PARTNERS IN ENVIRONMENTAL TECHNOLOGY

FALL 2000
NUMBER 6

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PARTNERS IN ENVIRONMENTAL TECHNOLOGY

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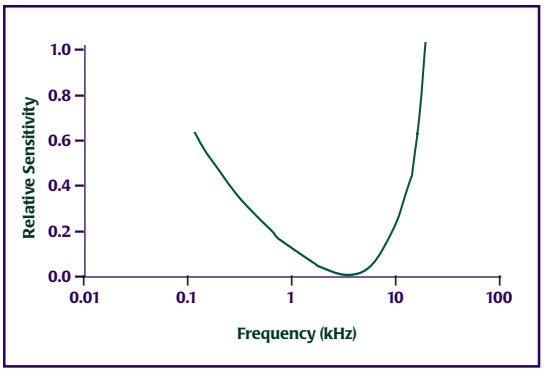
INFORMATION

B•U•L•L•E•T•I•N

SERDP Sponsors Development of Innovative Information and Technology Tools to Predict Potential Effects of Military Noise on Marine Mammals

Navy and merchant ships around the world produce a variety of sounds that transmit through water for long distances. Until now, the auditory anatomy and acoustic ecology of marine mammals has not been studied extensively and, therefore, assessments as to the effect of these sounds on the health and reproductive capabilities of the many marine mammals has been incomplete. Under SERDP sponsorship, Dr. David Helweg, of the Marine Mammal Research Branch of the U.S. Navy's Space and Naval Warfare Systems Center (SPAWAR) laboratory in San Diego, is spearheading a complex program *(CS 1082: Information Technology Tools for Assessment and Prediction of the Potential Effects of Military Noise on Marine Mammals)* to understand the hearing capabilities of marine mammals and the possible sensitivities and responses to various noise sources, including those produced by military and merchant ships.

The first part of the project consists of detailed investigations of marine mammal auditory anatomy. This effort is being led by Dr. Darlene Ketten at the Woods Hole Oceanographic Institution (WHOI). The goal is to gain understanding of normal variation in marine mammal ear structures, including variables such as how the ears of dolphins change with age (just as human ears do) and how gender may influence the aging process. A second goal is to relate observed anatomical differences to hearing ability, which is known for only some marine mammal species. By combining understanding of anatomy and hearing, predictions can be made as to the ear structures most susceptible to damage from underwater sound exposure, estimations of auditory sensitivity from anatomical measurements, and anatomical changes that are not normal. The anatomical measurements are being made through the use of CT/MRI scans and transmission electron and light microscopic histology of preserved ear material of recently deceased animals.



Top: North Pacific Humpback Whale
Bottom: Predicted audiogram for Humpback Whale

The second part of this research project combines expertise in marine mammal auditory anatomy with state-of-the-art computer techniques to produce computational models of baleen whale hearing. These computational models ("*WhalEar*" models) provide predictions of the relative sensitivity of

See MARINE MAMMALS, page 6

S•U•C•C•E•S•S STORIES

SERDP-funded research and development efforts and ESTCP-funded demonstration and validation activities continue to provide a rapidly increasing number of outstanding technical advances. These developments are highly important and relevant to the Department of Defense (DoD), Department of Energy (DOE), Environmental Protection Agency (EPA), and many other user communities.

SUCCESS STORY

Leak Detection System Provides First Online Monitoring of Bulk Fuel Storage Tanks

The DoD owns more than 1,000 underground storage tanks (UST) of varying capacities. Although Federal regulations have deferred bulk USTs from monthly monitoring, state regulators now are imposing stringent monitoring requirements. This presents a unique problem for the DoD because it is a primary owner of bulk USTs, and no online system currently exists that meets both monthly and annual testing requirements for these tanks. To address this situation, ESTCP is funding a demonstration/validation test of the Low Range Differential Pressure (LRDP) leak detection system for bulk fuel USTs *[CP-9806: Validation of the Low Range Differential Pressure (LRDP) Leak Detection System for Small Leaks in Bulk Fuel Tanks]*. The LRDP is a differential pressure measurement system capable of detecting very small leaks. This system relies upon a closed reference tube that is the same height as the tank and is filled with fuel to the same level as the fuel in the tank. The reference tube configuration enhances the precision of the differential pressure sensor measurements by significantly reducing the dynamic range required of the sensor. This allows the use of a dependable and robust off-the-shelf differential pressure transducer, while maintaining the precision required to meet bulk tank leak detection regulatory standards.

Demonstration/validation tests have been completed for both vertical and horizontal wall tanks at the following two locations: at Hunter Army Airfield, Georgia, a 50,000 gallon horizontal tank and at Point Loma, California, a 2.1 million gallon vertical tank. The demonstration at Hunter Army Airfield showed that the LRDP could meet the EPA's UST regulation for monthly and annual monitoring of leaks greater than 0.2 gallons per hour. The Point Loma test results provide numerous LRDP testing options that give fuel farms the needed operational flexibility while still meeting regulatory testing requirements. Third-party certification was conducted by Ken Wilcox and Associates on the Point Loma tank. A test can be performed overnight, in 10 hours, as well as in 24 hours, depending on performance requirements. The 24-hour tests can be averaged together to meet the annual testing requirements. The system is fully integrated into the Fuels Accounting System and is a stand-alone system.

Currently, the LRDP leak detection system is the only online system capable of performing monthly and annual monitoring of bulk USTs. Demonstrations have shown that it is easy to install, set up, and operate. The software is easy to use and requires minimal training. The system is made with off-the-shelf components and sensors with a proven record of durability, long-term stability, and low maintenance. This technology will provide facility operators with valuable tank integrity information and will serve as an invaluable tool to detect and prevent leaks from bulk fuel storage tanks. The LRDP is not a site-specific technology, and its performance is not affected by site geology or topographic factors. It can be implemented in any size tank of any configuration. The LRDP is listed by EPA's National Work Group for Leak Detection Evaluations (http://www.epa.gov/swerust1/ustsystm/nwgolde.htm) and has regulatory approval in California. Additionally, following EPA procedures, it has been evaluated for performance by an independent third-party and is ready for initial commercial sales.

For more information, please contact Ms. Leslie Karr, Naval Facilities Engineering Center, Port Hueneme, CA, at (805) 982-1618 or via e-mail at karrla@nfesc.navy.mil. ◆

LRDP leak detection system successfully demonstrated at 2.1 million gallon bulk fuel tank at Point Loma, CA

SERDP
Strategic Environmental Research and Development Program

SUCCESS STORY

Low-VOC CARC Successfully Transitions into Field-Scale Demonstrations as Environmentally Friendly Drop-In Replacement

Chemical warfare survivability is mandated by Army Regulation 750-1, which the Marine Corps also follows. This dictates that all tactical equipment (including combat, combat support, and essential ground support equipment; tactical wheeled vehicles; and aircraft) must be hardened against performance degradation caused by chemical warfare agents and decontamination procedures. In essence, therefore, virtually everything in the Army and Marine Corps inventory, in addition to Air Force vehicles and equipment procured through the Army, is painted with chemical agent resistant coatings (CARC) that meet one of two military specifications, MIL-C-46168 or MIL-C-53039.

Affecting this process, however, is the fact that Federal and local regulations based on the Clean Air Act and its amendments have resulted in restrictions on the amount of volatile organic compound (VOC) emitted during the application of protective coatings, such as CARC. The military specifications for the topcoats noted above have VOC limits set at 3.5 lb/gal, but local governments are permitted to set lower limits, and many, such as the San Diego Air Quality Management District (which has a limit of 2.8 lb/gal), have done so. In addition, total emission restrictions imposed on some facilities are such that a limit of 1.8 lb/gal must be achieved for the facility to stay in production. Finally, many of the coatings solvents are hazardous air pollutants (HAP), either as listed by the Clean Air Act Amendments of 1990 or targeted by the Environmental Protection Agency 33/50 Industrial Toxics Project.

To address this need, the Army Research Laboratory, under SERDP sponsorship, has successfully used recent developments in polymer and pigmentation technology to develop a high performance water reducible (WR) CARC polyurethane topcoat. The formulation, developed under SERDP Project *PP-1056: Low VOC Chemical Agent Resistant Coatings (CARC)*, succeeded in meeting the VOC objective of 1.8 lb/gal and has eliminated HAPs as well. In addition to being fully environmentally compliant, the new coating shows significant performance enhancements, such as improvements in low-temperature flexibility, mar resistance, and weathering durability. U.S. Patent No. 5,691,410 has been awarded for the WR formula that was the basis of the SERDP effort.

All application and stripping studies were completed using the pilot plant material produced by Hentzen Coatings, Inc. and The Sherwin-Williams Company. The data indicate that the new WR CARC topcoat will perform as a "drop-in" replacement to the current coating, requiring no significant process changes in application or removal. This formula was optimized for all five DoD Service colors, and industry partners have manufactured initial quantities of each color (camouflage green, brown, black, desert tan, and Air Force green) required by the Services.

With this new formulation, an estimated four million pounds of VOC emissions will be eliminated annually, and an equipment cost avoidance of $60 million and an annual operating cost savings of $3 million are predicted at 12 DoD facilities.

As part of a follow-on transition effort sponsored by ESTCP, the technology is being proven by production operators under a variety of climatic conditions at three DoD facilities. The first site is the Marine Corps demonstration site at Barstow Logistics Base in California which currently is restricted in its use of

Camouflage tank at Barstow Logistics Base painted using SERDP/ESTCP-developed low-VOC CARC.

CARC topcoat because of environmental considerations. The base primarily uses a waterborne polyurethane coating that is not chemical agent resistant. The production facility location in the Mojave Desert represents an extreme (dry) climatic condition which has been utilized successfully by the Marine Corps and Navy to demonstrate new coating materials. As the second site, the Ogden Air Logistics Center in Utah is the only Air Force site where CARC topcoat currently is being applied. As such, the Ogden Air Logistics Center is in an excellent position to compare the drop-in nature of the new coating for its facility. Finally, the Army's demonstration site, Tobyhanna Army Depot in Pennsylvania, is a large-scale user of CARC topcoat and is the Army Center of Excellence for painting for the depot community. The site provides a relatively humid environment that adds to the desired variety in climatic conditions of the demonstration sites.

The first demonstration of the new WR CARC technology was conducted during the week of May 8, 2000, at the Marine Corps Barstow facility where defense equipment was painted under production conditions. Materials coated included a light armored vehicle, a five-ton truck, and two high mobility wheeled vehicles. The demonstration proved to be highly successful in demonstrating the drop-in nature of the new coating. Barstow painters were impressed with the ease of application and the excellent appearance of the

See CARC, page 7

FY 2001 Program Development Process Nearing Completion

SERDP

During the last half of July, the Technology Thrust Area Working Groups (TTAWG) met to review the proposals and make their recommendations to the Executive Director. Out of the 161 full proposals that were received, 30 projects were selected for funding resulting in a selection rate of 18 percent. Of the 30 selected projects, 13 were led by U.S. Government organizations, 12 were led by Academia, and the remaining 5 were led by Private Industry. In addition, 10 SEED projects were selected from among the 106 proposals received. Of those selected, 5 were from Government, 3 were from Academia, and 2 were from Private Industry. SERDP Executive Director Mr. Bradley Smith and SERDP Technical Director Dr. Jeffrey Marqusee worked with the individual SERDP Program Managers for each Thrust to help prepare Principal Investigators (PI) for their briefings to the Scientific Advisory Board that met during August and September to review and provide funding recommendations to the SERDP Council. Following completion of the SAB review, SERDP management prepared a draft FY 2001 Program and forwarded it to the SERDP Executive Working Group for concurrence prior to meeting with the SERDP Council to ask for its approval of the Program. The Council meeting was scheduled to be held September 27.

Planning for the FY 2002 Program is well on the way. TTAWG members and SERDP staff have canvassed the user community to assess their priority environmental needs for research & development and currently are formulating the FY 2002 Statements of Need. These will be released to the private and public sectors in the form of a Broad Agency Announcement (BAA) and Federal Call for Proposals, respectively, on or about November 9, 2000. Please refer to the SERDP web site for additional information regarding the solicitation.

ESTCP

During the month of August, multi-Agency Review Committees reviewed proposals from both Federal and non-Federal submitters. Prior to briefing these Committees, each of the non-Federal proposers was linked with a DoD liaison who assisted in identifying candidate demonstration sites as well as in providing DoD relevant information for inclusion in the final proposal and briefing. Using the recommendations of the Review Committees, a draft Program is submitted to Ms. Sherri Goodman, the Deputy Under Secretary of Defense for Environmental Security (DUSD/ES), for final approval. Upon receipt of this approval, correspondence requesting an Execution Plan and scheduling a kickoff conference call was to be forwarded to each Project Manager.

ESTCP's FY 2002 Program development effort also is moving forward with topic areas being identified for a January 10, 2001, release date via a BAA to non-Federal organizations, a Call for Proposals (CFP) to non-DoD entities, and a CFP to DoD facilities. Watch the ESTCP web site for an update on the FY 2002 solicitation. ◆

SIX-HOUR BIOREMEDIATION COURSE TO BE OFFERED FREE OF CHARGE

in conjunction with the Partners in Environmental Technology Technical Symposium & Workshop

THURSDAY, NOVEMBER 30, 2000 ◆ 10:00 AM-5:00 PM* ◆ HYATT REGENCY CRYSTAL CITY ◆ ARLINGTON, VA

Presented by the Interstate Technology and Regulatory Cooperation (ITRC) Work Group and the Remediation Technologies Development Forum (RTDF)

Sponsored by the U.S. DOE Office of Science & Technology and ECOS with support from the U.S. EPA Technology Innovation Office and ESTCP

This special one-day course will provide environmental professionals with an overview of bioremediation technologies now being deployed for clean up of chlorinated solvents, regulatory requirements associated with these technologies, and barriers to regulatory and public acceptance of these technologies.

Attendance Is Limited! Don't Miss Out—Register Now!

Registration is limited to the first 80 respondents and will close October 30, 2000. To register, send a brief e-mail to PARTNERS@HGL.COM. The subject line of your e-mail should read *Bioremediation Course Registration.* Include your name, job title, organization, address, and telephone number in your e-mail. Registrations will be confirmed by e-mail by November 3, 2000.

QUESTIONS? Call (703) 736-4548.

*** The class start time and end time is approximate. The course will begin at the morning break of the Symposium & Workshop technical sessions. There will be a one-hour break at about Noon for lunch on your own.**

Joint Workshop Addresses Cultural Resource Issues

A Cultural Management Workshop, jointly sponsored by the SERDP Program and DoD's Legacy Resource Management Program (Legacy), was held June 13 through 16, 2000, at the Patuxent River Naval Air Station (NAS), Lexington Park, MD. The workshop was organized in response to the need to define how research, development, and demonstration technologies can provide improved methodologies and processes for the management of DoD's cultural resources. Sixty participants attended the workshop, including representatives from academia and the Services.

Important working hypotheses governed the design and content of the workshop. The first hypothesis is that it is possible to manage cultural resources on military bases while operations are ongoing. Additionally, efforts to manage cultural resources are supportive of specific military missions and to overall military mission readiness. These efforts advance the science of cultural resource management in general, and therefore, are of interest to the scientific community and improve the management of cultural resources on DoD lands and waters, including the identification, preservation, and conservation of cultural resources.

The Workshop included an introductory session, a plenary session, four breakout groups, field trips, and a wrap-up session. The introductory session provided the focus and expected outcomes for the Workshop and the current status of cultural resource management across DoD. The plenary session allowed the chairpersons of the four breakout areas to "set the stage" as to matters that would most likely be discussed by their respective teams and offer a basis to initiate discussions during breakout sessions.

Four focus areas were defined to encompass the breadth of issues related to management of cultural resources (i.e., Find It, Conserve/Preserve It, Manage It, Apply It). Each focus area group was tasked with defining the major knowledge gaps and, therefore, research, development, and demonstration needs that addressed the interests of the focus area.

- "Find It" addressed the application of remote sensing and modeling to locate and assess cultural resource artifacts (e.g., building foundations, land-buried artifacts, underwater artifacts, etc.).
- "Conserve It" concentrated on the issues related to conserving and preserving buildings, artifacts, and documents.
- "Manage It" dealt with field documentation and data management issues.
- "Apply It" centered on communication issues relevant to stakeholders such as Native American tribes, public groups, and regulatory bodies.

Several points were raised across the four focus areas. One of the primary areas related to the problem of locating archeological sites on DoD installations in general. There continues to be a need to be able to locate the sites using probability methods and by remote sensing techniques in order to reduce human involvement. The DoD, with its requirement for extensive and intensive land and coastal training, may put cultural resource sites at risk without rapid methods to detect them.

Additional topics of discussion by the participants addressed sampling methods and techniques to determine what may be present when a possible site has been identified and decision processes for removal or retention of the material. These are major hurdles for installation cultural resource and land management personnel. Upon sample removal, the processes of preservation and conservation must be undertaken in order to retain and maintain these items for historical as well as cultural purposes. These processes require large commitments of time and effort on the part of installation managers, and, therefore, better means must be identified for long-term categorizing and maintenance as well as integration of these processes into the overall management of natural and cultural resources on the installations. Included in these management schemes is the need for integration of diverse groups of stakeholders and communication amongst them in order to increase the knowledge of the processes while honoring and respecting those cultures that are involved.

Interspersed with the workshop agenda were field trips that afforded participants the opportunity to see and experience hands-on applications of cultural resource management efforts. These included a private tour of Historic St. Mary's City, the Jefferson Patterson Park and Museum, an on-site base tour of NAS Patuxent River, and the Piscataway Indian Museum. The workshop ended with all of the participants engaged in a discussion led by the focus area chairs to summarize the outcomes of the breakout sessions.

The report of the Workshop will be used as a basis for identifying important research and development gaps needed to be addressed to advance the management of DoD's cultural resources. ◆

F ◆ A ◆ Q s

from SERDP and ESTCP Principal Investigators

SUBJECT: SEED FOLLOW-ON PROCESS

Q: *How does a funded SERDP Exploratory Development (SEED) project receive outyear funding?*

A: Recently, SERDP has developed a new model to address continuing SEED projects. The foundation of this model includes rigorous technical review of completed work, as well as an independent peer review of the proposed new work. Upon completion of the initial one-year effort, the PI will brief the TTAWG on the project's significant accomplishments in the attainment of the project's objectives and proposed effort should the project be recommended for continuation. With a TTAWG recommendation, a new proposal will be written and submitted for peer review. If acceptable to the TTAWG, the PI would be requested to brief the Scientific Advisory Board for final review. A recommendation from the Board would allow the Executive Director to provide funding to the PI if adequate funds are available.

SUBJECT: PROJECT FUNDING SCHEDULES

Q: *What is the anticipated funding schedule for SERDP and ESTCP projects, and who should I contact if I have questions or problems related to receiving my funds?*

A: For non-Federal projects, given the process that is required to establish contracts, PIs generally will not receive their FY 2001 funds until March 1, 2001, for the first year's efforts. Second and subsequent year funding should be received by January 1 after the beginning of the fiscal year, because the contract already will be in place. For Federal projects, PIs generally will receive their funds at the beginning of January 2001. If you are a PI and are experiencing difficulties in the receipt of your funds, please contact your Program Manager.

SUBJECT: SYMPOSIUM & WORKSHOP ISSUES

Q: *I am with the Army and am in the process of registering for the Symposium & Workshop. The Symposium hotel is not on the approved list for the Army Lodging Success Program. Can I stay at the Symposium hotel?*

A: Yes. A waiver has been obtained that allows you to stay at the Hyatt Regency Crystal City in Arlington, Virginia, which is the site of this year's *Partners in Environmental Technology Technical Symposium & Workshop.* The group non-availability number for the event is 163326, issued June 7, 2000, by the Army Lodging Program.

Q: *I have been selected to be a technical speaker at the upcoming Symposium & Workshop. I am preparing my presentation and wonder what formats are available to me?*

A: This year, technical presenters will have the option of using either electronic or standard view graph format for their presentations. Should you choose to use the electronic format, you will need to submit your presentation in advance so that technical arrangements can be handled prior to the Symposium & Workshop. For specific information, refer to the Guidance Package for Presenters that you should have received earlier this month. ◆

MARINE MAMMALS, from page 1

each whale species to different sound types to which the whales may be exposed. Dr. Ketten at WHOI is deriving estimates of auditory sensitivity for several species of baleen whale. The sensitivity measures are integrated with comparative psychoacoustical information to predict a hearing sensitivity curve for each whale species. Dr. Dorian Houser, a National Research Council postdoctoral fellow, uses the SPAWAR High Performance Computer to derive an optimal filter configuration for each whale hearing curve using Evolutionary Programming algorithms. As an example, the predicted audiogram for humpback whales is shown on the front page and suggests that humpbacks hear sounds in about the same range as humans. The *WhalEar* filter sets represent the hearing of a species of whale and have been used to predict sensitivity to many types of manmade underwater sounds, such as sonar and seismic exploration waveforms, and the potential masking of whale communication calls by such sounds. The *WhalEar* models are the first step toward accurately predicting the risk of marine animals to harassment from underwater sound.

In the final part of the study, the findings of the previously described tasks are integrated into tools to help reduce the exposure of free-ranging whales to anthropogenic sound. This is being accomplished through the development of a toolkit designed to streamline the use of hydrophone arrays to monitor calling whales at sea. The *Smart Whale Acoustic Monitor* (*SWAM*) toolkit provides an inexpensive signal processing system that detects whale calls, identifies the species, and estimates the location of the calling whale. When compiled over time, these data provide a summary of relative whale abundance and distribution. These data can assist the naval operations manager to better plan activities that generate underwater sounds. The *SWAM* toolkit also contains the *WhalEar* models and sound propagation tools, which combine to provide the user with the ability to predict the relative sound exposure of free-ranging whales.

The results of this research have provided a better understanding of the auditory anatomy and acoustic ecology of marine mammals. The models developed will assist in predicting the susceptibility of certain marine mammals to military noise and also will aid the military in determining the abundance and distribution of marine mammals in order to maintain military testing and training.

For additional information about this project, please contact Dr. David Helweg, Marine Mammal Research Branch, Space and Naval Warfare Systems Center (SPAWAR), San Diego, CA, at (619) 533-5592 or via e-mail at helweg@spawar.navy.mil. ◆

PROGRAM NOTES

S◆E◆R◆D◆P

- **BOTH THE SERDP FY 2002 CORE SOLICITATION AND THE SOLICITATION FOR THE SERDP EXPLORATORY DEVELOPMENT (SEED) PROGRAM WILL BE RELEASED ON OR ABOUT NOVEMBER 9, 2000.** Watch the SERDP web site for the latest information and schedule.
- **THE PROGRESS DATA FOR THE FOURTH QUARTER OF GOVERNMENT FY 2000 IS DUE OCTOBER 31, 2000.** Beginning in FY 2001, Progress Reports and Monthly Financial Reports will be due on the 15th of the month following the end of the quarter/month, as appropriate. For assistance, contact your Program Manager Assistant.

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- **A FEDERAL CALL FOR PROPOSALS AND BROAD AGENCY ANNOUNCEMENT SOLICITATION FOR ESTCP FY 2002 PROJECT FUNDING** is expected to be released on or about January 10, 2001. Watch the ESTCP web site for the latest information and schedule.
- **THE PROGRESS DATA FOR THE FOURTH QUARTER OF GOVERNMENT FY 2000 WAS DUE OCTOBER 5, 2000.** Beginning in FY 2001, Progress Reports and Monthly Financial Reports will be due on the 15th of the month following the end of the quarter/month, as appropriate. For assistance, contact your Program Manager Assistant.

Congratulations to . . .

DR. MEL ROQUEMORE who was selected as the winner of the prestigious 2000 Air Force Science & Engineering Management Award. Dr. Roquemore has distinguished himself as an Air Force laboratory technical manager in fundamental and applied combustion research and development. Not only has he demonstrated a tremendous grasp of the technology, but he brings an intense enthusiasm to the work and an exceptional ability to form national and international teams. Dr. Roquemore has been particularly prolific in his management and leadership relative to the invention and development of trapped vortex combustor (TVC) technology for use in gas turbine engines. This innovative combustor concept holds great promise for future military and civilian low-emissions high-performance gas turbine engines.

In addition to his role as Principal Investigator (PI) on the SERDP-funded TVC project, Dr. Roquemore is also the PI on another SERDP project and is a member of two additional research teams, one for SERDP and one for ESTCP.

CARC, from page 3

finished products. Test panels and vehicles were coated concurrently and will be used to validate properties such as agent resistance, adhesion, impact resistance, flexibility, abrasion resistance, accelerated weathering, and strippability. The demonstrations for Ogden Air Logistics Center and Tobyhanna Army Depot are in the planning stages and will be conducted in the 4th Quarter FY 2000 and the 1st Quarter FY 2001, respectively.

For additional information, please contact Mr. Robert Katz, U.S. Army ARDEC, Picatinny Arsenal, New Jersey, at (973) 724-6518, or via e-mail at rkatz@pica.army.mil. ◆

PARTNERS IN ENVIRONMENTAL TECHNOLOGY

STRATEGIC ENVIRONMENTAL RESEARCH AND DEVELOPMENT PROGRAM (SERDP)
&
ENVIRONMENTAL SECURITY TECHNOLOGY CERTIFICATION PROGRAM (ESTCP)

INFORMATION

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FALL 2000 NUMBER 6

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FOR SERDP AND ESTCP

OCTOBER 2000

October 16-17
Scientific Advisory Board Meeting

October 31
SERDP Progress Report due for the fourth quarter of Government FY 2000

NOVEMBER 2000

November 9
The FY 2002 Core Solicitation for SERDP as well as the solicitation for the SERDP Exploratory Development (SEED) Program to be released on or about this date

November 28-30
SERDP and ESTCP Partners in Environmental Technology Technical Symposium & Workshop, "Environmental Challenges for the Next Decade," Hyatt Regency Crystal City, Arlington, VA

DECEMBER 2000

December 15
ESTCP New Start Projects to initiate monthly financial reporting

JANUARY 2001

January 10
A Federal Call for Proposals and a Broad Agency Announcement for ESTCP FY 2002 Project Funding to be released on or about this date

January 15
ESTCP Quarterly Reports for the first quarter of Government FY 2001 due

January 15
SERDP Progress Data for the first quarter of Government FY 2001 due

RELATED CONFERENCES & EVENTS

October 16-19
16th Annual International Conference on Contaminated Soils, Sediments, and Water
University of Massachusetts, Amherst
Amherst, MA

For more information, see www.aehs.com.

October 16-20
Interstate Technology and Regulatory Cooperation (ITRC) Work Group Fall Conference
"New Environmental Technologies and Market Opportunities"
St. Anthony Hotel
San Antonio, TX

For more information, see www.itrcweb.org.

December 11-14
Eleventh Annual International Workshop on Solvent Substitution and the Elimination of Toxic Substances & Emissions
The Radisson Resort & Spa Scottsdale
Scottsdale, AZ

For more information, call (202) 296-2814, Ext. 26, or visit http://www.exchangemonitor.com.

INFORMATION

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