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Navy's National Test Site at Port Hueneme: Advancing Remediation Technologies for Fuel Hydrocarbon Contamination

Cleanup of Department of Defense (DoD) hazardous waste sites is a problem of tremendous scale and technical complexity. Reliable, cost-effective, proven technologies able to meet DoD contaminant characterization and remediation goals are needed. Commercialization is hampered by technology transfer and lack of adequate facilities for demonstration of innovative remediation concepts under controlled conditions.

The DoD National Environmental Technology Test program unites the Services -- Air Force, Army, and Navy -- with the U.S. Environmental Protection Agency and the Department of Energy to conduct field demonstrations of environmental remediation technologies. Research and development efforts supported by the Federal Strategic Environmental Research and Development Program (SERDP) and a number of other federal, state, and industrial sponsors are leading to more cost-effective solutions to the hazardous materials and toxic spill cleanup problems. These technologies can then be applied to problems across the nation.

The Port Hueneme National Test Site (NTS) along with three other DoD and EPA NTSs are addressing these obstacles by providing a network of well-characterized test sites where technologies can be field-tested under known conditions against established standards. The NTS mission is to develop and maintain research and development platforms for testing, evaluation, and validation of promising environmental cleanup and monitoring technologies.

The Advanced Fuel Hydrocarbon Remediation NTS located on the Naval Construction Battalion Center, Port Hueneme, California, emphasizes remediation of fuel hydrocarbon contamination in soil and

groundwater. A secondary emphasis is on polychlorinated biphenyls (PCBs) and solvents.

The NTS infrastructure at Port Hueneme includes monitoring wells, an in-line sensor network, contaminated soil at a 3.8-acre ex-situ treatment facility, groundwater in a gasoline-contaminated shallow aquifer test site (an 11-acre gasoline plume with a methyl tertiary butyl ether (MTBE) plume extending another 22 acres), and an 80-acre harbor with 2 miles of canals/wetlands.

Over the past five years, the Port Hueneme NTS has hosted a number of monitoring and remediation technology demonstrations -- both at the ex-situ treatment facility and in the plumes. At the ex-situ facility, projects included 500 yd3 biopiles, a hot air vapor extraction system, phytoremediation, and a solvated electron chemistry process. The gasoline and MTBE plume projects included groundwater circulation wells, in-situ air sparging systems, a number of prototype tools on a site characterization and analysis penetrometer system (SCAPS), risk-based corrective action (RBCA) modified procedure, groundwater regime remediation modeling, gasoline fate and transport modeling, and a MTBE natural attenuation study. The following examples represent the diversity of the projects supported at the NTS.

Examples of NTS Field Test Projects

The Naval Facilities Engineering Service Center, Port Hueneme, California, conducted a biopile project that involved placing large volumes of contaminated soils into engineered piles using systems to control offgases and water runoff. Several different biopiles were constructed with different soil contaminants. A biopile construction design manual was prepared and it included system performance, and operation and maintenance data.

The Air Force Research Laboratory, Tyndall, Florida, installed two in-situ air sparging systems in the Port Hueneme gasoline plume. This technology forces air through contaminated aquifer materials and vadose zone. One was installed in the residual-phase area and the other was in the dissolved-phase portion of the plume. Data on engineering and hydrologic parameters are collected from the two systems. The sites were heavily instrumented, including excess wells for high-impulse borehole radar, three-dimensional electrode displays to measure aquifer electrical resistance, and miniaturized in-situ pressure sensors. Tracer gas tests have been conducted to identify air flow distribution patterns in the aquifer, development and destruction of preferential air channels in the aquifer and vadose zone, and the influence of forced air on contamination migration. The data collected is being used to determine an accurate groundwater flow rate and direction, as well as the significance of biodegradation, oxygenation and volatilization, all of which are necessary to calculate the rate and extent of treatment influence. This new data will be incorporated into the Air Force air sparging system design manual.

Also at Port Hueneme, Purdue University and Kansas State University have constructed a phytoremediation test containment area and planted plots with native grasses and legumes. Four toxicity risk assessment tests to determine reduction in petroleum contaminant toxicity in soil and leachate are being conducted. Plant growth assessments will be conducted to determine the four-way interaction between contaminants, soil, microbial community, and plant roots. Reduced soil toxicity will be an indication of improved soil health. Data obtained from this project will contribute to the overall database on the phytoremediation process.

The NTSs were created to provide principal investigators and project officers from DoD, DOE, and EPA laboratories with easily accessible sites and support facilities for applied research projects and technology demonstrations. Self-funded technology demonstrations from other agencies and the private sector could be accommodated on a space-available basis. The Port Hueneme NTS management support can include: (1) interacting with Federal, State, and municipal regulators, and public organizations, (2) maintaining water- and soil-contaminants historical data, and (3) providing temporary infrastructure facilities.

To inquire about ongoing activities and coordination for potential demonstrations, contact Mr. Ernest Lory, NFESC, ESC-411, 1100 23rd Avenue, Port Hueneme, CA 93043, (805) 982-1299, E-mail: elory@nfesc.navy.mil

PROFILE: New Director of Environment, James W. Wright Naval Facilities Engineering Command, Alexandria, VA

James W. Wright joined the Senior Executive Service and became Director of Environment, Naval Facilities Engineering Command, on August 31, 1997. He manages and executes Navy shore environmental programs, which include the Naval Environmental Protection Support Service, Natural Resources, Installation Restoration, Base Realignment and Closure, Environmental Compliance and Pollution Prevention, Hazard Abatement, and the NAVFAC Safety and Health Program.

Dr. Wright returned to NAVFAC from the National Aeronautics and Space Administration. In December, 1991, he became Environmental Program Manager at NASA Headquarters in Washington, DC. Shortly thereafter, he became Chief, Environmental Program Office at NASA's John F. Kennedy Space Center, responsible for environmental policy and performance and for the restoration and conservation of the Center's unique ecological systems. Before returning to NAVFAC, he served briefly as Associate Director of Payload Processing, responsible for the integration and testing of Payloads (e.g., spacecraft, space laboratories, space experiments) for Space Shuttle and Expendable Launch Vehicles. While with NASA, he was awarded the Kennedy Space Center Equal Opportunity Award in 1995 and the NASA Medal for Outstanding Leadership in 1996.

Dr. Wright was born in Massachusetts and raised in South Carolina. He received B.S. degrees in Marine Science (1975) and Mechanical Engineering (1980) from the University of South Carolina, an M.S. degree in Marine Biology from the College of Charleston (1978), and his Ph.D. in Environmental Science from George Mason University (1993). He is a registered Professional Engineer in the State of Florida.

Early in his career, Dr. Wright served as Marine Biologist at the Grice Marine Biological Laboratory in Charleston, SC and as Mechanical and Environmental Engineer at Exxon Company USA's Baton Rouge Refinery. In November, 1982, he first entered the Civil Service as Mechanical Engineer in the office of NAVFAC's Resident Officer-in-Charge of Construction at Marine Corps Air Station Cherry Point, NC. He subsequently served as design engineer and construction supervisor for the US Army's Fifth Signal Command in Worms, Germany, responsible for facilities construction in support of communications and data processing installations throughout western Europe. He joined NAVFAC Headquarters in 1987 as Program Manager for energy and, subsequently, environmental programs.

Five-Day Course: "Chemical Risk Management: A Practical Approach for Implementing Risk-Based Decisions for Corrective Action" Santa Fe, NM April 27-May 1, 1998

Sponsored by the Risk Assessment Corporation and the American Petroleum Institute, this course will focus on the practical application of risk assessment techniques and risk-based decisions for corrective action being used today. A case study will be introduced on Monday and instructors will use the case study throughout the week to illustrate their topics. Emphasis will be placed on the fundamentals of risk calculations and critical data that should be collected and applied.

Attendees will be provided with an opportunity to learn about the state-of-the-art methodologies for estimating risk. Software, including CRYSTAL BALL, MEPAS, ANALYTICA, BP Oil Company's Risk Integrated Software for Cleanups (RISC), API's Decision Support System Software, and the GIS software ARC/VIEW and its extensions, will be demonstrated and made available for attendees to evaluate.

For more information, call 312-988-7667 or visit the web site: www.racteam.com.

Massachusetts Environmental Justice Network: Environmental Professionals Doing Pro Bono Work for Disadvantaged Communities

In November 1994, Alternatives for Community & Environment, Inc. (ACE), in partnership with the Boston Bar Association, launched the MASSACHUSETTS ENVIRONMENTAL JUSTICE NETWORK (MEJN) to fulfill the need for pro bono legal and technical support to underserved communities throughout the Commonwealth. The MEJN acts as a clearinghouse matching communities facing environmental issues with the free services of attorneys, public health experts, and environmental consultants. The first of its kind network seeks to promote the empowerment of communities by facilitating their participation in decisions affecting their health, safety, environment, and quality of life and supporting the development of local leadership.

After three years, the MEJN has enlisted over 120 professionals, received more than 65 calls for assistance, and monitors 25 active cases across the state. In one case, an MEJN Licensed Site Professional (LSP) assisted Roxbury residents and environmental activists in their efforts to revitalize a severely contaminated brownfield by integrating DEP and EPA report data and producing a cost evaluation for further cleanup. In another matter, North Adams residents have partnered with an MEJN LSP in reviewing remediation plans proposed by a company responsible for a toxic plume that has contaminated several homes. In recognition of the MEJN's achievements, ACE received the American Bar Association's "Partnership Program Award of Merit" and the "Award of Professional Excellence" from the Association for Continuing Legal Education for its work in training Network Professionals.

In the upcoming year, the MEJN plans to continue expanding services into central and western Massachusetts. The successful implementation of the MEJN has made it a national model for harnessing the public interest commitments of the private sector.

For more information, or to register with the MEJN, please contact:

Michelle Alvarez, Staff Attorney / MEJN Director
ACE (Alternatives for Community & Environment)
2343 Washington St., Roxbury, MA 02119
(617) 442-3343, Ext. 22

AEHS STAFF DIRECTORY
Who to call for assistance
(Staff listed in alphabetical order.)

For Information Regarding:	Contact:	E-mail address:
The journal Human and Ecological Risk Assessment (HERA)	Barbara DelloRusso	barbara.hera@juno.com
Marketing/Advertising	Bob Heft	bob@aehs.com
The Matrix newsletter, Annual state-by-state cleanup standards survey	Christine Judge	cjudge@aehs.com

The West Coast Conference on Contaminated Soilsand Groundwater, The Journal of Soil Contamination	Barbara Knowles	bknowles@aehs.com
Special projects, administrative matters, Executive Director	Paul T. Kostecki, Ph.D.	paul@aehs.com
Ordering ASP publications and catalog, 1st International Conference on Petroleum Contaminated Soils (to be held in Caracas, Venezuela in Spring, 1999)	Heather McCreary	heather@aehs.com
Membership in AEHS	Betty Niedzwiecki	betty@aehs.com

Upcoming Events

Date:	Title:	Description:	Location:	Cost:
April 5-9, 1998	1998 International Hazardous Material Spills Conference	Sponsored by the National Response Team and Chemical Emergency Preparedness and Prevention Office (CEPPO). For information, visit www.nrt.org, or, for registration information, call Tom Crane of the Great Lakes Commission at **(313) 665-9135**.	Chicago, IL	$230 before March 5; $300 after March 5
April 15-17, 1998	ArcView Trainings	Stone Environmental Inc. Call **1-800-959-9987** for registration information.	Raleigh-Durham, NC	Call
May 4-5, 1998	ArcView Trainings	Stone Environmental Inc. Call **1-800-959-9987** for registration information.	Montpelier, VT	Call
April 27-May 1, 1998	Chemical Risk Management	A Practical Approach for Implementing Risk-Based Decisions for Corrective Action, sponsored by the Risk Assessment	Santa Fe, New Mexico	$1495

		Corporation and the American Petroleum Institute.		
May 14-15, 1998	Characterizing Human Risk	Linking Epidemiology and Toxicology for Improved Environmental Risk Assessment, an Environmental Health Forum co-sponsored by IBC and National Institute of Environmental Health Sciences. To register or request exhibiting information, call IBC at **(508) 481-6400**. On-line information at www.ibcusa.com.	Washington, DC	Call
June 14-18, 1998	Air & Waste Management 91st Annual Exhibition	sponsored by Air & Waste Management Association. Call (412) 232-3444 x312 for information.	San Diego, CA	Call
Scheduled for Spring 1999	First International Conference on Assessment and Remediation of Petroleum Contaminated Soils	sponsored by AEHS and Texaco, **413-549-5170**	Venezuela	Call