LM Lab Network Inception, Organization, and Implementation

RadWaste 2023

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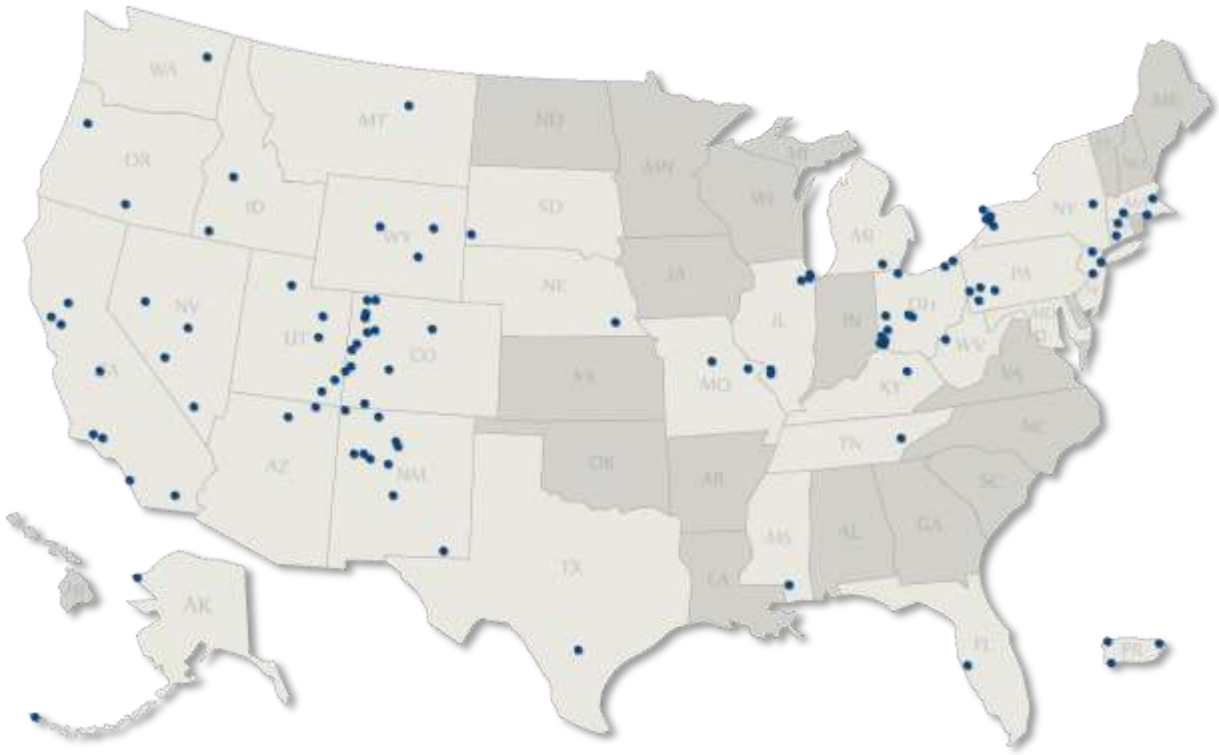
LM Mission

- The U.S. Department of Energy (DOE) Office of Legacy Management (LM) is responsible for ensuring that DOE's post closure responsibilities are met for sites that no longer have a continuing DOE mission.

- Goal 1 for LM is to “Protect human health and the environment.”

- In meeting this goal, LM is charged with meeting all regulatory requirements for the protection of human health and the environment while reducing long-term surveillance and maintenance costs.



Regulatory Complexity of LM Sites

- CERCLA/RCRA
- UMTRCA
  - Title I Processing and Disposal Sites
  - Title II Disposal Sites
- NWPA
- Manhattan Engineer District/Atomic Energy Commission or Atomic Energy Act
- State Water Quality Standards
- D&D
- FUSRAP
- Other
  - Nevada Offsites Program
  - Plowshare/Vela Uniform Program

Abbreviations

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act

RCRA = Resource Conservation and Recovery Act

UMTRCA = Uranium Mill Tailings Radiation Control Act

D&D = Decontamination and Decommissioning

FUSRAP = Formerly Utilized Sites Remedial Action Program

NWPA = Nuclear Waste Policy Act

LM National Lab Network Participants

Office of Science Laboratories

1. **Ames Laboratory**
   Ames, Iowa
2. **Argonne National Laboratory**
   Argonne, Illinois
3. **Brookhaven National Laboratory**
   Upton, New York
4. **Fermi National Accelerator Laboratory**
   Batavia, Illinois
5. **Lawrence Berkeley National Laboratory**
   Berkeley, California
6. **Oak Ridge National Laboratory**
   Oak Ridge, Tennessee
7. **Pacific Northwest National Laboratory**
   Richland, Washington
8. **Princeton Plasma Physics Laboratory**
   Princeton, New Jersey
9. **SLAC National Accelerator Laboratory**
   Menlo Park, California
10. **Thomas Jefferson National Accelerator Facility**
    Newport News, Virginia

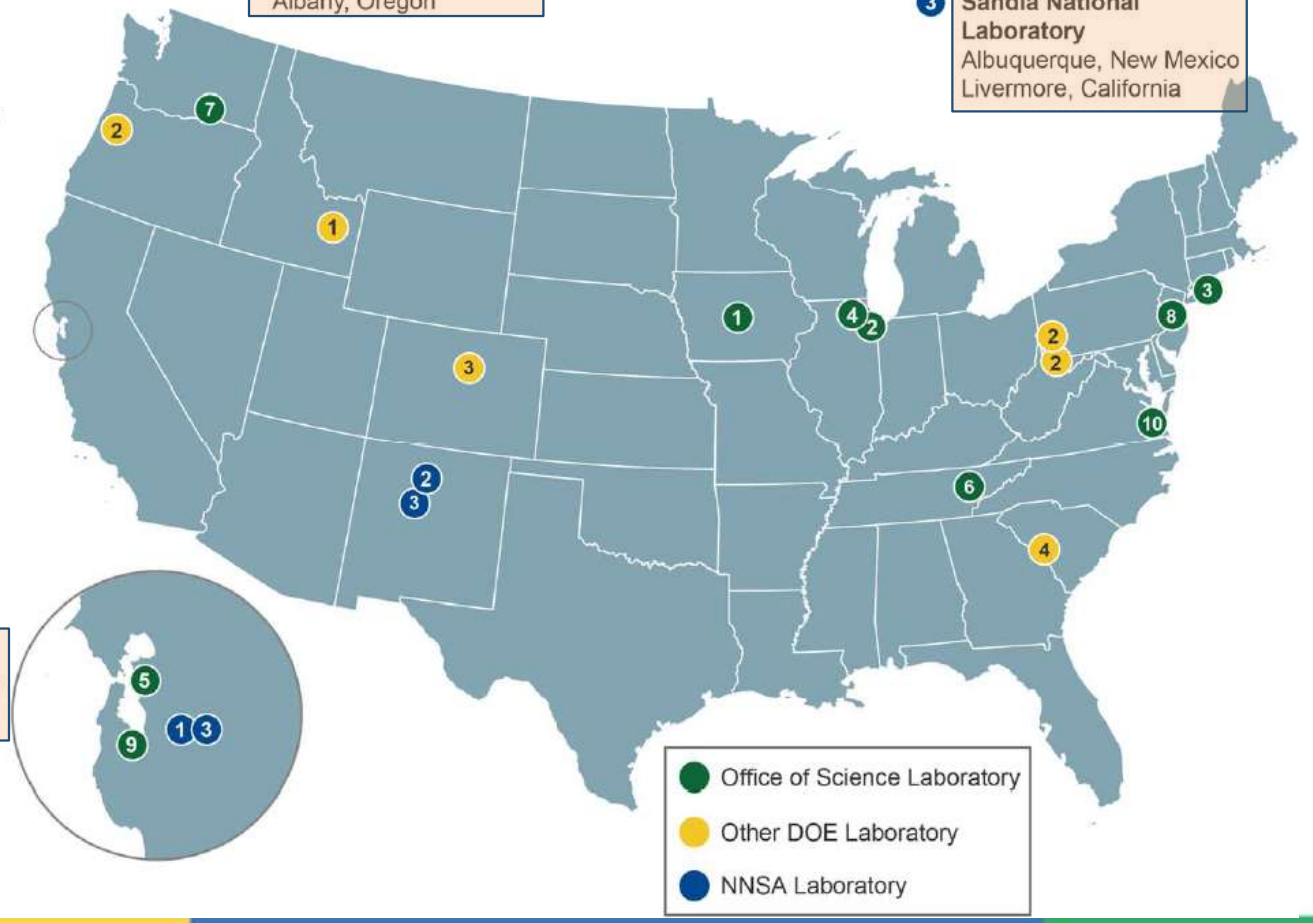
Other DOE Laboratories

1. **Idaho National Laboratory**
   Idaho Falls, Idaho
2. **National Energy Technology Laboratory**
   Morgantown, West Virginia
   Pittsburgh, Pennsylvania
   Albany, Oregon
3. **National Renewable Energy Laboratory**
   Golden, Colorado
4. **Savannah River National Laboratory**
   Aiken, South Carolina

SRNL is LM's Designated Lead Lab

NNSA Laboratories

1. **Lawrence Livermore National Laboratory**
   Livermore, California
2. **Los Alamos National Laboratory**
   Los Alamos, New Mexico
3. **Sandia National Laboratory**
   Albuquerque, New Mexico
   Livermore, California



HRS Working Groups – LM Risk Index

LM Long-Term Stewardship (LTS) Index - 2021
Current LM Sites

LM Site Information		Site Factor Inputs					LTS Index
LM Site Name	Regulatory Driver/ Programmatic Framework	Human Health Factor	Stakeholder Factor	Regulatory Factor	Institutional Control Factor	Site Complexity Factor	LTS Index
Tuba City, AZ, Disposal Site	UMTRCA Title I	High	High	High	High	Category-3	1.00
Shiprock, NM, Disposal Site	UMTRCA Title I	High	High	High	High	Category-3	1.00
Bluewater, NM, Disposal Site	UMTRCA Title II	High	High	High	High	Category-2	0.97
Monument Valley, AZ, Processing Site	UMTRCA Title I	Medium	High	High	High	Category-2	0.89
Slick Rock, CO - Rollup (3 Components)	UMTRCA Title I	Medium	Low	High	High	Category-2	0.79
Naturita, CO, Rollup (2 Components)	UMTRCA Title I	Medium	Low	High	High	Category-2	0.79
Weldon Spring, MO - Rollup (5 Components)	CERCLA/RCRA	Medium	Medium	High	Low	Category-3	0.78
Mound, OH - Rollup (8 Components)	CERCLA/RCRA	Medium	Medium	High	Low	Category-3	0.78
Gunnison, CO - Rollup (2 Components)	UMTRCA Title I	Medium	Low	High	Medium	Category-2	0.74
Riverton, WY, Processing Site	UMTRCA Title I	Low	High	High	Low	Category-2	0.72

High-Risk Site Working Groups

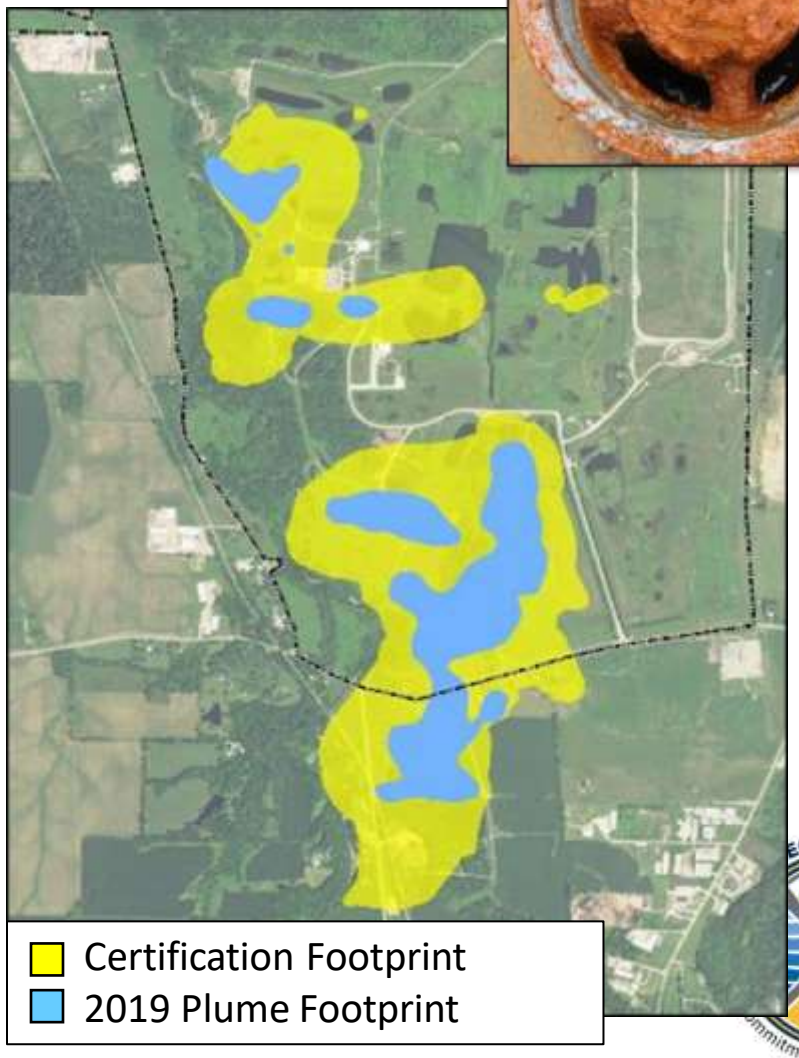
- Participants
  - LM
  - LMS
  - NNLEMS

(1) Tuba City, AZ
(2) Shiprock, NM
(3) Bluewater, NM
(4) Fernald, OH
(5) Weldon Spring, MO
(6) Monument Valley, AZ
(7) Rifle Disposal Cell
(8) Moab

- Observers and sometimes participants
  - US NRC (1,2,3,4)
  - US EPA (4,5)
  - Ohio EPA (5)
  - USACE (3)
  - Hopi Mining & Mineral Resources UMTRA Program (1)
  - Navajo Nation AML/UMTRA (1,2,4)
  - Navajo Department of Water Resources (4)
  - Navajo Nation EPA (1,2,4)
  - Shiprock Chapter President (1)
  - Tuba City Chapter President (2)
  - Navajo Nation Council Delegate (1,2,4)
  - Dennehotso Chapter President (4)
  - Oljato Chapter President (4)
  - University of Arizona (4)

High Risk Sites Working Groups

High Risk Site	Start	Report Status	Participating National Laboratories								
			SRNL	PNNL	SLAC	LBNL	Sandia	Argonne	NETL	Los Alamos	LLNL
Tuba City	Apr-20	Complete	X	X	X	X	X				
Shiprock	Feb-20	Complete	X	X	X	X	X				
Bluewater	Oct-20	Complete	X	X		X		X	X	X	
Fernald	Apr-21	Complete	X	X			X	X			
Weldon Spring	Nov-21	Complete	X	X					X	X	
Monument Valley	Jan-21	Complete	X	X		X			X	X	
Rifle Disposal	Feb-22	Complete	X	X			X	X	X		
Moab	Sep-22	In Review	X			X				X	X



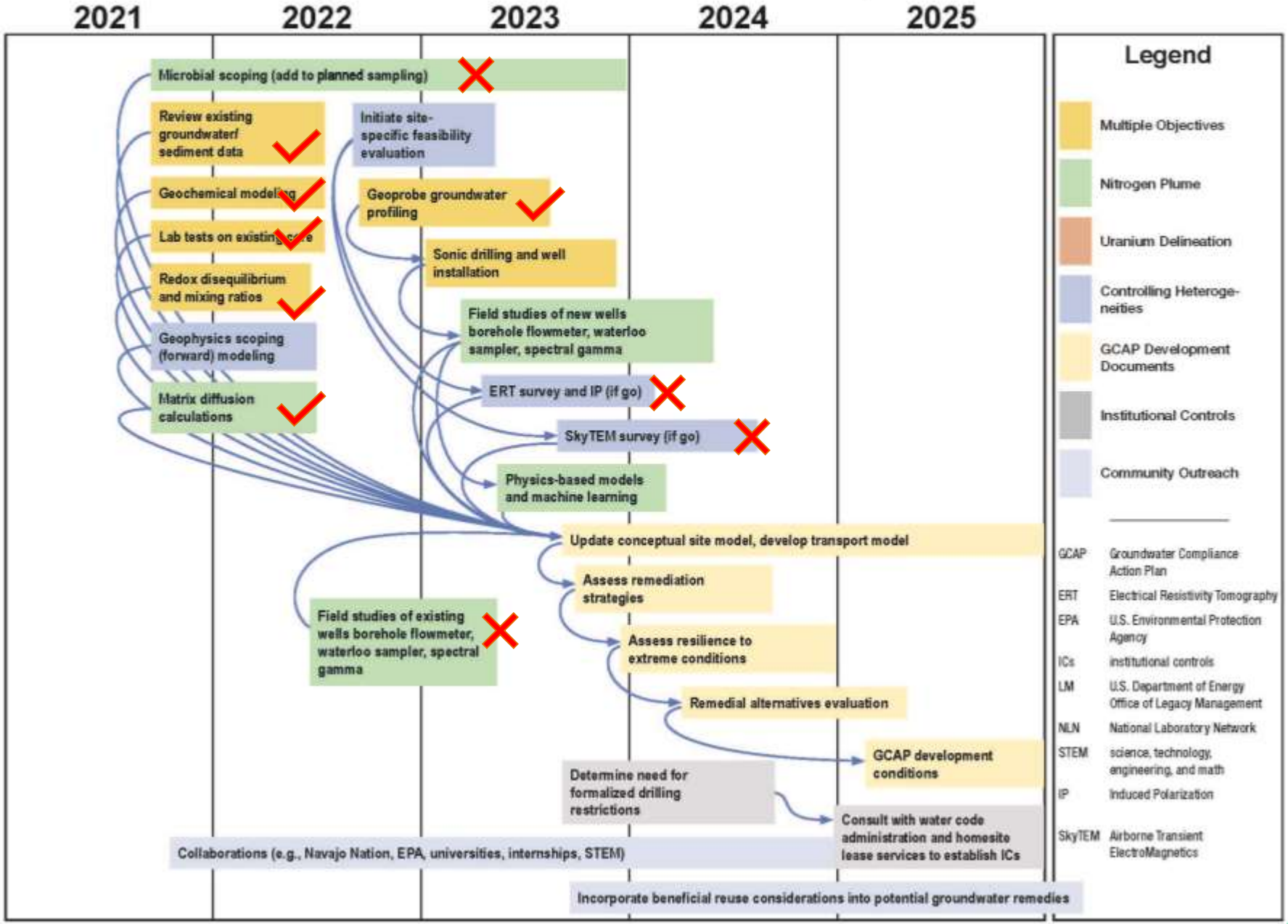
Fernald, OH, OU 5 Groundwater

High Risk Site Working Group Reports

- Report Expectations – Recommendations shall:
  - Directly address the high risks from the LM Risk Index
  - Be a consensus of LM/LMS/NNLEMS
  - Be actionable recommendations

- Questions for the Working Groups
  - What are we doing that we should keep doing?
  - What are we doing that we should stop doing?
  - What are we not doing that we should be doing?

Monument Valley LM/NLN Recommendations Implementation Timeline



Shiprock's Implementation Plan

- **BLUF:**
  - All recommendations are budgeted in the Shiprock LCB for FY22 - 24
  - LM scope includes planning and/or execution for all recommendations

- **Specific examples of current NLN-influenced actions include:**
  - June 2022 Drilling Campaign
  - Ongoing triangulation with Asset Management team and Navajo Land Department on IC improvements
  - Collaboration with Tuba City site on implementing internship opportunities
  - Planning and procurement for LBNL collaboration on geophysical investigation of Mancos Shale

Climate Resiliency and Adaptation

- LNBL helped us assess the potential climate risk at our sites based on current climate data

- Questions:
  - How resilient are our sites?
  - How can we become more resilient?
  - What steps can we take to identify impacts earlier than we do now?

- Results:
  - Ranking and analysis of climate risk is being used to update our site vulnerability analysis
  - LM is participating with EM on a vulnerability deep-dive of assets unique to EM and LM to include consideration of groundwater cleanup systems

Regions Used for the Fourth National Climate Assessment (NCA-4) 2018

- LM manages sites in 9 of the 10 regions used in "NCA-4"—the 4th National Climate Assessment

- Conclusions about impacts of climate change on environmental remedies from LBNL work could be used by other Program Offices

USACE use of National Lab Network: Potential Scope of Radiological Specialized Services

Potential Scope	Sites Impacted	Potential Lab Support
Volume Estimation Statistics	Maywood	ANL
Flyover and Drive Over Radiological Scans	Middlesex Sampling Plant	NNSS
Independent Technical Reviews/Verification	All Current Active Sites	ORAU
Specialized Laboratory Services	All Sites - Sylvania Corning	PNNL
Super Computer Use Time	All Sites	Uncertain
Conduct MARSSIM Training Workshops	All Sites	ANL
Criticality Assessment, Criticality Engineering, and Criticality Safety	Shallow Land Disposal Area (SLDA)	ANL/ORNL
Beryllium Subject Matter Expertise (SME)	Lucky	Los Alamos

USACE Support Activities

Project	Support Lab	Status	Scope
Fugitive Emissions Activities	Pacific Northwest National Laboratory	Scope accepted - finalizing business documents	Odor Panel Testing and Tracking and Characterizing Fugitive Emission Sources
Radiation Mapping	Lawrence Berkeley National Laboratory	Scope Accepted - Finalizing business Documents	Coupling radiation detection systems with robotics or other computer vision technologies in order to more rapidly and accurately locate and quantify in situ radioactive contaminants.
Jana School	Savanah River National Laboratory	Project completed. Final documentation in progress	Independent Technical Review (ITR) of the sampling results from the Final status survey evaluation of the Jana Elementary School sampling effort

Other Support Activities

Lab Activity	Status	LM Manager
Lead Lab Management	In progress	Kautsky
Mound	Completed	Lutz
Climate Resiliency	Completed	Kautsky
Geospatial Data Lifecycle Management	In progress	Moore
Soil Water Balance Model Evaluation	In Progress	Frazier
Amchitka Analytical	In progress	Pitton
Risk Ranking of LM sites	In Progress	Damiano
Pinellas 1-4 Dioxane	In Consultation with SRNL	Lutz

Questions?