



Test and Evaluation Center

MSE owns and operates the Mike Mansfield Advanced Test Center situated on 53-acres in Butte, Montana. This nationally known facility is a premier operation with equipment and systems available for testing components, equipment, and energy/material handling systems ranging from bench-scale apparatus through engineering-scale demonstrations and full-scale equipment development.

Originally the U.S. DOE Western Environmental Technology Office (WETO), MSE managed the facility from its inception, successfully privatized it in 1996, and renamed it the Mike Mansfield Advanced Technology Center. In managing this facility, we research, develop, test, and apply government-sponsored programs and commercial projects in the areas of waste treatment, environmental remediation, advanced materials, energy conservation, and other innovative technology areas.

At the Center, we offer clients equipment and systems to test technologies, components, equipment, and energy/materials handling systems ranging from bench-scale apparatus through engineering-scale

demonstrations and full-scale equipment development. Because of the flexibility built into the Center and its diverse infrastructure, we can develop, test, and apply new technologies to treat contaminated surface and ground waters and soils using biological, chemical, and physical methods.

To accommodate customers and military sites across the United States, our support components and systems are easily and economically transported to remote locations. Our workforce and equipment are mobile and used to travelling quickly and efficiently to support customer projects. We often provide support hundreds to thousands of miles away from the home facility.

The Center contains the infrastructure, laboratories, and machining and fabrication capabilities to support your projects.

Give us a call.

Test and Evaluation Center offers

- a UL Listed Panel Shop,
- full analytical laboratory,
- treatability studies laboratory,
- soils laboratory,
- machine shop,
- fabrication shop,
- shipping - receiving

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MSE Military Bases and Industrial Facilities Work Our Product is a Satisfied Customer

We find engineering solutions for our customers. Offices in Montana, Washington State, California, Tennessee, and West Virginia.

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Modernization of Military Bases & Industrial Facilities

Statement of Qualifications



Clients Government Agencies

U.S. Department of Energy (DOE)
Department of Defense (DoD)
U.S. Army Corps of Engineers (USACE)
USACE Construction Engineering Research Laboratory (USACERL)
U.S. Army Armament Research, Development and Engineering Center (ARDEC)
U.S. Environmental Protection Agency (EPA)
EPA National Risk Management Research Laboratory
DOE Savannah River Office,
DOE Headquarters Office of Science and Technology
National Aeronautics and Space Administration (NASA)

Clients: Commercial industrial sites

Radford Army Ammunition Plant
Watervliet
Fort Bragg
Pope AFB
Seymour-Johnson AFB

MSE: The Company

MSE Technology Applications, Inc. is a diversified engineering and technology solutions company providing a wide range of professional services to the government and private industry. We have three decades of professional service experience that includes thousands of successful project deliveries and technology innovations.

Headquartered in Butte, MT, with additional offices in Washington State, Idaho, West Virginia, North Carolina, South Carolina, and Tennessee, we have projects completed or under way in more than 42 states across the U.S. and are certified as a small business. MSE has performed a number of projects at Fort Bragg, Seymour Johnson Air Force Base, Radford Army Ammunition Plant, and Watervliet Arsenal.

Committed to providing cost-effective, unique solutions for customers, we have a working knowledge of many of the unit processes at industrial sites, and are successful at establishing productive working relationships with site personnel. Our dedicated staff of professionals—comprised largely of scientists, engineers, skilled crafts people, and technicians—provides the knowledge and real-world experience that allow us to handle specialized problems.

Incorporated in 1974 to conduct research and development to help the United States become less dependent on foreign sources of energy, we have completed a substantial volume of work for the Government and commercial clients.

Over the years, we have expanded our expertise and now offer clients specialized engineering, facility management, technology development and testing, technology evaluation and deployment, environmental remediation, military waste treatment, mine waste treatment, and site cleanup and closure services.

We provide unique solutions to our customer's engineering issues and problems.

Relevant Projects Highlighting our Capabilities

One of MSE's core competencies is applying leading-edge and creative solutions to engineering issues. We have extensive experience developing, evaluating, analyzing, and applying ideas and technologies. Our experience of more than 100 remedial action projects alone enables us to confidently manage work at industrial sites.

Familiarity with Military Base & Industrial Systems

We have successfully worked at military and industrial facilities and we know unit processes.

Water Treatment issues and Water Use/Reuse.

Prepared a Master Plan for design/installation of a Wastewater Supervisory Control and Data Acquisition (SCADA) System at Fort Bragg, NC. The project also included a pilot program to install hardware and software for the communication of 10 remote sites to a central master site.

Engineering Services to Support Pollution Prevention at Fort Bragg. Support pollution prevention activities carried out by the Fort Bragg Department of Public Works. We performed multiple projects related to wastewater control and monitoring, air emissions monitoring, and potable water controls.

Chlorine Disinfection Alternatives Feasibility Study/Pilot Study. Because of potential terrorism threats and contamination issues, the Fort Bragg drinking water treatment plant wanted to discontinue using chlorine gas cylinders. We evaluated numerous alternatives (to chlorine gas) to disinfect drinking water and pilot-tested several at the plant. Following our recommendations, Fort Bragg can eliminate chlorine gas while reducing regulated carcinogenic disinfection byproducts.

Soil Erosion/Depositional Modeling of Major Watersheds using the Unit Stream Power Erosion Depositional Model: Fort Bragg was spending \$6 million annually on erosion control without achieving the required sedimentation reduction. We developed a detailed Geographic Information System (GIS) model for each watershed to identify areas of high erosion and deposition. With this model, Fort Bragg was able to prioritize their erosion mitigation efforts.

MSE Staff - Working for You

For every project, whether at our corporate office in Butte, MT or any of our seven satellite offices, our staff is committed, motivated, and qualified, with hands-on knowledge of technology demonstrations and the practical knowledge of technology implementation at a project or task level. This professional experience includes complex mechanical and process systems, facility demolition, waste site cleanup and closure, waste treatment and disposal, and long-term stewardship and years of experience with the design, construction and operation of bench-scale through commercial-scale versions of various environmental remediation technologies.

To support our clients once tasks are defined, we assemble a project specific team of qualified personnel for the task at hand. Working within a matrixed organization gives us a flexible structure to meet customer needs within a safety first environment.

We have the engineering resources to perform your projects -- geologists, hydrologists, chemists, geochemists, biologists, safety and quality control professionals, environmental scientists and technicians-- along with risk analysis, data validation, quality assurance, drafting, documentation, and accounting support.

MSE's 160 plus employees are comprised of engineers, scientists, technicians, crafts, and administrative personnel who hold more than 100 academic degrees, including advanced degrees and Professional Engineering licenses. This creative resource base is available to support your projects.



Engineering Resources

Reg. Professional Engineers
Reg. Professional Geologists
Cert. Environmental Managers
Cert. Hazardous Waste Managers
Project Management Professionals (PMPs)
Aerospace Engineers
Biologists
Chemical Engineers
Chemists
Civil Engineers
Compliance Specialists
Economists
Environmental/Engineering Techs
Electrical Engineers
ES&H Specialists
Geochemists
Geologists
Geophysicists
Geotechnical Engineers
Hydrogeologists
Instrumentation & Control Engineers
Information Technology Spec.
Mechanical Engineers
Microbiologists
Process Engineers
Project Managers
QA Specialists
Soil Scientists
Statisticians
Structural Engineers
Systems Engineers
Technical Writers/Editors
Technical Communicators
Technicians
Waste Management Specialists
Water Resources Engineers
Operations Specialists

Environmental Capabilities ...

Technology Area	MSE Project Examples
Material Recycling	Watervliet Arsenal, Watervliet, New York. Designed, tested and installed an innovative distillation process to recycle waste acid solutions used for electroplating.
	Corpus Christi Army Depot. Designed, tested, and installed an ultrafiltration system to remove suspended solids from waste caustic solutions for solution regeneration for parts cleaning.
	Watervliet Arsenal. Developed, designed, and installed a process to recover/ reuse chrome-enriched rinse water used for metal plating.
Water Treatment Issues & Water Use/Reuse	Anniston Army Depot, Anniston, AL. Engineering study to evaluate industrial processes discharging to the Industrial Wastewater Treatment Plant and Domestic Sewage Treatment Plant.
	Fort Bragg. Prepared a Master Plan to design and installed a Wastewater SCADA System. The project also included a pilot program to install hardware and software to allow 10 remote sites to communicate with a central master site.
	Fort Bragg. Feasibility study to identify the budget, engineering, and environmental requirements to reuse effluent from the wastewater treatment plant as well as other sources, for landscape irrigation.
Ground & Surface Water Pollution	Designed and installed Permeable Reactive Barriers at Rocky Flats Environmental Technology Site and Monticello Mill Tailing Site for treatment of groundwater contaminated with volatile organic compounds, radionuclides, and nitrates.
	Butte, MT. Assisted U.S. Filter to design a 7.5 million gallon per day water treatment plant to treat acid mine drainage from mill leach dumps and eventually from the Berkeley Pit, a large abandoned open pit copper mine (the largest toxic body of water in the world). MSE also analyzed various treatment alternatives for the plant and managed a pilot-scale study to validate the treatment process to meet water discharge standards.
	EPA. Integration contractor for the EPA's Mine Waste Technology Program that demonstrates and deploys innovative technologies to treat contaminated liquids, soils and sediments, sludges, leachates, and surface and groundwater resulting from the past practices of mining metallic ores.
Other Capabilities	Developed economic models used on a nationwide basis for the life-cycle cost modeling of environmental and waste treatment technologies. Evaluated more than 50 technologies under Characterization and Monitoring, Barriers, In Situ Treatment, Mixed Wastes, Offgas Treatment, and Groundwater Vapor Extraction.
	Experts using simulation models to assess environmental conditions, develop treatment options, and predict remediation and waste treatment effectiveness.

Relevant Projects...*Highlighting our Capabilities*

Fort Bragg Alternatives to Incineration Feasibility Study:
Prepared a feasibility study and economic analysis to evaluate alternatives to incineration technologies to dispose of classified documents and medical wastes. This study assisted the Army's selection of alternatives to incineration.

Engineering and Electrical Contracting Services-Seymour Johnson Air Force Base. As a second tier subcontractor, MSE provided electrical engineering support and installed the electrical portion of the Type III Hydrant Fuel System project.

Nitric & Sulfuric Acid Mass Balance and Reduction of Acidic Wastewater: Radford Army Ammunition Plant loses 15 million pounds of nitric acid and 14 million pounds of sulfuric acid to the sewer system each year from the nitrocellulose and acid manufacturing areas, with 11 million pounds of lime used annually to neutralize the acidic water before being discharged to the New River. MSE evaluated the nitrocellulose manufacturing area and found areas where acid was being lost and could potentially be recycled: identifying approximately 4.5 million lbs/yr of nitric acid and 3.6 million lbs/yr of sulfuric acid, currently going to the drain that could be recycled and diverted by modifying current operations. Our recommendations could save as much as \$1.2 million annually.

Recycling of Selective Catalytic Reduction Unit Scrubber Acid (ongoing): The acid scrubber in the selective catalytic reduction (SCR) scrubber at Radford removes acid fumes from the nitrocellulose area process prior to venting. Currently, the acid recovered in the SCR scrubber is sent to the sewer because it cannot be used. This project will document acid losses and suggest methods to recover and/or recycle the acid.

Radford Overall Plant-Wide Mass Balance (ongoing) RFAAP: Provided an overall high level engineering mass balance, accounting for major product lines in each of the main facility areas, to identify areas of significant product loss for further study and process optimization. RFAAP believes a significant amount of raw materials and in process materials could be recycled for substantial operational cost savings.

Relevant Military, Industrial, and Troop Facility Projects:

- Research, develop, and test fuel detection system to alert the Waste Water Treatment Plant through SCADA alarming.
- Install overhead/underground medium/low voltage, internal power distribution, fire protection, lightning protection, and cathodic protection systems on hydrant fueling system: Seymour Johnson AFB.
- Develop/implement corrosion and water quality monitoring system in the water distribution SCADA system: Fort Bragg.
- Feasibility Study to reuse effluent at the Wastewater Treatment Plant: Fort Bragg.
- Evaluate alternative to disinfect drinking water: Chlorine Disinfection Alternatives Feasibility/Pilot Study: Fort Bragg.
- Predictive modeling study: Soil Erosion and Depositional Modeling of Major Watersheds using the Unit Stream Power Erosion Depositional Model: Fort Bragg.
- Alternatives to Incineration Feasibility Study: Fort Bragg.
- Demonstrate and evaluate innovative pollution prevention and waste treatment technologies throughout the defense complex: USACERL.
- Develop manufacturing pollution prevention technologies: USACERL.
- Support CERL and federal agencies in technology transfer programs—numerous environmental technologies demonstrated by MSE available for transfer throughout the Federal Facilities Complex.
- Support DOE (through the Mixed Waste Focus Area Program and Subsurface Contaminant Focus Area Programs) to screen, demonstrate, and evaluate technical performance/cost effectiveness of third-party developed resource recovery and treatment technologies for implementation into DOE's Environmental Program.
- Manage the EPA's Mine Waste Technology Program – screen, demonstrate, and evaluate technical performance and cost effectiveness of third-party developed technologies to treat mine and mineral processing wastewater.

Process Instrumentation & Control ... *Services we offer*

MSE provides state-of-the-art capabilities and resources to design and install instrumentation and control systems to improve process control, reduce chemical consumption, conserve energy, lower operation and maintenance costs, and enhance safety. We offer a total SCADA system to update infrastructure, integrate equipment, modernize facilities, and automate/optimize processes. We offer

- Engineering studies and cost estimates for automation and modernization of control systems.
- Design and installation of instrument control and diagnostic systems for new or modified systems.
- Selection and installation of monitoring instrumentation and primary sensors.
- Design and installation of SCADA systems.
- Integration for existing and new equipment.
- Systems with remote data gathering, alarming and reporting, real-time Intra/Internet control applications, remote telephone, and/or radio based telemetry.
- Design and implementation of Programmable Logic Controller (PLC) ladder logic control programs.
- Instrumentation and Control Systems

Facility Construction/Demolition

... *relevant experience*

As a second tier subcontractor, we managed the complete electrical installation, upgrade, and interfacing of the Hydrant Fuel System Replacement at Seymour Johnson Air Force Base. Coordinating our subcontractors through the prime, we provided quality assurance and ensured adherence to USACE specifications and National Electric Code (NEC) and National Fire Protection Association (NFPA) regulates for all Division 16 installations including the following:

- Medium voltage aerial and underground power distribution
- Low voltage underground and interior power distribution
- Main Distribution Switch (MDS) and Motor Control Center (MCC)
- Diesel Generator inspection, testing and relocation
- Telecommunications installation both interior to the plant as well as exterior distribution and interface to the base network.

We also managed special construction under Division 13 for lightning protection, cathodic protection using sacrificial anode and impressed current methods, and fire protection and alarming system.



Environmental Capabilities ...

Since 1994, MSE has been the prime integration contractor for the USACERL Waste Minimization and Pollution Prevention Program (WM/PP), now called the Facility Modernization and Sustainability Program. Its mission is to reduce environmental stewardship costs for U.S Army operations using innovative technologies and techniques. The program involves approximately 100 projects completed or underway at 26 troop-based and munitions facilities in 21 states. Long-term cost savings from the program are realized through reduced use of raw materials; energy efficiency; improved waste management, disposal, and handling; and enhanced regulatory compliance. Cumulative cost savings to date resulting from this program are more than \$20 million. The table below highlights a few of the diverse projects in which we helped customers find solutions to a variety of environmental and industrial problems.

Technology Area	MSE Project Examples
Process Upgrades/ Environmental Management and I&C	Fort Bragg, NC. Designed a Wastewater SCADA monitoring system. A shortage of personnel to operate the wastewater treatment plant and the collection system prompted the need for a high-tech SCADA system. The new instrumentation provided significant cost-savings and prevented numerous sewage spills (2001-2002).
Waste Minimization	Radford Army Ammunition Plant. Prepared an engineering mass balance for major product lines in the Nitrocellulose and acid manufacturing areas that supported design modifications to reduce nitric and sulfuric acid discharged to the Industrial Wastewater Treatment Plant.
Hazardous Waste Treatment	McAlester Army Ammunition Plant, McAlester, OK. Demonstrated and installed an anaerobic granular activated carbon fluidized bed reactor to treat pinkwater.
	Watervliet Arsenal, Watervliet, NY. Designed, tested, and installed an innovative distillation process to treat waste acid solutions used for electroplating. Corpus Christi Army Depot, Corpus Christi, TX. Designed, tested, and installed an ultrafiltration system to remove suspended solids from waste caustic solutions used for parts cleaning.
RCRA-Type Waste Management	Watervliet Arsenal. Developed and tested a process for the reduction and subsequent precipitation of hexavalent chromium from wastewaters using a biological process as an economic alternative to conventional processing for the plating lines.
Waste Incineration Issues	Fort Bragg. Prepared a Master Plan and installed a telemetry system for the inventory and data collection of all air emission and incineration sources.
	Fort Bragg. Prepared a feasibility study and economic analysis to evaluate alternatives to incineration technologies to dispose of classified documents and medical wastes.
Contaminated Site Remediation	Brookhaven National Laboratory in Long Island, NY. Developed, designed, and installed a viscous liquid barrier at the Linac Isotope Producer site to prevent the further migration of contamination to groundwater.
Contaminated Site Remediation	Designed and installed Permeable Reactive Barriers at ORNL, Rock Flats Environmental Technology Site, and Monticello Mill Tailing Site to treat groundwater contaminated with volatile organic compounds, radionuclides, and nitrates.

Continued on page 6