

NATURAL GAS AND OIL TECHNOLOGY PARTNERSHIP

-----bringing department of energy national laboratories capabilities to the petroleum industry-----

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March 30, 2004

Mr. David Alleman
National Petroleum Technology Office
US Department of Energy
Williams Center Tower One, 14th Floor
One West 3rd Street
Tulsa, OK 74103

SUBJECT: RECOMMENDATION FOR FY04 PARTNERSHIP FUNDING FOR E&P ENVIRONMENTAL TECHNOLOGY

Dear David:

The review of projects and proposals in the E&P Environmental Technology area was held at the Sheraton North Houston Hotel, Houston, TX, on February 25, 2004. Six ongoing projects and one completed project were presented in the review meeting. Due to budget limitations in the DOE program no new-start proposals were requested for the review in the FY04 funding cycle. The investigator presented the completed project to facilitate technical transfer to industry.

E&P ENVIRONMENTAL TECHNOLOGY PROJECT FUNDING

We have prepared a table for your review and assistance in understanding our funding recommendations. Proposal priority ratings (average of seven reviewers) were strongly bimodal, with four projects in the 4.3 to 4.6 range and two projects in the 1.6 to 2.0 range, based on the 1 to 5-priority scale (Table I). The recommendation is based on their being \$1.450 million available net for project funding, up slightly from the planning basis when proposals were requested.

Each of the highly ranked projects is recommended to receive somewhat more funding than requested in their respective proposals. This is a consequence of both the significant down rating of two of the projects and the slightly higher than planned funds availability. Each of the four projects received less funding than requested in FY03.

Two projects were significantly down rated from earlier reviews. For the mature project (EP15) we are recommending adequate funding to bring the project to a reasonable conclusion and to provide appropriate technical reporting. Project EP01 was highly rated in November of 2002 when the industry review of FY03 projects and proposals was held. It is not completely clear why this project lost much of its industry enthusiasm over the period between its initial review and this February. Funding is provided to wind down and report on this project or to reorient it to compete for funding in the fiscal 2005 cycle. Should the investigator opt to compete the project in the FY05 or subsequent period, it would be competed as a “new start” with no expectation of wind down funding should it not be rated in the range of funded projects.

A separate brief letter report will be provided discussing the marked change in industry review panel support for these two projects.

The narrative comments of the reviewers on each proposal were summarized and included in the Partners considerations leading to the funding recommendation. This summary is provided in Appendix A. Panelists were also encouraged to provide comments on the Upstream Environmental Technology area, the review process, and any other matters they viewed as pertinent. Those are summarized in Appendix B.

We appreciate the continuing confidence of NPTO and DOE in the role of the Partnership and the Laboratories in working with the petroleum industry to develop and deploy advanced technology to improve both the economics and environmental consequences of domestic petroleum exploration, production, and use.

Sincerely,

David K. Schmalzer
for
Natural Gas and Oil Technology Partnership

Enclosures

cc w enc.: Margaret Lou, NPTO
William Hochheiser, FE/HQ
Partnership Office Representatives

**Table 1
Upstream Environmental Technology Funding Proposal
(K\$)**

EPxx	Laboratory	PI	Topic	Project Year (FY04)	Title	FY02 Funding	FY03 Funding	FY03 Funding Shortfall	FY04 Funding Request	Priority Rating	FY04 Funding Strawman
4	SNL	Allan Sattler	Water	2	Managing Coal Bed Methane Produced Water for Beneficial Uses, Initially Using the San Juan and Raton Basins as a Model	0	240	50	240	4.57	310
16	LBNL	Nancy Brown	Air	3	Characterizing the Formation of Secondary Organic Aerosols	200	200	50	200	4.43	265
13	LLNL	John G. Reynolds	Water	2	Hydrophobic Membranes for Removal of Organic Impurities in Production Water	0	240	60	240	4.29	310
18	LBNL	Thomas E. McKone	Open	3	Science-Based Methods to Assess Risks Attributable to Petroleum Residues Transferred from Soil to Vegetation	200	200	100	200	4.29	265
1	ORNL	David W. DePaoli	Water	2	Use of Ionic Liquids in Produced Water Clean Up	0	250		250	2.00	150
15	ORNL	Joanna McFarlane	Water	3	Modeling of Water Soluble Organic Content in Produced Water	250	250		250	1.57	150
					SUMS	650	1380	260	1380	3.52	1450

Upstream Environmental Technology
Summary of Proposal-Specific Reviewer Comments

EP01 Use of Ionic Liquids in Produced Water Clean Up

Strengths: If concerns addressed (see suggested changes) then project should be supported. Promising for produced water clean up and for sensing organics in produced water.

Weaknesses: Impractical. Expensive technology for full scale remediation - requires justification. Perhaps too selective for effective sensor for contaminants. Sensor not required by industry. Disappointing results. Removal of organics not issue, and so should not be addressed by project - rather focus should be on sensor.

Suggested Changes: Concerns need to be addressed in project (cost/benefit, efficacy criteria, regeneration, losses to environment, potential toxicity, sensor operating in air versus aqueous environment). Focus on end product - a design package that could be manufactured and sold.

EP04 Managing Coal Bed Methane Produced Water for Beneficial Uses, Initially Using the San Juan and Raton Basins as a Model

Strengths: The project strengths are summarized in one reviewer's comment that the project was "very much environmentally desired and promising project and ...well defined in scope, tasks and deliverables."

Weaknesses: The proposed technologies need to be demonstrated in order for the economic viability to be determined. The emerging technologies need to apply to more produced water issues rather than just coal bed methane. Input from environmental organizations (NGOs?) and state agencies desired as project matures.

Suggested Changes: Fund and move the project forward towards more field application to determine the performance and economics of proposed technologies. Work with industry and environmental organizations to expand the project's scope where appropriate. Some reviewers suggested broaden the range of contaminants considered.

EP13 Hydrophobic Membranes for Removal of Organic Impurities in Production Water

Strengths: This project is environmentally relevant with promising results, addressing issues that will be increasingly important with time, regardless of location. The PI well illustrated the current and potential strengths of the technology applied to a variety of environmental and petroleum production issues. The project has well-defined scope, tasks, and deliverables. Interesting concept. This technology may be also useful for cleaning produced water so it can be reused. Would be a valuable asset to the Coal Bed Methane (CBM) business. Project appears to be moving along well. Project planners seem capable of adjusting scope to new findings. The PI gave a great presentation and showed very exciting results.

Weaknesses: Economics are not well established. The results for oil-spills and groundwater appear to be more optimistic in terms of cost effectiveness than those for production water treatment. May be better suited for groundwater remediation and light oil spill remediation.

Suggested Changes: Cost forecasting should be a component of the project. Process flow scheme should also be developed to address applicability and real operation issues such as waste streams and maintenance. The project should be expanded to further investigate applications for oil spill remediation.

EP15 Modeling of Water Soluble Organic Content in Produced Water

Strengths: Good academic exercise. Proceeding towards goals. Perhaps a future use in redrafting EPA sampling methods.

Weaknesses: Little progress. Not useful to industry because produced water easy to sample and analyze. Input data requirements are extensive and not available.

Suggested changes: None

EP16, Characterizing the Formation of Secondary Organic Aerosols

Strengths: The work completed to date is very impressive. Measuring the various pollutants has indeed given us better insight into the source and formation of secondary aerosols. Important information. - Little short-term impact but future impact could be large. The project presented as a well gathered data and gave background of the shortcomings in the existing regulatory estimation techniques of air polluting aerosols.

Weaknesses: This foundational research is impressive, but is only one input to model development.

Suggested changes: Tell us at the beginning what this means to O & G operations, e.g., better input parameters to model air emissions from our operations so that we don't have to shut in wells from our production. Future proposals should include a discussion of how the study will have application to the industry such as site studies, etc. Include a few sentences on the practical application and impact to industry.

EP18, Science-Based Methods to Assess Risks Attributable to Petroleum Residues Transferred from Soil to Vegetation

Strengths: The project has nationwide application providing good fundamental research with direct ties to regulatory decisions. The work is forming the foundation for better understanding of plant uptake from petroleum contaminated soils. The project is providing important findings and good scientific data to fill important data gaps. Results from this work will support improved guidelines and regulations and prevent overly conservative regulations for oil impacted soils. Can anticipate properly designed and validated model will have multiple beneficial applications including remediation of soil pollution, determining risk of exposure to pollution at large and support knowledge of disposal needs from oilfield activities. The work has field application and can be built upon as other plants and contaminants are studied. The project should continue.

Weaknesses: The research should be expanded to grains and plants that are more relevant to human exposure. The project needs additional funding.

Suggestions: The project represents the beginning of larger scale testing employing selective plants to specific remediation tasks and field studies. The Petroleum Environmental Research Forum is planning to supply additional data from phytoremediation field sites. Additional plants and grain should be included in the project. As such, the project needs additional funding.

Summary of Upstream Environmental Panelists General Comments

General comments from industry panelists were pretty sparse on this review.

Two panelists suggested it would be desirable to get a broader panel of reviewers and to seek more people with field operations background and current interest. Both indicated that the meeting was well organized and productive.

One panelist stated that future DOE funding should be focused toward those projects that will improve the environment and improve environmental compliance.