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0091908

10-AMCP-0191

JUN 29 2010

Ms. J. A. Hedges, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port off Benton Boulevard
Richland, Washington 99354

Dear Ms. Hedges:

M-91 TRANSURANIC MIXED/MIXED LOW-LEVEL WASTE PROJECT MANAGEMENT PLAN, JUNE 2010

This letter transmits the Annual Revision of the M-91 Transuranic Mixed/Mixed Low-level Waste Project Management Plan, June 2010, to the State of Washington Department of Ecology for review and approval.

This plan is submitted as a primary document under the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) Action Plan, Section 9.0, Documents and Records. Transmittal of this document completes the Tri-Party Agreement Interim Milestone M-91-03 requirement for submittal by June 30, 2010.

Comments or approval are requested within 45 days of receipt of this letter.

If you have any questions, please contact me, or your staff may contact Larry Romine, of my staff, on (509) 376-4747.

Sincerely,

Matthew S. McCormick, Assistant Manager
for the Central Plateau

AMCP:MSC

Attachment

cc: See Page 2

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M-091-03

cc w/attach:
G. Bohnee, NPT
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Administrative Record (M-91)
Environmental Portal

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M-91 TRANSURANIC MIXED/MIXED LOW-LEVEL WASTE PROJECT MANAGEMENT PLAN

JUNE 2010

Executive Summary

The Tri-Party Agreement, a legal agreement between the U.S. Department of Energy, Washington State Department of Ecology, and the U.S. Environmental Protection Agency, identifies cleanup actions and schedules, called milestones. The scope of the M-091 milestone series is to complete retrieval and eliminate the backlog of Hanford mixed low-level waste (MLLW) and transuranic mixed (TRUM) waste in storage. When these milestones are completed, the retrievably stored waste will have been removed from the burial grounds, the backlog of MLLW and TRUM waste will have been eliminated, and the TRUM waste will have been shipped offsite.

Washington State Department of Ecology and U.S. Department of Energy recently completed negotiations with a number of changes to the M-091 milestone series. The proposed milestones replace the "to be determined" dates with dates based on Hanford Site priorities. The changes also allow for all TRUM waste to be shipped to the Waste Isolation Pilot Plant (WIPP) in lieu of treatment, which benefits all parties by reducing worker exposure to hazardous materials and accelerates the shipment of TRUM waste by eliminating the need to treat the waste to the land disposal restriction treatment standards.

These proposed M-091 milestone series changes are subject to a public comment period extending from May 3, 2010, to June 30, 2010. The proposed changes will not be finalized until public comments have been considered. Both the current and proposed M-091 milestone series require the submission of a Project Management Plan (PMP) by June 30, 2010.

The information contained in this PMP considers both the existing and proposed milestones, and will be used to manage the transition from the existing to the new milestones. The public comments may impact the proposed milestones, and these impacts will be addressed in future revisions of the PMP.

The current projection for the last shipments to WIPP (end of fiscal year [FY] 2030) and subsequent closure date (end of FY2035) is based upon the current U.S. Department of Energy Office of Environmental Management (EM) planning for WIPP. Public Law 102-579 (WIPP Land Withdrawal Act [LWA]) does not specify the end date for operation of WIPP, rather it is only bounded by capacity and curie limitations (6.2 million cubic feet and 5.1 million curies, respectively). The current planning for WIPP is based on reaching full permitted capacity by FY2030. The variability of waste availability and shipping rates over the next ten years can

impact the projection for WIPP closure. The FY2011 budget report to Congress indicated a WIPP closure date as a range from 2035 to 2039. The current WIPP Hazardous Waste Facility Permit and draft Permit renewal request contain an anticipated overall schedule for closure activities that indicates that WIPP would notify the New Mexico Environmental Department of the intent to close WIPP (or implement contingency closure) starting in the year 2030. In addition, the latest Environmental Protection Agency Compliance Recertification Application for WIPP contains a timeline for disposal of transuranic (TRU) waste that ends about the year 2030. Every year, the TRU waste remaining inventory is evaluated against the capacity and curie limitations specified in the LWA. If that evaluation reveals that the WIPP closure date should change, the appropriate regulatory documentation will be submitted in accordance with applicable requirements. This revision of the PMP administratively aligns with the 2030 date in the current WIPP Hazardous Waste Facility Permit.

This PMP contains a description of completed work along, with the plans and schedule for completing the M-091 milestone series. The availability of American Recovery and Reinvestment Act funding has enhanced the approach and schedule for addressing the legacy MLLW and TRUM waste. The impact of this additional funding was considered in the proposed M-091 milestone series and has been reflected in this revision of the PMP.

This PMP is organized in a manner that closely follows the proposed milestones. The current status of each milestone is discussed, along with the approach and schedule being implemented to complete the milestone.

This PMP presents the plan for the acquisition of capabilities necessary for the retrieval, storage, and treatment/processing of the MLLW and TRUM waste. The plan includes several new technical approaches to provide the necessary capabilities to accomplish the M-091 milestone series. Included in this approach is the expanded use of commercial capabilities, the implementation of Next Generation Retrieval Technologies, and the Alpha Caisson Waste Retrieval Project.

The M-091 Tri-Party Agreement milestones scheduled for completion since the beginning of Fiscal Year 2009 have been met as shown in Table ES-1. This list reflects the modification of several M-091 interim milestone requirements approved through the Change Package M-91-08-05.

Table ES-1. Tri-Party Agreement Milestone Schedule

M-91 Milestone	Requirement	Required Completion Date	Actual Completion Date
M-091-03C	Submit annual revision of TRUM waste and MLLW PMP to Ecology.	6/30/09	6/30/09
M-091-40G-T01	Retrieve 9,950 m^3 (cumulative) CH-RSW.	9/30/09	3/04/09
M-091-40N	Designate large containers determined to be LLW.	12/31/08	12/31/08
M-091-42E	7,220 m^3 (cumulative) will be treated by 12/31/08.	12/31/08	12/31/08
M-091-42F-T01	Complete treatment of 7,600 m^3 (cumulative) CH-MLLW.	12/31/09	8/20/09
M-091-42J-T01	Treat 200 m^3 CH-TRUM waste.	9/30/09	4/30/09
M-091-43D-T01	Treat 300 m^3 additional RH-MLLW and large container CH-MLLW.	6/30/10	8/31/09
M-091-45	Complete negotiations and submit change package replacing specified M-91 "to be determined" dates.	4/30/10	4/20/10

CH = contact handled
LLW = low-level waste
RH = remote handled
RSW = retrievably stored waste

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Terms

ACWRP	Alpha Caisson Waste Retrieval Project
ALARA	as-low-as-reasonably-achievable
AMWTP	Advanced Mixed Waste Treatment Project (Idaho)
ARRA	American Recovery and Reinvestment Act
CBFO	Carlsbad Field Office (DOE)
CCP	Central Characterization Project
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH	contact handled
CHPRC	CH2M HILL Plateau Remediation Company
CWC	Central Waste Complex
DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
EM	U.S. Department of Energy Office of Environmental Management
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
FY	fiscal year
HFFACO	Hanford Federal Facility Agreement and Consent Order
LDR	land disposal restriction
LLBG	low-level burial ground
LLW	low-level waste
LWA	Land Withdrawal Act
MLLW	mixed low-level waste
MWDT	Mixed Waste Disposal Trench
NDA	non-destructive assay
NDE	non-destructive examination
NGR	Next Generation Retrieval
PMP	Project Management Plan
RCRA	Resource Conservation and Recovery Act of 1976
RH	remote handled
RSW	retrievably stored waste
RTR	real time radiography
SWB	standard waste box
SWIFT	Solid Waste Integrated Forecast Technical
SWITS	Solid Waste Information and Tracking System
SWOC	Solid Waste Operations Complex

TFPS	Trench Face Process System
TFRCS	Trench Face Retrieval and Characterization System
TPA	Tri-Party Agreement
TRU	transuranic
TRUM	transuranic mixed waste
WBS	Work Breakdown Structure
WIPP	Waste Isolation Pilot Plant (Carlsbad, New Mexico)
WPS	Waste Processing System
WRAP	Waste Receiving and Processing Facility
WRS	Waste Retrieval System

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1 Project Overview

The Hanford Site, managed by the U.S. Department of Energy (DOE), produced about 60 percent of the United States' plutonium from the mid-1940s to the late 1980s to support national defense efforts. The 943 km^2 (586 mi^2) site is located in southeastern Washington State. The Central Plateau covers approximately 121 km^2 (75 mi^2) in the middle of the Hanford Site. Much of the legacy waste and contaminated materials from the site's defense mission remain on the Central Plateau.

The Tri-Party Agreement (TPA), a legal agreement between DOE, the Washington State Department of Ecology (Ecology), and the U.S. Environmental Protection Agency (EPA), identifies cleanup actions and schedules, called milestones. The scope of the M-091 milestone series is to complete retrieval and eliminate the backlog of Hanford mixed low-level waste (MLLW) and transuranic mixed (TRUM) waste in storage. When these milestones are completed, the retrievably stored waste (RSW) will have been removed from the burial grounds, the backlog of MLLW and TRUM waste will have been eliminated, and the TRUM waste will have been shipped offsite.

This Project Management Plan (PMP) was developed in accordance with the TPA Section 11.5, Waste/ Material Stream Project Management Work Plans Prepared Under Agreement Milestone Series M-90-00, M-91-00, and M-92-00 of the TPA Action Plan (Attachment 2 to the TPA). Appendix A includes a matrix of the TPA Section 11.5 required elements and the corresponding section in the PMP where each element is addressed. This PMP contains a description of completed work, along with the plans and schedule for completing the M-091 milestone series. This PMP completely replaces previous revisions.

Ecology, EPA, and DOE began negotiations in Fall 2009 to establish dates for the "to be determined" dates based on Hanford Site priorities. During negotiations, they agreed to evaluate changes to the entire M-091 milestone series based on other Hanford Site priorities and availability of American Recovery and Reinvestment Act (ARRA) funding. New milestones were negotiated to ensure continued progress in processing and shipping Hanford wastes offsite including enforceable milestones for certification of TRUM waste in lieu of treatment of the waste to the land disposal restriction (LDR) treatment standards. The negotiations also responded to public comments to improve the readability, remove historical text, and convert embedded milestones to stand-alone milestones.

Negotiations have been completed, and are subject to a public comment period extending from May 3, 2010, to June 30, 2010. The proposed changes will not be finalized until public comments have been considered. The public comments may impact the proposed milestones, and these impacts will be addressed in future revisions.

The current projection for the last shipments to the Waste Isolation Pilot Plant (WIPP) (end of fiscal year [FY] 2030) and subsequent closure date (end of FY2035) is based upon the current the DOE Office of Environmental Management (EM) planning for WIPP. Public Law 102-579 (WIPP Land Withdrawal Act [LWA]) does not specify the end date for operation of WIPP, rather it is only bounded by capacity and curie limitations (6.2 million cubic feet and 5.1 million curies, respectively). The current planning for WIPP is based on reaching full permitted capacity by FY2030. The variability of waste availability and shipping rates over the next ten years can impact the projection for WIPP closure. The FY2011 budget report to Congress indicated a WIPP closure date as a range from 2035 to 2039. The current WIPP Hazardous Waste Facility Permit and draft Permit renewal request contain an anticipated overall schedule for closure activities that indicates that WIPP would notify the New Mexico Environmental Department of the intent to close WIPP (or implement contingency closure) starting in the year 2030. In addition, the latest Environmental Protection Agency Compliance Recertification Application for WIPP contains a timeline for disposal of TRU waste that ends about the year 2030. Every year, the transuranic (TRU) waste remaining inventory is evaluated against the capacity and curie limitations specified in the WIPP

LWA. If that evaluation reveals that the WIPP closure date should change, the appropriate regulatory documentation will be submitted in accordance with applicable requirements. This revision of the PMP administratively aligns with the 2030 date in the current WIPP Hazardous Waste Facility Permit.

Both the current and proposed M-091 milestones require the submission of a PMP by June 30 every year until the M-091 milestone series is completed. For DOE to adequately plan the needed tasks, it is necessary to consider both the existing and proposed milestones. This PMP will be used to manage this transition.

1.1 Goals and Objectives

The focus of the existing M-091 milestones is on the acquisition and modification of facilities and capabilities to support the retrieval, storage, and treatment of wastes. In the proposed changes, the TPA agencies refocused the major milestone on the original goal of treating all Hanford Site Resource Conservation and Recovery Act of 1976 (RCRA) MLLW, and of certifying and shipping TRUM waste to satisfy LDR treatment standards.

The proposed changes to the milestones establish a comprehensive approach for the safe and stable processing of retrieved and RSW. The proposed changes set a deadline of 2030 to remove all legacy TRUM waste from Hanford. The existing milestones do not include a deadline for removal of this waste. When the M-091 milestones are completed, all of the RSW will have been removed from the burial grounds, the backlog of MLLW and TRUM waste will have been eliminated, and TRUM waste will have been shipped offsite.

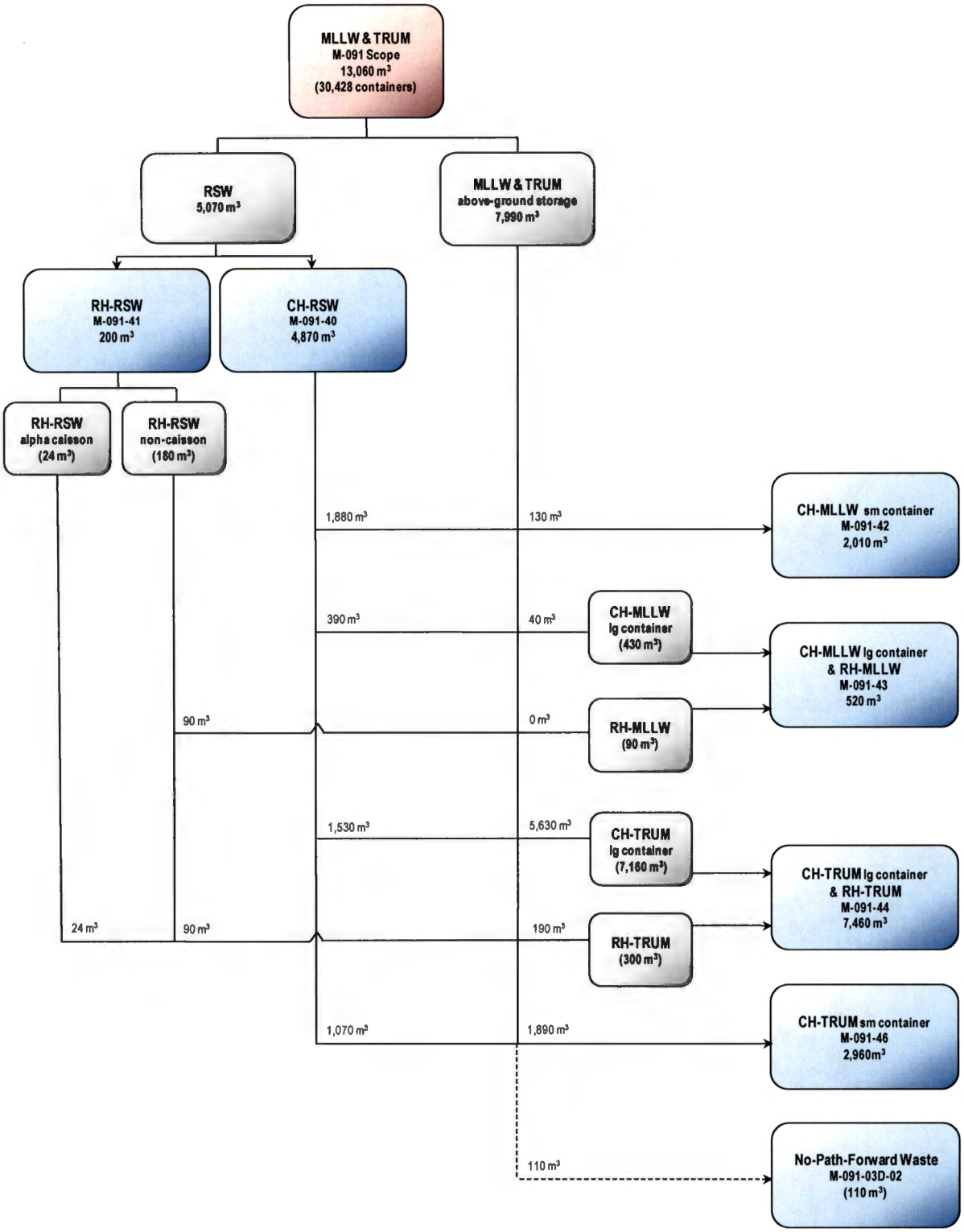
1.2 Scope

The scope of the proposed M-091 milestone series includes all MLLW and TRUM waste in aboveground storage and RSW as of June 30, 2009. Waste in aboveground storage is defined as the waste stored within the Central Waste Complex (CWC), T Plant, and the Waste Receiving and Processing Facility (WRAP). The RSW is defined as waste that was placed in the 218-W-4B, 218-W-4C, 218-W-3A, and 218-E-12B burial ground trenches after May 6, 1970, and was believed to meet TRU waste criteria when it was placed in one of these trenches.

Figure 1-1 presents the volume of wastes within the M-091 scope, as of June 30, 2009. There were 13,060 m^3 of MLLW and TRUM waste. Within this volume there was 7,990 m^3 of waste in aboveground storage and 5,070 m^3 of RSW. The values are based on internal volume of a waste container.

The amounts, characteristics, and locations of MLLW and TRUM waste presented in this document are obtained from the Solid Waste Information and Tracking System (SWITS). The SWITS is a dynamic database and is updated frequently to reflect waste receipts, processing, and shipment volumes, and, as a result, data presented in this revision of the PMP may differ from previous versions. Several assumptions are necessary to develop the data shown in Figure 1-1 and will be used throughout this PMP.

- The volume of a RSW container is as reported in SWITS, volumes will be adjusted based on actual volumes removed during waste retrieval operations.
- All RSW is considered to be suspect TRUM until it has been retrieved and determined otherwise.



Note: Volumes as of June 30, 2009 except for No-Path-Forward Waste Volume which is as of March 31, 2010.

Figure 1-1. Tree Chart for Waste Within M-091 Scope as of 6/30/09

- RH waste volumes are based on the sum of all containers listed in SWITS with a cumulative contact dose rate greater than 200 mrem/hr, shielding of lead, steel, or concrete, and/or coded in SWITS as RH.
- Volumes given are pre-treated volumes.

Several additional assumptions are used in this PMP to ensure adequate capabilities are available to manage the waste. Operational experience may make it necessary to change these assumptions in future revisions of this PMP. These assumptions address the change in the definition of TRU waste (to 100 nCi per gram from the former definition of 10 nCi per gram) that took place after the waste was placed into retrievable storage in the trenches.

- The CH-RSW in small containers is 64 percent CH-MLLW and 36 percent CH-TRUM waste.
- The CH-RSW in large containers is 25 percent CH-MLLW and 75 percent CH-TRUM waste.
- The non-caisson RH-RSW is 50 percent RH-MLLW and 50 percent RH-TRUM waste.
- Alpha caisson RH-RSW is 100 percent RH-TRUM waste.

The scope of the proposed milestones is the RSW and waste that was in aboveground storage as of June 30, 2009. The MLLW and TRUM waste within the scope of the Central Plateau Cleanup Completion Strategy (DOE/RL-2009-81) is not included in this revision of the PMP. Disposition of these waste streams is being accomplished through the Hanford Federal Facility Agreement and Consent Order (HFFACO) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 regulatory process. This process will define the cleanup approach, along with waste volumes and characteristics. It is expected that this decision-making process will result in a waste that will have an identified disposal pathway.

1.3 Summary of Progress

Substantial progress was made in FY2009 in retrieving RSW from the burial grounds, treating MLLW, and repackaging TRUM waste. Table 1-1 presents these significant accomplishments.

Table 1-1. Significant Accomplishments Since October 1, 2008

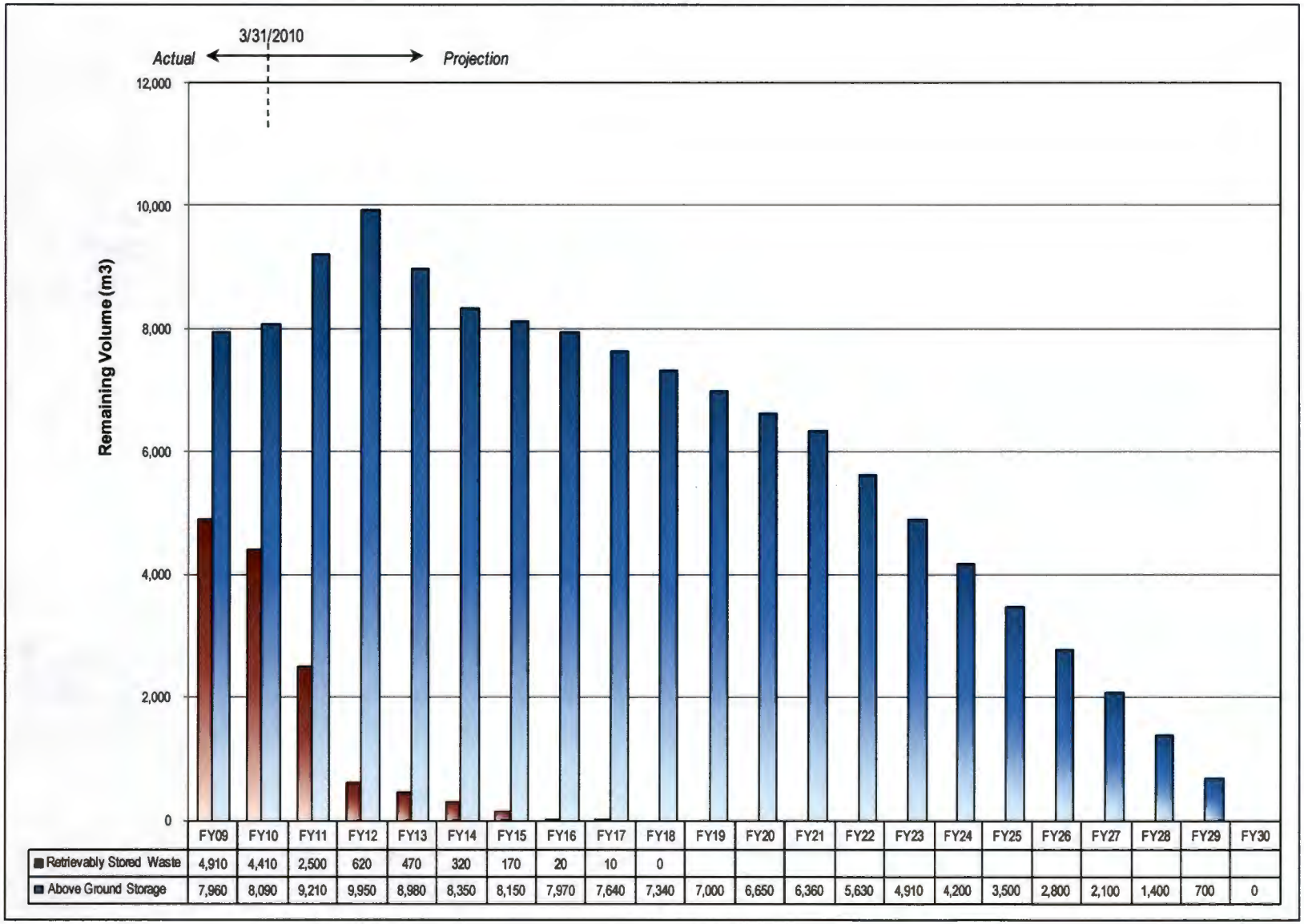
M-91 Milestone	Requirement	Required Completion Date	Actual Completion Date
M-091-03C	Submit annual revision of TRUM waste and MLLW PMP to Ecology.	6/30/09	6/30/09
M-091-40G-T01	Retrieve 9,950 m^3 (cumulative) CH-RSW.	9/30/09	3/04/09
M-091-40N	Designate large containers determined to be LLW.	12/31/08	12/31/08
M-091-42E	7,220 m^3 (cumulative) will be treated by 12/31/08.	12/31/08	12/31/08
M-091-42F-T01	Complete treatment of 7,600 m^3 (cumulative) CH-MLLW.	12/31/09	8/20/09
M-091-42J-T01	Treat 200 m^3 CH-TRUM waste.	9/30/09	4/30/09
M-091-43D-T01	Treat 300 m^3 additional RH-MLLW and large container CH-MLLW.	6/30/10	8/31/09
M-091-45	Complete negotiations and submit change package replacing specified M-91 "to be determined" dates.	4/30/10	4/20/10

1.4 Current Status

Figure 1-2 presents the inventory of RSW and stored mixed waste remaining as of September 30, 2009. As of this date, 4,910 m^3 of RSW and 7,960 m^3 waste in aboveground storage awaiting disposition remained. The projections used throughout this PMP are based on level loaded work-off rates where target milestones have not been established.

Figure 1-2 shows the following.

- All CH-RSW will be retrieved by September 30, 2016 and all RH-RSW will be retrieved by December 31, 2018.
- The backlog of MLLW and TRUM waste is to be eliminated, and the TRUM waste shipped offsite by the year 2030.
- The increase of inventory in aboveground storage through FY2012 is primarily a result of RSW retrieval (see also Figure 4-1).
- The step change decrease of inventory in aboveground storage during FY2013 and FY2014 is a result of the majority of RSW being retrieved (see also Figure 4-1) and the increase in rate of MLLW treatment (see also Figure 5-1).
- After FY2013, the inventory in aboveground storage decreases because the majority of RSW has been retrieved and steady shipments of TRUM waste to the WIPP is projected (see also Figure 6-2).



	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
Retrievably Stored Waste	4,910	4,410	2,500	620	470	320	170	20	10	0												
Above Ground Storage	7,960	8,090	9,210	9,950	8,980	8,350	8,150	7,970	7,640	7,340	7,000	6,650	6,360	5,630	4,910	4,200	3,500	2,800	2,100	1,400	700	0

Figure 1-2. RCRA MLLW/TRUM and Suspect MLLW/TRUM Waste Inventory

2 Acquisition of Capabilities for MLLW and TRUM Waste (M-091-01)

Current technologies and processing methods are not adequate to retrieve the remaining RSW in the LLBG or to process the waste to meet disposal criteria. As a result several new technical approaches are being implemented to provide the necessary capabilities and capacities for the retrieval, treatment/ processing, and shipment of MLLW and TRUM waste. These include expanded use of commercial treatment capabilities, implementation of a point of generation approach that processes and packages waste in the field, and new capabilities to retrieve and process the RH waste.

Key elements of the approach to acquire the necessary capacities and capabilities in order to meet the M-091 milestones are listed below.

- Demonstrate the ability to use commercial treatment for large container CH-TRUM waste.
- Work with offsite commercial facilities to explore the feasibility of expanding their treatment envelope to accept a broader range of waste.
- Implement Next Generation Retrieval (NGR) technologies for the retrieval and processing of the remaining drums of CH-RSW.
- Implement Alpha Caisson Waste Retrieval Project (ACWRP) technologies for the retrieval and processing of the alpha caisson RH-TRUM waste.
- Evaluate modifications to the current design/concept of NGR and ACWRP to process the remaining large container CH-TRUM and RH-TRUM waste to minimize the need for additional onsite facilities.
- Evaluate the use of a portable system and/or permanent capability of RH-77B canister and transport cask loading for the shipment of RH-TRUM to WIPP.

The following subsections provide status of acquiring new capabilities.

2.1 Status and Work Scheduled

Figure 2-1 presents the schedule for acquiring retrieval, storage, treatment/processing, and certification and shipping capabilities for MLLW and TRUM waste.

Accomplishments for acquiring retrieval, treatment/processing, and certification and shipping capabilities for MLLW and TRUM waste since the previous revision of the PMP include:

- Expanded T Plant processing capabilities of CH-TRUM waste drums in aboveground storage
- ACWRP initiated in May 2009 (accelerated from 2011 with ARRA funding); activities include completion of the Conceptual Design for the retrieval and processing portions of the project
- Designed/procured containment systems for use as required to support retrieval operations of a few waste packages that will require repackaging due to deterioration of the original container
- Designed and procured equipment, hired and trained staff for NGR

Work scheduled for acquiring retrieval, treatment/processing, and certification and shipping capabilities for MLLW and TRUM waste for the coming year includes the following.

- Initiate NGR retrieval operations in Burial Ground 218-E-12B.

M-91 Activities

23-Jun-10 09:20

Activity ID	Activity Name	Start	Finish
M-091-01		20-Apr-09	30-Sep-20
Next Generation Retrieval (NGR) Project		20-Apr-09	30-Sep-11
NGR Trench Face Retrieval & Characterization System (TFRCS)		20-Apr-09	30-Sep-10
A1000	Next Generation Retrieval (NGR) Project Design	20-Apr-09*	31-Aug-09
A1010	Next Generation Retrieval (NGR) Project Construction/ Readiness	01-Sep-09	30-Sep-10
NGR Trench Face Process System (TFPS)		18-Jan-10	30-Sep-11
B1000	NGR Trench Face Proc Sys (TFPS) Conceptual Design	18-Jan-10*	19-Apr-10
B1010	NGR Trench Face Proc Sys (TFPS) Definitive Design	20-Apr-10	09-Aug-10
B1020	NGR Trench Face Proc Sys (TFPS) Construction/Readiness	10-Aug-10	30-Sep-11
Alpha Caisson Waste Retrieval Project (ACWRP)		04-Jan-10	30-Sep-20
ACWRP Waste Retrieval System (WRS)		04-Jan-10	30-Sep-15
C1000	ACWRP Waste Ret Sys (WRS) Conceptual Design	04-Jan-10*	12-Feb-10
C1010	ACWRP Waste Ret Sys (WRS) Definitive Design	01-Apr-13*	31-Mar-14
C1020	ACWRP Waste Ret Sys (WRS) Construction/Readiness	01-Apr-14	30-Sep-15
ACWRP Waste Processing System (WPS)		04-Jan-10	30-Sep-20
C1040	ACWRP Waste Processing Sys (WPS) Conceptual Design	04-Jan-10*	12-Feb-10
C1050	ACWRP Waste Processing Sys (WPS) Definitive Design	03-Oct-16*	28-Sep-18
C1060	ACWRP Waste Processing Sys (WPS) Construction/Readiness	01-Oct-18	30-Sep-20
CH-TRUM (LG) & RH-TRUM Waste Processing Capab...		01-Jun-10	30-Sep-20
Waste Processing Capability		01-Jun-10	30-Sep-20
E0990	Alternative Study	01-Jun-10*	30-Sep-11
E1000	Waste Processing Capability Conceptual Design	01-Oct-15*	30-Sep-16
E1010	Waste Processing Capability Definitive Design	03-Oct-16	28-Sep-18
E1020	Waste Processing Capability Construction/Readiness	01-Oct-18*	30-Sep-20
RH Cask Loading Capability		01-Jun-10	30-Sep-20
Cask Loading Capability		01-Jun-10	30-Sep-20
F090	Alternative Study	01-Jun-10*	30-Sep-11
F1000	RH Cask Loading Facility Conceptual Design	01-Oct-15*	30-Sep-16
F1010	RH Cask Loading Facility Definitive Design	03-Oct-16*	28-Sep-18
F1020	RH Cask Loading Facility Construction	01-Oct-18*	30-Sep-20
M-91 Milestones		30-Sep-16	28-Sep-18
M-91 Milestones		30-Sep-16	28-Sep-18
G1000	TPA M-091-01A - Complete Conceptual Design / or acquisition / or modifications		30-Sep-16*
G1010	TPA M-091-01B - Complete Conceptual Design / or acquisition / or modifications		28-Sep-18*

Primary Baseline ◆ Milestone

Current Bar Labels % Complete

Page 1 of 1

TASK filter: M-091-01.

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Figure 2-1. M-091-01 Schedule

- Initiate commercial capability to treat/process large container CH-TRUM waste.
- Complete alternative study on the expanded NGR and ACWRP capabilities for CH-TRUM waste in large containers and RH-TRUM waste.
- Define functions and requirements for characterizing and loading RH-TRUM waste drums in RH-72B canisters and transport casks.

2.2 Commercial Capabilities

Processing MLLW at commercial facilities has been shown to be effective and has resulted in a significant reduction in the volume of stored MLLW. The success of commercial treatment of MLLW has made it possible to consider the option of commercial treatment of CH-TRUM. A pilot program will be undertaken to demonstrate the capability and to establish the potential processing capacity of the commercial option to treat TRUM waste. During FY2011, the pilot program will be initiated with the commercial processing of CH-TRUM waste that is within the existing treatability envelope of the commercial facility.

After completion of the pilot program and commercial treatment of CH-TRUM waste can be considered a viable option, expansion of the commercial treatability envelope will be explored. Regulatory issues will need to be resolved before the treatability envelope can be expanded. These regulatory issues include the facility operation permits that limits the total quantity of special nuclear material limit that can be stored at the facility. Details of how the waste would be transported to the facility must also be resolved.

2.3 Next Generation Retrieval Project

The NGR Project will provide capabilities to retrieve and process CH-TRUM waste in drums located in 218-W-3A, 218-W-4B, and 218-E-12B Low-Level Burial Grounds (LLBG) using enhanced methods and equipment. The goal of the NGR project is to retrieve the waste and perform all required processing steps as near to the retrieval process area as possible. The NGR Trench Face Retrieval and Characterization System (TFRCS) activities include retrieval and characterization of the waste containers. These containers will then be transferred to the NGR Trench Face Process System (TFPS) for processing.

The NGR approach will minimize staging, storage, and transfer of individual containers between multiple facilities to complete processing and preparation for final disposal. It will also increase the overall site capacity for processing the TRUM wastes. The certification process for the TRUM waste will be performed by the Central Characterization Project (CCP), which will complete the required WIPP characterization and documentation. The CCP has been contracted by the DOE Carlsbad Field Office (CBFO) to characterize and certify TRUM waste being packaged at Hanford.

Following retrieval non-destructive assay (NDA) will be performed on the containers to determine whether they are MLLW or TRUM waste. The MLLW containers will be staged in a transport container prior to being shipped offsite for treatment. The TRUM containers are sent to the TFRCS container venting station where a filter is installed in the container lid. The filter allows any flammable gases to be released. A second device is also installed for taking gas samples. If required, containers with flammable gas concentrations or volatile organic carbon gases greater than safety basis requirements are separated for an abatement period. The containers are sent on to non-destructive examination (NDE) by real time radiography (RTR). The NDE will identify any WIPP prohibited items and other potential process problems. Following NDE, the containers are separated for additional processing based on their TRU content and the content of prohibited and potential problem items.

As a final step in the retrieval and characterization activities, the waste drums are subjected to a batching process where the individual drum characteristics are reviewed and the appropriate drums are selected for inclusion in each standard waste box (SWB). Use of SWBs reduces the number of containers that need to be certified. The batching process is important to ensure that final waste containers, assembled from combining individual containers, meet the WIPP waste acceptance criteria. The batches of drums are transferred to the appropriate process. The drums are opened in the selected process unit and the waste is inspected and sorted. The conforming waste is then loaded into an SWB. The loaded SWBs will be closed and sent to the CWC to await characterization, certification, and shipment to WIPP by CCP.

The NGR process is targeted at the large majority of waste containers, specifically 55-gallon drums, and is not directly applicable to large boxes. Engineering tasks in FY2011 will determine if the techniques and equipment used for NGR may eventually be applied to retrieval and treatment operations for large boxes and RH-TRUM waste. These studies of equipment and techniques will be used to evaluate whether the NGR may also be applicable for small boxes or similar waste containers intermingled with drums and retrieved at the same time.

2.4 Alpha Caisson Waste Retrieval Project

The ACWRP will provide the capability to retrieve, characterize, and package the RH-TRUM waste that is currently located in the alpha caissons in the 218-W-4B LLBG. The processed waste will be certifiable (meeting all packaging requirements), and ready for characterization and certification by CCP.

Based on available records, approximately 24 m^3 of RH-TRUM waste is contained in the four alpha caissons. This waste was generated from post-irradiation examination activities on reactor fuel elements performed at the 325 and 327 hot cell facilities in the Hanford Site 300 Area. The alpha caissons, located 4 m (14 ft) below grade, are accessed by a 3-foot-diameter loading chute and a 1-foot-diameter ventilation shaft. This waste material loading into the alpha caissons occurred between 1970 and 1988. The RH-TRUM waste material is located in Alpha Caissons 1 through 4 only. Containers are primarily 1-gallon cans (Figure 2-2), with a few 2- and 5-gallon cans.

The ACWRP is divided between two major activities. The first is the ACWRP Waste Retrieval System (WRS) that will retrieve, package, and stage the RH-TRUM waste materials from the alpha caissons. The second is the Waste Processing System (WPS) that will receive the waste packages from the ACWRP-WRS activity and perform the required processing and packaging to generate WIPP-compliant packages. These packages will then be stored pending certification, and loading into the RH-72B shipping cask for transfer to WIPP. Any remaining RSW that is determined to be MLLW or CH-TRUM will be dispositioned by those established waste disposition paths.

Figure 2-2. Waste in Alpha Caisson 4 (1987)

2.5 RH-TRU Waste Cask Loading Facility

To facilitate the shipment of RH-TRU waste to WIPP for disposal, it will be necessary to acquire Hanford RH-72B canister and cask loading capability. An RH-TRU waste canister and cask loading facility provides capabilities to receive 30-gallon and 55-gallon drums and load them into a RH-72B cask (Figure 2-3) for shipment to WIPP. The use of mobile loading equipment to load RH-72B casks will also be assessed. The RH-72B cask contains a canister that holds up to three 55-gallon drums. The canister is then loaded into the cask for shipment to WIPP.

Figure 2-3. RH-72B Cask Used to Ship RH-TRUM Waste to WIPP

2.6 Storage Capacity

CH2M HILL Plateau Remediation Company (CHPRC) maintains a system for forecasting the amount of radioactive waste, including mixed waste, to be generated well into the future for management at CWC. This system is known as the Solid Waste Integrated Forecast Technical (SWIFT) Report. Input to this system is maintained in a database updated periodically by all waste-generating units. Significant changes to the input must be reported. These changes are evaluated for impact on the storage facilities as required. The following assumptions were made.

- MLLW and TRUM waste will remain in aboveground storage (as of June 30, 2009) until the waste is treated/processed.
- After designation, non-caisson RSW large container CH-TRUM waste and RH-TRUM waste will be stored at CWC awaiting treatment/processing.
- After treatment/processing, TRUM waste will be stored at CWC and WRAP awaiting final characterization, certification, and shipment to WIPP.

Based on the current projections, additional storage capacity is not expected to be necessary.

3 No-Path-Forward Waste (M-091-03D-02)

A number of miscellaneous small containers of MLLW have unique characteristics that are impediments to the identification of a disposal path. Considerable progress has been made in recent years in the treatment and disposal of these types of waste once thought to have no-path-forward. Since June 30, 2009, approximately 130 m^3 of no-path-forward waste has been dispositioned. Table 3-1 identifies the remaining inventory of no-path-forward waste as of March 31, 2010.

Table 3-1. No-Path-Forward Waste as of March 31, 2010

Waste Stream	Container Type	Volume (m^3)
Beryllium Dust (MLLW-08)	One drum	0.2
RH-MLLW (MLLW-07)	Drums and boxes	86
Sodium Waste (MLLW-10)	37 drums, three boxes	24
Total		**110**

The proposed M-091-03D-02 milestone requires the June 30, 2011, revision of this PMP to contain a disposition path for all of the no-path-forward wastes. This disposition plan will include the identification of any necessary treatment variances and a schedule.

It is possible that additional no-path-forward waste will be identified in future years. This waste could result from retrieval of the RSW. This waste could also be identified during the waste characterization and certification efforts.

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4 Retrieval and Designation of Retrievably Stored Waste (M-091-40, M-091-41)

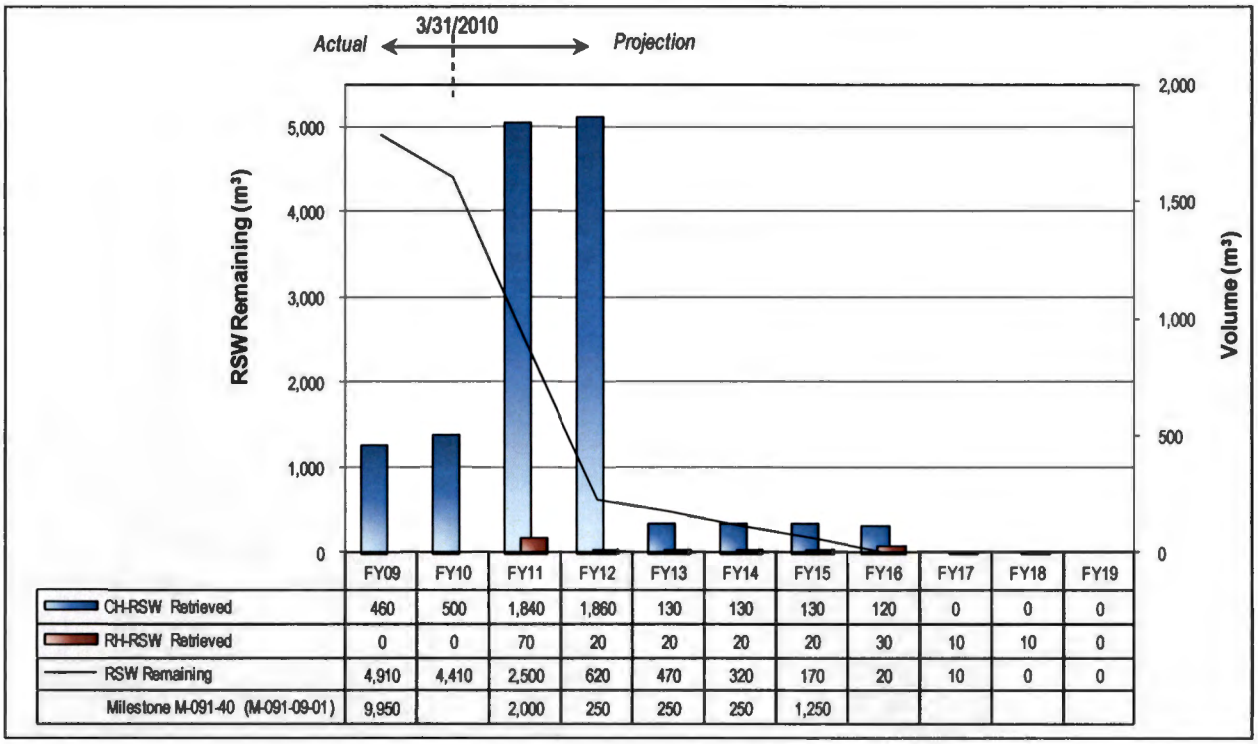
Substantial progress has been made to retrieve RSW from the burial grounds that contained approximately 15,200 m^3 of RSW. Retrieval operations began in 2003, and have successfully retrieved a total of 10,500 m^3 of waste, leaving an estimated 4,700 m^3 as of March 31, 2010.

Containers removed from 218-W-4C were generally in good condition, although some contaminated and deteriorated packages were retrieved. Retrieval of the remaining RSW has become increasingly difficult as a result of the degraded condition of the waste packages, higher levels of contamination, increased levels of contamination in the surrounding soils, and random placement of containers.

4.1 Status of Retrieval and Designation of Retrievably Stored Waste

As of March 5, 2009, a cumulative total of 9,950 m^3 of CH-RSW was retrieved, meeting TPA Milestone M-091-40G-T01. Since the completion of this milestone, an additional 540 m^3 of waste has been retrieved, as of March 31, 2010. Of the 540 m^3, 110 m^3 of CH-RSW was retrieved between March 6, 2009, and June 30, 2009.

Figure 4-1 presents a summary of the RSW that has been, or is projected to be, retrieved. The bars represent the CH-RSW and RH-RSW projected to be retrieved during a fiscal year and the line represents the remaining inventory at the end of a fiscal year. The NGR-TFRCS will retrieve the remaining drums of CH-RSW in FY2011 and FY2012 as shown in the figure by the sharp increase of retrieved CH-RSW.



	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
CH-RSW Retrieved	460	500	1,840	1,860	130	130	130	120	0	0	0
RH-RSW Retrieved	0	0	70	20	20	20	20	30	10	10	0
RSW Remaining	4,910	4,410	2,500	620	470	320	170	20	10	0	0
Milestone M-091-40 (M-091-09-01)	9,950		2,000	250	250	250	1,250				

Figure 4-1. CH-RSW (M-091-40) and RH-RSW (M-091-41) Inventory

4.2 Planned Approach and Schedule to Retrieval

The proposed milestones require the retrieval of 2,000 m^3 of waste by September 30, 2011. They also require all CH-RSW be retrieved by the end of FY-2016, and all non-caisson RH-RSW to be retrieved by

the end of FY2016. The proposed milestones require the retrieval and designation of waste from the 200 Area alpha caissons by December 31, 2018. To achieve these milestones, acquisition of capabilities is required. Figure 4-2 presents the schedule of these activities.

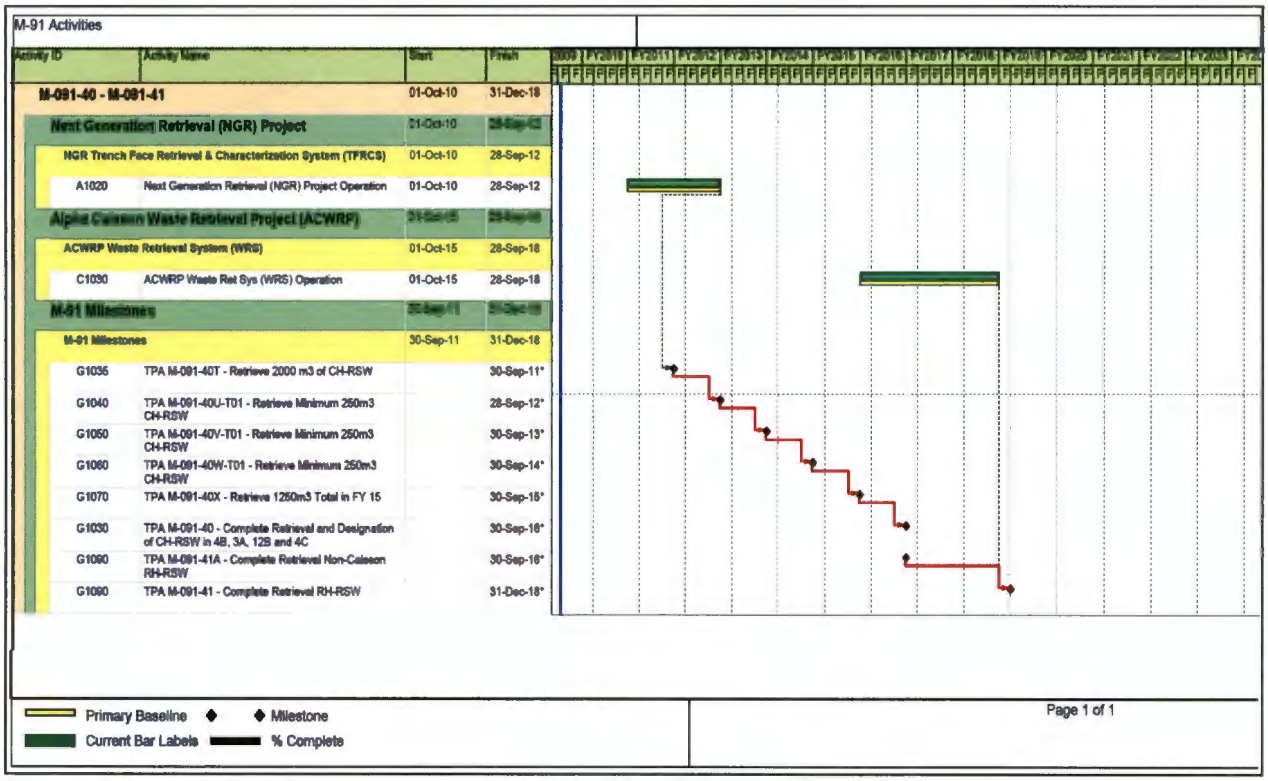


Figure 4-2. M-091-40 and M-091-41 Schedule

The retrieval process begins with workers reviewing historical or process knowledge, uncovering a container, removing it from the ground, and performing NDA to determine whether it is an MLLW or a TRUM waste. Current waste retrieval approaches rely on manual methods performed at the waste face in open air, without containment.

Using this approach, the majority of the waste is placed into 85-gallon overpacks. Repacking of the overpacked waste is required to meet the WIPP acceptance criteria. This repackaging includes removing the waste from the overpack, removing non-compliant items, and then repacking the waste into a WIPP-approved container. This repackaging is performed at the T Plant and WRAP.

Retrieval has become more challenging as more frequent occurrences of degraded, failed, and contaminated containers or areas are encountered, as shown in Figure 4-3. As a result, enhanced retrieval capabilities are being acquired, including NGR, which has been described previously in this PMP.

Construction of the NGR-TFRCS is expected to be completed during FY2010, with operation starting in FY2011 and continuing through FY-2012. The NGR-TFRCS will be used to retrieve and characterize small containers (specifically drums) of CH-RSW waste in 218-W-3A trenches 1, 4, 5, 6, 8, 10, 15, 23, 30, 32, 34, 6S and 9S; 218-W-4B trenches 7 and 11; and 218-E-12B trenches 17 and 27.

Figure 4-3. Retrieval of Degraded Boxes

Following retrieval, NDA will be performed on the containers to determine whether they are MLLW or TRUM waste. Designation of waste will be performed pursuant to WAC 173-303-070 through 173-303-100. The MLLW will typically be sent to an offsite commercial facility for treatment prior to disposal (Section 5). The TRUM waste will be further processed through the NGR-TFPS (Section 6). Small containers of RH-RSW intermingled with CH-RSW drums may also be retrieved based on as-low-as-reasonably-achievable (ALARA) and efficiency considerations.

While NGR will improve the ability to retrieve small containers, it will not support the retrieval of degraded large containers (that is, boxes). As Figure 4-4 shows, some of these boxes show significant deterioration. Boxes 80 and 82 are two significantly deteriorated boxes. Efforts are currently underway to develop a safe and efficient method to retrieve the waste contained in these deteriorating boxes. One method being considered is grouting the waste in place to provide stabilization of containers so they can be safely removed from the trench.

It is anticipated that the remaining large container CH-RSW and non-caisson RH-RSW will be retrieved using current technologies. This will require the removal of the overburden soil to expose the waste containers. Excavation activities will be monitored to identify any contamination that may be present and to minimize impacts to worker health and safety. The containers will be surveyed and smeared to measure dose and identify potential contamination.

Contamination on waste containers will be fixed, wrapped, and/or overpacked, as needed. A few waste packages will require repackaging because of the deterioration of the original container. Weather enclosures and containment systems will be used as required to support retrieval operations.

Figure 4-4. Retrieval of Box 82 in 218-W-4A Burial Ground

Construction of the ACWRP-WRS is projected to begin during FY-2014, with operation starting in FY-2016 and continuing through FY-2018. New capabilities provided by the ACWRP-WRS will be used to retrieve RH-RSW in the 218-W-4B Alpha Caissons and place the TRUM waste into shielded containers for storage awaiting treatment/processing through the ACWRP-WPS that is projected to begin operation in FY-2021.

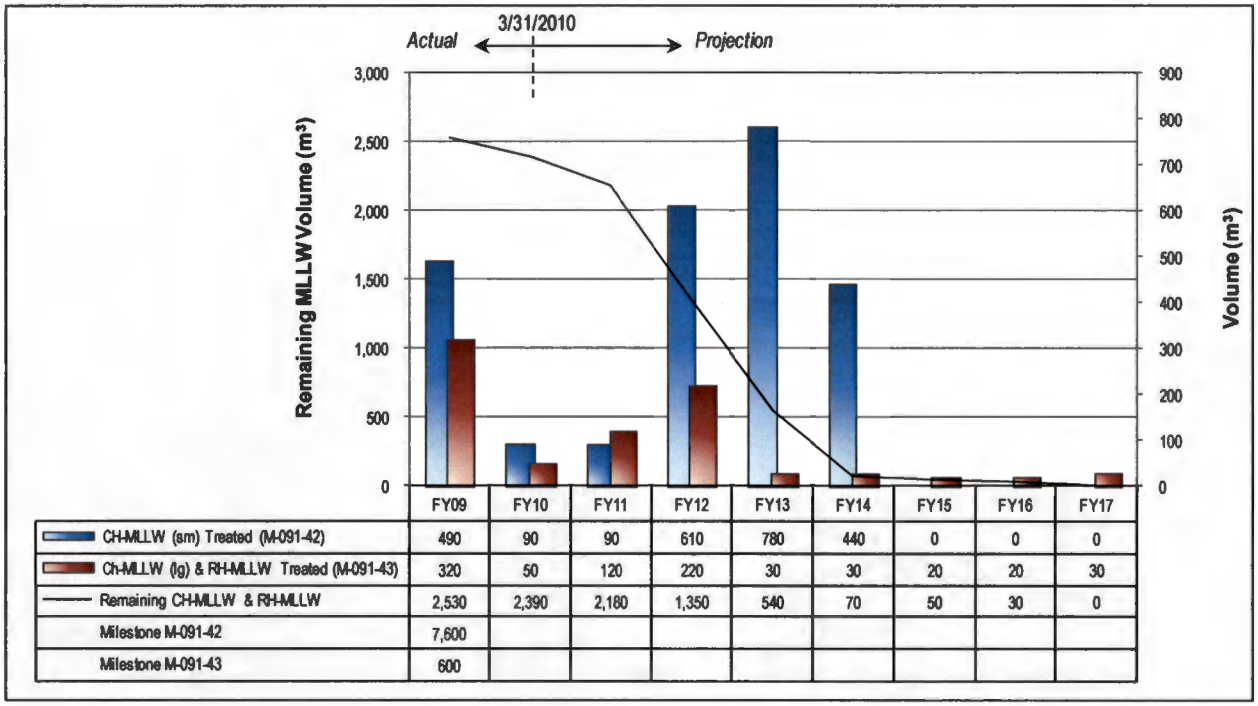
5 Treatment of Mixed Low-Level Waste (M-091-42, M-091-43)

Treatment of legacy MLLW continued at the Hanford Site during FY2009. The MLLW is grouped into 10 different treatability groups based on the necessary treatment path to ensure that the waste, once treated, will meet the LDR requirements for disposal. Appendices B and C provides a description of each of the treatability groups along with treatment capabilities.

5.1 Status of Treatment of Mixed Low-Level Waste

As of August 20, 2009, a cumulative total of 7,600 m^3 of small container CH-MLLW was treated, meeting TPA milestone M-091-42F-T01. Since the completion of this milestone, an additional 420 m^3 of small container CH-MLLW has been treated. On August 31, 2009, an additional 300 m^3 and (600 m^3 cumulative) of large container CH-MLLW and RH-MLLW was treated meeting TPA milestone M-091-43D-T01. Since the completion of this milestone, an additional 60 m^3 of large container CH-MLLW and RH-MLLW has been treated.

Figure 5-1 presents a summary of the volume of MLLW that has been, or is projected to be, treated. The bars represent the CH-MLLW and RH-MLLW projected to be treated during a fiscal year and the line represents the remaining inventory to be treated at the end of a fiscal year. The volume of stored MLLW requiring treatment decreases during FY2010 and FY2011 and then increases sharply as a result of the acceleration in retrieval of RSW.



	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17
CH-MLLW (sm) Treated (M-091-42)	490	90	90	610	780	440	0	0	0
Ch-MLLW (lg) & RH-MLLW Treated (M-091-43)	320	50	120	220	30	30	20	20	30
Remaining CH-MLLW & RH-MLLW	2,530	2,390	2,180	1,350	540	70	50	30	0
Milestone M-091-42	7,600								
Milestone M-091-43	600								

Figure 5-1. Mixed Low-Level Waste Inventory (M-091-42, M-091-43)

5.2 Planned Approach and Schedule to Treatment of Mixed Low-Level Waste

The proposed milestones require completion of treatment of MLLW by September 30, 2017. During FY2010, offsite commercial treatment capabilities will continue to be utilized for the treatment of MLLW. Much of the MLLW requires non-thermal treatment, such as macro-encapsulation or stabilization (inorganic non-debris (MLLW-02) and hazardous debris (MLLW-04). Processing MLLW wastes at commercial facilities has been successful and has resulted in a significant reduction of the volume of MLLW in storage (Figure 5-2)

Some in-trench treatment to meet the LDR requirements might be performed within Mixed Waste Disposal Trenches (MWDT) 31 and 34 of the 218-W-5 Burial Ground. Treatment to minimize worker risks and physical infrastructure limitations associated with opening and processing some of the RH-MLLW waste.

The planned approaches for treatment/processing of each of the applicable Treatability Groups are as follows.

- Commercial capabilities will be used within license limits to treat/process inorganic non-debris (MLLW-02), organic non-debris (MLLW-03), hazardous debris (MLLW-04), radioactive lead solids (MLLW-05), mercury waste (MLLW-06), and radioactive batteries (MLLW-09) designated as CH-MLLW and in small containers.
- Commercial capabilities will be used within license limits to treat/process RH-MLLW and CH-MLLW and in large containers (MLLW-07). In-trench treatment (218-W-5 trenches 31 and 34) may be used to minimize significant worker risks and physical infrastructure limitations associated with opening and processing some of the waste contained in this treatability group.

Figure 5-2. Shipment of Large Box of MLLW Debris to Commercial Facility for Treatment

6 Certification and Shipment of TRUM Waste (M-091-44, M-091-46)

This section discusses the treatment, certification, and shipment of TRUM waste. This TRUM waste includes small and large container CH-TRUM and RH-TRUM waste. The disposition of this waste is partially addressed in M-091-42 and M-091-44 of the current milestone series. In the proposed changes, the work has been consolidated into the M-091-44 and the new M-091-46 milestone series.

Previous versions of this PMP have addressed the completion of the current M-091 milestone to begin treatment of large container CH-TRUM and RH-TRUM waste by June 30, 2012. A pilot program is funded in FY2011 to begin this effort as previously discussed in Section 2.2. The proposed milestone requires the treatment of large container CH-TRUM and RH-TRUM waste to begin in FY2016. The information contained in this revision of the PMP addresses DOE plans to comply with the proposed milestones.

The WRAP Facility and T Plant Complex provide capabilities to receive waste, confirm contents of drums and SWBs, and repackage and inspect the waste to WIPP waste acceptance criteria. The WRAP Facility and T Plant Complex can process only waste in drums or SWBs. Once repackaged, the waste container is considered a WIPP Compliant Package or Certifiable Waste that is ready for CCP to characterize (that is, a high confidence that it will pass NDE, and will assay as TRU waste). Use of SWBs offers some efficiencies as fewer waste packages would need to be certified. Certification and shipment of TRUM waste to WIPP is based on support from CCP and WIPP. In some cases TRUM waste will be shipped to the Advanced Mixed Waste Treatment Project in Idaho for repackaging and certification prior to being shipped to WIPP for disposal.

WRAP processes 55-gallon drums of CH-TRU waste for shipment to WIPP. WRAP has the capability to process 85-gallon overpacks containing internal packages that potentially have integrity issues. WRAP processing includes shipping and receiving; waste container handling; waste staging and storage; NDE and NDA; waste treatment; MLLW and LLW verification; packaging and repackaging; headspace gas sampling; flammable gas sampling; drum venting; and Transuranic Package Transporter (TRUPACT) II loading.

T Plant capabilities provide capacity using modular containment systems that are attached to make a rigid enclosure, for MLLW and TRU waste sorting, processing, and volume reduction. The T Plant has limited capabilities to process RH wastes. Currently, the T Plant has the capability to repackage 55-gallon and 85-gallon CH-TRUM waste. T Plant will be maintained on a ready-to-service basis for interim storage of K-Basin sludge and possible support to the M-091 work scope for processing of TRUM waste.

6.1 Status for Certification and Shipment of TRUM Waste

As of April 30, 2009, 200 m^3 of CH-TRUM waste was treated, meeting TPA milestone M-091-42J-T01. Since the completion of this milestone, an additional 300 m^3 of small container CH-TRUM waste has been certified and 90 m^3 of TRUM has been shipped to WIPP for disposal as of March 31, 2010.

Certification is defined as (per M-091 Milestone Change Package M-091-09-01):

- Completion of all activities necessary for waste to be packaged such that it can meet the WIPP waste acceptance criteria. If subsequent WIPP certification reveals the waste cannot be shipped to WIPP, this waste will not count toward meeting the milestone volume requirements until such time as it has been determined to meet the WIPP waste acceptance criteria.
- The TRUM waste has been shipped to Idaho.

- The waste has been treated to meet LDR treatment standards.

Figure 6-1 presents a summary of the volume of TRUM waste that has been, and is projected to be certified. The bars represent the CH-TRUM and RH-TRUM waste projected to be certified during a fiscal year and the line represents the remaining inventory to be certified at the end of a fiscal year. The projected values are based on after processed volumes. For CH-TRUM waste and non-caisson RH-TRUM waste a factor of 1.25 was used and for caisson waste, a factor of 10 was used. Volume increases can result from activities such as repacking performed to generate compliant packages ready for final characterization, certification, and shipment to WIPP. At the end of FY2009, approximately 1,000 m^3 of waste was either certified waste awaiting shipment to WIPP or certifiable waste awaiting final characterization, certification, and shipment to WIPP.

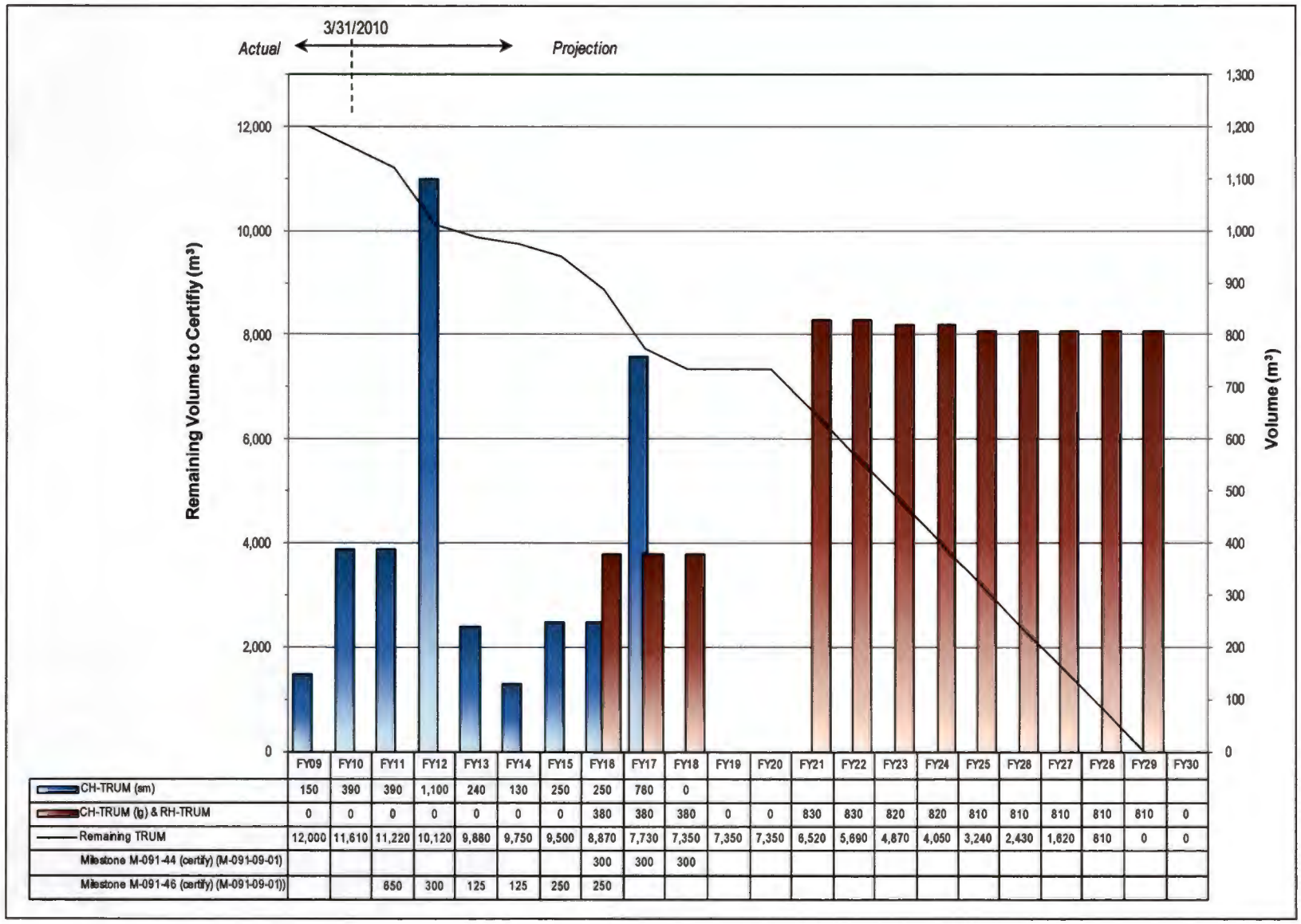
Figure 6-2 presents a summary of the volume of TRUM waste that has been, and is projected to be shipped to WIPP. The bars represent the CH-TRUM and RH-TRUM waste projected to be shipped to WIPP during a fiscal year and the line represents the remaining inventory to be shipped to WIPP at the end of a fiscal year.

6.2 Planned Approach and Schedule for Certification and Shipment of TRUM Waste

The proposed milestones require completion of certification and shipment offsite of small container CH-TRUM waste by September 30, 2018. This revision of the PMP administratively aligns with the 2030 date in the current WIPP Hazardous Waste Facility Permit for the certification and shipment of large container CH-TRUM and RH-TRUM waste. Figure 6-3 presents the schedule of these activities necessary to accomplish these milestones.

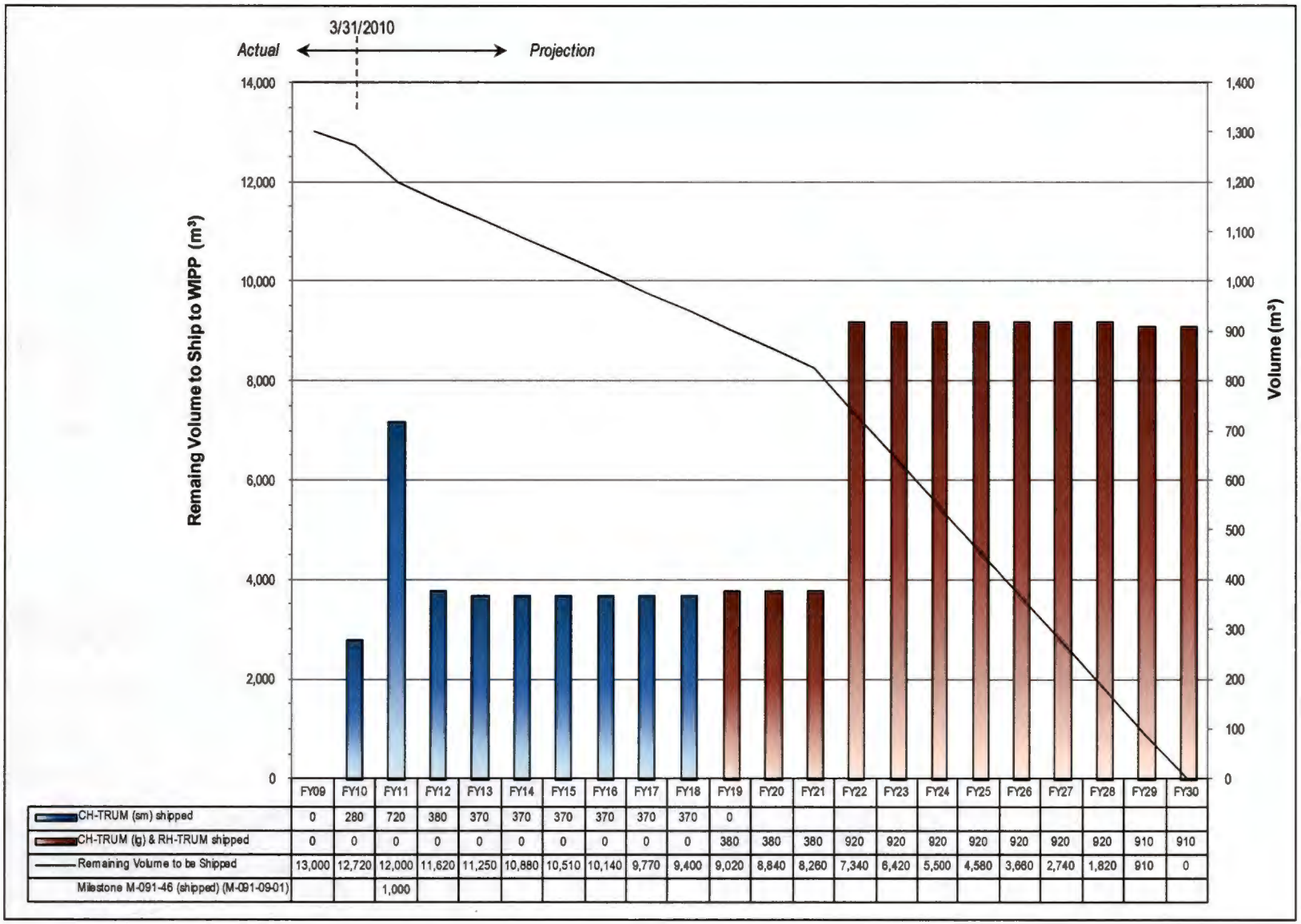
The plan to accomplish these milestones is described as follows.

- Small container CH-TRUM waste that was in aboveground storage as of June 30, 2009, will continue to be processed at the WRAP and T Plant. TRUM waste drums will continue to be loaded into TRUPACT IIs at the WRAP (Figure 6-4). The CPP will continue to certify and ship CH-TRUM waste to WIPP (Figure 6-5), or ship to the Advanced Mixed Waste Treatment Project (Idaho) (AMWTP) located in Idaho for processing.
- The CCP will certify CH-TRUM waste and the WRAP will be utilized to support certification and shipping of CH-TRUM waste to WIPP.
- During FY2011, large container CH-TRUM waste will be processed by an offsite commercial facility.
- During FY2011, the NGR-TFPS is expected to be completed, with operation starting in FY2012. The NGR-TFPS is expected to generate certifiable waste containers ready for final characterization, certification, and shipment to WIPP by CCP.
- During FY2020, construction of the ACWRP-WPS is projected to be completed, with operations starting in FY2021. The ACWRP-WPS will be used to process the retrieved waste from the alpha caissons into WIPP-compliant waste drums.
- A study is planned to be completed in FY2011 that will evaluate the remaining TRUM waste that cannot be processed through existing and planned capabilities. The study will focus on modifications of existing and planned capabilities (e.g., NGR, ACWRP), new supplemental capabilities, or a combination of options. An initial comparison performed in FY2010 identified the strongest



	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
CH-TRUM (sm)	150	390	390	1,100	240	130	250	250	760	0												
CH-TRUM (g) & RH-TRUM	0	0	0	0	0	0	0	380	380	380	0	0	830	830	820	820	810	810	810	810	810	0
Remaining TRUM	12,000	11,610	11,220	10,120	9,880	9,750	9,500	8,870	7,730	7,350	7,350	7,350	6,520	5,690	4,870	4,050	3,240	2,430	1,620	810	0	0
Milestone M-091-44 (certify) (M-091-09-01)								300	300	300												
Milestone M-091-46 (certify) (M-091-09-01))			650	300	125	125	250	250														

Figure 6-1. Certified Volume of CH-TRUM and RH-TRUM Waste (M-091-44, M-091-46)



	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
CH-TRUM (sm) shipped	0	280	720	380	370	370	370	370	370	370	0											
CH-TRUM (lg) & RH-TRUM shipped	0	0	0	0	0	0	0	0	0	0	380	380	380	920	920	920	920	920	920	920	910	910
Remaining Volume to be Shipped	13,000	12,720	12,000	11,620	11,250	10,880	10,510	10,140	9,770	9,400	9,020	8,840	8,260	7,340	6,420	5,500	4,580	3,660	2,740	1,820	910	0
Milestone M-091-46 (shipped) (M-091-09-01)			1,000																			

Figure 6-2. CH-TRUM and RH-TRUM Waste Shipments to WIPP (M-091-44, M-091-46)

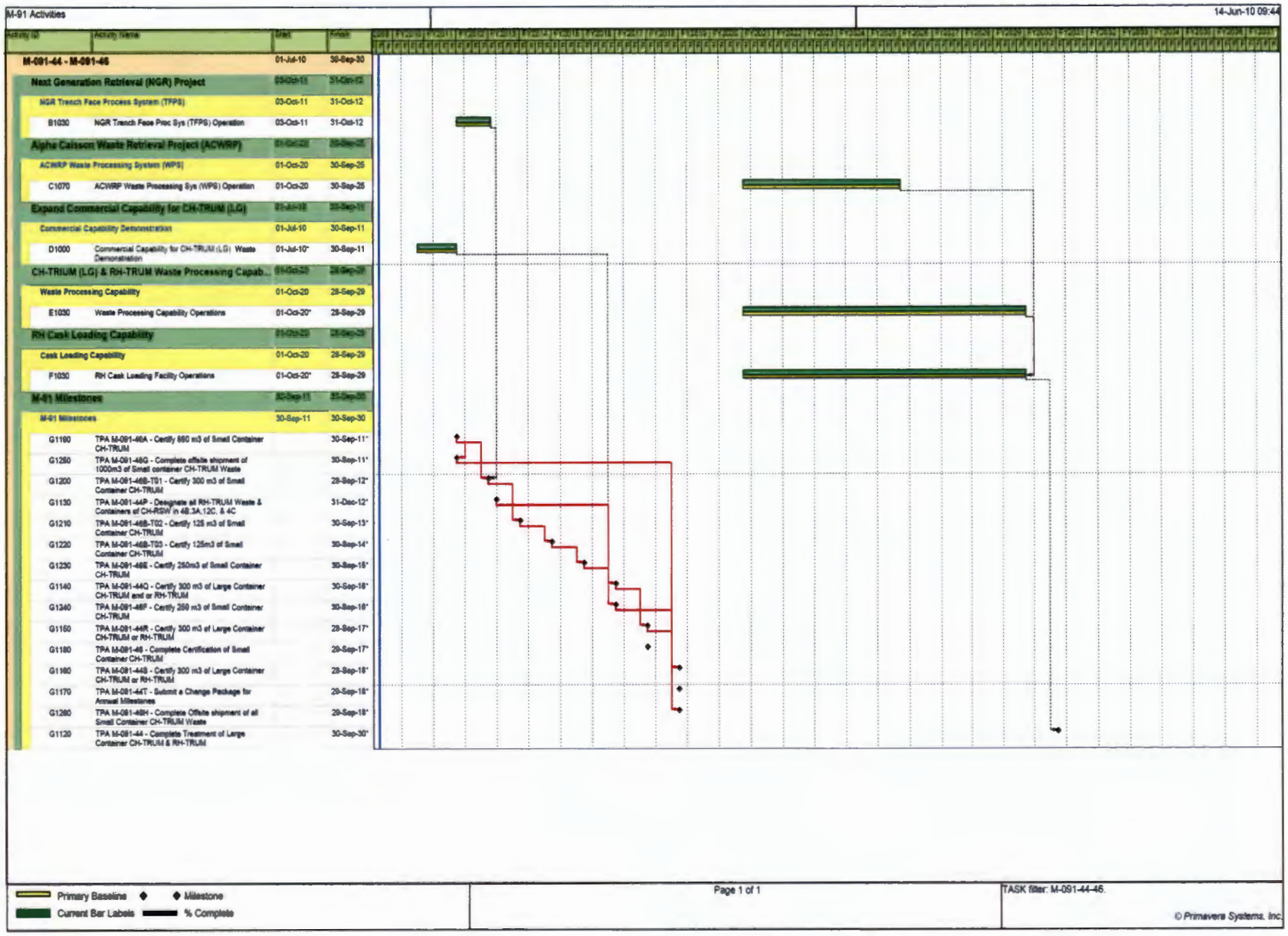


Figure 6-3. M-091-44 and M-091-46 Schedule

Figure 6-4. Loading a TRUPACT II with TRU Waste Drums at WRAP

Figure 6-5. TRUPACT II Shipment of TRUM Waste to WIPP

candidate to be based on concepts developed for NGR. Substantial opportunities exist to utilize existing and planned capabilities, and to minimize new construction. The need for backup processing capabilities and capacities will be considered based on demonstrated processing performed in the next few years.

- A study is planned to be completed in FY2011 that will evaluate the alternatives for acquiring RH-72B cask loading capability.

6.3 Constraints

Treatment/processing commitments for M-091-44 large container CH-TRUM and RH-TRUM waste during the next decade will primarily rely on commercial capability and capacity.

Final certification and shipment of TRUM waste to WIPP is based on support from CCP and WIPP. CCP has been contracted by the Carlsbad Field Office (DOE) (CBFO) to characterize and certify TRU waste being packaged at Hanford.

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7 Project Control

System and technical requirements will be made consistent and traceable throughout the Work Breakdown Structure (WBS), as these requirements are developed during the engineering and planning phases of the project. The control system activities will be compatible with DOE 413.3A and related project management activities.

7.1 Schedule and Critical Path Analysis

Appendix E presents the M-091 PMP logic-tied life-cycle schedule.

Tasks on the schedule address the following.

- Acquisition of new capabilities includes the new retrieval capabilities for CH-RSW drums (NGR), and for the retrieval of the alpha caisson RH-RSW (ACWRP-WRS). The capabilities for the treatment/processing of the remaining waste that may include expansion of currently planned capabilities and the capability to load RH casks for shipment to WIPP are also identified.
- The annual preparation of the PMP and the no-path-forward wastes (Milestone M-091-03).
- Retrieval of CH-RSW and RH-RSW (Milestones M-091-40 and M-091-41). Retrieval operations will generate CH and RH wastes in a variety of packages, which feed into the treatment and processing of MLLW and TRUM waste.
- The treatment/processing of CH-MLLW and RH-MLLW covered under Milestones M-091-42 and M-091-43. Waste for treatment and processing is from the RSW retrieval operations and waste in storage.
- The processing and shipment of CH-TRUM and RH-TRUM waste covered under Milestones M-091-44 and M-091-46. Waste for processing is from the RSW retrieval operations and waste in storage.

The PMP schedule identifies the acquisition of capabilities or facilities as the critical path tasks. It is logical that this is the critical path, as a portion of the waste (that is, RH waste) cannot be processed and shipped offsite until additional capabilities are available. The proposed M-091 milestone addresses this critical path by establishing a milestone (M-091-01A) for the completion (September 30, 2016) of the conceptual design and another milestone (M-091-01B) for the completion (September 30, 2018) of the definitive design for all necessary capabilities. DOE is currently working with its contractor to develop new and innovative methods to provide these capabilities. Options being evaluated include expanded use of commercial services, and the expansion of existing and planned onsite capabilities.

7.2 Key Deliverables/Products

Key deliverables/products that will be developed in support of the M-091 work scope include the following.

- Annual revisions of this PMP will be submitted on June 30 every year and continuing until the M-091 milestones are completed.
- The President's budget, which is issued each February, will be incorporated in the June PMP revisions.

7.3 Performance Measurement

Performance to complete the M-091 milestones is measured using a combination of traditional project management metrics, such as cost and schedule performance. In addition, monthly metrics of RSW retrieval, MLLW and TRUM waste treatment/processing and storage, TRUM waste certification, and shipment are tracked against the milestones.

7.4 Work Breakdown Structure

Figure 7-1 presents the WBS elements that are applicable to the MLLW and TRUM waste discussed in this PMP.

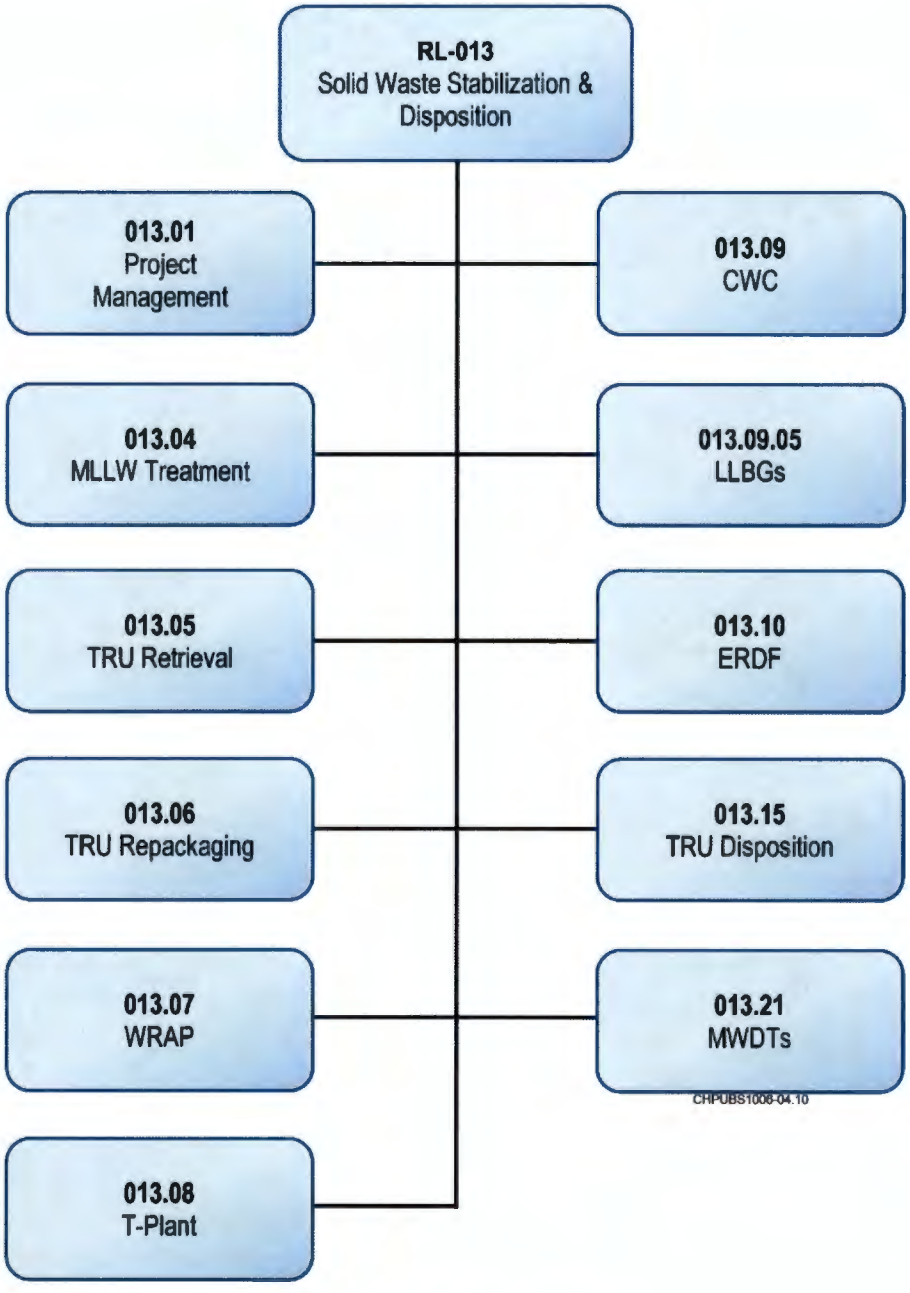

Figure 7-1. WBS Hierarchy

The WBS dictionary sheets identify the scope of activities covered under the WBS, planning assumptions applicable for planning the work scope, functions, and requirements that define the WBS workscope, and source documents that drive the requirements. Appendix D provides a brief description of each current WBS elements. Appendix E presents the ARRA and base funding profile to support the milestones and in some cases accelerates completion.

7.5 Project Interface Control

Project interfaces are controlled by a waste acceptance criteria document, an interface control document, and/or a Memorandum of Agreement/Understanding, when applicable. The definition of roles, responsibilities, and authorities are negotiated based on the type of interface management documentation to be developed.

Interface among the M-091-03 TRUM waste and MLLW activities and other projects, including waste-generating programs for inventory tracking and capacity configuration purposes, is essential for successful project execution. The following is a list of waste activities and projects that require integration for successful project execution:

- Office of River Protection
- CCP/WIPP
- MWDTs 31 and 34
- WRAP Facility
- T Plant
- CWC
- RSW Retrieval
- NGR
- ACWRP
- Environmental Restoration Disposal Facility (ERDF)
- Commercial Processing Facilities

7.6 Reporting

Reporting requirements in the TPA are described in TPA Section 4.0, Agreement Management. The primary interface for reporting and notifications is from the DOE Project Managers to their regulator counterparts or through the Interagency Management and Integration Team. Monthly M-091 Project Manager Meetings are held. The roles and responsibilities for the Project Manager and the Integration Team are contained in TPA Sections 4.1 and 4.2, respectively.

A reporting system has been implemented to provide the status relative to meeting all TPA milestones associated with M-091-03 TRUM waste and MLLW. Status on the M-091 milestones is typically provided to the Ecology Project Manager on a monthly basis. The system will maintain a standardized structure to measure progress against established schedules.

7.7 Change Management

The TPA and Baseline Change Management are discussed in the following sections.

7.7.1 TPA Change Management

Changes to the M-091 PMP will be in accordance with the TPA Action Plan, Section 9, Documentation and Records, and Section 9.3, Document Revision. Changes or revisions to the PMP may also result in the need to modify TPA milestones. Such changes are subject to the requirements of Section 12.0 of the Action Plan, Changes to the Agreement of the Action Plan.

Annual revisions of this PMP will be submitted on June 30 every year and continuing until the M-091 milestones are completed. The President's budget, which is issued each February, will be incorporated in the June revision to the PMP. The PMP revision will include plans and schedules to address all the requirements set forth in the M-091 milestone series. Each revision of the M-091-03 PMP will, after approval by Ecology, supersede previous M-091-03 PMPs.

PMP revisions will be submitted to Ecology for review and approval as primary documents pursuant to the Agreement Action Plan, Section 9.2.1 of the TPA. DOE will implement the Plan as approved.

7.7.2 Life-Cycle Baseline Change Management

DOE maintains a Contract Budget Log (CBL) under configuration control and management that reconciles to the current contract target costs. Changes are controlled and formally reviewed and approved. DOE requires the contractor to maintain a baseline change process that is approved by DOE.

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Appendix A

M-091 TPA Section 11.5 Matrix

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Table A-1. M-091 TPA Section 11.5 Matrix

Element Description	Applicable PMP Section
Project goal and objectives	Section 1.1, *Goals and Objectives.*
Waste stream physical information	Section 1.2, *Scope*; Sections 2.0 through 6.0, are broken into the different milestone activities (i.e., acquisition of capabilities, retrieval, MLLW treatment and disposal, TRUM certification, and disposal) that give a description of the waste (physical and characteristics), current inventories, and projections. Additional data are provided in Appendix A, *Background*, and Appendix B, *Description of Existing Capabilities.*
Current commercial disposition options	Section 2.2, *Commercial Capabilities*; Section 5.0, *Treatment of CH and RH Mixed Low-Level Waste (M-091-42, M-091-43)*; Appendix B, Section B.3.1, *Commercial MLLW Treatment/Processing.*
Component and stream stability, and known and suspected instances of contaminant migration	Appendix A, Section A.2, *Component and Treatability Groups Stability (Contamination Migration).*
Earlier evaluation of management and disposition options for each waste stream	Section 2.0, *Acquisition of Capabilities for MLLW and TRUM Waste (M-0910-01)*; Appendix A, Section A.3, *Evaluations*; Appendix B, Section B.3.1, *Commercial MLLW Treatment/Processing.*
Specific applicable regulatory requirements and impacts	Appendix A, Section A.4, *Significant Applicable Regulatory Statutes.*
Facilities and physical boundaries	Section 1.2, *Scope*; Appendix B, *Description of Existing Capabilities.*
Planned approach and action boundaries	Sections 2 through 6 each have subsections that discuss planned approaches.
Top-level Work Breakdown Structure	Section 7.4, *Work Breakdown Structure*; Appendix C, *Work Breakdown Structure Description.*
Projected Treatment, Storage, and/or Disposal capability(s)	Section 1.2, Scope; Section 2.0, *Acquisition of Capabilities for MLLW and TRUM Waste (M-0910-01)*; Sections 4 through 6.
Project constraints	Section 6.3, *Constraints*; Section 7.1, *Schedule and Critical Path.*
Schedule and critical path	Section 7.1, *Schedule and Critical Path;* Appendix E, *Critical Path Schedule;* Appendix D, *RL-013 Funding Profile.*
Key deliverables/products	Section7.2, *Key Deliverables/Products.*
Performance measurement	Section 7.3, *Performance Measurement.*
Project interface control	Section 7.5, *Project Interface Control.*
Reporting and notifications	Section 7.6, *Reporting.*
Change management	Section 7.7, *Change Management.*
Draft agreement change request	Appendix F, *M-091 Milestone Change Package M-091-09-01.*
CH = contacted handled MLLW = mixed low-level waste	RH = remote handled TRUM = transuranic mixed waste

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Appendix B

Background

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B1 Background **B-1**

B1.1 Overview of MLLW and TRUM Waste Management B-1

B1.1.1 MLLW Treatability Groups B-1

B1.1.2 TRUM Waste Treatability Groups B-2

B1.2 Component and Treatability Groups Stability (Contamination Migration) B-2

B1.3 Evaluation B-2

B1.4 Significant Applicable Regulatory Statutes B-3

B1.4.1 Clean Air Act (42 U.S.C. 7401 et seq.) B-3

B1.4.2 Hazardous Materials Transportation Act (49 U.S.C. 5101 et seq.) B-3

B1.4.3 National Environmental Policy Act (42 U.S.C. 4321 et seq.) B-3

B1.4.4 Toxic Substance Control Act B-4

B1.4.5 RCRA as amended by the Hazardous and Solid Waste Amendments (42 U.S.C. 6901 et seq.) B-4

B1.4.6 CERCLA (42 U.S.C. 9601 et seq.) B-4

B1.4.7 Washington State Hazardous Waste Management Act (Revised Code of Washington [RCW] Chapter 70.105) B-4

B1.4.8 Washington Clean Air Act (RCW Chapter 70.94) B-4

B1.4.9 Department of Transportation B-5

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Terms

ACWRP	Alpha Caisson Waste Retrieval Project
CBFO	Carlsbad Field Office (DOE)
CCP	Central Characterization Project
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH	contact handled
CPP	CERCLA past-practice
CSER	criticality safety evaluation report
CSFO	Carlsbad Field Office (DOE)
CWC	Central Waste Complex
DOE	U.S. Department of Energy
DOT	Department of Transportation
DSA	Documented Safety Analysis
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
FY	fiscal year
HSGS	head-space gas sampling
HWMA	Hazardous Waste Management Act
LDR	land disposal restriction
LLBG	Low-Level Burial Ground
LWA	Land Withdrawal Act
M&EC	Materials and Energy Corporation
MACRO	Macro-encapsulation
MLLW	mixed low-level waste
MOU	Memorandum of Understanding
MWDT	Mixed Waste Disposal Trench
NDA	non-destructive assay
NDE	non-destructive examination
NGR	Next Generation Retrieval

OU	operable unit
PCB	polychlorinated biphenyl
PMP	Project Management Plan
PUREX	Plutonium Uranium Extraction
RCRA	Resource Conservation and Recovery Act of 1976
RCW	*Revised Code of Washington*
RH	remote handled
ROD	Record of decision
RSW	retrievably stored waste
SNM	Special Nuclear Material
SWB	standard waste box
SWOC	Solid Waste Operations Complex
TFPS	Trench Face Process System
TPA	Tri-Party Agreement
TRU	transuranic
TRUM	transuranic mixed waste
TRUPACT	Transuranic Package Transporter
TSCA	*Toxic Substances Control Act of 1976*
TSD	treatment, storage, and/or disposal
W&FMP	Waste and Fuels Management Project
WARD	Westinghouse Advanced Reactor Division
WBS	work breakdown structure
WIPP	Waste Isolation Pilot Plant (Carlsbad, New Mexico)
WPS	Waste Processing System
WRAP	Waste Receiving and Processing Facility
WDOH	Washington State Department of Health

B1 Background

Background for mixed low-level waste (MLLW) and transuranic mixed waste (TRUM) waste discussed in this Appendix includes: (1) an overview of MLLW and TRUM waste management, (2) component and treatability groups stability (contamination migration), (3) recent evaluations, and (4) significant applicable regulatory statues.

B1.1 Overview of MLLW and TRUM Waste Management

MLLW is low-level waste (LLW) that is subject to *RCRA* or 70.105 RCW. LLW is defined as radioactive waste that is not spent fuel, high-level waste, transuranic (TRU) waste, by-product material, or naturally occurring radioactive material.

TRUM waste is TRU waste that is subject to Resource Conservation and Recovery Act *(RCRA)* or 70.105 *Revised Code of Washington* (RCW). TRU waste is defined as waste that meets the definition in Subsection (18) of Section 2 of the Waste Isolation Pilot Plant (Carlsbad, New Mexico) (WIPP) Land Withdrawal Act. Pub. L. 102-579.

B1.1.1 MLLW Treatability Groups

The necessary treatment path to ensure that the waste, once treated, will meet land disposal restriction (LDR) requirements for disposal categorizes the MLLW. The *Calendar Year 2009 Hanford Site Mixed Waste Land Disposal Restrictions Summary Report* (DOE/RL-2010-27) includes the following treatability groups:

MLLW-01 "LDR Compliant Waste," Treatment Path: Direct disposal without additional LDR treatment

MLLW-02 "Inorganic Non-Debris," Treatment Path: Non-thermal (stabilization)

MLLW-03 "Organic Non-Debris," Treatment Path: Thermal

MLLW-04 "Hazardous Debris," Treatment Path: Non-thermal (macroencapsulation)

MLLW-05 "Radioactive Lead Solids," Treatment Path: Non-thermal (macroencapsulation)

MLLW-06 "Mercury Waste," Treatment Path: Mercury stabilization (that is, amalgamation or grout stabilization)

MLLW-07 "RH and Large Container," Treatment Path: In-trench treatment, commercial, expanded NGR-TFPS, and ACWRP (processing)

MLLW-08 "Unique Wastes," Treatment Path: No path (lack of treatment capability)

MLLW-09 "Radioactive Batteries," Treatment Path: Macro-encapsulation

MLLW-10 "Reactive Metals," Treatment Path: Deactivation of reactive component

Pursuant to the *Hazardous and Solid Waste Amendments,* LDRs were promulgated beginning in 1986 for non-radioactive waste. The LDRs became effective at a later time for mixed waste. Beginning in 1990, Tri-Party Agreement (TPA) Milestone M-26-01 required a plan with subsequent yearly reports on the volume of mixed waste in storage at the Hanford Site. The latest year's report is the *Calendar Year 2009 Hanford Site Mixed Waste Land Disposal Restrictions Full Report*. The report provides total waste volume for both the currently stored inventory and the waste forecast to be generated during the next 5 years by the "Treatability Group." This Project Management Plan (PMP) addresses MLLW LDR Treatability Groups MLLW-02 through MLLW-10, as described in Section 2.2, Waste Requiring

Processing, and Disposition. Treatability Group MLLW-01, direct disposal of LDR-compliant waste, requires no processing, and is not included in this PMP.

B1.1.2 TRUM Waste Treatability Groups

TRUM waste is categorized by the necessary treatment path to ensure that this waste, once processed, will meet WIPP waste acceptance criteria for disposal. The *Calendar Year 2009 Hanford Site Mixed Waste Land Disposal Restrictions Full Report* includes the following:

TRUM contact handled (CH) Small Containers

TRUM CH Large Containers

TRUM remote handled (RH)

B1.2 Component and Treatability Groups Stability (Contamination Migration)

Aboveground storage for mixed waste is in accordance with regulatory requirements. Currently, mixed waste is primarily stored in the 200 West Area Central Waste Complex (CWC). The CWC buildings are designed to meet storage requirements for MLLW and TRUM waste as required by WAC 173-303.

Disposal of MLLW in accordance with regulatory requirements has occurred in Trenches 31 and 34 of burial ground 218-W-5 in the 200 West Area, and at the Environmental Restoration Disposal Facility (ERDF). The facilities are built to RCRA standards and employ a double-liner leachate collection system as required for near-term containment. All disposed wastes have been treated to satisfy LDR requirements for hazardous constituents prior to disposal as defined in WAC 173-303.

B1.3 Evaluation

A No-Path-Forward Waste Stream Alternative Analysis (CH2M HILL Plateau Remediation Company [CHPRC]-00604) was issued in April 2010. The analysis down-selected options from previous evaluations. The analysis developed alternatives for the safe and cost-effective disposition of Hanford Site solid waste with no currently defined path forward to disposal. The alternatives were developed to support the goals of accelerating disposition through expanding the use of offsite capabilities, minimizing the need to develop new technologies, minimizing the need for new onsite capabilities, and accelerating shipments of waste to WIPP.

The analysis grouped together wastes that will have similar processing and disposal requirements resulting in the following recommendations:

- Miscellaneous unique, small waste containers will be dispositioned through a variety of treatment paths, waivers, and variances. This continues with the successful disposition methods for these wastes, which together are a very small total volume of no-path-forward waste.
- A small volume of high-dose rate waste exists that is not amenable to treatment and requires alternate disposal paths. The majority of the remaining waste is associated with processing of non-dangerous German logs, and includes waste packages in 218-W-3AE and a few containers in CWC.

- Selected wastes will utilize commercial treatment capability including commercial treatment of CH-TRUM waste in large containers, with low Special Nuclear Material (SNM) content.
- Additional wastes not amenable for commercial processing are candidates for treatment through expansion of currently planned onsite capabilities (e.g., expanded Next Generation Retrieval [NGR]- Trench Face Process System [TFPS], Alpha Caisson Waste Retrieval Project [ACWRP] Waste Processing System [WPS]).

The analysis recognized that disposal paths for some containers may change as implementation proceeds and experience is gained. The approach builds on current successful waste processing by incrementally processing higher-activity wastes. Redundant and backup capabilities are also built into this approach to reduce overall risks to project success.

The analysis also recommended that efforts continue to establish a permanent RH-TRUM waste-loading capability.

B1.4 Significant Applicable Regulatory Statutes

Mixed waste management activities will consider the following requirements as well as any other applicable regulations or U.S. Department of Energy (DOE) requirements.

B1.4.1 Clean Air Act (42 U.S.C. 7401 et seq.)

The Hanford Site air operating permit has been issued in accordance with Title V of the *Clean Air Act and Amendments*, and is implemented through federal and state programs under 40 CFR Part 70 and WAC 173-401. The permit is intended to provide a compilation of applicable *Clean Air Act* requirements both for radioactive emissions and for criteria/toxic emissions at the Hanford Site. Current air permitting documentation is expected to address existing mixed waste management activities. New air permitting documentation will be needed for NGR, alpha caissons retrievably stored waste (RSW) retrieval, and future large container and RH capabilities. Activities addressed by the PMP will be reviewed against the permitting documentation, as necessary to ensure that mixed waste management activities are addressed.

B1.4.2 Hazardous Materials Transportation Act(49 U.S.C. 5101 et seq.)

Hazardous material transportation requirements include employee training programs, performance standards, and preparation of shipping papers to identify and track hazardous materials, design of packaging and containers, marking, and labeling. Specific requirements will be followed relating to mixed waste management activities and the shipment mode used (that is, rail, aircraft, vessel, and public highway). Offsite shipments of hazardous materials must comply with the implementing regulations at 49 CFR administered by the U.S. Department of Transportation (DOT). Onsite waste movements must comply with DOE requirements, including the *Hanford Sitewide Transportation Safety Document*.

B1.4.3 National Environmental Policy Act (42 U.S.C. 4321 et seq.)

DOE/EIS-0286F, *Final Hanford Site Solid (Radioactive and Hazardous) Waste Environmental Impact Statement* (HSW EIS, January 2004) analyzed potential impacts associated with the onsite and offsite treatment, storage, disposal, and transportation of MLLW and transuranic waste. A Record of Decision was issued (69 FR 39449, June 2004). The HSW EIS, was challenged, resulting in a settlement agreement (*Washington v. Bodman*, Civil No. 2:030-cv-005018-AAM, January 6, 2006). The settlement agreement includes the following stipulation:

> "Pending finalization of the TC&WM EIS, the HSW EIS will remain in effect to support ongoing waste management activities at Hanford (including off-site waste transportation such as TRU and TRUM shipments to WIPP), in combination with other applicable Hanford Site NEPA and CERCLA

documents, permits and approvals; provided, that pending finalization of the TC&WM EIS, DOE will not rely on the groundwater analysis in the HSW EIS for decision-making. When completed, the TC&WM EIS will supersede the HSW EIS."

A draft of the *Tank Closure and Waste Management Environmental Impact Statement* (TC&WM EIS, DOE/EIS-039, October 2009) has been prepared; public comment closed May 2010. Under NEPA, M-091 planning scenarios would continue to be compared to descriptions/analyses in the EIS(s) to ensure impacts have been adequately addressed.

B1.4.4 Toxic Substance Control Act

Chemical Waste Landfill authorization is required for specific categories of *Toxic Substances Control Act* (TSCA) waste. Currently the Mixed Waste Disposal Trenches (MWDTs) do not have this authorization, therefore, alternative disposal capabilities will be utilized (that is, ERDF, offsite commercial).

B1.4.5 RCRA as amended by the Hazardous and Solid Waste Amendments (42 U.S.C. 6901 et seq.)

Federal regulations implementing RCRA and RCRA corrective action address the requirements for hazardous wastes, including the treatment, storage, disposal, and transportation (40 CFR Parts 260-271). U.S. Environmental Protection Agency (EPA) has authorized the Washington State Department of Ecology (Ecology) to administer the State's Hazardous Waste Management Act (short title of RCW 70.105) (HWMA) and associated regulations at WAC 173-303 in lieu of the federal RCRA regulations.

B1.4.6 CERCLA (42 U.S.C. 9601 et seq.)

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) addresses spill cleanups and hazardous substances left at past practice waste sites. DOE performs investigation and cleanup actions as the lead agency for operable units (OU) at Hanford through the CERCLA process. Either EPA or Ecology is the lead regulatory agency for cleanup actions at Hanford. DOE submitted an M-016-93 implementation work plan to EPA for the acquisition of capabilities necessary to prepare TRUM waste generated by CERCLA cleanup actions at the Hanford Site for disposal at WIPP. This work plan reflected retrieval decisions, projected waste volumes, and schedules from all CERCLA cleanup actions authorized in record of decisions (RODs) and action memoranda at the Hanford Site, and will provide for updates and revisions as new information becomes available (that is, after all 200 Area RODs are issued). As part of the approval process, for RODs and action memoranda, RL and EPA will obtain Ecology concurrence to ensure that wastes from CERCLA OUs for which Ecology is the lead regulatory agency are properly planned.

B1.4.7 Washington State Hazardous Waste Management Act (Revised Code of Washington [RCW] Chapter 70.105)

The HWMA authorizes Ecology's authority to regulate the treatment, storage, disposal, and transportation, of dangerous waste in Washington State. Mixed waste is a subset of dangerous waste. Ecology has promulgated regulations in WAC 173-303. Mixed waste generation activities are subject to generator requirements. Mixed waste management activities that cannot utilize generator provisions must be conducted according to dangerous waste permits under WAC 173-303 in order to operate. Existing permits are expected to address processing activities.

B1.4.8 Washington Clean Air Act (RCW Chapter 70.94)

Ecology's Nuclear Waste Program regulates air toxic and criteria pollutant emissions from the Hanford Site. Ecology promulgates and enforces the regulations under the *Washington Clean Air Act*

(RCW Chapter 70.94). Ecology's implementing requirements (e.g., WAC 173-400, WAC 173-460) specify reviewing new source emissions, permitting, applicable controls, reporting, notifications, and complying with the general standards for applicable sources of Hanford Site emissions.

The Washington State Department of Health (WDOH) Radiation Protection Division regulates radioactive air emissions statewide as authorized by EPA and Washington State legislative and regulatory authority. The Washington State Department of Health implements the state requirements and adopts and implements for the federal requirements under WAC 246-247, and enforces the federal requirements under authority delegated by the EPA. Before beginning any work that would result in creating a new or modified source of radioactive airborne emissions, a notice of construction application must be submitted for review and approval by WDOH, resulting in issuance of an operating license. Typical license requirements for radioactive air emission sources include ensuring adequate emission controls, emissions monitoring/sampling, and annual reporting of emissions.

B1.4.9 Department of Transportation

Onsite transportation of waste is managed by DOE in accordance with the *Hanford Sitewide Transportation Safety Document*. Transportation of waste offsite is regulated by the U.S. DOT. A 2003 memorandum of understanding (MOU) between the Western Governors' Association and DOE headquarters requires that DOE conduct TRU waste shipments through the Western States, in accordance with the protocols contained in the *WIPP Transportation Safety Program Implementation Guide*, not including shipments within the same DOE site or other TRU waste shipments as agreed to between DOE and the states. Shipments of TRU waste to commercial firms using road closures are acceptable.

The type of packaging required to transport the waste depends, in part, on the total quantity of radioactivity, the form of the materials, and the concentration of radioactivity. DOE is responsible for determining the appropriate container for the material it is transporting. DOE ensures that each waste package being transported offsite meets DOT regulations for design, material, manufacturing methods, and testing.

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Appendix C

Description of Existing Capabilities

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C1 Description of Existing Capabilities

The following sections provide a description of the existing storage, treatment and processing, and disposal capabilities to manage the different type of waste previously described in Appendix B. Figure C-1 presents the typical flow path of the existing capabilities.

The *Hanford Site Solid Waste Acceptance Criteria* (HNF-EP-0063) defines the baseline criteria for acceptance of waste at the following Hanford Site SWOC treatment, storage, and disposal (TSD) units: the CWC, Waste Receiving and Processing Facility (WRAP) facility, T-Plant, and the low-level burial grounds that include the MWDT. The waste acceptance criteria for each TSD unit have been established in HNF-EP-0063 to ensure that waste can be managed within the operating requirements of the unit, including environmental regulations, DOE Orders, permits, nuclear safety requirements, waste analysis plans, performance assessments, and other applicable requirements.

The Hanford Site Solid Waste Acceptance Program requirements, which include the RCRA Part A storage limitations, dictate the volume of RSW waste containers and newly generated MLLW and TRUM waste containers that can be stored in the CWC, WRAP, and T-Plant. Spacing of stored waste containers depends on the dose equivalent curies in the packages and criticality limitations.

C1.1 RSW

The RSW waste is stored in Low-Level Burial Ground (LLBG) (non-caisson) and in caissons. Retrieval of the RSW in the LLBGs began in 2003. Capability to retrieve the RSW stored in the caissons does not currently exist.

C1.1.1 RSW (Non-Caisson)

The RSW is in designated areas in LLBGs 218-E-12B, 218-W-3A, 218-W-4B, and 218-W-4C. Burial ground 218-E-12B includes two trenches (T17 and T27) that contain primarily CH-RSW. Burial ground 218-W-3A includes 14 trenches (T1, T4, T5, T6, T6S, T8, T9S, T10, T15, T17, T23, T30, T32, and T34). Burial ground 218-W-4B includes three trenches (T7, T7V, and T11). Retreival from burial ground 218-W-4C is complete. The RSW is considered suspect TRUM waste until it has been retrieved and determined otherwise.

Approximately 37,000 RSW containers were placed in the retrievable trenches, starting in 1970 and ending in 1988. Some of the trenches were asphalt-paved. Most of the waste containers were covered with plywood, tarps, and soil. Although these wastes were placed with the intention of retrieving them, wastes that were placed before the effective date of mixed waste regulation (August 19, 1987) remain disposed under RCRA and HWMA unless and until they are removed from burial grounds for storage at a TSD unit in accordance with M-091.

The waste containers varied in size up to 6 m by 9 m by 3 m (20 ft by 13 ft by 11 ft), weights up to 37,648 kg (83,000 lb), dose rates (unshielded at the container surface) up to 20,000 rem/hr, and high plutonium content. The waste packages are placed in various configurations in the LLBG.

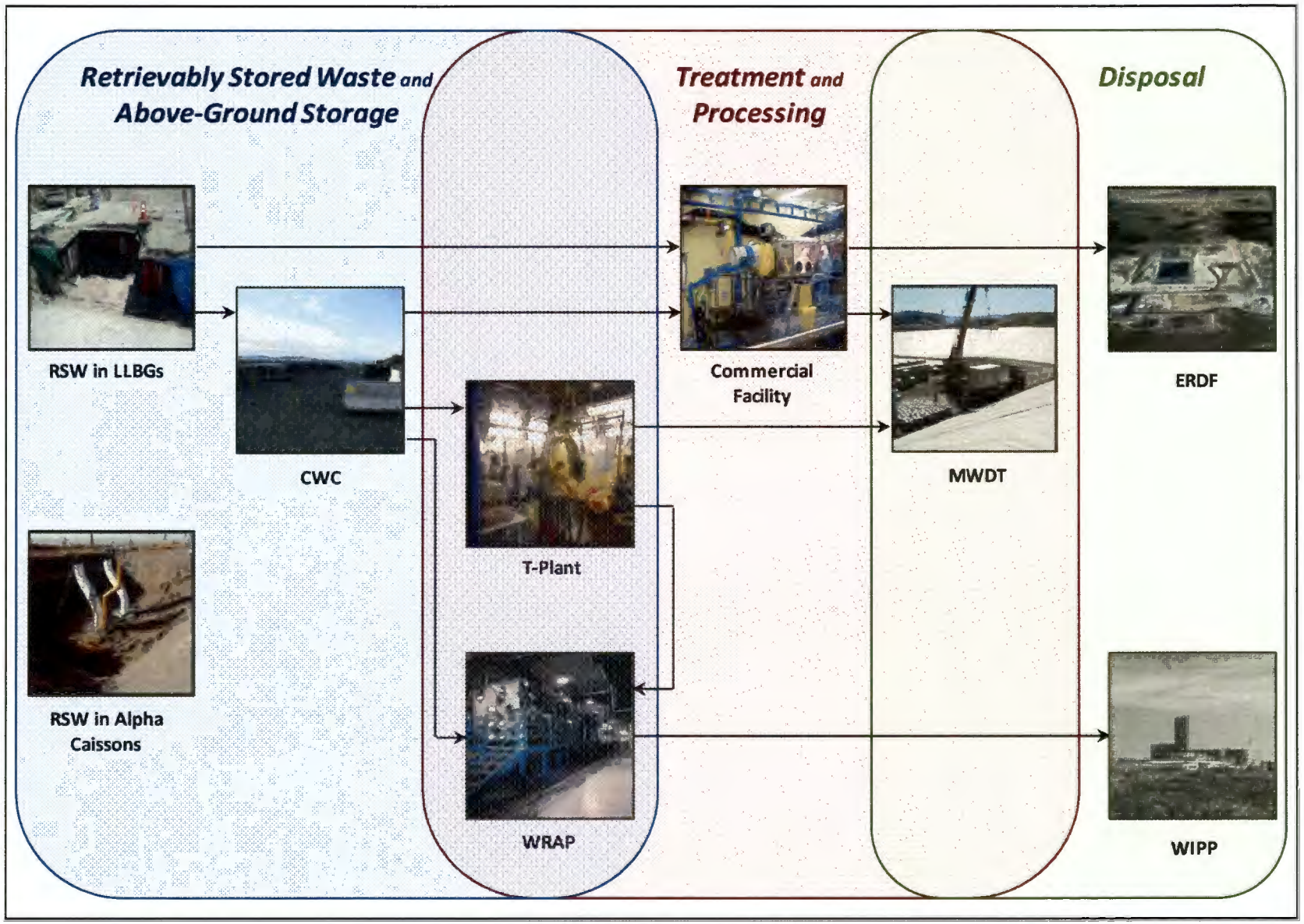

Figure C-1. Typical Flow Path of Existing Capabilities

Existing retrieval techniques are being used to remove RSW CH boxes and RH containers from the designated areas. Prior to conducting field activities, historical records are reviewed and applicable data recorded for each container scheduled for retrieval. The initial field activity comprises site setup and preparation. Retrieval and non-destructive assay (NDA) equipment are staged in or near the trench chosen for retrieval. Staging and work areas are defined and set up. Retrieval activities may be completed inside of a relocatable weather enclosure. Equipment setback distances are determined by engineering analysis to ensure trench slope stability is maintained. Work enclosures may be used in selected retrieval activities. The excavation of the trench is initiated following completion of site setup and preparation.

The overburden soil is removed to expose the waste containers. During TRU retrieval activities, once the overburden is removed to the extent that the containers become visible, the container condition is evaluated. If the visible containers provide evidence of significant degradation, an appropriate protective covering is applied to protect the waste from the environmental conditions until it is time to retrieve the containers. Upon commencement of individual container retrieval activities, if conditions are encountered that may require actions outside those in approved operating procedures, appropriate actions will be determined, documented, and taken to remediate the conditions.

Individual containers may not be immediately accessible for inspection to determine the extent of the condition upon removal of overburden, tarps, plywood, or other protective materials. Containers may also be exposed for an extended period before retrieval can start or be completed for various reasons (such as, equipment requirements, permits, weather, adjacent containers, or identification of new or changed conditions).

Containers with significant deterioration will be placed in a safe configuration (e.g., over packing of corroded drums and building of containment around degraded boxes) pending development of adequate retrieval methodologies. Containers that have been determined to present unacceptable hazards to the workers will be documented and may be reburied or placed into a culvert or other acceptable arrangement to provide adequate protection during storage.

Retrieval may include container repair, overpacking, application fixatives, and moving the containers to a staging location for final inspection, labeling, and surveys. A crane may be used to move the container to a location where a forklift can be used to move the container to the Process Area, or a forklift may be used without the crane. Other equipment may be used in the retrieval activities such as remote controlled equipment that will accomplish similar tasks without exposing personnel to the immediate hazards of retrieval.

C1.1.2 RSW (Caisson)

Burial ground 218-W-4B includes four alpha caissons containing RH-RSW. Based on available records, approximately 24 m^3 (79 ft^3) of RH-TRUM waste is contained in the alpha caissons. This waste was generated from post-irradiation examination of reactor fuel elements and other material in the 325 and 327 hot cell facilities in the Hanford Site 300 Area. The alpha caissons are cylindrical, underground waste repositories used to store dry, RH wastes shipped from the Hanford 325 and 327 Hot Cell Facilities. The alpha caissons, located 4 m (14 ft) below grade, are accessed by a 3-foot-diameter-loading chute and a 1-foot-diameter ventilation shaft. Loading of this waste material into the alpha caissons occurred between 1970 and 1988. The RH-TRUM waste material is only located in alpha caissons 1 through 4.

The ACWRP will provide the capability to retrieve, process, and package the RH-TRUM waste that is currently located in the alpha caissons in the 218-W-4B LLBG. The processed waste will be considered certifiable (meeting all WIPP acceptance requirements), and be ready for final characterization and certification by the Central Characterization Project (CCP).

C1.2 CWC

The CWC, a series of buildings conforming to WAC 173-303 requirements, receives and stores mixed radioactive waste in a safe and compliant manner. The CWC began accepting waste in August 1988.

The storage structures, located in the 200 West Area of the Hanford Site, include 12 small, mixed waste storage buildings (the 2402 series) and five large storage buildings (the 2403 series and 2404-WA). In addition, there are 27 modules for storing low flashpoint mixed waste and 12 modules for storing alkali metals and waste storage pads (paved and gravel) are part of the CWC.

The CWC provides indoor and outdoor aboveground storage for MLLW and TRUM waste that either: (1) was in storage as of June 30, 2009, (2) has been treated/processed awaiting certification, or (3) is awaiting shipment. The CWC operating indoor capacity is approximately 12,800 m^3 (12,800 ft^3).

The T-Plant Complex and the WRAP capabilities provide additional storage for mixed-waste packages. Packages are stored at the WRAP and T-Plant Complex waiting processing, shipment to CWC, or shipment directly to treatment or disposal.

C1.3 T-Plant

The T-Plant, located in the 200 West Area of the Hanford Site, provides both storage and processing capabilities.

C1.3.1 T-Plant Storage

The T-Plant Complex consists of the 221-T Canyon, the 2706-T Facility, and several support structures. The canyon has internal dimensions of 11 m (37 ft) wide by nearly 244 m (800 ft) long. There is 8 m (26 ft) of clearance between the canyon deck and the crane rails. The T-Plant Canyon crane can lift 40,823 kg (90,000 lb). Container size in the canyon is limited to less than 7 m (22 ft) long, 9 m (13 ft) high, and 5 m (18 ft wide). Container size in the 2706 T-Facility is limited to less than 12 m (40 ft) long, 4 m (14 ft) high, and 4 m (12 ft) wide. Current activities in the canyon facility and 2706-T include mixed waste storage.

C1.3.2 T-Plant Processing

Current activities in the canyon facility include treatment (e.g., pH neutralization, liquid absorption, and microencapsulation), venting, sampling, and repackaging waste. T-Plant capabilities provide capacity using modular containment systems that are attached to make a rigid enclosure for TRUM waste sorting, processing, and volume reduction. These activities are performed in gloveboxes inside the containment structures to control the spread of contamination.

Currently, the T-Plant has the capability to repackage 55-gallon and 85-gallon CH-TRUM waste. T-Plant modular containment systems have TRUM waste processing limitations (i.e., plutonium quantities, weight, sharp items, and so forth). The 2706-T Facility activities include staging, verification, treatment, venting, sampling, and repackaging, and storing CH waste.

C1.4 WRAP

The WRAP facility, located in the 200 West Area of the Hanford Site, provides both storage and processing capabilities.

C1.4.1 WRAP Storage

The WRAP facility provides waste staging and storage. Two large container storage buildings (2404-WB and 2404-WC) are part of the WRAP. Each building is 37 m (121 ft) wide, 55 m (800 ft) long and 6.1 m (20 ft) high (to the eave). Each building has 2,035 m^2 (6,677 ft^2) of floor area and accommodates approximately 4,600 55-gallon containers of waste.

C1.4.2 WRAP Processing

WRAP processes 55-gallon drums of CH-TRUM waste for shipment to WIPP. The facility process area is 650 m^2 (2,133 ft^2) containing glove boxes and storage areas. WRAP has limited capabilities to process 85-gallon overpacks containing internal packages that potentially have integrity issues. WRAP processing includes shipping and receiving; waste container handling; waste staging; non-destructive examination (NDE) and NDA; waste treatment; TRUM waste verification; packaging and repackaging; headspace gas sampling; and drum venting. WRAP NDE and NDA processes are automated to examine and characterize waste using radiography (NDE), and gamma and neutron assay (NDA) equipment. The 2404-WC building is used for head-space gas sampling operations. Repackaging waste is performed as required to meet WIPP certification requirements. Some of the waste-handling operations are performed remotely to minimize exposure of personnel to radioactive materials.

WRAP also performs NDE of transuranic waste in standard waste boxes (SWBs). Boxes not exceeding 2.74 m (9.0 ft) long by 1.6 m (5.2 ft) wide by 1.7 m (5.6 ft) high can be received for NDE and boxes not exceeding 2.43 m (7.97 ft) long by 1.5 m (4.9 ft) wide by 1.5 m (4.9 ft) high can be received for NDA screening. WRAP treatment capabilities include amalgamation of mercury (not currently in use), neutralization for acidity or alkalinity of an aqueous solution (pH) adjustment, solidification of free liquids, and limited macro-encapsulation. WRAP capabilities include WIPP shipment preparation and TRUPACT II loading.

C1.5 Commercial Treatment of MLLW

The commercial capabilities available are described in the following sub-sections. Small quantities of MLLW can also be disposed of at offsite commercial facilities.

C1.5.1 Stabilization

The objective of stabilization is to immobilize the hazardous component through chemical and/or physical fixation into low-solubility materials, and by encapsulation to reduce the potential for future releases. Usually, stabilization is accomplished by mixing the waste with Portland cement or pozzolanic materials at a preselected ratio, but stabilization can also include mixing with polymer materials. This treatment prepares the waste to meet the disposal requirements. Many pretreatment processes may be employed prior to stabilization, such as drying, shredding, screening, and chemical treatments.

The treatment path for inorganic non-debris MLLW is commercial stabilization and is represented in LDR Treatability Group MLLW-02. Waste within this group consists of many different inorganic solids (such as, particulates, absorbed liquids, sludges, resins, and soils) and labpacks that are contaminated with regulated metals and other inorganics.

Several commercial treatment facilities located in the United States can accept the majority of the Hanford Site's waste in the MLLW-02 Treatability Group. The T-Plant facility has waste stabilization capability and could be used to supplement commercial facilities. Waste within this group that cannot be accepted at a commercial facility or T-Plant for treatment will be included on a list of no-path-forward waste to be provided in the disposition plan required under M-091-03D-02. This disposition plan is to be included in the June 30, 2011, revision of the PMP.

C1.5.2 Thermal Treatment of Organics

The thermal treatment process destroys organic materials by oxidation, combustion, and/or pyrolysis.

The treatment path for organic non-debris MLLW is commercial thermal treatment and is represented in LDR Treatability Group MLLW-03. Waste within this group consists of many different inorganic and organic solids (such as, particulates, absorbed liquids, sludges, resins, and soils) and labpacks that are contaminated with organic regulated dangerous waste constituents. This group may also include dangerous waste containing PCBs that require thermal destruction.

Commercial treatment facilities are located in the United States that can accept the Hanford Site's waste in the MLLW-03 Treatability Group.

C1.5.3 Macro-Encapsulation

Macro-encapsulation consists of applying a surface coating of polymeric organics or using a jacket of inert inorganic materials (such as, cement) to substantially reduce surface exposure to potential leaching media. Hanford has mainly employed the use of Portland cement-based grouts to macro-encapsulate this waste. Prior to macro-encapsulation, the waste is typically sent through one or more size-reduction steps (such as, sorting, cutting/shearing, compaction, and super-compaction).

The primary treatment path for MLLW debris and radioactive lead solids is commercial macro-encapsulation.

Waste within the MLLW-04 treatability group that meets the definition of hazardous debris as defined in 40 CFR 268.2. The physical characteristics include paper, plastic, wood, rubber, rags, and lesser quantities of metallic and inorganic waste components. This waste may include organic/carbonaceous waste constituents in excess of 10 percent as defined in WAC 173-303-040.

Waste within the MLLW-05 treatability group meets the definition of the radioactive lead solids subcategory as described in 40 CFR 268.40. The physical makeup consists of many different forms of radioactive lead solids including bricks, sheets, shot-filled blankets, and lead-lined debris items where the lead comprises more than 50 percent of the waste matrix. The primary treatment path for MLLW debris and radioactive lead solids is commercial macro-encapsulation.

Waste within the MLLW-09 treatability group is, or contains, radioactively contaminated batteries that have the treatment requirements specified in 40 CFR 268.40 (that is, D006, cadmium batteries; D008, lead-acid batteries; D009, mercury batteries; and D011, silver batteries).

Commercial treatment facilities are located in the United States that can accept the Hanford Site's waste in the MLLW-04, -05, and -09 treatability groups. The T-Plant facility has macro-encapsulation capability and could be used to supplement commercial facilities.

C1.5.4 Mercury Stabilization and Amalgamation

Radioactively contaminated mercury waste requires either stabilization or amalgamation. The Hanford Site inventory of mercury-bearing waste is currently zero (represented in LDR Treatability Group MLLW-06). Commercial capabilities are available if this waste were to be generated.

C1.5.5 Repack

Treatment of a portion of MLLW-07 waste is best performed at the location in which it is to be disposed (such as, LLBG 218-W-5 T31/T34, ERDF), due to significant worker risks and physical infrastructure limitations associated with opening and processing some of the waste contained in Treatability Group MLLW-07. Waste that falls into this category includes very large packages that, when treated, pose a transportation concern, and/or waste packages that have a significant radiological inventory that pose a worker protection concern. The waste will be limited to hazardous debris; chemical stabilization and macro-encapsulation under 40 CFR Part 268.45 will be utilized to render the waste LDR compliant. In addition, the mixed-waste containers will meet the 90 percent full container requirements following treatment. Treatment would be limited to those technologies that can be employed for containerized mixed waste only. A Part A permit application revision for the LLBGs was approved by Ecology to allow immobilization of this MLLW in the MWDTs.

Commercial facilities will be used to treat most CH-MLLW in large containers and some RH-MLLW. Waste within the MLLW-07 treatability group consists of: (1) large containers of MLLW, (2) RH-MLLW packages, and (3) RH-MLLW that is shielded down to contact handling levels for safe handling and storage.

DOE has implemented significant commercial capability with firms in Washington and Utah to disposition a significant portion of this LDR treatability group. Waste within this group that cannot be accepted at a commercial facility for treatment or by in-trench-treatment will be included on a list of no-path-forward waste to be provided in the disposition plan required under M-091-03D-02. This disposition plan is to be included in the June 30, 2011, revision of the PMP.

C1.5.6 Deactivation

Reactive metals containing radioactive contamination require deactivation as the specified treatment technology under RCRA. Waste within the MLLW-10 treatability group is water- reactive materials including sodium metal, cyanide/sulfides, and so forth. The current inventory of reactive metal waste is sodium that is packaged in drums and boxes 79 m^3 (24 ft^3) and stored at the CWC. Some of this waste contains debris material (e.g., piping, pumps, and valves) that are contaminated with reactive metals.

The current inventory of waste within this group is a no-path-forward waste and will be included in the disposition plan required under M-091-03D-02. This disposition plan is to be included in the June 30, 2011, revision of the PMP.

C1.6 MWDT

The MWDT provide both treatment and disposal capabilities.

C1.6.1 MWDT in Trench Treatment

Treatment to meet the LDR requirements will be performed within the MWDTs 31 and 34 of the 218-W-5 burial ground. The treatment capability consists of the use of immobilization technologies for mixed-waste debris as listed under 40 CFR 268.45 and MACRO in 40 CFR 268.42. In addition, the mixed-waste containers will meet the 90 percent full container requirements following treatment. Treatment is limited to those technologies that can be employed in/on containerized waste.

C1.6.2 MWDT Disposal

Treatment is authorized in the LLBG Part A permit application for Trenches 31 and 34, which allows for use of immobilization technologies to treat MLLW debris per alternative treatment standards of 40 CFR 286.45. In-trench treatment (218-W-5 Trenches 31 and 34) may be used to minimize significant worker risks and physical infrastructure limitations associated with opening and processing some of the waste contaminated in Treatability Group MLLW-07.

C1.7 ERDF

ERDF is a RCRA-compliant landfill that is authorized under CERCLA. The landfill is used for disposal of environmental restoration waste being generated from cleanup activities. ERDF is designed to receive, treat (e.g., macroencapsulation), and dispose of MLLW generated through remediation of the Hanford Site. ERDF is designed to provide permanent disposal capacity to accommodate projected Hanford low-level and mixed wastes for the next 20 to 30 years.

In 2007, an amendment to the ERDF ROD was approved, authorizing treatment and/or disposal at ERDF of specific Hanford-only waste that is not covered in other existing Hanford CERCLA authorization or RODs. Examples of Hanford-only waste include waste from surveillance and maintenance at Hanford facilities, environmental research and development activities, sample analyses, liquid effluent waste treatment, and environmental monitoring programs.

C1.8 WIPP Shipment and Disposal

The *Transuranic Waste Acceptance Criteria of the Waste Isolation Pilot T-Plant* (DOE/WIPP-02-3122) defines the waste acceptance criteria applicable to the transportation, storage, and disposal of CH-TRU and RH-TRU waste at the WIPP. These criteria serve as the DOE primary directive for ensuring that CH-TRU and RH-TRU waste is managed and disposed of in a manner that protects human health and safety and the environment.

The authorization basis of WIPP for the disposal of CH-TRU and RH-TRU waste includes the DOE National Security and Military Applications of Nuclear Energy Authorization Act of 1980, and the WIPP Land Withdrawal Act (LWA). Included in this document are the requirements and associated criteria imposed by these acts and the RCRA, as amended, on the TRU waste destined for disposal at WIPP.

The DOE TRU waste sites must certify CH-TRU and RH-TRU waste payload containers to the waste acceptance criteria identified in this document. The Regulatory Basis of TRU Waste Acceptance Criteria, the flow-down of applicable requirements to the waste acceptance criteria are traceable to several higher-tier documents, including the WIPP operational safety requirements derived from the WIPP Documented Safety Analysis (DSA); the transportation requirements for CH wastes derived from the TRUPACT-II Certificate of Compliance; the transportation requirements for RH wastes derived from the RH-TRU 72-B Certificate of Compliance; the WIPP LWA; the WIPP Hazardous Waste Facility Permit (HWFP); EPA's Compliance Recertification Decision and approval for polychlorinated biphenyls (PCBs) disposal; and EPA's letter of approval of DOE's RH-TRU Waste Characterization Program.

Final certification and shipment of TRUM waste to WIPP is based on support from CCP and the DOE Carlsbad Field Office (CBFO). CCP has been contracted by the DOE Carlsbad Field Office (CBSO) to characterize and certify TRU waste being packaged at Hanford.

For TRU waste to be disposed at WIPP, information is required on specific waste streams to be disposed at WIPP. TRU waste streams will be developed by CCP as part of preparations for shipping waste to WIPP.

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Appendix D

Work Breakdown Structure

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D1 Description of Work Scope

This scope provides for overall project management, coordination, direction, and customer interface to ensure the proper conduct of operations for 200 Area Waste and Fuels Management Project (W&FMP).

D1.1 Work Breakdown Structure (WBS) 013.01 Project Management

This scope specifically includes support management and staff to the overall Project, such as Materials and Energy Corporation (M&EC) Management Team, who are contracted to manage CWC, T-Plant, and LLBG operations, as well as provide Waste Support Services to Hanford Site generators, Human Relations, Buyer/Procurement staff, and Project Controls (e.g., schedulers/cost analysts). In addition, safety, health, and quality technical support and oversight are performed to support implementation of key programs such as the Integrated Safety Management System, Corrective Action Management, Occurrence Reporting, and Quality Assurance Program.

Additional technical support to the W&FMP includes nuclear and criticality safety engineering from centralized organizations to support development and implementation of safety bases, including procedure reviews, hazard analysis generation, criticality safety evaluation report (CSER) development, and so forth.

Strategic Planning and Integration is another critical scope element that provides onsite interface with CHPRC and other Hanford contractors and subcontractors to ensure that mission needs are met. Also included in this scope is the maintenance of the CHPRC Transportation and Packaging Program, in accordance with applicable requirements for onsite and offsite shipments of regulated waste and materials and non-regulated materials.

The W&FMP activities continue through FY-2035.

D1.2 WBS 013.04 MLLW Treatment

This scope provides for M-091-42 MLLW and M-091-43 MLLW treatment (SWPC M-091-43 MLLW processing is included in WBS 013.15). Processing includes thermal and non-thermal treatment. Activities consist of managing offsite commercial MLLW treatment/disposal contracts, shipping MLLW packages that have been determined to be LDR-compliant to the MWDTs or ERDF for disposal, and in-treatment treatment of selected waste containers.

D1.3 WBS 013.05 TRU Retrieval

This scope provides for retrieval of suspect TRU waste from the LLBG (218-W-4C, 218-W-4B, 218-E-12B, and 218-W-3A). Retrieval consists of:

- Removing soil over CH waste containers within the trenches
- Removing the CH waste containers from the trenches
- Assaying containers and venting the containers as required
- Designating and sampling waste
- Shipping the containers to the appropriate TSD facility

Additional scope that is contained in this element includes the retrieval of RH waste from burial grounds 218-E-12B, 218-W-3A, and 218-W-4B (including the alpha caissons).

D1.4 WBS 013.06 TRU Repackaging

This scope provides repackaging of TRU waste at WRAP and T Plant such that it can be certified to meet the WIPP Waste Acceptance Criteria.

D1.5 WBS 013.07 WRAP

This scope provides activities for the safe operation of WRAP and maintaining WRAP in a ready-to-serve condition.

D1.6 WBS 013.08 T-Plant

This scope provides activities for the safe operation of T Plant and maintaining T Plant in a ready-to-serve condition.

D1.7 WBS 013.09 CWC

This scope provides activities for the safe operation of CWC and maintaining CWC in a ready-to-serve condition.

D1.8 WBS 013.09.05 LLBGs

This scope provides activities for the safe operation of LLBGs.

The LLBGs contain two lined mixed-waste trenches (31 and 34) that are included in WBS 013.21.

D1.9 WBS 013.15 TRU Disposition

This scope includes support of CCP certification activities and shipment of TRU waste.

D1.10 WBS 013.21 MWDTs

This scope provides activities for the safe operation of the MWDTs and maintaining the MWDTs in a ready-to-serve condition.

Appendix E

RL-0013 Funding Profile

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RL-0013 ARRA and Base Case Funding Profile ($000s)

	WBS	SCOPE	LIFECYCLE COST	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY2021
RL-013	013.01	Project Management -PBS RL-13	199,627	19,620	18,230	19,340	16,421	15,727	14,992	14,570	14,125	13,656	13,163	13,000	13,260	13,525
	013.04	Mixed Low Level Waste Treatment	58,180	16,760	14,543	11,721	8,015	7,140	0	0	0	0	0	0	0	0
	013.05	TRU Retrieval	316,212	14,766	52,415	38,328	27,900	21,424	61,006	24,780	17,123	19,626	25,800	13,044	0	0
	013.06	TRU Repackaging	204,135	8,251	15,482	15,985	3,158	3,245	27,474	28,023	25,498	26,008	26,528	8,000	8,160	8,323
	013.07	Waste Receiving and Processing Facility (WRAP)	112,474	7,234	9,025	9,143	9,315	10,552	9,344	9,531	7,792	7,948	8,107	8,000	8,160	8,323
	013.08	T-Plant	134,579	12,709	12,200	11,689	13,020	12,201	16,704	7,838	9,914	15,187	7,814	5,000	5,100	5,202
	013.09	Central Waste Complex	80,878	7,689	8,978	8,482	6,589	6,839	5,051	5,060	5,106	5,167	5,318	5,424	5,532	5,643
	013.10	Environmental Restoration Disposal Fac (ERDF)	27,794	6,308	11,747	0	30	30	68	1,214	32	1,263	40	1,020	1,040	5,000
	013.15	TRU Disposition	152,421	1,740	14,480	15,294	16,157	1,180	5,608	5,354	6,810	5,585	5,213	15,000	25,000	35,000
	013.21	Mixed Waste Disposal Trenches	13,548	3,351	1,197	596	595	1,260	352	359	366	1,952	1,991	500	510	520
RL-013 Subtotal			1,299,847	98,428	158,297	130,580	101,199	79,598	140,597	96,730	86,766	96,391	93,973	68,988	66,763	81,537

	WBS	SCOPE	LIFECYCLE COST	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY2035
RL-013	013.01	Project Management -PBS RL-13	220,372	22,058	22,499	22,949	23,408	23,876	24,354	24,841	25,338	25,844	1,000	1,020	1,040	1,061	1,082
	013.04	Mixed Low Level Waste Treatment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	013.05	TRU Retrieval	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	013.06	TRU Repackaging	135,613	13,902	14,181	14,464	14,753	15,048	15,349	15,656	15,970	16,289	0	0	0	0	0
	013.07	Waste Receiving and Processing Facility (WRAP)	79,870	8,188	8,352	8,519	8,689	8,863	9,040	9,221	9,405	9,593	0	0	0	0	0
	013.08	T-Plant	43,155	5,306	6,000	6,120	6,242	6,367	6,495	6,624	0	0	0	0	0	0	0
	013.09	Central Waste Complex	91,943	9,426	9,614	9,806	10,003	10,203	10,407	10,615	10,827	11,044	0	0	0	0	0
	013.10	Environmental Restoration Disposal Fac (ERDF)	81,467	8,352	8,519	8,689	8,863	9,040	9,221	9,405	9,593	9,785	0	0	0	0	0
	013.15	TRU Disposition	570,270	58,461	59,631	60,823	62,040	63,281	64,546	65,837	67,154	68,497	0	0	0	0	0
	013.21	Mixed Waste Disposal Trenches	8,476	531	541	552	563	574	586	598	609	622	634	647	660	673	686
RL-013 Total			2,531,012	126,224	129,336	131,923	134,561	137,252	139,997	142,797	138,896	141,674	1,634	1,667	1,700	1,734	1,769

Figure E-1. RL-0013 ARRA and Base Case Funding Profile

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Appendix F

Critical Path Schedule

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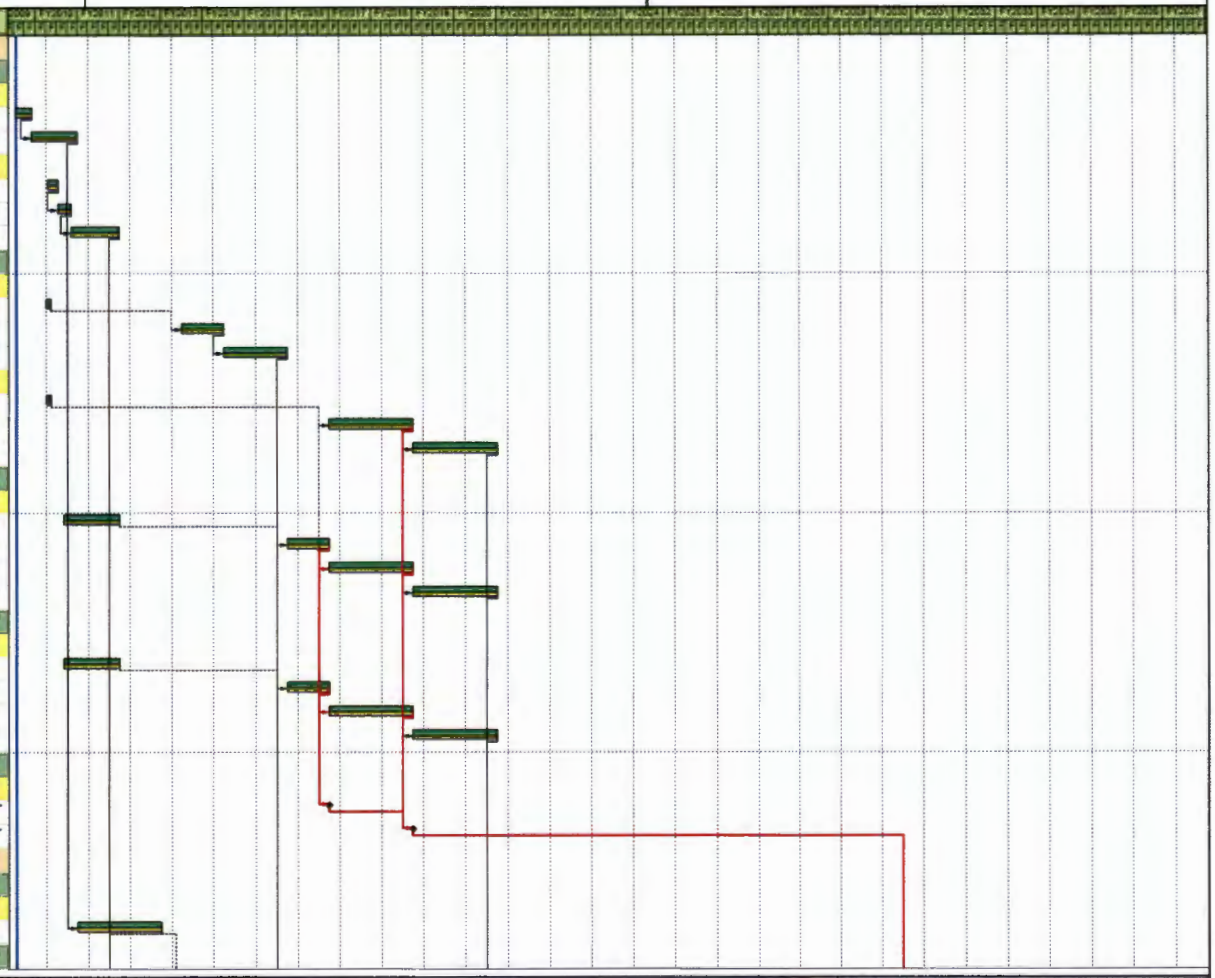
M-91 Activities

23-Jun-10 09:23

Activity ID	Activity Name	Start	Finish
M-091-01		20-Apr-09	30-Sep-20
Next Generation Retrieval (NGR) Project		20-Apr-09	30-Sep-11
NGR Trench Face Retrievel & Characterization System (TFRCS)		20-Apr-09	30-Sep-10
A1000	Next Generation Retrieval (NGR) Project Design	20-Apr-09*	31-Aug-09
A1010	Next Generation Retrieval (NGR) Project Construction/ Readiness	01-Sep-09	30-Sep-10
NGR Trench Face Process System (TFPS)		18-Jan-10	30-Sep-11
B1000	NGR Trench Face Proc Sys (TFPS) Conceptural Design	18-Jan-10*	19-Apr-10
B1010	NGR Trench Face Proc Sys (TFPS) Definitive Design	20-Apr-10	09-Aug-10
B1020	NGR Trench Face Proc Sys (TFPS) Construction/Readiness	10-Aug-10	30-Sep-11
Alpha Caisson Waste Retrieval Project (ACWRP)		04-Jan-10	30-Sep-20
ACWRP Waste Retrieval System (WRS)		04-Jan-10	30-Sep-18
C1000	ACWRP Waste Ret Sys (WRS) Conceptual Design	04-Jan-10*	12-Feb-10
C1010	ACWRP Waste Ret Sys (WRS) Definitive Design	01-Apr-13*	31-Mar-14
C1020	ACWRP Waste Ret Sys (WRS) Construction/Readiness	01-Apr-14	30-Sep-18
ACWRP Waste Processing System (WPS)		04-Jan-10	30-Sep-20
C1040	ACWRP Waste Processing Sys (WPS) Conceptual Design	04-Jan-10*	12-Feb-10
C1060	ACWRP Waste Processing Sys (WPS) Definitive Design	03-Oct-16*	28-Sep-18
C1080	ACWRP Waste Processing Sys (WPS) Construction/Readiness	01-Oct-18	30-Sep-20
CH-TRUM (LG) & RH-TRUM Waste Processing Capab...		01-Jun-10	30-Sep-20
Waste Processing Capability		01-Jun-10	30-Sep-20
E0990	Alternative Study	01-Jun-10*	30-Sep-11
E1000	Waste Processing Capability Conceptual Design	01-Oct-15*	30-Sep-16
E1010	Waste Processing Capability Definitive Design	03-Oct-16	28-Sep-18
E1020	Waste Processing Capability Construction/Readiness	01-Oct-18*	30-Sep-20
RH Cask Loading Capability		01-Jun-10	30-Sep-20
Cask Loading Capability		01-Jun-10	30-Sep-20
F090	Alternative Study	01-Jun-10*	30-Sep-11
F1000	RH Cask Loading Facility Conceptual Design	01-Oct-15*	30-Sep-16
F1010	RH Cask Loading Facility Definitive Design	03-Oct-16*	28-Sep-18
F1020	RH Cask Loading Facility Construction	01-Oct-18*	30-Sep-20
M-91 Milestones		30-Sep-16	28-Sep-18
M-91 Milestones		30-Sep-16	28-Sep-18
G1000	TPA M-091-01A - Complete Conceptual Design / or expiration / or modifications		30-Sep-16*
G1010	TPA M-091-01B - Complete Conceptual Design / or expiration / or modifications		28-Sep-18*
M-091-40 - M-091-41		01-Oct-10	31-Dec-16
Next Generation Retrieval (NGR) Project		01-Oct-10	28-Sep-12
NGR Trench Face Retrievel & Characterization System (TFRCS)		01-Oct-10	28-Sep-12
A1020	Next Generation Retrieval (NGR) Project Operation	01-Oct-10	28-Sep-12
Alpha Caisson Waste Retrieval Project (ACWRP)		01-Oct-15	28-Sep-18



Primary Baseline ◆ Milestone

Current Bar Labels % Complete

TASK filter: All Activities

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M-91 Activities

14-Jun-10 09:45

Activity ID	Activity Name	Start	Finish
	ACWRP Waste Retrieval System (WRS)	01-Oct-15	28-Sep-18
C1030	ACWRP Waste Ret Sys (WRS) Operation	01-Oct-15	28-Sep-18
	M-91 Milestones	30-Sep-11	31-Dec-18
	M-91 Milestones	30-Sep-11	31-Dec-18
G1035	TPA M-091-40T - Retrieve 2000 m3 of CH-RSW		30-Sep-11*
G1040	TPA M-091-40U-T01 - Retrieve Minimum 280m3 CH-RSW		28-Sep-12*
G1050	TPA M-091-40V-T01 - Retrieve Minimum 250m3 CH-RSW		30-Sep-13*
G1060	TPA M-091-40W-T01 - Retrieve Minimum 280m3 CH-RSW		30-Sep-14*
G1070	TPA M-091-40X - Retrieve 1250m3 Total in FY 15		30-Sep-15*
G1030	TPA M-091-40 - Complete Retrieval and Designation of CH-RSW in 4B, 3A, 12B and 4C		30-Sep-16*
G1080	TPA M-091-41A - Complete Retrieval Non-Caisson RH-RSW		30-Sep-16*
G1080	TPA M-091-41 - Complete Retrieval RH-RSW		31-Dec-15*
	M-091-44 - M-091-46	01-Jul-10	30-Sep-30
	Next Generation Retrieval (NGR) Project	03-Oct-11	31-Oct-12
	NGR Trench Face Process System (TFPS)	03-Oct-11	31-Oct-12
B1030	NGR Trench Face Proc Sys (TFPS) Operation	03-Oct-11	31-Oct-12
	Alpha Caisson Waste Retrieval Project (ACWRP)	01-Oct-20	30-Sep-25
	ACWRP Waste Processing System (WPS)	01-Oct-20	30-Sep-25
C1070	ACWRP Waste Processing Sys (WPS) Operation	01-Oct-20	30-Sep-25
	Expand Commercial Capability for CH-TRUM (LG)	01-Jul-10	30-Sep-11
	Commercial Capability Demonstration	01-Jul-10	30-Sep-11
D1000	Commercial Capability for CH-TRUM (LG) Waste Demonstration	01-Jul-10*	30-Sep-11
	CH-TRUM (LG) & RH-TRUM Waste Processing Capab...	01-Oct-20	28-Sep-29
	Waste Processing Capability	01-Oct-20	28-Sep-29
E1030	Waste Processing Capability Operations	01-Oct-20*	28-Sep-29
	RH Cask Loading Capability	01-Oct-20	28-Sep-29
	Cask Loading Capability	01-Oct-20	28-Sep-29
F1030	RH Cask Loading Facility Operations	01-Oct-20*	28-Sep-29
	M-91 Milestones	30-Sep-11	30-Sep-30
	M-91 Milestones	30-Sep-11	30-Sep-30
G1180	TPA M-091-46A - Certify 650 m3 of Small Container CH-TRUM		30-Sep-11*
G1250	TPA M-091-46G - Complete offsite shipment of 1000m3 of Small container CH-TRUM Waste		30-Sep-11*
G1200	TPA M-091-46B-T01 - Certify 300 m3 of Small Container CH-TRUM		28-Sep-12*
G1130	TPA M-091-44P - Designate all RH-TRUM Waste & Containers of CH-RSW in 4B,3A,12C, & 4C		31-Dec-12*
G1210	TPA M-091-46B-T02 - Certify 125 m3 of Small Container CH-TRUM		30-Sep-13*
G1220	TPA M-091-46B-T03 - Certify 125m3 of Small Container CH-TRUM		30-Sep-14*
G1230	TPA M-091-46E - Certify 250m3 of Small Container CH-TRUM		30-Sep-15*
G1140	TPA M-091-44Q - Certify 300 m3 of Large Container CH-TRUM and or RH-TRUM		30-Sep-16*
G1340	TPA M-091-46F - Certify 250 m3 of Small Container CH-TRUM		30-Sep-16*

Primary Baseline ◆ Milestone

Current Bar Labels % Complete

TASK filter: All Activities

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M-91 Activities

14-Jun-10 09:45

Primary ID	Activity Name	Start	Finish
G1150	TPA M-091-44R - Certify 300 m3 of Large Container CH-TRUM or RH-TRUM		29-Sep-17*
G1180	TPA M-091-46 - Complete Certification of Small Container CH-TRUM		29-Sep-17*
G1160	TPA M-091-44S - Certify 300 m3 of Large Container CH-TRUM or RH-TRUM		28-Sep-18*
G1170	TPA M-091-44T - Submit a Change Package for Annual Milestones		28-Sep-18*
G1260	TPA M-091-46H - Complete Offsite shipment of all Small Container CH-TRUM Waste		28-Sep-18*
G1120	TPA M-091-44 - Complete Treatment of Large Container CH-TRUM & RH-TRUM		30-Sep-30*
M-091 Milestones		30-Jun-11	28-Jun-30
M-91 Milestones		30-Jun-11	28-Jun-30
M-91 Milestones		30-Jun-11	28-Jun-30
G1020	TPA M-091-03D-02 - Submit a Rev of PMP for No Path Forward Waste		30-Jun-11*
G1290	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		30-Jun-11*
G1300	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		29-Jun-12*
G1310	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		28-Jun-13*
G1320	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		30-Jun-14*
G1330	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		30-Jun-15*
G1340	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		30-Jun-16*
G1350	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		30-Jun-17*
G1100	TPA M-091-42 - Complete Treatment of Small Container CH-MLLW		02-Oct-17*
G1110	TPA M-091-43 - Complete Treatment of Large Container CH-MLLW & RH-MLLW		02-Oct-17*
G1380	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		29-Jun-18*
G1390	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		28-Jun-19*
G1400	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		30-Jun-20*
G1410	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		30-Jun-21*
G1420	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		30-Jun-22*
G1430	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		30-Jun-23*
G1440	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		28-Jun-24*
G1450	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		30-Jun-25*
G1460	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		30-Jun-26*
G1370	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		30-Jun-27*
G1390	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		30-Jun-28*
G1470	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		29-Jun-29*
G1480	TPA M-091-03 - Submit Rev of Hanford TRUM and MLLW PMP to Ecology showing annual progress		28-Jun-30*

Primary Baseline ◆ ◆ Milestone

Current Bar Labels % Complete

TASK filter: All Activities

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Appendix G

M-091 Milestone Change Package M-091-09-1

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Tri-Party Agreement

TENTATIVE AGREEMENT ON NEGOTIATIONS FOR THE COMPREHENSIVE REALIGNMENT OF THE M-091 WASTE MANAGEMENT MILESTONES

April, 2010

April 2010

CONTENTS

1.	Tentative Agreement	NEGOTIATIONS FOR THE COMPREHENSIVE REALIGNMENT OF THE M-091 WASTE MANAGEMENT MILESTONES

Tri-Party Agreement change form for Public Comment

2.	M-91-09-01	Modification of Hanford Federal Facility Agreement and Consent Order (HFFACO) M-091 Series Milestones

TENTATIVE AGREEMENT ON NEGOTIATIONS FOR THE COMPREHENSIVE REALIGNMENT OF THE M-091 WASTE MANAGEMENT MILESTONES

The U. S. Department of Energy (DOE), Richland Operations Office (RL) the Washington State Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA) have concluded negotiations and reached a tentative agreement on the Hanford Federal Facility Agreement and Consent Order (HFFACO) M-091 milestone series. This tentative agreement completes interim milestone M-091-45

DOE and Ecology evaluated the scope of the entire M-091 milestone series covering different waste categories: contact- and remote-handled (CH and RH) mixed low-level waste (MLLW), CH and RH transuranic mixed (TRUM) waste, and waste with no currently available treatment options (referred to as "no path forward waste"). DOE and Ecology evaluated waste management activities including retrieval, treatment, designation, certification & shipment, and acquisition of capabilities and/or facilities for waste handling. The Parties established a series of milestones for all of these waste categories and waste management activities.

In response to public comments to make the milestones easier to read and understand, the Parties streamlined the milestones through the elimination of unnecessary historical text; removed requirements embedded in milestone text by establishing the requirements as stand-alone milestones; and reworded the milestones as distinct actions. The M-091 change package contains a comprehensive and understandable series of milestones to measure progress in the safe and stable processing and shipping offsite of Hanford Site mixed waste covered by the M-091 milestone series

Final approval of the change package by the Parties is subject to public comment and appropriate change package modifications, if required The Parties will submit the proposed change packages for a 45-day public comment period to run from late April 2010 into June 2010. Following conclusion of the public comment period, a response to comments document will be prepared and issued, the change packages will be updated accordingly then approved and incorporated into the HFFACO

This Tentative Agreement is to take effect upon the signature of the Parties.

Tri-Party Agreement

Tentative Agreement on Negotiations for the Comprehensive Realignment of the M-091 Waste Management Milestones

Approvals: Page 2 of 4

David A. Brockman, Manager
U.S. Department of Energy
Richland Operations Office

4/7/2010
Date

Tri-Party Agreement

Tentative Agreement on Negotiations for the Comprehensive Realignment of the M-091 Waste Management Milestones

Approvals: Page 3 of 4

Ted Sturdevant, Director
State of Washington
Department of Ecology

4/16/2010
Date

Tri-Party Agreement

Tentative Agreement on Negotiations for the Comprehensive Realignment of the M-091 Waste Management Milestones

Approvals: Page 4 of 4

Dennis J. McLerran, Regional Administrator
U.S. Environmental Protection Agency
Region 10

4/20/2010
Date

Change Number M-091-09-01	Federal Facility Agreement and Consent Order *Change Control Form* Do not use blue ink. Type or print using black ink.	**Date** 4/5/2010

Originator Matt McCormick **Phone** (509) 373-9971

Class of Change
[X] I – Signatories [ ] II – Executive Manager [ ] III – Project Manager

Change Title
Modification of Hanford Federal Facility Agreement and Consent Order (HFFACO) M-091 Series Milestones

Description/Justification of Change

The Washington State Department of Ecology (Ecology) and the U.S. Department of Energy (DOE) - Richland Operations Office (RL) initiated M-091-45 negotiations on September 8, 2009 to reach an agreement on adjustments in work scope and milestones consistent with a shift of resources to the river corridor and other higher priority Hanford Site cleanup tasks. The Parties agreed that it was prudent to expand the scope to encompass all the M-091 series milestones, and to simplify the language in the M-091 series, in response to public comments that the milestones were difficult to read and understand.

Continued on page 2

ıpact of Change
This change replaces existing milestones to establish a comprehensive approach for the safe and stable processing of retrieved and retrievably stored Hanford Site wastes, including establishing enforceable milestones for the shipment of TRUM waste from the Hanford Site, and revising the major milestone definition to focus on completing treatment and offsite shipment of TRUM waste.

Affected Documents
The HFFACO, as amended and Hanford Site internal planning management, and budget documents (e.g., DOE contractor Baseline Change Control documents; M-091-03 Hanford Site TRUM waste and MLLW Project Management Plan and LDR Report).

Approvals

_____ _____ _____ Approved _____ Disapproved
Ecology Date

_____ _____ _____ Approved _____ Disapproved
DOE-RL Date

_____ _____ _____ Approved _____ Disapproved
EPA Date

Description/Justification continued from page 1:

Previously, the major milestone focused on the acquisition and modification of facilities/capabilities to support retrieval, storage and treatment of wastes. Ecology and DOE refocused the major milestone on the original milestone goal, to treat all Hanford Site *Resource Conservation and Recovery Act of 1976 (RCRA)* mixed low-level waste (MLLW) and certify and ship transuranic mixed (TRUM) waste to satisfy Land Disposal Restriction treatment standards Interim milestones in this change package support the actions necessary to achieve the major milestone including waste: retrieval, treatment, certification, and shipment and the acquisition of necessary facilities and/or capabilities. DOE may choose to complete certification and shipment of TRUM waste for disposal at the Waste Isolation Pilot Plant (WIPP) in lieu of LDR treatment if, as of the time of shipment, such waste is exempt from LDR treatment requirements when disposed at WIPP.

Negotiation of these M-91 milestones started because milestone M-091-45 required DOE to submit a change package for interim milestones. M-091-45 requirements included that DOE replace a "To Be Determined" (TBD) date for the M-091-01 milestone. The latter milestone originally required DOE to complete acquisition of facilities, modification of existing facilities, and modifications of planned facilities by 6/30/2012. Ecology and DOE have agreed that DOE will now prepare a conceptual design for facilities by 2016, and replace the M-091-01 TBD date at that time (2016).

This M-091 change package provides a comprehensive, easily understood series of milestones to measure progress on the safe and stable processing and shipping of Hanford Site waste covered by the M-091 milestone series and meets the M-091-45 interim milestone requiring completion of negotiations.

This change package addresses the public's comments to make the milestones easier to read and understand. The negotiation team also streamlined the milestones through the elimination of unnecessary historical text, removing requirements embedded in the milestone text and rewording the milestones to a distinct understandable action.

The changes are extensive enough that the Parties have decided to issue the change package as a replacement of the M-091 series milestones.

Number	Milestone	Due Date
M-091-00	Complete the treatment to Land Disposal Restriction (LDR) treatment standards for all Hanford Site *Resource Conservation and Recovery Act of 1976 (RCRA)* mixed low-level waste (MLLW) and *RCRA* transuranic mixed (TRUM) waste. DOE may choose to complete certification and shipment of TRUM waste for disposal at the Waste Isolation Pilot Plant (WIPP) in lieu of LDR treatment if, as of the time of shipment, such waste is exempt from LDR treatment standards when disposed at WIPP. Notification of certification in support of shipment will be reported at least annually as part of the project manager meetings or quarterly milestone review for inclusion in the administrative record. **Definitions** **"Certification"** as used herein is defined as: • Completion of all activities necessary for waste to be packaged such that it can meet the Waste Isolation Pilot Plant Waste Acceptance Criteria	Date to be established pursuant to milestone M-091-044T

2

Number	Milestone	Due Date
	(WIPP WAC). If subsequent WIPP certification reveals the waste cannot be shipped to WIPP this waste will not count toward meeting the milestone volume requirements (and will be subtracted from meeting such requirements) until such time as it has been determined to meet WIPP WAC or; • The TRUM has been shipped to Idaho. TRUM waste shipped to Idaho may also count toward certification based upon actual shipment to Idaho and contingent upon the waste not returning to the Hanford Site, or; • The waste has been treated to meet LDR treatment standards. **"Contact Handled (CH)"** waste is a waste container with a surface dose rate less than or equal to 200 millirem per hour. **"MLLW"** is LLW that is subject to *RCRA* or 70.105 RCW. "LLW" is defined as radioactive waste that is not spent fuel, high-level waste, TRU waste, byproduct material, or naturally occurring radioactive material. **"Remote Handled (RH)"** waste is a waste container with a surface dose rate greater than 200 millirem per hour. **"Retrievably Stored Waste (RSW)"** as used herein is defined as waste that is or was believed to meet the TRU waste criteria when it was placed in the 218-W-4B, 218-W-4C, 218-W-3A and 218-E-12B burial ground trenches after May 6, 1970. RSW does not include waste in containers that have deteriorated to the point that they cannot be retrieved and stabilized (e.g. placed in over-packs) in a manner that would allow them to be transported and designated without posing significant risks to workers, the public or the environment. With respect to any such containers, and with respect to any release of RSW, how to move forward will be determined through the cleanup process set forth in *RCRA*, CH. 70.105 RCW, and/or the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)* as appropriate. Those processes may result in additional requirements for the remediation of such wastes. **"Retrieval of CH RSW"** is defined as uncovering CH wastes within DOE's RSW trenches, removing such CH wastes from the trenches, and transferring the waste to a permitted and compliant treatment, storage or disposal unit or the Environmental Restoration and Disposal Facility (ERDF). **"Retrieval of RH RSW"** is defined as uncovering RH wastes within DOE's RSW trenches and caissons, removing such RH wastes from the trenches and caissons, and transferring the waste to a permitted and compliant treatment, storage or disposal unit or the ERDF. **"Shipment"** is defined as TRUM waste containers leaving the Hanford Site, and includes waste shipped to either Idaho or the Waste Isolation Pilot Plant (WIPP), and contingent upon the waste not returning to the Hanford Site **"Small Containers and Large Containers"** as used herein have different meanings depending on whether they are used in reference to MLLW or TRUM waste.	

Number	Milestone	Due Date
	• When referring to MLLW, small containers are containers less than 10 cubic meters, including 55-gallon drums. A large container is anything not defined as a small container. • When referring to TRUM waste, small containers are 55-gallon drums or smaller containers even if over packed in 85-gallon drums, and WIPP standard waste boxes (SWB). A WIPP SWB is a 1.8 cubic meter steel container that is approximately 0.94 meters in height, 1.8 meters in length, and 1.4 meters in width and was qualified by the DOE in 1988 as meeting the U.S. Department of Transportation (DOT) requirements for specification 7A type A packaging. A large container is defined as any container that is not defined as a small container. **"TRUM Waste"** is TRU waste that is subject to *RCRA* or 70.105 RCW. **"TRU Waste"** as used herein is defined as waste that meets the definition in Subsection (18) of Section 2 of the WIPP Land Withdrawal Act. Pub. L. 102-579 **"200 Area Caissons"** as used herein are defined as RSW in the 218-W-4B burial ground caissons Alpha-1 through Alpha-4. **Note:** To provide further clarification on how volumes should be determined in different M-091 contexts, and to be consistent with the volumes of waste listed in the Hanford Site Solid Waste Inventory Tracking System (SWITS), the following descriptions are provided: • Volumes for the purposes of determining amounts retrieved shall be based on the volume of the original containers in retrievable storage. For example, the volume of a 55-gallon RSW drum that would be counted toward "retrieval" would be 55-gallons (0.208 cubic meters), even if in the process of retrieval the drum needed to be over-packed into an 85 gallon drum. • The volume of MLLW "treated" will be counted as the retrieval volume (for RSW) or the MLLW pre-treatment container volume (for stored waste). • The volume of small container CH TRUM waste counted as certified will be the volume of the certified container containing the waste unless the waste is compacted. In the event that the waste is compacted, the volume of the pre-compaction container will be counted. • The volume of large container CH TRUM waste and RH TRUM waste (in above ground storage as of June 30, 2009 and in retrievable storage)will be based on the pre-treatment volume of each large container CH TRUM waste as listed in Hanford's SWITS. **Note:** Each requirement of these M-091 series milestones is considered a distinct work requirement independently subject to the enforcement provisions of the agreement.	

Number	Milestone	Due Date
M-091-01	Complete the acquisition of new facilities, modification of existing facilities, and modification of planned facilities necessary for retrieval, storage, and treatment/processing, of all Hanford Site *RCRA* TRUM waste.	Date to be established pursuant to milestones M-091-01A and M-091-01B.
M-091-01A	Complete the conceptual design for acquisition of capabilities and/or acquisition of new facilities, modification of existing facilities, and/or modification of planned facilities necessary for retrieval, designation, storage, and treatment/processing prior to disposal of all Hanford Site RH TRUM waste and TRUM waste in large containers (in above ground storage as of June 30, 2009 and in retrievable storage). In addition, submit a milestone change package (based on the conceptual design) for annual construction milestones for the planned facilities necessary for retrieval, storage, and treatment/processing, of all Hanford Site RH TRUM waste and large container CH TRUM waste.	09/30/2016
M-091-01B	Complete the definitive design for acquisition of capabilities and/or acquisition of new facilities, modification of existing facilities, and/or modification of planned facilities necessary for retrieval, designation, storage, and treatment/processing prior to disposal of all Hanford Site RH TRUM waste and TRUM waste in large containers (in above ground storage as of June 30, 2009 and in retrievable storage). In addition, submit a milestone change package documenting any substantial variations, based on the definitive design, from annual construction milestones finalized pursuant to M-091-01A.	09/30/2018
M-091-03	Submit a revision of the Hanford Site TRUM waste and MLLW Project Management Plan (PMP) to Ecology pursuant to, and in compliance with, the requirements of agreement section 11.5. Revisions of the PMP shall address *RCRA* MLLW and TRUM waste and will consider and expressly evaluate the impact on M-091 retrieval, treatment and processing capabilities that may result from retrieval, treatment and/or processing of any other TRUM waste including but not limited to offsite TRUM waste and Hanford Site TRUM waste generated after January 1, 2003. Annual revisions of the PMP will be submitted on June 30 every year starting in 2008 and continuing until the M-091 milestones are completed. The PMP revisions shall include plans and schedules to meet all the requirements set forth in the M-091 milestone series. Each revision of the M-091-03 PMP shall, upon approval by Ecology, supersede previous M-091-03 PMPs. The PMP will include a description of completed and scheduled work relating to RH waste and large containers of RH and CH waste performed in accordance with the requirements of the M-091 milestone series. The PMP will document work completed during the previous federal fiscal year and work scheduled for the coming fiscal year. The PMP shall identify by citation all publicly available reports describing pertinent project issues and accomplishments, and shall identify anticipated projects for the coming year. With respect to RH TRUM waste, large container TRUM waste, RH MLLW and large container MLLW; the PMP submitted yearly will specifically include at least	Due date annually by June 30

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Number	Milestone	Due Date
	one measurable action to be taken by DOE to acquire capabilities to manage such wastes. PMP revisions will be submitted to Ecology for review and approval as primary documents pursuant to agreement action plan section 9.2.1. DOE shall implement the plan as approved.	
M-091-03D-02	Submit a revision to the PMP for disposition (treatment plans, variances or procurements and schedules) of all no path forward waste (as defined in the PMP) in above ground storage as of June 30, 2009.	06/30/2011
M-091-40	Complete the retrieval and designation of CH RSW in burial grounds 218-W-4B, 218-W-3A and 218-E-12B 1. If specific large containers cannot be removed from a trench within 60 days of being exposed DOE shall notify Ecology within the 60-day period. Ecology will inspect the containers and impose specific conditions for that waste container to prevent releases to the environment. In determining such conditions Ecology will consider among other factors; whether the waste containers has been inspected and found to be intact and not posing a threat to human health and the environment (or re-packaged to prevent release to the environment) and existing documentation concerning the presence of free liquids. 2. As RSW retrieval proceeds, DOE shall sample and analyze trench substrates with the purposes of determining whether or not releases of contaminants to the environment have occurred, and, if so, the nature and extent of contamination. Such sampling and analysis shall be in accordance with Ecology approved sampling and analysis plans (SAP) DOE will implement approved SAPs, as a requirement of this milestone, during retrieval of all RSW. The results of burial ground vent and substrate sampling and analysis pursuant to approved SAPs shall be submitted to Ecology quarterly in the project managers' meetings for inclusion in the administrative record. Such reports shall document results and methodologies, shall assess results against regulatory requirements, shall include a description (or descriptions) of documented contaminant releases to the environment, and shall describe planned and/or scheduled additional work. 3. Within 90 days of retrieval, DOE shall designate all CH RSW retrieved from the RSW trenches pursuant to the Washington Administrative Code (WAC) 173-303-070 through 100.	09/30/2016
M-091-40T	Retrieve 2,000 cubic meters of CH RSW.	09/30/2011
M-091-40U-T01	Retrieve a minimum of 250 cubic meters of CH RSW in Fiscal Year 2012. Any volume retrieved above the 250 cubic meters shall count towards fulfillment of M-091-40X.	09/30/2012

Number	Milestone	Due Date
M-091-40V-T01	Retrieve a minimum of 250 cubic meters of CH RSW in Fiscal Year 2013 Any volume retrieved above the 250 cubic meters shall count towards fulfillment of M-091-40X.	09/30/2013
M-091-40W-T01	Retrieve a minimum of 250 cubic meters of CH RSW in Fiscal Year 2014. Any volume retrieved above the 250 cubic meters shall count toward fulfillment of M-091-40X.	09/30/2014
M-091-40X	Retrieve a total of 1,250 cubic meters of CH RSW in Fiscal Year 2015	09/30/2015
M-091-41	Complete the retrieval and designation of RH RSW (regardless of package size, including the 200 area caissons).	12/31/2018
M-091-41A	Complete retrieval of non-caisson RH RSW.	09/30/2016
M-091-42	Complete the treatment of small container CH MLLW (in above ground storage as of June 30, 2009 and in retrievable storage) to meet applicable LDR treatment standards in compliance with WAC 173-303-140. 1. Treatment of *CERCLA* waste and newly generated CH MLLW will not be counted toward meeting the volume requirements of this milestone. RSW determined to be MLLW in the treatability groups covered by this milestone will be counted toward meeting the volume requirements of this milestone when treated. 2. If the actual volume of retrieved CH MLLW covered by this milestone is lower than the estimated volumes anticipated by these milestones DOE will only be required to treat the volume of waste generated, retrieved and/or in storage.	09/30/2017
M-091-43	Complete the treatment of large container CH MLLW and RH MLLW (in above ground storage as of June 30, 2009 and in retrievable storage) to applicable LDR treatment standards in compliance with WAC 173-303-140.	09/30/2017
M-091-44	Complete the treatment of large container CH TRUM waste and RH TRUM waste (in above ground storage as of June 30, 2009 and in retrievable storage). DOE may choose to complete certification and shipment of TRUM waste for disposal at the Waste Isolation Pilot Plant (WIPP) in lieu of LDR treatment if, as of the time of shipment, such waste is exempt from LDR treatment standards when disposed at WIPP Notification of certification in support of shipment will be reported at least annually as part of the project manager meetings or quarterly milestone review for inclusion in the administrative record	12/31/2035
M-091-44P	DOE shall designate all RH TRUM waste and large containers of CH TRUM waste currently in above ground storage (as of June 30, 2003) according to the requirements of WAC 173-303-070 through 100.	12/31/2012
M-091-44Q	Certify a total of 300 cubic meters of large container CH TRUM waste and/or RH TRUM waste.	09/30/2016

Number	Milestone	Due Date
	Any volume certified above 300 cubic meters shall count toward fulfillment of subsequent milestones.	
M-091-44R	Certify a total of 300 cubic meters of large container CH TRUM waste and/or RH TRUM waste. Any volume certified above 300 cubic meters shall count toward fulfillment of subsequent milestones.	09/30/2017
M-091-44S	Certify a total of 300 cubic meters of large container CH TRUM waste and/or RH TRUM waste.	09/30/2018
M-091-44T	Submit a change package for annual milestones to treat or certify and ship large container CH TRUM waste and RH-TRUM waste (in above ground storage as of June 30, 2009 and in retrievable storage) to complete the disposition of this waste.	09/30/2018
M-091-46	Complete the certification of small container CH TRUM waste (in above ground storage as of June 30, 2009 and in retrievable storage)	09/30/2017
M-091-46A	Certify 850 cubic meters of small container CH TRUM waste.	09/30/2011
M-091-46B-T01	Certify 300 cubic meters of small container CH TRUM waste. Any volume certified above the 300 cubic meters shall count towards fulfillment of M-091-46E.	09/30/2012
M-091-46C-T02	Certify 125 cubic meters of small container CH TRUM waste. Any volume certified above the 125 cubic meters shall count towards fulfillment of M-091-46E.	09/30/2013
M-091-46D-T03	Certify 125 cubic meters of small container CH TRUM waste. Any volume certified above the 125 cubic meters shall count towards fulfillment of M-091-46E.	09/30/2014
M-091-46E	Certify 250 cubic meters of small container CH TRUM waste. Any volume certified above 250 cubic meters shall count toward fulfillment of subsequent milestones.	09/30/2015
M-091-46F	Certify 250 cubic meters of small container CH TRUM waste.	09/30/2016
M-091-46G	Complete offsite shipment of 1,000 cubic meters of small container CH TRUM waste.	09/30/2011
M-091-46H	Complete offsite shipment of all small container CH TRUM waste (in above	09/30/2018

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Number	Milestone	Due Date
	ground storage as of June 30, 2009 and in retrievable storage).	

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