

Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Albuquerque**

Site Summary Level: **Los Alamos National Laboratory**

Project **AL013 / LANL Waste Management - Legacy Waste**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0472**

General Project Information

Project Description Narratives

Purpose, Scope, and Technical Approach:

Definition of Scope: The legacy project will:

- Manage all legacy mixed waste in compliance with the FFCO/STP, and prepare and submit the FFCO/STP Annual Update report.
 - Retrieve TRU waste from earth-covered storage pads; overpack damaged containers; vent and install high-efficiency particulate air (HEPA) filters into drum lids; and place the TRU waste containers into inspectable storage configurations. There are approximately 4,640 m3 of TRU that will be retrieved over a period of 7 years and stored in domes.
 - Certify 9,141.2 m3 of TRU waste to the requirements of WIPP Waste Acceptance Criteria (WAC) and LANL site-specific TRU project plans and procedures. The 9,141.2 m3 includes 93 m3 of remote-handled TRU waste. About 75% of the legacy TRU waste at LANL exceeds thermal power limits for transportation of the waste. The TRU waste in drums exceeding the thermal power limits must presently be repackaged into containers that meet the TRUPACT-II shipping requirements so that this waste may be transported to WIPP. On average, this is expected to result in shipped volumes being about 6 times those before repackaging. The quantity of legacy waste requiring repackaging is so large that work cannot be completed by FY 2006 under current funding targets, and the work is projected to be completed in FY 2013. If a technical or regulatory solution to the high wattage TRU waste problem is found, it could accelerate completion of the TRU waste workoff project by 8 years, and reduce the life cycle costs considerably. The actual schedule and cost savings would depend heavily on the magnitude of the change to existing thermal and gas generation limits.
 - Certify approximately 4.8 m3 of TRU waste from LRRI through FY 2006 to the requirements of WIPP WAC and the LANL site-specific TRU project plans and procedures. The schedule and cost for this activity have not been established.
 - Certify approximately 26.1 m3 of TRU waste from Sandia through FY 2006 to the requirements of WIPP WAC and the LANL site-specific TRU project plans and procedures. The 26.1m3 includes approximately 1.8 m3 of remote-handled TRU waste. The schedule and cost for this activity have not been established.
 - Store TRU waste in domes, shafts, and pits. After FY 1998, costs for storage are split between legacy and newly generated TRU waste.
 - Treat TRU waste. This includes TRU-size reduction and repackaging at the Waste Characterization Reduction and Repackaging Facility (WCRRF) or the Radioactive Materials Research, Operations and Demonstration Facility (RAMROD); and sort, segregate and repack TRU and MTRU waste.
- Note: "Treat" and "store" are used generically in this plan, and are not meant to imply RCRA-specific processes.
- Develop a transportation program to allow transportation of TRU between the LANL facilities, and perform those activities required to allow shipment of legacy TRU waste to WIPP. (This project does not include the cost of TRUPACT-II containers or the cost of actual shipment to WIPP)

Dataset Name: **FY 1999 Planning Data**

Date of Dataset: **9/20/1999**

Page 1 of 30

Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Albuquerque**

Site Summary Level: **Los Alamos National Laboratory**

Project **AL013 / LANL Waste Management - Legacy Waste**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0472**

Project Description Narratives

[the TRUPACT-II containers are supplied by DOE/Carlsbad Area Office or CAO]).

- Workoff all legacy remote handled TRU waste (93 m3) by FY2013.
- Ship by the end of FY 2013 all legacy TRU waste from LANL to WIPP for disposal (an estimated 9,141.2 m3).
- Implement "upstream treatment" of legacy TRU waste contained in non-certifiable packages. The projects will reduce the total volume of legacy TRU waste by as much as 2,000 m3 by size reduction of large objects and removal of waste that may be reclassified to low-level radioactive waste. Investment and operating costs for the upstream treatment for legacy TRU waste are estimated to total about \$5.7 million over the ten-year period.
- Store (until shipped for treatment and disposal) MLLW in domes, chemical storage sheds, and on asphalt pads. After FY 1998, costs for storage of MLLW are shared with newly generated MLLW.
- Characterize MLLW to determine appropriate treatment and to ensure compliance with transportation requirements and WAC of treatment and disposal facilities.
- Treat and dispose by the end of FY 2003 of all legacy MLLW (an estimated 637 m3 of MLLW generated through FY 1998) at RCRA permitted, radioactive licensed commercial or RCRA permitted DOE treatment and disposal facilities. It is expected that a small volume of waste may not have a disposal path for treatment. This waste may not be treated until as late as 2006.

Technical Approach: TRANSURANIC WASTE:

All retrieval operations to remove TRU waste from earth-covered storage pads will comply with all LANL and DOE site-specific requirements of DOE Order 5480.31 and Operational Readiness Reviews, the Consent Agreement with the New Mexico Environment Department (NMED) of 1994, and the LANL RCRA permit.

A single integrated program, which minimizes individual characterization activities where possible, is used to satisfy various requirements (including compliance orders and agreements, federal and state regulations, WIPP WAC, DOE orders, and on-site safe storage requirements). TRU waste must be fully characterized to meet requirements and must be certified as meeting the WIPP WAC. The main elements of characterization are: nondestructive testing (radiography and radioassay), acceptable knowledge development, sampling and chemical analysis, headspace gas sampling, visual characterization, and associated QA documentation and recordkeeping. Characterization includes use of both fixed nuclear facilities and mobile systems; mobile systems are used to supplement facility capacity and to facilitate characterization where bringing the systems to the location of the TRU waste is the most practical.

Certification tasks include developing, implementing, and maintaining procedures and plans to verify that TRU waste meets the WIPP WAC. The tasks that make up this activity provide for fully implementing certification of TRU waste to WIPP WAC revision 5, and all required WIPP and site-

Dataset Name: **FY 1999 Planning Data**

Date of Dataset: **9/20/1999**

Page 2 of 30

Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Albuquerque**

Site Summary Level: **Los Alamos National Laboratory**

Project **AL013 / LANL Waste Management - Legacy Waste**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0472**

Project Description Narratives

specific documents, including the TRU Waste Characterization Quality Assurance Program Plan, the LANL Quality Assurance Project Plan, the LANL TRU Waste Certification Plan, and associated procedures. The TRU waste certification program also satisfies certification as described in the LANL RCRA storage Waste Analysis Plan (WAP) for TRU waste and certification of radioactive waste as required by DOE orders and LANL Laboratory Standards. Beginning in FY2002, characterization and certification activities will be increased to two shifts a day, which will allow the work to be completed in FY2013.

Temporary Storage Enclosures (or domes) are used for the storage of fiberglass-reinforced plastic-coated plywood (FRP) crates, standard waste boxes (SWBs), and drums of TRU waste. The domes used for TRU waste storage are equipped with a smoke detection system in accordance with DOE 5480.7A and lightning protection is provided. Local ventilation consisting of single-stage HEPA-filtered blowers mounted on dollies may be required to reduce the possibility of airborne emissions from repackaging and overpacking operations and to control internal contamination.

Implement two upstream treatment projects for legacy TRU waste. These projects are targeted at treating legacy TRU waste contained in non-certifiable packages. One project will sort, segregate, and size reduce TRU wastes contained in non-standard waste containers currently on-site. It is expected that this will reduce legacy TRU waste volumes by as much as 2,000 m³. The second project will decontaminate some of the legacy TRU metal wastes contained in non-standard containers, which will result in reclassification of approximately 300 m³ of legacy TRU waste to low-level radioactive waste which can be disposed on site.

MIXED LOW LEVEL WASTE:

The overall process for managing legacy MLLW is to continue to store the waste pending treatment in accordance with requirements, prepare the waste for treatment, and ship the waste for treatment and disposal. Storage of legacy MLLW involves inspection of the waste containers, repackaging and overpacking wastes as necessary, and radiological surveys of the containers and storage facilities. The MLLW storage operations include activities for auditing, inspection, waste characterization and verification, maintaining equipment and storage facilities, and maintaining the database and records that document the RCRA classification and radiological characteristics of the MLLW inventory in storage.

The FFCO/STP Annual Update Report will be prepared each year throughout the MLLW work-off process in accordance with FFCO/STP requirements. Compliance with the FFCO/STP will be monitored and enforced on an ongoing basis. Changes in regulatory requirements and both waste generator and DOE needs will be assessed on an annual basis.

Project Status in FY 2006:

FY2006 STATUS

At the end of FY 2006, a total of 4,984 m³ of legacy TRU waste will have been characterized, certified, repackaged if necessary, placed in TRUPACTs and shipped to WIPP.

All legacy MLLW will be appropriately treated and disposed by the end of FY 2003.

Post-2006 Project Scope:

Dataset Name: **FY 1999 Planning Data**

Date of Dataset: **9/20/1999**

Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Albuquerque**

Site Summary Level: **Los Alamos National Laboratory**

Project **AL013 / LANL Waste Management - Legacy Waste**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0472**

Project Description Narratives

POST FY2006 scope

Legacy TRU waste, including remote-handled TRU waste, work-off activities will continue and be completed in FY 2013. Upon completion of legacy TRU waste work-off, facilities used for legacy TRU waste storage, characterization and certification activities will be closed. Decommissioning and decontamination activities, including regulatory closures, for the WCRRF and RAMROD facilities will begin in FY2014 and be completed in FY2015.

Project End State

End State

All legacy TRU waste, including remote-handled TRU waste, will be retrieved, characterized, treated, certified, placed in TRUPACTs and shipped directly to WIPP by the end of FY2013. Newly generated TRU waste will be certified and shipped to WIPP as it is generated starting in FY2002.

The upstream treatment projects for legacy TRU waste will be completed in FY2006.

All legacy MLLW will be appropriately disposed by the end of FY 2003. It is expected that a small volume of waste may not have a disposal path for treatment. This waste may not be treated until as late as 2006. Newly generated MLLW will be shipped for treatment and disposal within one year of generation after FY 1999. The WCRRF and the RAMROD will be decommissioned and decontaminated by the end of FY2015.

Cost Baseline Comments:

Cost Baseline

Waste management costs for each waste type are divided into four categories: base operating costs, treatment/storage/disposal (TSD), projects and upstream treatment. Base operating costs represent the costs required by a facility to maintain capability to process a single unit of waste. Base operating costs are not volume related. The costs will be incurred, subject to efficiencies, until the facility is essentially closed. TSD costs are related to volume of waste. Project costs are for improvement of process, upgrades of or additions to facilities. Costs of projects to treat waste at the point of generation to reduce volumes of waste received for treatment are identified as upstream treatment projects. These four components of cost define the LANL Focus 2006 Plan.

Activity based costing (ABC) techniques were used in the development of the FY1997 WM Baseline submittal. The base operating and TSD costs developed for that submittal have been extrapolated for this FOCUS 2006 PLAN.

This plan does NOT contain contingency or management reserve.

Safety & Health Hazards:

Hazards

Waste Management Program operations for legacy wastes at the Los Alamos National Laboratory (LANL) include management of mixed low level

Dataset Name: **FY 1999 Planning Data**

Page 4 of 30

Date of Dataset: **9/20/1999**

Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Albuquerque**

Site Summary Level: **Los Alamos National Laboratory**

Project **AL013 / LANL Waste Management - Legacy Waste**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0472**

Project Description Narratives

waste (MLLW), transuranic (TRU) waste, and mixed transuranic (MTRU) waste. Mixed wastes contain both a radioactive and a hazardous component. Activities involved in managing these waste types include characterization of the wastes, storage and waste handling, retrieval of TRU and MTRU wastes from storage in earth-covered storage pads, and preparation for off-site shipment for treatment and disposal. Projects for waste reduction (called upstream treatment projects) are also planned. Construction of waste storage facilities, and upgrades or modifications to the waste management facilities involve construction activities. Potential hazards associated with one or more of the waste management activities include radiation and radioactive materials; chemicals; confined spaces; thermal stress; fire/explosion; electrical, pressurized and mechanical systems; and industrial hazards from equipment such as cranes, forklifts, and earthmoving equipment.

Hazards analysis and review of waste management activities is an on-going process with annual reviews and revisions of safety and health documentation for the waste management facilities. New operations are analyzed and revisions to the documentation may be added to the facilities with the hazards analyzed appropriately. Specific hazard documentation for the waste management facilities includes hazards analyses, safety assessments, safety analysis reports, and performance assessments. Safety Analysis Reports (SARs), with their associated Technical Safety Requirements (TSRs), serve as the primary documents for the authorization basis for the facilities, and must be reviewed and approved by DOE-Albuquerque.

Existing and planned documentation for the LANL waste management facilities for legacy wastes include:

- Hazards Analysis of the Los Alamos National Laboratory Area G, Low Level Waste and Transuranic Waste Storage Facility, LANL LA-UR-95-8888
- Fire Hazard Analysis for Technical Area 54, Area G, LANL Report-54G-010
- Fire Hazard Analysis for the Retrieval Dome for the Transuranic Waste Inspectable Storage Project, at TA-54, Area G, LANL Report-54G-007
- Performances Assessment and Composite Analysis for Los Alamos National Laboratory Material Disposal Area G, LANL Report-54G-13
- Safety Analysis Report for TA-54, Area G, LANL CST-14G-Report-003
- Safety Analysis Report for the Retrieval of Transuranic Waste from Pads 1, 2, and 4 at TA-54 Area G, LANL TA-54G-Report-011
- Los Alamos National Laboratory TA-50 Waste Management Operations Safety analysis Report, Volume I: Information Common to All Facilities, LANL WASTEMGMT-REPORT-002,R.0
- Safety Analysis Report for the Waste Management Operations at TA-50, Volume II Information Specific to the Waste Characterization, Reduction, and Repackaging Facility, LANL CST7WCRRF-REPORT-002,R.1
- Safety Assessment for Radioassay and Nondestructive Testing Facility, TA-54-38, LANL CST7RANT-REPORT-002, R.2 (documents interim operations. Readiness assessment conducted February 1998)

Dataset Name: **FY 1999 Planning Data**

Date of Dataset: **9/20/1999**

Page 5 of 30

Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Albuquerque**

Site Summary Level: **Los Alamos National Laboratory**

Project **AL013 / LANL Waste Management - Legacy Waste**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0472**

Project Description Narratives

- Safety Analysis Report for Radioactive Materials Research, Operations, and Demonstration Facility, TA-50-37, LANL RAMROD-REPORT-001, R.0 (DOE approval August 1998).

Safety & Health Work Performance:

Work Performance

There are a number of ongoing activities and processes to ensure the adequacy of controls for health and safety, and to ensure readiness before the start of new processes or operations. Operational Readiness Reviews (ORRs) are conducted before the start of major operations or facilities. These ORRs include a review of the entire facility infrastructure including ESH programs, document control and records management, and radiation control programs. Document control programs manage all documents used at waste management facilities and ensure that changes to any process are reviewed against the authorization basis. Subject matter experts review all new documentation and changes to existing procedures to ensure compliance.

Unreviewed Safety Question Determinations (USQD) are performed regularly and are tracked by document control. If a proposed change does not fall within the authorization basis (SAR and TSRs), DOE approval is required before implementation of the proposed change.

The USQD program has not been implemented at the RAMROD Facility planned for TRU waste characterization. However, before the RAMROD Facility began operations, it completed an ORR, as required by DOE, in December 1998, to ensure that personnel and equipment were prepared and ready to begin programmatic operations.

In addition to the ORR and USQD programs, there are other programs in place to identify potential environment, safety and health (ESH) hazards and to manage facility changes and projects. These include the LANL ESH Project Summary Review process, and facility-level reviews by facility ESH review teams. The ESH Project Summary Review is coordinated through the LANL ESH Division and includes review by Subject Matter Experts across all ESH disciplines. The process owner or facility manager must respond to all comments to ensure they are considered before the project is initiated.

Task hazard analyses are performed for all waste management operations. From these analyses Standard and Detailed Operating Procedures are developed. Training plans are developed and training provided so that workers understand and can perform their work in a safe manner. All workers are instructed to stop work if the operation is unsafe or varies from the approved procedures. Radiation and Special Work Permits are used to supplement the procedures used on site, and are used by Radiation Control Technicians to ensure that operations follow ALARA principles for work involving radiation or radioactive materials. Facility Management Plans, Site Emergency Plans, and the LANL Emergency Management Plan establish procedures and resources to address non-routine and off-normal occurrences to minimize the risk to workers, the public, and the environment from leaks, spills or other occurrences.

Safety and Health resources are shown in the S&H Cost & FTE tables by functional category and are deemed adequate to perform the S&H scope of work.

Dataset Name: **FY 1999 Planning Data**

Date of Dataset: **9/20/1999**

Page 6 of 30

Project Baseline Summary Report

Data Source: EM CDB

Operations/Field Office: Albuquerque

Site Summary Level: Los Alamos National Laboratory

Project AL013 / LANL Waste Management - Legacy Waste

Report Number: GEN-01b

Print Date: 3/9/2000

HQ ID: 0472

Project Description Narratives

PBS Comments:

LANL is planning to be the first site ready to ship TRU waste to WIPP, and plans to process and ship all legacy TRU to WIPP before the end of FY2015.

Baseline Validation Narrative:

Programmatic validation was achieved through three internal review sessions of previous draft versions of the TYP. Each major activity was examined based on known milestones, regulatory drivers, and programmatic expectations. Budget validation was conducted by the Business Operations Office to ensure that appropriate pricing values were used for Laboratory resources. Since this is not a formal budget submittal, full and comprehensive validation, including Laboratory Controller sign-out of the TYP was not conducted.

General PBS Information

Project Validated? Yes Date Validated: 2/13/1997

Has Headquarters reviewed and approved project? No

Date Project was Added: 12/1/1997

Baseline Submission Date: 7/1/1999

FEDPLAN Project? Yes

Drivers:	CERCLA	RCRA	DNFSB	AEA	UMTRCA	State	DOE Orders	Other
	N	Y	N	N	N	Y	Y	Y

Project Identification Information

DOE Project Manager: James Nunz

DOE Project Manager Phone Number: 505-667-0573

DOE Project Manager Fax Number: 505-665-4872

DOE Project Manager e-mail address: jnunz@doe.lanl.gov

Is this a High Visibility Project (Y/N): Y

Planning Section

Baseline Costs (in thousands of dollars)

Dataset Name: FY 1999 Planning Data

Date of Dataset: 9/20/1999

Page 7 of 30

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Albuquerque**

Print Date: **3/9/2000**

Site Summary Level: **Los Alamos National Laboratory**

HQ ID: **0472**

Project **AL013 / LANL Waste Management - Legacy Waste**

	1997-2006 Total	2007-2070 Total	1997-2070 Total	1997	Actual 1997	1998	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006	
PBS Baseline (current year dollars)	355,498	353,495	708,993	16,426	24,247	28,127	27,333	17,126	21,000	29,000	35,574	42,979	55,615	55,668	53,983	
PBS Baseline (constant 1999 dollars)	327,423	272,989	600,412	16,426	24,247	28,127	27,333	17,126	20,448	27,657	33,229	39,320	49,833	48,855	46,402	
PBS EM Baseline (current year dollars)	355,498	353,495	708,993	16,426	24,247	28,127	27,333	17,126	21,000	29,000	35,574	42,979	55,615	55,668	53,983	
PBS EM Baseline (constant 1999 dollars)	327,423	272,989	600,412	16,426	24,247	28,127	27,333	17,126	20,448	27,657	33,229	39,320	49,833	48,855	46,402	
	2007	2008	2009	2010	2011- 2015	2016- 2020	2021- 2025	2026- 2030	2031- 2035	2036- 2040	2041- 2045	2046- 2050	2051- 2055	2056- 2060	2061- 2065	2066- 2070
PBS Baseline (current year dollars)	35,487	36,233	36,994	37,770	201,153	5,858	0	0	0	0	0	0	0	0	0	0
PBS Baseline (constant 1999 dollars)	29,876	29,876	29,876	29,876	149,559	3,926	0	0	0	0	0	0	0	0	0	0
PBS EM Baseline (current year dollars)	35,487	36,233	36,994	37,770	201,153	5,858	0	0	0	0	0	0	0	0	0	0
PBS EM Baseline (constant 1999 dollars)	29,876	29,876	29,876	29,876	149,559	3,926	0	0	0	0	0	0	0	0	0	0

Baseline Escalation Rates

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0.00%	0.00%	0.00%	2.70%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%
2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070

Dataset Name: **FY 1999 Planning Data**

Page 8 of 30

Date of Dataset: **9/20/1999**

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Albuquerque**

Print Date: **3/9/2000**

Site Summary Level: **Los Alamos National Laboratory**

HQ ID: **0472**

Project **AL013 / LANL Waste Management - Legacy Waste**

2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%

Project Reconciliation

Project Completion Date Changes:

Previously Projected End Date of Project:

Current Projected End Date of Project: 9/30/2013

Explanation of Project Completion Date Difference (if applicable):

Project Cost Estimates (in thousands of dollars)

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars):	586,074	Actual 1997 Cost:	24,247	Actual 1998 Cost:	27,333
Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars):	534,494	Inflation Adjustment (2.7% to convert 1998 to 1999 dollars):			14,431
Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	548,925				

Project Cost Changes

	Cost Adjustments	Reconciliation Narratives
Cost Change Due to Scope Deletions (-):		
Cost Reductions Due to Efficiencies (-):		
Cost Associated with New Scope (+):	6,934	Increased generation in FY98 of TRU Waste.
Cost Growth Associated with Scope Previously Reported (+):		
Cost Reductions Due to Science & Technology Efficiencies (-):		
Subtotal:	555,859	
Additional Amount to Reconcile (+):	0	
Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	555,859	

Dataset Name: **FY 1999 Planning Data**

Page 9 of 30

Date of Dataset: **9/20/1999**

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Albuquerque**

Print Date: **3/9/2000**

Site Summary Level: **Los Alamos National Laboratory**

HQ ID: **0472**

Project **AL013 / LANL Waste Management - Legacy Waste**

Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
Complete Determin. of Treatment Operations for LLMW	4172-19		12/20/1998		12/20/1998	12/9/1998				Y	
Complete Lead Decontamination	4172-20		12/2/1998		12/2/1998	11/30/1998				Y	
Complete Off-Site Shipment of Soil with Heavy Metals	4172-11		12/30/1998		12/30/1998					Y	
Document to NMED that Soil with Heavy Metals Received at TSDF	4172-14		3/9/1999		3/9/1999					Y	
LANL TRU Waste Inspectable Storage Project			9/30/1999						Y	Y	
Begin Work-off of TRU Legacy			3/26/1999								
Complete Work-off of TRU Legacy			9/30/2013								
D&D for TRU Legacy			9/30/2015								

Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critical Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
Complete Determin. of Treatment Operations for LLMW	4172-19										
Complete Lead Decontamination	4172-20										
Complete Off-Site Shipment of Soil with Heavy Metals	4172-11										
Document to NMED that Soil with Heavy Metals Received at TSDF	4172-14										
LANL TRU Waste Inspectable Storage Project											LANL Transuranic Waste Inspectable Storage Project recover 3300 drum-equivalents from TWISP pad 4 and place in inspectable storage.
Begin Work-off of TRU Legacy				Y							Begin shipment of the LANL TRU

Dataset Name: **FY 1999 Planning Data**

Page 10 of 30

Date of Dataset: **9/20/1999**

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Albuquerque**

Print Date: **3/9/2000**

Site Summary Level: **Los Alamos National Laboratory**

HQ ID: **0472**

Project **AL013 / LANL Waste Management - Legacy Waste**

Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critical Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
Complete Work-off of TRU Legacy					Y						Legacy Waste to WIPP. Final Shipment of the LANL TRU Legacy Waste to WIPP.
D&D for TRU Legacy						Y					The D&D Completion for TRU Legacy following TRU Legacy shipment to WIPP.

Performance Measure Metrics

Category/Subcategory	Units	1997-2006 Total	2007-2070 Total	1997-2070 Total	Actual Pre-1997	Planned 1997	Actual 1997	Planned 1998	Planned 1999	Planned 2000	Planned 2001	Planned 2002	Planned 2003	Planned 2004
TRU														
Storage	M3							9,141.70	9,131.20	9,028.20	8,925.20	8,426.30	7,915.90	6,778.30
TRU														
Ship. to WIPP	M3	4,980.60	4,161.10	9,141.70	0.00		0.00		10.50	103.00	103.00	498.90	510.40	1,137.60
MLLW														
Storage	M3							515.91	442.54	366.72	269.59	188.40	56.46	0.00
MLLW														
On-Site Disp.	M3	0.00	0.00	0.00	0.00		0.00							
MLLW														
Comm. Disp.	M3	570.11	0.00	570.11	0.00		0.00	112.42	59.37	55.82	90.13	64.28	131.63	56.40
MLLW														
Ship to DOE Disp.	M3	0.00	0.00	0.00	0.00		0.00							
MLLW														
TBD Disp.	M3	0.31	0.00	0.31									0.31	

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Albuquerque**

Print Date: **3/9/2000**

Site Summary Level: **Los Alamos National Laboratory**

HQ ID: **0472**

Project **AL013 / LANL Waste Management - Legacy Waste**

Performance Measure Metrics

Category/Subcategory	Units	1997-2006 Total	2007-2070 Total	1997-2070 Total	Actual Pre-1997	Planned 1997	Actual 1997	Planned 1998	Planned 1999	Planned 2000	Planned 2001	Planned 2002	Planned 2003	Planned 2004
LLW														
Storage	M3													
LLW														
On-Site Disp.	M3	0.20	0.00	0.20	0.00		0.00	0.20						
Rem. Waste														
Disposed	M3	211.50	0.00	211.50	0.00		0.00	211.50						
Tech.														
Deployed	Ntd	6.00	0.00	6.00					4.00	2.00				
Category/Subcategory	Units	Planned 2004	Planned 2005	Planned 2006	Planned 2007	Planned 2008	Planned 2009	Planned 2010	Planned 2011 - 2015	Planned 2016 - 2020	Planned 2021 - 2025	Planned 2026 - 2030	Planned 2031 - 2035	
TRU														
Storage	M3	6,778.30	5,696.10	4,161.10	3,082.50	2,097.10	1,355.80	634.00						
TRU														
Ship. to WIPP	M3	1,137.60	1,082.20	1,535.00	1,078.60	985.40	741.30	721.80	634.00					
MLLW														
Storage	M3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MLLW														
On-Site Disp.	M3													
MLLW														
Comm. Disp.	M3	56.46												
MLLW														
Ship to DOE Disp.	M3													

Dataset Name: **FY 1999 Planning Data**

Page 12 of 30

Date of Dataset: **9/20/1999**

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Albuquerque**

Print Date: **3/9/2000**

Site Summary Level: **Los Alamos National Laboratory**

HQ ID: **0472**

Project **AL013 / LANL Waste Management - Legacy Waste**

Category/Subcategory	Units	Planned 2004	Planned 2005	Planned 2006	Planned 2007	Planned 2008	Planned 2009	Planned 2010	Planned 2011 - 2015	Planned 2016 - 2020	Planned 2021 - 2025	Planned 2026 - 2030	Planned 2031 - 2035
MLLW													
TBD Disp.	M3												
LLW													
Storage	M3												
LLW													
On-Site Disp.	M3												
Rem. Waste													
Disposed	M3												
Tech.													
Deployed	Ntd												
Category/Subcategory	Units	Planned 2036 - 2040	Planned 2041 - 2045	Planned 2046 - 2050	Planned 2051 - 2055	Planned 2056 - 2060	Planned 2061 - 2035	Planned 2066 - 2070	Exceptions	Lifecycle Total			
TRU													
Storage	M3												
TRU													
Ship. to WIPP	M3											9,516.20	
MLLW													
Storage	M3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
MLLW													
On-Site Disp.	M3												135.50
MLLW													
Comm. Disp.	M3								2,123.10			2,661.42	
MLLW													
Ship to DOE Disp.	M3											0.00	

Dataset Name: **FY 1999 Planning Data**

Page 13 of 30

Date of Dataset: **9/20/1999**

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Albuquerque**

Print Date: **3/9/2000**

Site Summary Level: **Los Alamos National Laboratory**

HQ ID: **0472**

Project **AL013 / LANL Waste Management - Legacy Waste**

Category/Subcategory	Units	Planned 2036 - 2040	Planned 2041 - 2045	Planned 2046 - 2050	Planned 2051 - 2055	Planned 2056 - 2060	Planned 2061 - 2035	Planned 2066 - 2070	Exceptions	Lifecycle Total
MLLW										
TBD Disp.	M3									0.31
LLW										
Storage	M3								0.00	
LLW										
On-Site Disp.	M3								47.00	47.00
Rem. Waste										
Disposed	M3									0.00
Tech.										
Deployed	Ntd								4.00	6.00

Technology Needs

Site Need Code: AL-07-01-07-MW

Site Need Name: Treatment of Mixed Waste Contaminated with Mercury

Focus Area Work Package ID: MW-02

Focus Area Work Package: Treatment and Stabilization Alternative for Hg Bearing Mixed Waste

Focus Area: MWFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Both

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Mercury Contamination - Amalgamate Mercury (contract with NFS and ADA)

Stabilization of Mercury Using Sulfur Polymer Cement

Mercury Removal Using General Electric Process

Mercury Contamination - Separate and Remove Mercury using Polymer Filtration

Mercury Separation from Mixed Waste by Combining ORNL KI/I2 Leaching with PNNL SAMMS Technology

Dataset Name: **FY 1999 Planning Data**

Page 14 of 30

Date of Dataset: **9/20/1999**

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Albuquerque**

Print Date: **3/9/2000**

Site Summary Level: **Los Alamos National Laboratory**

HQ ID: **0472**

Project **AL013 / LANL Waste Management - Legacy Waste**

Technology Needs

Mercury Separation from Organic Liquids using SAMMs Technology
 Mercury Contamination - Separate and Remove Mercury using Sorbent Process
 Mercury Removal from DOE Waste Organics
 Mercury Contamination - National Treatment Initiative Support
 Mercury Wastes - >260ppm

<u>Related CCP Milestones</u>	<u>Related Waste Streams</u>	<u>Agree?</u>	<u>Change?</u>
	02392: LA-W920,25 - Mercury Legacy	Y	N

Site Need Code: AL-09-01-12-MW

Site Need Name: Decontamination and Volume Reduction of TRU and LLW Metals

Focus Area Work Package ID: MW-03

Focus Area Work Package: Handling Mixed Waste Contaminated Materials During Characterization, Treatment, Packaging, and Disposal

Focus Area: MWFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Both

<u>Technologies</u>	<u>Cost Savings (in thousands of dollars)</u>	<u>Range of Estimate</u>
Mechanical Systems - Adaptation and Development of Size Reduction Equipment for Remote Handled Waste		
Decontamination and Volume Reduction System	168,000	Unknown

<u>Related CCP Milestones</u>	<u>Related Waste Streams</u>	<u>Agree?</u>	<u>Change?</u>
	00327: LAT1 - Transuranic Waste (Legacy)	Y	N
	02392: LA-W920,25 - Mercury Legacy	Y	N
	02395: LA-W930,31 - Lead for Decon Legacy	Y	N

Project Baseline Summary Report

Data Source: EM CDB

Report Number: GEN-01b

Operations/Field Office: Albuquerque

Print Date: 3/9/2000

Site Summary Level: Los Alamos National Laboratory

HQ ID: 0472

Project AL013 / LANL Waste Management - Legacy Waste

Technology Needs

Site Need Code: AL-07-01-10-MW

Site Need Name: Cost effective, regulatorily acceptable treatment of Certain Low-Level Mixed Waste Streams

Focus Area Work Package ID: MW-07

Focus Area Work Package: Alternatives to Incineration to Reduce Emission Hazards.

Focus Area: MWFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Risk Reduction

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Direct Chemical Oxidation

Salt and Ash Stabilization - Stabilize Waste using Phosphate Ceramic Process

Electrolytic Treatment of Mixed Waste

Salt and Ash Stabilization - Stabilize High Salt Content Waste Using Cementitious Process

Stabilization of Salt Using Encapsulation with Polyester Resin

Salt and Ash Stabilization - Stabilize High Salt Content Waste Using Polysiloxane Process

Alternative Oxidation Technology - PCBs

Site Need Code: AL-07-01-11-MW

Site Need Name: Waste Sorting and Characterization

Focus Area Work Package ID: MW-03

Focus Area Work Package: Handling Mixed Waste Contaminated Materials During Characterization, Treatment, Packaging, and Disposal

Focus Area: MWFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Risk Reduction

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Mechanical Systems - Handling Material in Contact-handled Processes using HANDS-55 Systems

Mechanical Systems - Remote and Automation Technology Needs Investigation

Mechanical Systems - Mobile Adaptation of HANDSS-55 Technology

Dataset Name: FY 1999 Planning Data

Page 16 of 30

Date of Dataset: 9/20/1999

Project Baseline Summary Report

Data Source: **EM CDB**
 Operations/Field Office: **Albuquerque**
 Site Summary Level: **Los Alamos National Laboratory**
 Project **AL013 / LANL Waste Management - Legacy Waste**

Report Number: **GEN-01b**
 Print Date: **3/9/2000**
 HQ ID: **0472**

Technology Needs

<u>Related CCP Milestones</u>	<u>Related Waste Streams</u>	<u>Agree?</u>	<u>Change?</u>
	02398: LLW-Legacy - Stored LLW Legacy (managed as MLLW)	Y	N

Site Need Code: AL-09-01-11-MW

Site Need Name: Characterization of Equipment Potentially Contaminated with Alpha Emitting Transuranic (TRU) Radionuclides

Focus Area Work Package ID:

Focus Area Work Package:

Focus Area:

Agree with Technology Link: N

Benefits (Cost, Risk Reduction, Both): Both

<u>Technologies</u>	<u>Cost Savings (in thousands of dollars)</u>	<u>Range of Estimate</u>
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Site Need Code: AL-07-01-08-MW

Site Need Name: Remediation of Compressed Gas Cylinders

Focus Area Work Package ID: MW-08

Focus Area Work Package: Facilitating Deployment for Unique Wastes

Focus Area: MWFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Both

<u>Technologies</u>	<u>Cost Savings (in thousands of dollars)</u>	<u>Range of Estimate</u>
---------------------	---	--------------------------

Gas Recontainerization

<u>Related CCP Milestones</u>	<u>Related Waste Streams</u>	<u>Agree?</u>	<u>Change?</u>
	02391: W917,18,26 - Gas Cylinders Legacy	Y	N

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Albuquerque**

Print Date: **3/9/2000**

Site Summary Level: **Los Alamos National Laboratory**

HQ ID: **0472**

Project **AL013 / LANL Waste Management - Legacy Waste**

Technology Needs

Site Need Code: AL-09-01-10-MW

Site Need Name: Integrated Systems Approach to the Destruction and Treatment of Both Solid and Liquid Combustible Pu-239 Contaminated Waste

Focus Area Work Package ID:

Focus Area Work Package:

Focus Area:

Agree with Technology Link: N

Benefits (Cost, Risk Reduction, Both): Both

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Site Need Code: AL-07-01-09-MW

Site Need Name: Mixed Waste Treatment

Focus Area Work Package ID: MW-08

Focus Area Work Package: Facilitating Deployment for Unique Wastes

Focus Area: MWFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Both

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Related CCP Milestones

Related Waste Streams

Agree?

Change?

02387: MW-New-1 - MLLW Newly Generated FY95-FY98

Y

N

02382: MW-New-2 - MLLW Newly Generated (post 1998)

Y

N

Dataset Name: **FY 1999 Planning Data**

Page 18 of 30

Date of Dataset: **9/20/1999**

Project Baseline Summary Report

Data Source: EM CDB

Operations/Field Office: Albuquerque

Site Summary Level: Los Alamos National Laboratory

Project AL013 / LANL Waste Management - Legacy Waste

Report Number: GEN-01b

Print Date: 3/9/2000

HQ ID: 0472

Technology Needs

Site Need Code: AL-09-01-09-MW

Site Need Name: Integrated Systems Approach to the Destruction and Treatment of Both Solid and Liquid Combustible Pu-238 Contaminated Waste

Focus Area Work Package ID: MW-08

Focus Area Work Package: Facilitating Deployment for Unique Wastes

Focus Area: MWFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Both

Technologies

Advanced Technologies for Stabilization of Pu-238 Contaminated Combustible Waste

Cost Savings (in thousands of dollars)

160,068

Range of Estimate

Unknown

Related CCP Milestones

Related Waste Streams

02388: LA-W906-9 - Combustible Liquids Legacy

Agree?

Y

Change?

N

Site Need Code: AL-08-01-17-MW

Site Need Name: Certifiability of Newly Generated TRU Waste

Focus Area Work Package ID: MW-05

Focus Area Work Package: Payload Enhancement for Transporting TRU Waste within Restrictive Regulatory Limits

Focus Area: MWFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Both

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Related CCP Milestones

Related Waste Streams

00326: LAT3 - Transuranic Waste (Newly)

Agree?

Y

Change?

N

Dataset Name: FY 1999 Planning Data

Date of Dataset: 9/20/1999

Page 19 of 30

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Albuquerque**

Print Date: **3/9/2000**

Site Summary Level: **Los Alamos National Laboratory**

HQ ID: **0472**

Project **AL013 / LANL Waste Management - Legacy Waste**

Technology Needs

Site Need Code: AL-09-01-08-MW

Site Need Name: Processing Tritiated Mixed Wastes For Tritium Recovery and Waste Elimination

Focus Area Work Package ID: MW-08

Focus Area Work Package: Facilitating Deployment for Unique Wastes

Focus Area: MWFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Both

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Related CCP Milestones

Related Waste Streams

Agree?

Change?

00099: AD - MLLW

Y

N

02389: LA-W913-15 - Aqueous Waste with Heavy Metals Legacy

Y

N

Site Need Code: AL-09-01-04-SC

Site Need Name: Environmental Disposition from TRU Waste Source Terms

Focus Area Work Package ID: SS-01

Focus Area Work Package: Characterization, Monitoring, Modeling and Analysis

Focus Area: SCFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Both

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Related CCP Milestones

Related Waste Streams

Agree?

Change?

00326: LAT3 - Transuranic Waste (Newly)

Y

N

00327: LAT1 - Transuranic Waste (Legacy)

Y

N

Dataset Name: **FY 1999 Planning Data**

Page 20 of 30

Date of Dataset: **9/20/1999**

Project Baseline Summary Report

Data Source: **EM CDB**
 Operations/Field Office: **Albuquerque**
 Site Summary Level: **Los Alamos National Laboratory**
 Project **AL013 / LANL Waste Management - Legacy Waste**

Report Number: **GEN-01b**
 Print Date: **3/9/2000**
 HQ ID: **0472**

Technology Needs

Site Need Code: AL-09-01-05-MW

Site Need Name: Mobile Analysis Methods for Hazardous Metals in TRU Waste

Focus Area Work Package ID: MW-01

Focus Area Work Package: Nondestructive Characterization for Treatment, Transportation, and Disposal of MLL and MTRU Waste.

Focus Area: MWFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Both

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Mechanical Systems - Handling Material in Contact-handled Processes using HANDS-55 Systems

Mechanical Systems - Mobile Adaptation of HANDSS-55 Technology

Related CCP Milestones

Related Waste Streams

Agree?

Change?

00327: LAT1 - Transuranic Waste (Legacy)

Y

N

Site Need Code: AL-07-01-06-MW

Site Need Name: Cost-Effective Treatment for Low-Level Mixed Waste

Focus Area Work Package ID: MW-04

Focus Area Work Package: Efficient Stabilization of High Metal Content Salts and Ash Waste

Focus Area: MWFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Both

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Salt and Ash Stabilization - Stabilize Waste using Phosphate Ceramic Process

Cyanide Destruction/Immobilization of Residual Sludge

Electrolytic Treatment of Mixed Waste

Stabilization of Beryllium and Reactive Metals

Salt and Ash Stabilization - Stabilize High Salt Content Waste Using Polysiloxane Process

Dataset Name: **FY 1999 Planning Data**

Page 21 of 30

Date of Dataset: **9/20/1999**

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Albuquerque**

Print Date: **3/9/2000**

Site Summary Level: **Los Alamos National Laboratory**

HQ ID: **0472**

Project **AL013 / LANL Waste Management - Legacy Waste**

Technology Needs

Related CCP Milestones

Related Waste Streams

Agree?

Change?

02398: LLW-Legacy - Stored LLW Legacy (managed as MLLW)

Y

N

01293: AK - MLLW Soils/Sediments

Y

N

00099: AD - MLLW

Y

N

Site Need Code: AL-09-01-07-MW

Site Need Name: Portable Tomographic Gamma Scanner (TGS) System

Focus Area Work Package ID:

Focus Area Work Package:

Focus Area:

Agree with Technology Link: N

Benefits (Cost, Risk Reduction, Both): Both

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Site Need Code: AL-09-01-06-MW

Site Need Name: Mobile Neutron Assay System (Mn/aS) for SWBs

Focus Area Work Package ID:

Focus Area Work Package:

Focus Area:

Agree with Technology Link: N

Benefits (Cost, Risk Reduction, Both): Both

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Dataset Name: **FY 1999 Planning Data**

Page 22 of 30

Date of Dataset: **9/20/1999**

Project Baseline Summary Report

Data Source: **EM CDB**
 Operations/Field Office: **Albuquerque**
 Site Summary Level: **Los Alamos National Laboratory**
 Project **AL013 / LANL Waste Management - Legacy Waste**

Report Number: **GEN-01b**
 Print Date: **3/9/2000**
 HQ ID: **0472**

Technology Needs

Site Need Code: AL-07-01-14-MW

Site Need Name: Appropriate Characterization of TRU Waste Now Stored in Fiberglass Reinforced Plywood Boxes for Waste Isolation Pilot Project (WIPP)

Focus Area Work Package ID: MW-05

Focus Area Work Package: Payload Enhancement for Transporting TRU Waste within Restrictive Regulatory Limits

Focus Area: MWFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Both

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Related CCP Milestones

Related Waste Streams

Agree?

Change?

02153: -

Y

N

00327: LAT1 - Transuranic Waste (Legacy)

Y

N

Site Need Code: AL-09-01-13-MW

Site Need Name: Disposal & Recycle Technologies for Scrap Uranium Chips and Turnings

Focus Area Work Package ID: MW-08

Focus Area Work Package: Facilitating Deployment for Unique Wastes

Focus Area: MWFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Both

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Related CCP Milestones

Related Waste Streams

Agree?

Change?

02027: -

Y

N

Dataset Name: **FY 1999 Planning Data**

Date of Dataset: **9/20/1999**

Project Baseline Summary Report

Data Source: **EM CDB**
 Operations/Field Office: **Albuquerque**
 Site Summary Level: **Los Alamos National Laboratory**
 Project **AL013 / LANL Waste Management - Legacy Waste**

Report Number: **GEN-01b**
 Print Date: **3/9/2000**
 HQ ID: **0472**

Technology Needs

Site Need Code: AL-09-01-14-MW
Site Need Name: Elimination of Layers of Confinement in TRU Waste Containers

Focus Area Work Package ID: MW-03 **Focus Area Work Package:** Handling Mixed Waste Contaminated Materials During Characterization, Treatment, Packaging, and Disposal

Focus Area: MWFA **Agree with Technology Link:** Y

Benefits (Cost, Risk Reduction, Both): Risk Reduction

Technologies

Solutions for TRU Waste Streams without Disposition Options

Related CCP Milestones

Related Waste Streams

02153: -

Cost Savings (in thousands of dollars)

Range of Estimate

Agree?

Change?

Y

N

Site Need Code: AL-09-01-15-MW

Site Need Name: Improved method for measuring the hydrogen generation rate from TRU waste drum.

Focus Area Work Package ID: **Focus Area Work Package:**

Focus Area: **Agree with Technology Link:** N

Benefits (Cost, Risk Reduction, Both): Both

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Albuquerque**

Site Summary Level: **Los Alamos National Laboratory**

Project **AL013 / LANL Waste Management - Legacy Waste**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0472**

Technology Needs

Site Need Code: AL-09-01-16-MW

Site Need Name: Evaluation of Hydrogen G-values for TRU Waste Types

Focus Area Work Package ID:

Focus Area Work Package:

Focus Area:

Agree with Technology Link: N

Benefits (Cost, Risk Reduction, Both): Both

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Site Need Code: AL-09-01-17-MW

Site Need Name: Robust Hydrogen Getters for TRU Waste

Focus Area Work Package ID:

Focus Area Work Package:

Focus Area:

Agree with Technology Link: N

Benefits (Cost, Risk Reduction, Both): Both

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Albuquerque**

Print Date: **3/9/2000**

Site Summary Level: **Los Alamos National Laboratory**

HQ ID: **0472**

Project **AL013 / LANL Waste Management - Legacy Waste**

Technology Needs

Site Need Code: AL-09-01-17-Pu-S

Site Need Name: Stress Corrosion Cracking of Stainless Steel in Nitric Acid / Halide Environments

Focus Area Work Package ID:

Focus Area Work Package:

Focus Area:

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both):

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Related CCP Milestones

Related Waste Streams

Agree?

Change?

02017: LLW-3 - Non-Compactible

Y

N

Site Need Code: AL-09-01-19-MW-S

Site Need Name: Re-packaging of High Thermal Wattage TRU Waste Drums to Meet DOE Gas Generation Regulations

Focus Area Work Package ID: MW-03

Focus Area Work Package: Handling Mixed Waste Contaminated Materials During Characterization, Treatment, Packaging, and Disposal

Focus Area: MWFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Risk Reduction

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Hydrogen Gas Getters

Deployment of TRU Solutions

Solutions for TRU Waste Streams without Disposition Options

Related CCP Milestones

Related Waste Streams

Agree?

Change?

00327: LAT1 - Transuranic Waste (Legacy)

Y

N

Dataset Name: **FY 1999 Planning Data**

Page 26 of 30

Date of Dataset: **9/20/1999**

Project Baseline Summary Report

Data Source: **EM CDB**
 Operations/Field Office: **Albuquerque**
 Site Summary Level: **Los Alamos National Laboratory**
 Project **AL013 / LANL Waste Management - Legacy Waste**

Report Number: **GEN-01b**
 Print Date: **3/9/2000**
 HQ ID: **0472**

Technology Needs

Site Need Code: AL-09-01-20-MW-S
Site Need Name: Replacement of Pb-loaded Gloves with Non-Hazardous Alternatives for Use in Handling Actinides
Focus Area Work Package ID: **Focus Area Work Package:**
Focus Area: **Agree with Technology Link:** Y
Benefits (Cost, Risk Reduction, Both): Both

<u>Technologies</u>	<u>Cost Savings (in thousands of dollars)</u>	<u>Range of Estimate</u>
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<u>Related CCP Milestones</u>	<u>Related Waste Streams</u>	<u>Agree?</u>	<u>Change?</u>
	01291: AF - HAZ Rubble Debris	Y	N

Site Need Code: AL-09-01-21-SNF-S
Site Need Name: Chemical Passivation of Spent Fuel Elements After Transfer from Wet to Dry Storage to Mitigate Future Corrosion in a Long-term Dry Storage Environment
Focus Area Work Package ID: **Focus Area Work Package:**
Focus Area: **Agree with Technology Link:** Y
Benefits (Cost, Risk Reduction, Both):

<u>Technologies</u>	<u>Cost Savings (in thousands of dollars)</u>	<u>Range of Estimate</u>
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Site Need Code: AL-09-01-22-MW-S
Site Need Name: High Volume Throughput Reduction of Nitrates in Wastewater Discharge Systems
Focus Area Work Package ID: **Focus Area Work Package:**
Focus Area: **Agree with Technology Link:** Y
Benefits (Cost, Risk Reduction, Both):

<u>Technologies</u>	<u>Cost Savings (in thousands of dollars)</u>	<u>Range of Estimate</u>
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Dataset Name: **FY 1999 Planning Data**

Date of Dataset: **9/20/1999**

Project Baseline Summary Report

Data Source: **EM CDB**
 Operations/Field Office: **Albuquerque**
 Site Summary Level: **Los Alamos National Laboratory**
 Project **AL013 / LANL Waste Management - Legacy Waste**

Report Number: **GEN-01b**
 Print Date: **3/9/2000**
 HQ ID: **0472**

Technology Needs

<u>Related CCP Milestones</u>	<u>Related Waste Streams</u>	<u>Agree?</u>	<u>Change?</u>
	00100: AE - HAZ Soils/Sediments	Y	N

Site Need Code: AL-09-01-24-MW-S
Site Need Name: Radioassay of Remote-Handled Transuranic (RH-TRU) Waste Containers to Meet WIPP Data Quality
Focus Area Work Package ID:
Focus Area:
Benefits (Cost, Risk Reduction, Both):

Focus Area Work Package:
Agree with Technology Link: Y

<u>Technologies</u>	<u>Cost Savings (in thousands of dollars)</u>	<u>Range of Estimate</u>
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<u>Related CCP Milestones</u>	<u>Related Waste Streams</u>	<u>Agree?</u>	<u>Change?</u>
	00327: LAT1 - Transuranic Waste (Legacy)	Y	N

Site Need Code: AL-09-01-25-MW-S
Site Need Name: Radioassay of Very Large Containers of Low-Level Contact-Handled Transuranic (CH-TRU) Waste to Meet WIPP Data Quality Assurance Objectives
Focus Area Work Package ID:
Focus Area:
Benefits (Cost, Risk Reduction, Both):

Focus Area Work Package:
Agree with Technology Link: Y

<u>Technologies</u>	<u>Cost Savings (in thousands of dollars)</u>	<u>Range of Estimate</u>
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<u>Related CCP Milestones</u>	<u>Related Waste Streams</u>	<u>Agree?</u>	<u>Change?</u>
	00327: LAT1 - Transuranic Waste (Legacy)	Y	N

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Albuquerque**

Print Date: **3/9/2000**

Site Summary Level: **Los Alamos National Laboratory**

HQ ID: **0472**

Project **AL013 / LANL Waste Management - Legacy Waste**

Technology Needs

Site Need Code: AL-09-01-26-SNF-S

Site Need Name: Determination of the Fissile Content of Spent Nuclear Fuel Stored at DOE Facilities

Focus Area Work Package ID:

Focus Area Work Package:

Focus Area:

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both):

Technologies

Cost Savings (in thousands of dollars)

Range of Estimate

Related CCP Milestones

Related Waste Streams

Agree?

Change?

00327: LAT1 - Transuranic Waste (Legacy)

Y

N

Technology Deployments

Deployment Year

Deployment Status

Planned

Forecast

Actual Date

Technology Name: Mercury Contamination - Separate and Remove Mercury from Off-gas using a Gold Amalgamation Filter

Potential Deployment: 2000

Technology Name: Innovative Rotary Crossflow System for Volume Reduction of Mixed Hazardous and Rad Waste

Deployment Commitment: 1999

Technology Name: Gas Recontainerization

Potential Deployment: 2000

Technology Name: Decontamination and Volume Reduction System (DVRS)

Deployment Commitment: 1999

Dataset Name: **FY 1999 Planning Data**

Page 29 of 30

Date of Dataset: **9/20/1999**

Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Albuquerque**

Site Summary Level: **Los Alamos National Laboratory**

Project **AL013 / LANL Waste Management - Legacy Waste**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0472**

Technology Deployments

<u>Deployment Status</u>	<u>Deployment Year</u>		
	<u>Planned</u>	<u>Forecast</u>	<u>Actual Date</u>
Technology Name: Combined Thermal/Epithermal Neutron Prototype at the LANL RANT Facility			
Deployment Commitment	1999		
Technology Name: Combined Thermal/Epithermal Neutron (CTEN)			
Deployment Commitment	1999		