Panel Scientific and Technical Review

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

Proposal number: 2001-F202 **Short Proposal Title: Pilot demonstration of passivation technology for restoration of Newton Copper Mine.**

1a) Are the objectives and hypotheses clearly stated?

Summary of Reviewers comments:
Reviewers generally felt that the objectives and hypotheses were clearly stated. However, one reviewer indicated that the chemical processes resulting in passivation were not adequately described.

Panel Summary:
The objectives and hypothesis are clearly stated to test the passivation technology for mine tailings on a field scale at the Newton Copper Mine.

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

Summary of Reviewers comments:
Reviewers differed. While one reviewer was satisfied with the information presented, the other felt there was too little detail on the passivation mechanisms to understand the longevity of the process, possibly because those mechanisms are not yet well defined. The pilot/demonstration study provides an opportunity to identify and more closely examine those mechanisms.

Panel Summary:
The conceptual model does not define the passivation process clearly. This could be due to propriety constraints with DuPont or it could signal a need in the pilot/demonstration study to concurrently examine how the underlying mechanisms are affected by source water and application procedures.

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

Summary of Reviewers comments:
Reviewers felt that the approach was adequately defined, but one reviewer indicated that lab tests with treated material concurrent with field pilot demonstrations should be conducted prior to attempting large-scale tests. For example, the effect of other AMD waters and host rock on the durability of the passivation coatings is specific to the success of the treatment. It would seem useful for CALFED or general application of passivation protocols at this and other sites to quantitatively understand the geochemical and biologically mediated processes that regulate its success and longevity.

Panel Summary:
Promising results from batch experiments are presented indicating the potential usefulness of this technology to retard the oxidation of pyrite and hence the mobility of sediment-associated metals. There are two scalability issues for the pilot demonstration that are not addressed. First, based on the photomicrographs show in Fig. 3, it is not clear whether the mass of passivation coatings relative to the mass of treated mine tailings affects the feasibility of applying this protocol. Second, it is unspecified how the spraying of mine tailings in the demonstration project will reproduce the coatings generated in the laboratory batch experiments. These issues may implicitly be part of the pilot/demonstration study.

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

Summary of Reviewers comments:
Reviewers indicate that the selection of this project as a demonstration project is appropriate.

Panel Summary:
Although primarily a demonstration project, some research components may need to be addressed.

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

Summary of Reviewers comments:
Reviewers were in general agreement that both lab and field studies would provide useful information about this treatment method and its application to other acid-generating mine waste.

Panel Summary:
Yes, there is applicability to other acid mine sites.

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

Summary of Reviewers comments:
Although the monitoring efforts were generally considered adequate, it was not clear whether 1 year is adequate time to access the longevity of the treatment.

Panel Summary:
Consistent with one of the reviewers, there was concern expressed that a one-year evaluation may not be adequate to access the effective durability of the treatment.

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:
Reviewers differed. One was satisfied with the data collection plans, while the other felt that there was limited information about reporting and analytical plans (e.g., analytical methodology, QA/QC, and data management).

Panel Summary:
The data evaluation was not clear. The data collection and management procedures are not defined in the proposal.

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

Summary of Reviewers comments:
Although technically feasible, one reviewer indicated some concern that the tailings would be inadequately coated in the field demonstration project with the sprayers.

Panel Summary:
The proposed pilot/demonstration study is technically feasible, and holds considerable promise, particularly if the issues described above in the responses to item 1b2 have already been resolved or will be resolved during the study.

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

Summary of Reviewers comments:
Reviewers agreed that the project team was qualified, based on their extensive experience in AMD systems.

Panel Summary:
Consistent with the reviewers, the panel felt that the project team is qualified.

5) Other comments

Because CalFed funding may potentially contribute to the remediation of this site, a question was raised about whether federal funding for a permitted site was appropriate.

Overall Evaluation
PANEL SUMMARY COMMENTS

The panel clearly recognizes the potential applicability of the proposed work to a number of AMD systems, but direct linkage to CalFed applications is less clear. Absence of basic information about the passivation process and its scalability (from lab to pilot) of this treatment prevent a higher

rating, although it is understood that some of this information may be proprietary or an implicit objective of the proposed work.

The existing rating is conditioned on consideration of the reviewer's comments related to the design of the lab studies. The panel agrees with this reviewer that concurrent lab studies be conducted with the field work to support and help modify, as necessary, the field experiments. The applicants should consider prioritizing some of the tasks. This may allow the concurrent lab studies to be added to the proposal without greatly increasing the costs for the entire project. The panel supports the progression of this research, extending from the lab to field tests.

Summary Rating

Excellent
Very Good
Good
Fair
Poor

Your Rating: VERY GOOD