



U.S. DEPARTMENT OF  
**ENERGY**

OFFICE OF  
**ENVIRONMENTAL  
MANAGEMENT**



**LOS ALAMOS  
(EM-LA)**

# Executing Legacy Cleanup at LANL

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Northern New Mexico Citizens' Advisory Board Special Meeting

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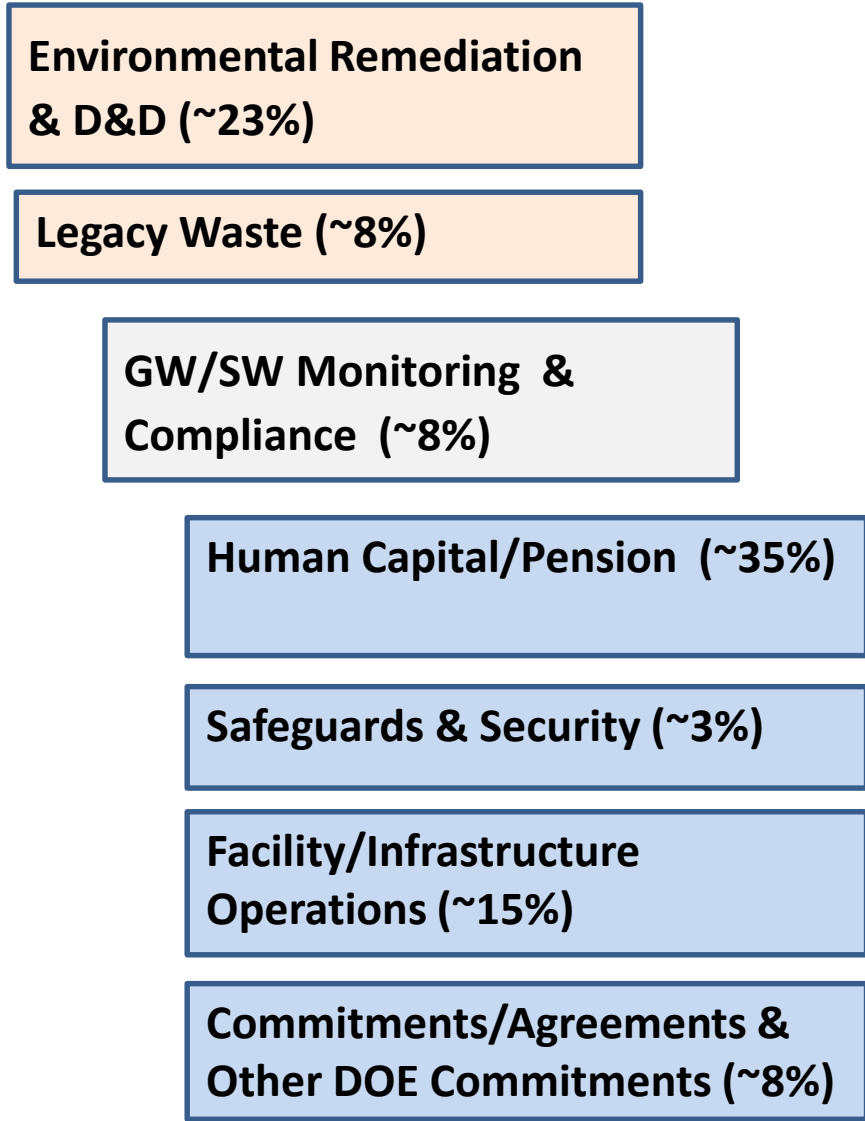


# Campaign Approach

- ❑ New Mexico Environment Department has Requested Logical Groupings of Solid Waste Management Units (SWMUs) that would rollup to Major Scopes of Work
- ❑ The remaining SWMUs have been Evaluated and “Bundled” to Represent an Executable & Logical Approach to Cleanup
  - An Approach that would involve Investigation to Remediation taking Advantage of Economies of Scale
  - Geographically Centered to take Advantage of Mobilization, Access and Like SWMUs
- ❑ This Approach was Experienced in the Recent 3,706 Campaign that Resulted in:
  - Team Synergism
  - Focused Attention
  - Achievable Results



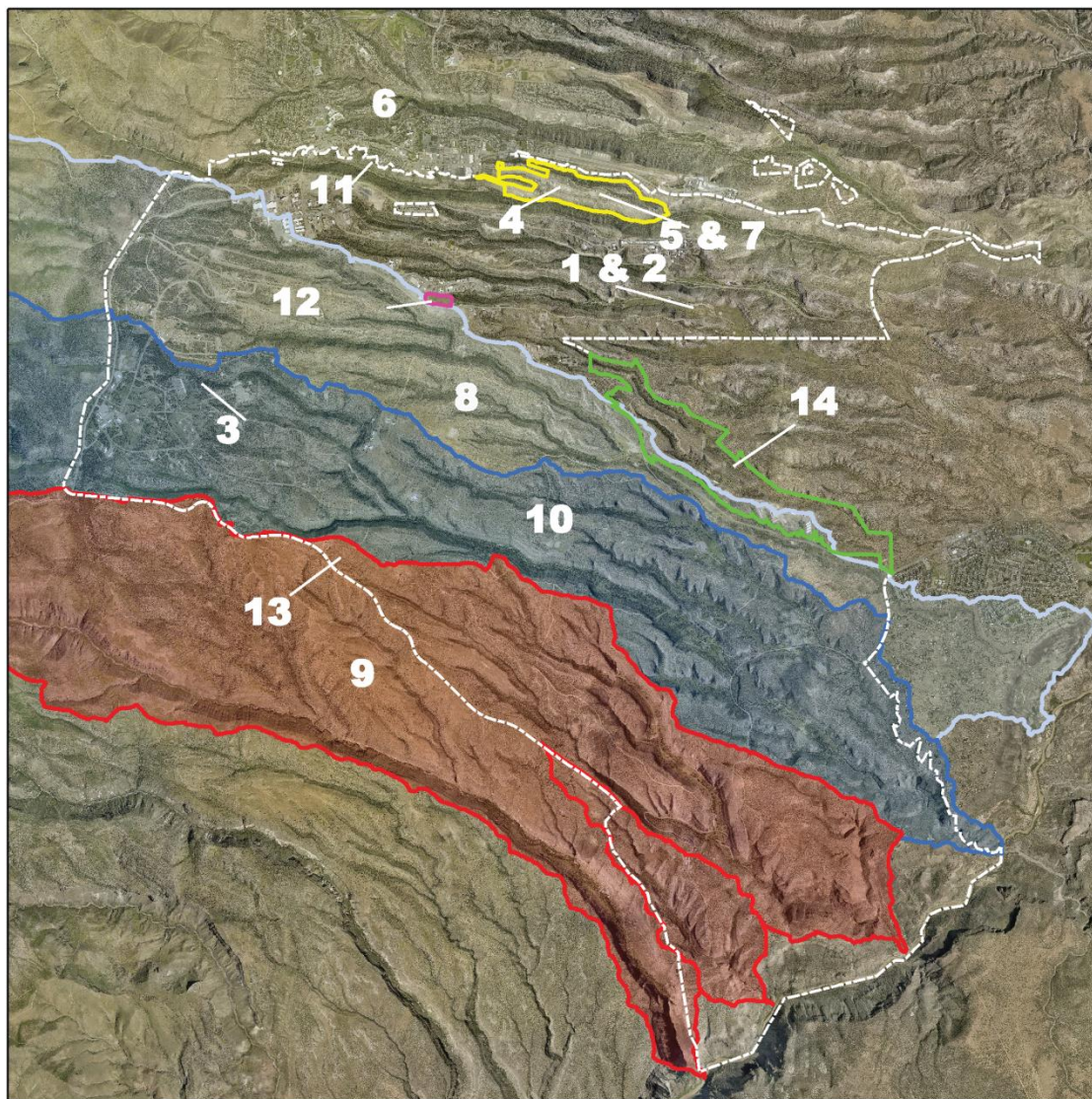
# Annual Operating Envelope



“These Percentages are subject to change on an annual basis”

# Campaign / Map

Campaigns	No.
Chromium Interim Measure	1
Chromium Final Remedy	2
RDX Interim Measure & Final Remedy	3
TA-21 Major Acceleration	4
General's Tanks (MDA-A)	5
Historical Properties	6
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# Chromium Interim Measure & Final Remedy

## Description

From 1956 to 1972, a non-nuclear power plant at Los Alamos National Laboratory periodically flushed water with chromium out of its cooling towers into Sandia Canyon. Chromium was commonly used in the industry as a corrosion inhibitor in cooling tower systems. Flushed water with chromium flowed down Sandia Canyon as surface water, penetrated the underlying rock layers, and ultimately infiltrated the regional aquifer beneath Sandia Canyon and Mortandad Canyon.

## Campaign Approach

Chromium would be approached as two campaigns: Interim Measures and Final Remedy. Interim Measures campaign would include installation and operations for ~2 years to obtain data needed for a final remedy decision. The final remedy campaign would be the installation and initial operations and monitoring (final remedy will have a long-term period).



## Environmental Risk

- Hexavalent chromium contamination in the regional aquifer
- Nearest supply well is approximately 1 mile from the plume
- Various monitoring wells have been installed to monitor plume behavior and to provide an early warning notification prior to approaching a receptor

## Campaign Data

- SWMUs: N/A
- Estimated Duration: ~3 – 5 years (for both campaigns)



# Royal Demolition Explosive (RDX) Interim Measures & Final Remedy

## Description

Past lab operations to test explosives in TA-16 and adjacent areas resulted in legacy contamination of RDX. Investigation and cleanup activities were separated into: 1) surface/alluvial groundwater and, 2) intermediate/regional groundwater. Cleanup activities for the surface and alluvial groundwater have been completed.

## Environmental Risk

The contamination risk is RDX.

## Campaign Approach

Further characterization of the intermediate/regional groundwater is needed to support completion of the evaluation and implementation of a final remedy. The current approach is to install an additional well, conduct tracer studies, and if data continues as expected, propose Monitored Natural Attenuation as the final remedy (MNA long-term remedy).

## Campaign Data

- SWMUs: 2
- Estimated Duration: ~3 – 5 years



# TA-21 Major Acceleration

## Description

TA-21 is the second generation buildings of the Manhattan Project, and the mesa top is adjacent to the Los Alamos County Airport. This area is approximately 250 acres and a land transfer priority for industrial space for the Los Alamos County. An aggregate of 14 SWMUs remain and will be addressed as a single project along with the remaining structures made up of buildings and floor slabs/footers.

## Environmental Risk

The remaining cleanup work contains radiological and hazardous waste contamination requiring both NMED and DOE regulatory authority to ensure cleanup activities are complete.

## Campaign Approach

The approach to completing the remaining SWMUs and demolition of the remaining facilities is to execute them in parallel optimizing required resources. TA-21 no longer has a DOE/NNSA mission. The remaining cleanup scope is in the eastern end of the mesa.

## Campaign Data

- SWMUs: 14
- Estimated Duration: ~4 – 6 years



# General's Tanks (MDA-A)

## Description

MDA-A is one of the first landfills constructed for disposal of operational waste during the Manhattan Project. Within the footprint of the landfill two 50,000 gallon tanks were placed underground to collect excess plutonium for future use. These tanks, also known as the General's Tanks, contain a heel of hazardous and radioactive material. The tanks are planned to be exhumed and disposed of.

## Environmental Risk

Radiological contamination

## Campaign Approach

This work will be conducted under strict safety requirements because of the radiological component (MDA-A is considered a nuclear facility). The two 50,000 gal. tanks will be exhumed and dispose of a heel of plutonium contamination from inside the tank. The tanks themselves are expected to be low level waste.

## Campaign Data

- SWMUs: N/A
- Estimated Duration: ~3 – 4 years





# Historical Sites

## Description

The Historical Properties includes middle and upper Los Alamos Canyon, Fenton Hill, and sites located in Los Alamos County. Investigation and cleanup of these sites have a priority focus and in some cases require access agreements to government and private land. Certificate of Completion (CoC) have been received for 57 sites and have been requested for 31 more sites. CoCs will be requested for 8 additional sites for which corrective actions have been completed.

## Environmental Risk

The contamination for the historical properties is low level radiological and hazardous constituents.

## Campaign Approach

Establish a team that understands and works collaborative with land owners to coordinate cleanup activities. These sites will require access agreements from the owners prior to performing the necessary cleanup work.

## Campaign Data

- SWMUs: 29
- Estimated Duration: 2 – 3 years



## Description

These MDAs are the last two landfills that remain at TA-21. MDA-A is approximately 1.25 acres, while MDA-T is approximately 3 acres. MDA-A contains radiological waste and hazardous constituents at approximately 25 ft. in depth. MDA-T contains predominantly radiological contamination in absorption beds and deep shafts.

## Environmental Risk

Hazardous and radiological contamination

## Campaign Approach

This campaign will require a Radiological Risk Assessment to ensure the radiological contamination is adequately analyzed. The final remedy is anticipated to be an engineered cover that would take advantage of economy of scales in terms of materials, engineering, and equipment. The MDAs are within 50 yards of each other and the combined acreage is less than 5 acres making the overall construction activities very executable as one integrated project. If an engineered cover is selected as the final remedy, these portions of TA-21 would be maintained by DOE-NNSA under institutional controls.

## Campaign Data

- SWMUs: 30
- Estimated Duration: ~4 – 5 years



# Pajarito Canyon Watershed

## Description

A watershed is an area that contains more than one SWMU within a distinct delineation of the geographical area. These SWMUs can be investigated as an aggregate for overall impacts. This watershed will likely require some hot spot remediation and final risk analysis to close out the cleanup requirements.

## Environmental Risk

This watershed contains both hazardous and radiological contamination. [Types of sites include: firing sites, high explosives (HE) production areas, laboratories, etc.]

## Campaign Approach

Bundle the aggregate investigation and remediation (as necessary) of SWMUs and carry out the necessary cleanup from cradle to grave to take advantage of contractor execution efficiencies. Investigating and remediating as a single phase will optimize resources and schedule.

## Campaign Data

- SWMUs: 197
- Estimated Duration: ~3 – 4 years



# Ancho & Chaquehui Watershed

## Description

A watershed is an area that contains more than one SWMU within a distinct delineation of the geographical area. These SWMUs can be investigated as an aggregate for overall impacts. This watershed will likely require some hot spot remediation and final risk analysis to close out the cleanup requirements.

## Campaign Approach

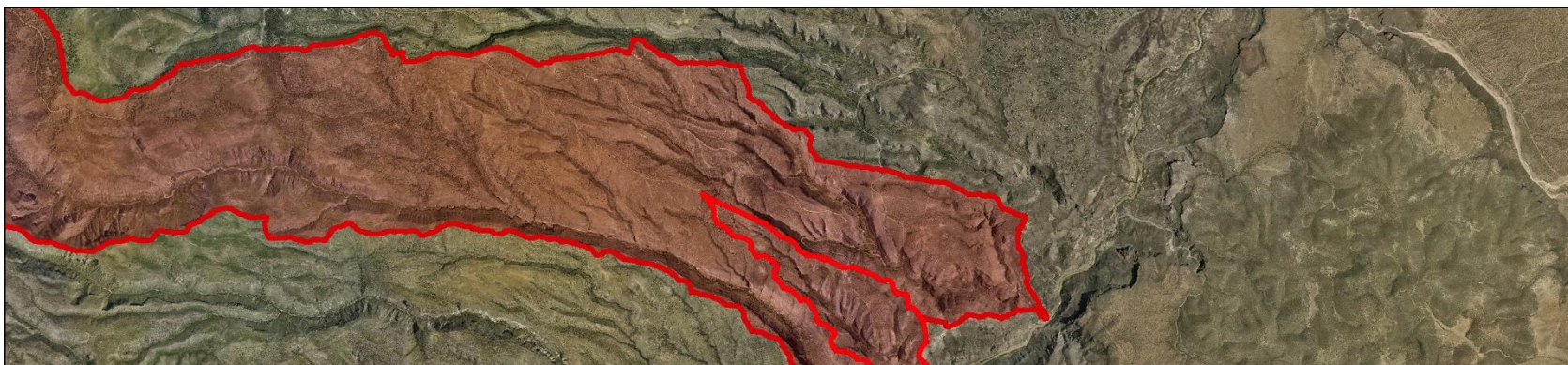
Bundle the aggregate investigation and remediation (as necessary) of SWMUs and carry out the necessary cleanup from cradle to grave to take advantage of contractor execution efficiencies. Investigating and remediating as a single phase will optimize resources and schedule.

## Environmental Risk

This watershed contains both hazardous and radiological contamination. [Types of sites include: firing sites, high explosives (HE) production areas, laboratories, etc.]

## Campaign Data

- SWMUs: 75
- Estimated Duration: ~2 – 3 years



# Water Canyon Watershed

## Description

A watershed is an area that contains more than one SWMU within a distinct delineation of the geographical area. These SWMUs can be investigated as an aggregate for overall impacts. This watershed will likely require some hot spot remediation and final risk analysis to close out the cleanup requirements.

## Environmental Risk

This watershed contains both hazardous and radiological contamination. [Types of sites include: firing sites, high explosives (HE) production areas, laboratories, etc.]

## Campaign Approach

Bundle the aggregate investigation and remediation (as necessary) of SWMUs and carry out the necessary cleanup from start to end to take advantage of contractor execution efficiencies. Investigating and remediating as a single phase will optimize resources and schedule.

## Campaign Data

- SWMUs: 337
- Estimated Duration: ~4 – 5 years



# Remaining SWMUs

## Description

The remaining SWMUs are in locations that can be approached as a geographical area. These SWMUs can be investigated as an aggregate for overall impacts. This bundle of SWMUs will likely require some hot spot remediation and final risk analysis to close out the cleanup requirements.

## Environmental Risk

These remaining SWMUs contain both hazardous and radiological contamination.

## Campaign Approach

Bundle the aggregate of SWMUs and perform the necessary investigation and remediation from start to end to while taking advantage of contractor resources. Investigating and remediating as a single phase will optimize resources and schedule. NOTE: This campaign is to complete actions on sites that were begun under other projects and not included in other campaigns.

## Campaign Data

- SWMUs: 49
- Estimated Duration: ~2 – 3 years



## Description

MDA-C is a 12.3 acre site that contains predominantly volatile organic compounds (VOC) vapors. The site is adjacent to the TA-50 facilities (in the heart of the Pajarito corridor). This is a large landfill with VOCs and tritium vapors migrating off MDA-C footprint. NOTE: the TRU Waste Facility was required to drill monitoring wells to monitor for VOC vapors from MDA-C.

## Environmental Risk

Hazardous (VOC vapors) and radiological contaminants.

## Campaign Approach

This will be one of the largest landfills that is anticipated to have an engineered cover. Strict safety requirements and a congested Pajarito corridor present challenges to construct the cover, however the cover itself is not expected to be difficult to construct.

## Campaign Data

- SWMUs: 1
- Estimated Duration: ~3 – 4 years



## Description

MDA-AB located in TA-49, includes test shafts (hydro-nuclear experiments) that contain uranium and plutonium, with lead (hazardous component). This MDA is relatively small at approximately 0.5 acres. However, the contaminants of concern are radiological. Investigations to date have not shown migration outside the shafts.

## Environmental Risk

Main risk is radiological contamination.

## Campaign Approach

MDA-AB contains shaft fields that may be capped individually (~4 Shaft Fields) to include a buffer area. The anticipated remedy is an engineered cover as contamination has not migrated and excavating radiological contamination would be high risk to the worker.

## Campaign Data

- SWMUs: 13
- Estimated Duration: ~3 – 4 years





# Area G Closure (MDAs G, H & L)

## Description

Upon completion of all TRU waste retrieval, processing and shipment, Area G will be structured as a closure site, and the remaining cleanup and demolition would be bundled as a package. The SWMU corrective actions are presumed to be an engineered cover for the three remaining MDAs, with Long Term Surveillance and Maintenance requirements from the regulator.

## Environmental Risk

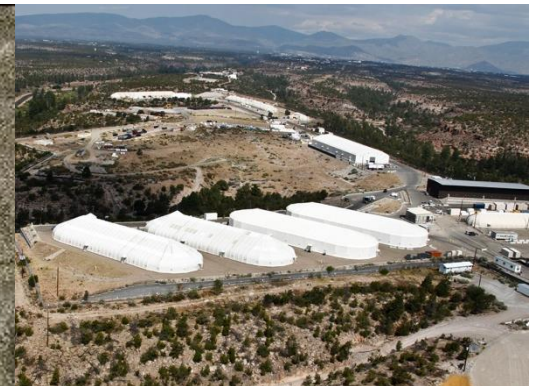
Hazardous and radiological wastes are the contaminants of concern with rad waste being the key risk.

## Campaign Approach

Establish a closure contract to complete investigations, demolition of remaining facilities, and install the final remedy (anticipated to be engineered covers). MDA-G is the largest MDA at about 65 acres and obtaining and transporting the necessary material will be challenging. The transportation of the material will require road work/repair and traffic flow management through the Pajarito corridor. The final remedy will incorporate the on-going vapor extraction system and the necessary long-term maintenance and surveillance requirements.

## Campaign Data

- SWMUs:11
- Estimated Duration: ~ 6 – 8 years



## □ Priority Remains:

- Safety - Protection of Human Health
- Protection of the Environment

## □ Approach (Determined by Public Process):

- Realistic
- Maximize Taxpayer's Dollars
- Technically Sound

