Panel Scientific and Technical Review

(Note: Review comments will be anonymous, but public.)

Proposal number: 2001-F206 Proposal Title: Relative contribution of SJR nutrient sources

1a) Are the objectives and hypotheses clearly stated?

Summary of Reviewers comments:
Proposal clearly states the objectives and hypotheses.

Panel Summary:
YES, objectives clearly stated.

1b1) Does the conceptual model clearly explain the underlying basis for the proposed work?

Summary of Reviewers comments:
Yes, the conceptual model clearly explains the underlying basis for the work. Critical factors linking tracers to nutrients are presented and it is clear that the PIs have a detailed understanding of the concepts and of the analytical methods required for this work.

This work apparently differs from past qualitative work in the analysis of a larger number of potential tracers. Thus, it is more likely that this project will achieve its goal of being quantitative, although the number of samples collected will be relatively small, and there are a large number of potential sources within this large study area.

Panel Summary:
Project does fit within framework of molecular tracer work, but over all is lacking detailed information on nutrient sources to San Joaquin River, and project excludes sediment bound nutrients (stating that it is beyond the scope of the present study) that could be incorporated into the analysis.

1b2) Is the approach well designed and appropriate for meeting the objectives of the project?

Summary of Reviewers comments:
The approach appears to be well designed, but there are several issues that need to be addressed. 1) The time frame for data collection is too narrow. 2) The number of samples is small and the potential statistical power of the analysis is suspect. 3) The potential costs for implementing such a project may be too high. 4) South Delta hydrodynamics are complex and could play a role in the development of oxygen-depleted waters near Stockton. These factors are not included in the present analysis. 5) It is unclear what decomposition method will be used to distinguish between sources. 6) Conservative tracers should be used if possible.

Panel Summary:
The panel agreed with the comments of the reviewers for the most part. Of critical importance are the following. Qualitative apportioning was okay, but quantitative assessment lacking. It was unclear how the quantification would be conducted. Also, time frame is too limited. Need more information than can be obtained during a 10 day "wet period", consensus that sampling needs to include more than 10 days and needs to target episodic storm events. Simulating runoff is not satisfactory. The number of samples is too low and sources were not defined. For example, agriculture should be partitioned into animal facilities, tail water, run-off, subsurface drainage, etc.. Not clear how fingerprinting of "pure" sources will occur and how "matching" with stream values would be obtained. Groundwater contributions are not mentioned. Atmospheric characterization not described in sufficient detail.

1c1) Has the applicant justified the selection of research, pilot or demonstration project, or a full-scale implementation project?

Summary of Reviewers comments:
One reviewer indicated that the project was clearly research, the other indicated that it was a monitoring project. The designation is research.

Panel Summary:
YES this is a research project.

1c2) Is the project likely to generate information that can be used to inform future decision making?

Summary of Reviewers comments:
If the tracers are sufficiently developed and the monitoring cost decreased, the tool should prove useful to managers. It will be at least 4 years before this tool could be put to use and another year or two before sufficient data are available to direct management actions. However, the issue of SJR water quality has been persistent and many significant questions have not been addressed to date. This tool could provide a means to answer some of these questions.

Panel Summary:
If sources could be quantified, it would be an enormously useful tool, but the quantification aspect is not developed enough to indicate likelihood of success.

2a) Are the monitoring and information assessment plans adequate to assess the outcome of the project?

Summary of Reviewers comments:
It should be noted that this is research to develop a tracer tool for identifying specific nutrient load apportions. It will not answer the question of which sources contribute the greatest loads until it is

utilized in an appropriate monitoring program. One important point to note is that this type of study will generate useful information even if the study objectives have to be modified over time.

Panel Summary:
Not directly applicable; this is research to develop a useful tool. However, panel was in consensus that the sampling scale outlined may not be sensitive enough to achieve objectives.

2b) Are data collection, data management, data analysis, and reporting plans well-described, scientifically sound and adequate to meet the proposed objectives?

Summary of Reviewers comments:
Recommendation is that the researchers make a presentation specifically to Calfed and the work group trying to resolve the DO problems and not just at national scientific meetings.

Panel Summary:

Using the range of tracers listed in the text, it is doubtful if all sources could be distinguished because of the difficulties in pattern recognition analysis and interpreting unspecified patterns. The range of tracers may not be appropriate or unique enough to generate unique signatures. Need more detail on pattern recognition analysis. Need more explicit discussion of quantification of sources. Quantification of the load-tracer relationship is critical to understanding nutrient loads.

3) Is the proposed work likely to be technically feasible?

Summary of Reviewers comments:
The project is technically feasible. Recommendation is that if a sample is lost and needs to be recollected that the upstream or downstream counterpart also be recollected. It is clear that even if the project fails to meet all of its objectives, it will provide valuable and useful information.

Panel Summary:
See above. Applicants appear qualified to technically perform study, but need to link with the dissolved oxygen stakeholder group (technical and steering committees).

4) Is the proposed project team qualified to efficiently and effectively implement the proposed project?

Summary of Reviewers comments:
Yes, both of the PIs have sufficient expertise with analytical chemistry, field sampling and studies, source apportionment modeling, and with the behavior of nutrients in aquatic systems.

Panel Summary:
Panel concurs with reviewers, see above.

5)Other comments

Outside technical reviewers: "VERY GOOD" and "EXCELLENT". Both were supportive of the concept as a tool for evaluating nutrient load. One reviewer commented on high cost and that this might preclude widespread use of this approach. Both reviewers acknowledged the problems with assessing relative contributions of nutrient sources once tracers are identified.

Review Panel:

Overall Evaluation
PANEL SUMMARY COMMENTS

Technically this is a strong proposal. The panel felt that the proposal would be greatly improved if it were coordinated locally, possibly with the San Joaquin River Dissolved Oxygen TMDL stakeholder group. There is also active and related research (e.g., USGS in Sacramento) that could assist these studies and would help avoid duplication of efforts.

Summary Rating

- Excellent
- Very Good
- Good
- Fair
- Poor

Your Rating: GOOD