



**Presentation for  
Northern New Mexico Citizens' Advisory Board  
LANL Legacy Cleanup: Corrective Action Process for  
Aggregate Areas**

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**Cleaning Up Today for a Safer Tomorrow**

# Introduction

## Los Alamos Legacy Cleanup Contract



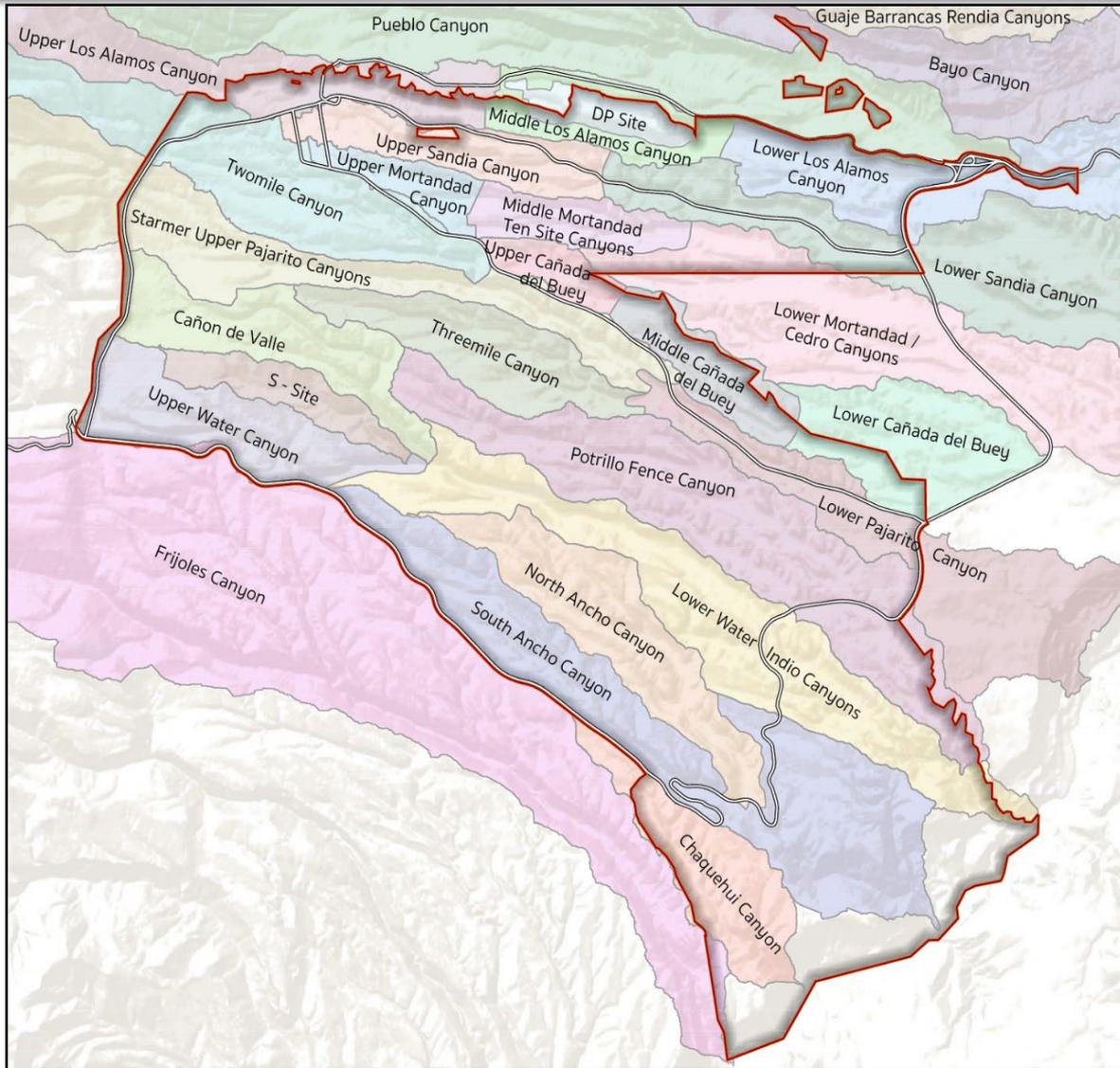
# Aggregate Areas: What are they?

- New Mexico Environment Department (NMED) regulates Resource Conservation and Recovery Act (RCRA) corrective action activities regarding legacy waste at Los Alamos National Laboratory (LANL) under the 2016 Compliance Order on Consent, as revised in 2024 (Consent Order).
- **Aggregate Area:** An area within a single watershed or canyon made up of one or more solid waste management units (SWMUs) or areas of concern (AOCs) and the media affected or potentially affected by releases from these SWMUs or AOCs, and for which investigation or remediation, in part or in entirety, is conducted for the area as a whole to address area-wide contamination, ecological risk assessment, and other factors.
- **Solid Waste Management Unit (SWMU):** Any discernable unit at which solid waste has been placed at any time, and from which NMED determines there may be a risk of a release of hazardous waste or hazardous waste constituents, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at the Facility at which solid wastes have been routinely and systematically released; they do not include one-time spills.

# Aggregate Areas: What are they?

- Area of Concern (AOC): Any area having a known or suspected release of hazardous waste or hazardous constituents that is not from a solid waste management unit and that the Secretary of NMED has determined may pose a current or potential threat to human health or the environment. An AOC may include buildings and structures at which releases of hazardous waste or constituents were not remediated, including one-time and accidental events.
- Aggregate Areas are combined into Campaigns in the Consent Order.
- U.S. Environmental Protection Agency (EPA) additionally regulates cleanup through the Toxic Substances Control Act (TSCA) particularly with SWMUs and AOCs potentially contaminated with polychlorinated biphenyls (PCBs).

# Aggregate Areas: Overview



- **CLEANUP GOAL:** Conduct corrective actions so that contaminated soil and debris do not result in unacceptable risk to human health and ecological receptors based on current and reasonably foreseeable land use.
- **CAMPAIGNS:** Campaigns consist of corrective action activities using a risk-based approach to grouping, prioritizing, and accomplishing such activities at SWMUs and AOCs.

# Aggregate Area: History

- Contain soil and debris contaminated from legacy operations
  - Manhattan Project
  - Cold War Era
- Potential contamination may impact soil, tuff, surface water, groundwater, and sediment



Investigation sampling at  
Starmer/Upper Pajarito Canyon  
Aggregate Area

# Aggregate Areas: Consent Order Class A Campaigns

Campaigns in Progress	Total SWMUs/AOCs
Historical Properties Completion	93
Pajarito Watershed	178
Southern External Boundary	74
Supplemental Investigation Reports	226
Sandia Canyon Watershed	70
Upper Water Watershed	273

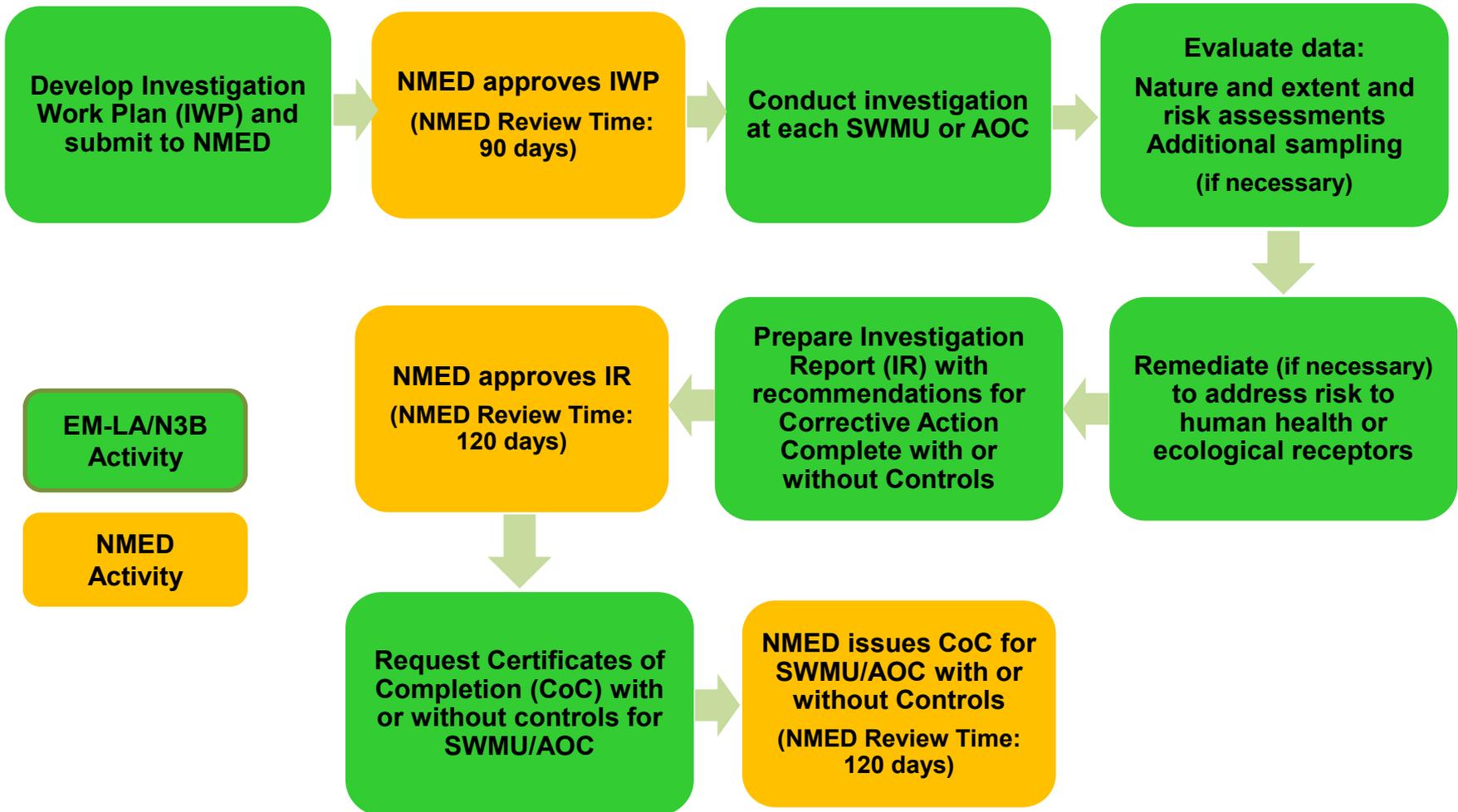
Campaigns Completed	SWMUs/AOCs
Known Cleanup Sites (Above SSLs)	6

# Summary of RCRA Corrective Action Process



RCRA = Resource Conservation and Recovery Act

# Corrective Action Process per the Consent Order



# Evaluate Data – What is involved

**Evaluate data:**  
**Nature and extent and risk assessments**  
**Additional sampling and remediation, if necessary**

**Are the inorganic chemicals detected above background values?**

If yes, conduct statistical tests to determine if different than background.

**Retain as contaminants of potential concern (COPCs) all detected organic chemicals and radionuclides.**

**Vertical extent of COPCs: do concentrations increase with depth?**  
**Lateral extent of COPCs: do concentrations increase away from the COPC point of origin?**

**Conduct human health and ecological risk assessments.**  
**Evaluate industrial, construction worker, and residential scenarios.**  
**Evaluate for recreational scenario where appropriate.**  
**Evaluate ecological risk assessment for receptors**  
(plants, earthworms, small mammals, birds, larger mammals)

# Types of Environmental Risk Assessments

## Human Health:

The process to estimate the nature and probability of adverse health effects in humans who may be exposed to chemicals in contaminated environmental media, now or in the future.

### Scenarios

- Residential
- Recreational
- Industrial
- Construction

## Ecological:

The process for evaluating how likely it is that ecological receptors may be impacted as a result of exposure to one or more environmental stressors.

### Exposure scenarios

- Receptors representing ecosystem groups or a threatened or endangered species

# Receptors and Target Risk Levels

## Human Health Target Risk Levels

- NMED: Lifetime excess cancer risk of  $1 \times 10^{-5}$  (carcinogens)
- NMED: Hazard Index (HI) of 1 (non-carcinogens)
- DOE: Dose of 25 mrem/year (radionuclides)

## Ecological Target Risk Levels

- NMED: Hazard Index (HI) of 1 (non-carcinogens, including both radionuclides and non-radionuclides)

# Conduct Risk Assessments – What is involved

## Human Health Risk Assessments

### Residential and Construction Worker Scenarios

- Evaluate all data from 0-10 ft depth

### Industrial and Recreational Scenarios

- Evaluate all data from 0-1 ft depth
- Compare analytical data for each COPC to NMED Soil Screening Levels (SSLs)
- Evaluations are made for Carcinogenic COPCs, Noncarcinogenic COPCs, and Radionuclide COPCs

## Ecological Risk Assessments

- Evaluate all data from 0-6 ft depth
- Compare analytical data from each COPC to Ecological Screening Levels
- Threatened and endangered species are assessed

# Aggregate Area Challenges

## Challenges

- Depleted uranium
- Beryllium
- Archeological, historic, and Manhattan Project National Historical Park
- Threatened and endangered species
- Historical munitions
- LANL mission work
- Weather delays: rain, lightning, wind, snow, and fire



South Ancho Canyon Aggregate Area  
SWMU 33-003(a), Underground Chamber

# Aggregate Areas: Recently Completed Phase I Projects

- **Pajarito Watershed Campaign**

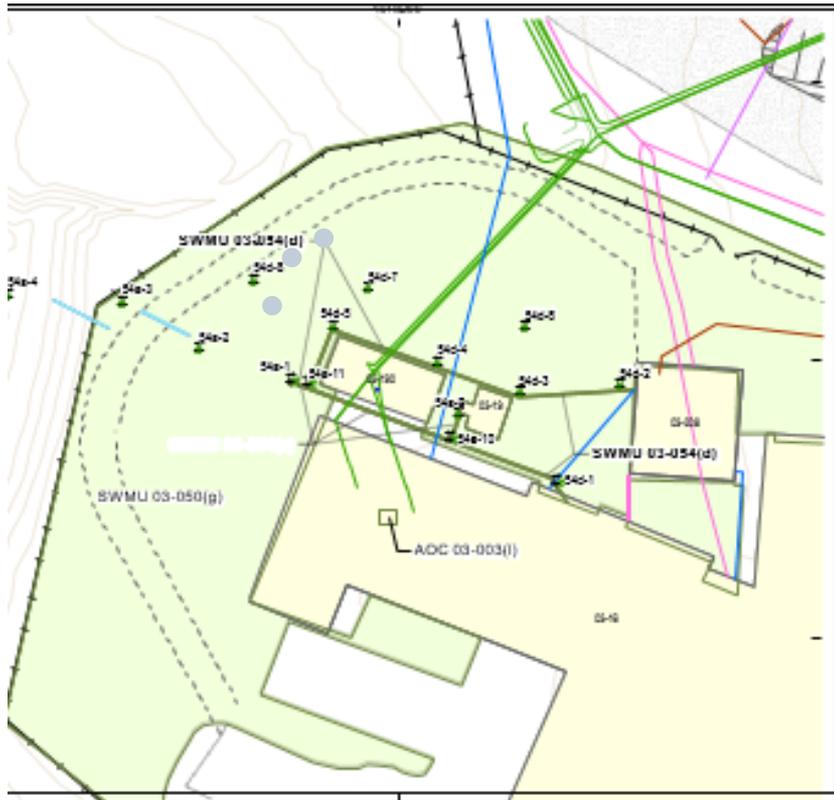
- **Starmer/Upper Pajarito Canyon Aggregate Area**

- 70 SWMUs and AOCs
    - Collected 3,387 investigation samples
    - Field work began August 2022
    - 28 SWMUs/AOCs proposed for Corrective Action Complete without Controls
    - 36 SWMUs/AOCs proposed for Corrective Action Complete with Controls
    - 1 SWMU requires additional sampling and remediation

- **Twomile Canyon Aggregate Area**

- 59 SWMUs and AOCs
    - Collected 3,605 investigation samples
    - Field work began September 2022
    - 43 SWMUs/AOCs proposed for Corrective Action Complete without Controls
    - 15 SWMUs/AOCs proposed for Corrective Action Complete with Controls
    - 2 SWMUs/AOCs require remediation (additional sampling in March 2026)
      - At 1 SWMU, remediation of PCBs was completed January 2026

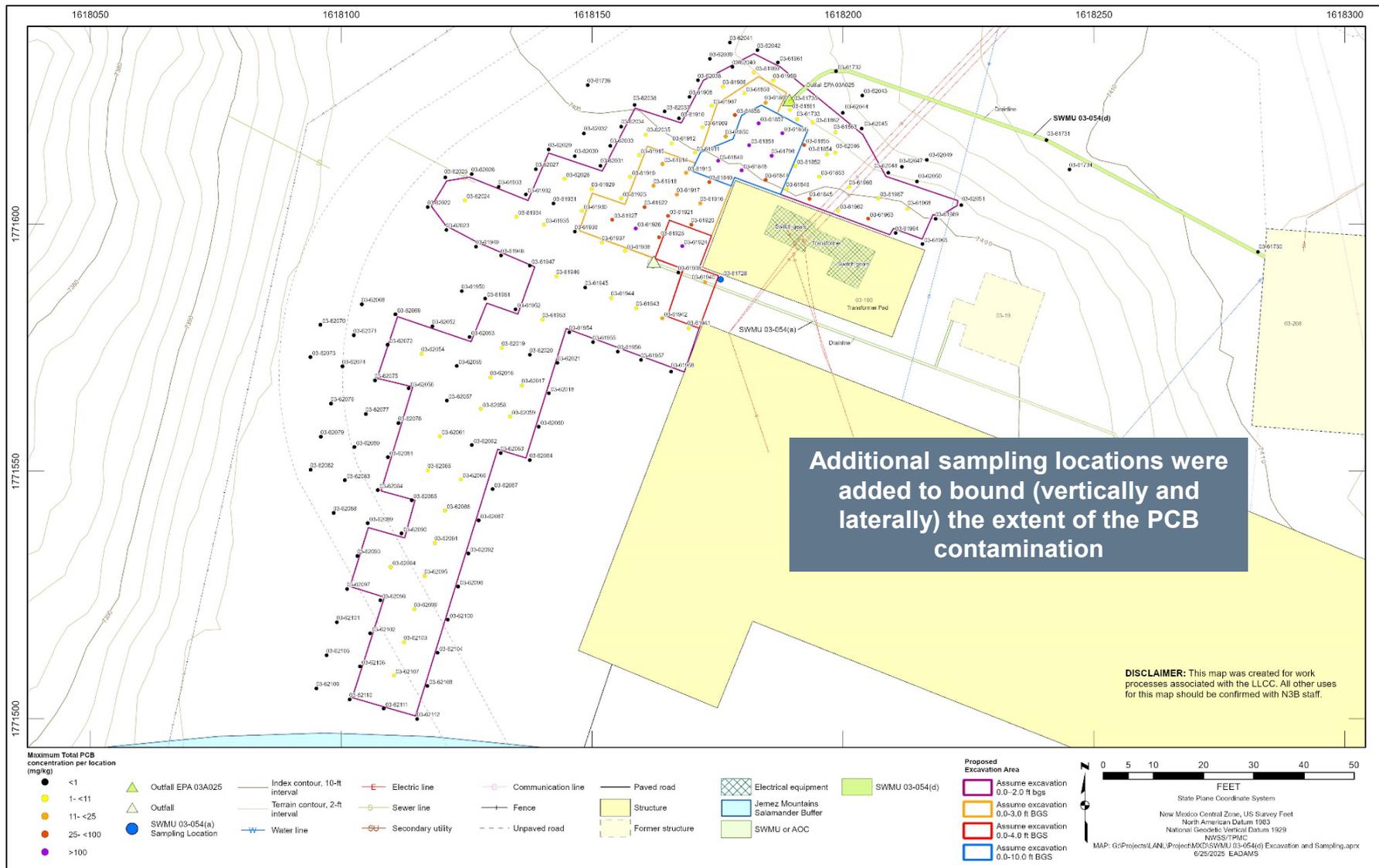
# Deeper Examination: Twomile Canyon Aggregate Area



## **SWMU 03-054(d) – Outfall**

- Initial sampling indicated elevated concentrations of polychlorinated biphenyls (PCBs) at 3 locations (identified as red dots) in the surface samples (0-1 ft depth) at concentrations of 1100 mg/kg, 397 mg/kg, and 309 mg/kg
- PCB remediation conducted per TSCA regulations and Consent Order

# Twomile Canyon Aggregate Area Excavation Area



# Twomile Canyon Aggregate Area – PCB Remediation



Excavation showing step down from 2-ft to 3-ft to 4-ft depth. Photo taken near SW corner of Transformer Pad (03-190) looking north



Deep excavation section (14.6 ft deep); excavation south of 14.6-ft section was backfilled prior to completing 14.6-ft section for safer access/operation - photo taken from above Outfall (EPA 03A025) looking southwest



Backfilling the deep excavation section; dust suppression using water

# Twomile Canyon Aggregate Area – PCB Remediation



Photo taken from northwest side of excavation looking east



Photo taken from south end of excavation looking north

# Look Ahead: Potrillo and Fence Canyons Aggregate Area

## Southern External Boundary Campaign

### Work Scope for 9 SWMUs/AOCs:

- Implement NMED-approved Phase II Investigation Work Plan

### Phase II Investigation:

- 900 samples

### Additional Details:

- **Additional sampling** to define nature and extent as needed according to the Supplemental Investigation Report and to bound the excavation
- **Complete corrective actions** identified in the Phase I Investigation Report, including excavation of soil with elevated risk to construction workers and ecological receptors

### Schedule:

- Investigated 4 SWMUs/AOCs in FY23
- Progress Report Summarizing Field Work Implementation: 9/30/23
- Progress Report Summarizing remaining 5 SWMUs/AOCs: 9/30/26 and 9/30/27
- Complete investigation of 5 SWMUs/AOCs in FY26/FY27
- Complete excavation of soil near Firing Site E-F in FY28
- Phase II Investigation Report: TBD

# Look Ahead: Potrillo and Fence Canyons Aggregate Area

- **Southern External Boundary Campaign (continued)**

## Challenges:

- SWMUs/AOCs are within Weapons Facility Operations (WFO) area, which requires coordination with schedules for core mission activities
- Large volume of excavation at multiple SWMUs
- Chronic Beryllium Disease Prevention Program controls
- Depleted uranium shrapnel area
- Some SWMUs/AOCs are also subject to cultural restrictions (State Historic Preservation Office) and Mexican Spotted Owl restrictions and monitoring for the Jemez Mountain Salamander

# Our Goal: Clean Up the Environment & Protect the Land and Water



Questions

**N3B** *Los  
Alamos*