DRAFT

December 4, 1999

Assemblyman Michael Machado

Dear Assemblyman Machado:

Subject: Grant Line Canal Issues

During the summer Lester Snow promised to provide you with an update on CALFED's evaluation of the Grant Line Canal Barrier. Mr. Snow promised to provide that update after the end of the public comment period, which ended on September 23, and before the end of the calendar year.

The following paragraphs provide that update, with a short synopsis on the status of our current knowledge, studies underway, and coordination with interested agencies and stakeholders. It should be kept in mind that these alternative actions would be implemented in concert with the other identified actions in the Lower San Joaquin River and South Delta region, in order to achieve a well balanced, fully integrated suite of actions. All proposed actions are subject to refinement, and may be modified in the course of the detailed project planning and environmental documentation process.

In May CALFED recommended a preferred alternative to be evaluated along with other alternatives in the project level environmental documentation for South Delta Improvements, in order to help identify and resolve the various technical and policy issues surrounding the south Delta. CALFED made its recommendation with the best available information at the time, including a recognition of the uncertainty involving many aspects of that information, and with detailed information regarding stakeholder concerns and interests. CALFED has recently reviewed its decision in light of the substantial ongoing staff efforts since May to advance the technical understanding of the issues. No fundamentally new or different information has been developed as a result of these efforts, although progress is being made in refining the hydrodynamic and water quality modeling of the lower San Joaquin River and south Delta region. Therefore the key policy question is whether CALFED should reiterate its May recommendation, or, based on the uncertainties surrounding potential impacts, defer to the project level documentation the selection of a preferred approach. CALFED has decided to

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South Delta Facilities Alternatives

The main features of the proposed South Delta Facilities have not changed significantly over the past several months. They include:

- New screened intake for Clifton Court Forebay.
  - Two alternative locations will be analyzed in the project EIR/EIS:
    - A northeastern location, opposite Victoria Canal.
    - A northwestern location, on Byron Tract just north of Italian Slough and connected to Clifton Court Forebay with a siphon under the slough.
  - The screened intake would be implemented in stages: First, a 500 cfs test facility will be constructed and operated at the Tracy Pumping Plant to develop and test features for managing debris, predators, fish sorting and holding, transport, and release. Second, a 2500 cfs screened intake module would be constructed at the new intake locations. Third, additional 2500 cfs screen modules would be constructed to fully screen the full average daily export capacity of 10,300 cfs.
  - Three operational scenarios are under consideration for the screened intake.
    - The first approach, referred to as "gulping", would mimic existing operations, which avoid inflows to CCFB during low tides and thus minimize stage impacts.
    - The second approach, referred to as "sipping", would vary inflows to CCFB in concert with the tides, ranging about the average daily export rate by about plus or minus 30 % of the mean.
    - The third approach, referred to as "straight line", would mimic the operations of Tracy Pumping Plant, in which exports are held nearly constant throughout the tidal cycle.
- Dredge Old River between the new intake location and Highway 4. This would incrementally reduce velocities in the reach and reduce stage impacts in the south Delta region.
- Construct and operate the Head of Old River Barrier.
- Agricultural Barriers. Three alternatives will be fully analyzed in the project EIR/EIS:
  - No Barriers: Local water supply impacts would be addressed through extensive dredging, extension of intakes, and re-operation of the San Joaquin River system
  - Two Agricultural Barriers, with the option of implementing Grant Line Canal Barrier if necessary. (CALFED's preliminary preferred approach). Features of this alternative include:
    - Construct and operate the Middle River Barrier.
    - Construct and operate the Old River at Tracy Barrier.
    - Extend and/or consolidate agricultural diversions as required in Grant Line Canal, Salmon Slough, Middle River, and Old River to provide full access to water supplies. Screen and maintain screens at CALFED expense all those screens which are modified. Conduct limited dredging in the vicinity of the intakes and as required to assure availability of water to the extended intakes. Current operational experience suggests that sedimentation in Middle River and Old River, exacerbated by the flood of January 1997 has become severe, impacting both flood flow capacity and low flow water supply availability.

Therefore dredging may need to be fairly extensive to restore adequate channel capacity.

- ➢ Phase out the temporary barriers program as soon as feasible, beginning with the Grant Line Barrier. This barrier would be phased out as soon as agricultural intake extension, screening, and dredging are completed.
- ➢ Operate and evaluate the barriers (interagency and stakeholders participate on Barrier Operation Control Team) and export facilities, with careful monitoring of stages, water quality, and fisheries impacts. If unacceptable impacts occur, evaluate and implement additional measures to address these impacts, including a Grant Line Canal Barrier.

- ❑ Three agricultural barriers
  - ➢ Construct all three agricultural barriers in approximately the same time period.
  - ➢ Dredge and extend/screen intakes in Grant Line Canal as necessary to address water availability concerns for local diverters.

- Provide mitigation for facilities footprint impacts, dredging impacts, and other features as determined in the project environmental analysis.

Some stakeholders, particularly representatives of SDWA have strenuously objected to CALFED's preliminary selection of the Two Agricultural Barrier configuration, citing a number of technical and policy concerns. Other concerns surrounding the proposed location of the GLC barrier, the operation of the various barriers, and export operations, have been raised. A fundamental objection is that CALFED's preliminary selection was based on inadequate information and inadequate analyses. The key issues which have been raised and CALFED staff evaluations of these issues can be summarized as follows. ***The current draft has not been reviewed and approved by the SDIT.***

Barrier Operations

The draft 1993 settlement agreement between SDWA, DWR, and USBR indicated that the three agricultural barriers would be operated year round to the extent permittable. This in turn would allow the SWP and CVP the flexibility to operate at high pumping rates without impacting south Delta water supplies. The current CALFED proposal calls for operation of the barriers only during the peak irrigation season, from June 1 through October 30, and August 1 through September 30 for the GLC barrier, if it were installed. SDWA asserts that this mode of operation would leave SDWA with unacceptable impacts throughout most of the year, since its farmers need water for pre-irrigation, leaching, and so on throughout the year. With the barriers open, stage impacts of full pumping would be significant, such as experienced in recent weeks. If CALFED were to limit exports to those levels which would not create stage impacts when the barriers are not operating, it would eliminate most of the yield associated with expanded Banks pumping capacity.

Grant Line Canal Barrier Effect on Stockton Dissolved Oxygen

SDWA asserts that the Stockton regional dissolved oxygen problem is improved by dilution and displacement when GLC operates in tandem with the other two agricultural barriers. It forces more San Joaquin River water down the main stem San Joaquin River.

The same result is achieved with a HOR barrier, but this barrier, when operating alone has adverse effects on stages and circulation in the south Delta. We agree with SDWA on this issue, and have no work effort underway to refine the Stockton Water Quality Model, developed by Schanz and Chen, 1993. Detailed analyses of the effect of flow management on Stockton DO is provided in "*Potential Solutions for Achieving the San Joaquin River Dissolved Oxygen Objectives*", prepared by JSA, June 1998.

Grant Line Canal Barrier Effect on Fisheries

SDWA asserts that CALFED has provided no evidence to demonstrate that the south Delta barriers have an adverse impact on fish and therefore has not made the case for limiting the annual period of operation and for leaving GLC barrier out of the preferred alternative.

CALFED agencies do not argue with the specific assertion, but note that in the absence of definitive information, ESA trust agencies must take a cautious approach, and it is reasonable to believe that the barriers do cause fishery impacts. Two possible causative mechanisms have been identified. The first is that the GLC barrier would delay the passage of fish through the GLC, thus making them more vulnerable to local unscreened diversions, predation, etc, and delaying the fulfillment of migration goals (i.e. spawning, moving into rearing areas, etc). While there is no doubt that the GLC barrier reduces the net flow down GLC, in its proposed operation it would be open most of the time, closing only on the low end of the receding tide.

The possible causative mechanism is increased reverse flow in Turner Cut and Columbia Cut. If fish are concentrated in that region, and if fish go with the flow, the additional reverse flow of several hundred cfs could draw more fish (smelt especially) to the export pumps than if the flow down GLC were unimpeded.

CALFED is currently developing a study plan to resolve this issue. Monitoring associated with the Temporary Barriers Program has so far yielded little insight on this issue. CMARP staff will give a high priority to designing a specific set of experiments to resolve this issue and begin the appropriate field work. Given the complexity of the issues involved, and the many uncontrolled variables that must be addressed, this is expected to be a difficult and possibly lengthy undertaking.

Grant Line Canal Barrier Effect on Salt Exported to the San Joaquin Basin and Effect on San Joaquin River Salinity

SDWA has asserted that operation of the GLC barrier will reduce the total salt load exported to the San Joaquin River Basin, because it blocks a portion of the re-circulation of saline San Joaquin River agricultural drainage to the Tracy Pumps.

While CALFED staff agrees with SDWA that the export salt load is higher without GLC barrier, we currently do not have in place the tools to fully analyze the relationship between export salinity and drainage salinity. CALFED's current modeling uses DWRSIM for system operations and DWRDSM2 for Delta simulation. The upstream boundary salinity for DWRDSM2 is based on a historical relationship between flow and

salinity, which was developed over the many years of CVP operation without the GLC barrier in operation. DWR has embarked on an ambitious effort to develop a dynamic salt budget model, which will take at least 6 months before preliminary analyses can begin. It will likely take several years to fully develop, calibrate, verify, and gain acceptance for such a new model. There will be no quick answers.

Grant Line Canal Barrier Effect on Water Quality in the SDWA Service Area
In general, water quality in the interior south Delta channels (Old River, Middle River, Grant Line Canal, Salmon Slough) improves, because poor quality drainage from the San Joaquin River is hydraulically blocked from entering the interior south Delta channels at the Head of Old River. There is a compensatory increase in reverse flow in Turner Cut and Columbia Cut, with a corresponding decrease in water quality in the northern portion of the south Delta due to this effect. There is general agreement between SDWA and CALFED on the qualitative nature of this effect.

Localized Dredging Effect on Water Levels and Circulation in the South Delta Region
SDWA has asserted that any dredging to achieve adequate depth in one region will increase the rate of drainage through GLC and thus reduce stages upstream. The approach is therefore completely unworkable. CALFED agrees that channel dredging in Grant Line Canal and adjoining channels will accelerate drainage on the receding tide, and therefore reduce stages, but are uncertain how pronounced the upstream effect will be. Preliminary analyses with the existing model suggests that if the dredging were performed on a regional scale (say 4' depth over most channels in the SDWA area) there would be a modest decline in water levels.

CALFED and SDWA's engineer, Dr. Gerald Orlob, agree that the current model does not have the spatial resolution to analyze the effects of the limited and localized dredging required to allow agricultural intakes to be lowered and screened . DWR is working to incorporate more detailed geometry (about 100 new cross sections) into the DWRDSM2 model, which we hope will improve the model's ability to resolve the detailed hydraulic effects of such localized dredging. The model must be recalibrated after the new geometry is incorporated. This recalibration effort will take several months. Our goal is to identify, through a series of modeling evaluations with the refined model, specific dredging quantities and locations which would allow for lowering intakes in Grant Line Canal and affected upstream areas, while minimizing stage impacts on the rest of the SDWA. SDWA asserts that this balancing of objectives will be impossible to achieve to its satisfaction. CALFED staff's recommendation is to develop, by trial and error, the optimal combination of dredging and diversion modifications and then evaluate that as part of the project-level environmental documentation process.

Dredging and Extending Intakes as an Alternative to the Grant Line Canal Barrier
SDWA's fundamental objection to this approach is CALFED's insistence that along with lowering their intakes, those intakes must be screened. SDWA views this as unfair: CALFED forces diversions to be screened in order to mitigate for SWP and CVP impacts on their operations. Even if the installation and maintenance costs and work are fully

covered by CALFED agencies, SDWA has no confidence that government agencies will honor commitments to fund and maintain the diversion screens and thus their operations will be significantly impaired.

Dredging and extending intakes also does not achieve the same beneficial effects as the GLC barrier on SDWA salinity. On the other hand, experience with the temporary GLC barrier suggests that under summer low-flow conditions, the GLC barrier can cause dead zones and oxygen depletion, since net circulation is decreased, as compared to the conditions with only two agricultural barriers in place. An operable GLC could be opened as necessary to allow enough circulation to prevent stagnation and oxygen depletion.

Operation of a Screened Clifton Court Forebay Effect on South Delta Water Levels
Current CCFB operations minimize the stage impacts of SWP export operations. In general, we agree with SDWA that pumping on a more continuous regime would result in additional stage impacts. However, our analyses suggest that the effect is not as large as SDWA believes. SDWA uses the rule of thumb of 0.1 foot of drop per 1000 cfs of pumping, based on experience with the CVP. Our modeling suggests that the effect is much less. In part, this may be because CALFED has proposed moving the CCFB intake further north on Old River, past the constricted West Canal region. The further north the intake, the less the effect on south Delta water levels. Also, our proposed operating regime, unlike the current CVP operations, vary with tide. We assume plus and minus 30% of average diversion rate fluctuation in concert with tidal variations. We are currently conducting modeling to evaluate this issue more fully, and to isolate and clarify apart some of the key variables. SDWA will have the opportunity to review the results which we hope will be available in the next several months.

Comparative Merits of the Western and Eastern Locations for the Grant Line Canal Barrier
The western location would provide stage protection for the entire length of Grant Line Canal and is therefore SDWA's preferred location. However, this location would impede the movement of recreational traffic in GLC. The reach of GLC between its mouth and Tracy Boulevard is one of the premier water skiing reaches in the Delta because it is wide, straight, long, and aligned perpendicular to the prevailing wind pattern. The Corps has made a preliminary determination that the recreational benefits of this section of the canal are a significant public trust asset, and even with boat locks, the barrier at this location will create unacceptable impacts. A barrier at this location is likely to be unpermittable under Section 10 of the Rivers and Harbors Act. The eastern barrier location, east of the Tracy Boulevard Bridge, would allow unimpeded boat traffic to the west, while still providing significant regional water stage benefits. Experience with the temporary barrier installation suggests that some boaters, especially anglers, will take advantage of the proposed boat locks to access the channels to the east. A barrier at this location would be less expensive to construct. Diversions to the west would need to be extended and screened.

Efforts to Foster Stakeholder Participation

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SDWA has repeatedly criticized CALFED for ignoring stakeholder input while developing the South Delta Facilities alternatives for Policy Group consideration. CALFED staff and the South Delta Improvements Team disagree. SDWA technical and policy concerns were clearly understood and considered during its deliberations, in which it sought to balance fisheries, recreation, water quality and water supply reliability concerns. The SDIT has conducted periodic public workshops to inform the interested public and receive comments on CALFED's South Delta planning process. These meetings were held on March 5, April 2, April 30, May 28, and September 22. The next meeting will be on December 9, 1:00 P. M. at the Tracy Community Center. In addition, the SDIT has begun to conduct a series of meetings with South Delta Water Agency representatives to formulate, discuss, and review technical analyses (especially modeling of hydrodynamics, water quality and project operations). The first two of these meetings were held on October 12 and November 16; the next meeting is expected to be held in January 2000.