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JUL 28 1997

**1997 Category III
Ecosystem Restoration
Projects and Programs**

**Proposal for Comparative
Evaluation of Acid Mine Drainage
Treatment Technologies**

Submitted To:



Submitted By:



July 28, 1997



IES

The Institute of Environmental Solutions, Inc.

717 K Street Suite 224 • Sacramento, CA 95814 • (916) 444-3412 • Fax: (916) 447-3726

July 28, 1997

Ms. Kate Hansel
CALFED Bay-Delta Program
1416 Ninth Street, Suite 1155
Sacramento, CA 95814

Subject: This proposal provides for Comparative Evaluation of Acid Mine Drainage Treatment Technologies.
Project Title: CALFED Acid Mine Drainage Program (CALFED AMD Project)
Reference: CALFED Category III RFP
Submitted by: The Institute of Environmental Solutions, Inc. (IES), dated June 28, 1997

Dear Ms. Hansel:

IES is pleased to submit the enclosed response to the subject RFP which addresses one of CALFED's major goals, the reduction of acid mine drainage (AMD) from mine wastes. The title of this proposed project is CALFED Acid Mine Drainage Project (CALFED AMD Project.) The IES proposal addresses this major problem through a comparative test treatment program and site demonstration of current best available technologies (BAT) conducted on materials from the Spencerville mine site, located a short distance from Sacramento. There is a good possibility that the process developed may be partially self supporting through resource recovery in the form of metal powders.

We have the support of industry groups, such as the California Mining Association, and Federal and State agencies, such as the California Department of Fish and Game, the California Department of Conservation, and the U. S. Department of Energy. A Peer Review Committee drawn from these organizations and other entities will provide oversight for the project. Our team is comprised of highly experienced environmental and process development engineers. Active community and public participation meetings will be conducted during the project to ensure that the community's needs and concerns are identified and submitted to the Peer Review Advisory Committee. All community concerns will be documented, responded to, and addressed.

IES/MFG, in conjunction with the Peer Review Advisory Committee, believe our proposal contains the highest of standards and protocols, and also assures a fairness of opportunity for technology providers (public and private) throughout each phase of this project. Consequently, this project provides a holistic approach in identifying, representing and addressing the diverse group of "stakeholders" (problem holders and/or service providers) that are impacted by and/or have a relationship to this project and the problems associated with AMD. We look forward with enthusiasm to the opportunity to contribute to the CALFED program. Should you have any questions regarding our proposal, please do not hesitate to call Jim Cornelius at IES; his phone number is (916) 444-3412. Thank you kindly.

Yours sincerely,


Rebekah J. Buckles, President
Institute of Environmental Solutions

Encl.: Proposal and Attachments

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I-005791

I. EXECUTIVE SUMMARY**a. Project Title and Applicant Name**

Project Title: CALFED Acid Mine Drainage Bay Delta Program (CALFED AMD Program.) This proposal provides for Comparative Evaluation of Acid Mine Drainage Treatment Technologies.

Applicant Name: The Institute of Environmental Solutions (IES)

b. Project Description and Primary Biological/Ecological Objectives - It is proposed to conduct concurrent feasibility tests or trials using the best available technology (BAT) from several technology vendors. Technologies from agency programs such as the EPA/DOE Mine Waste Technology Program will be tested against others from private sector vendors. Some of the technologies have shown promise in tests on AMD, and at least one may provide offsets to costs through resource recovery in the form of pure metal powders.

Acid Mine Drainage (AMD) is a major ecological problem in the CALFED area, affecting water quality and wildlife, including priority species such as the Winter Run Chinook Salmon in the Sacramento River. Reduction of AMD has been identified as a major CALFED goal.

c. Approach/Tasks/Schedule - Through the input, guidance and oversight of a Peer Review Advisory Committee, the tests will be conducted at the vendor's facilities on samples drawn from the abandoned Spenceville mine site, located close to Marysville, California. The site covers approximately 10 acres and contains approximately 50,000 cubic yards of tailings and an acid pit holding 6 million gallons. The property is owned by the California Department of Fish and Game. The end product will be a report identifying the best technologies from the comparative testing and recommendations and cost estimates for a follow up demonstration project at Spenceville, or elsewhere. A strong peer group drawn from senior government agency and private sector representatives will assist in the selection of technologies and provide oversight on the project.

Basic tasks will be:

- i. Planning and organization, including selecting the technologies to be tested. (Conducted through Peer Committee input, guidance, and oversight.)
- ii. Developing a set of sampling protocols, drawing uniform samples to be delivered to each vendor, and setting up the QA/QC program. (Conducted through Peer Committee input and guidance.)
- iii. Running the test programs on Spenceville material. (Conducted through Peer Committee input, guidance, and oversight.)
- iv. Evaluating the test progress and reporting. (Conducted through Peer Committee input, guidance, and oversight.) Progress reports will be presented monthly.
- v. Final evaluation report, selection of the best technology, and recommendations and cost estimate for an on site demonstration. (Conducted through Peer Committee input, guidance, and oversight.)

Schedule - It is anticipated that the overall program will be accomplished in 1 year after project funding. (Please see Attachment A, Project Schedule.)

d. Justification for Project and Funding by CALFED - Via the Peer Review Advisory Committee, input, guidance and oversight, the project provides a uniform testing vehicle to address a major ecological problem. It will provide the pathway for development of a successful process to solve the problem of AMD. Unlike the venue of several other test programs, Spenceville is located 1 1/2 hours drive from Sacramento.

The project should be funded by CALFED since it addresses one of the major goals or visions stated in the "CALFED Ecosystem Restoration Program Plan", Vol. 1. (Page 277.)

e. Budget Costs and Third Party Impacts - The Budgeted cost is \$268,773. Various agencies and the California Mining Association will supply matching funds in the form of services-in-kind in excess of \$50,000.

f. Applicant Qualifications - The IES team is led by Mr. Jim Cornelius, a registered civil engineer who served for over 35 years with the California Department of Health Services and the State Water Resource Control Board and was the chief of the Regulatory Programs Branch for the latter agency. One of his many responsibilities included hazardous waste programs for mine wastes. The facilitator of the Peer Review Advisory Committee, from project initiation through completion, is Rebekah Buckles, President of IES. Ms. Buckles has pioneered the design, implementation and management of nationally based land reuse and technology deployment programs for Federal (DOE and DoD), rural and urban (brownfield) sites. He is supported by MFG Associates, a group of highly experienced senior engineers familiar with hazardous waste remediation and process development. MFG has extensive mine experience including, mine drainage sampling and fluid measurement, mine tailings, geotechnical and hydrogeological characterization, and mine mapping.

g. Monitoring and Data Evaluation - IES/MFG and the Peer Review Advisory Committee will develop and oversee a set of sampling and test protocols to ensure uniformity of sampling and test results. IES/MFG will develop and operate a QA/QC program, under the input and oversight of the Peer Review Advisory Committee. Treated materials will be tested by an independent laboratory.

h. Local Support/Coordination with other Programs/Compatibility with CALFED objectives - There is little or no impact on the local community from the project. This is a testing and verification program which will be mostly conducted offsite. IES/MFG will conduct community and/or public meetings that describe the project and seek issues and concerns that must be addressed and responded to by the Peer Review Advisory Committee. However, the owners of the Spenceville Mine, the California Department of Fish and Game are fully supportive and are supplying matching funds through services-in-kind. The program paves the way for attainment of one of CALFED's major objectives, the reduction of AMD in the Bay/Delta system.

II. Title Page

**CALFED ACID MINE DRAINAGE
BAY DELTA PROGRAM
Submitted July 28, 1998**

**Institute of Environmental Solutions
James Cornelius, Project Manager
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Sacramento, CA 95814**

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E-Mail: reb@sna.com**

Corporate Structure: IES is a 501(c)(3) non-profit organization.

Tax Identification Number: 68-0265277

**Participants are MFG Associates, Principals: Gerald Bowes
Michael Gross
Fred Conwell**

RFP Project Group: Other Services

III. PROJECT DESCRIPTION

a. Project Description and Approach - The concept of this proposed project is to conduct a feasibility study. This project is identified as the CALFED Acid Mine Drainage Project (CALFED AMD Project), which proposes to conduct a series of comparative feasibility tests and/or trials using best available technology (BAT) with the objective of reducing AMD throughout the San Francisco Bay-Delta System through the utilization of decontamination technologies, methodologies, and approaches. AMD contamination is a severe problem for the Bay-Delta Ecosystem. A secondary goal of this program is to identify and demonstrate vital resource recovery measures that will simultaneously "mine value" from any residual product that is harmful or identified as a heavy metal. Under each, value is accrued; whether it is the protection of public health, safety, and the environment of the San Francisco Bay Delta System or the accruing of economic value through the resource recovery of heavy metals. As stated in the CALFED Ecosystem Restoration Program Plan, Vol. 1, P 277, "*One goal is to remediate abandoned mines that contribute significant amounts of heavy metals, sediments, acidified water, and other pollutants to tributaries and mainstream rivers, thereby increasing contaminant loading to the Bay-Delta Estuary.*" The stressors from AMD are, water quality and increased contamination by acidic waters containing heavy metals.

The technology demonstration tests and/or trials will be conducted on liquids and tailings from the abandoned Spenceville copper mine, located near Marysville, California, within the CALFED area, which is under the ownership of California Department of Fish and Game. At least one of the currently identified technologies results in the recovery of nearly pure heavy metals and has the potential to offset costs of future full scale remediation. The project concept has received the support and cooperation of industry through the California Mining Association, and state agencies such as the Department of Conservation and the State Fish and Game.

Peer Review Program and Process: To assure fairness of opportunity is extended equally to all technology proposers submitting appropriate technologies under the CALFED AMD Program and that the highest scientific review standards are utilized, a Peer Review Committee will be formed, representing balanced participation from Federal, State, and Local Government, Community Organizations, Private Sector, and other appropriate candidate entities which are inclusive of but not limited to:

- CALFED Bay-Delta Program Representative
- State Department of Conservation - Office of Mine Reclamation
- California Department of Fish and Game
- Department of Conservation - Abandoned Mine Task Force
- CAL/EPA Technology Certification Program
- U.S. EPA, and US DOE Mine Waste Technology Program
- Army Corps of Engineers - Mine Waste Management Program
- Community and Private Interest Advocacy
- Others, as identified

Peer Review Advisory Committee Facilitator: The proposed facilitator overseeing the Peer Review Guidance Committee is Rebekah Buckles, president and founder of the Institute of Environmental Solutions. Ms. Buckles is responsible for the design, implementation, and management of DOE EM-50's LandTech Program, which has pioneered a life-cycle systems approach for cleanup, closure and reuse of nationally based DOE, DoD and urban

(brownfields) sites through the deployment of BAT's, methodologies and approaches. Further information on Ms. Buckles qualifications can be found in Section V.

Note: A facilitator assists the Program Lead for the Prime Contractor and is responsible for assuring that balanced representation and fairness of opportunity is given to all members of the Peer Review Committee. The facilitator also assures the development of the policies and protocols that represent the balanced interests of the Peer Review Committee and the marketplace (public and private) so that the identification, selection and recommendation of best available technology is procured through the highest of standards, and that conflicts are mediated and resolved rapidly.

The Peer Review Guidance Committee: This committee will develop a peer review process and protocol for the entirety of the CALFED AMD Project. The following steps (project phases) described below, which are subjected to the Peer Review Committee input and guidance, are inclusive of but not limited to:

- Identification
- Selection
- Selection review
- Demonstration Awards,
- Implementation and Sampling, and
- Development of project plan for a follow-up demonstration program, which selects and recommends BAT;
- Analysis of sampling results, process definitions, summary reports of each selected technology, and a follow-up

Preliminary Representative Sample of Appropriate Technology Candidates

Examples of appropriate mine waste technologies currently identified include:

- Capacitive De-ionization - a process developed by Lawrence Livermore Laboratory and licensed a Tucson, Arizona based corporation.
- Electrokinetic Remediation - a process developed in Holland and patented by a firm located in Berkeley, California.
- H.T. P. Acid Mine Drainage Technology, developed by a firm in Grass Valley, California. This process has been evaluated by the EPA/DOE Mine Waste Technology Program and Lawrence Livermore Laboratory.
- One or more of the processes currently being tested at the EPA/DOE Mine Waste Technology Program (located in Butte, Montana).

In addition to the technology examples that will be submitted to the Peer Review process, technologies developed by other federal agencies and national laboratories may have application to mine waste.

The Peer Review Guidance Committee Membership: Membership will assure the CALFED AMD Program's life-cycle (from project initiation through closure) demonstrates a fairness of opportunity for all potential technology providers. The aforementioned representative sample technologies are not given preference, and will be responsible in meeting the criteria developed by the Peer Review Guidance Committee.

Feasibility Testing Methodologies: The anticipated feasibility testing will consist of drawing controlled sets of samples of liquid and tailings from the Spenceville site and treating them in the above processes. Results will be evaluated against required clean-up criteria, compared and the best technologies selected. The end product and deliverable will be recommended technologies with process definitions, and a project plan, cost estimate and schedule for a follow up demonstration project at the Spenceville site. (The Peer Review Guidance Committee will develop and oversee the implementation of the Feasibility Testing.

Program Leads: The Institute of Environmental Solutions (IES) will be the prime contractor for this project. IES is a Sacramento based 501 (c)(3) non-profit corporation. Its mission is to facilitate the productive and sustainable recycling and reuse of contaminated land. In addition, IES assists in the identification and application of BATs to specific hazardous waste problems, one of which is AMD and other mine wastes. Mr. James Corneliua, our proposed Program Manager is the Manager for Technology Deployment and Principle Environmental Engineer at IES. He serves on the Environmental Committee and the Mine Closure and Abandonment Committees of the California Mining Association, and has a strong involvement in the solution of mine waste problems. IES is supported by MFG Associates (MFG) a Bay Area partnership of experienced environmental consultants, with extensive experience in mining waste. MFG will provide technical support to IES in a sub-contracted joint-venture. Further details regarding IES and MFG Associates are provided in Section V.

b Location/Geographic Boundaries: The tests will be conducted on materials from the abandoned Spenceville copper mine, bordering Beale Air Force Base near Marysville, California. (See Location Map Attachment B) The 10 acres site consists of approximately 50,000 cubic yards. of tailings piles and a pH 2.5 acidic water pit containing 6 million gallons. AMD from the site drains into the Little Dry Creek and eventually into the Feather River. The site has been well characterized by the California Department of Conservation, Office of Mine Reclamation in their draft "Spenceville Mine Remediation and Reclamation Plan". Photographs of the site are provided in Attachment C.

c Expected Benefits: As is apparent, the project will have multiple benefits. There are 68 high priority mines impacting CALFED Bay Delta Project Area. (California State Water Resources Control Board.) Successful completion of this project would pave the way for effective clean up of many, if not all, of these contamination sources.

- The primary stressors from AMD are reduced water quality and presence of significant quantities of heavy metals, such as cadmium, zinc, copper, and mercury in the Bay - Delta system.
- Primary habitats affected by AMD are virtually all of the categories listed in Section D, with the main effect on the upstream, freshwater sections.
- This project has a high degree of ecological and biological effectiveness. As noted in the CALFED Ecosystem Restoration Program Plan Vol. 1 (P. 276) acute toxicity from AMD generated from abandoned mines in the Sacramento River Basin has resulted in fish kill and poses a hazard to the endangered winter run chinook salmon on the Sacramento River. Other salmon and fish species are affected and consumer Advisories are in effect for the consumption of fish in many CALFED areas. Little Dry

Creek, which is adjacent to the site drains into Dry Creek which according to the Department of Fish and Game has a Fall Chinook salmon run of 100 to 200 fish, and a few steelhead. Fish and Game plant 100,000 chinook salmon and 50,000 steelhead fry annually in the vicinity of the site.

- As noted above, from at least one of the representative sample technologies identified, the electrokinetic process, results in resource recovery by the deposition of metals at the process cathodes.. For example, pure iron powders are valuable and in demand. Such recovery could help offset costs on future remediation projects. California Department of Conservation staff estimate that \$300,000 worth of precious metals is present at the Spenceville mine site.
- The project has clear long term ecological benefits, in that if successful, it will lead to a methodology for greatly reducing a major source of river pollution in the CALFED area.

d. Background and Biological/Technical Justification: The need for the project lies in the fact that while effective treatment processes are fairly well established for organic contamination, there is little or no solution to the AMD problem. Several technologies have evolved but there exists a need for a systematic evaluation such as this project would provide. Furthermore, while other evaluations have been conducted at sites outside California, many in remote locations, this project would use materials from the Spenceville site, located about 1 1/2 hours drive from Sacramento.

Other than the EPA/DOE Mine Waste Demonstration Program (MWDP) there is little in the way of an organized, comparative technology evaluation specifically targeted to AMD, such as is proposed in this program. However, at least one of the technologies developed in the MWDP will be evaluated in this project.

The basis for the expected benefits is clear, since a successful evaluation would lead to a solution of the AMD problem and attainment of a major CALFED goal.

The benefits from AMD treatment will be permanent. By successful treatment, tailings or acid pits would be eliminated from abandoned mines. Operating mines would be able to treat generated tailings piles and prevent the formation of AMD.

The current status of the project is that all the technologies under consideration have shown success in similar applications such as removing heavy metal contamination from soils. Two of the technologies, electrokinetics and the MWTP process have had limited, but promising testing on similar applications to AMD. In particular, such processes as electrokinetics show promise to treat tailings with resource recovery benefits. Work to date on these two technologies is detailed in "Electrochemical Techniques for the Remediation of Acid Mine Drainage Problems", Clarke, Turner, Jones and Walsh, and the EPA/DOE Mine Waste Technology Program Annual Report for FY 1996. This project would allow parallel and comparative evaluation of these competing technologies.

e. Proposed Scope of Work: Incremental project phases will be as follows:

- Planning and organization (Peer Review, et al)
- Sampling
- Testing
- Evaluation and Reporting
- Second Phase Design

Specific tasks and deliverables will be as follows:

1. Announce and select peer review advisory.
2. Peer review advisory develop and approve guidance and protocols for all project phases.
3. Develop project criteria and objectives.
4. Prepare project plan and schedule.
5. Execute sub-contracts with technology vendors.
6. Project assignments.
7. Prepare QA/QC plan.
8. Kick-off meeting with representatives of peer review committee and involved agencies. (Ex., Fish and Game, Department of Conservation, State of California Abandoned Mine Committee) Also, meeting with California Mining Association, Mine Closure and Abandoned Mine Subcommittees.
9. Kick-off meetings with technology suppliers.
10. Meeting with USEPA/DOE Mine Waste Technology Program staff and review of their demonstration projects.
11. Peer review preparation of sampling plan, chain of custody, data validation, etc.
12. Site visits with technology suppliers, agency representations, and peer review advisory representatives.
13. Collection of liquid and solid samples, with peer review oversight.
14. Reviews by Department of Conservation, California Mining Association, Fish and Game, etc.
15. Test runs by technology vendors with peer review oversight.
16. Evaluation of test results, ongoing and on completion, with peer review input and oversight.
17. Selection of best technologies, with peer review input and oversight.
18. Review potential application to the 68 mine waste sites identified by the State Water Resources Control Board, IES, and peer review advisory.
19. Analysis of results for potential submittal of technologies for certification by the California Environmental Protection Agency Technology Certification Program
20. Preliminary design and cost estimate of future demonstration projects at Spenceville or elsewhere.

Reporting: Technical and financial reports will be prepared on a monthly basis. They would consist of a narrative of the overall project position, any available tests results with analysis, and cost and schedule status. The principal deliverable of the project will be a final report and recommendations as stated in Items 17 through 20 above.

f. Monitoring and Data Evaluation: IES and MFG will prepare a set of test protocols to insure uniformity of samples tested and evaluation criteria. Integrity of data packages will be evaluated by an independent data validation sub-contractor. Uniform reporting of test results will be required to ensure that results are comparable. Through the support of MFG personnel, IES will have adequate resources to handle the biological, chemical and financial reporting. The sampling protocols will ensure uniformity of samples supplied to each technology vendor. The protocols will also define sampling techniques, such as depths in the acid pit, and depths and locations in the tailings, and will cover other directions such as

chain of custody. Samples will be physically taken under the direction of MFG, not by the technology vendors.

Existing monitoring at Spenceville is limited to caretaker monitoring by Fish and Game.

Alternatives to the proposed evaluation set will be compared and discussed as detailed in Section III a. above.

g. Implementability: There will be no conflict with laws and regulations, or requirement for permits, easements, etc., since the test work will be performed at the equipment vendor's premises. The owner of the Spenceville Mine site, the California Department of Fish and Game who support the project and will benefit from the project. For similar reasons it is not anticipated that there would be any socioeconomic type obstacles to the program.

- The project is not dependent on other on-going work, although IES/MFG will keep abreast of any AMD related developments, to ensure that latest technology is considered.
- This program is ready to be funded and start operation. IES/MFG have visited the site, have access to extensive site information from prior Department of Conservation studies, and have talked with the technology vendors and in some cases visited their laboratories.
- The California Department of Conservation, Office of Mine Reclamation has committed to supply \$20,000 of matching funds in the form of service in kind. (see Attachment D.)
- The California Mining Association has committed to provided \$10,000 of matching funds in the form of service in-kind. (See Attachment E.)
- The U.S. Department of Energy, Oakland Operations Office, supports this project and is prepared to discuss their level of support. (See Attachment F.)
- The California Department of Fish and Game has provided a Letter of Support for the project. (See Attachment G.)

V. APPLICANT QUALIFICATIONS

The proposed project organization is attached (Attachment H). The project organization has been carefully constructed to ensure that there is proper representation of industry and agency groups, and that the work benefits from the advice and counsel of persons experienced in the field. In addition, the advisory group will help ensure that all relevant technologies are considered.

Project Management:

Program Lead: The program lead for IES's Mine Waste Program, and Facilitator of the CALFED AMD Peer Review Advisory Committee will be Rebekah Buckles, IES.

Project Manager: Project management will be provided by James Cornelius of IES, who will be the direct contact with CALFED.

Peer Review Facilitation and Oversight: There will be a peer review facilitation and oversight function provided by Rebekah Buckles, president of IES. As Program Lead for IES Mine Waste Program, she will support Jim Cornelius in his role as Project Manager, and will oversee and facilitate the peer review and advice provided by the Peer Review Committee, composed of:

- CALFED
- State Department of Conservation - Office of Mine Reclamation
- California Department of Fish and Game
- Department of Conservation - Abandoned Mine Task Force
- Cal/EPA Technology Certification Program
- U.S. EPA, and US DOE Mine Waste Technology Program
- Army Corps of Engineers - Mine Waste Management Program
- Others, as identified

Program Management: The Institute of Environmental Solutions will serve as the Program Manager and Project Lead. Established in 1991, IES was created to facilitate the productive recycling and sustainable reuse of rural, and urban, federal, state, and local contaminated land. IES has gained recognition as a pioneer in the development and implementation of "life cycle systems approaches," which span the entire course of a land reuse project, from site identification, through project initiation, cleanup, closure, finance, and productive reuse of blighted land. IES's preliminary design of a life-cycle systems approach for land reuse was presented to the U. S. Department of Energy (DOE) and EM-50, the Office of Science and Technology under a five year cooperative agreement (1994-99). The program funded, entitled LandTech, has pioneered a comprehensive method of identifying, integrating, and transferring, for broad public use and benefit, the best available technology and resources from the federal and state governments and the private sector. DOE's oversight of LandTech is provided by the DOE Oakland Operations Office.

As IES's most prominent program, LandTech also utilizes a consensus-building communication, project management, and land reuse implementation process. This project management process, known as IMBR (Integrated Management for Brownfields Reuse), provides a vertical integration of innovative approaches and technologies as they must respond to and interact with the interests of all parties involved in the land reuse process. The LandTech and IMBR programs have been linked into one seamless dynamic electronic system, and are accessible to the public

via the internet in September of 1997. Rebekah Buckles, President of IES, and James Cornelius, P.E, Technical Program Manager, are responsible for facilitating the nationally based consensus guidance committees and peer review advisories that are the foundations in supporting these dynamic land reuse programs, and for guiding IES's staff and partnership in their unique ability to understand the needs of, and facilitate communication and commerce among a wide ranged of interdependent stakeholders -- landowners, lenders insurance carriers, regulators, scientists and technologists, government agencies, and public interest/community groups. (Further information via IES's Statement of Qualifications and Services furnished upon request).

Technical support:

Technical support will be provided by Dr. Michael Gross, Mr. Fred Conwell, and Mr. Gerald Bowes of MFG Associates, who will assist in project planning, oversee field sampling, supervise testing, assist in report preparation, and generally give technical support to Mr. Cornelius. MFG is a partnership of experienced environmental engineers with a strong background in hazardous waste management, environmental permitting, process development and project management. IES makes a practice of employing interns where possible to provide students and others an opportunity to gain experience. Interns will be used in assistant roles on this project when they are available.

Administration - Administrative support will be provided by IES staff and is anticipated to include secretarial, interns (Masters and Ph.D. candidates), and editorial functions.

Biosketches of Responsible Individuals:

James Cornelius: The IES Project Manager, Jim Cornelius, has 37 years of professional experience as an environmental engineer. He is a registered Civil Engineer with a Masters degree in Public Administration. Mr. Cornelius joined the Institute of Environmental Solutions (IES) as IES's Principal Environmental Engineer on June 1, 1966, after five months an Environmental Engineering Manager at the Sacramento office of a major environmental consulting firm. Cornelius was employed for 10 years (1960-1970) with the California Department of Health Services, and over 25 years (1970-75) with the California State Water Resources Control Board (SWRCB). The last 10 years with the SWRCB, he was the Chief of the Regulatory Program Branch with statewide responsibility for hazardous/solid waste programs, underground/above ground tank programs, site remediation programs, including U. S. DoD and U. S. DOE sites, and the regulation of mining waste within the State of California. Mr. Cornelius has had an active role in mining waste issues, including working with all the Regional Water Quality Control Boards, The Department of Toxic Substances Control (DTSC), and U. S. EPA. He served as the SWRCB's representative on the Western Governor's Association's Mine Waste Task Force for 5 years, and 3 years on the USEPA's Policy Mine Waste Committee on Mine Waste. Currently Mr. Cornelius is active on the California Mining Association's Environmental Committee, and their Mine Closure and Abandoned Mine sub committee.

Rebekah J. Buckles: As Program Lead for IES' Mine Waste Program, Rebekah will act as a Facilitator for CALFED AMD Peer Review Advisory Committee and project. Rebekah Buckles is founder and president of the Institute of Environmental Solutions (IES), a 501 (2) (3) nonprofit corporation based in Sacramento, California. She is responsible for the design, implementation and management of all of IES' nationally based land reuse programs and for facilitating consensus advisory and peer review committees, that along with IES' highly capable staff guide

the dynamic efforts of these programs (see IES Overview). Buckles has over 20 years experience in commercial, municipal, and environmental finance. She began her career in Banking (1973-79) and concluded as the Assistant Credit Manager for First National Bank in Illinois (1982). Ms. Buckles first pioneered programs that facilitate the integration and cooperation of diverse interests (public and private) to resolve land reuse issues on the Central Coast of California. In 1987, one of the country's largest family owned agri-business corporations (Teixeira Farms) hired Ms. Buckles as President of Environmental Response Corporation (ERC). She was responsible for overseeing all operations of this start-up company that designed, patented, scientifically certified, and obtained DOT certification for a self-berming hazardous waste storage tank. Under Ms. Buckles Management, ERC, in cooperation with the sponsorship of Santa Barbara County she designed and assisted in the drafting of the first California Law, under Mello-Roos (AB2610) to provide public financing for all phases of cleanup of environmentally property; authored by Assembly O'Connell (now Senator O'Connell). Through Ms. Buckles' technical support, she facilitated a six month passage of the controversial bill; under a "urgency statute", and the bill became law. Recognizing that the resolution of land reuse problems required a partnership between private sector and government, Ms. Buckles founded the Institute of Environmental Solutions (IES) in 1991, as a 501(c)(3) corporation. Through her work with IES, Buckles has received many awards, including The Woman of the Year award for Science and Trades from the YMCA, the Award of Excellence from ENR, McGraw Hill for her development of a systems approach to land reuse, and has served on many advisory committees to develop a Sustainable Technology program for the Office of the President, Office of Science and Technology.

MFG Associates:

Fred Conwell: Mr. Conwell is a registered geologist and certified engineering geologist with over 40 years of experience in a wide spectrum of geological, geotechnical, earthquake, and environmental investigations, including mine related work. He has performed remedial investigations, remediation and closure of hazardous waste sites. Mr. Conwell has also performed landfill assessments, and investigation and remediation of groundwater contamination. In mine related work Mr. Conwell performed regional and mine specific hydrogeological surveys for the DuPont Corporation on a disseminated copper sulfide deposit located east of Mammoth, Arizona. Mr. Conwell evaluated impacts on mine drainage, on spring and local stream flow and on surface water quality.

Gerald Bowes: Mr. Bowes has 34 years experience as a senior process engineer, an environmental engineer, and as a project and development program manager. He is experienced in hazardous waste management, project management, process development, EIS development and permitting.

Mr. Bowes has managed several process developments, including a program for Dole Corporation, Honolulu, Hawaii, which successfully developed a process for large scale extraction of a protealytic enzyme from agricultural wastes, a solvent extraction recovery process utilizing filtration, centrifuging, distillation and other operations relevant to AMD extraction. He also managed the development of a downhole oil well liner extraction device for URS corporation, San Mateo, California, and a continuous rendering process for FMC Corporation of San Jose, California. Mr. Bowes also has a wide field construction background, having managed the construction of three large production plants, one of which was located in a remote Alaskan location.

Michael Gross: Dr. Gross has over 28 years of professional experience as a senior mechanical engineer, project manager, and computational expert. This professional background includes geotechnical engineering and hydrological analysis for radioactive waste projects as well as mechanical and thermal response of structures and nuclear reactors. Major geotechnical projects include stability analyses of underground tunnels in tuff and dolomite geologies, the design, layout and stability of rooms in a salt mine, and the design of shaft seals for a salt mine. Hydrological analyses include the fate and transport of radionuclides from the Waste Isolation Pilot Plant. As Deputy Manager of a 350 person environmental group, Dr. Gross provided management oversight for projects in environmental engineering, geotechnical studies, and quality assurance services.

Conflict of interest - There is no known conflict of interest. The peer review groups, drawn from agencies involved in mine waste and industry, will help to ensure that all appropriate technologies are considered or evaluated on an equitable basis.

Similar Past Projects:

IES:

Jim Cornelius: Lead Regulatory Responsibility from 1985- to December 31, 1995 for proposed revisions to include implementation of Article 7 (Mine Waste Management). Reference: James Pompy, Manager of Reclamation Unit, State of California, Department of Conservation - [916] 323-8565

- Represented the SWRCB and the State of California in the Western Governor's Association's Mine Waste Task Force from 1988 through December 31, 1995. This task force addressed the USEPA's federal regulation for mining waste, including characterization, risk assessment, fate and transport, treatment, and remediation. Reference: James Pompy, Manager of Reclamation Unit, State of California, Department of Conservation - [916] 323-8565.
- Served three years on the USEPA's Mining Policy Dialogue Committee, consisting of 7 members representing mining companies and 7 members representing environmental groups. This was a very intense program to develop federal statute changes for regulation of mining waste. Reference: James Pompy, Manager of Reclamation Unit, State of California, Department of Conservation - [916] 323-8565.

Rebekah Buckles, Program Lead
James Cornelius, Technical Project Manager

- **1994- 1999 (Anticipate continued involvement):** Represented the U. S. Department of Energy in the design implementation and management of a life cycle (project initiation and closure) systems approach to technology deployment and land reuse. Developed program areas for technology deployment activities; including DOE sites, DoD sites, rural and urban sites (brownfields). Developed fairness of opportunity policy and peer review guidance. Reference: Thomas Parker, Manager for Technology Deployment, Office of Science and Technology, DOE -EM-54 - [310] 903-2154.
- **1994 - Open-ended:** Developed the LandTech program with DOE and four national laboratories, Savannah River Technology Center, Argonne National Laboratory, Idaho National Engineering Laboratory for the deployment of technology within the framework of land reuse. LandTech, has pioneered a comprehensive method of identifying, accessing,

integrating, and commercializing, for broad public use and benefit, the best available technology and resources from the federal and state governments and the private sector. Reference: John Gladden, Group Manager, SRTC's Environmental Sciences Section- [803] 725-5215.

- **1996 - Present:** Represented the City of National City, Community Development Commission in re-engineering a prominent project, within a fully developed commercial auto mall, that has been at vacant and at impasse since 1992. IES was responsible for evaluating and recommending alternative approaches to resolving gridlock associated with regulatory issue, technical issues, financial issues, community/stakeholders, legal issues, as well as the identification and recommendation of innovative technologies that could reduce costs and enhance project integrity. Identified 22 appropriate technologies under a national technology query. Related the usage of technologies to the associated land reuse issues. Reference: Paul Desrochers, Executive Director, National City Community Development Commission - [619] 336-4250.

MFG Associates Project Experience: (More detailed information available upon request.)

- Hydrogeological Surveys on Copper Sulfide Mine. Mammoth, AZ. DuPont Corporation.
- Protealytic Enzyme Extraction Process. Honolulu, HI. Dole Corporation.
- Stability Analysis of Underground Tunnels. Defense Nuclear Agency.
- Salt Mine Tunnel and Shaft Design. Fluor Daniels/DOE.
- Waste Isolation Pilot Plant (WIPP). Advanced Sciences/DOE. Reference: Mr. George Basabilvazo, (505) 234-7488
- Oil Well Liner Project. Reference: Dr. Franklin Agardy, (415) 347-1277

VI: COMPLIANCE

July 28, 1997

Kate Hansel
CALFED Bay-Delta Program
1416 Ninth Street, Suite 1155
Sacramento, California, 95814

Dear Ms. Hansel:

All forms have been submitted that are applicable with our RFP project group type. The terms and conditions are agreeable to IES and IES will be able to comply with these terms.

The documents and attachments submitted with this proposal include:

Attachment A: Project Schedule
Attachment B: Location Map
Attachment C: Photographs
Attachment D: **Support Ltr.:** Department of Conservation
Attachment E: **Support Ltr.:** CMA
Attachment F: **Support Ltr.:** USDOE
Attachment G: **Support Ltr.:** Fish and Game
Attachment H: Organization Chart
Attachment I: IRS non-profit status
Attachment J: Insurance Policy
Attachment K: EOE

Sincerely,

Rebekah Buckles, President

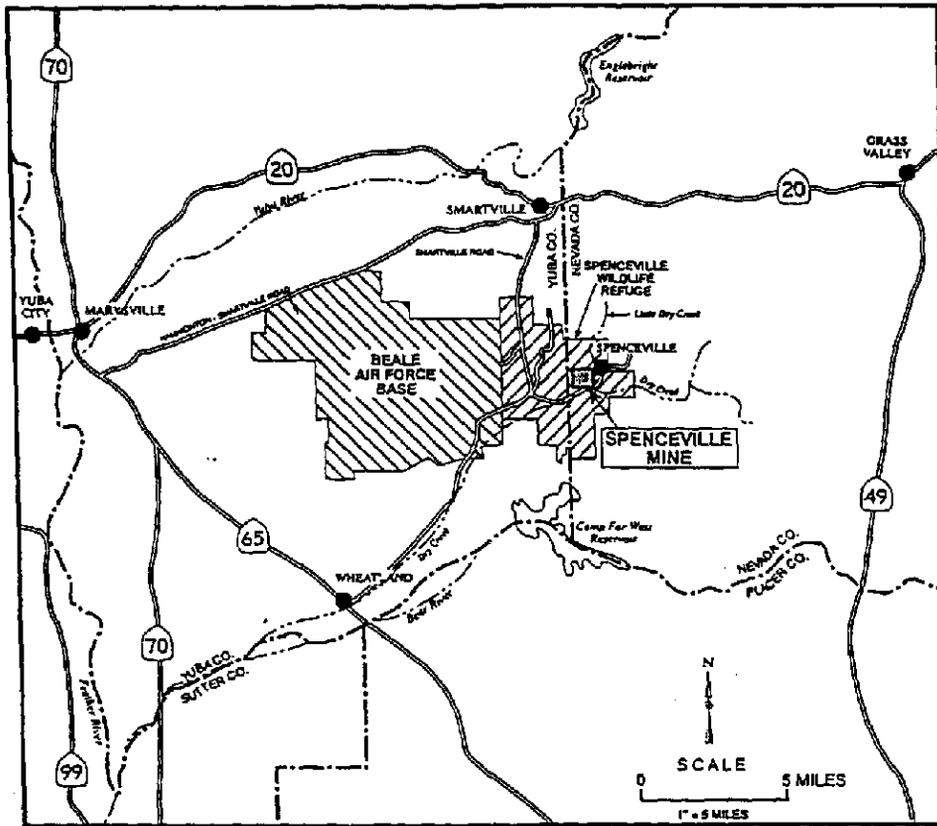
**CALFED AMD Project
Overall Project Schedule**

Attachment A

	Phase	Month					
		1 - 2	3 - 4	5 - 6	7 - 8	9 - 10	11 - 12
1	Planning & Organization	■					
2	Site Evaluation & Sampling		■	■	■	■	
3	Technology Testing		■	■	■	■	
4	Evaluation & Final Report					■	■
	Monthly Progress Reports * Costs included in above categories	◆ ◆	◆ ◆	◆ ◆	◆ ◆	◆ ◆	◆ ◆

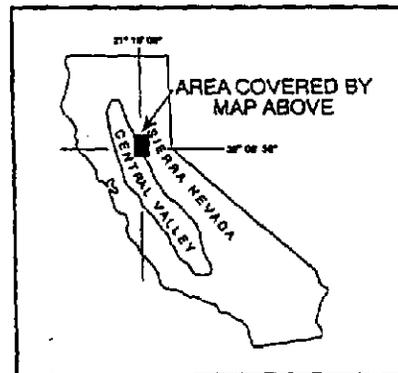
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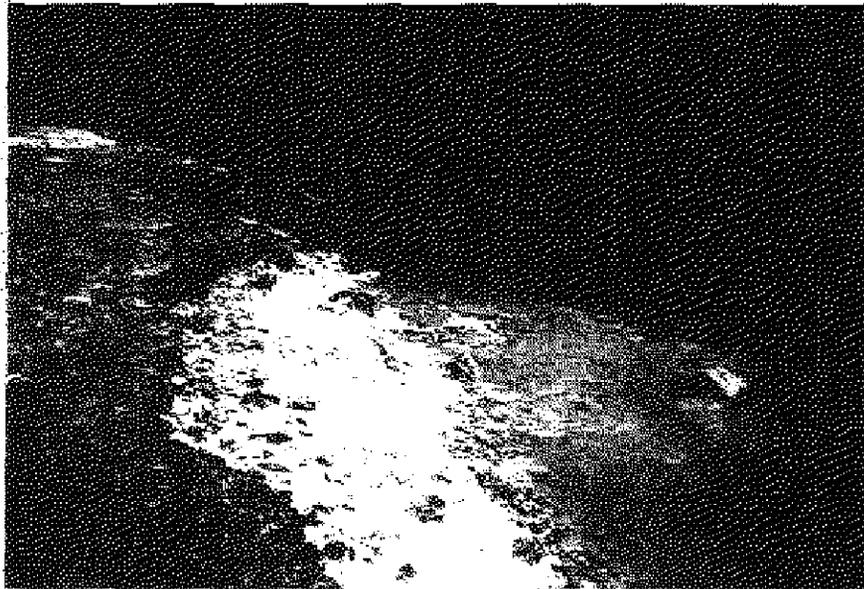
Attachment B

Site location from the California Department of Conservation, Office of Mine Reclamation draft report, Spenceville Mine - Remediation and Reclamation.





Overall view of Spencerville Mine site showing tailings piles and drainage pit.



Pollution from AMD (acid mine drainage) in Little Dry Creek.

DEPARTMENT OF CONSERVATION
OFFICE OF MINE RECLAMATION
801 K Street, MS 09-06
Sacramento, CA 95814-3529
TEL: (916) 323-9198
FAX: (916) 322-4862
E-MAIL: omr@consrv.ca.gov



Telecommunications
For The Deaf
TDD (916) 324-2555

July 28, 1997

Mr. James Cornelius
Institute of Environmental Solutions
717 K Street
Sacramento, CA 95814

Dear Mr. Cornelius:

I am pleased that the Institute of Environmental Solutions (IES) is responding to the CALFED Bay-Delta Program RFP regarding Ecosystem Restoration Projects and Programs. Your proposal, to conduct a feasibility study of innovative technologies to treat acid mine drainage (AMD) at Spenceville Mine, focuses on an important environmental issue in California. AMD was identified in a study conducted by the University of California, Berkeley, as the most serious problem associated with mine waste in the state. Identifying a feasible technology to remediate AMD is a necessary step in securing funding for cleanup.

The Department of Conservation, Office of Mine Reclamation (OMR), supports your proposal and will provide \$20,000 in the form of services-in-kind. Several state agencies, including OMR, have conducted site characterization studies at the site. OMR will conduct a literature review, acquire and review existing site characterization data, and provide a map of the current site configuration. In addition, OMR can assist with site sampling and provide historical information on mining and beneficiation methodologies that were employed at the site.

OMR understands that this is a feasibility study only, and that no on site remediation is proposed. We also understand that IES, as prime contractor, carries \$1 million in liability insurance and would assume any liability associated with the demonstration project.

Please call me if you need any additional information.

Sincerely,

Dennis J. O'Bryant
Assistant Director

CALIFORNIA

MINING ASSOCIATION

"The California Mining Association is dedicated to the advancement of responsible mining and the education of the public to the vital role of minerals and mining in our society."

July 25, 1997

Mr. James Cornelius
Institute of Environmental Solutions
717 K Street
Sacramento, California 95814

Dear Jim:

The California Mining Association (CMA) understands that the Institute of Environmental Solutions, Inc. (IES) is responding to the current CALFED Bay-Delta Program RFP regarding Ecosystem Restoration Projects and Programs. IES would like to use funding from this source for a feasibility study of several innovative technologies to treat Acid Rock Discharge (ARD). Specifically, IES will propose to evaluate at least four new technologies to treat ARD at the Spenceville Mine near Marysville, California. The end product from this work would be one or more processes which could be used at a wide variety of mine locations.

The California Mining Association supports IES in their proposal. The RFP states that provision of matching funds is a selection criteria, and CMA can provide a matching fund contribution in the form of services-in-kind. Specifically, the Mine Closure and Abandoned Mine Subcommittee of the Association's Environment Committee could provide peer review of the various products of the demonstration project. We suggest that approximately 100 hours of review effort with a value of approximately \$10,000 would be appropriate.

As we understand, IES is also seeking similar matching fund services-in-kind contributions from the Department of Conservation, Office of Mine Reclamation and the State Department of Fish and Game.

CMA understands that, since this is a feasibility demonstration program only, there is little or no chance of liability accruing to CMA. The services our committee would be providing would be limited to review of progress reports and general advice. We also understand that IES, as prime contractor, carries \$1 million liability insurance and would assume any liability associated with the demonstration project.

Sincerely,



Denise M. Jones
Executive Director



Department of Energy

Oakland Operations Office
1301 Clay Street
Oakland, California 94612-5208

Mr. James Cornelius
Institute of Environmental Solutions
717 K Street
Sacramento, California 95814

Dear Jim,

Your initiative with current CALFED Bay-Delta Program and the Ecosystems Restoration Projects and Programs to propose a feasibility study of several innovative technologies to treat Acid Rock Discharge at Spencerville, California would be of great interest to us. As you know, the Department of Energy, especially our Oakland Operations Office (DOE/OAK), is very interested in getting the technologies developed by our laboratories out in practical use. We would be highly supportive of any effort in this direction.

As soon as you have more information about the acceptance of your initiative, please call me at 510-6371598 to establish a meeting so that we can determine the type of support that DOE OAK and its national laboratories can provide to you and IES. Looking forward to work with you and the IES organization.

Sincerely,

A handwritten signature in black ink, appearing to be "John Lee", written over a horizontal line.

John Lee, Deputy Division Director
Environmental Programs Division

DEPARTMENT OF FISH AND GAME

1416 NINTH STREET
P.O. BOX 944209
SACRAMENTO, CA 94244-2090
(916) 654-3821



July 28, 1997

Mr. James Cornelius
Institute of Environmental Solutions
717 K Street
Sacramento, CA 95814

Re: Support for CALFED RFP

Dear Mr. Cornelius:

On behalf of the nonprofit Institute of Environmental Solutions (IES), you have contacted the California Department of Fish and Game (DFG) regarding an abandoned mine on DFG property. This mine, known as the Spenceville Mine site, discharges acid mine drainage (AMD) and associated heavy metals into a salmonid-rearing creek at the Spenceville Wildlife Refuge. You have indicated that IES, in cooperation with and funded by other State and Federal agencies as well as the California Mining Association, is interested in testing alternative treatment technologies for the AMD at the Spenceville site. You have offered to assist DFG in arranging for funding the cleanup of this abandoned mine by using the Spenceville Mine as a test site for these alternative treatment technologies.

As the owner of the Spenceville Wildlife refuge and as the State trustee for fish, wildlife and biota, DFG supports this project in concept and your RFP to the CALFED Bay-Delta Program for Ecosystem Restoration Projects and Programs. DFG hopes that your research and this pilot project will result in the development of mobile treatment technologies that could be used at the hundreds of abandoned mines throughout California and the Western States. As I indicated to you, DFG is prepared in concept to commit staff time to assist you on this project once approvals have been obtained within DFG as well as by the other involved regulatory oversight agencies and State administrative agencies such as the Department of Finance. I look forward to working with you on the project and finding a solution to some of California's mining waste problems. Should you need more information about the Spenceville Mine or assistance with the proposal, please do not hesitate to contact me at (916) 654-3830.

Sincerely,

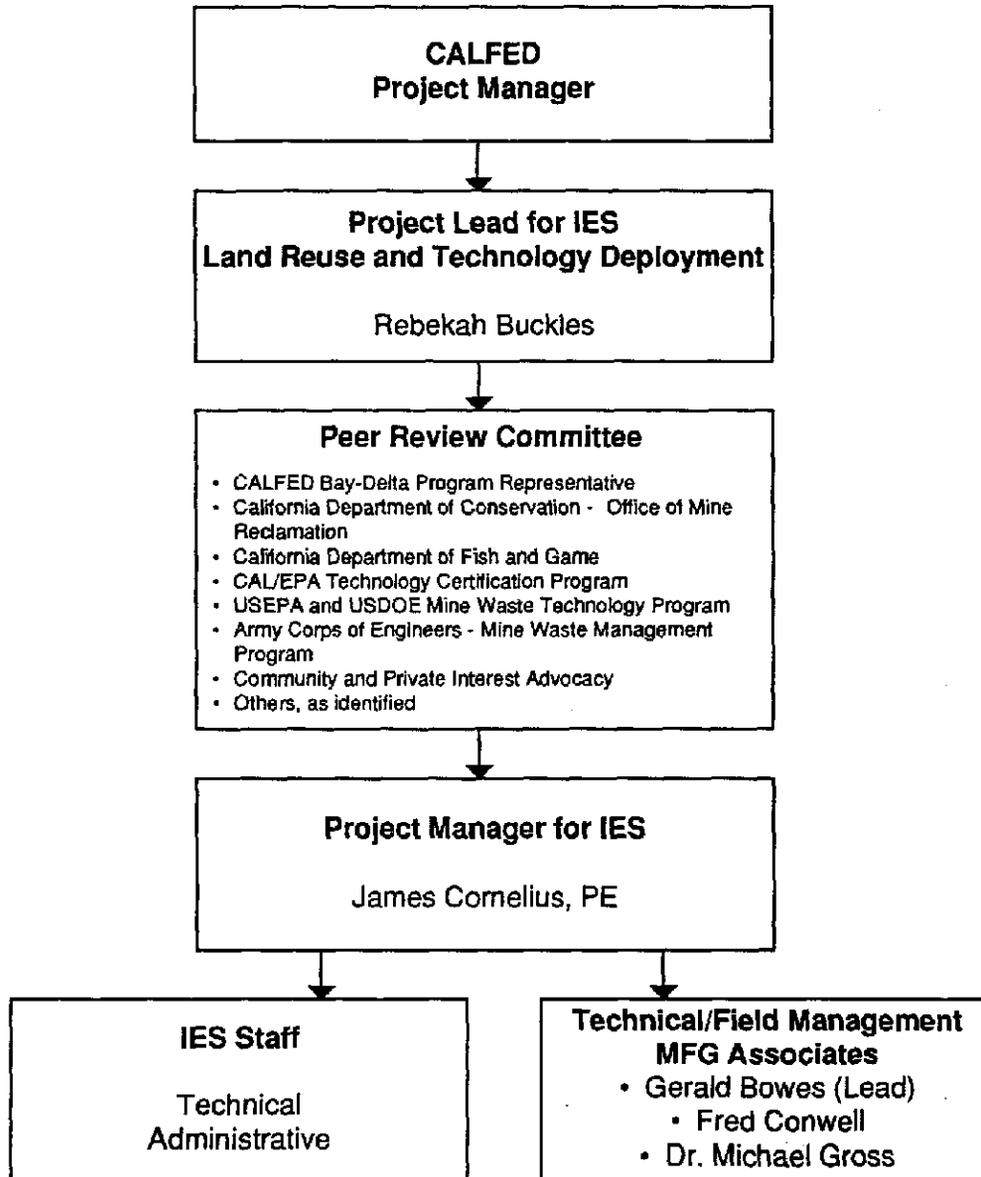
A handwritten signature in black ink, appearing to read "Jennifer A. Decker", is written over a horizontal line.

Jennifer A. Decker
Staff Counsel

JAD/de

cc: Pat Perkins, Region 2
Department of Fish and Game

CALFED Acid Mine Drainage (AMD) Project



INTERNAL REVENUE SERVICE
 DISTRICT DIRECTOR
 2 CUPANIA CIRCLE
 MONTEREY PARK, CA 91755-7431

DEPARTMENT OF THE TREASURY

Date: APR 14 1997

Employer Identification Number:
 68-0265277
 Case Number:
 957028009
 Contact Person:
 EO CUSTOMER SERVICE
 Contact Telephone Number:
 (213) 894-2289
 Our Letter Dated:
 July 1993
 Addendum Applies:
 No

APR 16 1997

INSTITUTE OF ENVIRONMENTAL
 SOLUTIONS
 717 K STREET 224
 SACRAMENTO, CA 95814-3406

Dear Applicant:

This modifies our letter of the above date in which we stated that you would be treated as an organization that is not a private foundation until the expiration of your advance ruling period.

[Your exempt status under section 501(a) of the Internal Revenue Code as an organization described in section 501(c)(3) is still in effect.] Based on the information you submitted, we have determined that you are not a private foundation within the meaning of section 509(a) of the Code because you are an organization of the type described in section 509(a)(1) and 170(b)(1)(A)(vi).

Grantors and contributors may rely on this determination unless the Internal Revenue Service publishes notice to the contrary. However, if you lose your section 509(a)(1) status, a grantor or contributor may not rely on this determination if he or she was in part responsible for, or was aware of, the act or failure to act, or the substantial or material change on the part of the organization that resulted in your loss of such status, or if he or she acquired knowledge that the Internal Revenue Service had given notice that you would no longer be classified as a section 509(a)(1) organization.

As of January 1, 1984, you are liable for taxes under the Federal Insurance Contributions Act (social security taxes) on remuneration of \$100 or more you pay to each of your employees during a calendar year. You are not liable for the tax imposed under the Federal Unemployment Tax Act (FUTA).

You are required to file Form 990 only if your gross receipts each year are normally more than \$25,000. For guidance in determining whether your gross receipts are "normally" more than \$25,000, see the instructions for Form 990. If a return is required, it must be filed by the 15th day of the fifth month after the end of your annual accounting period. A penalty of \$10 a day is charged when a return is filed late, unless there is reasonable cause for the delay. However, the maximum penalty charged cannot exceed \$5,000 or 5 percent of your gross receipts for the year, whichever is less. This penalty may also be charged if a return is not complete, so please be sure your return is complete before you file it.

If we have indicated in the heading of this letter that an addendum applies, the addendum enclosed is an integral part of this letter.

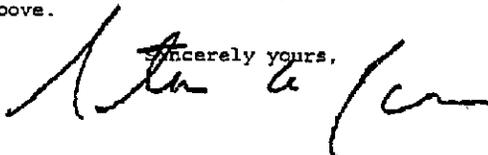
Letter 1050 (DO/CG)

INSTITUTE OF ENVIRONMENTAL

Because this letter could help resolve any questions about your private foundation status, please keep it in your permanent records.

If you have any questions, please contact the person whose name and telephone number are shown above.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Steven A. Jensen". The signature is written in a cursive style with a large initial "S" and a long horizontal stroke at the end.

Steven A. Jensen
District Director

Letter 1050 (DO/CG)

ACORD. INSURANCE BINDERDATE (MM/DD/YY)
07/26/96

THIS BINDER IS A TEMPORARY INSURANCE CONTRACT, SUBJECT TO THE CONDITIONS SHOWN ON THE REVERSE SIDE OF THIS FORM.

PRODUCER PHONE (A/C No. Ext): 962-3708	COMPANY CREDIT GENERAL	BINDER # 0072996
J-6 INSURANCE SERVICES 9706 FAIR OAKS BLVD #C FAIR OAKS, CA 95628 FAX: 916-966-6953	DATE EFFECTIVE TIME 07/29/96 12:01	EXPIRATION TIME 09/29/96 12:01 AM NOON
CODE: SUB CODE:	THIS BINDER IS ISSUED TO EXTEND COVERAGE IN THE ABOVE NAMED COMPANY PER EXPIRING POLICY #:	
AGENCY CUSTOMER ID: INSURED	DESCRIPTION OF OPERATIONS/VEHICLES/PROPERTY (Including Location) ENVIRONMENTAL CONSULTING	
INSTITUTE OF ENVIRONMENTAL SOLUTIONS 717 K STREET, SUITE 224 SACRAMENTO, CA 95814		

TYPE OF INSURANCE	COVERAGES/FORMS	AMOUNT	DEDUCTIBLE	COINS %
PROPERTY CAUSES OF LOSS <input type="checkbox"/> BASIC <input type="checkbox"/> BROAD <input type="checkbox"/> SPEC				
GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input checked="" type="checkbox"/> CLAIMS MADE <input type="checkbox"/> OCCUR <input type="checkbox"/> OWNERS & CONTRACTOR'S PROT <input checked="" type="checkbox"/> PROFESSIONAL <input checked="" type="checkbox"/> POLLUTION	RETRO DATE FOR CLAIMS MADE:	GENERAL AGGREGATE \$1,000,000 PRODUCTS - COMP/OP AGG \$1,000,000 PERSONAL & ADV INJURY \$1,000,000 EACH OCCURRENCE \$1,000,000 FIRE DAMAGE (Any one fire) \$ 50,000 MED EXP (Any one person) \$ 5,000		
AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS		BOODY INJURY (Per person) \$ BOODY INJURY (Per accident) \$ PROPERTY DAMAGE \$ MEDICAL PAYMENTS \$ PERSONAL INJURY PROT \$ UNINSURED MOTORIST \$		
AUTO PHYSICAL DAMAGE DEDUCTIBLE <input type="checkbox"/> ALL VEHICLES <input type="checkbox"/> SCHEDULED VEHICLES		ACTUAL CASH VALUE STATED AMOUNT \$ OTHER		
GARAGE LIABILITY <input type="checkbox"/> ANY AUTO		AUTO ONLY - EA ACCIDENT \$ OTHER THAN AUTO ONLY: \$ EACH ACCIDENT \$ AGGREGATE \$		
EXCESS LIABILITY <input type="checkbox"/> UMBRELLA FORM <input type="checkbox"/> OTHER THAN UMBRELLA FORM	RETRO DATE FOR CLAIMS MADE:	EACH OCCURRENCE \$ AGGREGATE \$ SELF-INSURED RETENTION \$ STATUTORY LIMITS		
WORKER'S COMPENSATION AND EMPLOYER'S LIABILITY		EACH ACCIDENT \$ DISEASE - POLICY LIMIT \$ DISEASE - EACH EMPLOYEE \$		
SPECIAL CONDITIONS/OTHER COVERAGES				

INSURED'S COPY	MORTGAGEE	ADDITIONAL INSURED
	LOSS PAYEE	
	LOAN #	
AUTHORIZED REPRESENTATIVE <i>Hella Jordan</i>		

ACORD 06-5 (12/78) NOTE: INFORMATION CONTAINED HEREON IS UNINSURED UNLESS OTHERWISE SPECIFIED

Employee Handbook - The Institute of Environmental Solutions

Employee and IES agree that arbitration shall be the exclusive forum for resolving all disputes arising out of or involving Employee's employment with IES or the termination of that employment (with the exception of claims for workers' compensation, unemployment insurance and any matter within the jurisdiction of the California Labor Commissioner); provided, however, that either party may file a request with a court of competent jurisdiction for equitable relief, including but not limited to injunctive relief, pending resolution of any dispute through the arbitration procedure set forth herein. If IES does not receive a written request for arbitration from Employee within one year from the date of the employee's termination, Employee agrees that he/she will have waived any right to raise any claim, in any forum, arising out of the termination of employee's employment.

Employee and IES shall each bear their own costs for legal representation at any such arbitration and the cost of the arbitrator, court reporter, if any, and any incidental costs of arbitration.

Employee and IES hereby agree that nothing contained herein shall preclude either party from obtaining injunctive or other equitable relief to restrain violations of this agreement or applicable law or to preserve the status quo pending the arbitration of any disputes subject to this section.

Employee and IES hereby agree that this section shall survive the termination of Employee's employment and shall survive the termination and/or expiration of this agreement.

My signature below certifies that I understand that the foregoing agreement on at-will status is the sole and entire agreement between IES and myself concerning the duration of my employment and the circumstances under which my employment may be terminated. It supersedes all prior agreements, understandings and representations concerning my employment with IES.

Employee's Signature _____ Date _____

Company Representative _____ Date _____

1005 Equal Employment Opportunity

IES is an equal opportunity employer and makes employment decisions on the basis of merit. We want to have the best available persons in every job. IES policy prohibits unlawful discrimination based on race, color, creed, sex, religion, marital status, age, national origin or ancestry, physical or mental disability, medical condition, sexual orientation, or any other consideration made unlawful by federal, state or local laws. All such discrimination is unlawful.