

Office of Science and Technology Technical Task Plan

Technical Task Plan for ASTD (01) - (P2) Field Demonstration of Multiple Permeable Reactive Barriers - LANL

TTP Number: **AL11SS31** 03 Subsurface Contaminants Focus Area
Authorization for Fiscal Year 2002 Albuquerque Operations Office

Product Line: SS03 SCFA Metals & Radionuclides in Vadose & Saturated Zones
Work Package: SS02 SCFA - Subsurface Barrier Systems in the Vadose Zone

Contractor/Site: LANL University of California (LANL)

TTP Points of Contact:

Field Program Manager	_____	Date: _____
	Jim Wright Office of DOE-SR	
	Phone (803) 725-5608 Fax: (803) 725-2123 E-mail: jamesb.wright@srs.gov	
HQ Program Manager	_____	Date: _____
	Kurt Gerdes Office of EM-54	
	Phone (301) 903-7289 Fax: (301) 903-7457 E-mail: kurt.gerdes@em.doe.gov	
Financial Officer	_____	Date: _____
	Vicki Barden Office of EM-12	
	Phone (301) 903-8192 Fax: (301) 903-4979 E-mail: vicki.barden@hq.doe.gov	
TPO	_____	Date: _____
	Pam Saxman Office of DOE-AL	
	Phone (505) 845-6101 Fax: (505) 845-4216 E-mail: psaxman@doeal.gov	
Principal Investigator (PI)	<i>John P. Kaszuba</i> _____	Date: <i>4/18/02</i>
	John Kaszuba Office of LANL	
	Phone (505) 665-7832 Fax: (505) 665-4955 E-mail: jkaszuba@lanl.gov	
Other	<i>Bruce R. Erdal</i> _____	Date: <i>4/5/02</i>
	Bruce Erdal Office of LANL	
	Phone (505) 667-5338 Fax: _____ E-mail: _____	

This list reflects ALL Points of Contact identified in the PEG/TTP document. Note that not all POCs are required to sign the document. For required signatures please refer to OST Standard Operating Procedures and/or other communications.

Work Scope Summary:



Rev. 2; FY02 BOY TTP:

As the FY02 begins, this project remains on hold due to ongoing funding issues. In FY01 the LANL Environmental Science & Technology Program Office (E-ST) issued a temporary stop work on multi-barrier project until budget issues are evaluated. The design documentation and implementation cost estimates indicate a substantial difference between the estimated costs and the project funding in place. While the costs and approaches available to fund completion of the multi-barrier installation in Mortandad Canyon are evaluated, all work on the project was suspended as of August 7, 2001.

Task Title: Field Demonstration of Multiple Permeable Reactive Barriers - Los Alamos National Laboratory (LANL)

FY01 Funding level: \$800K

FY02 Funding Level=\$0K, (FY01 carryover \$265K)

Schedule/Duration: October 2000 - September 2002

Key Problem Area Addressed:

SCFA project number AL-200-0013

PBS # AL009

OST Technology Number 46

Target Problem:

Mortandad Canyon, near Los Alamos National Laboratory, and its tributary canyons have received liquid waste discharges since 1951. Liquid effluents containing elevated concentration of strontium-90, tritium, plutonium-238, -239, -240, cesium-137, americium-241, nitrate, organic nitrogen and other contaminants have impacted alluvial groundwater within the canyon. A total of 342 million gallons of LANL effluent containing a total of 830 curies of radioactivity, were discharged into the canyon from 1963-1995. The regional drinking water aquifer lies at a depth of 970 feet and tritium has already been found at depths of 650 feet.

Since the May 2000, Cerro Grande Fire at Los Alamos, there is a particularly urgent aspect to this target problem as the fire has changed the groundwater chemistry such that U and Sr have been remobilized in these canyons and now exceed the MCLs. A position for a multibarrier has been identified in Mortandad Canyon that would be optimal for emplacement and for treating contaminants of nitrate, U, Pu, Am, and Sr. These radionuclides are stable in the dissolved phase and they also may adsorb onto colloids consisting of calcium carbonate, silica, ferric hydroxide, and solid organic carbon. Nitrogen species (nitrate and total Kjeldahl nitrogen) also occur in alluvial groundwater.

Treatability studies with actual groundwater and materials to be used in the field are underway and have shown promising results. The barrier will be emplaced and monitored to demonstrate effectiveness. The barrier will be emplaced between existing monitoring wells that have good historic data and that can be used for performance assessment.

Proposed Statement of Work:

This project proposes to develop a multiple permeable reactive barrier as a passive remediation option for alluvial groundwater within the canyons. LANL batch experiments conducted during FY00 using apatite, organic matter and calcium carbonate's reactive barrier material, have demonstrated over 99-percent removal of strontium-90, americium-241, plutonium isotopes and nitrate from canyon groundwater samples. Within a 16 day contact time with the barrier material, final activities and concentration of these contaminants met EPA and DOE drinking water standards.

A multiple reactive barrier will be placed across Mortandad Canyon to passively remove the alluvial groundwater contaminants. The barrier design includes shallow monitoring wells upstream, within and downstream of the engineered structure. This demonstration will build upon the large success achieved in laboratory experiments and will accelerate remediation schedules for alluvial groundwater within the canyon.

The project has three primary tasks:

Task A: Initial Characterization and Design,

Task B: Emplacement

Task C: Final Characterization and Closure

Proposed Deliverables:

1. Demonstration Project Plan, due 12/20/2000, Status: Done 1/23/01
2. Monthly project tracking, due 20th of each month, a project activity report will be loaded into the LANL web-based PRS system, Status: completed to date.
3. 2001 Mid Year report, The PI will present a project status report at the SCFA mid year review, status: The PI attended the SCFA mid-year in Atlanta, Georgia. A poster and a talk summarizing the project were presented.
4. Quarterly reporting, The PI will prepare quarterly reports for the IPABS data system at the end of each quarter, status: completed to date.

Carryover Milestone:

Final Report: The PI will prepare a report on the projects success and its Life cycle waste reduction and actualized DOE monetary benefits. Due 10/31/01 reforecast date 9/30/02 assuming a Spring 2002 start up of project.

Prior Year Progress:

FY01, Task A: Initial Characterization and Design,

The project plan was finalized January 23, 2001. Preliminary geo-hydrologic assessments of Mortandad Canyon were conducted as a prelude to field investigation and site characterization activities. A contract was awarded to perform site characterization, design, and installation of the multi-barrier. The Phase I Site Investigation was completed, and a summary report issued. This investigation developed geo-technical, hydraulic, chemical, and other data needed for design of the multi-barrier and for developing a waste characterization and disposal strategy. The conceptual design for the multi-barrier was begun.

The project team is under a review and evaluation hold to determine the unanticipated impacts of the increased costs for material disposal. These costs have risen significantly with the increase in debris resulting from the May 2000 Cerro Grande Fire.

Upon release of BOY funds and a defined schedule the PI will submit a TCR with the FY02 BCWS.

Financial Planning Information:

BCWS (Current Year Spend Plan) (FY 2002)

OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	Total
0	0	0	0	0	0	0	0	0	0	0	265	265

Fiscal Year Funding Request: (FY 2002)

Site Code	B/R Code	Prior Yr Uncosted C/O	Current Year Funding	Total Funding
LANL	EW4010	265	0	265
TTP Total:		265	0	265

Out Year Spend Plan:

Fiscal Year	2003	2004	All Subsequent Years
TTP Amount	0	0	0

Milestones:

TTP Level Milestones:

Milestone Code Number	Milestone Level	Milestone Title	Plan Date	Track in IPABS?
1	HQ	Final Report	9/30/02	No

Milestone Description: A report detailing the project and associated lifecycle cost savings will be prepared for distribution.

Work Scope Detail (optional for PEG):

FY02 Closeout Scope:

- Task B: Emplacement
- Task C: Final Characterization and Closure

The project hold will continue until it is determined that sufficient funds are available to address the material disposal costs. The project team is looking to leveraging this expense. A degree of urgency exists in making this determination as the emplacement schedule is dependant upon favorable weather conditions.

Assuming an expedient resolution to the material disposal cost issue, it is estimated that final design will be completed and installation completed in late September. Preliminary performance assessment activities completed in late October, 2001. Permits needed for multi-barrier installation may require a 30 day public comment period. At present, the impact this public comment period will have on the schedule is not known.

Impacts:

This demonstration will build upon the large success achieved in laboratory experiments and will accelerate remediation schedules for alluvial groundwater within this canyon and potentially for other canyons in the Los Alamos area.

Benefit:

The multi-barrier emplacement will target the contaminants of concern (strontium, plutonium, americium, nitrate, and perchlorate) using reactive materials. Since the May 2000, Cerro Grande Fire at Los Alamos, there is a particularly urgent aspect to this target problem as the fire has changed the groundwater chemistry such that U and Sr have been remobilized in these canyons and now exceed the MCLs. A position for a multibarrier has been identified in Mortandad Canyon that would be optimal for emplacement and for treating contaminants of nitrate, U, Pu, Am, and Sr. These radionuclides are stable in the dissolved phase and they also may adsorb onto colloids consisting of calcium carbonate, silica, ferric hydroxide, and solid organic carbon. Nitrogen species (nitrate and total Kjeldahl nitrogen) also occur in alluvial groundwater.

Project Budget Summary by Task:

- Task A: Initial Characterization and Design, \$450K
- Task B: Emplacement 250K, (Initial estimates under review.)
- Task C: Final Characterization and Closure, \$100K

Cost Savings Analysis:

The Project Team will complete a cost and performance assessment of the multi-barrier and submit this as a final report. To complete the report, the Technical Team will need to establish the performance of the barrier after emplacement by completing the following two activities:

Determine and evaluate the effect of the multi-barrier on groundwater flow. Hydrologic modeling will have been conducted as part of the engineering design. The validity of the modeling will be verified by monitoring the level of the water table in and around the multi-barrier, as measured through existing monitoring wells and wells and sample ports installed with the multi-barrier.

Determine and evaluate the effect of the multi-barrier on groundwater chemistry by monitoring the groundwater composition before and after multi-barrier emplacement. This will be accomplished by sampling well waters outside of (upgradient and downgradient) and within the barrier volume, both prior to and after emplacement. Results of analytical testing will be used to establish performance of the barrier.

Life-cycle costs, related cost savings, and return on investment will be determined as part of the final report. Cost savings will be based upon comparison with baseline technologies. Life-cycle cost components include: emplacement, monitoring, and any disposal costs.

Additional Costs:

In addition to the technical scope the project team will support Peer Reviews, User Reviews, FY02 Mid Year Technical Reviews as requested by SCFA. Also the PI will provide supportive information to the OST organization responsible for preparing the Technology Safety Data Sheet (TSDS).

memorandum

DATE: April 13, 2001

REPLY TO

ATTN OF: SCFA (Lanigan, 803/725-0404)

SUBJECT: Request for Draft Short Form Technical Task Plans (STTPs) to support the Subsurface Contaminants Focus Area (SCFA) Fiscal Year (FY) 2002 Program Execution Guidance (PEG)

TO: Technical Program Officers

In anticipation of the Office of Science and Technology (OST/EM-50) PEG for FY 2002, the SCFA is requesting draft STTPs for the projects funded in FY01 that will continue into FY02. Though official EM-50 PEG guidance has not yet been issued, the SCFA Lead Office is requesting STTPs now to allow sufficient time to prepare its FY02 program to present to EM-50. This memo is concerned with currently funded or "mortgaged" projects and should not be confused with other data calls for potential new-start projects.

TTPs funded in FY01 and continuing into FY02 require a STTP prepared in accordance with Attachment 1 and will include Characterization, Monitoring, and Sensor Technology (CMST) Program projects that are in the SCFA program. Attachment 2 identifies the projects that the SCFA believes will be continuing into FY02 and their estimated funding.

As you are probably aware, there is considerable uncertainty about what the final FY02 budget will be for OST and DOE Environmental Management in general. Our current direction from EM-50 is to keep operating as we have and not to make any significant changes until all budget issues are finalized. Therefore, the SCFA will continue operating under the assumption that it will receive its original target funding in FY02. The SCFA will use the information provided in the STTPs to justify our continuation of currently funded work. However, if the SCFA does receive a reduction in FY02 funding, some of the mortgaged STTPs we are requesting may not continue into the next fiscal year.

At this time, the SCFA is evaluating the technical and relevance reviews for projects conducted at the March SCFA mid-year review. Since this activity will take some time to complete, the SCFA will forward any pertinent comments, which would affect out-year scope, to the Technical Program Officers (TPOs) during the STTP comment resolution period when the SCFA PEG is finalized.

If you identify a project(s) that is not listed on Attachment 2 that needs to be funded in FY02 or if the estimated funding level is in error, please contact Carl Lanigan at the SCFA Lead Office immediately. In addition, there are a few TTPs listed in Attachment 2 that address technical support activities (i.e., SCFA Lead Laboratory). The SCFA Lead Office will expect STTPs for those activities, however only those items identified in Attachment 1 that are pertinent to technical support need to be addressed.

Please provide STTPs using the Work Authorization Module (WAM) format. The WAM template can be downloaded from the following web address:

www.saic-rs.com/ars/ars2001/peg2001.asp/

SCFA expects submission of STTPs for Accelerated Site Technology Deployments (ASTD)/Technology Deployment Initiative projects which will baseline scope, cost, and schedule for FY02 and identify any changes from the original proposal. These projects require an STTP prepared in accordance with the guidance in Attachment 1 addressing only those items applicable to an ASTD project. They must have milestones identifying deployment start and finish dates, be in agreement with deployment plans, or clearly identify any changes from those plans.

Those TTPs identified continuing in FY02, with FY01 carryover funding only, must also submit a close out TTP that identifies the activities and cost to complete the project in FY02. This includes ASTD projects.

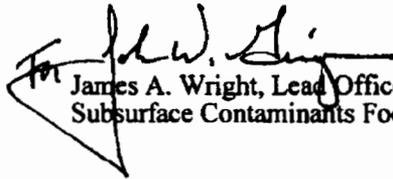
The STTPs are due May 11, 2000. Please provide both paper and electronic copies of your STTP to this office. The SCFA Lead Office will review these documents and work with the Principal Investigators and Technical Program Officers to resolve any comments. Please note that this STTP is normally submitted to EM-50 in August and is considered the baseline for the project.

After the SCFA presents its FY02 program to EM-50, the Lead Office will transmit additional guidance for completing Long Form Technical Task Plans LTTPs. Any changes to part 1 of the LTTP (which is the STTP) must be accompanied with a Task Change Request, since EM-50 has already baselined the document in August.

Although FY02 STTPs must address the life-cycle cost of the project, acceptance by SCFA does not constitute a commitment to fund the project in the out years. Funding is committed on a year-to-year basis through the appropriations process and projects are re-evaluated yearly.

In order to facilitate the promulgation of the call for proposals, this memo and its attachments will be sent by email to interested parties.

If you have questions concerning this memo, please call Carl Lanigan of my staff at (803) 725-0404.


James A. Wright, Lead Office Manager
Subsurface Contaminants Focus Area

SCFA:CL:rdg

OB-01-022

2 Attachments:

- (1) SCFA STTP Preparation Guidance
- (2) SCFA FY02 Mortgaged Projects

TPOs

3

April 13, 2001

cc w/attach:

S. McMullin, PLM-SR
E. Phillips, PLM-OR
L. Yarbrough, PLM-AL
J. Jones, NV
K. Cohen, FETC

cc w/o attach:

M. Lankford, EM-53
S. Chamberlain, EM-53

MEMO SENT TO:

Technical Program Officers:

	<i>FAX NUMBERS</i>
P. Saxman, AL	505/845-4216
M. Dionisio, CH	630/252-2654
K. Nickel, FERN	513/648-3076
G. Schneider, ID	208/526-6249
R. Schrieber, NETL	304/285-4403
D. Maynor, OH	937/865-4402
P. Ko, OK	510/637-1646
C. Gist, OR	865/576-6074
C. Morgan, NV	702/295-1810
G. Huffman, RF	303/966-4763
M. Glasper, RL	509/372-4549
T. Treger, SR	5-3616 (Hand Carry)
G. Ashby, WETO	406/494-7298

ATTACHMENT 1

SUBSURFACE CONTAMINANTS FOCUS AREA SHORT FORM TECHNICAL TASK PLAN PREPARATION GUIDELINES

Proposals are to be prepared and submitted using STTP format. An STTP template is available in the EM server under www.saic-rcs.com/ars/ars2001/peg2001.asp.

The proposal format is as follows:

PROJECT TITLE Task Summaries:

Provide a summary (in the format shown below) for each task (A, B, C,...) included in the STTP

- 1. Task Title - Principal Investigators Name, FY02 Funding Level request, Joint funding (as appropriate)**
- 2. Key Problem Area Addressed:**
 - A. Brief overview of the needs to be satisfied by this task**
 - B. Links to End Users -** Specify the STCG Needs being addressed and links to EM Paths to Closure (PTC) Project Baseline Summaries (PBSs). The proposal should specify the primary need being addressed at the target demonstration site and specify the other needs for which this STTP provides a viable solution. Similarly, the proposal should specify the PBS that covers the target deployment site for the technology and the PBS that covers any other sites for which this technology may constitute a viable solution. This information is available from the IPABS system or can be found by using the STCG link located on the SCFA Home Page (www.envnet.org/scfa/links.htm)

End user commitment to the proposal should be identified as well as stakeholder acceptance.
 - C. Prior Year's Progress Summary -** Summarize project scope and accomplishments to date.
- 3. Technical Issues -** Describe any issues surrounding or impeding the technical response to the problem area being addressed.
 - A. FY01 Carryover Scope -** Please provide an estimate of FY01 funding to be carried over into FY02 and its associated work scope.
 - B. FY02 Technical Scope -** Describe the technical objectives, expected outcomes, and products of the FY02 work scope as it addresses the problem and issues.
 - C. Outyear Activities -** Note major activities for each year the project is expected to receive funding to complete development. Define the project completion date and expected out-year costs.

- D. Maturity Level/Gate Status** - Refer to the Gate Model for development. Define the project's current maturity level/gate status.
- E. Impacts** - For each DOE site that may be affected by this technology, define the benefit in terms of cost reduction/avoidance, environmental restoration schedule compression, and/or risk reduction. It should also address the technology's ability to meet regulator requirements.
- F. Benefit** - Define for each site affected, what will be the benefit of using the proposed technology (e.g., will enable site to do ___ by year ___ and reduce mortgage, risk, etc.). Estimates for cost savings benefits from deployment of technologies are required. Therefore, please provide a cost savings estimate for this technology. SCFA acknowledges that this estimate may have significant uncertainty. SCFA requests that the Principal Investigator (PI) address this uncertainty by providing their best estimate of the potential cost savings and the uncertainty associated with it (e.g., +/-20%).
- G. Milestones** - Identify major accomplishments, deliverables, or decision points for each task and provide due dates. Number these sequentially (i.e. A1-01, A1-02; where A denotes the task, 1 denotes the work element, and 01, 02, etc., are the milestone sequence numbers). At a minimum, milestones are required for demonstrations, deployments, and ready for implementation. Additional milestones should be identified as needed for important deliverables, interim status of major activities (e.g., Gate reviews, Peer reviews, etc.), and actions necessary to support deployment (e.g., operational readiness reviews, technology safety data sheets, etc). Milestones must be identified as level: 1-HQ, 2-Focus Area, or 3-Contractor. Levels 1 and 2 refer to high-level project milestones that must receive HQ or SCFA approval if changed. SCFA expects transmittal of deliverables for HQ (level 1) milestones. Level 2 milestones, controlled by SCFA, must have Lead Office approval to be changed. Level 3 milestones are contractor controlled.

4. Budget Summary

- A. Life Cycle Costs** - Provide a budget summary that is a roll-up of costs for each task. Current year estimates must be supported by detailed, activity-based estimates for each task. Out-year estimates should represent the entire life of the task through closeout. Actual costs should be included for all prior years that the task was funded. Any unusual circumstances should be explained in a cover sheet. SCFA recognizes that such cost estimates may include considerable uncertainty, but SCFA is required to demonstrate end-point goals for each project, a reasonable schedule to achieve the project goals, and the ability to meet the end-users schedule requirements at a reasonable cost. The uncertainty in this estimate can be expressed in terms of "best estimate" and bracketed with a range of certainty (e.g., +/- 20%, or whatever percentage is appropriate for the project).

Project funding sources external to SCFA must also be identified. This includes money or in-kind services to be provided by private industry, other Federal Agencies, or the DOE Operations Offices. This should be noted in the narrative. Please note that only EM-50 funding has to be identified in the budget summary table and budget expense schedule.

B. Additional Costs: Adequate support costs (including travel) should be anticipated for the following technical review activities, which will be direct costs to the project, including, but not limited to:

1. Gate Reviews
2. Independent Peer Reviews
3. User reviews
4. Cost savings and Return on Investment analyses [e.g., Innovative Technology Summary Reports (ITSRs)]. All projects must prepare a camera-ready ITSr (in accordance with EM-50 guidance) in the project's final development stage.
5. Midyear Technical Review
6. Development of follow-on long form Technical Task Plans (LTTPs)

C. Spending Plan: The spending plan is a time-phased budget for the project in FY02 and is a roll-up of the spending plans for each task within the STTP. Spending plans for the individual tasks are based on scope and schedule for performing the work in FY02.

HQ00C221	JCEM Contaminant Transport Studies - Russian	CMST	SS01-MR	180	
AL10SS10	Lead Lab Technical Support-LANL	TSSFA	SS11-STCR	150	
AL20SS10	Lead Lab Technical Support-SNL	TSSFA	SS11-STCR	150	
AL21SS21	Engineering Design Guidance for Long Term Cover Performance Systems	SSFA	SS04-STCR	450	
AL11SS31	ASTD(01)-(P2-01) Field Demonstration of Multiple Permeable Reactive Barriers - LANL	SSFA	SS02-MR		Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necessitates the development of a FY02 STTP.
AL08SD12	ASTD(98TDI) Permeabel Reactive Treatment Wall for Rads and Metals	SSFA	SS05-MR		Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necessitates the development of a FY02 STTP.
AL08SD11	ASTD(98TDI) Alternative Landfill Cover System	SSFA	SS04-STCR		Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necessitates the development of a FY02 STTP.
AL01SS31	ASTD(01)-(P2-01) IN Situ Natural Biodegradation of Highly Explosive Contaminated Soil - Pantex Plant	SSFA	SS07-MR		Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necessitates the development of a FY02 STTP.
AL21SS22	Risked Based Performance Assessment of Long Term Cover Design for Waste Isolation and Disposal of DOE Facilities.	SSFA	SS04-STCR	250	
AL21SS23	Cover Performance Verification and Long Term Monitoring System	SSFA	SS11-STCR	500	
AL21SS24	Characterization of the Environmental Envelope for the Design of Long Term Covers	SSFA	SS04-STCR	255	
AL21SS31	Treatment of Mixed Contamination in Complex Hydrogeologic Settings (Vadose Zone)	SSFA	SS07-MR	600	
AL28C221	Alternative LF Cover Demonstration	CMST	SS11-STCR	600	
AL28SS10	Innovative Treatment Remediation Demonstration (ITRD)	SSFA	SS07-MR	1,000	
CH09SS10	Technical Connection Program (Techcon)	TSSFA	SS08-DNAPL	1,000	
CH11SS11	Lead Lab Technical Support - Ames	SSFA	SS08-DNAPL	150	
CH20SS10	Lead Lab Technical Support - ANL	TSSFA	SS08-DNAPL	150	
CH31SS11	Lead Lab Technical Support - BNL	TSSFA	SS08-DNAPL	150	
CH31SS20	Develop Perfluorocarbon Tracer Technology	SSFA	SS11-STCR	475	
FT10WE21	Interagency DNAPL (Task A)	WETO	SS08-DNAPL		0 Project does not continue into FY02

FT10WE21	Nontraditional In Situ Vit (Task F)	WETO	SS03-STCR	0	Project does not continue into FY02
FT10WE21	Mercury Cleanup at ORNL (Task N)	WETO	SS03-STCR	500	
FT10WE21	Ground Water Monitoring (LTS - Task L)	WETO	SS11-MR	350	
FT10WE21	Determination of conditions that affect U movement in the Hanford 200 Area.(Task M)	WETO	SS11-MR	412	
FT10WE21	Cost Savings Analysis/Tech Sum (Task K)	WETO	SSPM	250	
FT10WE21	Long Term Stewardship	WETO	SS11-STCR	300	
FT10WE21	Reactive Media (TaskE)	WETO	SS05-MR	0	Project does not continue into FY02
FT10WE21	DOE Contract Support & close out (includes NETL Overhead)	WETO	SSPM	188	
ID70SS11	Lead Lab Technical Support- INEEL	TSSFA	SS01-DNAPL	150	
ID79SS41	ASTD(99) Bioremediation and Natural Attenuation for In Situ Resotration of Chlorinated Solvents	SSFA	SS06-DNAPL	0	Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necesitates the development of a FY02 STTP.
ID78SS32	RTDF Bioremediation	SSFA	SS06-DNAPL	50	Product Line Integrator task will be transferred from this project into its own TTP (to be submitted by the site) in FY02. Estimated funding \$300K.
NV01C221	New Solicitation: Implementation of Geophysical/Chemical	CMST	SS01-DNAPL	300	
NV01C222	Long-Term Monitoring to Spt Land Stewardship	CMST	SS11-STCR	400	
NV01SS21	Coupled Environmental Process and Long Term Closure Cover Design	SSFA	SS04-STCR	270	
NV09C261	Technical and Programmatic Support to CMST	CMST	SSPM	450	
NV09SS21	ASTD (99) An Alternative Cover and Monitoring System	ASSFA	SS11-STCR	134	
OH00SS11	ASTD(00) Accelerated Groundwater Remediation	SSFA	SS05-DNAPL	0	Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necesitates the development of a FY02 STTP.
OH00SS31	ASTD(00) Permeable Treatment Wall	SSFA	SS11-MR	0	Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necesitates the development of a FY02 STTP.
OH01SS31	ASTD(01) Accelerated Excavstgion Control System	SSFA	SS10-MR	0	Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necesitates the development of a FY02 STTP.

OH10SS20	Long Term Stewardship at Fernald	SSFA	SS11-STCR	2,000	
OR01SS12	Interagency DNAPL Consortium (IDC)- Thermal Treatment Methods	SSFA	SS08-DNAPL	0	Project does not continue into FY02
OR00SS10	Lead Lab Technical Support-ORNL	TSSFA	SS08-DNAPL	150	
OR01SS11	Treatment in Difficult/Deep Conditions; Paducah, OR, Hanford-IDC DNAPL in Fractured Rock	SSFA	SS08-DNAPL	725	
OR01SS14	ASTD(01) In Situ Bioremediation	SSFA	SS05-DNAPL	0	Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necessitates the development of a FY02 STTP.
OH01SS32	ASTD(01) Improved Soil Washing	SSFA	SS07-MR	0	Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necessitates the development of a FY02 STTP.
OR01SS21	ASTD(01) Integrated Technology Suite for Delineation of Soil Contamination	SSFA	SS01-DNAPL	0	Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necessitates the development of a FY02 STTP.
OR01SS13	Novel Hotpoint DNAPL Detector for Subsurface Analyses	SSFA	SS01-DNAPL	420	Product Line Integrator task will be transferred from this project into its own TTP (to be submitted by the site) in FY02. Estimated funding \$325K.
OR09SS30	Reactive Barrier Performance	SSFA	SS11-DNAPL	650	
OR18SS35	Interagency Bioremediation Program	SSFA	SS06-DNAPL	100	
RL01SS11	Lead Lab Technical Support-Bechtel Hanford	SSFA	SS08-DNAPL	120	
RL09SS21	ASTD(99) Enhanced Site Characterization System	SSFA	SS01-MR	0	Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necessitates the development of a FY02 STTP.
RL30SS10	Lead Lab Technical Support-PNNL	TSSFA	SS08-DNAPL	150	
RL31SS20	Develop Enhanced Moisture Sensing and Cover Performance/Hanford Site Surface Barrier.	SSFA	SS11-STCR	200	
RL31SS31	Hanford Vadose Zone Characterization (Flow & Transport Processes)	CMST	SS01-MR	425	
RL35C223	JCCEM Contaminant Transport Studies	CMST	SS01-MR	600	
SF10SS11	Lead Lab Technical Support - LBL	TSFA	SS11-MR	150	
SF11SS13	Mapping DNAPL Transport and Contamination in Sedimentary and Fractured Rock Aquifers with-High Resolution Borehole Seismic Imaging	SSFA	SS01-DNAPL	369	
SF11SS34	Isotopic Tracers for Tracking Migration of Rads through the Vadose Zone	CMST	SS01-MR	159	

SF20SS10	Lead Lab Technical Support - LLNL	TSSFA	SS11-MR	150	
SF21SS21	Electrical Methods for Evaluating & Monitoring Geomembrane Caps	SSFA	SS11-STCR	175	
SR10SS10	Lead Lab Technical Support-SRTC	TSSFA	SS07-MR	150	
SR10SS15	Lead Lab Technical Support-SRTC	TSSFA	SS11-STCR	750	
SR11SS01	Interagency Monitored Natural Attenuation Remediation	SSFA	SS08-DNAPL	1,300	
SR09SS14	ASTD(99) Purge Water Management System	SSFA	SS01-DNAPL	0	Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necesitates the development of a FY02 STTP.
SR09SS32	ASTD(99) Improved Surface Water Monitoring System	SSFA	SS01-MR	0	Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necesitates the development of a FY02 STTP.
SR01SS11	ASTD(01) Dynamic Underground Stripping	SSFA	SS08-DNAPL	0	Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necesitates the development of a FY02 STTP.
SR09SS15	ASTD(99) Dynamic Underground Stripping 321M Solvent Storage	SSFA	SS08-DNAPL	0	Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necesitates the development of a FY02 STTP.
SR09SS31	ASTD(99) SRS Vdose Zone Monitoring System	SSFA	SS01-MR	0	Eventhough this project will not get any outyear EM-50 funding it is anticipated that funding will be carried over into FY02 which necesitates the development of a FY02 STTP.
SR11SS15	Cone Penetrometer Off-Surface Sensor-DNAPLS in Vadose Zone	SSFA	SS01-DNAPL	125	
SR11SS21	Long Term Cover Sys Functional Performance Assessment for Humid Climates	SSFA	SS11-STCR	100	Product Line Integrator task will be transferred from this project into its own TTP (to be submitted by the site) in FY02. Estimated funding \$250K
SR11SS29	Long Term Waste Stabilization Design for Long Term Cover System	SSFA	SS04-STCR	300	
SR16C221	Cone Penetrometer Sensor Testing and Evaluation	CMST	SS01-DNAPL	100	
SR16PL21	International Remediation Initiative (Poland)	SSFA	SS06-STCR	200	
SR17C221	Innovative DNAPL Characterization Technology	CMST	SS01-DNAPL	0	Project does not continue into FY02

Office of Science and Technology Program Execution Guidance

Program Execution Guidance for Field Demonstration of Multiple Permeable Reactive Barriers- Los Alamos National Laboratory

TTP Number: **AL11SS31** **SUBSURFACE CONTAMINANTS FOCUS AREA**

Authorization for Fiscal Year 2001 **ALBUQUERQUE OPERATIONS OFFICE**

Pollution Prevention

Product Line: SS03 SCFA METALS & RADIONUCLIDES IN VADOSE & SATURATED ZONES

Work Package: SS02 SCFA - Barrier Systems in the Vadose Zone/Contain & Control

Crosscut Program Affiliation: SS SUBSURFACE CONTAMINANTS FOCUS AREA

Contractor/Site: LANL UNIVERSITY OF CALIFORNIA (LANL)

TTP Points of Contact:

Field Program Manager	_____	Date: _____
	Jim Wright Office of DOE-SR	
	Phone (803) 725-5608 Fax: (803) 725-2123 E-mail: jamesb.wright@srs.gov	
HQ Program Manager	_____	Date: _____
	Kurt Gerdes Office of EM-64	
	Phone (301) 903-7289 Fax: (301) 903-7457 E-mail: kurt.gerdes@em.doe.gov	
HQ Financial Officer	_____	Date: _____
	Vicki Barden Office of EM-12	
	Phone (301) 903-8129 Fax: (301) 903-4978 E-mail: vicki.barden@hq.doe.gov	
TPO	_____	Date: _____
	Pam Saxman Office of DOE-AL	
	Phone (505) 845-6101 Fax: (505) 845-4216 E-mail: psaxman@doeal.gov	
Principal Investigator (PI)	_____	Date: <u>8/11/2000</u>
	<i>David Janecky</i> David Janecky Office of LANL	
	Phone (505) 667-8914 Fax: (505) 665-8118 E-mail: janecky@lanl.gov	
Other POC	_____	Date: _____
	Kaszuba John Office of LANL	
	Phone (505) 665-7832 Fax: (505) 665-4955 E-mail: jkaszuba@lanl.gov	

This list reflects ALL Points of Contact identified in the PEG/TTP document. Note that not all POCs are required to sign the document. For required signatures please refer to OST Standard Operating Procedures and/or other communications.

Work Scope Summary:

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opt name: PEG

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TTP Number: AL11SS31 Field Demonstration of Multiple Permeable Reactive Barriers- Los Alamos National Lab

SCFA project number AL-200-0013

Task Title: Field Demonstration of Multiple Permeable Reactive Barriers -- Los Alamos National Laboratory (LANL)

Proposed FY01 Funding level: \$800K

Proposed Schedule/Duration: October 2000 -- September 2001

Target Problem:

Mortandad Canyon, near Los Alamos National Laboratory, and its tributary canyons have received liquid waste discharges since 1951. Liquid effluents containing elevated concentration of strontium-90, tritium, plutonium-238, -239, -240, cesium-137, americium-241, nitrate, organic nitrogen and other contaminants have impacted alluvial groundwater within the canyon. A total of 342 million gallons of LANL effluent containing a total of 830 curies of radioactivity, were discharged into the canyon from 1963-1995. The regional drinking water aquifer lies at a depth of 970 feet and tritium has already been found at depths of 650 feet.

Since the May 2000, Cerro Grande Fire at Los Alamos, there is a particularly urgent aspect to this target problem as the fire has changed the groundwater chemistry such that U and Sr have been remobilized in these canyons and now exceed the MCLs. A position for a multibarrier has been identified in Mortandad Canyon that would be optimal for emplacement and for treating contaminants of nitrate, U, Pu, Am, and Sr. These radionuclides are stable in the dissolved phase and they also may adsorb onto colloids consisting of calcium carbonate, silica, ferric hydroxide, and solid organic carbon. Nitrogen species (nitrate and total Kjeldahl nitrogen) also occur in alluvial groundwater.

Treatability studies with actual groundwater and materials to be used in the field are underway and has shown promising results. The barrier will be emplaced and monitored to demonstrate effectiveness. The barrier will be emplaced between existing monitoring wells that have good historic data and that can be used for performance assessment.

Proposed Statement of Work:

This project proposes to develop a multiple permeable reactive barrier as a passive remediation option for alluvial groundwater within the canyons. LANL batch experiments conducted during FY00 using apatite, organic matter and calcium carbonate's reactive barrier material, have demonstrated over 99-percent removal of strontium-90, americium-241, plutonium isotopes and nitrate from canyon groundwater samples. Within a 16 day contact time with the barrier material, final activities and concentration of these contaminants met EPA and DOE drinking water standards.

A 30-foot deep by 10 foot thick multiple reactive barrier will be placed across a 100 foot section of the Los Alamos Canyon to passively remove the alluvial groundwater contaminants. The barrier will be equipped with shallow monitoring wells upstream, within and downstream of the engineered structure. This demonstration will build upon the large success achieved in laboratory experiments and will accelerate remediation schedules for alluvial groundwater within the canyon.

Cross-walk data: NA, new project in FY01

Proposed Deliverables:

1. Demonstration Project Plan, due 12/20/2000, a draft Project Plan will be due to the SCFA 11/15/00, any comments will be incorporated into the Final Project Plan due 12/20/2000
2. Monthly project tracking, due 20th of each month, a project activity report will be loaded into the LANL web-based PRS system.
3. Mid Year report, The PI will present a project status report at the SCFA mid year review.
4. Quarterly reporting, The PI will prepare quarterly reports for the IPABS data system at the end of each quarter.

Proposed Milestones:

Final Report, due 10/30/2001, The PI will prepare a report in the success of the project and its life cycle waste reduction and actualized DOE monetary benefits.

Performance Reporting: If at any time the project is experiencing significant cost or schedule variances the LANL EM Program Office will notify SCFA. If necessary a stop-work order will be issued until the projects activities/issues have been resolved to the satisfaction of the Focus Area.

Financial Planning Information:

BCWS (Current Year Spend Plan) (FY 2001)

rpl name: PEG

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LANL EM/TD

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TTP Number: AL113331

Field Demonstration of Multiple Permeable Reactive Barriers- Los Alamos National Lab

Fiscal Year Funding Request: (FY 2001)

Site Code	B/R Code	Prior Yr Uncosted C/O	Current Year Funding	Total Funding
LANL	EW4010	0	800	800
TTP Total:		0	800	800

Out Year Spend Plan:

Fiscal Year	2002	2003	All Subsequent Years
TTP Amount	0	0	0

Milestones:

TTP Level Milestones:

Milestone Code Number	Milestone Level	Milestone Title	Plan Date	Track in IPABS?
1	OPS	Final Report	10/30/01	No

Milestone Description:

rpt name: PES

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02

LANL EN/LD

505 685 818

12/08/00 10:00

TTP Number: AL11SS31

ASTD (01) - (P2) Field Demonstration of Multiple Permeable Reactive Barriers – LANL
FY'02 PEG

Task Title: Field Demonstration of Multiple Permeable Reactive Barriers – Los Alamos National Laboratory (LANL)

FY'01 Funding level: \$800K

FY'02 Funding Level=\$0K, FY'01 carryover projected \$60K

Schedule/Duration: October 2000 – December 2001

Target Problem:

Mortandad Canyon, near Los Alamos National Laboratory, and its tributary canyons have received liquid waste discharges since 1951. Liquid effluents containing elevated concentration of strontium-90, tritium, plutonium-238, -239, -240, cesium-137, americium-241, nitrate, organic nitrogen and other contaminants have impacted alluvial groundwater within the canyon. A total of 342 million gallons of LANL effluent containing a total of 830 curies of radioactivity, were discharged into the canyon from 1963-1995. The regional drinking water aquifer lies at a depth of 970 feet and tritium has already been found at depths of 650 feet. Since the May 2000, Cerro Grande Fire at Los Alamos, there is a particularly urgent aspect to this target problem as the fire has changed the groundwater chemistry such that U and Sr have been remobilized in these canyons and now exceed the MCLs. A position for a multibarrier has been identified in Mortandad Canyon that would be optimal for emplacement and for treating contaminants of nitrate, U, Pu, Am, and Sr. These radionuclides are stable in the dissolved phase and they also may adsorb onto colloids consisting of calcium carbonate, silica, ferric hydroxide, and solid organic carbon. Nitrogen species (nitrate and total Kjeldahl nitrogen) also occur in alluvial groundwater. Treatability studies with actual groundwater and materials to be used in the field are underway and have shown promising results. The barrier will be emplaced and monitored to demonstrate effectiveness. The barrier will be emplaced between existing monitoring wells that have good historic data and that can be used for performance assessment.

Proposed Statement of Work:

This project proposes to develop a multiple permeable reactive barrier as a passive remediation option for alluvial groundwater within the canyons. LANL batch experiments conducted during FY'00 using apatite, organic matter and calcium carbonate's reactive barrier material, have demonstrated over 99-percent removal of strontium-90, americium-241, plutonium isotopes and nitrate from canyon groundwater samples. Within a 16 day contact time with the barrier material, final activities and concentration of these contaminants met EPA and DOE drinking water standards. A 30-foot deep by 10 foot thick multiple reactive barrier will be placed across a 100 foot section of the Los Alamos Canyon to passively remove the alluvial groundwater contaminants. The barrier will be equipped with shallow monitoring wells upstream, within and downstream of the engineered structure. This demonstration will build upon the large success achieved in laboratory experiments and will accelerate remediation schedules for alluvial groundwater within the canyon.

Proposed Deliverables:

1. Demonstration Project Plan, due 12/20/2000, a draft Project Plan will be due to the SCFA 11/15/00, any comments will be incorporated into the Final Project Plan due 12/20/2000, Status: Done
2. Monthly project tracking, due 20th of each month, a project activity report will be loaded into the LANL web-based PRS system, Status: completed to date.
3. Mid Year report, The PI will present a project status report at the SCFA mid year review, status: The PI attended the SCFA mid-year in Atlanta, Georgia. A poster and a talk summarizing the project were presented.
4. Quarterly reporting, The PI will prepare quarterly reports for the IPABS data system at the end of each quarter, status: completed to date.

Proposed Milestones:

Final Report, due 10/30/2001 reforecast to 11/30/01, The PI will prepare a report on the projects success and its Life cycle waste reduction and actualized DOE monetary benefits.

Prior Year Progress:

The project plan was finalized January 23, 2001 Preliminary geohydrologic assessments of Mortandad Canyon were conducted as a prelude to field investigation and site characterization activities. After delays with the procurement process, the RFP for the subcontractor (required for barrier design/installation) was issued on February 28, 2001. The award letter was issued April 19, 2001.

Field investigation/site characterization planning meetings with the subcontractor began April 26, 2001. The scope of the task is to characterize two candidate sites for hydraulics, saturated water column, potential waste disposal, water chemistry, and geotechnical characteristics. The report of field investigations is due June 28, 2001. The conceptual design and cost estimate for final design/field implementation is due July 23, 2001. The schedule for the final design (July 23 to August 13) and field implementation (August 20 to October 1) will be refined in the conceptual design.

The LANL ESH-ID Review Process was begun and continues. This process provides a formal, systematic, and documented approach for risk identification and hazard management and provides quality, safety, health, and environmental protection. It is also the mechanism that identifies permit requirements. We currently await the results of a Threatened and Endangered Species survey in Mortandad Canyon. The ecological disruption from the Cerro Grande Fire precludes any prediction of what survey's results.

The schedule assumes that the results of the Threatened and Endangered Species survey will permit field work beginning May 15, 2001. Currently, no noise-generating activities are allowed in the canyons while the surveys are being conducted. If nesting owls are found near the work zone, all work will be prohibited until Aug 31, 2001.

FY'02 Closeout Scope:

Preliminary performance assessment activities will be performed in October, 2001. Final report milestone will be submitted by November 30, 2001. This schedule represents a delay of approximately 30 days for the milestone report.

In the event of delays due to Threatened and Endangered Species in Mortandad Canyon, the aforementioned schedule will be delayed approximately 16 weeks.

No FY02 funds are in the budget. It is anticipated that FY01 funds will carry over to complete FY02 scope. rpt name: PEG

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