Environmental Technologies Testing and Demonstration Sites

A Federal Directory

Environmental Technology Working Group
Committee on Environment and Natural Resources
National Science and Technology Council

September 1996

Executive Office of the President
Office of Science and Technology Policy

About the National Science and Technology Council

President Clinton established the National Science and Technology Council (NSTC) by Executive Order on November 23, 1993. This Cabinet-level council is the principal means for the President to coordinate science, space, and technology policies across the Federal Government. NSTC acts as a "virtual" agency for science and technology to coordinate the diverse parts of the Federal research and development enterprise. NSTC is chaired by the President. Membership consists of the Vice President, Assistant to the President for Science and Technology, Cabinet Secretaries and agency heads with significant science and technology responsibilities, and other senior White House officials.

An important objective of NSTC is the establishment of clear national goals for Federal science and technology investments in areas ranging from information technologies and health research, to improving transportation systems and strengthening fundamental research. The Council prepares research and development strategies that are coordinated across Federal agencies to form an investment package that is aimed at accomplishing multiple national goals.

To obtain additional information regarding NSTC, contact the NSTC Executive Secretariat at 202-456-6100.

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The Office of Science and Technology Policy (OSTP) was established by the National Science and Technology Policy, Organization, and Priorities Act of 1976. OSTP's responsibilities include advising the President in policy formulation and budget development on all questions in which science and technology are important elements; articulating the President's science and technology policies and programs; and fostering strong partnerships among Federal, State, and local governments and the scientific communities in industry and academe.

To obtain additional information regarding OSTP, contact the OSTP Administrative Office at 202-395-7347.

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Acknowledgments

This document is a product of the Environmental Technology Working Group of the Committee on Environment and Natural Resources within the National Science and Technology Council. This directory would not exist if it had not been for the hard work and dedication of Julia Jones of the U.S. Department of Agriculture. In addition, Richard Burrow of the Department of Energy helped to finalize the document and Jim Ball at the National Technology Transfer Center developed the electronic version. We are also indebted to the many people at the agencies who contributed the information contained in the directory and are willing to act as potential partners in demonstrating innovative environmental technologies.

THE WHITE HOUSE

WASHINGTON

September 11, 1996

Dear Colleague:

In April 1995, the Clinton-Gore Administration released the National Environmental Technology Strategy, initiating a number of programs designed to accelerate the development and deployment of environmental technologies both here and abroad. The strategy is the result of over one year of discussions and meetings with key stakeholders from industry, academia, non-governmental organizations, and state and local government. One of the key objectives of the strategy is to ensure that the federal government becomes a more accessible partner with the private sector in advancing the development of environmental technologies.

In furtherance of this partnership goal, we are releasing this document, *Environmental Technologies Testing and Demonstration Sites: A Federal Directory.* It provides information about the availability of federally controlled lands and laboratories for public-private partnerships to test and demonstrate innovative environmental technologies. The directory lists over 100 sites that are available for demonstrating new remediation, control, monitoring, or pollution prevention technologies. The Directory underscores our belief that one of the most effective ways of moving environmentally critical technologies into the marketplace is to work with industry to prove that these technologies meet their performance objectives.

Sincerely,

John H. Gibbons
Assistant to the President
for Science and Technology

NSTC Committee on Environment and Natural Resources Participants
Full Committee

Name	Agency	Phone	Fax/E-Mail
Cochairs			
D. James Baker[a]	NOAA	202-482-3436	408-9674
			jbaker@hq.noaa.gov
Robert Watson[a]	OSTP	202-456-6202	456-6025
Rosina Bierbaum	OSTP	202-456-6077	456-6025
			rbierbau@ostp.eop.gov
Agency Representatives			
Michael Stegman	HUD	202-708-8100	619-8000
Dr. Floyd Horn	USDA	202-720-5923	690-2842
Allison Biggs[b]	USDA	202-720-7173	720-4732
Dr. Anna Johnson-Winegar	DOD	703-697-8714	693-7042
			j-winegar@acq.osd.mil
Robert Boyd[b]	DOD	703-697-8535	693-7042
			boydrl@acq.osd.mil
Ms. Patricia Beneke	DOI	202-208-3136	371-1825
Paul Dresler[b]	DOI	202-208-3024	371-2815
			pdresler@ios.doi.gov
Dr. Anne Petersen[a]	NSF	703-306-1001	306-0109
Penny Firth[b]	NSF	703-306-1480	306-0367
			pfirth@nsf.gov
Eileen B. Claussen	DOS	202-647-1554	647-0217
Bill Sullivan[b]	DOS	202-647-0240	647-1106
Dr. Charles Kennel[a]	NASA	202-358-1700	358-3092
			ckennel@mtpe.hq.nasa.gov
Nancy Maynard[b]	NASA	202-358-2559	358-2770
			nmaynard@mtpe.hq.nasa.gov
Dr. Kenneth Olden	HHS	919-541-3201	541-2260
Mary Gant[b]	NIEHS	301-496-2919	496-0563
Robert H. Volland	FEMA	202-646-3948	646-4387
Dr. Ronald L. Ritschard	TVA	205-386-2026	386-2126
H. Ronald Pulliam[a]	DOI	202-482-5707	273-3279
Thomas Lovejoy[a]	SI	202-786-2263	786-2304
			oaseaoo4@sivm.si.edu
Robert Hugget[a]	EPA	202-260-7676	260-9761
Christine Ervin[a]	DOE	202-586-9220	586-9260
			ee-as@hq.doe.gov
Robert Vallario[b]	DOE	202-586-0411	586-1737
Joseph Canny	DOT	202-366-4540	366-7127
Linda Zall	CIA	703-351-2135	527-6139
Skip Wright	FCCMSSER	301-427-2002	427-2007

NSTC Committee on Environment and Natural Resources Participants
Full Committee

Name	Agency	Phone	Fax/E-Mail
Office of Management and Budget			
PAD: T.J. Glauthier		202-395-4561	395-4639
DAD: Kathy Peroff		202-395-3404	395-4817
BC: Jack Fellows		202-395-3935	395-4817
BE: Sarah Horrigan		202-395-3534	395-4817
NSTC Liaison			
Peter Backlund	OSTP	202-456-6081	456-6025
CENR Executive Secretariat			
Susan Fruchter	NOAA	202-482-6096	402-9674 sfruchter@hq.noaa.gov
Donna Wieting	NOAA	202-482-5181	482-1156 dwieting@rdc.noaa.gov
NSTC Executive Secretary			
Angela Philips Diaz	NSTC	202-456-6100	456-6026
Gail Williams[b]	NSTC	202-456-6100	456-6026

[a]Executive committee member
[b]Denotes agency/subcommittee contact

Table of Contents

Executive Summary

The National Environmental Technology Strategy, released in April 1995, outlines a number of policies and programs critical to facilitating the development and deployment of environmental technologies both here in the United States and abroad. A key focus of the strategy is on developing new ways to demonstrate innovative environmental technologies in order to answer questions concerning their performance, economic viability, and acceptance. Technology demonstration builds an important bridge between R&D activities and the commercial application and export of environmentally critical technologies.

This directory was developed in response to specific recommendations made during the White House Conference on Environmental Technologies held in December 1994. A number of representatives from the environmental technology industry wanted to know where they could partner with the Federal Government to test their technologies. At that time, there was no comprehensive inventory or directory of Federal testing sites and facilities. This document is a response to the need for better information on demonstration opportunities for environmental technology developers.

The directory contains detailed information on more than 100 sites managed by Federal departments and agencies that are available for public-private partnerships to test and demonstrate environmental technologies. Some listed sites, such as those under the Department of Defense and Department of Energy, have a variety of environmental contaminants in existence. At other sites, such as those of the Department of Agriculture, there are no existing contaminants, yet the sites could be available for testing and demonstrating various monitoring or pollution-avoidance technologies.

A listing of a site in this directory should not be taken as a guarantee of site availability under all circumstances. Site leaders listed in the directory are in the best position to determine the compatibility of proposed demonstrations. Agreements to use the site must be negotiated between the private-sector entity and the onsite Federal manager.

Introduction

The pages of this Directory contain detailed information on physical sites managed by U.S. Government departments and agencies. These sites in particular, among all U.S. Government sites, are listed because they are available for public-private partnerships to test and demonstrate environmental technologies.

Some listed sites, such as those under the Department of Defense and the Department of Energy, have a variety of environmental contaminants in existence. In these cases, the full range of environmental technologies—remediation, control, monitoring, and avoidance—can be demonstrated. In other cases, such as sites under the Department of Agriculture, there are no existing contaminants, yet the sites would be available for testing and demonstrating monitoring and avoidance technologies.

While as much information as possible has been included in this brief directory, there will remain questions users would like to have had answered. In all cases, directory users should refer to the listed location point of contact for additional information.

This directory points to possible large- and small-scale sites for testing and demonstrating environmental technologies, but should not be taken as a guarantee of site availability under all circumstances. Site leaders, who know the character of ongoing research efforts, are in the best position to determine the compatibility of proposed demonstrations. Agreements to use the site are made between the private sector and the on-site Federal management.

This directory has been compiled under the direction of the Office of Science and Technology Policy and the National Science and Technology Council. This work responds to suggestions made by participants in the White House Conference on Environmental Technology, held December 11-13, 1994, and by those participating in the development of its National Environmental Technology Strategy. The participants' observations were that it is difficult to locate a suitable site to test proposed environmental technologies in ways that will demonstrate the ability of the technology to meet environmental regulatory standards. It is hoped this first edition of the directory will address this need. Expanded editions will be published on a periodic basis.

Special thanks go to Julia Jones, U.S. Department of Agriculture; Richard Burrow, William Becker, and Claire Sink, U.S. Department of Energy; Robert Holst, U.S. Department of Defense; and Connie Sasala and Alfred Lindsey, U.S. Environmental Protection Agency, for providing the data contained herein.

Department of Energy

Solar Energy Research Facility

Reporting Agency/Department: DOE, National Renewable Energy Laboratory

Site Name and Location: Solar Energy Research Facility, 14975 Denver West Parkway, Golden, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research and development facility with 42 laboratories in the areas of photovoltaics, superconductivity, and related materials sciences

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ☐ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Related fundamental research, development of advanced materials and solar cells, manufacturing technology and module development, and system development and validation. Examples of materials are thin-film photovoltaics, based on copper and indium selenide, diselenide, or telluride materials. The laboratory performs testing for solar cells from industry manufacturers for determination of cell performance and measurement of efficiency under standardized conditions and provides insight into mechanisms of failure after exposure to weather and simulated service life so that manufacturers can develop appropriate processing conditions for optimal performance. Testing is performed using such techniques as electron microprobe, Auger electron spectrometry, secondary ion mass spectrometry, x-ray photoelectron spectrometry, and scanning tunneling microscopy. An Outdoor Test Facility for performing outdoor photovoltaic experiments is being completed.

List Major Limitations Associated With Potential Use of the Site:
Private-sector access to these facilities can be obtained on a cost-reimbursement mode through Work for Others agreements. Other arrangements such as cooperative research and development agreements and cost-shared work can be negotiated as a function of the DOE program goals and objectives.

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: Dr. Antony Catalano
Mailing Address: DOE/NREL/SERF
1617 Cole Blvd.
Golden, Colorado 80401
E-Mail Address: catalana@tcplink.nrel.gov
Telephone: (303) 384-6446
Fax: (303) 384-6530

National Wind Technology Center

Reporting Agency/Department: DOE, National Renewable Energy Laboratory

Site Name and Location: National Wind Technology Center, 18200 State Highway 128, Golden, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research facility

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ☐ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
This facility provides two methods of structural excitation for modal tests of wind turbines—the hand-held hammer test and the ground-mounted shaker test. With these tests, researchers determine the natural frequencies of components and systems and provide vital information required to reduce fatigue damage of rotating structures.

List Major Limitations Associated With Potential Use of the Site:
Private-sector access to these facilities can be obtained on a cost-reimbursement mode through Work for Others agreements. Other arrangements such as cooperative research and development agreements and cost-shared work can be negotiated as a function of the DOE program goals and objectives.

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: Robert Thresher
Mailing Address: DOE/NREL/NWTC
1617 Cole Blvd.
Golden, CO 80401
E-Mail Address: thresher@tcplink.nrel.gov
Telephone: (303) 384-6922
Fax: (303) 384-6901 or 6999

National Wind Technology Center, Structural Test Facility

Reporting Agency/Department: DOE, National Renewable Energy Laboratory

Site Name and Location: National Wind Technology Center, Structural Test Facility, 18200 State Highway 128, Golden, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research facility

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ☐ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
This multi-use facility is used to test and evaluate the structural integrity of wind turbine blades. The nondestructive tests include photoelastic, brittle lacquer, and deflection measurements. Researchers also conduct destruction blade tests to determine ultimate blade strength and to establish fatigue characteristics. Equipment includes three test stands to support blades up to 18 m (60 ft) in length. The test stands and loading apparatus can withstand overturning torques up to 1.4 million N-m (1 million feet/lb). Researchers conduct fatigue tests using state-of-the-art servo hydraulic simulation test equipment supplied by MTS Corporation.

List Major Limitations Associated With Potential Use of the Site:
Private-sector access to these facilities can be obtained on a cost-reimbursement mode through Work for Others agreements. Other arrangements such as cooperative research and development agreements and cost-shared work can be negotiated as a function of the DOE program goals and objectives.

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: Robert Thresher
Mailing Address: DOE/NREL/NWTC
1617 Cole Blvd.
Golden, CO 80401
E-Mail Address: thresher@tcplink.nrel.gov
Telephone: (303) 384-6922
Fax: (303) 384-6901/6999

National Wind Technology Center, Wind Turbine Test Facility

Reporting Agency/Department: DOE, National Renewable Energy Laboratory

Site Name and Location: National Wind Technology Center, Wind Turbine Test Facility, 18200 State Highway 128, Golden, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research facility

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ☐ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
This facility is used to test wind turbine systems to determine their aerodynamic, structural, and electronic performance characteristics. Currently, researchers are testing a 10-kW Bergey turbine and a 20-kW "combined experiment" turbine for unsteady aerodynamics. The facility is capable of testing other turbine designs.

During late fall and winter, high-pressure zones being pushed across the Continental Divide by the winter jet stream cause turbulent gusts to funnel through Colorado's front-range canyon. These winds are characteristic of those powering California's wind farms and are perfect for wind load and system fatigue testing. In the late winter and spring, low pressure drives less frequent but smoother winds from the south and east up against the Rocky Mountains, generating stable conditions that are excellent for wind system calibration, component reconfiguration, and turbine certification.

List Major Limitations Associated With Potential Use of the Site:
Private-sector access to these facilities can be obtained on a cost-reimbursement mode through Work for Others agreements. Other arrangements such as cooperative research and development agreements and cost-shared work can be negotiated as a function of the DOE program goals and objectives.

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: Robert Thresher
Mailing Address: DOE/NREL/NWTC
1617 Cole Blvd.
Golden, CO 80401
E-Mail Address: thresher@tcplink.nrel.gov
Telephone: (303) 384-6922
Fax: (303) 384-6901 or 6999

Plastics Recycling Laboratory

Reporting Agency/Department: DOE, National Renewable Energy Laboratory

Site Name and Location: Plastics Recycling Laboratory, Field Test Laboratory Building, 15003 Denver West Parkway, Golden, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ✔ Control ☐ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
This facility is used to study the conversion of mixed waste plastics to high-value chemicals. Researchers convert the plastics using selective pyrolysis into valuable chemical feedstocks.

The facility houses small-scale fluidized-bed reactors coupled to on-line mass spectrometers. Larger batch and fluidized-bed reactors are used to test promising reactions on a larger scale. Research techniques include using analytical pyrolysis to rapidly characterize plastic samples including mixtures in waste streams.

List Major Limitations Associated With Potential Use of the Site:
Private-sector access to these facilities can be obtained on a cost-reimbursement mode through Work for Others agreements. Other arrangements such as cooperative research and development agreements and cost-shared work can be negotiated as a function of the DOE program goals and objectives.

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: Helena L. Chum
Mailing Address: DOE/NREL
1617 Cole Blvd.
Golden, CO 80401
E-Mail Address: chumh@tcplink.nrel.gov
Telephone: (303) 275-2949
Fax: (303) 275-2905

High-Flux Solar Furnace

Reporting Agency/Department: DOE, National Renewable Energy Laboratory

Site Name and Location: Solar Industrial Mesa Test Area, High-Flux Solar Furnace; Golden, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory and demonstration facility

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ☐ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
This outdoor facility is used for solar thermal and industrial experiments, and particularly for experiments related to solar detoxification of hazardous wastes in water and air. It is ideal for experiments that require a low to medium concentration (1 to 20 suns) of ambient sunlight.

The High-Flux Solar Furnace (HFSF) was named a National User Facility by DOE in 1993. This designation established the HFSF as a one-of-a-kind resource that is staffed by personnel with unparalleled expertise and recognizes the facility's unique capabilities in advanced materials processing. Current HFSF research focuses on the production or processing of advanced materials and the destruction of environmental contaminants in the gas phase. The furnace's ability to rapidly produce high temperatures on the surface of a material without affecting the base materials has led to studies of phase-transformation hardening, cladding, thin-film deposition and rapid thermal annealing.

Because the system delivers the entire solar spectrum, researchers can work with either broad-spectrum radiation or a particular frequency, ranging from infrared to the near ultraviolet. The unit's long focal length and off-axis design give researchers great experimental flexibility and control over the incoming solar flux. A large flat mirror tracks the sun and reflects solar energy into 25 individual curved mirrors collectively known as the primary concentrator. The concentrator focuses the flux at an area in the test building that is equipped with a reflective or refractive secondary concentrator. Under optimal conditions, the furnace's primary concentrator can achieve maximum flux intensities of about 2,500 suns. The secondary concentrator, installed at the primary concentrator's focal point, increases the intensity further. Reflective secondaries can easily achieve intensities of up to 50,000 suns.

List Major Limitations Associated With Potential Use of the Site:
Private-sector access to these facilities can be obtained on a cost-reimbursement mode through Work for Others agreements. Other arrangements such as cooperative research and development agreements and cost-shared work can be negotiated as a function of the DOE program goals and objectives.

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: Stephen Hauser
Mailing Address: DOE/NREL
1617 Cole Blvd.
Golden, CO 80401
E-Mail Address: hausers@tcplink.nrel.gov
Telephone: (303) 384-7416
Fax: (303) 384-7411

Solar Radiation Research Laboratory

Reporting Agency/Department: DOE, National Renewable Energy Laboratory

Site Name and Location: Solar Radiation Research Laboratory, Golden, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ☐ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
This facility provides measurements of solar radiation and other meteorological data to support research in renewable energy. The facility also is used to calibrate broadband radiometers outdoors that are traceable to the World Radiometric Reference using a reference group of absolute cavity radiometers. Outdoor spectral and broadband radiometer measurements also are used to evaluate photovoltaic device performance. In addition, researchers can use the facility to develop and test new instrumentation, such as automated solar trackers.

List Major Limitations Associated With Potential Use of the Site:
Private-sector access to these facilities can be obtained on a cost-reimbursement mode through Work for Others agreements. Other arrangements such as cooperative research and development agreements and cost-shared work can be negotiated as a function of the DOE program goals and objectives.

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: Thomas Bath
Mailing Address: DOE/NREL
1617 Cole Blvd.
Golden, CO 80401
E-Mail Address: batht@tcplink.nrel.gov
Telephone: (303) 275-4606
Fax: (303) 275-4611

Mirror Preparation and Exposure Testing Laboratories

Reporting Agency/Department: DOE, National Renewable Energy Laboratory

Site Name and Location: Mirror Preparation and Exposure Testing Laboratories, Golden, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
These facilities house three types of accelerated weathering units used to test the reflector optical properties of reflector materials, including polymer samples and mirrors. Each unit can control ultraviolet light, heat, and humidity.

List Major Limitations Associated With Potential Use of the Site:
Private-sector access to these facilities can be obtained on a cost-reimbursement mode through Work for Others agreements. Other arrangements such as cooperative research and development agreements and cost-shared work can be negotiated as a function of the DOE program goals and objectives.

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: Stephen Hauser
Mailing Address: DOE/NREL
1617 Cole Blvd.
Golden, CO 80401
E-Mail Address: hausers@tcplink.nrel.gov
Telephone: (303) 384-7416
Fax: (303) 384-7411

Thermochemical Engineering Laboratory, Field Test Laboratory

Reporting Agency/Department: DOE, National Renewable Energy Laboratory

Site Name and Location: Thermochemical Engineering Laboratory, Field Test Laboratory Building, 15003 Denver West Parkway, Golden, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ☐ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
This facility is used for generation of pyrolysis oil from biomass and waste feedstocks, employing a novel engineering-scale fast-pyrolysis process. This pilot facility operates at 20 to 40 kg/h (44 to 88 lb/h). Oils can be used as feedstocks for fuels, for the production of chemicals, or for the generation of electric power. Associated facilities are available for chemical fractionation of the oils and catalytic upgrading. The laboratory also has complete analytical facilities for characterization and catalytic upgrading. A versatile Biomass Thermochemical Facility for pyrolysis, gasification, catalytic upgrading, and analysis is available for testing of feedstocks and catalysts.

List Major Limitations Associated With Potential Use of the Site:
Private-sector access to these facilities can be obtained on a cost-reimbursement mode through Work for Others agreements. Other arrangements such as cooperative research and development agreements and cost-shared work can be negotiated as a function of the DOE program goals and objectives.

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: Helena L. Chum
Mailing Address: DOE/NREL
1617 Cole Blvd.
Golden, CO 80401
E-Mail Address: chumh@tcplink.nrel.gov
Telephone: (303) 275-2949
Fax: (303) 275-2905

Alternative Fuels Users Facility

Reporting Agency/Department: DOE, National Renewable Energy Laboratory

Site Name and Location: Alternative Fuels Users Facility, Golden, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ☐ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
This area is used to convert biomass feedstocks to ethanol and other fuels and chemicals. The facility includes a building that houses a process development unit to test lignocellulosic biomass-to-ethanol technologies on a pilot scale. A 907-kg/day (1-ton/day) biomass-to-ethanol pilot plant began operating in mid-1994. The pilot plant features equipment for pretreating biomass feedstocks, and several large-scale 9,000-L (2,377-gal) fermenters for producing cellulose and converting cellulose and xylose to ethanol. Three more fermenters will be added to bring total capacity to about 63,926 L (16,888 gal). A distillation column for product recovery also is available. The bench-scale unit includes pretreatment equipment, fermenters, and a distillation column. Both systems have extensive data acquisition capabilities.

List Major Limitations Associated With Potential Use of the Site:
Private-sector access to these facilities can be obtained on a cost-reimbursement mode through Work for Others agreements. Other arrangements such as cooperative research and development agreements and cost-shared work can be negotiated as a function of the DOE program goals and objectives.

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: Charles Wyman
Mailing Address: DOE/NREL
1617 Cole Blvd.
Golden, CO 80401
E-Mail Address: wymanc@tcplink.nrel.gov
Telephone: (303) 275-4453
Fax: (303) 275-4452

Biomass Conversion and Organic Synthesis Laboratories

Reporting Agency/Department: DOE, National Renewable Energy Laboratory

Site Name and Location: Biomass Conversion and Organic Synthesis Laboratories, Field Test Laboratory Building, 15003 Denver West Parkway, Golden, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
These facilities are used to investigate novel methods for the transformation of renewable and biomass-derived material into useful fuels and chemicals. A complete analytical facility for biomass analysis is available. Organic and organometallic synthesis, electrochemical synthesis, and catalysis are used to analyze the composition of biomass feedstocks.

List Major Limitations Associated With Potential Use of the Site:
Private-sector access to these facilities can be obtained on a cost-reimbursement mode through Work for Others agreements. Other arrangements such as cooperative research and development agreements and cost-shared work can be negotiated as a function of the DOE program goals and objectives.

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: Helena L. Chum
Mailing Address: DOE/NREL
1617 Cole Blvd.
Golden, CO 80401
E-Mail Address: chumh@tcplink.nrel.gov
Telephone: (303) 275-2949
Fax: (303) 275-2905

Molecular Beam Mass Spectrometry Laboratory

Reporting Agency/Department: DOE, National Renewable Energy Laboratory

Site Name and Location: Molecular Beam Mass Spectrometry Laboratory, Field Test Laboratory Building, 15003 Denver West Parkway, Golden, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
This facility is used to study biomass-derived feedstocks, plastics, and wastes that can be converted to useful fuels and chemicals. Specific items being studied include complex biomass gasifier tars, analytical pyrolysis for fuel biomass and waste feedstock analysis, thermal processing of plastics wastes for high-value chemicals recovery, and the release of alkali vapor in the high-temperature combustion of woods and grasses.

This facility comprises three direct sampling, molecular beam, mass spectrometer systems—one fixed and the other two transportable for field applications. These systems can extract and measure reactive and condensable species from hot, moist, particle-laden, reactive systems under simulated or real reactor or stack conditions. The mass spectrometer provides a nearly universal detector, and the advanced multi-variate analysis capabilities aid deconvolution and interpretation of complex spectra. Equipment is used in the field to optimize processes and minimize their environmental impact.

List Major Limitations Associated With Potential Use of the Site:
Private-sector access to these facilities can be obtained on a cost-reimbursement mode through Work for Others agreements. Other arrangements such as cooperative research and development agreements and cost-shared work can be negotiated as a function of the DOE program goals and objectives.

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: Helena L. Chum
Mailing Address: DOE/NREL
1617 Cole Blvd.
Golden, CO 80401
E-Mail Address: chumh@tcplink.nrel.gov
Telephone: (303) 275-2949
Fax: (303) 275-2905

Argonne National Laboratory

Reporting Agency/Department: DOE, Argonne National Laboratory

Site Name and Location: Argonne, Illinois

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Fabrication Facility, Energy Technology Division

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ☐ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Fabrication facility for advanced materials processing and fabrication, including radioactive materials.

List Major Limitations Associated With Potential Use of the Site:
Private-sector access to these facilities can be obtained on a cost-reimbursement mode through Work for Others agreements. Other arrangements such as cooperative research and development agreements and cost-shared work can be negotiated as a function of the DOE program goals and objectives.

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: Dwight Diercks
Mailing Address: DOE/ANL
9700 S. Cass Ave.
Argonne, IL 60439
E-Mail Address: dr_diercks@qmgate.anl.gov
Telephone: (708) 252-5032
Fax: (708) 252-4798

Western Environmental Technology Office

Reporting Agency/Department: DOE, Western Environmental Technology Office

Site Name and Location: Butte, Montana

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research and demonstration facility

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:

- Plasma-arc waste processing demonstration units
- Berkeley pit and other mine-waste sites
- Spray casting waste minimization demonstration facility
- Off-gas treatment and emissions control facility

List Major Limitations Associated With Potential Use of the Site:
Radioactive testing not conducted. Private-sector access to these facilities can be obtained on a cost-reimbursement mode through Work for Others agreements. Other arrangements such as cooperative research and development agreements and cost-shared work can be negotiated as a function of the DOE program goals and objectives.

List the Three Major Contaminants at the Site: (1) Organics and energetics, (2) Heavy metals, (3) Mine waste

Location Point of Contact

Name: Mel Shupe
Mailing Address: DOE/WETO
P.O. Box 3462
Butte, MT 59702
Telephone: (406) 494-7205
Fax: (406) 494-7490

Grand Junction Projects Office

Reporting Agency/Department: DOE, Grand Junction Projects Office

Site Name and Location: Grand Junction, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Radiometric Calibration Facility

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
The facility consists of fabricated boreholes and pads containing known concentrations of potassium, uranium, and thorium. The facility is described in DOE/ID/12584/179, Third Edition

List Major Limitations Associated With Potential Use of the Site: None

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: John A. Stelmach
Mailing Address: DOE/Grand Junction Projects Office
P.O. Box 2567
Grand Junction, CO 81502
Telephone: (970) 248-6022
Fax: (970) 248-6023

Rabbit Valley Geophysical Performance Evaluation Range

Reporting Agency/Department: DOE, Grand Junction Projects Office

Site Name and Location: Rabbit Valley Geophysical Performance Evaluation Range, near Grand Junction, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Demonstration and geophysical performance evaluation facility

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
This site is a geophysical instrument test range with a large selection of subsurface targets of various sizes, shapes, orientations, and compositions. See the report DOE/ID/12584-195 for details.

List Major Limitations Associated With Potential Use of the Site:
No limitations. The site is on public land with no restrictions on access. It is open to the public.

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: John A. Stelmach
Mailing Address: DOE/Grand Junction Projects Office
P.O. Box 2567
Grand Junction, CO 81502
Telephone: (970) 248-6022
Fax: (970) 248-6023

Grand Junction Walker Field Airport

Reporting Agency/Department: DOE, Grand Junction Projects Office

Site Name and Location: Grand Junction Walker Field Airport, Grand Junction, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Large-area distributive-source radiometric calibration pads

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Large area (30 ft. x 40 ft.) pads containing known concentrations of potassium, uranium, and thorium. The five pads are used by aircraft and surface vehicle systems; hand-held instruments also are calibrated on the pads. The large area calibration pads are described in DOE/ID/12584-179, Third Edition.

List Major Limitations Associated With Potential Use of the Site:
The site is leased from the Walker Field Airport Authority. Access information can be obtained by calling the DOE Grand Junction Projects Office contractor at 970-248-6702.

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: John A. Stelmack
Mailing Address: DOE/Grand Junction Projects Office
P.O. Box 2567
Grand Junction, CO 81502
Telephone: (970) 248-6022
Fax: (970) 248-6023

Sandia National Laboratories

Reporting Agency/Department: DOE, Sandia National Laboratories

Site Name and Location: Albuquerque, New Mexico

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): National engineering research and development laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:

- Large controlled site in close proximity to metropolitan area with a large scientific research and development support infrastructure.
- On-going site production activities (weapon components, medical isotopes, etc.) provide real-time pollution prevention and wastemanagement opportunities.
- Limited scope environmental restoration legacies (landfills, contaminated groundwater plumes, hazardous and nuclear wastes, etc.) provide demonstration opportunities.
- On-site teams with experience in environmental operations, regulatory compliance, technology development, testing, and demonstrations.
- Notable competencies in advanced manufacturing processes; robotics; landfill and plume remediation; characterization, monitoring, and sensor technologies; environmental management and decision support; alternative energy research; transportation systems; engineered systems; and computational sciences.
- Closely linked with California laboratory site.

List Major Limitations Associated With Potential Use of the Site:

- Activities must comply with California environmental requirements.
- Site collocated on Kirtland Air Force Base.
- Security requirements place restrictions on access by non-U. S. citizens and personnel unable to obtain security clearances.

List the Three Major Contaminants at the Site: (1) Volatile organic compounds, (2) Heavy metals, (3) Radioactive materials

Location Point of Contact

Name: George Allen
Mailing Address: Sandia National Laboratories
P.O. Box 5800, MS-0756
Albuquerque, NM 87185
E-Mail Address: gcallen@sandia.gov
Telephone: (505) 844-9769
Fax: (505) 844-0968

Sandia National Laboratories, Livermore Facility

Reporting Agency/Department: DOE, Sandia National Laboratories

Site Name and Location: Livermore, California

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): National engineering research and development laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:

- Controlled site near major urban area.
- Large scientific research and development support infrastructure.
- Close proximity to large California environmental market and technology suppliers.
- Limited-scope environmental restoration legacies (fuel oil spill) provide demonstration opportunities.
- On-site teams with experience in environmental operations, regulatory compliance, technology development, testing, and demonstrations.
- Notable competencies in combustion research; advanced manufacturing processes; non-thermal waste treatment technology; characterization, monitoring, and sensor technologies; alternative energy research; engineered systems; and computational sciences.
- Closely linked with New Mexico laboratory site.

List Major Limitations Associated With Potential Use of the Site:

- Activities must comply with California environmental requirements.
- Security requirements place restrictions on access by non-U. S. citizens and personnel unable to obtain security clearances.

List the Three Major Contaminants at the Site: (1) Fuel oil, (2) miscellaneous hazardous and explosive materials

Location Point of Contact

Name: Taz Bramlette
Mailing Address: Sandia National Laboratories
P.O. Box 969, MS-9410
Livermore, CA 94550
E-Mail Address: taz_bramlette@sandia.gov
Telephone: (510) 294-2299
Fax: (510) 294-2999

Fernald Environmental Management Project

Reporting Agency/Department: DOE, Fernald Environmental Management Project

Site Name and Location: Cincinnati, Ohio

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Former uranium processing facility

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ☐ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
This site is undergoing remediation. A baseline is established against which the technology demonstrations can be compared to judge their feasibility. All Records of Decision (RODs) are in place and the remediation is proceeding on a predictable schedule with a defined end point. The Fernold RODs, in agreement with regulators, encourage the continued pursuit of improved technology for application within the CERCLA process. Numerous new support technologies, including real-time analytical and enhanced dismantlement methods are being sought. Advantaged technologies will be put to further use at the site during the accelerated (10-year) remediation effort.

List Major Limitations Associated With Potential Use of the Site: Site final use has been selected

List the Three Major Contaminants at the Site: (1) Uranium

Location Point of Contact

Name:	Paul J. Pettit	Rod Warner
Mailing Address:	Fermco	U.S. DOE
	P.O. Box 538704	P.O. Box 538705
	Cincinnati, OH 45253	Cincinnati, OH 45253
Telephone:	(513) 648-6558	(513) 648-3156
Fax:	(513) 648-6913	(513) 648-3076

Idaho National Engineering Laboratory, Cold Test Pit

Reporting Agency/Department: DOE, Idaho National Engineering Laboratory

Site Name and Location: Cold Test Pit, Idaho Falls, Idaho

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Demonstration and testing area.

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Test site with no nearby communities. On-site research teams with experience in testing and demonstration. Simulated INEL waste problems. An area 40 ft (12 m) wide, 228 ft (68 m) long, and about 10 ft (3 m) deep was excavated in 1988 about 600 ft (183 m) south of the Subsurface Disposal Area (SDA) in the Radioactive Waste Management Complex (RWMC). This area, known as the Cold Test Pit, was initially divided into five cells, with each cell representing a different configuration of the waste. The cells contain randomly dumped barrels, randomly dumped barrels and boxes, stacked barrels, stacked boxes, and the large objects pit (the waste seam is about 8 ft thick with a 4- to 5-ft soil cap). Each barrel and box was filled with simulated waste in specific, marked cells and backfilled in the same manner as the SDA waste pits that were constructed between 1953 and 1970. Items such as metals, tools, plastics, concrete, asphalt, wood, and simulated sludge were placed in each container. Cardboard containers were used to hasten deterioration of the barrels and boxes—a condition most likely to be encountered at the SDA. Water also was sprayed on the containers just prior to burial to accelerate the deterioration. In order to simulate the presence of radioactive waste for migration and detection purposes, rare earth tracers were placed into each container. These tracers are valuable when measuring the effectiveness of contamination control technologies. Only one kind of tracer was placed in each cell. No tracers were placed in the large objects pit. The following kinds of tracers were placed in each of the cells: randomly dumped barrels; dysprosium; randomly dumped barrels and boxes, ytterbium; stacked barrels, terbium; stacked boxes, neodymium. Two additional test cells were added in 1992 to support characterization and retrieval demonstrations. The total size of the cells is 40 ft (12 m) wide, 43 ft (13 m) long, and 12 ft (3.7 m) deep. The retrieval cell was excavated in the FY 93 Remote Excavation System proof-of-principle demonstration. A 1993 shallow characterization cell was added to support the Trench Dig-Face Demonstration and will be used as a calibrated test cell for future demonstrations. The dimensions of this cell are 32 ft (9.6 m) wide and 8 ft (2.4 m) long. The Cold Test Pit is being used as a simulated waste disposal area to test and demonstrate characterization, retrieval, and treatment technologies. It provides known targets and waste forms for accurate evaluation and calibration of procedures, technologies, and equipment tested. Testing at the Cold Test Pit reduces hazards to personnel and the environment otherwise unavoidable in an actual disposal area.

List Major Limitations Associated With Potential Use of the Site: None

List the Three Major Contaminants at the Site: None, simulated waste

Location Point of Contact

Name: Kevin Kostelnik,
Mailing Address: DOE/INEL
P.O. Box 1625
Idaho Falls, ID 83415
E-Mail Address: kvk@inel.gov
Telephone: (208) 526-9642
Fax: (208) 526-6802

Idaho National Engineering Laboratory

Reporting Agency/Department: DOE, Idaho Operations Office

Site Name and Location: Idaho National Engineering Laboratory, Idaho Falls, Idaho

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Multipurpose applied engineering and nuclear research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:

The mission of the Idaho National Engineering Laboratory (INEL) is to develop, demonstrate, and deploy advanced engineering technologies and systems to improve national competitiveness and security; to make the production and use of energy more efficient; and to improve the quality of life and the environment. INEL is managed by Lockheed Idaho Technologies Corporation (LITCO). Lockheed promotes the development of technologies by industry and the universities. Lockheed will provide support to demonstrations within the constraints of a tight budget and the need to meet regulatory milestones.

The INEL environmental restoration program includes activities to assess and clean up inactive operations areas, including waste sites where there are known or suspected releases of harmful substances into the environment, and to safely manage contaminated surplus nuclear facilities. Three Remediation Technology Test Beds have been listed for Idaho. The test bed listed as No. 8 is an actual remediation at Test Area North. The contaminates near this facility are described in more detail under the facility description below. A ROD for the remediation has been signed and can be made available to industry representatives. The Arid Testbed (No. 19) is an experimental/demonstration site developed by the Buried Waste Integrated Demonstration Project and now managed by the Landfill Focus Area (Focus Areas are integrated project teams which currently manage the technology development program with the DOE's Office of Technology Development). The Cold Test Pit is another experimental/demonstration site developed as part of demonstration of retrieval and treatment technology which resulted in the current contract usually referenced as Pit 9.

Waste management program activities are designed to protect INEL employees, the public, and the environment through the design, construction, maintenance, and operation of treatment, storage, and disposal facilities for hazardous, transuranic, alpha contaminated and mixed high-level waste and spent nuclear fuel from military, research, and commercial sources. DOE-ID and the INEL are the lead for the Mixed Waste Focus Area. Contracts are placed with industry to demonstrate technologies which can treat the mixed waste stored at this site and others. There are no designed test beds for waste treatment but the dismantlement and the materials recycle test bed (No. 21) can support both waste treatment and remediation demonstration.

The nine major facility areas located at the INEL site are:
- Test Area North
- Test Reactor Area
- Idaho Chemical Processing Plant
- Central Facilities Area
- Power Burst Facility
- Experimental Breeder Reactor I and Boiling Water Reactor Experiment
- Radioactive Waste Management Complex
- Naval Reactors Facility
- Argonne National Laboratory West

Numerous support facilities are located in the City of Idaho Falls.

The Test Area North is located in the northern portion of the INEL site on State Highway 33 about 24 kilometers (15 miles) east of the town of Howe and 19 kilometers (12 miles) west of the town of Mud Lake. This facility area covers a total area of about 80 hectares (200 acres). Test Area North's current purpose includes handling and evaluating irradiated materials, supporting energy research and defense programs (including production of tank armor), demonstrating dry-cask storage of spent nuclear fuel, performing flow tests to support reactor safety studies, and storing spent nuclear fuel. The major facilities include the Process Experimental Pilot Plant; the Water Reactor Research Test Facility, which is used for reactor flow experiments and includes the Thermal-Hydraulic Experimental Facility Assembly and Test Building; and the Containment Test Facility, which houses the Specific Manufacturing Capability project that produces tank armor for the U.S. Army.

The Test Reactor Area's current purpose is to study the effects of radiation on materials, fuels, and equipment and to perform chemistry and physics experiments. The Test Reactor Area's major facilities include the Materials Test Reactor, the Engineering Test Reactor, the Advanced Test Reactor, four low-power reactors, and a hot-cell operation for handling highly radioactive materials. The Materials Test Reactor and Engineering Test Reactor have been deactivated and are planned for decontamination and decommissioning. The Advanced Test Reactor still is operating. It is used for materials testing under reactor conditions and for producing radioisotopes used in medicine, research, and industry. The four low-power reactors used for criticality measurements are the Engineering Test Reactor Critical Facility (in decommissioning and decontamination), the Advanced Test Reactor Critical Facility (on line), the Advanced Reactivity Measurement Facility (shutdown status), and the Coupled Fast Reactivity Measurement Facility (shutdown status).

The Idaho Chemical Processing Plant's current purpose is to receive and store DOE-assigned spent nuclear fuels; prepare high-level liquid and solid waste for disposition in a repository; develop technologies for the disposition of spent nuclear fuel, sodium-bearing waste, and high-level waste; and develop and apply technologies to minimize waste generation and manage radioactive and hazardous wastes. Storage facilities provide spent nuclear fuel storage (pools and dry storage), calcine (dry granular waste) storage (in bins), and liquid high-level waste storage (in underground tanks). Treatment facilities include a waste solidification facility for treatment of liquid high-level waste and sodium-bearing waste (New Waste Calcining Facility) and an evaporator used to concentrate low-level waste and mixed low-level waste. Another treatment facility prevents radioactive waste from being discharged to the percolation ponds and recovers nitric acid for reuse. Mixed and low-level waste is handled and stored in the Hazard-

ous and Radioactive Mixed Waste Staging Area and the Hazardous Chemical/Radioactive Waste Facility. Other operating facilities include process development and robotics laboratories.

The Central Facilities Area's purpose is to provide technical and support services for the INEL site. These services include environmental monitoring and calibration laboratories, communication systems, security, fire protection, medical services, warehouses, a cafeteria, vehicle and equipment pools, the DOE-ID West office, and bus operations. There are two waste operations facilities: the Hazardous Waste Storage Facility and the INEL Landfill Complex. The Hazardous Waste Storage Facility temporarily stores hazardous wastes pending transport to a commercial, offsite, U. S. Environmental Protection Agency-permitted treatment and disposal site. The Landfill Complex is a facility used to dispose of INEL industrial waste.

The Power Burst Facility is planned for use in a cancer research and treatment program. The reactor support facilities are being used for waste management-related research, including the development of radioactive waste volume-reduction techniques and waste immobilization research. The Power Burst Facility has four major facilities: the Waste Experimental Reduction Facility, which was designed to treat low-level and mixed low-level waste for volume reduction and removal of Resource Conservation and Recovery Act hazardous waste; the Mixed Waste Storage Facility, which provides temporary storage for mixed low-level waste; the Waste Experimental Reduction Facility Waste Storage Building, which stores waste awaiting treatment in the Waste Experimental Reduction Facility and augments the capacity of the Mixed Waste Storage Facility; and the Waste Engineering Development Facility, which is used for treatment, decontamination, and technology development activities.

Near the Power Burst Facility area is the Auxiliary Reactor Area. The Auxiliary Reactor Area's program has been phased out, and all reactors have been removed or dismantled. All remaining buildings at the Auxiliary Reactor Area have been identified for decontamination and decommissioning. All buildings in the area are vacant except for intermittent small-scale testing programs.

The Experimental Breeder Reactor I and Boiling Water Reactor Experiment facility is a National Historic Landmark.

The Radioactive Waste Management Complex provides waste management for interim storage of transuranic waste and disposal of low-level waste. It also supports research and development projects to improve treatment and interim storage of transuranic waste, low-level waste disposal, buried waste remediation technologies, and environmental remediation. Two main areas, including several major facilities, are operating; the Transuranic Storage Area and the Subsurface Disposal Area. The Transuranic Storage Area is dedicated to the management of transuranic waste, including interim storage operations, certification, technology development, and future transport to the Waste Isolation Pilot Plant. The Stored Waste Examination Pilot Plant, located in the Transuranic Storage Area, is currently on operational stand-by. The Transuranic Storage Area also includes the following: three asphalt transuranic storage pads, TSA-1, -2, and -3; an area that stores wastes from buried waste retrieval studies, TSA-R; and the Intermediate-Level Transuranic Storage Facility, which handles waste with radiation levels that require remote handling. The Subsurface Disposal Area is dedicated to the permanent disposal of low-level waste generated at the INEL site. Related projects support studies of buried waste, remediation technologies, and contaminant migration. The Subsurface Disposal Area includes pits, trenches, and concrete-lined and

unlined soil vaults for low-level disposal. One disposal pit (Pit 9) is the subject of a comprehensive demonstration project for buried waste remediation.

The Naval Reactors Facility is under the jurisdiction of the Naval Nuclear Propulsion Program, a joint DOE-Navy program. Its current purposes are as a research and development facility and for inspection of naval spent fuel. The major facility at the Naval Reactors Facility is the Expended Core Facility, where naval fuel and fuel from the facility itself are received and examined to support fuel development and performance analyses. The Expended Core Facility also removes structural material from the fuel assemblies prior to transferring the fuel to the Idaho Chemical Processing Plant for storage.

The Argonne National Laboratory West area is within the boundaries of the INEL site but reports to DOE's Chicago Operations Office and is managed by Argonne National Laboratory, not LITCO. The facility consists of several major complexes, including the Experimental Breeder Reactor II, the Transient Reactor Test Facility, the Zero-Power Physics Reactor, the Hot-Fuel Examination Facility, the Fuel Cycle Facility, and the Fuel Manufacturing Facility. The Experimental Breeder Reactor-II was being used to demonstrate the Integral Fast Reactor concept. The Transient Reactor Test Facility and the Zero-Power Physics Reactor are used to conduct reactor analysis and safety experiments. The Hot-Fuel Examination Facility provides a large inert-atmosphere containment for handling and examining irradiated reactor fuel. The Fuel Cycle Facility has been modified for the Integral Fast Reactor program to demonstrate remote reprocessing and refabrication in the fuel cycle. The Fuel Manufacturing Facility is used to manufacture metallic fuel elements for the fuel cycle. Support facilities at Argonne National Laboratory-West include the Radioactive Liquid Waste Treatment Facility, the Radioactive Scrap and Waste Facility, the Radioactive Sodium Storage Facility, and the Sodium Process Facility. The Radioactive Liquid Waste Treatment Facility processes low-level (aqueous) liquid waste. Transuranic waste from Argonne National Laboratory-West is stored at the Radioactive Scrap and Waste Facility. Contract-handled mixed waste is stored in the Radioactive Sodium Storage Facility (sodium contaminated), and remote-handled mixed waste is stored at the Radioactive Scrap and Waste Facility. The Sodium Process Facility was built to process reactor sodium.

The Idaho Falls Operations area includes the INEL Research Center, which is the location for research in a wide variety of disciplines and features a prominent plasma research center, biotechnical center, materials research laboratory, and measurement sciences laboratory. Other major facilities include DOE-ID office buildings, the Willow Creek Building, the INEL Supercomputing Center, the Engineering Research Office Building, and many technical support buildings.

Much of the INEL site is open space that has not been designated for specific uses. The INEL site encompasses 571,000 acres (230,000 hectares). Categories of land use at the INEL site include facility operations, grazing, general open space, and infrastructure, such as roads. Land also is used for recreation and environmental research associated with the designation of the INEL as a National Environmental Research Park. Some of this space serves as a buffer zone between INEL facilities and other land uses. About 8 percent of the total INEL site area is used; 2 percent is for facilities and operations and approximately 6 percent is devoted to public roads and utility rights-of-way that cross the site. Recreational uses include public tours of general facility areas and the Experimental Breeder Reactor I National Historic Landmark and controlled hunting, which is generally restricted to half a mile within the INEL boundary. About 60 percent of the site is used for cattle and sheep grazing. A 900-acre (400-hectare) portion of this land, located at the junction of Idaho State Highways 28 and 33, is used by the

U.S. Sheep Experiment Station as a winter feed lot for approximately 6,500 sheep. Grazing is not allowed with 2 miles (3 kilometers) of any nuclear facility and, to avoid the possibility of milk contamination by long-lived radionuclides, dairy cattle are not permitted. The INEL site is located within the Medicine Lodge Resource Area (approximately 140,415 acres or 56,800 hectares in the eastern and southern portions of the INEL site) and the Big Butte Resource Area (430,499 acres or 174,000 hectares in the central and western portions), both of which are administered by the Bureau of Land Management. Under resource management plans, portions of these resource areas are managed for grazing and wildlife habitat. No mineral exploration or development is allowed on INEL land.

List Major Limitations Associated With Potential Use of the Site:

Public access to most facility areas is restricted.

Technical limitations: For some waste types, there is currently no means of transport from one location to another. Demonstrations involving contaminated soil and water must have complete plans for disposal of all disturbed material and all secondary waste from the process. Plans for disposal of contaminated equipment also must be complete and the dismantlement portion of the demonstration funded. Disposal criteria for many site wastes and waste forms have not been confirmed and disposal facilities, such as the Waste Isolation Pilot Plant, have not been permitted to accept waste.

Sole-source aquifer: The INEL site overlies the Snake River Plain Aquifer, the largest aquifer in Idaho. As designated by the Safe Drinking Water Act (42 U.S.C. Section 1427), a sole-source aquifer is defined as one that supplies 50 percent of the drinking water consumed in the area overlying the aquifer. Sole-source aquifer areas have no alternative source or combination of sources that could physically, legally, and economically supply all who obtain their drinking water from the aquifer. Because groundwater supplies 100 percent of the drinking water consumed within the eastern Snake River Plain and an alternative drinking water source or combination of sources is not available, the U.S. Environmental Protection Agency designated the Snake River Plain Aquifer a sole-source aquifer in 1991 (F.R. 1991).

Contaminants: Radionuclides released and observed in the groundwater include tritium, strontium-90, iodine-129, cobalt-60, cesium-137, plutonium-238, plutonium-239/240, and americium-241. As of 1992, concentrations of iodine-129, cobalt-60, tritium, strontium-90, and cesium-137 exceeded the U.S. Environmental Protection Agency maximum contaminant levels for radionuclides in drinking water in localized areas inside the INEL site boundary.

Sodium, chromium, lead, and mercury have been released on the INEL site and into the subsurface through unlined ponds and deep wells. Of these metals, sodium was released in the greatest quantity from water treatment processes; however, it is not considered toxic and does not have an established maximum contaminant level. In 1988, chromium concentrations exceeding the maximum contaminant level were measured near the Test Reactor Area. Lead and mercury have been observed at concentrations below the maximum contaminant level.

Chloride, sulfate, and nitrates have been released into the subsurface by human activities at the INEL site. Although chloride and sulfate have been released, only nitrate has exceeded maximum contaminant levels. Since 1988, the levels of nitrate have decreased to below the maximum contaminant level as a result of reduced disposal rates.

Concentrations of volatile organic compounds have been detected in the aquifer beneath the INEL site. Concentrations of the following compounds exceeding the maximum contaminant levels have been observed in and near the Test Area North disposal well: chloroform, 1,2-cis-dichloroethylenel 1,1-dichloroethylene, 1,2-transdichloroethylene, tricholorethylene, tetrachloroethylene, and vinyl choride. Carbon tetrachloride was in the aquifer at concentrations above the maximum contaminant level; however, this concentration was observed only once.

Perched water quality. Wastewater discharges from INEL site operations have infiltrated into the vadose zone and created locally perched water beneath the INEL site. Elevated concentrations of the following contaminants have been detected in samples collected from the following locations: tritium, cesium-137, cobalt-60, chromium, and sulfate concentrations in deep perched water near the Test Reactor Area; tritium in shallow perched water and carbon tetrachloride, chloroform, 1,1,1-trichloroethane, tricholorethylene, tetrachloroethylene, and 1,1,-dichloroethylene in deep perched water near the Radioactive Waste Management Complex; and strontium-90 in perched water near the Idaho Chemical Processing Plant.

List the Three Major Contaminants at the Site: (1) Tritium, (2) Iodine-129, (3) NO_x during calcining runs. As can be inferred from the above discussion of contaminates, the major problems in terms of volume are VOC-contaminated groundwater and soils around waste management units which are contaminated with radionuclides. The list provided contains those that contribute to current risk to the public. Tritium is found at numerous locations, some of which are near the site boundaries; iodine-129 has the potential for airborne transport; and NO_x is released when the liquid high-level waste from past processing of Naval spent nuclear fuel is calcined into a dry waste form for interim storage.

Location Point of Contact

Name: Kathleen Hain
Mailing Address: DOE/Idaho Operations Office
785 DOE Place
Idaho Falls, ID 83401-1136
Telephone: (208) 526-4392
Fax: (208) 526-0160

Savannah River Site

Reporting Agency/Department: DOE, Savannah River Site

Site Name and Location: Aiken, South Carolina

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Environmental management site

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
The Savannah River Site (SRS) is very receptive to hosting demonstrations and has extensive experience in this area. SRS is a very large (300 square miles) site located in South Carolina. The site is predominately forested. It has waste sites requiring cleanup. These sites contain volatile organic compounds, heavy metals, and radionuclides. There are gaseous and aquatic effluents from industrial operations. The site has extensive environmental monitoring instrumentation and on-site research teams to facilitate testing, demonstration, and permitting. There is an ongoing waste site closure program. The research program conducted by the technical staff includes the following general areas: plumes, landfills, mixed waste, tanks, and decontaminating and decommissioning. There are a number of buildings where innovative technologies could be safely evaluated for commercial or personnel purposes.

List Major Limitations Associated With Potential Use of the Site:
There are no major limitations to potential use of the site.

List the Three Major Contaminants at the Site: (1) Volatile organic compounds, (2) Heavy metals, (3) Radionuclides

Location Point of Contact

Name: John Steele
Mailing Address: Westinghouse Savannah River Site
Building 773-A
Aiken, SC 29808
E-Mail Address: john02.steele@srs.gov
Telephone: (803) 725-1830
Fax: (803) 725-8136

Argonne National Laboratory

Reporting Agency/Department: DOE, Argonne National Laboratory

Site Name and Location: Argonne, Illinois

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research Laboratory, Environmental Restoration Program

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:

- The Argonne site contains a series of small, well-characterized waste units, some with complex technical problems.

- Site geology is high in clay, limiting migration of contaminants off-site.

- Contaminated groundwater is found in shallow sand layers (less than 30 ft deep), making access for *in situ* treatment technologies or characterization technologies easier.

- There are no known releases to off-site receptors; thus, the site is in a good position for use in research and development activities.

- Tritium is present in leachate and shallow groundwater, creating opportunities for innovative ways to control tritium releases. The presence of low levels of tritium also provides an ideal tracer for groundwater migration experiments.

- Highly experienced environmental research personnel are present on site.
  - Expertise in contaminant/actinide speciation and Pu/actinide organic mixture speciation.
  - Expertise on formulation/testing of glass and other vitreous products to immobilize contaminants.
  - Established labs and microscopy techniques to determine state of hazardous/radioactive contaminants.

- The site has the capability of designing and fabricating specialized processes and equipment.
  - On-site research teams with experience in testing and demonstration.
  - Glove-box and hot-cell facilities for conducting tests and demonstrations with radioactive and hazardous materials.

  - Newly renovated waste management facility provides ability to test decontamination techniques on low-activity equipment.
  - Can verify effectiveness before going to full remote-handled demonstration.

- Specialized characterization labs and a fully equipped research-quality analytical laboratory is located on site.
  - Unique instrumentation available.
  - Experienced research staff and environmental analysts available.
  - Laser spectroscopy lab.
  - Unique array of spectroscopic equipment and research expertise relevant to environmental technology development and use..

- Sodium-metal research laboratory can monitor the controlled oxidation of sodium metal in Environmental Protection Agency permitted Alkali Metal Passivation Booth for cleanup of tanks and pipes.

List Major Limitations Associated With Potential Use of the Site:
The Argonne National Laboratory site is surrounded by a nature preserve which is, in turn, surrounded by rapidly developing residential and commercial areas. Many of the contaminated sites are located near the site boundary.

List the Three Major Contaminants at the Site: (1) Volatile organic compounds in soil and groundwater, (2) Tritium in leachate and groundwater, (3) hydrocarbons in soil and groundwater

Location Point of Contact

Name: Lawrence P. Moos
Mailing Address: Argonne National Laboratory
9700 S. Cass Avenue
Argonne, IL 60439
E-Mail Address: lmoos@anl.gov
Telephone: (708) 252-3455
Fax: (708) 252-9767

Western Environmental Technology Office

Reporting Agency/Department: DOE, Western Environmental Technology Office

Site Name and Location: Butte, Montana

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research and development—small-scale plasma furnace

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:

- Operating small scale plasma centrifugal furnace with on-site research reams experienced in testing and demonstration.
- Unique offgas and emissions monitoring equipment.
- Site located within the Butte/Silver Bow Superfund Site.
- Large flexible facility with significant support (cooling water, electrical, cryogenic N_2O_2).

List Major Limitations Associated With Potential Use of the Site:

- Rivendell Psychiatric Center proximity.
- Butte/Silver Bow Vocational Technical Center proximity.
- Zoned light industrial.
- No radioactive materials capability.
- Hazardous materials tested under treatability study.

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: Mel Shupe, Manager
Mailing Address: DOE/WETO
P.O. Box 3462
Butte, MT 59702
Telephone: (406) 494-7100 ext. 205
Fax: (406) 494-7290

Nevada Test Site

Reporting Agency/Department: DOE,Nevada Operations Office

Site Name and Location: Nevada Test Site (NTS), Las Vegas, Nevada

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): National Testing and Demonstration Facility

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
The Nevada Test Site (NTS) comprises a 1,350-square-mile reservation of primarily undeveloped high desert land. Site contamination is very limited and tends to fall into two main categories: (1) limited areas of radioactive residue from underground tests which are deep beneath the surface and stable, and (2) limited surface and near-surface contamination, generally of a light industrial, nonradioactive nature. NTS is uniquely qualified for environmental technology development and testing by virtue of its status as a massive and secure outdoor laboratory and national experimental center, with the following assets:

- Physical size: 1,350 square miles, larger than the State of Rhode Island.
- Controlled access: Readily accessible with appropriate clearances and badges.
- Reliable security: Buffered on 3 sides by 4,120 square miles of federally controlled land (Nellis AFB).
- Predictable air: Air quality and climatology are well characterized and highly predictable.
- Predictable water: Groundwater is deep (500 to 2,000 ft), slow moving, and well characterized.
- Predictable soil: Subsurface stratigraphy well characterized.
- Undisturbed condition: 45 years of controlled access leave much of the site in pristine condition.
- Existing infrastructure: 100 miles of roads, 45 megawatts of power, two airstrips, 1,500 buildings (2.9 million sq ft).
- Population density: Located in a sparsely populated region (16,000 residents within 50 mile radius).
- Metropolitan access: Las Vegas (pop. 1,000,000) located 65 miles SE of NTS.
- Academic access: University of Nevada at Las Vegas and Desert Research Institute located in Las Vegas.
- Academic affiliations: NTS has teaming agreements with many national academic institutions.
- Designated status: Designated as a National Environmental Research Park by DOE.
- Human resources: Uniquely skilled cadre of technical testing specialists, as discussed below.

The above features provide an ideal location for environmental testing and demonstrations in a real-world outdoor setting that is at the same time a controlled environment, far from any private development or population centers. In addition to the inherent natural features of the site itself, there are several major facilities which are vital for supporting the environmental technologies testing mission. Specific facilities available for access under the DOE/NV umbrella include:

- RSL (Remote Sensing Laboratory) in North Las Vegas with state of the art capabilities in diagnostics and remote measurement technologies.
  - Complete Digital Orthophotography Laboratory
  - Optics Laboratory
  - Extensive Geophysical Modeling Laboratory
  - Global Positioning Systems
  - Geographical Information Systems
  - Multispectral Scanner Systems
  - Photo/Video Processing and Production Facility
  - Acoustics Laboratory and 10,000-cubic-foot Anechoic Chamber
  - High-Power Laser Laboratory
  - Marine Laboratory and Sensor Testing Laboratory

- STF (Spill Testing Facility) at NTS with Clean Air Act exemption status allows for efficient, timely testing and controlled releases.
  - DESIGNATED IN THE CLEAN AIR ACT AS THE ONLY FACILITY IN THE NATION APPROVED FOR LARGE-SCALE TESTING OF HAZARDOUS LIQUIDS AND GASES
  - Cryogenic and Pressurized Tank Farm
  - Enclosed Test Cell
  - Spill Pads
  - Variable Environment Wind Tunnel
  - Wide Array of Anemometer Stations, Meteorological Towers and Photographic Stations
  - Remote Command and Control Facility with 700-Channel Data Acquisition System

- TTF (Treatability Test Facility) at NTS with complete soils laboratory, formerly used for testing radionuclide separation technologies.
  - Soils Laboratory including Drying Furnaces
  - Radiological Counting Laboratory
  - Precision Soil Sieve/Classifier
  - Various Soil Blenders/Mixers

- STL (Special Technologies Laboratory) (affiliated facility located near Santa Barbara, California. Focus is on compact, mobile sensor system development .
  - Photonics and Laser Physics Laboratory
  - Microwave and Radar Laboratory
  - Electro-Optics Laboratory

- WAM (Washington Aerial Measurements) (affiliated facility located in Washington, D.C.)

- NeTI (Nevada Testing Institute) leverages NTS capabilities in scientific and testing technologies, with particular focus on drilling, excavation, explosive and seismic experiments.

- STI (Sustainable Technology Institute) in Las Vegas leverages NTS capabilities in scientific research and demonstration technologies, with particular focus on sustainable energy and the environment.

- Additional Laboratories/Facilities
  - Radiological Analysis Laboratory
  - X-ray and Ultra High Frequency Laboratory
  - Vacuum Laboratory
  - Fiber-Optics Laboratory
  - Soils Testing Laboratory
  - Materials Testing Laboratory
  - Electrical and Physical Calibrations and Standards Laboratory
  - Prototype Fabrication Facilities
  - Large Scale Decontamination Facility

NTS assets also include a highly technically trained work force of engineers, scientists, craftsmen, etc., skilled in the efficient management and safe execution of potentially dangerous, sensitive, fast-track, first-of-a-kind experiments. Core competencies include an in-depth understanding of sophisticated control, sensing, measurement, analysis, and simulation techniques. Because of the nature of its 40-year testing mission, where second chances to gather data were impossible, the NTS work force has developed and institutionalized the ability to conduct successful experiments the first time, every time.

List Major Limitations Associated With Potential Use of the Site:
No limitations. The remoteness of the site, the federal lands buffer, and the low population density all favor use of the site for environmental technologies testing.

List the Three Major Contaminants at the Site: (1) Localized subsurface fission products, (2) Isolated areas with metals contamination, (3) Very small areas of plutonium-contaminated surface soil

Location Point of Contact

Name: Robert A. Hughes
Mailing Address: Bechtel Nevada
2621 Losee Road, M/S NLV022
North Las Vegas, NV 89130
E-Mail Address: hughesra@nv.doe.gov
Telephone: (702) 295-2709/1924
Fax: (702) 295-3020/3069

Name: Sheldon H. Freid
Mailing Address: Bechtel Nevada
2621 Losee Road, M/S NLV038
North Las Vegas, NV 89130
E-Mail Address:: freidsh@nv.doe.gov
Telephone: (702) 295-2708
Fax: (702) 295-2633

Lawrence Berkeley National Laboratory

Reporting Agency/Department: DOELawrence Berkeley National Laboratory

Site Name and Location: Berkeley, California

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): DOE National Research Laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
On-site research teams with experience in testing and demonstration. Well-characterized contamination, but site is very steep and difficult to work.

List Major Limitations Associated With Potential Use of the Site: None

List the Three Major Contaminants at the Site: (1) Tritium in soil, (2) Chlorinated HC in soil and groundwater.

Location Point of Contact

Name: Iraj Javandel
Mailing Address: LBNL
Cyclotron Road
Berkeley, CA 94720
E-Mail Address: ijavandel@lbl.gov
Telephone: (510) 486-6106
Fax: (510) 486-5686

Energy Technology Engineering Center

Reporting Agency/Department: DOE, Energy Technology Engineering Center

Site Name and Location: Canoga Park, California

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Large demonstration and test facility

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Monitoring ☐ Control ☐ Voidance

List Unique Opportunities and Challenges Associated With the Site:

- Decontamination and decommissioning of numerous nuclear facilities.
- Cleanup of soil contaminated with radionuclides and organics.
- Cleanup of groundwater contaminated with organics.
- Highly experienced personnel.

List Major Limitations Associated With Potential Use of the Site: None

List the Three Major Contaminants at the Site: (1) Radionuclides (cobalt, cesium, strontium), (2) Volatile organic compinds (VOC), (3) Heavy metals (Cr)

Location Point of Contact

Name: G. Subbaraman
Mailing Address: Rockwell/ETEC MC:T038
P.O. Box 7930
Canoga Park, CA 01309-7930
E-Mail Address: gsubbara@rdyne.rockwell.com
Telephone: (818) 586-5625
Fax: (818) 586-5118

Energy Technology Engineering Center

Reporting Agency/Department: DOE, Energy Technology Engineering Center

Site Name and Location: Canoga Park, California

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Large demonstration and test facility

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ☐ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:

- Electric and hybred vehicles (fuel cells and flywheels)
- Alternate-fuel vehicles (hydrogen, methanol)
- Advanced ground mass transportation (bus testing)
- Fueling infrastructure (hydrogen)
- Experienced team and miles of private roads for performance tests

List Major Limitations Associated With Potential Use of the Site: None

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: G. Subbaraman
Mailing Address: Rockwell/ETEC MC:T038
P.O. Box 7930
Canoga Park, CA 91309-7930
E-Mail Address: gsubbara@rdyne.rockwell.com
Telephone: (818) 586-5625
Fax: (818) 586-5118

Lawrence Livermore National Laboratory

Reporting Agency/Department: DOELawrence Livermore National Laboratory

Site Name and Location: Livermore, California

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:

- Large volume of contaminated groundwater.
- Areas containing mixed waste; a portion of the contamination has spread off-site.
- Unique instrumentation available.
- On-site research teams available.
- Source areas clearly defined.
- High degree of subsurface characterization conducted.
- Highly heterogeneous subsurface strategraphy.
- Diverse suite of contaminants present in saturated and unsaturated sediments.

List Major Limitations Associated With Potential Use of the Site:

- Highly developed industrial site with complex above- and below-ground utilities.
- Large inventory of hazardous and radioactive materials.
- Schools and residences near by.
- Portions of site under high security.
- Strict safety requirements.
- Comprehensive programmatic requirements.
- Comprehensive regulatory requirements and oversight.
- Large employee base on site.

List the Three Major Contaminants at the Site: (1) TCE, (2) PCE, (3) Tritium

Location Point of Contact

Name: Dorothy Bishop
Mailing Address: P.O. Box 808
Livermore, CA 94550
E-Mail Address: bishop2@llnl.gov
Telephone: (510) 422-2267
Fax: (510) 422-9203

Stanford Linear Accelerator Center

Reporting Agency/Department: DOEStanford Linear Accelerator Center (SLAC)

Site Name and Location: Menlo Park, California

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Extremely low permeability of contaminated media, on the order of 10-6 cm/sec, and high total dissolved solids in groundwater, up to 10,000 mg/L range.

List Major Limitations Associated With Potential Use of the Site:
SLAC is located on prime real estate in the San Francisco Bay Area, near the Stanford University campus, businesses, and residential dwellings. Additional residential development is planned adjacent to SLAC.

List the Three Major Contaminants at the Site: (1) TCE, (2) DCE, (3) DCA

Location Point of Contact

Name: Kim Efishoff
Mailing Address: 1301 Clay Street, Rm. N700
Oakland, CA 94612
E-Mail Address: kim.efishoff@oak.doe.gov
Telephone: (510) 637-1513
Fax: (510) 637-2078

Lawrence Livermore National Laboratory

Reporting Agency/Department: DOELawrence Livermore National Laboratory

Site Name and Location: Livermore, California

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): High explosives test site for DOE laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:

- Six study areas within 10-square-mile area:
  - General Services Area
  - Building 834
  - Building 832 Canyon
  - East/West Firing Area
  - High Explosives Process Area
  - Pit 6
- Study area leaders, staff, and technicians with ER experience.
- Support services (plant engineering, electricians, hazards control, etc.) on site.
- Environmental investigations began in 1982. More than 700 boreholes have been drilled and 460 monitor wells installed.
- More than 8,500 groundwater samples, 5,500 soil samples, and 900 soil vapor samples have been collected and analyzed..
- Twelve distinct groundwater contaminant plumes have been identified.
- Site 300 was placed on the EPA's NPL in 1990 due to high concentrations of TCE in groundwater at Building 834, and two off-site VOC groundwater plumes at the General Services Area.
- Past and ongoing remedial activities include soil vapor and/or groundwater extraction and treatment systems, landfill and lagoon capping, inactive water supply well and drill well closures, and a number of innovative remedial technology projects such as soil heating, bioremediation, and the use of an electron accelerator and ultraviolet light to treat VOCs in soil vapor and water.
- More than 270 kg of TCE have been recovered to date. The remedial program also addresses potential impacts of contamination on two nearby private water-supply wells, which are in hydraulic communication with contaminated aquifers.
- Site 300's hydrogeology is dominated by the Miocene Neroly Formation siltstone, claystone, and varably saturated sandstone. Thin veneers of colluvium and variably saturated alluvium locally overlay bedrock.
- In the Building 834 Study Area, contaminated groundwater is confined to a perched water-bearing zone. The historical maximum total VOC concentration detected in perched groundwater is 800,000

ppb. HNAPLs are known to be present. T-BOS, a pump and seal lubricant, and diesel fuel contamination also are present as LNAPLs. An Interim record of decision was finalized in September 1995 that allows for a 3-year period of innovative remedial technologies testing.

- The General Services Area record of decision will be completed in FY 96; it will be the first record of decision finalized at Site 300.
- The Building 832 Canyon area and the East/West Firing Area are both currently in the characterization phase.

List Major Limitations Associated With Potential Use of the Site:

- Remote site (13 miles west of LLNL main site).
- Semi-arid Altamont Hills (elevation 500 ft to 1,700 ft).
- Site is active explosives testing facility.
- Building 834 Study Area is in classified area (need escort if not Q cleared).

List the Three Major Contaminants at the Site: (1) TCE, (2) PCE, (3) Tritium

Location Point of Contact

Name: Dorothy Bishop
Mailing Address: P.O. Box 808
Livermore, CA 94550
E-Mail Address: bishop2@llnl.gov
Telephone: (510) 422-2267
Fax: (510) 422-9203

Hanford Site

Reporting Agency/Department: DOE, Richland Operations Office

Site Name and Location: Hanford - Richland, Washington

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Nuclear Weapons Production Facility being remediated

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
The Hanford Site is 560 square miles with a wide variety of radioactive and hazardous materials which need to be remediated. There is a significant legacy of radioactive, hazardous, and mixed waste from the previous defense mission. There is a need to protect the environment from the radioactive and hazardous substances located on the site. There is a requirement to monitor the effects of the radioactive and hazardous substances on the environment. And, the cleanup efforts must avoid as much as possible the production of process-generated hazardous materials. Hanford personnel have extensive knowledge and experience in research, testing, and demonstration.

Examples of potential demonstration opportunities include the following. A more complete list can be obtained through the location point of contact.

1. Surface decontamination: Radioactive contamination at Hanford facilities is primarily a surface phenomena, where walls are coated with contaminants or have absorbed radioactive materials. Other hazardous materials also appear as surface films, including protective lead paints, used to cover radioactive “hot spots” from previous operations. Other inorganic and organic toxins also are found in paints and coatings. The safe, effective removal of these surface materials is a major goal in reducing operator exposure, extending the usefulness of existing facilities.
2. Fuel sludge removal at K basins: Fuel canisters stored in the K basins contain uranium oxide sludge. This sludge must be removed and the canisters de-watered to reduce or eliminate the radiolytic and chemical dissociation reactions which are adding a heat load to the storage facility.
3. Low-level mixed waste thermal treatment: This process uses private resources to treat mixed waste, remove the chemically hazardous constituents, and volume-reduce the radioactive components prior to approved disposal (burial).

List Major Limitations Associated With Potential Use of the Site:
Environmental, health, and safety requirements associated with such a site due to the nature of the previous site activities.

List the Three Major Contaminants at the Site: (1) Cesium, strontium, plutonium; (2) Nitrates, chromium, trichloroethylene; (3) Mixed waste

Location Point of Contact

Name: James T. Mayeda
Mailing Address: Technology Transfer and Infusion
Economic Transition Center
Westinghouse Hanford Company
P.O. Box 1970 (H8-64)
Richland, WA 99352
Telephone: (509) 376-6896
Fax: (509) 372-2454

Oak Ridge K-25 Site Demonstration Facility

Reporting Agency/Department: DOE, Office of Environmental Management, Office of Technology Development

Site Name and Location: Oak Ridge K-25 Site Demonstration Facility, Oak Ridge, Tennessee

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Demonstration facility; laboratory facilities; field site for testing; large, permitted buildings; stored mixed waste

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
The K-25 Site has a significant amount of hazardous and mixed wastes in storage in various permitted facilities. These wastes can be easily moved to a treatment unit or laboratory setup.

The K-25 Site has hosted numerous technology demonstrations associated with treatment or cleanup of hazardous or radioactive wastes. The K-25 Site has developed an infrastructure that can easily support applications of various technologies. Laboratory facilities exist for bench-scale demonstrations. Laboratory analytical capabilities exist to obtain data on treatment of wastes. Maintenance and other support personnel are available to provide services such as utilities, machine-shop support, communications, disposal of wastes, etc. A Technology Demonstration Area has been established at the K-25 Site to support field-scale demonstrations developed to treat hazardous and radiologically contaminated wastes. The Technology Demonstration Area is fenced in a manner that allows easy access for uncleared personnel visiting and working at the site.

List Major Limitations Associated With Potential Use of the Site: None

List the Three Major Contaminants at the Site: (1) Uranium, (2) RCRA Listed Wastes, (3) PCBs

Location Point of Contact

Name: Frank Van Ryn
Mailing Address: Lockheed Martin Energy Systems, Inc.
P.O. Box 2003
Oak Ridge, TN 37831-7328
E-Mail Address: xs2@ornl.gov
Telephone: (423) 574-1907
Fax: (423) 574-9786
URL: http://www.ornl.gov/k-25/techdemo/

Portsmouth Clean Site

Reporting Agency/Department: DOE, Office of Environmental Management, Office of Technology Development

Site Name and Location: Portsmouth Clean Site in Portsmouth, Ohio

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Demonstration facility for field testing the physical operation and hydrodynamic performance of environmental restoration technologies.

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:

- Outside limited area (no security issues).
- No contaminants (radiological or chemical).
- No underground utilities in area.
- Shallow depth to bedrock (30 ft).
- Moderately permeable sediments (silty clays, silty sands).

List Major Limitations Associated With Potential Use of the Site: None

List the Three Major Contaminants at the Site: None

Location Point of Contact

Name: Thomas Houk
Mailing Address: P.O. Box 628
X-7725 Bldg.
MS-7602
Piketon, Ohio 45661
E-Mail Address: houktci@cos1.priv.ornl
Telephone: (614) 897-6502
Fax: (614) 897-3800

Inorganic Membrane Technology Center

Reporting Agency/Department: DOE, Office of Environmental Management, Office of Technology Development

Site Name and Location: Inorganic Membrane Technology Center at Oak Ridge K-25 Site, Oak Ridge, Tennessee

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Laboratory for research, development, testing, and demonstration of inorganic membrane technologies for environmental application. Field demonstrations sites available.

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ☐ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:

- Unique research, development, testing, and manufacturing equipment for inorganic membranes.
- Demonstration sites available at the Oak Ridge K-25 Site.
- On-site research and development teams with experience in research, development, testing, demonstration, and application of inorganic membranes for environmental applications.

List Major Limitations Associated With Potential Use of the Site:
Users must be U.S. citizens associated with wholly owned U.S. companies. There is also a present requirement of meeting the DOE guidelines for access to Confidential Restricted Data.

List the Three Major Contaminants at the Site: (1) Uranium, (2) RCRA Listed Wastes, (3) PCBs

Location Point of Contact

Name: John M. Vance
Mailing Address: Lockheed Martin Energy Systems, Inc.
P.O. Box 2003
Oak Ridge, TN 37831-7271
Telephone: (423) 576-0159
Fax: (423) 576-2930

Oak Ridge Center for Materials Characterization

Reporting Agency/Department: DOE, Office of Environmental Management, Office of Technology Development

Site Name and Location: Oak Ridge Center for Materials Characterization, Oak Ridge, Tennessee

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Laboratory for research, development, testing, and evaluation (RDDT&E) of environmental restoration and waste management technologies; waste, waste form, and soil characterization; and performance evaluation of cleanup options.

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ☐ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
The Oak Ridge Center for Materials Characterization includes extensive microstructural characterization resources (equipment and personnel) currently used to support RDDT&E of environmental restoration and waste management technologies. Equipment such as optical and electron microscopes, x-ray diffraction and microfluorescence units, and surface analysis equipment is used to give information on the amount, spatial distribution, and chemical interactions of materials within their environments. This information is indispensable in both the materials' development and in understanding the relationships of materials with their environment. The arrangement is greatly enhanced through the association of users with experts in particular areas of application.

List Major Limitations Associated With Potential Use of the Site: None

List the Three Major Contaminants at the Site: (1) Uranium, (2) RCRA Listed Wastes, (3) PCBs

Location Point of Contact

Name: D.P. Hoffman
Mailing Address: Lockheed Martin Energy Systems, Inc.
P.O. Box 2003
Oak Ridge, TN 37831-7272
E-Mail Address: hoffmanndp@cosmail.4.ctd.ornl.gov
Telephone: (423) 574-3896
Fax: (423) 576-2820

Solid Waste Storage Area 6

Reporting Agency/Department: DOE, Office of Environmental Management,Office of Technology Development

Site Name and Location: Solid Waste Storage Area 6 (SWSA 6 or WAG 6) at Oak Ridge National Laboratory, Oak Ridge, Tennessee

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Active disposal area for solid, low-level radioactive waste

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
SWSA 6 is available for waste-related engineering and scientific studies related to environmental management. Diverse research studies are under way to address physical and chemical means of immobilizing contaminants and preventing migration. SWSA 6 contains waste buried in trenches, auger holes, and silos, as well as waste disposed in tumuli. It is a humid site with a high water table and fractured shale and clay soil.

List Major Limitations Associated With Potential Use of the Site: None

List the Three Major Contaminants at the Site: (1) Cesium and Strontium, (2) RCRA Listed Wastes, (3) PCBs

Location Point of Contact

Name: S.H. Stow
Mailing Address: Lockheed Martin Energy Systems, Inc.
P.O. Box 2008
Oak Ridge, TN 37831-6038
E-Mail Address: stowish@a1@oax
Telephone: (423) 574-7830
Fax: (423) 576-8646

Subsurface Weirs at Oak Ridge National Laboratory

Reporting Agency/Department: DOE, Office of Environmental Management, Office of Technology Development

Site Name and Location: Subsurface Weirs at Oak Ridge National Laboratory, Oak Ridge, Tennessee

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Weirs are below-ground rooms where groundwater can be sampled and subsurface flow conditions related to contaminant transport in humid environments can be quantitatively analyzed.

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Weirs are available for research projects dealing with shallow-groundwater flow in heterogeneous media.

List Major Limitations Associated With Potential Use of the Site: None

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: S.H. Stow
Mailing Address: Lockheed Martin Energy Systems, Inc.
P.O. Box 2008
Oak Ridge, TN 37831-6038
E-Mail Address: stowish@a1@oax
Telephone: (423) 574-7830
Fax: (423) 576-8646

Bioprocessing Research and Development Facility

Reporting Agency/Department: DOE, Office of Environmental Management, Office of Technology Development

Site Name and Location: Bioprocessing Research and Development Facility at Oak Ridge National Laboratory, Oak Ridge, Tennessee

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Bioprocessing research and development laboratories

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Advanced bioreactor systems and biological research laboratories that are supported by sterilizers and other preparative equipment and by extensive bioanalytical instrumentation. Extensive technical and scientific expertise are available.

List Major Limitations Associated With Potential Use of the Site: None

List the Three Major Contaminants at the Site: (1) Volatile Organic Compounds, (2) BTEX, (3) PCBs

Location Point of Contact

Name: Brian H. Davison
Mailing Address: Lockheed Martin Energy Systems, Inc.
P.O. Box 2008
Oak Ridge, TN 37831-6226
E-Mail Address: davisonbh@cosmail2.ctd.ornl.gov
Telephone: (423) 576-8522
Fax: (423) 574-6442

Lysimeter Facility

Reporting Agency/Department: DOE, Office of Environmental Management, Office of Technology Development

Site Name and Location: Lysimeter Facility at Oak Ridge Y-12 Plant, Oak Ridge, Tennessee

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Lysimeter facility

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
A group of large lysimeters are available for use. Well-conceived lysimeter experiments can generate a fundamental understanding of the behavior of shallow land, industrial landfills and the development of applications to remediate radioactive and hazardous contaminants.

List Major Limitations Associated With Potential Use of the Site: None

List the Three Major Contaminants at the Site: (1) Uranium, (2) PCBs, (3) Mercury

Location Point of Contact

Name: James E. Thompson
Mailing Address: Lockheed Martin Energy Systems, Inc.
P.O. Box 2009
Oak Ridge, TN 37831-8156
E-Mail Address: thompsonje@a1@ocb
Telephone: (423) 574-2503
Fax: (423) 574-3460

Bag/Box Monitor at Oak Ridge Y-12 Plant

Reporting Agency/Department: DOE, Office of Environmental Management, Office of Technology Development

Site Name and Location: Bag/Box Monitor at the Oak Ridge Y-12 Plant, Oak Ridge, Tennessee

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): The Bag/Box Monitor is a large monitoring device, designed to screen bulky items of up to 500 lb. in weight for radioactive contamination.

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
The Bag/Box Monitor uses an array of six large plastic scintillation detectors surrounding a counting chamber (one each on the top, bottom, back, left, and right sides of the chamber, plus one in the door). The Bag/Box Monitors are equipped with either single-channel or multi-channel analyzers. It is intended that the Bag/Box Monitors be used to segregate low-level waste from non-contaminated waste in low- to medium-density materials such as paper suits, building trash, and floor sweepings. There are few monitors of this type available. They could be useful to companies dealing with radioactive material.

List Major Limitations Associated With Potential Use of the Site: None

List the Three Major Contaminants at the Site: (1) Uranium

Location Point of Contact

Name: James E. Thompson
Mailing Address: Lockheed Martin Energy Systems, Inc.
P.O. Box 2009
Oak Ridge, TN 37831-8156
E-Mail Address: thompsonje@a1@ocb
Telephone: (423) 574-2503
Fax: (423) 574-3460

Gunite and Associated Tanks at Oak Ridge National Laboratory

Reporting Agency/Department: DOE, Office of Environmental Management, Office of Technology Development

Site Name and Location: Gunite and Associated Tanks at Oak Ridge National Laboratory, Oak Ridge, Tennessee

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Demonstration facility

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Twelve 170,000-gallon tanks; four 2,000- to 4,000-gallon stainless steel tanks; and five 13,000- to 25,000-gallon carbon steel tanks are located at the site. The tanks collectively contain about 34,000 Ci of radioactive waste as dilute supernates and sludges.

List Major Limitations Associated With Potential Use of the Site:
Testing and demonstration must be compatible with planned waste management activities.

List the Three Major Contaminants at the Site: (1) Strontium, (2) Cesium

Location Point of Contact

Name: Cavanaugh Mims
Mailing Address: Information Resource Center
105 Broadway
Oak Ridge, TN 37830
E-Mail Address: mims@ornl.gov@smtp
Telephone: (423) 576-9481
Fax: (423) 576-6074

Materials Research Partnership Center

Reporting Agency/Department: DOE, Materials Research Partnership Center

Site Name and Location: Albany, Oregon

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
- Analytical and materials processing expertise.
- Minerals beneficiation expertise.
- Hazardous waste site characterization and evaluation

List Major Limitations Associated With Potential Use of the Site: None

List the Three Major Contaminants at the Site: (1) Low-level radioactive isotopes, (2) Metals powders, (3) Organics

Location Point of Contact

Name: William D. Riley
Mailing Address: DOE
1450 Queen Ave., SW
Albany, OR 97321
E-Mail Address: riley@alrc.usbm.gov
Telephone: (503) 967-5851/5966
Fax: (503) 967-5991

Environmental Protection Agency

National Risk Management Research Laboratory

Reporting Agency/Department: EPA/ORD

Site Name and Location: National Risk Management Research Laboratory, Center Hill Research Laboratory, Cincinnati, Ohio

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research Laboratory and Demonstration Facility

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Research laboratory with analytical, biological, and soil-handling capabilities, in-house high-bay (20 ft x 95 ft x 15 ft high) with 16-ft double door warehouse, on-site hazardous waste storage, five acres of usable land site that has a hazardous waste permit.

List Major Limitations Associated With Potential Use of the Site:
Use generally limited to pilot-scale facilities.

Location Point of Contact

Name: James Horton
Mailing Address: 5995 Center Hill Avenue
Cincinnati, OH 45224
Telephone: (513) 569-7886
Fax: (513) 569-7879

National Risk Management Research Laboratory Test and Evaluation Facility

Reporting Agency/Department: EPA/ORD

Site Name and Location: National Risk Management Research Laboratory, Test and Evaluation Facility, 1600 Gest Street, Cincinnati, Ohio

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Bench-scale and pilot plant-scale research building

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ☐ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
State of Ohio RCRA Part A Permit for storage and treatment of 150 hazardous waste categories, RCRA Part B Permit Application submitted, RCRA Small Quantity Treatability Exemption, PCB permitting possible (under the provisions of State and Federal permits held by T&E, research and development activities may be conducted to evaluate the chemistry of pollutant destruction, pollution-control devices, and hazardous waste treatment technologies), 24,000 square feet, 30-foot high bay area plus bench-scale laboratory, wet chemistry laboratory, instrumental analysis laboratory, constant supply of municipal wastewater primary and secondary WWTP flows (hazardous wastes may be manifested in the facility and stored in permitted storage tanks up to 10,000 gallons in capacity or in container storage areas in as many as twenty 55-gallon drums), on-site machine shop, on-site contractor for research technical support, two 5-ton bridge cranes, good ventilation in high bay and once-through HVAAC filtered air in laboratory, three 16-ft by 16-ft roll-up door accesses to high bay, located in secured (24 hours a day) WWTP compound.

List Major Limitations Associated With Potential Use of the Site:
Import restrictions on RCRA listed dioxin and furan wastes and radioactive wastes. Usual regulations for health, safety, and environmental compliance apply. High-temperature treatment technologies excluded.

Location Point of Contact

Name: Francis L. Evans, III
Mailing Address: T&E Facility
26 W. Martin Luther King Drive
Cincinnati, OH 45268
Telephone: (513) 569-7051
Fax: (513) 569-7052

Full Containment Facility/Andrew W. Breidenbach Research Facility

Reporting Agency/Department: EPA/ORD, National Risk Management Research Laboratory

Site Name and Location: Full Containment Facility/Andrew W. Breidenbach Research Facility, Cincinnati, Ohio

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research on highly toxic or hazardous material

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Facility designed for analytical and experimental work on highly toxic or hazardous materials. This includes the capability to analyze and characterize unknown waste samples from Superfund sites or other locations and the ability to conduct laboratory-scale treatment and treatment-related research on waste surrogates.

List Major Limitations Associated With Potential Use of the Site: Laboratory scale, limited space

Location Point of Contact

Name: John J. Convery
Mailing Address: 26 W. Martin Luther King
Cincinnati, OH 45268
Telephone: (513) 569-7896
Fax: (513) 569-7680

Andrew W. Breidenbach Environmental Research Center

Reporting Agency/Department: EPA/ORD, National Risk Management Research Laboratory

Site Name and Location: Andrew W. Breidenbach Environmental Research Center, Cincinnati, Ohio

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory and facility

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Bioremediationand metal contamination reduction and stabilization. Organic waste removal, site characterization, and remedial technologies for hazardous waste treatment. Drinking-water research, disinfecting pilot plants, waste-water treatment technologies.

List Major Limitations Associated With Potential Use of the Site: Laboratory scale, limited space

Location Point of Contact

Name: John J. Convery
Mailing Address: 26 W. Martin Luther King
Cincinnati, OH 45268
Telephone: (513) 569-7896
Fax: (513) 569-7680

National Risk Management Research Laboratory
Air Pollution Prevention and Control Division

Reporting Agency/Department: EPA/ORD, National Risk Management Research Laboratory

Site Name and Location: Air Pollution Prevention and Control Division, Research Triangle Park, North Carolina

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
This site is an engineering research and development laboratory with centrally managed health, safety, and compliance. The Division has a full range of R&D laboratories, pilot plants, and analytical support facilities including:

1. Full RCRA-permitted combustion laboratory with five experimental systems ranging from 10^5 to 3 x 10^6 Btu/hr. The flue-gas cleaning system allows operation of the combustors in a variety of modes.
2. Acid gas dry scrubbing pilot plant with capacity from 50 to 2,000 ACFM of flue gas.
3. Multifuel mass-fed 2 x 10^6 Btu/hr combustor capable of burning a variety of solid fuel (e.g., coal, municipal waste, and biomass) and simulating practical time-temperature-residence time profiles. Fully supported by fuel-preparation and flue-gas cleaning systems.
4. ACFM Electrostatic Precipitator pilot plant capable of evaluating novel fine particle, acid gas, and dioxin control technologies.
5. Indoor air laboratory featuring large and small chambers and a test house with modeling and organic analytical capability to support them.
6. Refrigeration laboratory capable of evaluating chlorofluorocarbon (CFC) substitutes. Facilities include properties laboratory, compressor calorimeter, environmental chambers, and experimental refrigeration apparatus.
7. Innovative 10^5 Btu/hr coal-fired furnace capable of testing NO_x, SO_2, and dioxin control technologies.
8. A variety of other fundamental laboratories supporting pilot plant work.
9. Chemical analytical laboratories providing organic (e.g., dioxin) and inorganic (e.g., toxic metals) instrumentation.

List Major Limitations Associated With Potential Use of the Site:
All experimental plans and equipment must be reviewed by facility EHS official to ensure compliance with air, water, and RCRA permits. Equipment may be subject to inspection and certification to applicable electrical codes. Quality Assurance Plan required on all experimental work.

Location Point of Contact

Name: G. Blair Martin
Mailing Address: USEPA, MD 60
Research Triangle Park, NC 27711
E-Mail Address: martin.blair@a1@mail
Telephone: (919) 541-7504
Fax: (919) 541-5227

Other Potential Sites

Reporting Agency/Department: EPA

Site Name and Location: Other potential sites

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Laboratories

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
All of EPA's laboratories contain state-of-the-art, highly specialized equipment, and many laboratories have permitted testing facilities. This includes, for example, hazardous waste test and evaluation facilities, an indoor air chamber facility, and automated test equipment. Research expertise includes studies on bioremediation and other innovative control and remediation technologies, health and ecological effects, and advanced monitoring systems.

List Major Limitations Associated With Potential Use of the Site: None

Agency Point of Contact

Name: Larry Fradkin
Mailing Address: EPA/ORD
26 W. Martin Luther King Drive
Cincinnati, OH 45268
Telephone: (513) 569-7960
Fax: (513) 569-7132

Department of Agriculture

(Does not include federally related sites that conduct environmental technology testing and demonstrations)

Food Animal Protection Research Laboratory

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Food Animal Protection Research Laboratory, College Station, Texas

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Site has cropland and pasture, laboratories, and available scientific expertise in food animal protection, animal physiology, pathology, microbiology, biochemistry, veterinary medicine, agricultural engineering, plant genetics, and crop pest management.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Glen W. Ivie
Mailing Address: USDA/ARS/SPA
Route 5, Box 810
College Station, TX 77845
E-Mail Address: a03faprl@attmail.com
Telephone: (409) 260-9372

Conservation and Production Research Laboratory

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Conservation and Production Research Laboratory, Bushland, Texas

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
1,545 acres of cropland and pasture with on-site research team with expertise in water management, soil and crop management, and bovine respiratory disease research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Nolan Clark
Mailing Address: USDA, ARS
P.O. Drawer 10
Bushland, TX 79012
E-Mail Address: a03lcbushlan@attmail.com
Telephone: (806) 356-5726
Fax: (806) 735-6750

Conservation and Production Systems Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Conservation and Production Systems Research Unit, Big Spring, Texas

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
230 acres of cropland and pastures with on-site research team with expertise in conservation and production systems.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Don Fryear
Mailing Address: USDA/ARS
P.O. Box 909
Big Spring, TX 79721-0909
E-Mail Address: a03dwfryear@attmail.com
Telephone: (915) 263-0293
Fax: (915) 263-3154

Rice Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Rice Research Unit, Beaumont, Texas

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
USDA rice research facility.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Robert R. Cogburn
Mailing Address: USDA/ARS/SPA
Route 7, Box 999
Imes Road
Beaumont, TX 77713
E-Mail Address: a03jcbeaumon@attmail.com
Telephone: (409) 752-5221
Fax: (409) 752-5560

Pecan Genetics and Improvement Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Pecan Genetics and Improvement Research Unit, Brownwood, Texas

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Land, laboratories, and scientific expertise in pecan genetics and improvement research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Tommy E. Thompson
Mailing Address: USDA/ARS/SPA
701 Woodson Rd.
Brownwood, TX 76801
E-Mail Address: a03lcbrownwo@attmail.com
Telephone: (915) 646-0593
Fax: (915) 646-4118

Grassland Soil and Water Research Laboratory

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Grassland Soil and Water Research Laboratory, Temple, Texas

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
480 acres of cropland and pasture with cattle. Long-term data sets in hydrology. On-site research team with expertise in agriculture and engineering.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Clarence Richardson
Mailing Address: USDA/ARS
808 E. Blackland Rd.
Temple, TX 76502
E-Mail Address: a03lctemple@attmail.com
Telephone: (817) 770-6500
Fax: (817) 770-6561

Subtropical Agricultural Research Laboratory

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Subtropical Agricultural Research Laboratory, Weslaco, Texas

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
115 acres of irrigated cropland with on-site research team of 30 scientists with expertise in crop quality and fruit insects, subtropical cotton insects, remote sensing research, conservation and production systems, honey bee research, and biological pest control research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Edgar King
Mailing Address: USDA/ARS
2301 S. International Blvd.
Weslaco, TX 78596
E-Mail Address: a03lcweslaco@attmail.com
Telephone: (512) 565-2606
Fax: (512) 565-6133

Livestock Insects Laboratory

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: U.S. Livestock Insects Laboratory, Kerrville, Texas

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Research expertise in livestock insects.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Sidney E. Kunz
Mailing Address: USDA/ARS/SPA
2700 Fredericksburg Road
Kerrville, TX 78028-9184
E-Mail Address: a03lckerrvil@attmail.com
Telephone: (512) 745-0303
Fax: (512) 745-3140

Jornado Experimental Range

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Jornado Experimental Range, Las Cruces, New Mexico

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Open Rangeland

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
193,000 acres of desert rangeland, with on-site research team .

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Kris Havstad
Mailing Address: USDA/ARS
P.O. Box 30003, NMSU
Dept. 3JER
Las Cruces, NM 88003-0003
E-Mail Address: a03lclascruc@attmail.com
Telephone: (505) 646-4842
Fax: (505) 646-5889

Plant Science and Water Conservation Laboratory

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Plant Science and Water Conservation Laboratory, Stillwater, Oklahoma

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Land, laboratory, and research expertise in hydraulic engineering and cereal crops.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Robert L. Burton
Mailing Address: USDA/ARS/SPA
1301 N. Western Street
Stillwater, OK 74075
E-Mail Address: a03lcstillwa@attmail.com
Telephone: (405) 624-4126
Fax: (405) 372-1398

Southern Plains Research Station

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Southern Plains Research Station, Woodward, Oklahoma.

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Open rangeland with research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
4,950 acres of open prairie with on-site research team.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Phillip Sims
Mailing Address: USDA/ARS
2000 18th Street
Woodward, OK 73801
E-Mail Address: a03lcwoodwar@attmail.com
Telephone: (405) 256-7449
Fax: (405) 256-1322

Forage and Livestock Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Forage and Livestock Research Unit, El Reno, Oklahoma

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Rangeland, cropland, and pasture

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
6,800 acres of open rangeland with pasture, cropland, and river bottom lands

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Sam Coleman
Mailing Address: USDA/ARS
P.O. Box 1199
El Reno, OK 73036
E-Mail Address: a03lcelreno@attmail.com
Telephone: (405) 262-5291
Fax: (405) 262-1330

South Central Agricultural Research Laboratory

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: South Central Agricultural Research Laboratory, Lane, Oklahoma

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
On-site scientific expertise in genetics and production research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Elbert V. Wann
Mailing Address: USDA/ARS/SPA
P.O. Box 159
3 West
Lane, OK 64555
E-Mail Address: a03lcland@attmail.com
Telephone: (405) 889-7395
Fax: (405) 889-5783

National Agricultural Water Quality Laboratory

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: National Agricultural Water Quality Laboratory, Durant, Oklahoma

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Land, laboratory, and scientific expertise in soil and water resources and water quality research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Billy B. Barnes
Mailing Address: USDA/ARS/SPA
P.O. Box 1430
Durant, OK 74702
E-Mail Address: a03lcdurant@attmail.com
Telephone: (405) 924-5066
Fax: (405) 924-5307

South Central Family Farms Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: South Central Family Farms Research Unit, Booneville, Arkansas

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
2,200 acres under long-term lease from State of Arkansas, mostly in pasture. On-site research team with expertise in agriculture and livestock.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Michael Brown
Mailing Address: USDA/ARS
Rt. 2, Box 144A
Booneville, AR 72927-9214
E-Mail Address: a03lcboonevi@attmail.com
Telephone: (501) 675-3834
Fax: (501) 675-2940

Horticultural Crops Research Laboratory

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Horticultural Crops Research Laboratory, Fresno, California

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
154 acres owned by USDA plus other parcels leased from the University of California system, with an on-site research team of about 30 scientists. All irrigated cropland.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Patrick Vail
Mailing Address: USDA/ARS
2021 S. Peach Ave.
Fresno, CA 93727
E-Mail Address: a03lcfresno@attmail.com
Telephone: (209) 453-3005
Fax: (209) 563-3011

Western Human Nutrition Research Center

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Western Human Nutrition Research Center, San Francisco, California

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Large laboratory devoted to the study of human nutrition with expertise in biochemistry, physiology, and medical technology.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: James M. Iacono
Mailing Address: USDA/ARS/PWA
P.O. Box 29997
Presidio of San Francisco, CA 94129
E-Mail Address: a03dirwhnrc@attmail.com
Telephone: (415) 556-9697

Western Regional Research Center

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Western Regional Research Center, Albany, California

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Large regional center including the Plant Gene Expression Center and scientific expertise in food safety research, cereal product utilization research, crop improvement research, and process chemistry and engineering.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Antoinete A. Betschart
Mailing Address: USDA/ARS/PWA
800 Buchanan Street
Albany, CA 94710
E-Mail Address: a03dirwrrc@attmail.com
Telephone: (510) 559-5600
Fax: (510) 559-5963

Aquatic Weeds Control Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Aquatic Weeds Control Research Unit, Davis, California

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Associated with the University of California at Davis, expertise in aquatic weeds control, crop pathology and genetics and germplasm preservation.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Lars W. Anderson
Mailing Address: USDA/ARS/PWA
University of California
Botany Dept.
Davis, CA 95616
E-Mail Address: a03anderson@attmail.com
Telephone: (916) 752-6260
Fax: (916) 752-5410

Small Grains and Potato Germplasm Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Small Grains and Potato Germplasm Research Unit, Aberdeen, Idaho

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Research conducted in small grains and potato germplasm.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Darrell Wesenberg
Mailing Address: USDA/ARS/PWA
P.O. Box 307
Aberdeen, ID 83210
E-Mail Address: a03lcaberdee@attmail.com
Telephone: (208) 397-4162
Fax: (208) 397-4165

Sheep Experiment Station

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: U.S. Sheep Experiment Station, DuBois, Idaho

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Open rangeland

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
52,000 acres of sagebrush rangeland at elevations of 5,500 to 8,500 feet. On-site research team.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: John Walker
Mailing Address: USDA/ARS
HC 62, Box 2010
DuBois, ID 83423-9602
E-Mail Address: a03lcdubois@attmail.com
Telephone: (208) 374-5306
Fax: (208) 374-5582

Soil and Water Management Laboratory

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Soil and Water Management Laboratory, Kimberly, Idaho

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
74 acres of irrigated cropland with watersheds and on-site research team.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: David Carter
Mailing Address: USDA/ARS
3793 N. 3600 E
Kimberly, ID 83341
E-Mail Address: a03lckimberl@attmail.com
Telephone: (208) 423-5582
Fax: (208) 587-6555

Range and Meadow Management Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Range and Meadow Management Research Unit, Burns, Oregon

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Open rangeland

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
13,400 acres of open rangeland with on-site research team. Weather records.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Tony Svejcar
Mailing Address: USDA/ARS
Star Rt. 1, 4.5 Hwy. 205
Burns, OR 97720
E-Mail Address: a03lcburns@attmail.com
Telephone: (503) 573-2064
Fax: (503) 573-3042

Vegetable and Forage Crops Production Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Vegetable and Forage Crops Production Research Unit, Prosser, Washington

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in irrigated agriculture especially vegetable and forage crops.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: John M. Kraft
Mailing Address: USDA/ARS/PWA
Rt. 2, Box 2958-A
Prosser, WA 99350-9687
E-Mail Address: a03lcprosser@attmail.com
Telephone: (509) 786-3454
Fax: (509) 786-4635

Wheat Genetics, Quality, Physiology, and Disease Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Wheat Genetics, Quality, Physiology, and Disease Research Unit, Pullman, Washington

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
In addition to expertise in wheat, animal diseases research also is conducted at Pullman.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Robert E. Allan
Mailing Address: USDA/ARS/PWA
Washington State University
Johnson Hall, Rm. 209
Pullman, WA 99164-6420
E-Mail Address: a03lcpullman@attmail.com
Telephone: (509) 335-8663
Fax: (509) 335-6669

Forage Seed and Cereal Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Forage Seed and Cereal Research Unit, Corvallis, Oregon

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Resident expertise in forage seed and cereal research, horticultural crops, and the National Clonal Germplasm Repository.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Lloyd F. Elliott
Mailing Address: USDA/ARS/PWA
3450 SW. Campus Way
Corvallis, OR 97331-7102
E-Mail Address: a03sprc@attmail.com
Telephone: (503) 750-8722
Fax: (503) 750-8750

Soil and Water Conservation Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Soil and Water Conservation Research Unit, Pendleton, Oregon

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in soil and water conservation with microbiologists, soil scientists, agronomists, agricultural engineers, and mathematicians.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Elizabeth L. Klepper
Mailing Address: USDA/ARS/PWA
P.O. Box 370
Pendelton, OR 97801
E-Mail Address: a03lcpendlet@attmail.com
Telephone: (503) 276-3811
Fax: (503) 278-4188

Northern Plains Experimental Range

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Northern Plains Experimental Range, Ft. Collins, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Open Rangeland

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
16,000 acres of shortgrass prairie

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Gary Frasier
Mailing Address: USDA/ARS
1701 Center Avenue
Ft. Collins, CO 80526
Telephone: (303) 498-4232
Fax: (303) 482-2909

Natural Resources Research Center

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Natural Resources Research Center, Akron, Colorado

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in soil and plant research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: William E. Beard
Mailing Address: USDA/ARS/NPA
P.O. Box 400
Akron, CO 80702-0400
E-Mail Address: a03lcakron@attmail.com
Telephone: (303) 345-2259
Fax: (303) 345-2088

Range and Livestock Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Range and Livestock Research Unit, Miles City, Montana

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Open Rangeland

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
55,300 acres of rangeland with on-site research team.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Rod Heitschmidt
Mailing Address: USDA/ARS
Rt. 1, Box 2021
Miles City, MT 59301-9202
E-Mail Address: a03aomilecty@attmail.com
Telephone: (406) 232-4970
Fax: (406) 232-6375

Meat Animal Research Center

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: U.S. Meat Animal Research Center, Clay Center, Nebraska

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in animal research with emphasis on reproduction, biological engineering, production systems, genetics and breeding, and animal health systems.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Danny Laster
Mailing Address: USDA/ARS
P.O. Box 166, State Spur 18D
Clay Center, NE 68933
E-Mail Address: a03dirclay@attmail.com
Telephone: (402) 762-4100
Fax: (402) 762-4148

Rangeland Resource Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Rangeland Resource Research Unit, Cheyenne, Wyoming

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Open rangeland, research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
2,880 acres of open rangeland with laboratory facilities and on-site research team. Long-term data sets relating to vegetation and grazing.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Gerald Schuman
Mailing Address: USDA/ARS
8408 Hildreth Road
Cheyenne, WY 82009
E-Mail Address: a03aocheyene@attmail.com
Telephone: (307) 772-2433
Fax: (307) 637-6124

Anthropod-Borne Animal Disease Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Anthropod-Borne Animal Disease Research Unit, Laramie, Wyoming

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in microbiology research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Frederick R. Holbrook
Mailing Address: USDA/ARS/NPA
P.O. Box 3965
University Station
Laramie, WY 82071-3965
E-Mail Address: a03lclaramie@attmail.com
Telephone: (307) 766-3600
Fax: (307) 766-3500

Red River Valley Agricultural Research Center

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Red River Valley Agricultural Research Center Fargo, North Dakota

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in animal metabolism, biology, genetics, and cereal crops research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Don C. Zimmerman
Mailing Address: USDA/ARS/NPA/NCL
1307 N. 18 St.
P.O. Box 577
Fargo, ND 58105-5677
E-Mail Address: a03lcfargo@attmail.com
Telephone: (701) 239-1370
Fax: (701) 239-1395

Beltsville Agricultural Research Center

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Beltsville Agricultural Research Center, Beltsville, Maryland

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratories

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
7,200 acres of cropland, pasture, and livestock facilities with several on-site research teams with expertise in agriculture.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: K.D. Murrell
Mailing Address: USDA/ARS/BA
Bldg. 003, Room 223
BARC-West
Beltsville, MD 20705
E-Mail Address: a03adba@attmail.com
Telephone: (301) 504-6078
Fax: (301) 504-5863

Foreign Disease-Weed Science Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Foreign Disease-Weed Science Research Unit, Frederick, Maryland

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in plant pathology and microbiology research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Patricia L. Freaner
Mailing Address: USDA/ARS/NAA
Fort Detrick, Bldg. 1301
Frederick, MD 21702
E-Mail Address: a03lcfrederi@attmail.com
Telephone: (301) 619-2922
Fax: (301) 619-2880

Plum Island Animal Disease Center

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Plum Island Animal Disease Center, Greenport, New York

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in molecular biology, microbiology, and molecular pathology.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Roger Breeze
Mailing Address: USDA/ARS/NAA/PIADC
P.O. Box 848
Greenport, NY 11944
E-Mail Address: a03rpdpiadc@attmail.com
Telephone: (516) 323-2500

Appalachian Soil and Water Conservation Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Appalachian Soil and Water Conservation Research Unit, Beckley, West Virginia

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in soil, water, and plant research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Paul R. Murrmann
Mailing Address: USDA/ARS/NAA
P.O. Box 867
Airport Road
Beckley, WV 25802-0867
E-Mail Address: a03lcbeckley@attmail.com
Telephone: (304) 252-6426
Fax: (304) 253-7705

Appalachian Fruit Research Laboratory

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Appalachian Fruit Research Laboratory, Kearneysville, West Virginia

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in fruit production and storage research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Stephen S. Miller
Mailing Address: USDA/ARS/NAA
45 Wiltshire Rd.
Kearneysville, WV 25430
E-Mail Address: a03lcafrs@attmail.com
Telephone: (304) 725-3451
Fax: (304) 728-2340

Food Science Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Food Science Research Unit, Raleigh, North Carolina

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in food and plant science research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Henry P. Fleming
Mailing Address: USDA/ARS/SAA
322-A Schaub Hall
North Carolina State University
Box 7624
Raleigh, NC 27695-7624
E-Mail Address: a03rlfs@attmail.com
Telephone: (919) 515-2979

Southern Piedmont Conservation Research Laboratory

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Southern Piedmont Conservation Research Laboratory, Watkinsville, Georgia.

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
960 acres in pasture, cropland, and forest. On-site research team with expertise in agriculture and engineering.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Jean Steiner
Mailing Address: USDA/ARS
1420 Experiment Station Rd.
Watkinsville, GA 30677
E-Mail Address: a03lcwatkins@attmail.com
Telephone: (706) 769-5631
Fax: (706) 769-8962

Fruit and Nut Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Fruit and Nut Research Unit, Byron, Georgia

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in plant pathology and biology research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Ray H. Adams
Mailing Address: USDA/ARS/SAA
P.O. Box 87
Byron, GA 31008
E-Mail Address: a03aobyron@attmail.com
Telephone: (912) 956-5656
Fax: (912) 956-2929

Plant Introduction Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Plant Introduction Research Unit, Griffin, Georgia

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in plant research including pathology, agronomy, and biology.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Stephen Kresovich
Mailing Address: USDA/ARS/SAA
1109 Experiment Street
Redding Bldg.
University of Georgia
E-Mail Address: a03lcgriffin@attmail.com
Telephone: (770) 228-7254
Fax: (770) 229-3323

Peanut Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Peanut Research Unit, Dawson, Georgia

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in peanut research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Richard J. Cole
Mailing Address: USDA/ARS/SAA
1011 Forrester Dr., SE
Dawson, GA 31742
E-Mail Address: a03lcdawson@attmail.com
Telephone: (912) 995-4441
Fax: (912) 995-5611

Citrus and Subtropical Fruits Quality Improvement Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Citrus and Subtropical Fruits Quality Improvement Unit, Winter Haven, Florida

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ☐ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in citrus chemistry and biology research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Jacquelyn L. Olinger
Mailing Address: USDA/ARS/SAA
P.O. Box 1909
Winter Haven, FL 33880
E-Mail Address: a03lcwinterh@attmail.com
Telephone: (813) 293-4133
Fax: (813) 299-8678

Subtropical Horticulture Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Subtropical Horticulture Research Unit, Miami, Florida

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in subtropical horticulture research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Jennifer L. Sharp
Mailing Address: USDA/ARS/SAA
13601 Old Cutler Rd.
Miami, FL 33158
E-Mail Address: a03lcmiami@attmail.com
Telephone: (305) 238-9321

Vegetable Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Vegetable Research Unit, Charleston, South Carolina

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in vegetable research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Claude E. Thomas
Mailing Address: USDA/ARS/SAA
2875 Savannah Hwy.
Charleston, SC 29414
E-Mail Address: a03lccharle@attmail.com
Telephone: (803) 556-0840
Fax: (803) 763-7013

Cotton Quality Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Cotton Quality Research Unit, Clemson, South Carolina

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in cotton research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Charles K. Bragg
Mailing Address: USDA/ARS/SAA
P.O. Box 792
Clemson, SC 29631
E-Mail Address: a03aoclemson@attmail.com
Telephone: (803) 656-2488

Soil and Water Conservation Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Soil and Water Conservation Research Unit, Florence, South Carolina

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in soil and water research and also cotton production research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Patrick G. Hunt
Mailing Address: USDA/ARS/SAA
Darlington Hwy.
Box 3039
Florence, SC 29502
E-Mail Address: a03lcflorence@attmail.com
Telephone: (803) 669-5203
Fax: (803) 669-6970

Sugarcane Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Sugarcane Research Unit, Houma, Louisiana

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in sugarcane and agricultural plant research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Benjamin L. Legendre
Mailing Address: USDA/ARS/MSA
P.O. Box 470
Houma, LA 70361
E-Mail Address: a03lchouma@attmail.com
Telephone: (504) 872-5042
Fax: (504) 868-6389

Soil and Water Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Soil and Water Research Unit, Baton Rouge, Louisiana

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in soil and water research and also honey bee breeding, genetics, and physiology.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Guye H. Willis
Mailing Address: USDA/ARS/MSA
P.O. Box 225071
Baton Rouge, LA 70894-5071
E-Mail Address: a03lcbatroug@attmail.com
Telephone: (504) 387-2783
Fax: (504) 389-0326

Southern Regional Research Center

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Southern Regional Research Center, New Orleans, Louisiana

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in plant management, fiber physics and biochemistry, textile finishing chemistry, and food quality research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Peter B. Johnsen
Mailing Address: USDA/ARS/MSA
1100 Robert E. Lee Blvd.
P.O. Box 19687
New Orleans, LA 70179
E-Mail Address: a03ffqsrrc@attmail.com
Telephone: (504) 286-4421

National Sedimentation Laboratory

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: National Sedimentation Laboratory, Oxford, Mississippi

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Over 6,000 acres of rural farmland under long-term lease from Mississippi State University, 10 percent cropland, 40 percent pasture, 40 percent forest. On-site research team with expertise in hydrology and engineering.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: George Foster
Mailing Address: USDA/ARS
P.O. Box 1157
Oxford, MS 38655
E-Mail Address: a03eproxford@attmail.com
Telephone: (601) 232-2900
Fax: (601) 232-2915

Cotton Host Plant Resistance Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Cotton Host Plant Resistance Research Unit, Mississippi State, Mississippi

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in crop science research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Johnie N. Jenkins
Mailing Address: USDA/ARS/MSA
P.O. Box 5367
Mississippi State University, MS 39762
E-Mail Address: a03csrlmsu@attmail.com
Telephone: (601) 323-2230
Fax: (601) 323-9150

Erosion Process Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Erosion Process Research Unit, Oxford, Mississippi

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in sedimentation, erosion, and watershed research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: George R. Foster
Mailing Address: USDA/ARS/MSA
P.O. Box 1157
Oxford, MS 38655
E-Mail Address: a03eproxford@attmail.com
Telephone: (601) 232-2900
Fax: (601) 232-2915

North Appalachian Experimental Watershed

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: North Appalachian Experimental Watershed, Coshocton, Ohio.

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
1,047 acres owned by ARS or leased from the county, including cropland, pasture and forest. On-site research team with expertise in hydrology and agriculture.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Joe Edwards
Mailing Address: USDA/ARS
State Rte. 621, P.O. Box 478
Coshocton, OH 43812
E-Mail Address: a03lccoshon@attmail.com
Telephone: (614) 545-6349
Fax: (614) 545-5125

Soil Management Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Soil Management Research Unit, Morris, Minnesota

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in plant and soil management research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Ward B. Voorhees
Mailing Address: USDA/ARS/MWA
Conservation Research Laboratory
Morris, MN 56267
E-Mail Address: a03lcmorris@attmail.com
Telephone: (612) 589-3411
Fax: (612) 589-3787

National Animal Disease Center

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: National Animal Disease Center, Ames, Iowa

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Large research laboratory specializing in diseases of domestic livestock. Expertise in metabolic diseases, immunology, and bacterial research, pathology, veterinary medicine, and parasitology.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Thomas Walton
Mailing Address: USDA/ARS/NADC
2300 Dayton Ave.
Ames, IA 50010
E-Mail Address: a03dirnadc@attmail.com
Telephone: (515) 239-8201
Fax: (515) 239-8458

National Soil Tilth Laboratory

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: National Soil Tilth Laboratory, Ames, Iowa

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Research laboratory

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ✔ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
278 acres of watersheds and cropland with on-site research team with expertise in agronomy, hydrology, and engineering.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Jerry Hatfield
Mailing Address: USDA/ARS
2150 Pammel Drive
Ames, IA 50011-4420
E-Mail Address: a03dirnstl@attmail.com
Telephone: (515) 294-5723
Fax: (515) 294-8125

Field Crops Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Field Crops Research Unit, Ames/Ankeny, Iowa

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in agricultural plant and soil research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Keith Bidne
Mailing Address: USDA/ARS/MWA
1575 Agronomy Bldg.
Iowa State University
Ames, IA 50011
E-Mail Address: a03rlfcr@attmail.com
Telephone: (515) 294-3122
Fax: (515) 294-9359

Biological Control of Insects Research Unit

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: Biological Control of Insects Research Unit Columbia, Missouri

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Expertise in insect microbiology research.

List Major Limitations Associated With Potential Use of the Site:
Existing experiment and small study sites cannot be disturbed.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Arthur H. McIntosh
Mailing Address: USDA/ARS/MWA/BCI
P.O. Box 7629
Columbia, MO 65205
E-Mail Address: a03rlbci@attmail.com
Telephone: (314) 875-5361
Fax: (314) 75-4261

National Center for Agricultural Utilization Research

Reporting Agency/Department: USDA, Agricultural Research Service

Site Name and Location: National Center for Agricultural Utilization Research, Peoria, Illinois

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Agriculture research and development

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

☐ Remediation ☐ Control ✔ Monitoring ✔ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Major national research center focusing on new uses for agricultural products such as biomedical supplies from corn starch.

List Major Limitations Associated With Potential Use of the Site:
Proposed research cannot interfere with on-going efforts.

List the Three Major Contaminants at the Site: N/A

Location Point of Contact

Name: Richard L. Dunkle
Mailing Address: USDA/ARS/MWA/NCAR
1815 N. University Street
Peoria, IL 61604
E-Mail Address: a03dirncaur@attmail.com
Telephone: (309) 685-4011
Fax: (309) 360-7226

Department of Defense

Groundwater Remediation Field Laboratory

Reporting Agency/Department: United States Air Force

Site Name and Location: Groundwater Remediation Field Laboratory, Dover Air Force Base, Delaware

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): The Groundwater Remediation Field Laboratory (GRFL) will support the development, testing, and demonstration of technologies for characterizing, monitoring, and remediating contaminated soils and groundwater, primarily *in situ*. The demonstrations are conducted in areas where both fuels and solvents contamination exists. The research emphasis will be on the development of technologies to treat dense nonaqueous phase liquids (DNAPLs). A unique feature of the GRFL will be the ability to conduct experimental, contained releases of contaminants.

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ✔ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Occupies approximately 3,700 acres and is home to the 436th Military Airlift Wing, which operates and maintains 36 C-5 Galaxy transport aircraft.

The hydrogeology of the Dover AFB area is composed of the Columbia (Pleistocene) Formation, which forms a water table aquifer overlying the Calvert (Miocene) Formation. The lithology of the Columbia Formation is composed of medium to coarse sands with some silt and gravel. Depth to the water table ranges from 10 to 12 feet below the ground surface. The depth to the Calvert Formation is approximately 35 to 40 feet below ground surface. This unit is composed of marine, estuarine, and delta plain silty clays, and forms an aquitard. The topography of this area of Delaware is flat cropland with some hardwood forests. Monthly average temperatures range from 25 to 67 degrees F, with annual average of 45 degrees F. Annual average precipitation is 40.4 in, with August being the wettest month. Summers are warm and humid. Winters can be cold, but are generally mild.

List Major Limitations Associated With Potential Use of the Site:
Soil and groundwater contamination consists of fuels (JP-4) and solvents, including NAPLs. Discrete fuels plumes, as well as mixed solvent, fuel, and oil plumes exist and are well characterized. The experimental contained release facility is being constructed at an uncontaminated site and will be used for research on the fate, transport, monitoring, and Remediation of DNAPL contamination.

Location Point of Contact:

Name: Mark H. Smith
Mailing Address: Armstrong Laboratory
Environics Directorate
139 Barnes Drive, Bldg 1120, Suite 2
Stop 37
Tyndall AFB, FL 32403-5323
Telephone: (904) 283-6126
Fax: (904) 283-6286

Louisiana Army Ammunition Plant

Reporting Agency/Department: United States Army

Site Name and Location: Louisiana Army Ammunition Plant, Shreveport, Louisiana

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): This site is used to demonstrate systems for remediating soils and groundwater contaminated with heavy metals, volatile organic compounds, and explosives, using *in situ* and *ex situ* techniques.

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ☐ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Site consists of 14,974 acres of land, of which 80 percent is woodlands and 20 percent production lines and mission support facilities. LAAP is a U.S. Army Armament, Munitions and Chemical Command facility that is operated under contractual agreement with the Thiokol Corporation. The site is currently on modified caretaker status. Past operations at the site have included the manufacture of shell metal parts to Load-Assemble-Pack (LAP) ammunition items.

Soils in the demonstration area are generally sandy loam underlain by clayey sand. There are two aquifers underlying the demonstration area. The depth to ground water in the shallow, unconfined aquifer ranges from 7 to 20 ft. The depth to water in the lower, artesian aquifer is 130 to 260 ft. Average monthly temperatures range from 47 to 83 degrees F, with an annual average temperature of 66 degrees F. August and September are the driest months, while April is the wettest. Annual average precipitation is 44.7 in.

List Major Limitations Associated With Potential Use of the Site:
This site was placed on the National Priorities List in October, 1984 due to groundwater contamination from the Area P lagoons. Investigations showed that the upper aquifer is contaminated with explosives; however, no contamination was found in the deeper aquifer, which is the drinking water source for LAAP. The Area P lagoons received explosives-contaminated wastewater (pink water) from various manufacturing operations during the 1940s; they were officially closed in August of 1990, however, the groundwater beneath Area P is thought to be contaminated with explosives. An RI/FS identified six other areas of concern at the LAAP, including two burning grounds, a landfill, an oily waste landfarm, an electroplating waste lagoon, and a chromium etching facility. Soils and groundwater are contaminated with metals (thallium, lead, arsenic and chromium), explosives (TNT, DNT, tetryl, RDX, and HMX and various related nitroaromatic compounds), and solvents.

Location Point of Contact:

Name: Erik B. Hangeland
Mailing Address: Bldg. 4430
U.S. Army Environmental Center
SFIM-AEC-ETP
Aberdeen Proving Ground, MD 21010-5401
Telephone: (410) 612-6858
Fax: (410) 612-6836

McClellan Air Force Base

Reporting Agency/Department: United States Air Force

Site Name and Location: McClellan Air Force Base, Sacramento, California

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): This site is used to demonstrate systems for remediating soils and groundwater contaminated with solvents, using *in situ* and *ex situ* techniques.

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ☐ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
The main base facility includes 2,949 contiguous acres. Its current primary mission is management, maintenance, and repair of aircraft, electronics, and communication equipment. The base was and is engaged in a wide variety of operations involving the use, storage and disposal of hazardous materials. These include industrial solvents, caustic cleaners, electroplating chemicals, heavy metals, polychlorinated biphenyls, low-level radioactive wastes and a variety of fuel oils and lubricants. Approximately 250 waste sites, potential release locations, and other areas that warrant investigation have been identified. The base has a large operational soil vapor extraction (SVE) system in place and is currently establishing other SVE units throughout the base. There is also an operable groundwater treatment plant that treats extracted ground water.

The base is located on an alluvial plain which was created by the deposition of sediments eroded from the Sierra Nevada. The land surface slopes gently. Soils in the vicinity of the base are derived from the weathering of alluvial material that is principally granitic in origin. The stratigraphy beneath the base is complex, as is typical of heterogeneous fluvial deposits. Typical sediments present are sands, silts, clays, and, rarely, gravels. The groundwater level is about 100 ft below land surface. The climate is characterized by hot, dry summers and cool, moist winters. Average monthly temperatures vary from 45 to 75 degrees F, with an annual average of 60 degrees F. Annual precipitation is 17.2 in, with January being the wettest month.

List Major Limitations Associated With Potential Use of the Site:
Groundwater contamination consists of volatile organic compounds and metals. Contaminants consistently detected include: benzene, carbon tetrachloride, TCE, vinyl chloride, 1,1-DCE, 1,2-DCE, 1,2 DCA, TCE, acetone, bromodichloromethane, 2-butanone, 1,1-DCA, 4-methyl-2-pentanone, toluene, and trichlorofluoromethane. The contaminant having the greatest spatial extent is TCE. Approximately 660 acres of the base are underlain by plumes having TCE concentrations above the drinking water standard. Soils contamination consists principally of chlorinated hydrocarbons (including many of the same compounds listed for groundwater). The known areal extent of soils contamination is about 370 acres.

Location Point of Contact:

Name: Bud Hoda
Mailing Address: M-ALC/EM
5050 Dudley Blvd., Suite 3
McClellan AFB, CA 95652-1389
Telephone: (916) 643-1742
Fax: (916) 643-0827
Fax Alternate: (916) 643-5880

Naval Construction Battalion Center

Reporting Agency/Department: United States Navy

Site Name and Location: Naval Construction Battalion Center, Port Hueneme, California

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): Demonstration facility used to demonstrate systems for characterization and remediating soils, sediment, and groundwater contaminated with fuel hydrocarbons and waste oil, using either *in situ* or *ex situ* techniques.

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ☐ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Site consists of 1,647 acres of coastal land. A 3.8-acre *ex situ* soil remediation facility was built on the base where gasoline- and diesel-contaminated soil was stockpiled for controlled tests. A 300-ft x180-ft x2-ft impoundment area within the facility has been constructed to assure all rainwater and test fluids are captured and monitored for contamination levels before discharge. Facility is monitored to detect any contamination migration from the site. In addition to the *ex situ* site, several isolated sites have been identified for *in situ* demonstrations of characterization and remedial technologies for contaminated soil, groundwater, harbors, canals, and wetlands. A three-dimensional monitoring network with long-term data retrieval is available for data comparison.

The ground surface is relatively flat, and is underlain by approximately 300 ft of unconsolidated clay, silt, sand, and gravel of Holocene age that overlie clay, shale, and sandstone deposits of Pleistocene and older ages. The geology, within 30 ft of the surface, consists of unconsolidated sands, silts, and clays with minor amounts of gravel and fill material. A semi-perched aquifer is the uppermost groundwater unit present beneath the site. The aquifer is contained within the first three depositional soil units, consisting of an upper silty sand unit, an underlying fine- to coarse-grained sand unit, and a basal clay unit. In general, groundwater within this aquifer flows southwest, with gradients ranging from approximately .001 to .003 ft/day. The site experiences a moderately dry climate with mild, moist winters, and warm, dry summers.

List Major Limitations Associated With Potential Use of the Site:
Primary contaminants consist of diesel, gasoline and waste oil. Secondary contaminants consist of pesticides, transformer fluid containing PCBs, metals (As, Be, Mn, Ni, Sb), acids, solvents and materials from firefightier training burnsites. Contaminants identified in harbor and canal water and sediments include waste oils, detergents, solvents, PCBs, metals (Cu, Zn), benzoic acid, and pesticides.

Location Point of Contact:

Name: Ernest Lory
Mailing Address: Naval Facilities Engrg.Svc. Ctr.
Port Hueneme, CA 93043
Telephone: (805) 982-1299
Fax: (805) 982-4304
Fax Alternate: (805) 982-1418

Volunteer Army Ammunition Plant

Reporting Agency/Department: United States Army Environmental Center

Site Name and Location: Volunteer Army Ammunition Plant, Chattanooga, Tennessee

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): This site is used to demonstrate systems (physical, chemical, and biological) for remediating soils and groundwater contaminated with heavy metals and explosives, using either *in situ* or *ex situ* techniques.

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ☐ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
The plant consists of 6,546 acres of land and facilities used for manufacture of bulk TNT. The government-owned, contractor-operated facility is currently maintained in inactive status for possible resumed production of TNT. Some of the remnants of 19 batch nitration lines (last used in 1975) were removed for construction of the newer (1974) continuous lines. TNT production at the installation ended in 1977. The area selected for demonstrations contains the former batch nitration lines (although no tests are planned near the newer continuous lines), the World War II landfill, World War II burning ground and the Redwater Treatment Plant Area.

Soil in this area is primarily of the Fullerton group, is strongly acidic (pH 5), and is of generally undulating terrain. The topsoil consists of 8 to 18 in of brownish-gray cherty silt loam. The subsoil consists of 10 to 32 in of yellowish-red silty clay loam, which has slow internal drainage. The soil contains chert fragments and is highly susceptible to erosion. Soil thickness varies from approximately 25 to 135 ft. Depth to groundwater varies spatially as well as with time. There are numerous monitoring wells located around the installation. Depths to water range from a few feet below the land surface to as deep as 60 ft. Depths to groundwater in the demonstration area are between 20 and 40 feet. Average monthly temperatures range is from 41 to 79 degrees F, with an average of 60 degrees F. Annual average precipitation is 51.9 in, with March being the wettest month.

List Major Limitations Associated With Potential Use of the Site:
Soil and groundwater contaminants consist principally of explosives and explosives manufacturing-related contaminants (TNT, DNT, and nitroaromatics), with some heavy metals (Cr, Cu, Pb, As, Be, Co, and Ni) present in a few areas of the installation. Most soil contamination is located near old buildings (or their remains) that were used to batch-manufacture TNT. Contamination has been detected in the vadose zone but has not been well characterized or traced to entry points.

Location Point of Contact:

Name: Erik B. Hangeland
Mailing Address: Bldg. 4430
U.S. Army Environmental Center
SFIM-AEC-ETP
Aberdeen Proving Ground, MD 21010-5401
Telephone: (410) 612-6858
Fax: (410) 612-6836

National Center for Integrated Bioremediation Research and Development

Reporting Agency/Department: U.S. Environmental Protection Agency, the University of Michigan, and the United States Air Force

Site Name and Location: Wurtsmith Air Force Base, (National Center for Integrated Bioremediation Research and Development), Oscoda, Michigan

Nature of Facility: (e.g., Research Laboratory, Open Rangeland, Demonstration Facility, Military Base): This site is used to demonstrate bioremediation-based systems for *in situ* remediation of soils, sediments, and groundwater contaminated with fuels, solvents and organic mixtures.

Types of Environmental Technologies Appropriate for the Site (See Taxonomy Attached, Check as Many as Are Appropriate):

✔ Remediation ☐ Control ☐ Monitoring ☐ Avoidance

List Unique Opportunities and Challenges Associated With the Site:
Wurtsmith AFB occupies 7 square miles bounded by the Au Sable River/Au Sable River Wetlands complex to the south, Lake Van Etten and Lake Huron to the east and to the west by bluffs fronting a 5-mile-wide plain extending on to the base. The altitude of the land surface ranges from 580 to 750 ft above mean sea level. Lake Huron ultimately receives the discharge from the associated groundwater and surface water flow system and the Au Sable River. Surficial geologic materials are of quaternary glacio-fluvial origins made up largely of medium to fine sands and coarse sand and gravel deposits to depths of 60 to 90 ft. Below the glacial deposits lies a thick confining lacustrine clay layer (125 to 250 ft thick) that separates the upper aquifer from the lower, more saline waters in the bedrock units. In the eastern regions of the area, intermittent sand, sand/gravel, and clay layers of 1 to 3 ft thickness have been observed in the saturated zone. Monthly average temperatures range from 14 to 58 degrees F, with an annual average of 37 degrees F. Average annual precipitation is 29.8 in, including snowfall, with July being the wettest month. The location is ideal for *in situ* demonstration and experimentation, as the geology is fairly uniform and the saturated/unsaturated permeabilities are favorable.

List Major Limitations Associated With Potential Use of the Site:
A large number of known and potential contamination sites (>50) have been identified at the base. Principal contaminants of concern include: aromatic and aliphatic components of POL, chlorinated organic solvents (e.g., TCE, DCE), fire-fighting compounds, combustion products (e.g., aquifer solids). Sediments and groundwater are the major environmental media affected.

Location Point of Contact:

Name: Mark Henry
Mailing Address: 4140 E. California, Bldg. 1845
Oscoda, MI 48750
Telephone: (517) 739-0185
Fax: (517) 739-0186

Index

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

R

S

T

U

V

W

X

Z

Additional copies may be obtained from:

Julia Jones
U. S. Department of Agriculture
Global Change Program
300 12th Street, S. W., Rm. 2M08
Washington, DC 20250
e-mail: gevans@nalusda.gov
Telephone: 202-401-3798
Fax: 202-401-3812

Richard C. Burrow
Office of Science Policy
U. S. Department of Policy
1000 Independence Ave., S. W.
Washington, DC 20585
e-mail: richard.burrow@hq.doe.gov
Telephone: 202-586-1709
Fax: 202-586-5342

For further information contact: David Rejeski, Office of Science and Technology Policy, Environment Division, OEOB, Rm. 443, Washington, DC 20502; Phone: 202-456-6084.