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Compliance Order on Consent Update



ENVIRONMENTAL MANAGEMENT
SAFETY ♦ PERFORMANCE ♦ CLEANUP ♦ CLOSURE

Doug Hintze
Manager
Environmental Management Los Alamos Field Office
November 29, 2018



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Presentation Outline

- **Background**
- **Consent Order Overview**
- **Campaign Approach**
- **Appendix C: Consent Order Campaigns**
- **Appendix B: FY 2018 Enforceable Milestones**



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Background

- 2002: Litigation between DOE, NMED, and the Regents of the University of California (LANS' predecessor)
- 2005: NMED, DOE and the Regents of the University of California entered into a "Compliance Order on Consent" (2005 Consent Order)
- 2012: NMED and DOE entered into a non-binding agreement, called the Framework Agreement
- 2016: Consent Order signed by NMED and DOE in June of 2016. Supersedes the 2005 Consent Order



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- **Appendix A: Solid Waste Management Unit/Area of Concern List**
- **Appendix C: Future Campaigns**
- **Appendix B: Milestones and Targets**
- **Process for updating Appendix B**
 - Current FY, FY+1, & FY+2, with milestones and targets
 - Updated annually
 - Review includes changed conditions, priorities, & funding
 - Revised Appendix B posted on NMED's website
 - Public meeting held to present changes to Appendix B
- **Dynamic process allows for revision during the year due to upward or downward adjustments in funding**





- **EM-LA Lifecycle Cost Estimate (LCE) is based on a campaign approach**
 - **LCE is integrated with the 2016 Consent Order**
 - 17 Soil and Water campaigns identified in Appendix C
 - **Legacy waste is a standalone campaign driven by DOE radiological authority (rather than the Consent Order)**
- **Campaigns are worked in the prioritized order listed in Appendix C**
- **Multiple campaigns underway simultaneously**
- **Safe, efficient and transparent execution**





Appendix C: Consent Order Campaigns

Item #	Campaign Title	SWMUs/AOCs	Estimated Completion	Estimated Cost (M)
1	Chromium Interim Measure	1	2020 – 2022	\$38.9 - \$50.6
2	Historic Properties Completion	84	2019 – 2020	\$5.3 - \$6.4
3	Royal Demolition Explosives (RDX) Characterization	2	2022 – 2024	\$1.6 - \$2.1
4	Supplemental Investigations Reports	222	2019 – 2019	\$0 - \$1.0
5	TA-21 D&D and Cleanup	41	2020 – 2022	\$45.8 - \$54.9
6	RDX Remedy	0	2024 – 2025	\$22.3 - \$26.8
7	Known Cleanup Sites	20	2027 - 2028	\$34.8 - \$41.8
8	Material Disposal Area (MDAs) A & T Remedy	30	2028 – 2031	\$92.1 - \$124.3
9	Chromium Final Remedy	0	2026 – 2028	\$100.3 - \$130.0
10	Southern External Boundary	60	2025 – 2026	\$10.0 - \$12.0
11	MDA C Remedy	1	2024 – 2026	\$34.6 - \$48.7
12	Sandia Canyon Watershed	49	2024 – 2025	\$6.3 - \$7.6
13	Pajarito Watershed	167	2028 – 2030	\$20.7 - \$24.9
14	Upper Water Watershed	253	2030 – 2031	\$33.5 - \$40.2
15	MDA AB Remedy	12	2027 – 2030	\$41.8 - \$50.2
16	MDA H Remedy	1	2029 – 2030	\$15.3 - \$18.3
17	MDA G & L Remedy / D&D	12	2035 – 2040	\$237.9 - \$356.9

Highlighted rows indicate campaigns currently underway





Appendix B: FY 2018 Enforceable Milestones

Campaign	Consent Order Milestone	Target Date	Forecast	Actual (M/NM)
Chromium IM & Characterization	Technical Report Package for Chromium Plume Center Characteristics	Mar 30, 2018	Mar 28, 2018	Met
Chromium IM & Characterization	Letter Report to NMED-HWB documenting integrated operation of Chromium Extraction Well 4 (CrEX-4) into the existing IM System	Mar 30, 2018	Mar 22, 2018	Met
Chromium IM & Characterization	Summary Report (Completion or Progress) Phase I Pilot Amendment Test Results	Jul 31, 2018	Jul 31, 2018	Met
Chromium IM & Characterization	Phase II Pilot Amendment Test Work Plan	Sep 28, 2018	Sep 28, 2018	Renegotiated
Chromium IM & Characterization	Annual Progress Report on Chromium Plume Control IM Performance	Sep 28, 2018	Sep 28, 2018	Met
RDX Characterization	Technical Report Package related to Deep Groundwater Investigation	Mar 30, 2018	Mar 30, 2018	Met
RDX Characterization	R-69 Field Completion	Sep 28, 2018	Sep 28, 2018	Renegotiated
RDX Characterization	First Annual Long-Term Monitoring Report following completion of Surface CMI and approval of Long-Term Monitoring Plan	Sep 28, 2018	Sep 28, 2018	Met





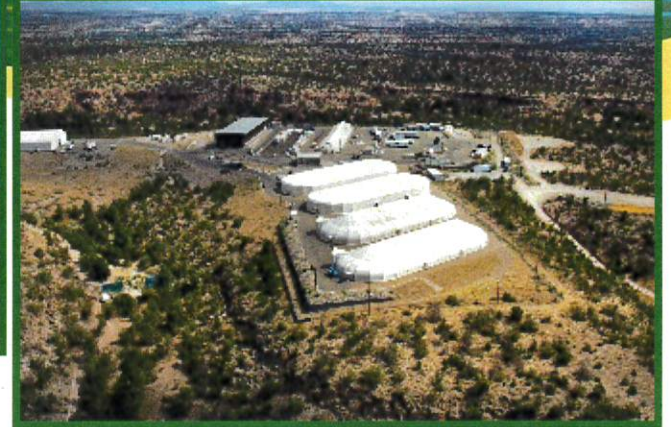
Campaign	Consent Order Milestone	Target Date	Forecast	Actual (M/NM)
Historical Properties Upper LA Canyon	Upper LA Canyon Phase II IR Submitted to NMED	Sept 28, 2018	Sept 28, 2018	Met
Historical Properties Middle LA Canyon	Middle LA Canyon Phase II IR Submitted to NMED	Sept 28, 2018	Sept 28, 2018	Met
TA-21 D&D and Cleanup	Investigation Report for DP sites Aggregate Area at DP East at TA-21	Jun 29, 2018	Jun 29, 2018	Met
Known Cleanup Sites	Field Completion for Aggregate Area Known Cleanup Sites	Sep 28, 2018	Sep 28, 2018	
Sandia Canyon Watershed	Sandia Canyon Wetland Performance Report for Period April 2017-December 2017	Apr 30, 2018	Apr 30, 2018	Met
N/A	Annual Monitoring Report for the completed FY17 and Plan for the upcoming FY18 LA/Pueblo Watershed Sediment Transport Mitigation Project	Apr 30, 2018	Apr 28, 2018	Met
N/A	Annual Update to the Interim Facility-Wide Groundwater Monitoring Plan	May 30, 2018	May 30, 2018	Met





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Compliance Order on Consent Appendix B Milestones for Fiscal Year 2019



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**Arturo Duran, Designated Agency Manager
Environmental Management Los Alamos Field Office
November 29, 2018**



Section VIII.C Annual Planning Process

- The annual planning process is the process the Parties will use to update Appendix A, Appendix B, and Appendix C, as appropriate.
- Prior to the end of the first quarter of each FY, DOE will provide a revision of Appendix A and Appendix C to NMED indicating proposed changes.
- DOE shall update the milestones and targets in Appendix B on an annual basis, accounting for such factors as, actual work progress, changed conditions, and changes in anticipated funding levels.





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Appendix B Milestones

Campaign Approach

- Corrective action activities required by the Consent Order will be organized into campaigns, generally based upon a risk-based approach to grouping, prioritizing, and accomplishing corrective action activities at SWMUs and AOCs.
- A campaign may consist of one or more projects; campaigns and projects consist of one or more tasks and deliverables.



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Appendix B Milestones

Campaigns in Fiscal Year 2019

- Chromium Interim Measure and Characterization
- Historical Properties Completion
- Royal Demolition Explosives (RDX) Characterization
- Supplemental Investigation Reports
- Technical Area 21 D&D and Cleanup
- Known Cleanup Sites (Above SSLs)
- Material Disposal Areas A and T Remedy
- Southern External Boundary
- Multi-Campaigns



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Appendix B Milestones

Chromium Interim Measure and Characterization Campaign

- Includes the installation and operation of wells and associated equipment necessary to meet three primary objectives:
 - 1) provide interim measures to prevent migration of the plume beyond the Laboratory boundary;
 - 2) perform scientific studies and aquifer testing to obtain data necessary to conduct a corrective measures evaluation; and
 - 3) conduct a corrective measures evaluation.



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Chromium Interim Measure & Characterization Campaign

Milestone #	Milestone	Milestone Description	Milestone Date
5	Sandia Canyon Wetland Performance Report for Period Jan 2018 - Dec 2018	Report on results of monitoring necessary to document efficacy of wetland stabilization efforts.	4/30/2019
2, 16	Semiannual Performance Monitoring Progress Reports of the Chromium Plume Control Interim Measure (July 2018 to December 2018) and (January 2019 to June 2019)	These progress reports will include summaries of the data collected from performance monitoring wells, operational activities, and analysis of performance of the IM with respect to the plume control objective. Modeling may be included as necessary to support the analysis. The reports may also include recommendations for the subsequent operating year.	3/29/2019 & 9/30/2019
9	Completion Report for Conversion of CrIN-6 to CrEX-5 and Integration into Chromium IM System	This report will include information associated with conversion of CrIN-6 to an extraction well (CrEX-5) in accordance with an NMED-approved work plan. The report will also include as-built information for CrEX-5.	6/28/2019
8	Letter Report Documenting Completion of R-70 and Collection of First Samples	R-70 will be located down gradient of CrIN-6 and will monitor performance of IM activities, specifically associated with the northeastern portion of the plume.	5/31/2019
10	Phase 2 Pilot Amendment Testing Work Plan	The work plan will provide the description of the test design and data collection needs to meet the work plan objectives.	6/28/2019



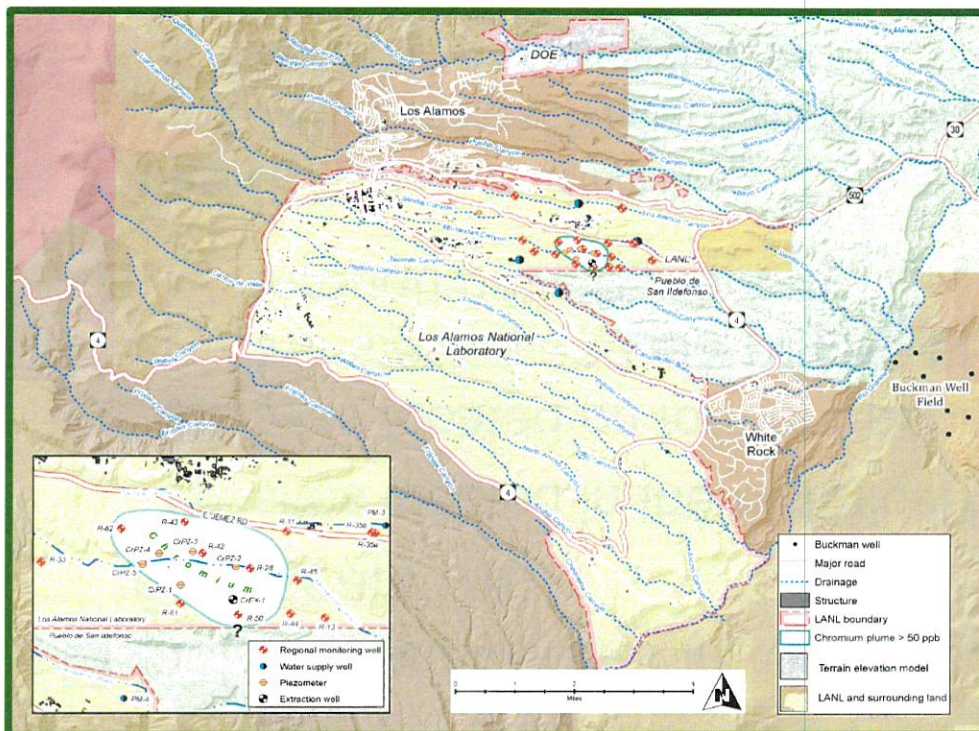


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Appendix B Milestones

Chromium Interim Measure & Characterization Campaign



Location of the Chromium Campaign



Drilling angled injection well for Interim Measure



Chromium central treatment area



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Historical Properties Completion Campaign

Includes additional investigation and remediation as necessary for:

- 1) sites located in the historical location of the Laboratory; and
- 2) sites located on former Laboratory properties that were transferred and are private properties or that require access through private property.

Aggregate Areas in campaign:

- Guaje/Barrancas/Rendija Canyons Canyon Aggregate Area
- Pueblo Canyon Aggregate Area
- Upper Los Alamos Canyon Aggregate Area
- Middle Los Alamos Canyon Aggregate Area



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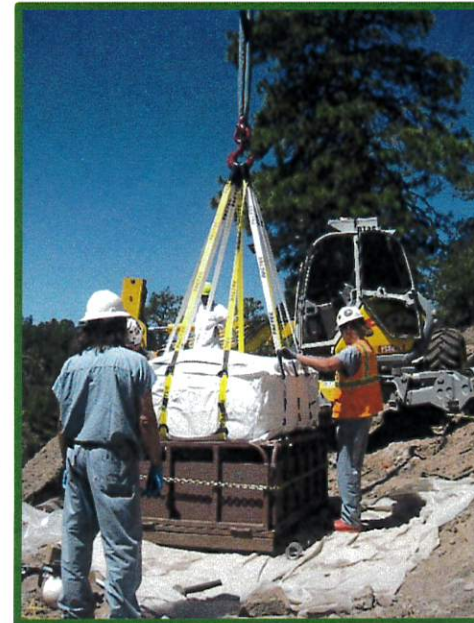


Historical Properties Completion Campaign

Milestone #	Milestone	Milestone Description	Milestone Date
6	Addendum to the Middle Los Alamos Canyon Aggregate Area Phase II Investigation Report for SWMU 02-014	Addendum to the Phase II Investigation Report that documents investigation activities at SWMU 02-014. This SWMU consists of three former electrical transformer stations that served buildings in Technical Area 2.	4/30/2019



Excavation using a spider excavator at SWMU 01-001(d3)



Waste-packaging at SWMU 01-001(d3)





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Appendix B Milestones

Historical Properties Completion Campaign

Drilling and sampling activities were conducted at SWMU 02-014 in 2017/2018. This is a newly identified SWMU that is associated with three former electrical transformer stations that served buildings in Technical Area 2. Remediation at this site started in November 2018.



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Royal Demolition Explosives (RDX) Characterization Campaign

- Includes potential interim measures or surface activities to prevent further migration of RDX, and characterization of the intermediate/regional groundwater, through well installation, tracer studies, and other evaluations necessary to complete the investigation of nature and extent and determine the need for a corrective measures evaluation (CME).



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Royal Demolition Explosives (RDX) Characterization Campaign

Milestone #	Milestone	Milestone Description	Milestone Date
1	R-69 Field Completion	Letter report documenting field completion of the well and first samples completed. This is a campaign level milestone because data from R-69 is necessary to address important conceptual model questions for the Investigation Report for Deep Groundwater.	12/14/2019
15	Investigation Report for Deep Groundwater	Investigation report that culminates results of investigation activities associated with deep groundwater and includes a groundwater risk assessment. Follows completion and multiple rounds of data collection at R-69.	8/30/2019
17	Annual Long-Term Monitoring Report of Results following Surface RDX Corrective Measures Implementation Completion	Executes the reporting required in the Remedy Completion Report for Corrective Measures Implementation at Consolidated Unit 16-021(c)-99 for long-term monitoring and inspections.	9/30/2019

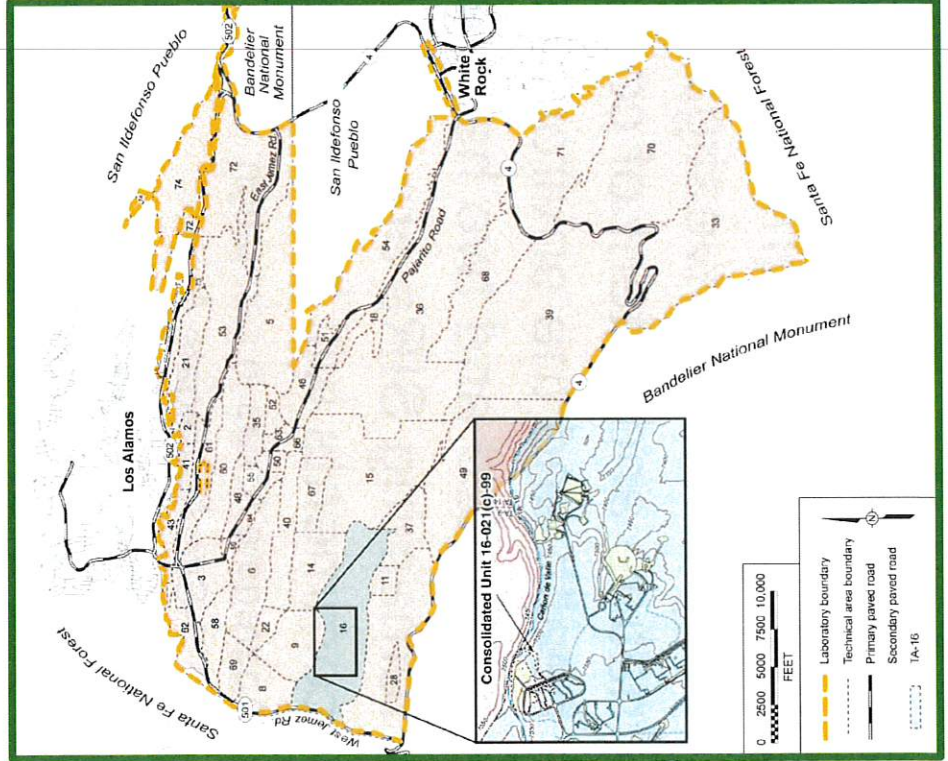




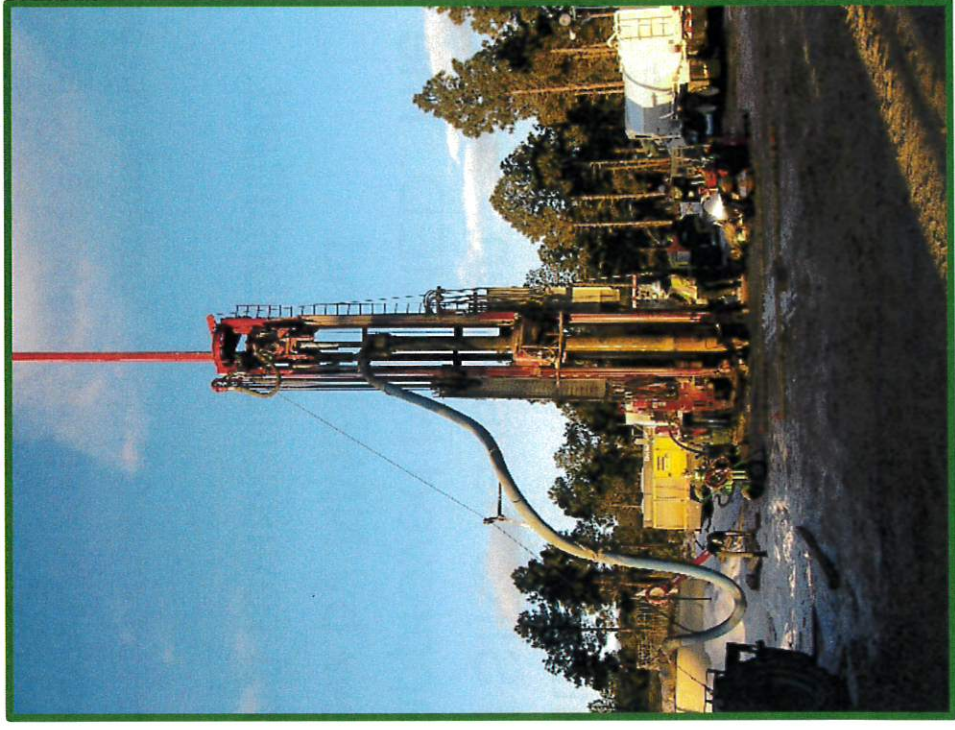
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Appendix B Milestones

RDX Characterization Campaign



Location of RDX Campaign with respect to Laboratory TAs



Regional well R-68 under construction



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Supplemental Investigation Reports Campaign

- Includes the submission of ten aggregate area supplemental investigation reports that reevaluate the nature and extent of contamination and risk to human health and the environment. All SIRs have been submitted and two have been approved by NMED. The remaining SIRs are under review by NMED and comments will be addressed and revisions submitted.

Aggregate Areas in campaign:

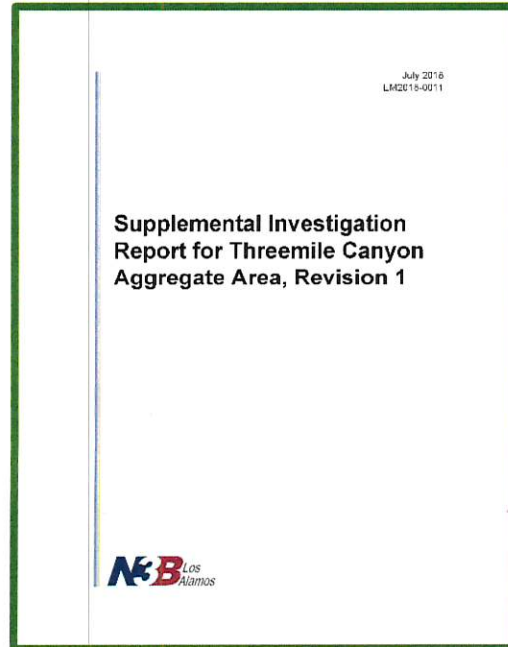
- S-Site Aggregate Area
- Cañon de Valle TA-14
- Threemile Canyon Aggregate Area
- TA-49 Inside the NES Boundary
- TA-49 Outside the NES Boundary
- Potrillo/Fence Canyons Aggregate Areas
- North Ancho Canyon Aggregate Area
- Lower Sandia Canyon Aggregate Area
- Upper Cañada del Buey Aggregate Area
- Upper Mortandad Canyon Aggregate Area





Supplemental Investigation Reports Campaign

Milestone #	Milestone	Milestone Description	Milestone Date
7	Supplemental Investigation Report (SIR) for S-Site Canyon Aggregate Area, Revision 1	Resolve NMED comments, incorporate changes, and submit Revision 1 to the SIR	4/30/2019
13	Supplemental Investigation Report (SIR) for Potrillo/Fence Canyons Aggregate Area, Revision 1	Resolve NMED comments, incorporate changes, and submit Revision 1 to the SIR	7/31/2019



The Threemile Canyon Aggregate Area SIR, Revision 1, was approved by NMED in August 2018. The SIR recommends corrective action complete without controls for 20 sites. Five other sites require additional sampling for extent, and two of those sites are recommended for cleanup.





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Technical Area 21 D&D and Cleanup Campaign

- Includes investigations of SWMUs and AOCs after removal and remediation of buried waste lines and contaminated soils associated with demolition of facilities and slabs (not part of the Consent Order) at DP West and the Radiological Liquid Waste Treatment Facility (RLWTF), building 21-257. Also includes the investigation of sites located outside the Nuclear Environmental Site (NES) boundary at Material Disposal Area (MDA) T.

Aggregate Area in campaign:

- DP Site Aggregate Area



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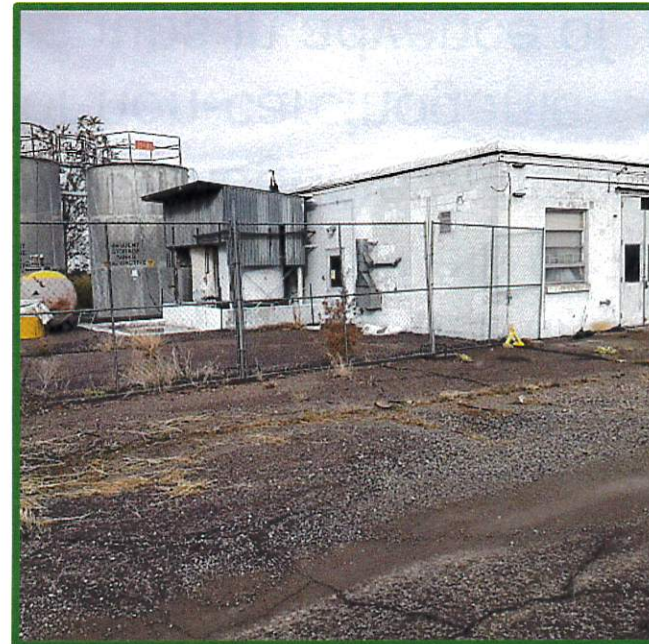


TA-21 D&D and Cleanup Campaign

Milestone #	Milestone	Milestone Description	Milestone Date
18	TA-21 Delta Prime (DP) West Investigations Letter Report	Letter report that summarizes the initiation of investigation activities after the removal of waste lines at DP West.	9/30/2019



Remaining slabs at DP West at Technical Area 21 will be removed and sumps and waste lines investigated.



Building 21-257 at Technical Area 21 will be decontaminated and demolished and associated SWMUs/AOCs will be investigated.





Known Cleanup Sites (Above SSLs) Campaign

- Includes soil removal from six sites that previous investigations identified have hazardous contaminants at concentration that exceed the target risk levels of 10^{-5} lifetime excess cancer risk for carcinogenic contaminants and a hazard index (HI) of 1 for non-carcinogenic contaminants. Accelerates cleanups in advance of finalizing remaining aggregate area site investigations.

Aggregate Areas in campaign:

- North Ancho Canyon Aggregate Area
- Upper Mortandad Canyon Aggregate Area
- Upper Cañada del Buey Aggregate Area
- Threemile Canyon Aggregate Area





Known Cleanup Sites (Above SSLs) Campaign

Milestone #	Milestone	Milestone Description	Milestone Date
19	Field Completion Letter Report for Aggregate Area Known Cleanup Sites; SWMU 39-002(a), SWMU 46-004(q), SWMU 15-008(b), and SWMU 15-007(c)	Letter report documenting field completion of cleanups of remaining four sites currently known to exceed soil screening levels. Sites to be addressed are; SWMU 39-002(a), SWMU 46-004(q), SWMU 15-008(b), and SWMU 15-007(c).	9/30/2019

Sampling and cleanup of contaminated soil at a former outfall in TA-50, SWMU 50-006(d), and site stabilization after cleanup.





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Material Disposal Areas A and T Remedy Campaign

- Includes completion of additional characterization activities at MDAs A and T and installation of a moisture monitoring network at MDA T. These CMEs will result in NMED's statements of basis and selections of a remedy, and then the campaign will implement the remedies.



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Material Disposal Areas A and T Remedy Campaign

Milestone #	Milestone	Milestone Description	Milestone Date
11	Submit Revised Work Plan for Vadose Zone Moisture Monitoring at MDA T within the NES	The revised work plan will include proposed drilling, characterization activities, and installation and instrumentation of a vadose zone moisture monitoring system at MDA T within the NES.	6/28/2019



Material Disposal Area A



Material Disposal Area T





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Southern External Boundary Campaign

- ❑ Includes initial investigations, remediation of media above soil screening levels, and risk assessments, for five aggregate areas. These aggregate areas are located in the border area between the Laboratory, Bandelier, and White Rock populated areas.

Aggregate Areas in campaign:

- Chaquehui Canyon Aggregate Area (initial investigation)
- South Ancho Canyon Aggregate Area (initial investigation)
- Lower Water Canyon Aggregate Area (initial investigation)
- North Ancho Canyon Aggregate Area (Phase II)
- Potrillo/Fence Canyon Aggregate Area (Phase II)

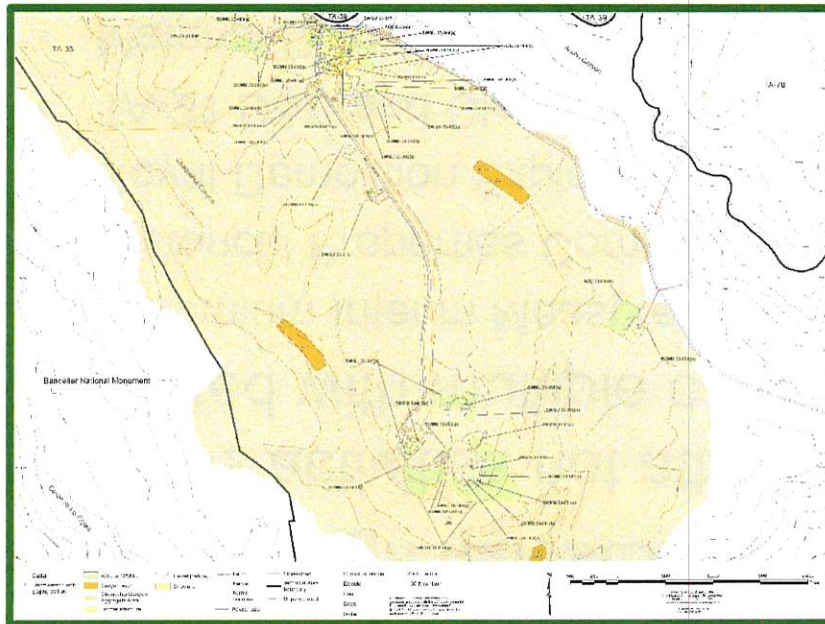


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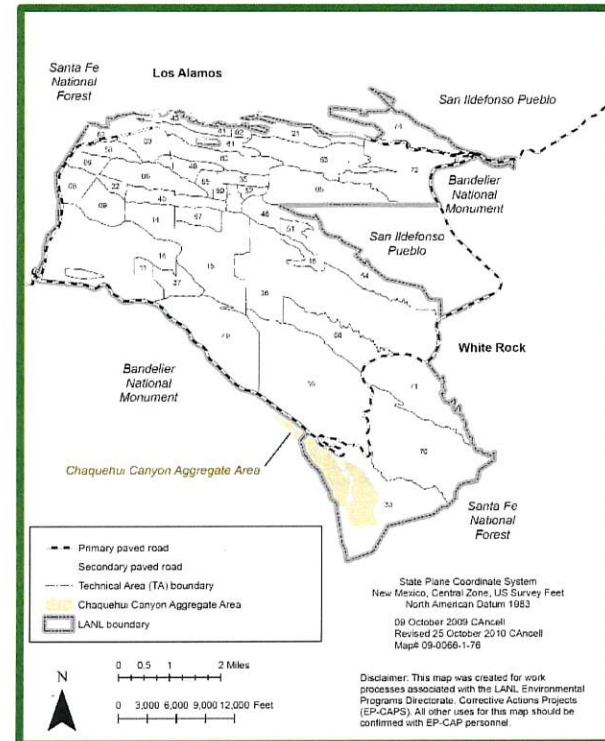


Southern External Boundary Campaign

Milestone #	Milestone	Milestone Description	Milestone Date
20	Chaquehui Canyon Aggregate Area Letter Report	Letter report that summarizes the fieldwork implementation and status of site investigations in Chaquehui Canyon Aggregate Area.	9/30/2019



Sites to be investigated in Chaquehui Canyon Aggregate Area



Location of Chaquehui Canyon Aggregate Area with respect to Laboratory TAs





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Multi-Campaign Milestones

- ❑ Includes activities not attributed to a single campaign but attributed with multiple campaigns, including;
 - Chromium Interim Measures and Characterization
 - Historical Properties Completion
 - Royal Demolition Explosives (RDX) Characterization
 - TA-21 D&D and Cleanup
 - Material Disposal Areas A and T Remedy
 - Material Disposal Area C Remedy
 - Material Disposal Area H Remedy
 - Material Disposal Areas G and L Remedy



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Multi-Campaign Milestones

Milestone #	Milestone	Milestone Description	Milestone Date
12	Annual Update to the Interim Facility-Wide Groundwater Monitoring Plan (IFGMP) for MY2020 (October 2019-September 2020)	Annual update to the groundwater monitoring program baseline document with adjustments to sampling, monitoring groups, analytes, and frequencies based on previous results.	6/30/2019
14	Westbay Wells Reconfiguration Completion Report for R-5, R-7, R-8, R-9i, R-19, R-25, and R-31	This report will include a summary of field activities and as-built information associated with reconfiguration of R-5, R-7, R-8, R-9i, R-19, and R-31, and plugging and abandonment of R-25 which requires removal of the Westbay system.	8/30/2019
3	Annual Monitoring Report for the Los Alamos/Pueblo Watershed Sediment Transport Mitigation Project	Annual report of last year's results that addresses the performance of stormwater controls installed in the LA/Pueblo watershed.	4/30/2019
4	Annual Monitoring Plan for the Los Alamos/Pueblo Watershed Sediment Transport Mitigation Project	Annual plan for the upcoming year that addresses the performance of stormwater controls installed in the LA/Pueblo watershed.	4/30/2019

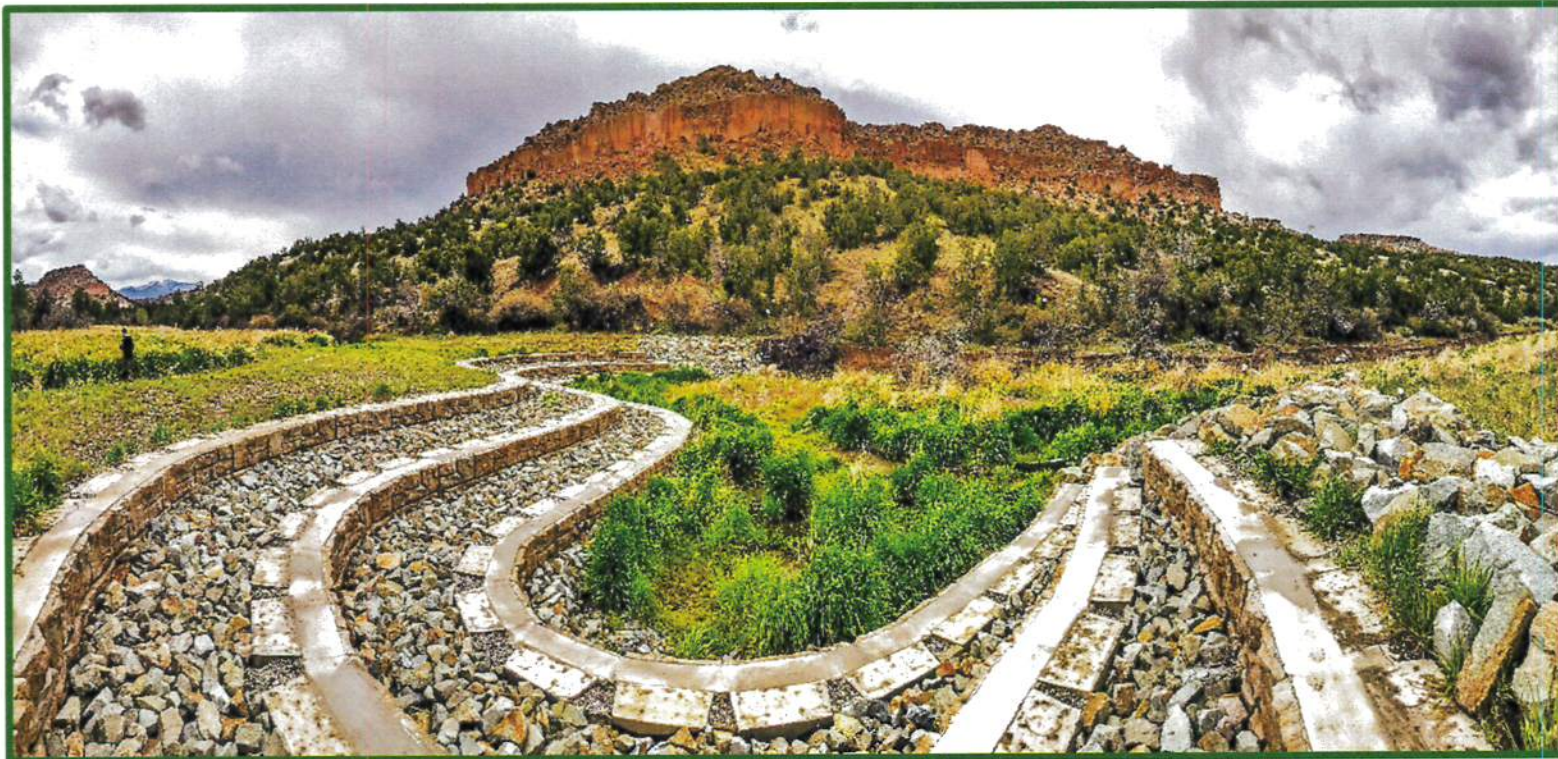




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Appendix B Milestones



Redi-Rock wetland stabilization structure in Pueblo Canyon



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