Part IV - Acceptance Conditions

EPA IAG Identification Number: DW96936739-01-0

27. General Conditions

The other agency covenants and agrees that it will expeditiously initiate and complete the project for which funds have been awarded under this agreement.

28. Special Conditions (Attach additional sheets if needed)

Any equipment purchased under this IAG will remain with the host country after the close of the project and continue to be used as a demonstration tool on different industrial wastewater streams in that country.

All travel funds will be used for project travel only to cover site visits by USACERL personnel to monitor progress and meet with host country personnel.

CERL - EPA "Environmental Technology" MOU 9/30/94

Part V - Offer and Acceptance

Note: 1) For Funds-out actions, the agreement/amendment must be signed by the other agency official in duplicate and one original returned to the Grants Administration Division for Headquarters agreements or to the appropriate EPA Regional IAG administration office within 3 calendar weeks after receipt or within any extension of time as may be granted by EPA. The agreement/amendment must be forwarded to the address cited in item 29 after acceptance signature.

Receipt of a written refusal or failure to return the properly executed document within the prescribed time may result in the withdrawal of the offer by EPA. Any change to the agreement/amendment by the other agency subsequent to the document being signed by the EPA Action Official, which the Action Official determines to materially alter the agreement/amendment, shall void the agreement/amendment.

2) For Funds-in actions, the other agency will initiate the action and forward two original agreements/amendments to the appropriate EPA program office for signature. The agreements/amendments will then be forwarded to the appropriate EPA IAG administration office for acceptance signature on behalf of the EPA. One original copy will be returned to the other agency after acceptance.

EPA IAG Administration Office (for administrative assistance)	EPA Program Office (for technical assistance)
29. Organization/Address U.S. Environmental Protection Agency Grants Information and Analysis Branch MC (3903F) Grants Administration Division Fairchild Building 499 S. Capitol Ave., SW Washington, DC 20460	30. Organization/Address Risk Reduction Engineering Laboratory OEETD, ORD, EPA 26 W. Martin Luther King Drive Cincinnati, OH 45268

Certification

All signers certify that the statements made on this form and all attachments thereto are true, accurate, and complete. Signers acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law.

Decision Official on Behalf of the Environmental Protection Agency Program Office

31. Signature	Typed Name and Title	Date
John J. Convery	E. Timothy Oppelt, Director, RREL	7/7/94

Action Official on Behalf of the Environmental Protection Agency

32. Signature	Typed Name and Title	Date
W. Scott McMoran	W. Scott McMoran Chief, Grants Information and Analysis Branch/GAD	9/30/94

Authorizing Official on Behalf of the Other Agency

33. Signature	Typed Name and Title	Date
David J. Rehbein	DAVID J. REHBEIN, LTC, EN Commander and Acting Director	9/30/94

Attachment AA

QUALITY ASSURANCE FOR CATEGORY IV PROJECTS

A. Quality Assurance Project Plan (QAPP)

This project requires an RREL approved QAPP. The QAPP shall be submitted by the awardee to the RREL project officer (PO) or work assignment manager (WAM) who is technically responsible for the project. The QAPP shall be submitted as a separate document thirty (30) days prior to the beginning of any measurement, data gathering, or data generation activity.

The awardee shall submit five (5) copies of the QAPP to the RREL PO/WAM in order that the QAPP can be reviewed by the RREL technical/management staff in concert with the RREL QA office, the RREL QA support group, or an authorized representative of the Government. These copies shall be accompanied by an RREL Quality Assurance Project Plan Approval Form (obtained from the RREL PO/WAM) with the appropriate commitment signatures. The awardee should also provide any supporting documentation, such as work plans, standard operating procedures, etc.

No measurement, data gathering, or data generation activity may be started without RREL's written approval of the QAPP. (Deviations from this will constitute a violation of EPA Order 5360.1.)

The QAPP shall contain, in document control format, a thorough discussion of the awardee's and any subcontractor's internal quality assurance and quality control (QA/QC) procedures. It shall also contain provisions for the external review of the QA/QC program designed for the project.

Guidance on the development of a Category IV QAPP is provided in the RREL Pocket Guide "Preparing Perfect Project Plans", EPA/600/9-89/087, Oct. 1989. Additional guidance can be found in the document "Preparation Aids for the Development of Category IV Quality Assurance Project Plans", EPA/600/8-91/006, Feb. 1991. Both documents can be obtained from the RREL PO/WAM. The QAPP shall contain the following key elements as a minimum:

1. Project description, including the intended use of the data
2. QA objectives for critical measurements (i.e. process and analytical measurements essential to achieving project objectives) and the impact of not meeting the QA objectives
3. Sampling and analytical procedures
4. Approach to QA/QC

Following written approval of the QAPP by RREL, the awardee and any subcontractor shall implement the approved QAPP. Any substantive changes to the measurement, data gathering, or data generation activity must be documented in a revision to the approved QAPP. Such revisions will require the written approval of the RREL PO/WAM and concurrence by the QA Manager prior to implementation by the awardee or any subcontractor. (The term "substantive change" is defined as "any change in an activity that may alter the quality of data being generated or gathered".)

(continued on back)

B. Quality Assurance Audits

The awardee and any subcontractor shall anticipate that one or more RREL quality assurance audits may be performed during the project duration. These external quality assurance audits will be performed by EPA or authorized Government personnel in concert with the RREL QA office or the RREL QA support group. Selection of the specific areas of focus for audits will be commensurate with the scope and needs of the program. (Note: These external audits are intended to complement, not replace, the good laboratory practice of internal audits performed by the awardee.)

C. Quality Assurance Reporting

Each interim or final report produced as a result of a measurement, data gathering or data generation activity shall include, as an integral section of the project report or as an Appendix, a readily identifiable discussion of the data quality of research results. Interim reports shall include the following items as a minimum:

- Discussions of the quality of data produced in terms of precision, accuracy, completeness, method detection limit, representativeness, and comparability, or semi-quantitative assessments of data quality, as applicable.
- Changes to the QAPP, if any.
- Limitations or constraints on the use of the data, if any.
- Identification of any significant QA/QC problems encountered.
- Resolution (i.e., corrective actions) of significant QA/QC problems.
- Discussions on the QA objectives that were met and those that were not.

The QA section of a project's final report should lend support to the credence of the data as well as the validity of the conclusions. Data quality statements for precision and accuracy shall be included.

The awardee shall comply with EPA's Chapter 5 document "Calculation of Precision, Bias, and Method Detection Limit for Chemical and Physical Measurements, March 30, 1984" whenever normally or near normally distributed data are assessed. When data normality cannot be confirmed or assessed then the awardee shall delineate the specific approach by which the data sets have been assessed.

D. Ethics and Data Integrity

The awardee and any subcontractor shall adhere to an ethics and data integrity code. No person shall participate in:

- the intentional selective reporting of data,
- the intentional reporting of data values that are not the actual values obtained
- the intentional reporting of dates and times of data analyses that are not the actual dates and times of data analyses, and
- the intentional representation of another's work as one's own.

SCOPE-OF-WORK

DEMONSTRATION OF ANAEROBIC, EXPANDED-BED, GAC BIOREACTOR

OBJECTIVE

The primary objective of this project is to conduct a marketing demonstration of an emerging technology in Eastern Europe. This project will be conducted under the U.S. Technology for International Environmental Solutions (U.S. TIES) Initiative for In-Country Demonstrations as part of the U.S. Environmental Protection Agency (U.S. EPA) Environmental Technology Initiative (ETI). The selected technology uses granular activated carbon (GAC) as a support medium for anaerobic bacteria in an expanded bed for liquid waste treatment. This technology combines adsorption and biodegradation. Candidate waste streams should contain solutes which are both adsorbable and biodegradable, preferably in high strength. This process would be used as a pretreatment for an industrial wastewater, which may require further treatment in a conventional aerobic wastewater treatment plant.

Secondary objectives include accessing international markets for an innovative U.S. environmental technology, providing technical assistance and training on that technology, and providing an informational showcase of U.S. technology.

BACKGROUND

Many high strength industrial wastes contain hazardous components and vary widely in composition. Conventional aerobic treatment systems require excessively long hydraulic retention time to successfully treat these wastes. Furthermore, some of these wastes resist aerobic biological treatment due to the presence of toxic and/or inhibitory materials. Finally, some highly volatile organics may be stripped to the atmosphere during aerobic treatment. These factors represent a significant challenge in biologically treating such wastes to acceptable limits or in pretreating them so they are more amenable to conventional treatment.

Intensive development over the last 17 years, particularly in the last 5 years between U.S. EPA's Risk Reduction Engineering Laboratory (RREL), the U.S. Army Construction Engineering Research Laboratories (USACERL), and the University of Cincinnati has resulted in an innovative process for pretreating high strength hazardous and industrial wastes. This process, the anaerobic, expanded-bed, granular activated carbon (GAC) bioreactor, combines physical adsorption and anaerobic biodegradation and is ideally suited for the treatment of industrial wastes containing mixtures of readily biodegradable and biologically refractory organic compounds.

USACERL began investigating the use of anaerobic expanded-bed bioreactors for treatment of propellant wastewater in FY90. Dinitrotoluene (DNT) is a constituent

hazardous material which is used in single base propellant manufacture, primarily as a plasticizer. It enters a waste stream at propellant production facilities during initial screening and extraction of excess solvents. The excess solvents provide a high concentration of biodegradable material (primarily ethanol and ether) along with the DNT.

Laboratory tests were conducted for USACERL at the University of Cincinnati on synthetic mixtures of DNT, ethanol, and ether. After successful treatment using synthetic wastewater, one of the bioreactors was taken to the Radford Army Ammunition Plant (RAAP) for tests using the wastewater from propellant processing. These tests proved successful, with biotransformation of DNT to diaminotoluene (DAT) as the principal product. The controlled laboratory tests at the University of Cincinnati were expanded to include aerobic treatment following anaerobic treatment to determine the fate of DAT in a conventional biological treatment plant. Results indicate that DAT is readily biodegraded aerobically. The testing was also expanded to include trinitrotoluene (TNT) as the target compound due to the success with DNT. Results to date suggest that TNT, rather than being transformed into an intermediate compound, is completely mineralized.

Additional tests at the demonstration scale are underway at RAAP. A commercially available unit will be tested during an upcoming propellant production run. Additional demonstrations are planned for other Army wastes using Strategic Environmental Research and Development Program (SERDP) funds and the Michigan Biotechnology Institute. These are being conducted with FY93 SERDP funds.

In addition to the nitrated munitions wastes studied by USACERL, several other waste types have been effectively treated using the anaerobic, expanded-bed, GAC bioreactor. These wastes include coal gasification and coke oven wastewaters, refinery sour water stripper bottoms, solvent bearing wastes, and wastes containing chlorinated volatile and semivolatile compounds. In recent cooperative agreements between RREL and the University of Cincinnati, successful studies were carried out on wood preserving wastes and hazardous landfill leachates. Specific chemicals of interest treated by this process include substituted phenols, chlorinated phenols, polycyclic aromatic hydrocarbons, benzenes, ketones, chlorinated aliphatics, pesticides, and phthalates. These chemicals comprise a variety of volatile and semivolatile organic compounds that appear on the U.S. EPA list of priority pollutants. Of 27 toxic compounds tested to date, all were removed to levels of 85% or greater, 22 to levels of 90% or more, 20 to levels of 95% or greater, and 15 to levels of 98% or greater.

APPROACH

A consortium of U.S. governmental agencies, private/public research institutions, and commercial vendors/equipment manufacturers with experience in anaerobic, expanded-bed, GAC bioreactors will be established. The goal is to further the use and

commercialization of this technology for industrial wastewater treatment abroad. A site will be selected in Eastern Europe, based on the occurrence of contaminants for which treatment capability has already been demonstrated with other wastewaters. A research partner in the host country will be selected. Selection of the partner will be based on knowledge of the field, access to laboratory facilities and operating personnel, familiarity with and proximity to the candidate sites, and knowledge of local, state, and host country laws regarding permit approvals.

U.S. EPA will provide funding and technical guidance based on previous bench-scale research and will assist in the final selection of candidate site(s) for demonstration in the host country. USACERL will be responsible for overall program execution and coordination and will provide technical guidance based on ongoing demonstrations of this technology at Department of Defense (DOD) facilities. USACERL will acquire a commercially available anaerobic, expanded-bed, GAC bioreactor using FY93 SERDP funds. Additional partners in the U.S. consortium will include the selected vendor, the University of Cincinnati (under an existing contract with USACERL), and Michigan Biotechnology Institute (under an existing contract with USACERL). The selected vendor will provide on-site startup and progress review assistance. The University of Cincinnati and Michigan Biotechnology Institute will provide process design and operations guidance for the demonstration and conduct bench-scale studies as needed. Private/public consultants will be used to monitor the process and establish a U.S. presence in the host country.

MAJOR REQUIREMENTS

To accomplish the goals and objectives of this project, the following tasks, under direction of the U.S. consortium described above, must be accomplished:

Task 1. Select an initial host country partner who will provide assistance in locating candidate demonstration sites. This initial partner may or may not be chosen as the permanent local project manager.

Task 2. In cooperation with the initial partner, gather information on wastewater streams from industries operating in the selected country. Identify candidate sites from these industries based on previous treatment data. Samples of wastewater will be taken and analyzed before selecting a final site. Up to two bench-scale treatability evaluations will be conducted on synthetic wastewaters reconstructed based on the wastewater sample analysis.

Task 3. Select a final site and local project manager based on the results of Task 2. Develop testing and analytical protocols with the selected local project manager for the demonstration. Determine the need for additional instrumentation, if any. Appropriate funding mechanisms will be established to all host country participants.

Task 4. Prepare a range of specifications for performance requirements. Solicit bids from commercial vendors to supply off-the-shelf units that fall within the specified range of operation. Ensure that all electronic components are compatible with host country power characteristics.

Task 5. Acquire the demonstration unit and GAC medium, arrange shipment to the host country, install equipment, perform initial operational shakedown, and provide operator training for local project manager under the direction of the U.S. team.

Task 6. Operate the commercial unit in the host country for a period of 1 year. Data will be collected in accordance with the protocols established in Task 3. Quarterly reports (in English) on all data, operating characteristics, and deviations from stated protocols will be submitted by the local project manager to the USACERL Principal Investigator.

Task 7. Prepare final report describing results of the project under the direction of the Principal Investigator, with the assistance of the U.S. consortium and the host country project manager. The report will be prepared in English and in the host country language.

Task 8. Publish results in the refereed literature, and present the results at European conferences for the purpose of market penetration for U.S. technology in that region.

PROGRAM COORDINATION

USACERL and RREL will establish a data exchange program to review all former and on-going work related to anaerobic, expanded-bed, GAC bioreactors. RREL will visit sites of current and projected demonstrations of this technology being undertaken by USACERL and/or the Army Environmental Center. This will include demonstrations at DOD facilities under the related SERDP project.

A. RREL will provide the necessary information on past accomplishments, current activities, and future plans for research, development, and demonstration related to anaerobic, expanded- bed, GAC bioreactors.

B. RREL will review proposals for research and development prepared by USACERL to evaluate their relevance to current and future demonstrations.

C. USACERL will develop contracts and bid documents for execution of this program in Eastern Europe using commercially available U.S. technology. USACERL will provide technical support based on previous bench- and pilot-scale data, as well

as demonstrations being conducted under the SERDP project. USACERL will provide TDY orders for RREL personnel to visit the sites of SERDP demonstrations and associated meetings at the SERDP contractor.

D. USACERL will provide overall program coordination and will modify the program as required based on technical review by RREL.

SCHEDULE

This project will be conducted over a 2-year period. The scheduled tasks are as follow:

Tasks 1 through 4 shall be accomplished in Months 1 through 4 after receipt of funds.

Task 5, Equipment acquisition, shipping and initial shake-down, shall be accomplished in Months 5 through 9.

Task 6, Operation at field scale, shall be accomplished in 1 year (Months 10 through 21).

Task 7, final report generation, shall be accomplished in the last 3 months (Months 22 through 24).

Task 8, Publication in Peer Reviewed Literature and Presentation at Professional Meetings, shall be accomplished after project activity completion.

PRINCIPAL POINTS OF CONTACT

The RREL Project Officer is Mr. Richard C. Brenner, COMM 513-569-7657. The USACERL Principal Investigator is Dr. Stephen W. Maloney, COMM 217-373-3482. The Principal Technical Consultant is Dr. Makram T. Suidan, 513-556-3695 (University of Cincinnati). A second Technical Consultant is Dr. Robert F. Hickey, 517-336-4630 (Michigan Biotechnical Institute). Biographical information on these four persons is attached.

DETAILED BUDGET

Category		USEPA (ETI Funds)	USACERL (SERDP Funds)
Labor			
Principal Investigator:	$ 15,006		
Assistant Investigator:	$ 15,381		
Administrative Assistant:	$ 6,152		
Total Labor		$ 36,539	
Indirect Costs (includes fringe benefits)		$ 28,339	
G&A Costs [Includes building rental, utilities (HVAC, telephone, and computer systems support), support personnel (shipping and receiving, EEO, and research management), and guard and janitorial contracts]		$ 23,786	
Travel (5 trips to host country site)		$ 14,336	
Equipment (Anaerobic, expanded-bed, GAC bioreactor)			$125,000
Contracts			
Michigan Biotech. Inst.:			$50,000
University of Cincinnati:	$175,000		
International Consultant:	$ 50,000		
Host Country Participants:	$197,000		
Total Contracts		$422,000	$ 50,000
FEDERAL PARTNER COSTS		$525,000	$175,000

TOTAL PROJECT COST: $700,000

BIOGRAPHICAL INFORMATION

1. Richard C. Brenner
2. Stephen W. Maloney
3. Makram T. Suidan
4. Robert F. Hickey

RICHARD C. BRENNER

Chief, Biosystems Engineering Section
Biosystems Branch
Water and Hazardous Waste Treatment
Research Division
Risk Reduction Engineering Laboratory
U.S. Environmental Protection Agency
Cincinnati, OH 45268

PROPOSED PROJECT ROLE RREL Project Officer

EDUCATION

M.S. Environmental Engineering, University of Cincinnati, 1966
B.S. Civil Engineering, University of Cincinnati, 1963

PROFESSIONAL EXPERIENCE

1990-Present Chief, Biosystems Engineering Section, U. S. Environmental Protection Agency, Cincinnati, OH
1967-1990 Environmental Engineer, U.S. Environmental Protection Agency, Cincinnati, OH
1966-1967 Environmental/Civil Engineer, Allied Chemical Co., Syracuse, NY
1963-1964 Management Trainee, East Ohio Gas Co., Cleveland, OH

COMMITTEES

1977-Present American Society of Civil Engineers Committee on Oxygen Transfer Standards.
1979-1984 Joint Task Group on Oxygen Transfer for the 16th Edition of Standard Methods for Examination of Water and Wastewater.
1984-Present Water Environment Federation Technical Practice Committee Task Force on Aeration.
1985-Present American Society of Civil Engineers Committee on Oxygen Transfer.

HONORS AND AWARDS

1974 Nominated for Federal Environmental Engineer Award.
1975 Nominated for Federal Environmental Engineer Award.
1976 Selected as Cincinnati Federal Employee of the Year Award, Professional/Scientific Category.
1985 Selected as U.S. EPA Engineer of the Year and nominated for National Society of Professional Engineers Federal Engineer of the Year Award.

PUBLICATIONS *Partial Listing*

Author of 16 refereed publications, one book chapter, over 15 conference proceedings, and other technical presentations. Over 40 conference, workshop, and symposia presentations.

1. Barth, E.F., R.C. Brenner, and R.F. Lewis, "Chemical-Biological Control of Nitrogen and Phosphorous in Wastewater Effluent," Journal of the Water Pollution Control Federation, Vol. 40, No. 12, pp. 2040-2054 (1968).
2. Barth, E.F., B.N. Jackson, R.F. Lewis, and R.C. Brenner, "Phosphorus Removal from Wastewater by Direct Dosing of Aluminate to a Trickling Filter," Journal of the Water Pollution Control Federation, Vol. 41, No. 11, pp. 1932-1942 (1969).
3. Nash, N., P.J. Krasnoff, W.B. Pressman, and R.C. Brenner, "Oxygen Aeration at Newtown Creek," Journal of the Water Pollution Control Federation, Vol. 49, No. 3, pp. 388-400 (1977).
4. Stenquist, R.J., D.S. Parker, W.E. Loftin, and R.C. Brenner, "Long-Term Performance of a Coupled Trickling Filter-Activated Sludge Plant," Journal of the Water Pollution Control Federation, Vol. 49, No. 11, pp. 2265-2284 (1977).
5. Brenner, R.C., J.A. Heidman, E.J. Opatken, and A.C. Petrasek, Jr., "Design Information on Rotating Biological Contractors," U.S. Environmental Protection Agency, EPA-600/2-84-106, Cincinnati, OH (1984).
6. Heidman, J.A., R.C. Brenner, and W.G. Gilbert, "Summary of Design Information on Rotating Biological Contactors," U.S. Environmental Protection Agency, EPA-430/9-84-008, Washington, DC (1984).
7. Stensel, H.D., R.C. Brenner, K.M. Lee, H. Melcer, and K. Rakness, "Biological Aerated Filter Evaluation," Journal of Environmental Engineering, ASCE, Vol. 114, No. 3, pp. 655-671 (1988).
8. Heidman, J.A., R.C. Brenner, and H.J. Shah, "Pilot-Plant Evaluation of Porous Biomass Supports," Journal of Environmental Engineering, ASCE, Vol. 114, No. 5, pp. 1077-1096 (1988)
9. Boyle, W.C., M.K. Stenstrom, H.J. Campbell, Jr., and R.C. Brenner, "Oxygen Transfer in Clean and Process Water for Draft Tube Turbine Aerators in Total Barrier Oxidation Ditches," Journal of the Water Pollution Control Federation,

Vol. 61, No. 8, pp. 1449-1463 (1989).

10. Narayanan, B., M.T. Suidan, A.B. Gelderloos, and R.C. Brenner, "Treatment of Semivolatile Compounds in High Strength Wastes Using an Anaerobic Expanded-Bed GAC Reactor," Water Research, Vol. 27, No. 1, pp. 171-180 (1993).
11. Narayanan, B., M.T. Suidan, A.B. Gelderloos, and R.C. Brenner, "Treatment of VOCs in High Strength Wastes Using an Anaerobic Expanded-Bed GAC Reactor," Water Research, Vol. 27, No. 1, pp. 181-194 (1963).
12. Suidan, M.T., A.T. Schroeder, R. Nath, E.R. Krishnan, and R.C. Brenner. "Treatment of CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) Leachates by Carbon-Assisted Anaerobic Fluidized Beds, Water Science and Technology, Vol. 27, No. 2, pp. 278-282 (1993).
13. Vidic, R.D., M.T. Suidan, and R.C. Brenner, "Oxidative Coupling of Phenolics on Activated Carbon: Impact on Adsorption Equilibrium," Environmental Science and Technology, Vol. 27, No. 10, pp. 2079-2085 (1993).
14. Sorial, G.A., M.T. Suidan, R.D. Vidic, and R.C. Brenner, "Effect of GAC Characteristics on Adsorption of Organic Pollutants," Research Journal of the Water Environmental Federation, Vol. 65, No. 1, pp. 53-57 (1993).
15. Vidic, P.D., M.T. Suidan, G.A. Sorial, and R.C. Brenner, "Molecular Oxygen and the Adsorption of Phenols - Effect of Functional Groups," Research Journal of the Water Environment Federation, Vol. 65, No. 2, pp. 156-161 (1993).
16. Vidic, R.D., M.T. Suidan, and R.C. Brenner, "Impact of Oxygen Mediated Oxidative Coupling on Adsorption Kinetics," Water Research, Vol. 28, No. 2, pp. 263-268 (1994).

STEPHEN W. MALONEY Acting Team Leader
Ordnance Pollution Abatement/Prevention Team
U.S. Army CERL, Champaign, IL 61826-9005

PROPOSED PROJECT ROLE Federal Partner/USACERL Principal Investigator

EDUCATION

Ph.D. Environmental Engineering, Drexel University, 1982
M.S. Environmental Engineering, Drexel University, 1977
B.S. Civil Engineering, Drexel University, 1976

PROFESSIONAL EXPERIENCE

1993-Present Acting Team Leader, USACERL
1989-1993 Principal Investigator, USACERL
1988-1989 Assistant Project Manager, Metropolitan Water District of Southern California, Los Angeles
1985-1988 Principal Investigator, USACERL
1983-1985 Research Engineer, Société Lyonnaise des Eaux et de l'Éclairage, le Pecq (Paris), France
1977-1982 Project Engineer, Betz Converse Murdoch, Inc. (Consulting Engineers), Plymouth Meeting, PA

RELEVANT EXPERIENCE

- Principal Investigator and/or Acting Team Leader for 65 projects for approximately $11,100,000 since 1992
- Principal Investigator on "Dinitrotoluene Abatement in Propellant Production Wastewaters," 1990-1994
- Principal Investigator, "Applied Demonstration Program in Environmental Compliance and Bioremediation, 1993
- Principal Investigator, "Membrane Separation for Treatment of Liquid Gun Propellant
- Vice Chairman, ASCE Task Committee on Control of Lead Levels in Potable Water, 1990-1993
- Member, American Water Works Association, Taste and Odor Committee, 1983-1984

PROFESSIONAL SOCIETIES AND RECOGNITION

- American Society of Civil Engineers, 1974-Present
- American Water Works Association, 1978-Present
- Research and Development Achievement Award for the Pipe Loop System (with Ed Smith, Prakash Temkar, and Rik Scholze), 1989
- Patent pending on CERL Pipe Loop System (with Ed Smith, Prakash Temkar, Chester Neff, and Rik Scholze)

PUBLICATIONS

1. Sorial, G.A., M.T. Suidan, R.D. Vidic, and S.W. Maloney, "Competitive Adsorption of Phenols on GAC - II, Adsorption Dynamics," Journal of Environmental Engineering, ASCE, Vol. 119, No. 6, pp. 1044 (1993).
2. Sorial, G.A., M.T. Suidan, R.D. Vidic, and S.W. Maloney, "Competitive Adsorption of Phenols on GAC - I. Adsorption Equilibrium," Journal of Environmental Engineering, ASCE, Vol. 119, No. 6, pp. 1026 (1993).
3. Hao, O.I., K.K. Phull, A.P. Davis, J.M. Chen, and S.W. Maloney, "Wet Air Oxidation of Trinitrotoluene Manufacturing Red Water," Research Journal of the Water Environment Federation, Vol. 65, No. 3, pp. 213-220 (1993).
4. Hao, O.J., K.K. Phull, J.M. chen, A.P. Davis, and S.W. Maloney, Journal of Hazardous Materials, Vol. 34, pp. 51 (1993).
5. Temkar, P.M., Y.S. Lee, R.J. Scholze, S.W. Maloney, and E.D. Smith, "Lead Reduction Strategies In Drinking Waster Systems Using the CERL Pipe Loop System," Technical Paper #90168, National Association of Corrosion Engineers, NACE Publications Department, Houston, TX (1990).
6. Peyton, G.R., C.S. Gee, J.T. Bandy, and S.W. Maloney, "Catalytic-Competition Effects of Humic Substances on Photolytic Ozonation of Organic Compounds," in Aquatic Human Substances: Influence on Fate and Treatment of Pollutants, eds., I.H. Suffet and P. MacCarthy, ACS Advances in Chemistry #219, ACS Books, Washington, DC, pp. 639 (1989).
7. Peyton, G.R., C.S. Gee, J. Bandy, and S.W. Maloney, "Byproducts from Ozonation and Photolytic Ozonation of Organic Pollutants in Water: Preliminary Observations,"in Biohazards of Drinking Water Treatment, R.A. Larson, ed., Lewis Publishing, Chelsea, MI (1988).
8. Maloney, S.W., J. Manem, J.Mallevialle, and F. Fiessinger, "Transformation of Trace Organic Compounds in Drinking Water by Enzymatic Oxidative Coupling," Environmental Science and Technology, Vol. 20, No. 3, pp. 249 (1986).
9. Maloney, S.W., I.H. Suffet, K. Bancroft, and H.M. Neukrug, "Ozone-GAC Following Conventional U.S. Drinking Water Treatment," Journal of the American Water Works Association, Vol. 77, No. 8, pp. 66 (1985).
10. Maloney, S.W., K. Bancroft, W.O. Pipes, and I.H. Suffet, "Bacterial TOC Removal on Sand and GAC," Journal of the Environmental Engineering Division, ASCE, Vol. 110, No. 3, pp. 519 (1984).

11. Neukrug, H.M., M.G. Smith, S.W. Maloney, and I.H. Suffet, "Biological Activated Carbon - At What Cost," Journal of the American Water Works Association, Vol. 76, No. 4, pp. 158 (1984).
12. Fiessinger, F., S.W. Maloney, J. Manem, and J. Mallevialle, "Potential Use of Enzymes as Catalysts in Drinking Water for the Oxidation of Taste Causing Substances," Aqua, No. 2, pp. 116 (1984).
13. Bancroft, K., S.W. Maloney, J. McElhaney, I.H. Suffet, and W.O. Pipes, "Assessment of Bacterial Growth and Total Organic Carbon Removal on Granular Activated Carbon Contactors," Applied and Environmental Microbiology, Vol. 46, No. 3, pp. 683 (1983).
14. Maloney, S.W., K. Bancroft, I.H. Suffet, and P.R. Cairo, "Comparison of Adsorptive and Biological TOC Removal by GAC in Potable Water Treatment," in Treatment of Water with Granular Activated Carbon, eds., I.H. Suffet and M.J. McGuire, ACS Advances in Chemistry #202, ACS Books, Washington, DC, pp. 279 (1993).

MAKRAM T. SUIDAN Professor of Environmental Engineering
and Director of Environmental Program
Department of Civil and Environmental Engineering
University of Cincinnati, Cincinnati, OH 45221-0071

PROPOSED PROJECT ROLE Principal Technical Consultant

EDUCATION

Ph.D. Environmental Engineering, University of Illinois, Urbana, 1975
M.S. Environmental Engineering, University of Illinois, Urbana, 1973
B.S. Civil Engineering, American University of Beirut, 1971

PROFESSIONAL EXPERIENCE

1990-Present Professor and Director of Environmental Program, University of Cincinnati, Cincinnati, OH
1985-1989 Professor of Environmental Engineering, University of Illinois, Urbana, Illinois.
1980-1985 Associate Professor of Environmental Engineering, University of Illinois, Urbana, IL
1976-1980 Assistant Professor of Environmental Engineering, The Georgia Institute of Technology, Atlanta, GA
1976 Special Consultant on Computer Simulations and Process Design (Summer), Snell Environmental Group, Lansing, MI
1975 Visiting Assistant Professor of Environmental Engineering, University of Illinois, Urbana, IL

RELEVANT EXPERIENCE

- Principal Investigator on 49 Research Projects and Grants since 1980 with actual expenditures of $8,689,400.
- Principal Investigator, "Research on Bioremediation of Hazardous Wastes and Chemical Spills," UC/U.S. EPA Cooperative Agreement on, April 1993-March 1996 ($6,000,000).
- Principal Investigator, "Indefinite Delivery Contract for the Army," U.S. Army Construction Engineering Research Laboratory, October 1993-September 1996 ($2,000,000).
- Secretary of the Anaerobic Digestion Group of the International Association of Water Quality. 1987-1992.
- Chairman of the Distinguished Lecturer Committee, of the Association of Environmental Engineering Professors. 1985-1989.
- Chairman of the Unit Operations Manual Committee. 1985-present.

- Chairman of the Research Symposium Subcommittee of the Program Committee of the Water Environment Federation. 1992-present.
- Member of the Standard Methods Committee. 1984-present.
- Associate Editor of the Journal of Environmental Engineering, American Society of Civil Engineers. 1989-present.
- Chairman of the Science Advisory Committee Chairman for the Region 7 & 8 U.S. EPA HSRC, 1988-92.

PROFESSIONAL SOCIETIES AND RECOGNITION

- American Society of Civil Engineers, 1972-present.
- American Water Works Association, 1972-present.
- American Society for Microbiology, 1991-present.
- International Association of Water Quality, 1977-present.
- Water Environment Federation, 1972-present.
- Outstanding Graduate Teaching Award, 1991
- WPCF Award for Best Student Paper in the Ph.D. Category, (Awardee: my adviser R.D. Vidic), 1991.
- College of Engineering Research Award, University of Cincinnati, 1993.
- Association of Environmental Engineering Professors, CH2MHILL Ph.D. thesis supervisor award, 1993.
- WEF Award for Best Student Paper in the M.S. Category, (Awardee: my adviser M. Gupta), 1994.
- Unsolicited and Unrestricted Research Grant from the Ford Motor Co., 3-yr, $120,000, 1994.

PUBLICATIONS *Partial Listing*

Author of over 100 refereed publications, 10 books and book chapters, 80 conference proceedings and other technical publications. Over 20 Invited Presentations, and 125 conference presentations.

1. Narayanan, B., M. T. Suidan, A. B. Gelderloos, and R. C. Brenner, "Treatment of VOC's in High Strength Wastes Using an Anaerobic Expanded-Bed GAC Reactor," Water Research, Vol. 27, No. 1, pp. 181-194 (1993).
2. Vidic, R. D., G. A. Sorial, S. P. Papadimas, M. T. Suidan, and T. F. Speth, "Molecular Oxygen Effect on the Scale-Up of GAC Adsorbers," Journal of the American Water Works Association, Vol. 84, No. 8, pp. 98-105 (1992).
3. Sorial, G.A., M.T. Suidan, R.D. Vidic, and R.C. Brenner, "Effect of GAC Characteristics on Adsorption of Organic Pollutants," Research Journal of the Water Environment Federation, Vol. 56, No. 1, pp. 53-57 (1993).
4. Suidan, M. T., A. T. Schroeder, R. Nath, E. R. Krishnan, and R. C. Brenner, "Treatment of CERCLA Leachates by Carbon-Assisted Anaerobic Fluidized Beds," Accepted for publication, Water Science and Technology.

5. Flora, J..R.V., M.T. Suidan, P. Biswas, and G.D. Sayles, "Modeling Substrate Transport into Biofilms: Role of Multiple Ions and Ph Effects," Journal of Environmental Engineering, ASCE, Vol. 119, No. 5, pp. 908-930 (1993).
6. Sorial, G.A., M.T. Suidan, R.D. Vidic, and S.W. Maloney, "Competitive Adsorption of Phenols on GAC - I. Adsorption Equilibrium, II. Adsorption Dynamics Under Anoxic Conditions," Accepted for publication, Journal of Environmental Engineering, ASCE.
7. Sakakibara, Y., J.R.V. Flora, M.T. Suidan, P. Biswas, and M. Kuroda, "Measurement of Mass Transfer Coefficients with an Electrochemical Method Using Dilute Electrolyte Solutions," Accepted for publication, Water Research.
8. Vidic, R.D., M.T. Suidan, and R.C. Brenner, "Impact of Oxygen Mediated Oxidative Coupling on Adsorption Kinetics," Accepted for publication, Water Research.
9. Flora, J.R.V., M.T. Suidan, A.M. Wuellner, and T.K. Boyer, "Anaerobic Treatment of a High Strength Industrial Wastewater Containing Chlorophenols," Accepted for publication, Research Journal of the Water Environment Federation.
10. Fox, P. and M.T. Suidan,"A Comparison of Expanded-Bed GAC Reactor Designs for the Treatment Of Refractory/Inhibitory Wastewaters," Water Research, Vol. 27, No. 5, pp. 769-776 (1993).
11. Khodadoust, A.P., J.A. Wagner, M.T. Suidan, and S.I. Safferman, "Solvent Washing of PCP Contaminated Soils with Anaerobic Treatment of Wash Fluids," Accepted for publication, Research Journal of the Water Environment Federation.
12. Flora, J.R.V., M.T. Suidan, A.M. Wuellner, and T.K. Boyer, "Anaerobic Treatment of a High Strength Industrial Wastewater Containing Chlorophenols," Accepted for publication, Research Journal of the Water Environment Federation.
13. Smith, P.J., P. Biswas, M.T. Suidan, and R.C. Brenner, "A Fundamental Approach to Modeling Biofilters Used for the Treatment of VOC Air Streams," Submitted for publication, Journal of the Air and Waste Management Association.
14. Fox, P. and M.T. Suidan," A Comparison of Expanded-Bed GAC Reactor Designs for the Treatment Of Refractory/Inhibitory Wastewaters," Water Research, Vol. 27, No. 5, pp. 769-776 (1993).
15. Sorial, G.A., S.P. Papadimas, M.T. Suidan, and T.F. Speth, "Competitive Adsorption of VOCs and BOM - Oxic and Anoxic Environments," Accepted for publication, Water Research.
16. Gupta, A., J.R.V. Flora, M. Gupta, G.D. Sayles, and M.T. Suidan, "Methanogenesis and Sulfate-Reduction in Chemostats: I. Kinetic Studies and Experiments," Water Research, Vol. 28, No. 4, pp. 781-793 (1994).
17. Vidic, R.D., M.T. Suidan, and R.C. Brenner, "Oxidative Coupling of Phenols on Activated Carbon," Environmental Science and Technology, Vol. 27, No. 10, pp. 2079-2085 (1993).

ROBERT F. HICKEY

Director, Waste Treatment Technologies
Michigan Biotechnology Institute
3900 Collins Road
Lansing, MI 48910

PROPOSED PROJECT ROLE Technical Consultant

EDUCATION

Ph.D. Civil Engineering, University of Massachusetts, 1987
M.E. Environmental Engineering, Manhattan College, 1974
B.E. Mechanical Engineering, Manhattan College, 1973

PROFESSIONAL EXPERIENCE

1990-Present Director, Waste Treatment Technologies, Michigan Biotechnology Institute, Lansing, MI
1988-1990 Senior Engineer, Waste Treatment Technologies Group, Michigan Biotechnology Institute, Lansing, MI
1984-1988 Project Manager, SAIC, Paramus, NJ
1979-1984 Project Manager, Ecolotrol, Inc., Bethpage, NY

RELEVANT EXPERIENCE

- Director and supervisor for development of vapor phase biofiltration for treatment of volatile petroleum hydrocarbons.
- Senior engineer of GAC-FBR process for treatment of contaminated groundwater and development of fungal composting for treatment of contaminated soils from Manufactured Gas Plants.
- Project manager for managed research on identifying trace gases evolved from various controlled biological processes.
- Lead investigator on troubleshooting team performing U.S. EPA-sponsored diagnostic evaluations of POTWs experiencing chronic permit compliance difficulties.
- Project manager of full-scale demonstration project for the anaerobic treatment of pulp and paper wastewaters using an anaerobic fluidized bed reactor system.
- Technical supervisor of project to develop design criteria for coupled U-tube oxygenators and biological fluidized bed reactors.
- Project engineer planning and supervising daily operation of a pilot facility where biological fluidized bed process was developed and demonstrated at a scale of 0.1 mgd.

PROFESSIONAL SOCIETIES

- American Society for Microbiology
- American Water Works Association
- International Association on Water Quality
- Water Environment Federation

Publications *Partial Listing*

Author of over 27 publications.

1. Jeris, J.S., R.W. Owens, R.F. Hickey, and R. Flood," Biological Fluidized Bed Treatment for BOD and Nitrogen Removal," Journal of the Water Pollution Control Federation, Vol. 49, No. 5, pp. 816-831 (1977).
2. Hickey, R.F. and R.W.Owens, "Methane Generation from High-Strength Industrial Wastes with the Anaerobic Biological Fluidized Bed," Biotechnology and Bioengineering Symposium No. 11, pp. 399-413, John Wiley and Sons (1981).
3. Hickey, R.F., W.-M. Wu, M.C. Veiga, and R. Jones, "Start-up, Operation, Monitoring and Control of High-Rate Anaerobic Treatment Systems,", Water Science Technology, Vol. 24, pp. 207-255 (1991).
4. Hickey, R.F., D. Wagner, and G. Mazewski, "Treating Contaminated Groundwater Using a Fluidized Bed Reactor," Remediation:1 (No. 2) pp. 447-460 (1991).
5. Voice, T. et al., "Biological Activated Carbon in Fluidized Bed Reactors for the Treatment of Groundwater Contaminated with Volatile Aromatic Hydrocarbons," Water Research, Vol. 26, pp. 1384-1401 (1992).

PATENTS *Partial Listing*

Holder of 6 patents.

1. Hickey, R.F. and R.W. Owens, "Excess Growth Control for Fluidized Bed Reactors," U.S. Patent No. 4,177,144, (1979).
2. Owens. R.W., R.C. Hickey, and C. Capetanopoulos, "Liquid Flow Distributor," U.S. Patent No. 4,464,262 (1984).
3. Hickey, R.F., "Method of Monitoring and/or Controlling Biologically Catalyzed Reaction," U.S. Patent No. 4,986,916 (1991).

SAS011701

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO ATTENTION OF:

11 JAN 1995

CECW-I

MEMORANDUM FOR THE ACTING ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

SUBJECT: Empowerment - Reimbursable Support to U.S. Agencies Overseas--FOR DECISION

1. PROBLEM. To obtain Acting Assistant Secretary of the Army (Civil Works) (ASA(CW)) delegation of authority to the U.S. Army Corps of Engineers (USACE) to accept reimbursable work for U.S. agencies overseas.

2. RECOMMENDATION. That the Acting ASA(CW) delegate authority to USACE to accept reimbursable work requests from U.S. agencies for work overseas and to negotiate and conclude appropriate agreements.

APPROVED [signature] NOT APPROVED _____ OTHER _____

Please ok memorandum to document of brief narrative then completion of encl. 4 to facilitate future evaluations of encl 4.

3. BACKGROUND AND DISCUSSION.

a. Reference CECW-I memo dated 18 May 1994, empowerment (enclosure 1).

b. This memo modifies enclosure one by adding "support to Commander-in-Chiefs (CINCs)" to the delegation request. The remainder of enclosure one remains current and valid.

c. Our proposal is that you would delegate authority to the Corps to provide reimbursable support to U.S. agencies using the same procedures and approvals as for the support we provide in the United States and its Commonwealth and Territories.

d. Delegation/empowerment will decrease the response time to customers. I anticipate that quicker response time to sister agencies and to CINCs around the world will result in increased customer satisfaction and will assist in implementing U.S. foreign policy objectives. I view growth in this program as good, within the limits of our resources and capabilities, and intend to be proactive in keeping the CINCs and U.S. agencies informed of our capabilities.

e. HQUSACE will continue to provide guidance and oversight; the major subordinate commands and research and development directorate will validate resources and the ability to meet customers' needs and will receive empowerment from the headquarters to negotiate, sign and execute agreements and authority to delegate the same to district commands.

CECW-I
SUBJECT: Empowerment - Reimbursable Support to U.S. Agencies Overseas--FOR DECISION

Please also include periodic follow-up interviews of customers.

f. Performance will be measured through Customer Satisfaction Surveys (Civil Works and Military Programs Customer Survey forms at enclosure 2). The MSCs and HQUSACE will evaluate customer satisfaction as a measure of program success. USACE will incorporate the customer survey results into our annual report to your office.

g. An empowerment flow chart showing the relationships and responsibilities of the parties is found at enclosure 3. The customer initiates the request for support to the district; the district validates the request confirming that it (the district/lab) has the resources for the work, goes through the criteria checklist (enclosure 4) to determine whether the issue needs to be elevated to higher authority, obtains a local political-military (pol-mil) check off or asks headquarters to obtain a Washington level pol-mil check off, and insures that our standard MOA items are covered in any agreement.

The major subordinate command or research and development (R&D) directorate validates that the resources are available without compromising normal missions, ensures that another district/lab would not be better suited and approves the support. Headquarters provides program guidance and is informed of the support to provide "a sanity check." Headquarters provides: (1) guidelines to the field to establish boundaries for the appropriate use of USACE resources and (2) information on the current political/military situations (as they impact USACE support). I believe these checks and balances provide substantial empowerment while still maintaining some higher authority checks on the system.

Your office will continue to receive bimonthly international activity reports (BIAR) that provide the status of USACE international projects, including reimbursable support to U.S. agencies overseas. We expect to continue to receive policy oversight and political-military guidance from your office. Customer surveys will go from the customer through the districts/labs to the major subordinate commands/R&D directorate. Problems surfaced by these surveys will be investigated by headquarters for appropriate action. See comment, item f.

h. Once approved, I will provide guidance to the field based on the above.

4. IMPACTS. See enclosure one.

5. COORDINATION. None required.

Encls

Stanley G. Genega
STANLEY G. GENEGA
Major General, USA
Director of Civil Works

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CECW-I 13 March 1995

MEMORANDUM FOR USACERL (VICTOR G. MARTY, JR.)

SUBJECT: Questions on Proposed Interagency Agreement between the U.S. Army Construction Engineering Research Laboratories and the Environmental Protection Agency Risk Reduction Engineering Laboratory for Work in Eastern Europe.

1. Reference USACERL memorandum, dated 2 March 1995, subject as above.

2. Thank you for your prompt response in providing the answers to our questions regarding our memorandum, dated 28 February 1995, subject as above.

3. Based on your response/answers to our questions and that the inclusion of the key provisions of MODEL MOA FOR SUPPORT TO U.S. AGENCIES OVERSEAS will be part of your agreement with EPA, you have our concurrence for the subject activity. Our concurrence is contingent upon satisfactory resolution of any comments from CECC and formal approval by CERD.

4. Thank you for cooperation.

5. POC is Lucius D. Gibson, Jr., telephone #202-504-4269.

DONALD R. KISICKI
Chief, Office of Interagency and
International Activities
Directorate of Civil Works

CF:
CERD
CECC-ZA

CECW-I 28 February 1995

MEMORANDUM FOR USACERL (Vic Marty)

SUBJECT: Proposed Interagency Agreement between the U.S. Army Construction Engineering Research Laboratories and the Environmental Protection Agency Risk Reduction Engineering Laboratory for Work in Eastern Europe.

1. Reference USACERL draft memorandum, subject above.

2. The Acting ASA(CW) has delegated to HQUSACE authority to approve agreements for reimbursable work for U.S. agencies overseas. Consequently, we will not be forwarding your decision memo to the ASA(CW) for approval. However, before granting HQUSACE approval for you to proceed we need to have a better understanding of several items to insure that the actions are being done within legal authority, that it supports U.S. foreign policy objectives and is supported by U.S. officials in the countries where we will be operating, and that USACE employees have appropriate diplomatic protections. Please provide clarification/answers to the following:

a. Under what legal authority is EPA conducting the TIES program? This authority will need to be cited in the agreement you intend to enter into with EPA.

b. Since you propose to use $175K of SERDP funds and $10K of DO48 funds what is the benefit of this proposal to the SERDP and DO48 programs? Is there a clear authority to use these funds for technical transfer to foreign countries? If not, we need to be able to clearly state the benefits of the expenditure of these funds and our participation with EPA in Eastern Europe to our programs. We need to be able to answer the question why we are conducting our research in Eastern Europe.

c. What countries in Eastern Europe will this work be done?

d. Has any coordination been done with the U.S. Embassy, if not, how will it be handled?

e. Paragraph 4, first sentence, reads, "No additional funds are required to execute or administer the agreement." but in the third sentence it states that, "This IAG will have no effects on the civil works program..... by bringing EPA expertise to an

CERD-ZA
SUBJECT: Proposed Interagency Agreement between the U.S. Army Construction Engineering Research Laboratories and the Environmental Protection Agency Risk Reduction Engineering Laboratory for Work in Eastern Europe.

More recently, in a House Science Committee meeting on Impact of Science on the Future (06 JAN 95), EPA Administrator Carol Browner used the TIES program as an example of Federal agencies partnering to assist in the implementation of U.S. environmental technology around the globe.

This IAG will assist the EPA in meeting its goal of working with other Federal agencies in developing innovative environmental technologies, it will further the development of a technology of interest to the Army, and it will assist President Clinton in meeting his goal for the United States of enhancing the marketplace for U.S. environmental technologies abroad.

4. IMPACTS: No additional funds are required to execute or administer the agreement. EPA will be providing funds to USACERL to select a site, prepare the site as necessary, and provide start-up assistance and expendable materials for this demonstration. This IAG will have no effects on the civil works program, and will enhance the military program by bringing EPA expertise to an ongoing project while only paying for travel costs. One USACERL PI will be committed to the project for 30% time, with EPA paying for the PI's time, travel, and specialized communication (e.g., Federal Express) in support of this project. This IAG will provide funds to leverage an additional demonstration in a project already under contract from SERDP funds.

5. COORDINATION:

CECC-ZA Concur/Nonconcur_____( )_____(Date)
CECW-ZI Concur/Nonconcur_____( )_____(Date)

ROBERT B. OSWALD
Director, Research
and Development

SWM S. Maloney, EPO
E. Smith, EP
W. Goran, EL
M. White, OC

CERD-ZA
SUBJECT: Proposed Interagency Agreement between the U.S. Army Construction Engineering Research Laboratories and the Environmental Protection Agency Risk Reduction Engineering Laboratory for Work in Eastern Europe.

More recently, in a House Science Committee meeting on Impact of Science on the Future (06 JAN 95), EPA Administrator Carol Browner used the TIES program as an example of Federal agencies partnering to assist in the implementation of U.S. environmental technology around the globe.

This IAG will assist the EPA in meeting its goal of working with other Federal agencies in developing innovative environmental technologies, it will further the development of a technology of interest to the Army, and it will assist President Clinton in meeting his goal for the United States of enhancing the marketplace for U.S. environmental technologies abroad.

4. IMPACTS: No additional funds are required to execute or administer the agreement. EPA will be providing funds to USACERL to select a site, prepare the site as necessary, and provide start-up assistance and expendable materials for this demonstration. This IAG will have no effects on the civil works program, and will enhance the military program by bringing EPA expertise to an ongoing project while only paying for travel costs. One USACERL PI will be committed to the project for 30% time, with EPA paying for the PI's time, travel, and specialized communication (e.g., Federal Express) in support of this project. This IAG will provide funds to leverage an additional demonstration in a project already under contract from SERDP funds.

5. COORDINATION:

CECC-ZA	Concur/Nonconcur_____	( )	_____(Date)
CECW-ZI	Concur/Nonconcur_____	( )	_____(Date)
DAIM-ED	Concur/~~Nonconcur~~	( )	30 Mar 95 (Date)
OADUSD(ET)	Concur/Nonconcur_____	( )	_____(Date)

ROBERT B. OSWALD
Director, Research
and Development

US Army Corps of Engineers
Construction Engineering Research Laboratory
Stephen W. Maloney, Ph.D., P.E.
Environmental Engineering Division
P.O. Box 9005
Champaign, IL 61826-9005
Office: 1-800-USA-CERL x1482
217/373-3482
Fax #: 217/373-3490
Fax ID CERLENW
smaloney@cecer.army.mil

4 Encl 5

CERD-ZA
SUBJECT: Proposed Interagency Agreement between the U.S. Army Construction Engineering Research Laboratories and the Environmental Protection Agency Risk Reduction Engineering Laboratory for Work in Eastern Europe.

More recently, in a House Science Committee meeting on Impact of Science on the Future (06 JAN 95), EPA Administrator Carol Browner used the TIES program as an example of Federal agencies partnering to assist in the implementation of U.S. environmental technology around the globe.

This IAG will assist the EPA in meeting its goal of working with other Federal agencies in developing innovative environmental technologies, it will further the development of a technology of interest to the Army, and it will assist President Clinton in meeting his goal for the United States of enhancing the marketplace for U.S. environmental technologies abroad.

4. IMPACTS: No additional funds are required to execute or administer the agreement. EPA will be providing funds to USACERL to select a site, prepare the site as necessary, and provide start-up assistance and expendable materials for this demonstration. This IAG will have no effects on the civil works program, and will enhance the military program by bringing EPA expertise to an ongoing project while only paying for travel costs. One USACERL PI will be committed to the project for 30% time, with EPA paying for the PI's time, travel, and specialized communication (e.g., Federal Express) in support of this project. This IAG will provide funds to leverage an additional demonstration in a project already under contract from SERDP funds.

5. COORDINATION:

CECC-ZA	Concur/Nonconcur_____	( )	_____(Date)
CECW-ZI	Concur/Nonconcur_____	( )	_____(Date)
DAIM-ED	Concur/Nonconcur_____	( )	_____(Date)
OADUSD(ET)	(Concur)/Nonconcur RAJ	( )	20 Jan 95 (Date)

ROBERT B. OSWALD
Director, Research
and Development

Encl 6

CERD-L 27 Mar 95

MEMORANDUM FOR CECC-R

SUBJECT: Request for Legal Review

1. This proposed Interagency Agreement between the U.S. Army Construction Engineering Research Laboratories and the Environment Protection Agency Risk Reduction Engineering Laboratory for Work in Eastern Europe was received by this directorate for review and approval.

2. Request your review and comments as indicated below.

PETER D. SWART
Assistant Director
Research and Development
(Lab Operations)

CECC-R

27 Mar 95

MEMORANDUM FOR CERD-L

1. The memorandum of agreement has been reviewed. Appropriate block(s) are checked below.

____ There are no legal objections to approving/executing this agreement.

_____ Recommend approval.

_____ Comments are attached as separate enclosure.

_____ Recommend disapproval. Comments are attached.

_____ Recommend additional coordination with _____.

2. The legal review was conducted by ____ Me ____.

R J Jennings
Rupert Jennings
Senior Counsel
for Military Programs

KATHY A. KURKE
Assistant Chief Counsel
for Research and Development

DEPARTMENT OF THE ARMY
CONSTRUCTION ENGINEERING RESEARCH LABORATORIES, CORPS OF ENGINEERS
P.O. BOX 9005
CHAMPAIGN, ILLINOIS 61826-9005

REPLY TO
ATTENTION OF

CECER-ZB (1) 3 Apr 95

MEMORANDUM FOR Director, Research and Development,
6208 Pulaski Building, Washington,
DC 20314-1000 - FOR APPROVAL

SUBJECT: Proposed Interagency Agreement Between the US Army Construction Engineering Research Laboratories and the Environmental Protection Agency Risk Reduction Engineering Laboratory for Work in Eastern Europe

1. PROBLEM: The US Army Construction Engineering Research Laboratories (USACERL) desires to enter into an Interagency Agreement with the US Environmental Protection Agency (EPA), at the request of EPA, to perform a demonstration project in Eastern Europe. EPA sought USACERL's participation in a proposal to the Environmental Technology Initiative's (ETI) US Technology for International Environmental Solutions (US-TIES) program.

2. RECOMMENDATION: That the Director, Research and Development, US Army Corps of Engineers, delegate the authority to USACERL to work with the EPA and enter into an Interagency Agreement for this project with EPA.

APPROVED: ✓ 4/14/95 DISAPPROVED: _____ OTHER: _____

3. BACKGROUND AND DISCUSSION:

The use of anaerobic fluidized bed bioreactors (FBRs) containing granular activated carbon (GAC) to treat Army industrial wastewaters began at the US Army Construction Engineering Research Laboratories (USACERL) in 1991. Previous work at Radford Army Ammunition Plant (RAAP) by others had shown an anomaly between batch and continuous flow GAC capacity studies, suggesting that combined absorption and biodegradation was occurring. After reviewing this data, USACERL initiated the study of FBRs at the laboratory scale.

CECER-ZB (1)
SUBJECT: Proposed Interagency Agreement Between the US Army Construction Engineering Research Laboratories and the Environmental Protection Agency Risk Reduction Engineering Laboratory for Work in Eastern Europe

The study was conducted at the University of Cincinnati under the direction of Dr. Suidan, who has extensive experience in this area. After successful demonstration of the technique on synthetic wastewater, one 4-inch diameter FBR was taken to RAAP for testing with actual production wastewater in FY92/3. In FY93, a Congressional interest project was placed in the Strategic Environmental Research and Development Program for demonstration of FBR technology. This was assigned to USACERL because of our on-going work in that area, but has been closely coordinated with the Army Environmental Center (AEC).

As a result of the coordination, USACERL and AEC are jointly conducting a project at RAAP. AEC has provided the funds for site preparation, and the SERDP funds provided the reactor and support of personnel at Michigan Biotechnology Institute. Two to three other demonstrations were also planned under the SERDP funds, but they also would need site preparation costs provided by the Army.

The EPA has been interested in this technology for the treatment of synthetic organic chemicals for some time. As part of the ETI, Richard Brenner of the Risk Reduction Engineering Laboratory (RREL) proposed a demonstration in Eastern Europe, with USACERL as a partner. This proposal allows us to further leverage the SERDP funds, with EPA essentially paying for the site preparation costs, and the participation of USACERL researchers. The following is a summary of the funding in K$ for development of anaerobic FBRs. This has been a highly leveraged project with funding from several sources:

CECER-ZB (1)
SUBJECT: Proposed Interagency Agreement Between the US Army Construction Engineering Research Laboratories and the Environmental Protection Agency Risk Reduction Engineering Laboratory for Work in Eastern Europe

	6.2 D048	6.3 SERDP	AEC (Site Prep Costs)	EPA
FY91	110			
FY92	280			
FY93	255	3,500	360	
FY94	50	-	-	
FY95		-	-	525

Of the $3,500K in the SERDP project, $175K will go to support this project (supply the anaerobic fluidized bed bioreactor). EPA will support the project with $525K. The $525K will support 30% of a CERL Principal Investigator (PI).

More recently, in a House Science Committee meeting on Impact of Science on the Future (8 Jan 95), EPA Administrator Carol Browner used the TIES program as an example of Federal agencies partnering to assist in the implementation of US environmental technology around the globe.

This IAG will assist the EPA in meeting its goal of working with other Federal agencies in developing innovative environmental technologies, it will further the development of a technology of interest to the Army, and it will assist President Clinton in meeting his goal for the United States of enhancing the marketplace for US environmental technologies abroad.

4. IMPACTS: No additional funds are required to execute or administer the agreement. EPA will be providing funds to USACERL to select a site, prepare the site as necessary, and provide start-up assistance and expandable materials for this demonstration. This IAG will have no effects on the civil works

program, and will enhance the military program by bringing EPA expertise to an on-going project while only paying for travel costs. One USACERL PI will be committed to the project for 30% time, with EPA paying for the PI's time, travel, and specialized communication (e.g., Federal Express) in support of this project. This IAG will provide funds to leverage an additional demonstration in a project already under contract from SERDP funds.

5. DOCUMENTATION: Enclosure 1 is a copy of the Interagency Agreement prepared by EPA signed by the EPA representative and Commander and Acting Director of USACERL. The enclosure also includes the Scope of Work prepared by the USACERL Principal Investigator. Enclosure 2 is a copy of the ASA(CW) delegations of authority to the US Army Corps of Engineers to accept reimbursable work for US agencies overseas. Enclosures 3 thru 6 are copies of coordination documents as noted in the following table.

CECC-ZA	Concur/Nonconcur_____( )_____(Date)	(Encl 3)
CECW-ZI	Concur/Nonconcur_____( )_____(Date)	(Encl 4)
DAIM-ED	Concur/Nonconcur_____( )_____(Date)	(Encl 5)
OADUSD(ET)	Concur/Nonconcur_____( )_____(Date)	(Encl 6)

Encl

DAVID J. REHBEIN
LTC, EN
Commander and Acting Director

Part II - Approved Budget

EPA IAG Identification Number: DW96936739-01-0

22. Budget Categories	Itemization of This Action	Itemization of Total Project Estimated Cost to Date
(a) Personnel	36,539	36,539
(b) Fringe Benefits	0	0
(c) Travel	14,336	14,336
(d) Equipment	125,000	125,000
(e) Supplies	0	0
(f) Procurement / Assistance	472,000	472,000
(g) Construction	0	0
(h) Other	23,786	23,786
(i) Total Direct Charges	671,661	671,661
(j) Indirect Cost: Rate 0.00% Base $	28,339	28,339
(k) Total: (EPA Share: 75.00%) (Other Agency Share 25.00%)	700,000	700,000

23. Is Equipment authorized to be furnished by EPA or leased, purchased, or rented with EPA funds? [X] Yes [ ] No
(Identify all equipment costing $1000 or more.)

ANAEROBIC GAC BIO- REACTOR SYSTEM

24. Are any of these funds being used on extramural agreements? (See Item 22f.) [X] Yes [ ] No

Type of extramural agreement [ ] Grant [ ] Cooperative Agreement [X] Procurement (Includes Small Purchase Order)

Contractor / Recipient Name (If known)	Total Extramural Amount under this Project	Percent Funded by EPA (If known)
MICHIGAN BIOTECHNOLOGY UNIVERSITY OF CINCINNATI INT'L CONSULTANT (UNKNOWN)	472,000	89.40

Part III - Funding Methods and Billing Instructions

25.

[X] Funds-Out Agreement (Note: EPA Agency Location Code (ALC) - 68010727)

[X] Disbursement Agreement

[X] Repayment Request for repayment of actual costs must be Itemized on SF-1080 and submitted to the Financial Management Office, Cincinnati, OH 45268:
[X] Monthly [ ] Quarterly [ ] Upon Completion of Work

[ ] Advance Only available for use by Federal agencies on working capital fund or with appropriate justification of need for this type of payment method. Unexpended funds at completion of work will be returned to EPA. Quarterly cost reports will be forwarded to the Financial Management Center, EPA, Cincinnati, OH 45268.

[ ] Allocation Transfer-Out Used to transfer obligational authority or transfer of function between Federal agencies. Must receive prior approval by the Office of the Comptroller, Budget Division, Budget Formulation and Control Branch, EPA Hdqtrs. Forward appropriate reports to the Financial Reports and Analysis Branch, Financial Management Division, PM-226F, EPA, Washington, DC 20460.

26. [ ] Funds-In Agreement

[ ] Reimbursement Agreement [ ] Repayment [ ] Advance

[ ] Allocation Transfer-In

Other Agency's IAG Identification Number	EPA Program Office Allowance Holder/Resp. Center No. 26C
Other Agency's Billing Address (Include ALC or Station Symbol Number)	Other Agency's Billing Instruction and Frequency