Panel Scientific and Technical Review

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

Proposal number: 2001-F207 **Short Proposal Title: in situ removal of mercury from groundwater.**

1a) Are the objectives and hypotheses clearly stated?

Summary of Reviewers comments:
The hypotheses are not well stated. The objective of using the column experiments to evaluate the use of permeable reactive barriers is clearly stated.

Panel Summary:
There was consensus that the objectives were clearly stated. However, the hypotheses are not explicitly stated, instead this section provides more background. Linkage to Bay Delta discussed below.

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

Summary of Reviewers comments:
Reviewers differed. One reviewer commented that the relationship of the treatment system to the overall reduction of Hg loads to the Delta is not described. And linkages to biota are not given, nor are linkages to receiving waters (see below, also). The other reviewer commented that the conceptual model is clearly explained.

Panel Summary:
No consensus that conceptual model is clear basis for proposed project. Technique outlined, but no linkages to processes or mechanisms are reviewed or incorporated into model.

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

Summary of Reviewers comments:
Although generally well described, the approach appears to have a basic flaw in the design, in that the researchers will "spike" the influent with mercury (presumably mercuric salt as was done previously) to artificially increase the actual concentration of mercury found in the ground water. This seems to be problematic from two perspectives: 1) if the technology is evaluated for concentrations higher than that which would be found in sites to be treated, how will conclusions regarding efficacy be drawn?; 2) the form of mercury added to the influent may be more amenable to removal than the forms actually present in the ground water.

Otherwise, the approach is generally well stated.

Panel Summary:
Spiking method may bias results, but could be addressed by adequately characterizing the field form of mercury. Further, the spiking involves only one treatment of the five proposed. Regarding the selection of the reactive mixture, the use of TOC may affect production of methyl mercury and this needs to be considered.

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

Summary of Reviewers comments:
The project is essentially a research project. Linkages to biota and transport to watershed are not demonstrated.

Panel Summary:
Consensus that 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:
The value would be extremely limited at this point. The project will likely guide decision making with respect to remediation of one particular mine site, but may not be useful for CALFED decision making.

Panel Summary:
This is a localized remediation project, widespread applicability to CalFed Bay Delta efforts are not clear. The focus on mercury has not been on ground water in Bay Delta efforts, but on surface water. This project will not affect near term decision making, but may inform future remediation studies.

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

Summary of Reviewers comments:
Reviewers differed. One reviewer comment that since there appear to be basic flaws with the design of the project, it is unlikely that the monitoring plan would adequately address the outcome. Another commented that the monitoring is adequate to assess the outcome of the column experiments and to determine the effectiveness of the PRB technology at the chosen mine site.

Panel Summary:
Generally, the plan is adequate. The major negative comment on spiked mercury treatment may have limited impact on overall study since there is a treatment control.

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:
Well described

Panel Summary:
Generally, YES, but the mercury species analytical method is not specified on page 9.

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

Summary of Reviewers comments:
Technically feasible, application in the field is likely to be limited.

Panel Summary:
YES, it is technically feasible to construct the treatment facility and evaluate mercury reduction. However, the engineering hypothesis of mercury reduction by PRB is unknown and field applicability is likely to be limited.

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

Summary of Reviewers comments:
The project team has demonstrated capability with regard to the use, understanding, and development of PRB technology.

The team has experience in similar types of projects.

Panel Summary:
YES, clearly experienced with technology. However, did not demonstrate needed expertise for linkage to larger scale CALFED applicability.

5)Other comments

Reviewers: The proposal is technically sound, but may not be applicable to current CALFED needs for mercury management in the Bay-Delta system. In particular, the extent of mercury transport via ground water has not been characterized. Until that is known, this technology has great potential for site remediation, but cannot be considered a high priority for the CALFED program.

Spiking the site ground water with mercury would appear to compromise any of the results derived from the project.

Technical reviewers comments: One "GOOD" and one "POOR"; the POOR comment is based on the spiking issue and the review panel and second reviewer do not think this is a big issue and is addressed in proposal by a control treatment.

Misc. Panel comments:

There is no demonstrated need for the steering committee for the flow test. Justification for all analytical costs need further clarification.

Overall Evaluation
PANEL SUMMARY COMMENTS

Well thought out, technically feasible project, but with limited scope. The technology is promising, as proven in the recent remediation applications involving contaminated groundwater plumes. This is consistent with both reviewer's comments. Applicability to CALFED objectives is not certain. Mercury contamination from groundwater has not been proven to be a significant issue in Bay-Delta surface water (with the except of hotsprings).

Summary Rating
- Excellent
- Very Good
- Good
- Fair
- Poor

Your Rating: FAIR