Progress of Sandia's Environmental Restoration Operations

Joe Estrada

Environmental Restoration Operations

Federal Project Director

DOE/NNSA

Sandia Field Office

John R. Cochran

Environmental Restoration Operations

Project Manager

Sandia National Laboratories

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Overview of Sandia's Environmental Restoration Operations

- Mission – Identify, characterize & remediate sites where hazardous &/or radioactive materials have been released
- Scope: 315 sites
  - Legally - Solid Waste Management Units or Areas of Concern
  - For presentation - Environmental Restoration sites or "ER sites"
- All activities regulated by New Mexico Environment Department (NMED) under the 2004 Compliance Order on Consent (COoC)
- DOE/NNSA and Sandia Corporation are in compliance with: Compliance Order on Consent, Federal and State requirements

Overview of Sandia's Environmental Restoration Operations

- Very successful, completed corrective action at 302 of 315 ER sites
- 13 ER sites remain in corrective action process
- Presentation will review progress in completing corrective action at these 13 ER sites
- Focus on progress made during last 6 months

Remaining 13 ER Sites

6 “Soil sites”

3 “Active mission” sites with deferred corrective action

1 Mixed Waste Landfill

3 Groundwater Areas of Concern

- Burn Site
- Tijeras Arroyo
- Technical Area V

Remaining 13 ER Sites

6 Soil sites

~~3 "Active mission" sites with deferred corrective action~~

1 Mixed Waste Landfill

3 Groundwater Areas of Concern

- Burn Site
- Tijeras Arroyo
- Technical Area V

Remaining 10 ER Sites

- 6 Soil sites **(Five plus One)**
- 1 Mixed Waste Landfill
- 3 Groundwater Areas of Concern
  - Burn Site
  - Tijeras Arroyo
  - Technical Area V

Five Soil Sites

- “Soil sites” to separate them from the landfill and the groundwater areas of concern
- A 2010 letter from NMED requested additional groundwater characterization of these ER sites (ER sites 8/58, 68, 149 & 154)
- All required groundwater characterization work has been completed and the results documented
- In letter dated February 24, 2015, NMED stated that corrective action activities have been completed, and that Certificates of Completion may be requested for these sites
- In letter dated September 4, 2015, Certificates of Completion were requested for the five soil sites

One “New” Soil Site

- “New” release site, discovered in 2012, ER site 502
- Voluntary corrective actions completed at this site
- Remaining concentrations in soil below cleanup criteria
- Reported the results to NMED in November 2013 and are awaiting NMED review

Remaining 10 ER Sites

- 6 Soil sites (five plus one)
- 1 Mixed Waste Landfill
- 3 Groundwater Areas of Concern
  - Burn Site
  - Tijeras Arroyo
  - Technical Area V

Mixed Waste Landfill

Mixed Waste Landfill

- Implementing Long Term Monitoring and Maintenance Plan (the LTMMP)

- October 17, 2014 DOE and Sandia requested a Permit Modification, for NMED to grant Corrective Action Complete with Controls status to the MWL
- NMED hosted a public comment period on their intent, pending public comment, to approve Corrective Action Complete with Controls status for the MWL
- Public Hearing was requested during the public comment period

Mixed Waste Landfill

- NMED hosted 2 meetings in attempts to resolved differences, without Public Hearing, meetings unsuccessful
- Public Hearing was held July 8 – 11, 2015
- DOE and Sandia participated in Public Hearing
- Next Steps:
  - Hearing Office will issue a final Hearing Officers Report with recommendations to the Secretary of the Environment, and
  - Secretary of the Environment will make a final determination
- To better inform the community, DOE/Sandia made presentations to:
  - Albuquerque/Bernalillo County Water Utility Authority Governing Board on August 19 and to their
  - Water Protection Advisory Board on September 11

Remaining 10 ER Sites

6 Soil sites (five plus one)

1 Mixed Waste Landfill

3 Groundwater Areas of Concern

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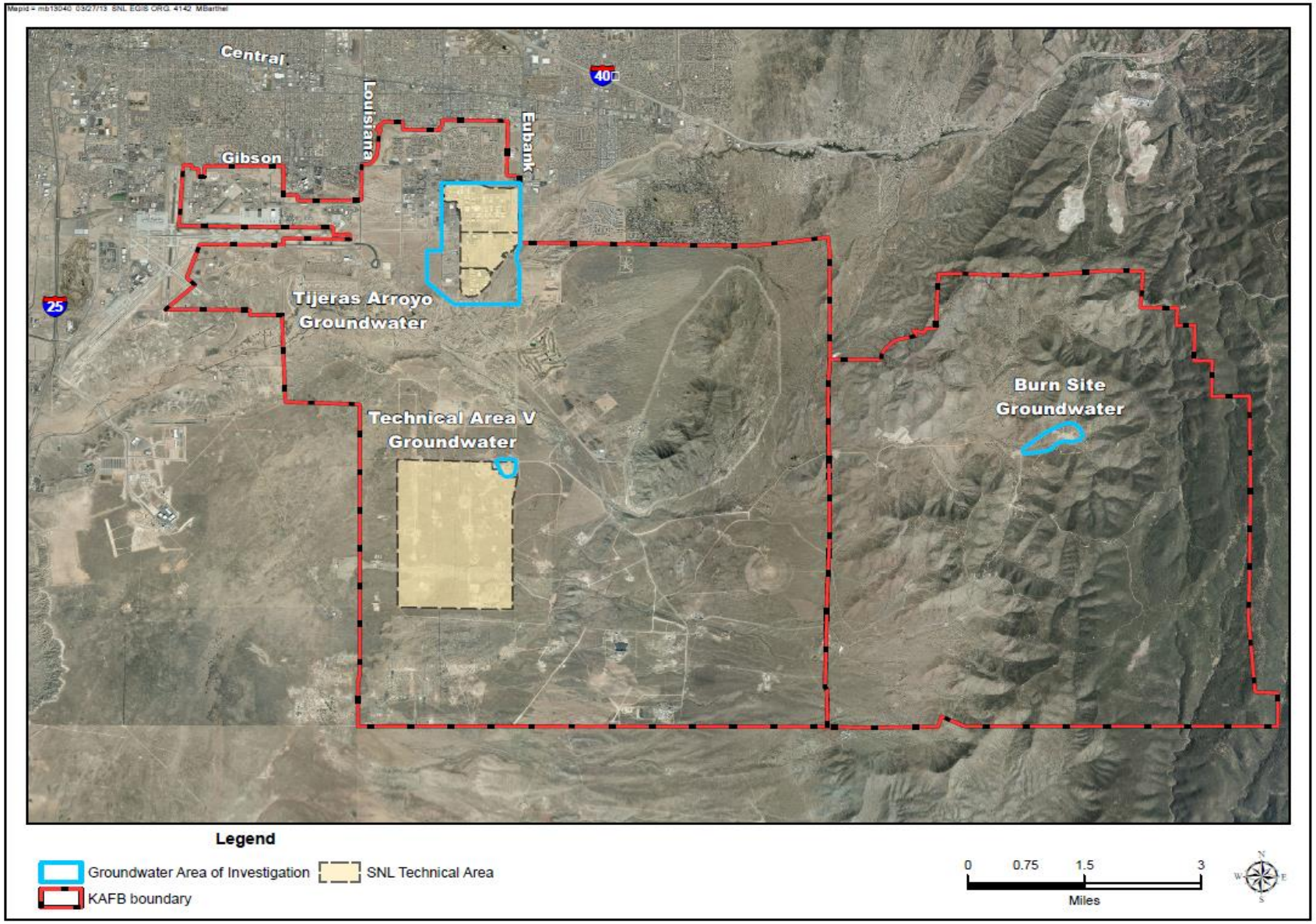

Location of 3 Groundwater AOCs on KAFB

National Nuclear Security Administration

Sandia National Laboratories

Remaining 10 ER Sites

6 Soil sites (five plus one)

1 Mixed Waste Landfill

3 Groundwater Areas of Concern

- Burn Site
- Tijeras Arroyo
- Technical Area V

Burn Site GW AOC

- GW occurs ~100 to 200 ft. below surface in fractured bedrock
- GW contains nitrate, up to 42 ppm (regulatory standard is 10 ppm)
- On June 18, 2014, NMED approved extension for Corrective Measure Evaluation (CME) Report to March 31, 2016 to allow weight-of-evidence process to determine origin of nitrates in GW
- Currently conducting weight-of-evidence process
- Continuing to monitor the GW

Remaining 10 ER Sites

6 Soil sites (five plus one)

1 Mixed Waste Landfill

3 Groundwater Areas of Concern

- Burn Site
- → Tijeras Arroyo
- Technical Area V

Tijeras Arroyo GW AOC

- Perched GW occurs:
  - ~250 ft. below surface, and
  - ~ 250 ft above regional aquifer
- Perched GW contaminated with nitrate and TCE
  - Nitrate: up to 39 ppm (regulatory standard is 10 ppm)
  - TCE: up to 9 ppb (regulatory standard is 5 ppb)
- Updating the 2005 CME Report with new data from SNL and KAFB (by December 2, 2016)
- Continuing to monitor the GW

Remaining 10 ER Sites

6 Soil sites (five plus one)

1 Mixed Waste Landfill

3 Groundwater Areas of Concern

- Burn Site
- Tijeras Arroyo
- → Technical Area V

Technical Area V GW AOC

- Regional GW occurs 500 ft. below surface
- Contaminated with nitrate and TCE
  - Nitrate: up to 14 ppm (regulatory standard is 10 ppm)
  - TCE: up to 19 ppb (regulatory standard is 5 ppb)
- NMED agreed to consider possible bio remediation, and extended due date for CME Report to November 30, 2016
- Treatability Study Workplan for in-situ bio remediation of GW submitted to NMED on October 20, 2015
- Continuing to monitor the GW

Summary of Status of Sandia's ER Operations

- Requested Certificates of Completion for 5 soil sites
- Voluntary Corrective Action completed at 1 soil site
- MWL: (1) LTMMP being implemented, (2) NMED held public comment period and Public Hearing (July 8-11) on their intent to grant corrective action complete with controls status to MWL
- Conducting weight-of-evidence process at Burn Site GW AOC
- Updating CME Report on Tijeras Arroyo GW AOC
- Submitted Treatability Study Workplan to NMED for the treating GW at the TA-V GW AOC

More Information & Questions

- On-line information ER documents hosted by NMED - http://www.nmenv.state.nm.us/HWB/snlperm.html
- On-line collection of ER documents hosted by UNM's Lobo Vault - http://repository.unm.edu/handle/1928/10963
- Annual Groundwater Monitoring Report for Sandia Labs - http://www.sandia.gov/news/publications/environmental_reports/index.html
- Send email questions to - envinfo@sandia.gov
- Call Sandia National Laboratories Community Involvement - (505) 284-5200

Backup Slides

Mixed Waste Landfill - Background

- 2.6 acre landfill
- Operational 1959 to 1988
- GW monitoring & other field investigations began 1990
  - 500 feet to groundwater, groundwater is not contaminated
  - Very little rain, 500 feet of dry absorb soils
  - Wastes will not migrate to groundwater
- Natural evapotranspirative (ET) cover recommended as remedy (2003)
- Public Hearing on remedy in 2004

Summary of Long-Term Monitoring Parameters, Frequencies, and Methods Mixed Waste Landfill, Sandia National Laboratories, New Mexico

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Sampling Media	Monitoring Parametersa/ Constituents of Concern	Monitoring Frequencya	Number of Samples Per Event	Locations	Monitoring Method	Comments
Air	Radon	Year 1 – Quarterly Year 2 – Quarterly Year 3 – Semiannual Year 4 – Semiannual Year 5 and subsequent years – Annual	17	10 detectors placed at corners and midpoints of perimeter fence 5 detectors placed on completed cover 2 detectors at background locations (TBD)	Track-etch detectors (at breathing level); sampling and analysis per Appendix C	Samples are time-weighted average and will be collected over a 3-month period.
Surface Soil	Tritium	Annual	4	One sample collected from each corner of the MWL ET Cover.	Grab samples of soil collected; moisture extracted and analyzed for tritium using liquid scintillation	Samples will continue to be collected from the original MWL ground surface at the four corners of the ET Cover.
Vadose Zone	VOCs in soil vapor	Year 1 – Semiannual Year 2 – Semiannual Year 3 – Semiannual Year 4 and subsequent years – Annual	17	Samples collected from 3 perimeter multi-port FLUTe™ or equivalent wells (5 sampling ports per well) and 2 single-port soil-vapor monitoring points installed through the ET Cover	Sampling and analysis per Appendix D (Compendium Method TO-15 or equivalent). Table 3.4.1-1 presents list of analytes	The 3 multiport FLUTe™ wells or equivalent are proposed and located at the MWL perimeter. Sampling ports planned for depths of 50, 100, 200, 300, and 400 ft bgs. The 2 single-port soil-vapor monitoring points have a sampling port approximately 35 ft below the original ground surface.
Vadose Zone	Moisture content underneath the ET Cover	Year 1 – Semiannual Year 2 – Semiannual Year 3 and subsequent years – Annual	171	3 soil-moisture monitoring access tubes Measurements obtained at 1-ft increments from 4 ft to 25 ft bgs, then 5-ft increments to total depth of the access tube (200 linear ft)	Soil-moisture monitoring per Appendix E	Moisture content in vadose zone beneath the cover is measured using a neutron probe to evaluate moisture infiltration through the ET Cover.

Summary of Long-Term Monitoring Parameters, Frequencies, and Methods Mixed Waste Landfill, Sandia National Laboratories, New Mexico

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Sampling Media	Monitoring Parametersa/ Constituents of Concern	Monitoring Frequencya	Number of Samples Per Event	Locations	Monitoring Method	Comments
Ground water	VOCs, metals, tritium, radon, gamma-emitting radionuclides (short list), and gross alpha/beta activity	Semiannual	4	MWL compliance groundwater monitoring well network: MWL-BW2, MWL-MW7, MWL-MW8, and MWL-MW9	Sampling and Analysis per Appendix F. Table 3.5.4-1 lists specific analytes and EPA Methods[b]	Monitoring wells MWL–MW4, MWL-MW5, and MWL-MW6 will be retained for information only.
Biota – Surface Soil	RCRA Metals plus Cu, Ni, V, Zn, Co, and Be; and gamma-emitting radionuclides (short list)	Annual	Up to 4 (2 each, if they exist)	Variable - ant hills and animal burrows on the MWL ET Cover located during ET Cover inspections, if present	Grab sampling and analysis of surface soil at animal burrow and/or ant hill feature per Appendix G	Soil sampling will be performed in August or September to evaluate potential for mobilization of contaminants by biota. If no features are identified, no samples will be collected.
Biota – Cover Vegetation	Gamma-emitting radionuclides (short list) in vegetation	Annual	Up to 2 if they exist	Variable - potentially deep-rooted vegetation overlying former disposal areas located during ET Cover inspections, if present	Grab sampling and analysis of vegetation, including the plant and root system per Appendix G	Vegetation sampling will be performed in August or September to evaluate potential for mobilization of contaminants by plants. If no potentially deep-rooted plants are present, no samples will be collected.