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Accelerated Closure of the Chemical Waste Landfill Through Voluntary Corrective Measures

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U.S. DEPARTMENT OF ENERGY | NNSA

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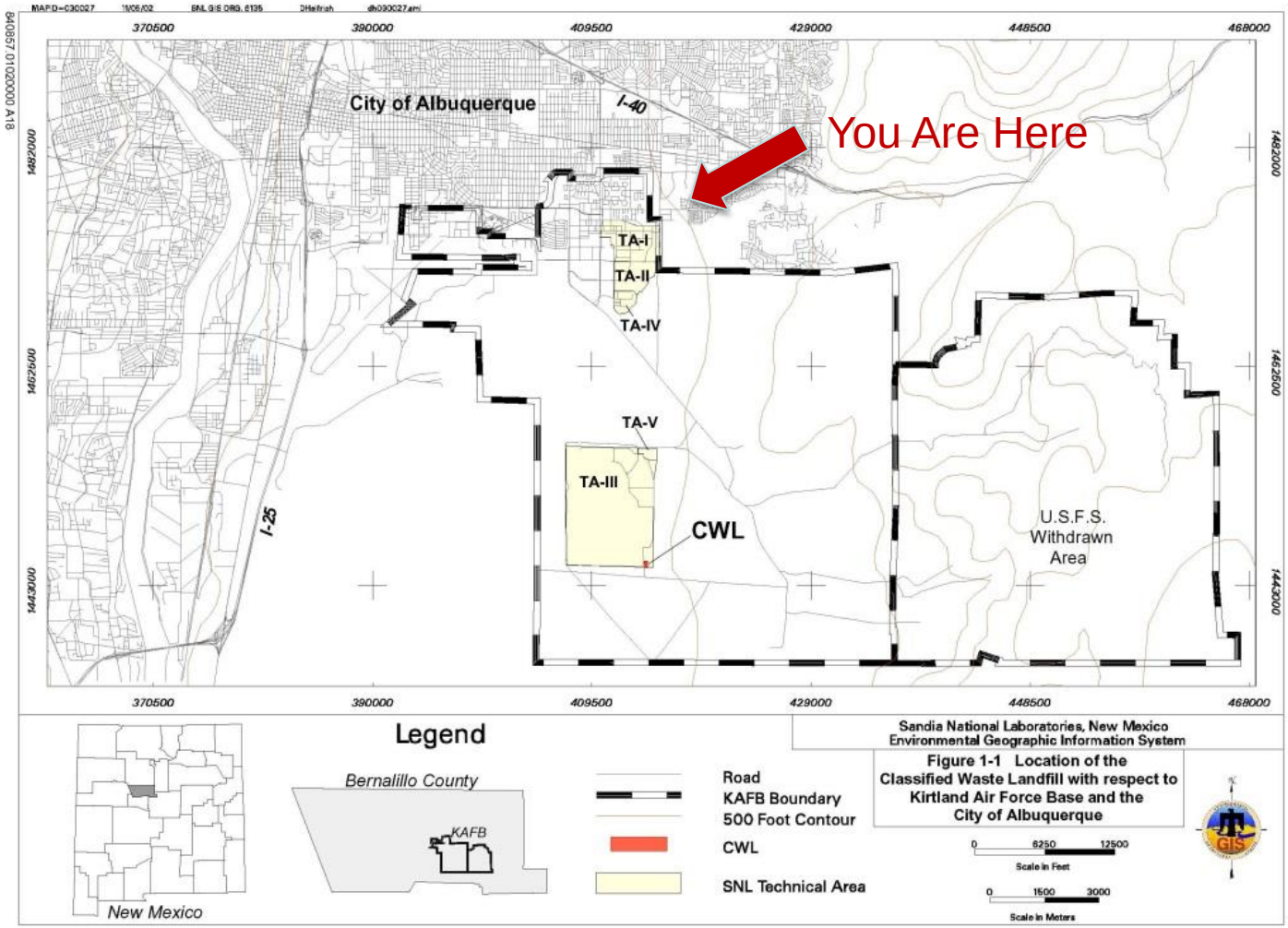
Purpose of Voluntary Corrective Measure (VCM)

- Programmatic Challenge:
  - Reduce Cost and Schedule for Closure
  - Minimize Long Term Liability and Risk
  - Positive Public Image
- CWL Represents Significant Challenge
  - At-Risk Voluntary Closure Approach
  - Technically Complex Site
  - Corrective Action Management Unit (CAMU) Uncommon

Location of the Chemical Waste Landfill (CWL)



Kirtland Air Force Base

Boundaries of CWL and CAMU

Chemical Waste Landfill in 1992

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Waste Disposal Pit at the CWL

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Drum Storage at the CWL

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Chronology of Key Events

- 1962 to 1981: Liquid and solid waste disposal
  - Solid waste disposal continued until 1985
- 1985: GW Monitoring begins, Waste disposal operations cease, operated as a drum storage facility until 1989
- 1989: All waste operations cease
- 1990: TCE detected in GW >MCL of 5 parts per billion
- 1993: Closure Plan approved as per 40CFR265
  - Unsaturated zone characterization completed
- 1995: GW Assessment Report completed
  - VOC vapor plume cause of GW contamination
- 1997: Closure Plan modified to include VCM approach

Why the Voluntary Corrective Measure Approach?

- Cause of groundwater contamination >MCL and the remedy known
- Aggressive approach for CWL critical to meeting Project closure schedule goals as per Department of Energy
- Regulatory acceptance of approach through Closure Plan modification
- Positive public relations

VCM Approach - Strategic Analysis

- PROs
  - Faster process
  - Problem and solution known
  - Demonstrates commitment to action
  - Reduction of overall site liability and risk in long term
- CONs
  - High dollar, “at risk” work
  - Operational risks (worker safety)

Overall VCM Strategy - The “1-2 Punch”

Vapor Extraction VCM

Landfill Excavation VCM

Vapor Extraction (VE) VCM Summary

- Objectives
  - Control the VOC vapor plume source
  - Reduce TCE levels in GW to <MCL
    - Depth-specific performance objectives
    - GW monitoring results
  - Prepare shallow subsurface for LE VCM
- Pilot Testing
- May 1997 through July 1998 Operational Period
- Passive venting period ongoing

VE VCM System

Vapor Extraction System

Vapor Extraction System Well

VE VCM Results

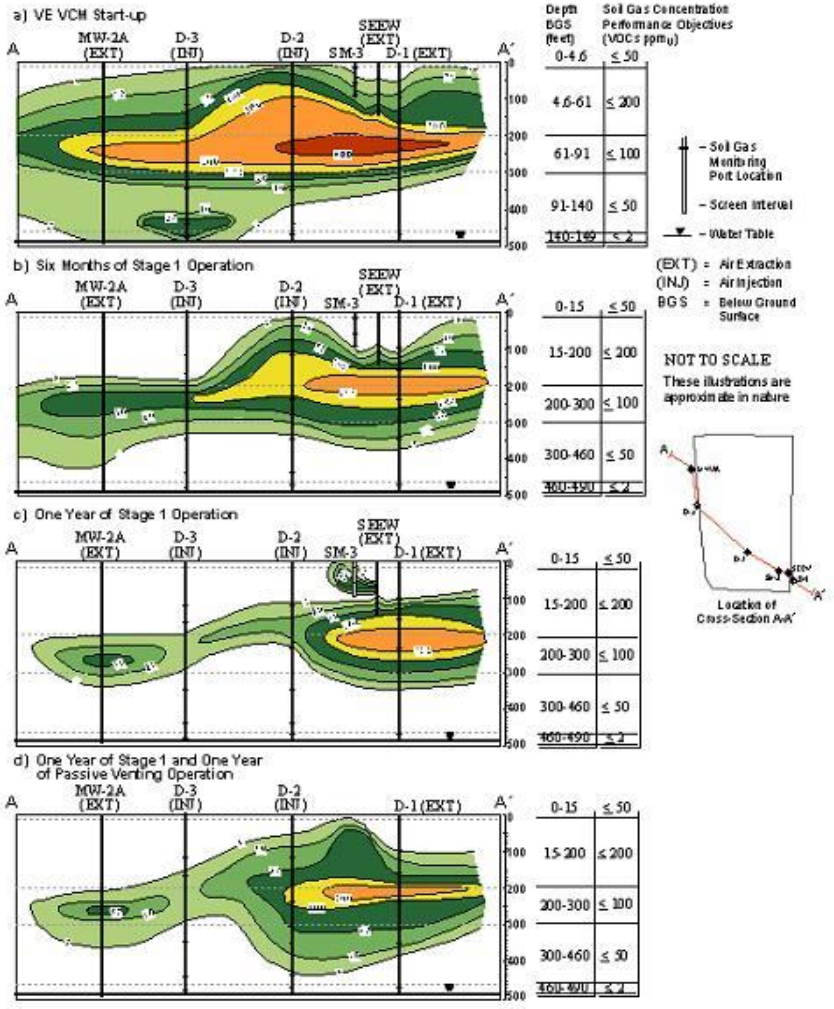
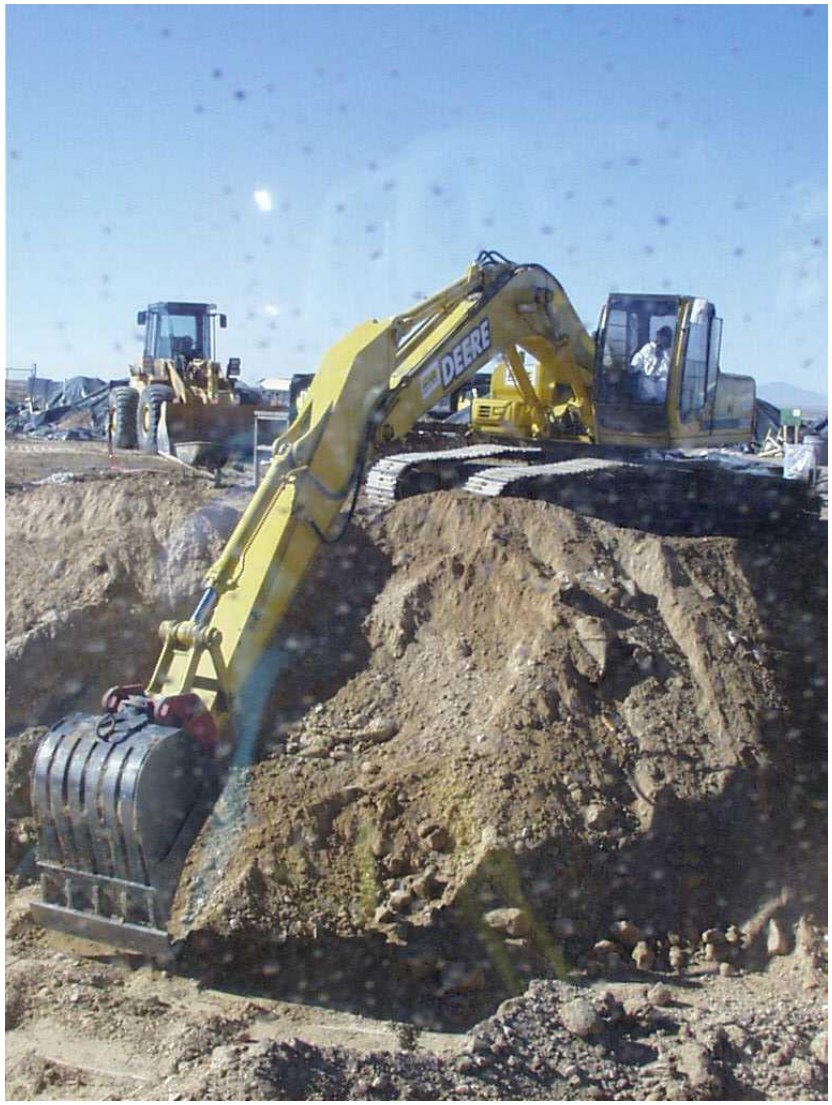


Figure 12-2 Vertical Profiles of Total VOC Concentration Distribution Along Alignment A-A'
Chemical Waste Landfill, Sandia National Laboratories/New Mexico

Landfill Excavation (LE) VCM Summary

- Objectives
  - Remove the buried waste
    - VOC vapor plume source
  - Achieve clean up standards
- September 1998 through February 2002 Operational Period
- Final Backfilling Completed February 2004
- Final Cover Installation pending NMED review and approval of CMS Report and Conceptual Design

Landfill Excavation (LE) VCM



LE VCM Process

Table Screening Process for Debris Segregation

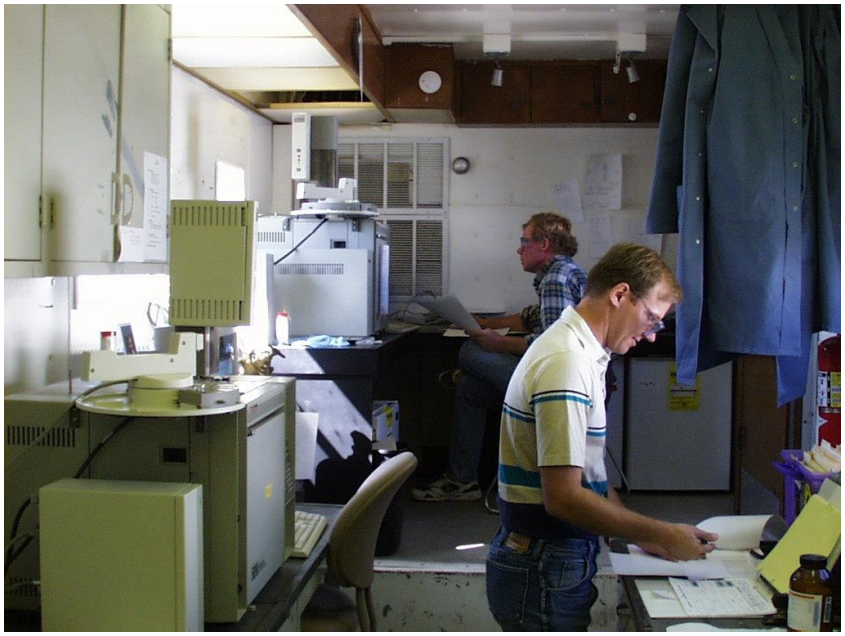
Mechanical Screening for Debris Segregation

LE VCM Process (cont.)

Expanded Site Operational Boundary

Conveyor System for Debris & Rock Segregation

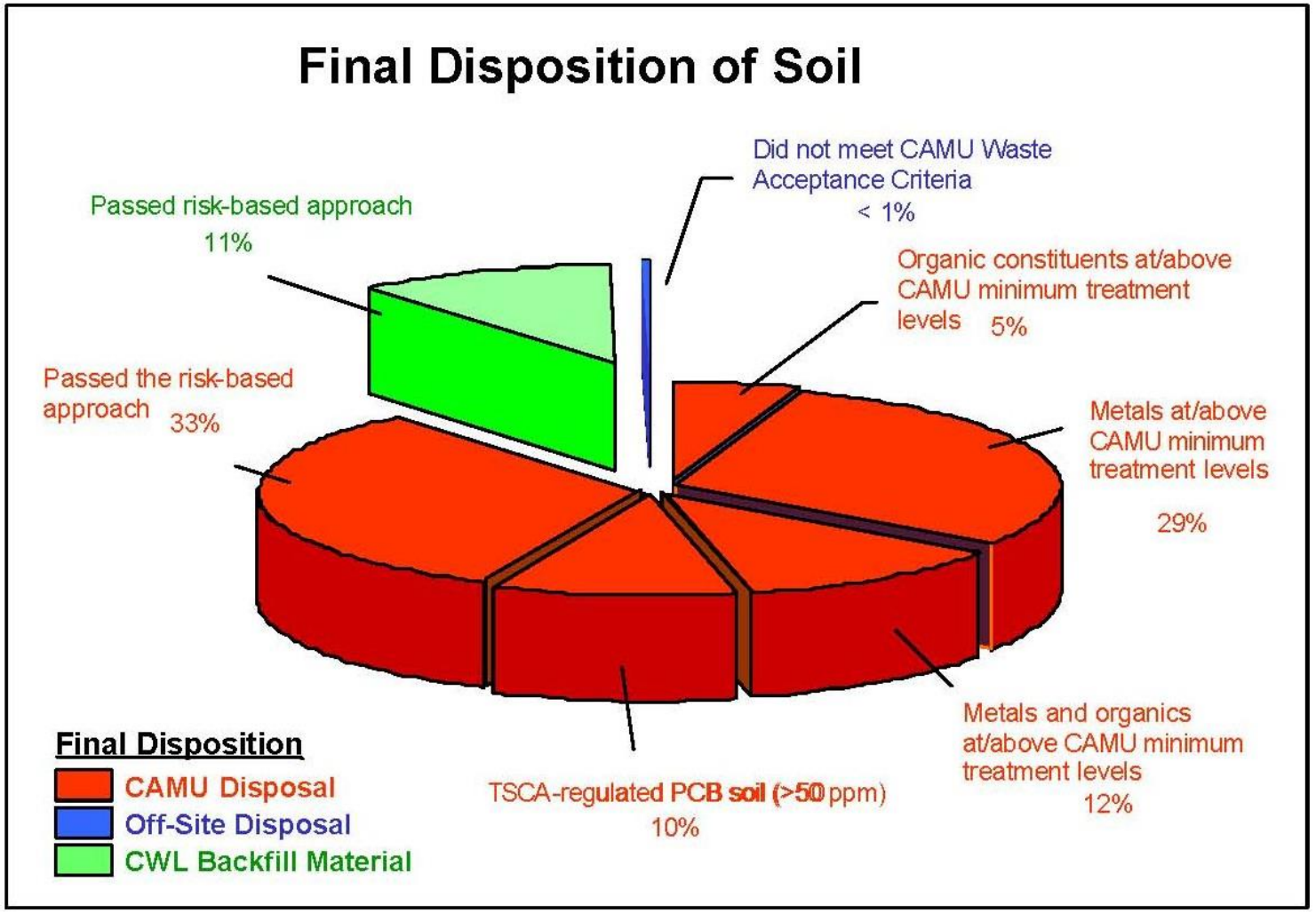
LE VCM Process (cont.)



On-Site Laboratory Characterized Wastes

Soil Staged Until CAMU Acceptance Obtained

LE VCM Results



52,000 cubic yards of Soil Excavated

LE VCM Results - Concluded

Excavated Debris Items

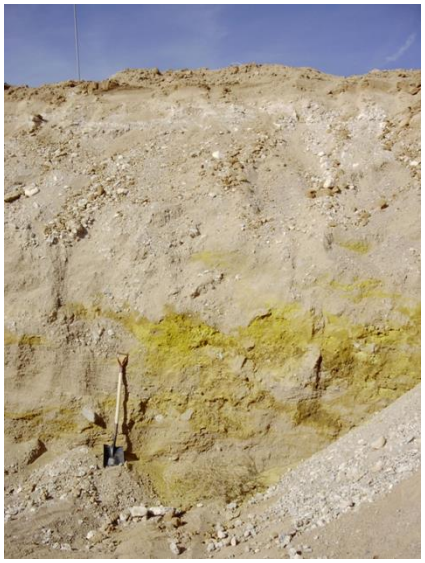
Munitions Debris, Elemental Sodium
Soft Debris

Liquid Mercury
Intact Full Chemical Containers

Compressed Gas Cylinders
Thermal Batteries

LE VCM Risk Assessment Results

Excavation to 30 ft bgs for PCB-contaminated soil



Risk Assessment of Chromium Staining

Verification sampling of excavation floor

Post-Remediation Backfill

Maximum Excavation
30 ft bgs in one area

Rock Marker Layer at 12 ft bgs

Backfill at ~8 ft bgs

Evapotranspirative (ET) At-Grade Cover

Engineered cover from 8 fbgs to grade

Big Picture View

- ~$26.6 million spent
- CWL meets risk-based standards
- Lack of NMED approval of earlier characterization work causing delays in approval of the CMS Report and final cover
- Real progress made - CWL positioned for closure
- Approach has facilitated regulatory action - remaining site issues are being negotiated

Conclusions

Back-up Slides

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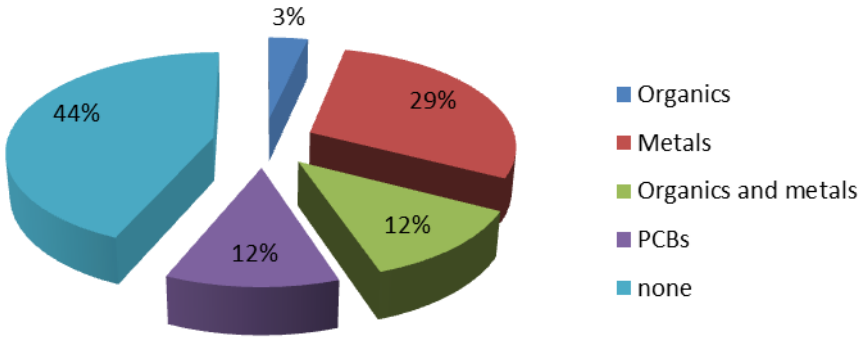
Summary of Excavated Soils



Volume of Material Excavated (cubic yards)	Constituents Above Risk-Based Criteria
1,780	Organics
14,607	Inorganics
6,160	Organics & Inorganics
5,850	PCBs[a]
21,925	None[a]
50,322	

Summary of Excavated Debris

Volume of Material Excavated (cubic yards)	Constituents Above Risk-Based Criteria
50	Wood
40	Concrete
188	Metal
120	Compactable Materials
45	Resins and Epoxies
443	