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TO: Dan Ray, CALFED ERP  
 FROM: Darren Mierau, McBain and Trush  
 RE: Response to CALFED Reviews of Proposal #182

This memorandum is prepared in response to the Technical and Selection Panel reviews of CALFED Proposal #182 Tuolumne River Sediment Acquisition and Spawning Gravel Transfusion Project, submitted by the Turlock Irrigation District on behalf of the Tuolumne River Technical Advisory Committee (TRTAC). McBain and Trush has been consultant to the TRTAC since 1995, assisted in preparing this CALFED proposal, and offer the following comments.

This project will provide a long-term source of sediment for spawning gravel augmentation and large-scale channel rehabilitation, while simultaneously reclaiming the sediment source site by wetland and riparian habitat restoration. The high value of sediment resources, combined with excavation and transportation costs, makes this a relatively expensive project. As we attempted to demonstrate in the proposal (Sections A2a, A2d, A3b), this project was developed in part to reduce higher material and transportation costs incurred in previously planned and implemented projects, including the Mining Reach, SRP 9, and previous CDFG Gravel Addition project phases. Thus, while this project may appear expensive, implementing gravel augmentation and floodway restoration projects by purchasing commercial aggregate is much more expensive. As stated in Section B3, paragraph 2, following completion of this project an estimated 1.47 million cubic yards of sediment will remain available for use in subsequent restoration projects on the Tuolumne River, substantially reducing the cost of each of those projects.

The Selection Panel Review has recommended that this proposal be revised, re-reviewed, and be considered as directed action. As the basis for this recommendation is somewhat vague, we respectfully request that CALFED provide more explicit information describing what modifications or additions to the proposal will satisfy the Selection Panel. Also, if additional monitoring is added to the project, can the budget be increased to accommodate this?

Below we address individual comments. Underlined text is from the CALFED reviews; page and line numbers reference the original proposal.

Selection Panel Review: "This recommendation [for consideration as directed action] is based on the need to include, as an important aspect of the revised proposal, application of science within the study design, and adaptive management concepts into the project."

We have incorporated science within the study design by: (1) quantifying present spawning gravel availability in the upper 15.7 miles of the gravel-bedded zone, and comparing this to past inventories to show the steady depletion and limited supply of spawning gravels (described in Section A2b Spawning Habitat Improvement, pg. 6), (2) developing a comprehensive list of gravel transfusion sites and volumes, then prioritized these sites for immediate vs. future implementation based on several criteria,

including immediate benefit to salmon, longevity of gravel, site logistics, etc. (described in part in Section 3 Approach, pg. 10), (3) surveying topography and developing construction designs for gravel augmentation at five priority sites, (4) inventorying sediment sources and evaluating quantity, location, and relative costs, then prioritizing source sites for acquisition as long-term supplies (described in Section 2d Gravel Source Criteria, pg. 7). This research and planning process has culminated in this proposal recommending the purchase and development of a large sediment source close to the highest need areas between La Grange Dam and Roberts Ferry Bridge. This recommendation is based substantially on the scientific research conducted over the past several years, as well as the managerial-level strategies and priorities identified in the Tuolumne River Restoration Plan and during development of the Coarse Sediment Management Plan.

Additionally, the 'borrow site' reclamation into more productive habitats would encompass technical design, implementation, and monitoring phases, would be based on the best available restoration science, would include technical experts from numerous disciplines, and would be subjected to external design review similar to other large-scale restoration projects presently being implemented on the Tuolumne and other rivers.

We have attempted to include "adaptive management concepts into the project" by developing the core objectives of this project, which are management responses to past and ongoing research and restoration actions. I'll provide three examples: (1) the recommendation to implement gravel transfusion to increase spawning gravel availability was made in the Restoration Plan and further substantiated by recent studies, and was based on monitoring conducted by agencies and Irrigation Districts which identified spawning habitat as a potential limiting factor for chinook salmon during years of high escapement; (2) the recommendation to obtain a supply of sediment to be set aside specifically for large-scale river restoration projects is based on the need to reduce gravel costs and reduce the demand for commercial aggregate, which in turn resulted from the Mining Reach and SRP 9 project implementation; (3) simultaneous rehabilitation of the source site to higher quality wildlife habitat is based on the desire to avoid creating additional terrace mining pits associated with commercial gravel mines.

A large monitoring component was not included in this proposal primarily to contain the overall project costs, but also because adaptive management and monitoring guidelines are still being developed as part of the Coarse Sediment Management Plan. In proposing monitoring, we felt constrained both by the overall project costs and by the maximum three year duration of CALFED contracts. We consider three areas to be important for monitoring and post project information: the borrow site wetland and riparian habitat restoration, the gravel augmentation sites, and the mineral appraisal, permitting, and material processing process for restoration purposes. Our monitoring for the wetland sites was limited to project performance criteria (plant survival), and groundwater table. The gravel augmentation sites would include monitoring of geomorphic aspects (channel morphology, particle mobility) with funds from this proposal, as well as biological and habitat responses such as salmon redd counts, permeability, and sediment sampling conducted under the umbrella of FERC monitoring. Project success would be measured by improved habitat quality (higher permeability in introduced gravels, lower percentage of fine sediment, less embeddedness), increased habitat quantity (more usable spawning habitat), and increased fish use (higher redd counts) in augmentation sites.

Selection Panel Review: "... the revised proposal should respond to the Tuolumne River Adaptive Management Forum report and concepts."

The AMF Panel had not completed their final report at the time the PSP was submitted. These responses are based in retrospect on that final report. While it is not possible to provide a comprehensive response to all the issues raised by the AMF Panel within this proposal, we have attempted to address two major concerns that are closely related to this project.

One of the strongest recommendations of the AMF Panel was the need to develop a comprehensive monitoring program that synthesizes ecosystem scale and project level monitoring, along with required FERC license monitoring, and assures that projects that are implemented have testable hypotheses, employ variables that measure project-level quantitative responses, and are linked to quantitative expectations for species recovery. The Tuolumne River Technical Advisory Committee began a series of meetings in February 2002 to discuss the Adaptive Management Forum report and develop a strategy for responding that is appropriate within the constraints of the existing FERC Settlement Agreement and other regulatory, funding, and logistical considerations. The TRTAC is evaluating expansion of the existing river-wide monitoring plan associated with the FERC Settlement Agreement, taking into consideration the AMF report and concepts. These concepts are also being evaluated for incorporation into the planning, design, and implementation of the Tuolumne River Sediment Source and Spawning Gravel Transfusion project. Folding monitoring of this project under the developing river-wide monitoring plan is a more logical planning process than developing individual responses to the AMF Report within this proposal. The need to synthesize and coordinate the numerous monitoring activities and projects is a critical need for the Tuolumne River restoration program, but should not jeopardize initiating a valuable and important project.

Second, the AMF Panel expressed concerns that individual projects are not being designed and implemented with a tributary-scale ecosystem perspective. The two central objectives of this project (sediment acquisition and gravel transfusion) are responses to regional or ecosystem-scale objectives. Specifically, acquiring a sediment source designated for river restoration purposes is a strategy developed to reduce the high costs and demand for commercial aggregate, and to avoid using commercial aggregate that simply perpetuates the problems the restoration projects are intended to address. Also, the proposed large volume of gravel transfusion is responding to the original limiting factor analysis conducted by agencies and the Irrigation Districts during the 1980's and '90's, suggesting that spawning habitat quality and availability is a limiting factor for chinook salmon production during high escapement years.

Research and Restoration Technical Panel Review: "...the idea of extracting gravel, i.e., destroying the landscape, in one location to restore another seems odd. The implication is that the restored landscape has a higher value than the one being destroyed. No discussion of issue is presented."

The reader apparently missed several references to this issue. The extraction area was dredged in the early 1900's, then partially reclaimed as much of the tailings were removed for construction of New Don Pedro Dam. Areas adjacent to the river channel, including the Joe Domecq County Park and Zanker property, will NOT be destroyed by gravel extraction, but significantly improved by removing the remaining dredge spoils and restoring higher quality wetland and riparian habitats. These parcels were described in the proposal as:

"... barren, unproductive surfaces, with exposed gravel/cobble and little or no soil layer" (pg.2 paragraph 3);

"...several large parcels (totaling ~300 acres) in the La Grange vicinity that were historically river floodplain and terrace that were dredged for gold in the 1930's, then partially re-excavated to provide aggregate for constructing New Don Pedro Dam (Figure 3). Some dredger spoils were left in place, and now exist as flat, barren, rocky surfaces that provide little or no wildlife habitat of recreational value" (pg. 3 paragraph 4);

Also reference Section 3: Approach (pg. 10 paragraph 2). The restoration approach proposed for the Domecq/Zanker borrow site is as follows: (1) excavate previously dredged and scraped material from relatively unproductive zones (those with armored cobble surfaces, lacking soil development, groundwater, etc.) (Figure 4), (2) process and transport this material to the Tuolumne River either as screened and washed spawning gravel for insertion at 'gravel transfusion sites', or as bulk, unprocessed

material to be used at large-scale channel reconstruction sites, and (3) reclaim the 'borrow' site to wetland, riparian, and woodland habitats by replanting with native riparian and wetland vegetation. Areas that already provide 'healthy' habitat, such as intermittent patches of willow and cottonwood, or the existing wetland ponds at the Domecq County Park, will be integrated into the overall restoration design to highlight their value.

Research and Restoration Technical Panel Review: "... The cost of restoration [of the borrow site] seems extremely expensive. Assuming 300 acres are restored, the unit cost would be approximately \$15,000/acre.

This per-acre figure was determined simply by dividing the total project cost (\$4.35 million) by the proposed 300 acres of restored wetland and riparian habitat, which therefore includes the cost of the aggregate, as well as the design, appraisal, permitting costs, and contingencies. The total cost of project implementation was given as \$2,544,000 (\$8,480/acre) but includes material excavation, processing, transportation, and placement of approximately 100,000 cubic yards of cleaned spawning gravel into the Tuolumne River in addition to habitat restoration at the borrow area. When we sum only the budget figures that pertain to borrow site reclamation, this work totals \$1,294,000, or a more modest \$4,313/acre.

But this discussion partially misses the point. The primary focus of the project is not wetland and riparian habitat restoration at the borrow site. The opportunity to improve habitat values at the borrow site is simply a by-product of the larger goal of acquiring a source of sediment for present and future channel rehabilitation projects. Within those projects, future potential cost savings will be substantial, and counterbalance the upfront investment in sediment and planning for site reclamation.

Research and Restoration Technical Panel Review: "... The San Joaquin Regional Review is low. The fact that only a few landowners would benefit limited the rating.

The proposal was developed primarily to benefit the river ecosystem and salmon population, not the local landowners. But there would also be a significant benefit to the local aggregate industry and Stanislaus County by reducing the demand on regional aggregate supplies and protecting the County's revenue base. And a large County Park would be substantially restored by this project, which would benefit all the citizens of the Stanislaus County and the region.

External Scientific #3: "The need to continually augment the gravel supply of the restored reach is of great concern. More thought needs to be given to restoration techniques such as grade control.

One of CALFED's goals is to implement river ecosystem restoration. An important component of a healthy river ecosystem is gravel transport and routing. This project embraces this concept by encouraging a dynamic alluvial channel with a variable flow regime, including periodic high flows intended to mobilize channel bed sediments, flush fine sediment from spawning gravels, and transport coarse sediment downstream. This approach will require periodic gravel maintenance, depending on the sequence of water year types and resulting high flow regime. Long-term gravel maintenance will require much smaller volumes than are being recommended in this proposal, however, which is a large scale transfusion to restore supplies progressively lost during the past century of flow and sediment regulation. Engineered grade control techniques have been implemented on the Tuolumne River with limited or short-term success (Kondolf et al. 1995), and is not needed on this reach of the river.

External Scientific #4: "Perhaps the most valuable product from this project will be the description of the appraisal and permitting process. Describing how these two hurdles were overcome could be of great use to decision-makers for future projects. The other products described in the proposal are fairly routine and static. I encourage CALFED to provide a small supplemental award to the proposers that will allow them to establish a project website and update it during gravel removal, cleaning, placement, and upland restoration.

We welcome the opportunity to share as much of the information value of this project as possible with resource managers and other river restoration proponents.

Budget Review Question 3: Does the proposal clearly state the type of expenses encompassed in indirect rates or overhead costs? NO. Consultant services are providing funding.

The Turlock Irrigation District (project applicant) and the Technical Advisory Committee are not in position to do the actual project implementation, but operate more efficiently by controlling the contract and project management aspects, and then subcontracting to qualified contractors for project implementation. Our budgeting typically does not include "indirect costs" or "overhead costs" as these costs are incorporated into consultant services rates. We have, however, budgeted adequately for project management (3% of total project costs for TID project management), and the consultant team has similar project management budgets along with a modest contingency budget.