



U.S. DEPARTMENT OF  
**ENERGY**

OFFICE OF  
**ENVIRONMENTAL  
MANAGEMENT**



# 2016 Lifecycle Cost Estimate For Los Alamos National Laboratory's Environmental Legacy Cleanup Responsibilities



**ENVIRONMENTAL MANAGEMENT**  
SAFETY ♦ PERFORMANCE ♦ CLEANUP ♦ CLOSURE

**Doug Hintze, Manager**  
**Environmental Management Los Alamos Field Office**  
**January 16, 2018**



## ➤ **2016 Consent Order, Section VIII: Campaign Approach**

### ❑ **Subsection A:**

- “[...] the Parties agree to use a structure called the "campaign approach." [...] Corrective action activities required by this 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. Campaigns, projects, tasks, and deliverables may be subject to two types of deadlines: milestones, which are enforceable; or targets, which are not enforceable.”

### ❑ **Subsection B:**

- “The Parties agree that DOE's project plans and tools will be used to identify proposed milestones and targets. These project plans and tools will also be used to evaluate changes to milestones and targets.”
- “The Parties further agree to identify and utilize a list of other submittals that are associated with the milestones listed in Appendix B and facilitate implementation of the campaigns by enabling the Parties to allocate resources.”





# Lifecycle Cost Estimate Campaign List

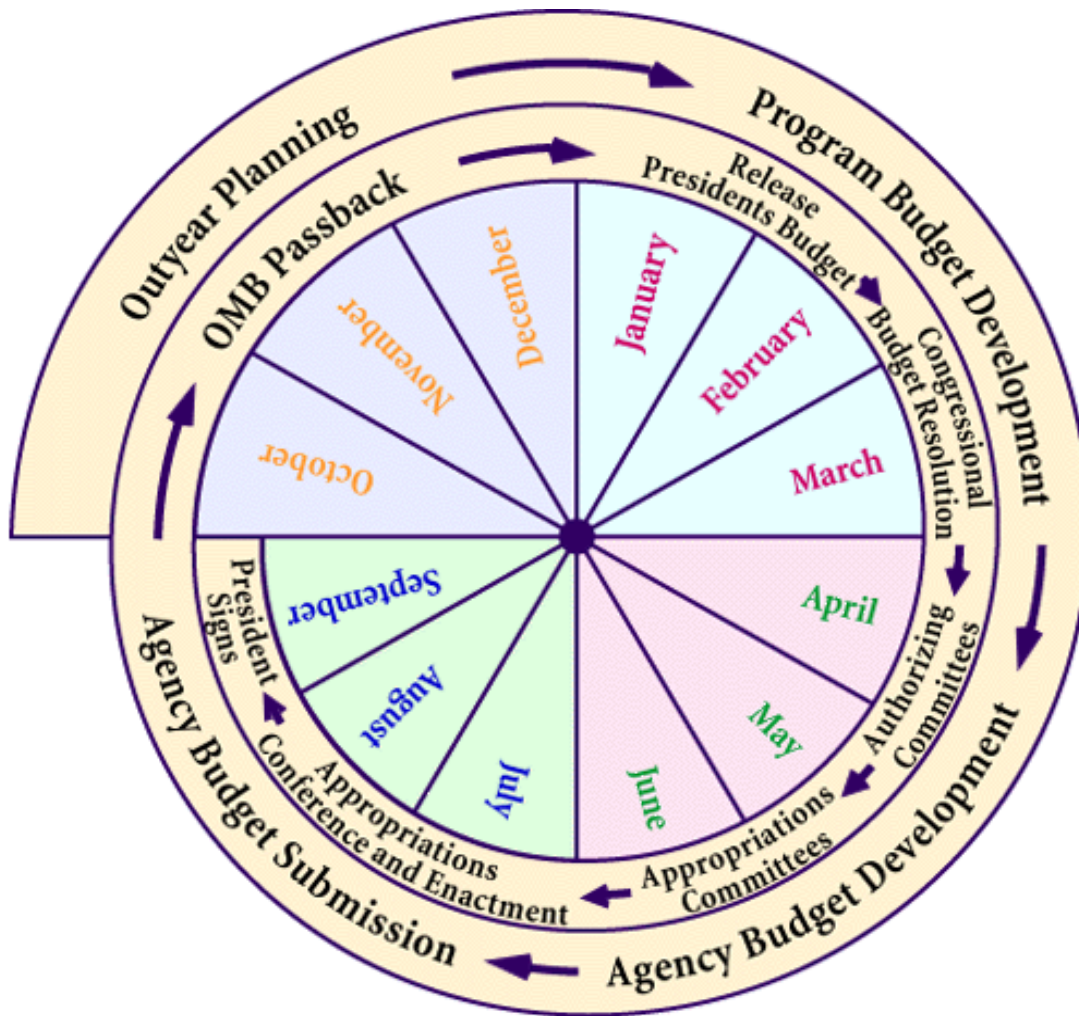
Lifecycle Cost Estimate Soil & Groundwater Campaigns (PBS-0030)					
Item #	Campaign Title	*SWMUs/AOCs	Estimated Year Completion Range	Estimated Cost Range (M)	Status
1	Chromium Interim Measure	1	2020 – 2022	\$38.9 - \$50.6	
2	Historic Properties Completion	84	2019 – 2020	\$5.3 - \$6.4	
3	Royal Demolition Explosives (RDX) Characterization	2	2022 – 2024	\$1.6 - \$2.1	
4	Supplemental Investigations Reports	222	2019 – 2019	\$0 - \$1.0	
5	Technical Area 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	



# Lifecycle Cost Estimate Campaign List

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	
<p>*SWMU: Solid Waste Management Unit AOC: Area of Concern <u>Status Legend:</u> Complete:  In Process/Starting in FY18:  Future: </p>					







# Budget Outlook

EM-LA Programs	FY 2016 President's Request	FY 2016 Enacted	FY 2017 President's Request	FY 2017 Enacted	FY 2018 President's Request	FY 2018 House Markup	FY 2018 Senate Markup
<b>PBS 30</b> Soil & Groundwater Remediation	<b>120,230</b>	<b>100,935</b>	<b>93,336</b>	<b>93,366</b>	<b>121,799</b>	<b>121,799</b>	<b>137,699</b>
<b>PBS 13</b> Solid Waste	<b>65,001</b>	<b>80,671</b>	<b>92,240</b>	<b>97,240</b>	<b>66,436</b>	<b>68,807</b>	<b>76,436</b>
<b>PBS FAO</b> Community & Regulatory Support	<b>3,394</b>	<b>3,394</b>	<b>3,394</b>	<b>3,394</b>	<b>3,394</b>	<b>3,394</b>	<b>3,394</b>
<b>EM-LA Overall Budget</b>	<b>188,625</b>	<b>185,000</b>	<b>189,000</b>	<b>194,000</b>	<b>191,629</b>	<b>194,000</b>	<b>217,529</b>





- **The Lifecycle Cost Estimate is a strategic planning tool that is tied to the 2016 Consent Order**
- **External interactions, funding, technologies, new ideas, and regulatory changes will continue to shape the Lifecycle Cost Estimate**
- **Safe, efficient and transparent execution**







U.S. DEPARTMENT OF  
**ENERGY**

OFFICE OF  
ENVIRONMENTAL  
MANAGEMENT



# 2016 Compliance Order on Consent Progress Update for FY 2017 and FY 2018 Appendix B Update

Arturo Duran, Compliance and Permitting Manager  
Office of Quality and Regulatory Compliance  
Environmental Management Los Alamos Field Office  
January 16, 2018



ENVIRONMENTAL MANAGEMENT  
SAFETY ♦ PERFORMANCE ♦ CLEANUP ♦ CLOSURE





U.S. DEPARTMENT OF  
**ENERGY**

OFFICE OF  
ENVIRONMENTAL  
MANAGEMENT

# Presentation Outline

- **FY 2017 Progress**
- **FY 2018 Appendix B Milestones and Targets**
- **Questions**



**ENVIRONMENTAL MANAGEMENT**  
SAFETY ♦ PERFORMANCE ♦ CLEANUP ♦ CLOSURE



## ➤ **Appendix A**

- 7 sites received Certificates of Completion with Controls
- 55 sites received Certificates of Completion without Controls
- 107 additional sites with work completed and reports submitted to NMED-HWB
- 17 sites were changed to a deferred status

## ➤ **Appendix B**

- Recurring deliverables completed – Integrated Facility Groundwater Monitoring Program and Los Alamos/Pueblo Canyon Sediment Monitoring
- Chromium
  - 4 Injection Wells completed
  - 2 Extraction Well Evaluation and Recommendation on CrEX-2
  - Initial Operation of Interim Measures for Boundary Protection





## ➤ Appendix B

- Historical Properties Completion Campaign - Upper & Middle Los Alamos Canyon Aggregate Area Cleanups completed (except one PCB site in Middle Los Alamos Canyon) – reports submitted
- Royal Demolition Explosives (RDX) in Canon de Valle (TA-16)
  - Tracer test completed
  - Aquifer testing for CdV-9-1(i) completed
  - New potential source (TA-9) identified and R-68 completed
- Supplemental Investigation Reports
  - All milestones were met
- Sandia Canyon Wetland Performance Report (post grade control structure installation)







## ➤ **Appendix A**

- Markup provided with 186 status changes plus some deferred sites identified

## ➤ **Appendix B**

- Includes 15 Milestones for FY 2018 and 12 targets for FY 2019 and 11 Targets for FY 2020

## ➤ **Appendix C**

- No changes made





- **Appendix B is organized by specific campaigns and includes milestones for current year and targets for the next two subsequent years.**
- **It is negotiated and updated each year.**
- **The FY 2018 Appendix B includes 15 milestones, and identifies 12 targets for FY 2019 and 11 targets for FY 2020.**



Appendix B MILESTONES AND TARGETS											
			FY 2018 MILESTONES			FY 2019 TARGETS			FY 2020 TARGETS		
	Campaign	Milestone # FY2018	Milestone	Milestone Description	Milestone Date	Target	Target Description	Target Date	Target	Target Description	Target Date
		6	Annual Update to the Interim Facility-Wide Groundwater Monitoring Plan (IFGMP),for MY2019 (October 2018-September 2019)	Annual update to the groundwater monitoring program baseline document with adjustments to sampling, monitoring groups, analyts, and frequencies based on previous results.	5/30/2018	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, analyts, and frequencies based on previous results.	5/30/2019	Annual Update to the Interim Facility-Wide Groundwater Monitoring Plan (IFGMP) for MY2021 (October 2020-September 2021)	Annual update to the groundwater monitoring program baseline document with adjustments to sampling, monitoring groups, analyts, and frequencies based on previous results.	5/30/2020
		4	Annual Monitoring Report for the Completed FY17 and Plan for the upcoming FY18 for Los Alamos/Pueblo Watershed Sediment Transport Mitigation Project	Annual report of last year's results and update to plan for the upcoming year based on last year's observations. Both the annual report and the plan address the performance of stormwater controls installed in the LA/Pueblo watershed.	4/30/2018	Annual Monitoring Report for the Completed FY18 and Plan for the upcoming FY19 for Los Alamos/Pueblo Watershed Sediment Transport Mitigation Project	Annual report of last year's results and update to plan for the upcoming year based on last year's observations. Both the annual report and the plan address the performance of stormwater controls installed in the LA/Pueblo watershed.	4/30/2019	Annual Monitoring Report for the Completed FY19 and Plan for the upcoming FY20 for Los Alamos/Pueblo Watershed Sediment Transport Mitigation Project	Annual report of last year's results and update to plan for the upcoming year based on last year's observations. Both the annual report and the plan address the performance of stormwater controls installed in the LA/Pueblo watershed.	4/30/2020
Chromium IM & Characterization	Chromium IM & Characterization	1	Technical Report Package for Chromium Plume Center Characterization	Compendium of technical reports that will present results of hydrology, geology, and geochemistry studies that support plume-center characterization and evaluation of remedial alternatives.	3/30/2018						
	Chromium IM & Characterization	3	Letter Report to NMED-HWB documenting integrated operation of Chromium Extraction Well 4 (CrEX-4) into the existing IM system.	Letter report documenting completion of a sequence of activities conducted to build out additional IM functionality including: 1) installation of CrEX-4; 2) installation and testing of CrEX-4 piping; 3) control system modification to include CrEX-4; and 4) demonstration that CrEX-4 extracted water is injected into one or more injection well.	3/30/2018						
	Chromium IM & Characterization	9	Annual Progress Report on Chromium Plume Control Interim Measure Performance	The progress report will include data and trends for performance monitoring wells, analysis of performance, and documentation and recommendations for operational changes in distribution of treated water into injection wells. Modeling results will be included as necessary to support analysis of performance and recommendations.	9/28/2018	Annual Progress Report of the Effectiveness of the Chromium Plume Control Interim Measure	This progress report will include summaries of the data collected, the modeling activities and changes in projections, and a discussion of the effectiveness to meet the objectives of plume control, and recommendations on additional changes to be considered in the subsequent operating year.	9/30/2019	Annual Progress Report of the Effectiveness of the Chromium Plume Control Interim Measure	This progress report will include summaries of the data collected, the modeling activities and changes in projections, and a discussion of the effectiveness to meet the objectives of plume control, and recommendations on additional changes to be considered in the subsequent operating year.	9/30/2020
	Chromium IM & Characterization	8	Summary Report (Completion or Progress) of the Phase 1 Pilot Amendment Test Results	The report will include the description of the tests, the data collected in relation to the test plan, identify any anomolous conditions observed, and any preliminary results available.	7/31/2018						
	Chromium IM & Characterization	10	Phase 2 Pilot Amendment Testing Work Plan submitted to NMED-HWB	The investigation work plan will provide the description of the testing and data collection needs to meet stated data quality objectives.	9/28/2018	Summary Report (Completion or Progress) of the Phase 2 Pilot Amendment Test Results submitted to NMED-HWB	Summary report will include the description of the tests, the data collected in relation to the test plan, identify any anomolous conditoinis observed, and any preliminary results available.	9/30/2019	Chromium Corrective Measures Evaluation (CME) Report completed and submitted to NMED-HWB	The CME will be the culmination of the chromium investigatory activities and will include a recommendation of a remedy.	9/30/2020



Appendix B MILESTONES AND TARGETS											
			FY 2018 MILESTONES			FY 2019 TARGETS			FY 2020 TARGETS		
	Campaign	Milestone # FY2018	Milestone	Milestone Description	Milestone Date	Target	Target Description	Target Date	Target	Target Description	Target Date
Historical Properties Completion	Historical Properties - Upper LA Cyn	11	Upper Los Alamos Canyon Aggregate Area Phase II Investigation Report Submitted to NMED	Campaign level milestone for completion of all SWMUs/AOCs in Upper Los Alamos Canyon Aggregate Area and development and submittal of the Investigation Report. This report will include those DOE SWMUs on the back-side of private property (including SWMUs cleanup in Former TA-32 and separately reported).	9/28/2018						
	Historical Properties - Middle LA Cyn	12	Middle LA Canyon Phase II, Revision 2 Investigation Report submitted to NMED	This milestone is the final Phase II report for Middle Los Alamos Canyon Aggregate Area and will document the completion activities for cleanups, ECORisk studies, and risk assessments for all sites within the aggregate area.	9/28/2018						
RDX Characterization	RDX Characterization	2	Technical Report Package related to Deep Groundwater Investigation	Compendium of technical reports that will present results of hydrology, geology, and geochemistry studies that support Investigation Report for Deep Groundwater	3/30/2018						
	RDX Characterization	13	R-69 Field Completion	Letter 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.	9/28/2018	Investigation Report for Deep Groundwater	Investigation Report that culminates results of investigation activities associated with deep groundwater and includes a groundwater risk assessment. Folllows completion and multiple rounds of data collection at R-69.	3/30/2019	Corrective Measures Evaluation (CME) for the RDX Contaminant Plume in the Deep Groundwater	This CME will address RDX contamination in deep groundwater if the risk assessment in the Deep Groundwater Investigation Report indicates a driver for remediation to protect the regional aquifer.	3/30/2020
	RDX Characterization	14	First Annual Long-Term Monitoring Report following completion of Surface CMI and approval of a Long-Term Monitoring Plan	Annual report presenting results of periodic monitoring and inspection as required by Long-Term Monitoring Plan included in the Remedy Completion Report for Corrective Measures Implementation at Consolidated Unit 16-021(c)-99.	9/28/2018	Second Annual Long-Term Monitoring Report of Results following Surface RDX Corrective Measures Implementation Completion	Executes the reporting required for long-term monitoring and inspection for the Remedy Completion Report	9/30/2019	Third Annual Long-Term Monitoring Report of Results following Surface RDX Corrective Measures Implementation Completion	Executes the reporting required for long-term monitoring and inspection for the Remedy Completion Report	9/30/2020
TA-21 D&D and Cleanup	TA-21 D&D and Cleanup	7	Investigation Report for DP Sites Aggregate Area (DPSAA) at DP East at TA-21	Includes 4 SWMUs in Consolidated Unit 21-004(B)-99 and one SWMU in DP East (consolidated two previous targets).	6/29/2018	TA-21 Delta Prime (DP) West Building Footprint Investigations Complete and Investigation Report	This report will summarize the investigation of sites located at DP West.	9/30/2019	Following demolition of TA-21 Building 21-257 (not under Consent Order), initiate the Building 21-257 Footprint Investigation (tied to removal of DP West Industrial Waste Lines).	Initiate investigations of SWMUs/AOCs assoicated with Building 21-257	9/30/2020
	TA-21 D&D and Cleanup					TA-21 Westbay Wells Reconfiguration Activities Completed for (R-5, R-7, R-8, R-9i) and Report	This report will include a summary of field activities and as-built information asscoated with reconfiguration of the wells.	3/31/2019			

Appendix B MILESTONES AND TARGETS											
			FY 2018 MILESTONES			FY 2019 TARGETS			FY 2020 TARGETS		
	Campaign	Milestone # FY2018	Milestone	Milestone Description	Milestone Date	Target	Target Description	Target Date	Target	Target Description	Target Date
RDX Remedy	RDX Remedy										
Known Cleanup Sites (Above SSLs)	Known Cleanup Sites (Above SSLs)	15	Field Completion for Aggregate Area Known Cleanup Sites Campaign: SWMU 03-049(a) and SWMU 50-006(d)	Letter report documenting field completion of cleanups of two of the remaining seven sites currently known to exceed soil screening levels. Sites to be addressed are SWMU 03-049(a) and SWMU 50-006(d).	9/28/2018	Field Completion for Aggregate Area Known Cleanup Sites Campaign: 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 three of the remaining seven 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). This completes the Known Cleanup Sites Campaign.	9/30/2019			
MDAs-A & -T Remedy	MDAs-A & -T Remedy					MDA T Moisture Monitoring Instrumentation Installation Completion and Field Summary Report	Summary report describing the installation and instrumentation of boreholes at MDA T.	4/30/2019	MDA T Moisture Monitoring Report	Submittal of the Moisture Monitoring report including results and recommendations for final monitoring configuration.	4/30/2020
Southern External Boundary	Southern External Boundary					Chaquehui Canyon Aggregate Area Investigation Report Completed and Submitted to NMED-HWB	Initial Investigation and development of IR for one of the southern canyons. This campaign is paired with South Ancho as geographical proximity warrants pairing.	9/30/2019	Investigation Report for South Ancho Canyon Aggregate Area	Investigaiton Report for this aggregate area and the requisite risk assessment. This would include cleanups for media above SSLs.	9/30/2020
	Southern External Boundary								Investigation Report for Lower Water/Indio Canyon Aggregate Area	Investigaiton Report for this aggregate area and the requisite risk assessment. This would include cleanups for media above SSLs.	9/30/2020
MDA-C Remedy	MDA-C Remedy										
Sandia Canyon Watershed	Sandia Canyon Watershed	5	Sandia Canyon Wetland Performance Report for Period April 2017 - December 2017 [2018]	Annual inspection report describing activities performed in canyon to stablize headcutting in the wetland that is keeping trivalent chromium entrained.	4/30/2018	Sandia Canyon Wetland Performance Report for Period April 2018 - December 2018 [2019]	Annual inspection report describing activities performed in canyon to stablize headcutting in the wetland that is keeping trivalent chromium entrained.	4/30/2019	Sandia Canyon Wetland Performance Report for Period April 2019 - December 2019 [2020]	Annual inspection report describing activities performed in canyon to stablize headcutting in the wetland that is keeping trivalent chromium entrained.	4/30/2020
Pajarito Watershed	Pajarito Watershed										
Upper Water Watershed	Upper Water Watershed										
MDA-AB Remedy	MDA-AB Remedy										

Appendix B MILESTONES AND TARGETS

Appendix B MILESTONES AND TARGETS												
			FY 2018 MILESTONES			FY 2019 TARGETS			FY 2020 TARGETS			
	Campaign	Milestone # FY2018	Milestone	Milestone Description	Milestone Date	Target	Target Description	Target Date	Target	Target Description	Target Date	
MDA-H MDAs-G & - L Remedies	MDA-H Remedy											
	MDAs-G & -L Remedies											
					15				12			11