historical flow patterns if significant alterations in flow take place. Presumably this would be due to alterations in flow from CVPDA restoration water or changing flows to accommodate future Bay/Delta water rights decisions. The annual selenium load cap in table 1B appears arbitrarily increased above the sum of the monthly limits in table 5C. This results in recommended maximum annual loads which are greater; 13 percent higher in normal and dry years and 32 percent higher in above normal and wet years for the 2005 compliance date. The staff report states "this is done to account for the 1995 increases in

Mr. William Crooks

allowable load." We feel compelled to point out that all of the load numbers are driven by the current 5 µg/L 4-day average selenium objective for the San Joaquin River. If unquantified potential future increases in flow are given consideration, should not equal consideration be given to the possibility that between now and the implementation date of 2005 the applicable standard may become 2 µg/L rather than 5µg/L? The additional flows in the system, if they occur, may be needed to meet a more stringent objective. Scientific evidence for a lower standard has been mounting. The 2 µg/L standard has already been adopted in Arizona and New Mexico for flowing waters with fish and wildlife beneficial use designations and is currently under evaluation in Colorado, Nevada, and Texas. We, therefore, do not believe it appropriate to raise the annual load target based only on the possibility of increased flows at some future date. We recommend that the annual selenium load numbers in table 5C, which is based on 22 years of flow data and the monthly load numbers necessary to meet the 5µg/L objective, be substituted for table 1B.

The objective of 2 µg/L for Salt Slough and other wetland supply channels in the grasslands are still proposed to be implemented by October 1 1996, a time frame we support. The Grasslands Bypass project which makes these objectives immediately implementable also includes an ongoing collection of biota to evaluate selenium bioaccumulation in Mud Slough and other areas. This data together with water chemistry and flow data will be evaluated by an interagency oversight committee as well as a technical advisory committee. We suggest the biota data should also be considered by the Board in its regulatory capacity. We have previously presented the ecological risk criteria for interpreting selenium body burdens. Should invertebrates, plants, fish and/or bird eggs collected from the Mud Slough corridors show levels of selenium above the well established toxic concentrations to fish and birds during the course of the operation of the grasslands bypass it will be apparent that solutions to drainage will need to be accelerated.

We recommend that specific language be added to Waste Discharge Requirements which takes into consideration the ecological risk criteria for selenium body burdens and the selenium bioaccumulation data collected as part of the monitoring program for the Grasslands Bypass. In addition, we request that WDRs be open to review at any time, if needed, in the event of unacceptably high bioaccumulation of selenium. My staff is available to assist you, the Board and your staff in incorporating selenium body burden components of selenium risk evaluation into any WDRs the Board may seek to issue.

Thank you for allowing this additional opportunity to provide input to the Board's decision making process. If you have any questions regarding this letter, please contact Dr. Steven Schwarzbach or Michael Morse at (916) 979-2110.

Sincerely,

Joel A. Medlan
Field Supervisor

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