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EDMC

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

Dear Ms. Hedges:

M-91 TRANSURANIC MIXED/MIXED LOW-LEVEL WASTE PROJECT MANAGEMENT PLAN, HNF-19169, REVISION 6

This letter transmits the M-91-Transuranic Mixed/Mixed Low-Level Waste Project Management Plan, HNF-19169, Revision 6 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 Tri-Party Agreement Interim Milestone M-91-03 requirement for submittal by June 30, 2009.

Comments or approval is 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. McCormack, Assistant Manager
for the Central Plateau

AMCP:MSC

Attachment

cc: See Page 2

H-0-12

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HNF-19169
Revision 6

M-91 Transuranic Mixed/Mixed Low-Level Waste Project Management Plan

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

CH2MHILL
Plateau Remediation Company

P.O. Box 1600
Richland, Washington 99352

Approved for Public Release;
Further Dissemination Unlimited

HNF-19169
Revision 6

M-91 Transuranic Mixed/Mixed Low-Level Waste Project Management Plan

Date Published
June 2009

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

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PREFACE

This revision of the Project Management Plan (PMP) for the M-91-series milestones of the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement [TPA]) addresses Washington State Department of Ecology (Ecology) revision 4 comments; and documents Department of Energy (DOE) funding and prioritization assumptions, and strategies for TPA M-91 milestones. Processing assumptions used for FY 2009 include the following:

- Retrieval of 750 m^3 of retrievably stored waste (RSW) toward M-91-40 (10,500 m^3 cumulative)
- Treatment of 850 m^3 of mixed low-level waste (MLLW) toward M-91-42 (7,600 m^3 cumulative)
- Treatment of 270 m^3 of remote-handled (RH) and large container contact-handled (CH) MLLW toward M-91-43 (600 m^3 cumulative).

Two funding cases, a Base Case and an As-Soon-As-Feasible Compliance Case, are discussed for work scope planned to support M-91 milestones in Fiscal Years (FYs) 2009 through 2035. The Base Case funding profile is based on the FY 2009-2018 Plateau Remediation Contract (PRC) baseline and reflects incorporation of both the President's FY 2010 budget as well as additional American Recovery and Reinvestment Act funding in the FY 2009-2011 timeframe. Funding for FYs 2019 through 2035 was estimated based on assumptions regarding operations that support achievement of M-91 milestone series and is subject to change as planning is refined.

This Program Management Plan reflects a point-in-time approach to MLLW and transuranic waste management. The analyses of waste processing volumes and rates presented in the Appendices are based on waste forecasts developed by generators in response to an annual data call in January of each year and represent the generator's best estimate of waste generation, based on funded work scope. CHPRC is working with the generators to improve the forecasting tool/process to increase the timeliness and confidence level of the forecast in the future. While the DOE RL Certified Baseline, approved in May of 2008, contained a near term funding profile significantly lower than that used in the Plan, the Plan's identified scope and funding is consistent with the FY 2009-2018 PRC baseline which is currently under review by the DOE. Adjustments to the FY 2009-2018 CHPRC baseline may be necessary following DOE review and approval. Scope in the out years (e.g., 2019 through mission completion) is based on the best data currently available and is expected to be updated as planning matures.

A summary description of the As-Soon-As-Feasible Compliance Case funding for FY 2009 and beyond is presented to be consistent with As-Soon-As-Feasible Compliance with M-91-series milestone completion dates. Annual treatment/WIPP compliant packaging processing volume charts for both the Base Case and the As-Soon-As-Feasible Compliance Case are included in this PMP. Included for information only is the draft TPA Change Package M-91-08-05 (the February 2, 2009 version) to reach agreement on adjustments in workscope and milestones.

Building blocks of added treatment/processing are provided for the possibility of additional FY 2010 funding. Subsequent annual PMP revisions will provide building blocks for the respective President's budget year and will incorporate the previous year's accomplishments. The building blocks will support the As-Soon-As-Feasible Compliance Case for achieving M-91-series milestone commitments, where feasible, with removal of funding constraints. Life-cycle funding profiles are provided for the Base Case and the As-Soon-As-Feasible Compliance Case.

Per TPA Change Package M-91-08-03, CY 2008 M-91 accomplishments are included in the Foreword.

FOREWORD

This revision of the Project Management Plan (PMP) for Tri-Party Agreement (TPA) M-91-series milestones was prepared by the Hanford CH2M HILL Plateau Remediation Company with guidance from the U.S. Department of Energy (DOE). The M-91-series milestones include: (1) retrieval of RSW, (2) acquisition of capabilities and/or facilities to process/treat mixed low-level waste (MLLW) and transuranic waste, and (3) treatment of MLLW and certification of transuranic waste.

Since completion of M-91 negotiations in 2003, DOE has met 52 of the 59 M-91 requirements on or ahead of schedule. Accomplishments include retrieval of more than 9,800 m^3 of RSW, treatment of more than 7,500 m^3 of MLLW, and certification of more than 3,300 m^3 of transuranic waste.

Two funding cases, a Base Case and an As-Soon-As-Feasible Compliance Case, are discussed for work scope planned to support M-91 milestones in Fiscal Years (FYs) 2009 through 2035. The Base Case funding profile is based on the FY 2009-2018 Plateau Remediation Contract (PRC) baseline and reflects incorporation of both the President's FY 2010 budget as well as additional American Recovery and Reinvestment Act funding in the FY 2009-2011 timeframe. Funding for FYs 2019 through 2035 was estimated based on assumptions regarding operations that support achievement of M-91 milestone series and is subject to change as planning is refined. The following table summarizes selected impacts to M-91 TPA requirements:

M-91 Milestone	Requirement	Base Case Completion Date	As-Soon-As-Feasible Case Completion Date
M-91-40G-001	DOE shall retrieve all CH RSW within burial grounds 218 W 4C, 218 W 4B, 218 W 3A, and 218 E 12B by 12/31/2010	12/31/2013	12/31/2012
M-91-41A	Retrieval of non-Caisson RH RSW shall be completed by 12/31/2014	12/31/2013	12/31/2013
M-91-41B	Retrieval of the 200 Area caissons RH RSW in the 218 W 4B burial ground shall be completed by 12/31/2018	12/31/2018	12/31/2017
M-91-42F	Complete treatment of all CH MLLW(5066 cubic meters in storage as of 12/31/02 as described above, and retrieved CH-MLLW and newly generated CH-MLLW in the treatability groups described above, as of 6/30/09), by 12/31/09	12/31/2014	12/31/2013
M-91-42J	DOE shall treat the waste categories described above (CH-TRUM) to meet LDR requirements on the following schedule: 4,200 cubic meters (cumulative) by 12/31/07. DOE may choose to complete certification of CH transuranic waste for disposal at in lieu of LDR treatment.	12/31/2011	12/31/2011

M-91 Milestone	Requirement	Base Case Completion Date	As-Soon-As-Feasible Case Completion Date
M-91-43D	DOE shall complete treating RH MLLW and large containers of CH MLLW to meet LDR treatment requirements of the second 300 cubic meters per year increment by June 30, 2010.	12/31/2009	12/31/2009
M-91-44C	Complete certification of first 300 m^3 per year increment of RH TRUM waste and large container CH TRUM waste by 6/30/2013	12/31/2020	12/31/2016

DOE plans to complete M-91-42 MLLW, and available lower activity M-91-43 MLLW requirements by using available commercial capabilities and capacities. Starting in 2019 for the Base Case (2012 for the As-Soon-As-Feasible Case), low-gram M-91-44 transuranic waste will be processed using available commercial capabilities and capacities. M-91-43 MLLW and M-91-44 transuranic waste that cannot be commercially treated will be processed through future large container and RH waste processing capabilities. Future large container and RH waste processing capabilities will be operational by December 31, 2018 for the Base Case, and by December 31, 2016 for the As-Soon-As-Feasible Case.

In the Base Case, milestone M-91-44 transuranic waste processing is completed in CY 2040. In the As-Soon-As-Feasible Compliance Case, M-91-44 transuranic waste processing is completed in FY 2038. This PMP assumes that transuranic waste can be sent to an offsite facility for disposal through year 2050.

In the Base Case, T Plant is maintained through FY 2028. In the Base Case T Plant will process M-91-42 transuranic waste using two processing lines (one line operating two shifts and one line operating one shift) starting in FY 2010 (350 m^3 per year). WRAP continues to process M-91-42 transuranic waste with one operating shift. In the As-Soon-As-Feasible Case processing rates are increased in FY 2011 by adding an additional shift at T Plant and WRAP (to two shifts). DOE plans to evaluate alternatives to establish offsite processing capability for selected M-91-42 CH transuranic waste.

In 2009 the WIPP Central Characterization Project (CCP) will provide visual examination support for packaging of transuranic waste, for transuranic waste stream approval, and waste package Non-Destructive Assay (NDA), Non-Destructive Examination (NDE) and head space gas characterization. The CCP will initiate shipping of CH transuranic waste packages starting in FY 2014 to WIPP at a rate of 1,000 m^3 per year.

This PMP also includes estimated volumes of waste containing transuranic constituents at levels above 100 nanocuries per gram (nCi/g) that could result from current or future Hanford *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) waste site remediation.

Building blocks of scope and funding are provided in Section 4.2 to assist possible adjustments needed if funding obtained for FY 2010 is different than the Base Case.

The M-91-08-05 Draft Change Package, to reach agreement on adjustments in work scope and milestones, is included in Appendix T for information.

CY 2008 M-91 accomplishments include:

- M-91-40:
  - Met milestone M-91-40F on 9/10/2008 (Completed retrieval of 9,700 m^3 of RSW)
  - Retrieved 2,590 m^3 of RSW.
- M-91-42 MLLW:
  - Met milestone M-91-42E on 12/31/2008 (Completed treatment of 7,220 m^3 of CH small container MLLW)
  - Shipped MLLW to four different commercial treatment facilities.
- M-91-42 transuranic waste:
  - Completed certification of 3,000 m^3 of CH small container transuranic waste on 4/01/2008
  - Certified 540 m^3
  - Five new WIPP-approved waste streams
- M-91-43 MLLW:
  - Met milestone M-91-43C on 9/2/2008 (Completed treatment of 300 m^3 of large container and RH MLLW)
  - Shipped and completed additional quantities of RH MLLW.

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1.0 PROJECT GOALS AND OBJECTIVES

This Project Management Plan (PMP) was developed in accordance with the Tri-Party Agreement (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). This PMP completely replaces previously prepared M-91 PMPs.

Waste management objectives include the following:

- Compliant storage of mixed low-level waste (MLLW) and transuranic waste
- Retrieval of retrievably stored waste (RSW)
- Effective management of newly generated MLLW and transuranic waste
- Treatment/processing of MLLW and transuranic waste
- WIPP compliant packaging, certification and shipment of transuranic waste for disposal at the Waste Isolation Pilot Plant (WIPP)
- Acquisition of capabilities and/or facilities to treat/process large container and remote-handled (RH) MLLW and transuranic waste.

Two funding cases, a Base Case and an As-Soon-As-Feasible Compliance Case, are discussed for work scope planned to support M-91 milestones in Fiscal Years (FYs) 2009 through 2035. The Base Case funding profile is based on the FY 2009-2018 Plateau Remediation Contract (PRC) baseline and reflects incorporation of both the President's FY 2010 budget as well as additional American Recovery and Reinvestment Act funding in the FY 2009-2011 timeframe. Funding for FYs 2019 through 2035 was estimated based on assumptions regarding operations that support achievement of M-91 milestone series and is subject to change as planning is refined.

2.0 BACKGROUND

2.1 Overview of Mixed Waste Management

Mixed waste is waste that contains both *Resource Conservation and Recovery Act of 1976* (RCRA) hazardous waste and source, special nuclear, or byproduct material subject to the *Atomic Energy Act* (AEA). Recognizing the potential for mixed waste to be subject to RCRA, radioactive waste disposal operations began segregating non-mixed low-level waste (LLW) from MLLW in July 1986.

Based on the *Radioactive Waste; Byproduct Material, Final Rule of 1987,* the radiological constituents of mixed waste are governed by the AEA, and the chemical and hazardous constituents are governed by RCRA. The Washington State Department of Ecology (Ecology) is authorized by the Environmental Protection Agency (EPA) to implement the State program in lieu of federal hazardous waste rules in Washington State. The State of Washington regulations are the *Dangerous Waste Regulations* (Washington Administrative Code [WAC] 173-303), which implement the *Washington State Hazardous Waste Management Act* (HWMA) as amended.

In order to obtain the authorization for mixed waste from EPA, the Washington State HWMA was amended in July 1987 to incorporate the definition of mixed waste.

In November 1987, Ecology was authorized by the EPA to regulate mixed waste in lieu of federal regulation. Subsequently, representatives from Department of Energy (DOE) Richland Operations Office (RL) and Westinghouse Hanford Company (WHC), EPA Region X, and Ecology met to discuss the strategy needed to handle the mixed waste that was being generated at the Hanford Site. The resulting strategy,

effective January 15, 1988, allowed all containerized mixed waste generated onsite (except for RH waste and ignitable waste) to be consolidated for temporary aboveground storage on retrievable storage pads. Mixed waste generated offsite could not be accepted for storage, except on a case-by-case basis with concurrence from EPA and Ecology, until the radioactive mixed waste storage buildings were in place. These new storage buildings were placed into service beginning in 1989 and are now part of the Central Waste Complex (CWC).

Finally, in September 1996, agreement was reached with the Attorney General of Washington that the effective date for mixed waste regulation in Washington State is August 19, 1987. Land Disposal Restrictions (LDR) for mixed waste became applicable over time as the national capacity variance for a treatment standard expired. Today, in Washington State, all LDRs apply to mixed waste.

2.1.1 Types of Waste

LLW is radioactive waste that is not spent fuel, high-level waste, transuranic waste, byproduct material, or naturally occurring radioactive material. LLW includes both MLLW and non-MLLW. LLW can be CH or RH.

MLLW is LLW that is subject to RCRA or Chapter 70.105 of the *Revised Code of Washington* (RCW). Non-MLLW is LLW that is not subject to RCRA or *70.105 RCW*. MLLW can be CH or RH.

Transuranic waste is waste that meets the definition in subsection (18) of Section 2 of the WIPP Land Withdrawal Act, Pub. L. 102-579. Transuranic waste includes both non-mixed and mixed transuranic waste, and comprises the following categories: CH TRU, CH TRUM, RH TRU, and RH TRUM.

In this PMP, waste labeled transuranic includes both non-mixed transuranic and mixed transuranic waste. Waste labeled as TRUM is mixed transuranic waste. Waste labeled as TRU is non-mixed transuranic waste.

2.1.2 Retrievably Stored Waste

The Atomic Energy Commission (AEC, a DOE predecessor agency) initially defined transuranic waste as "wastes with known or detectable contamination of transuranium nuclides." In March 1970, the AEC directed Field Sites to segregate transuranic waste and place it in retrievable storage that would allow the waste to be retrieved within 20 years. Before this date, this waste was disposed as LLW.

In 1973, the transuranic waste segregation limit was established at 10 nanocuries of transuranic isotopes per gram. In 1982, the limit was changed to 100 nanocuries per gram. This limit was enacted by Congress in 1992. Because of the changing definition of transuranic waste, waste generated and stored between 1970 and 1982 could contain less than the current threshold of 100 nanocuries per gram for defining transuranic waste. This waste has been termed "suspect" transuranic because some of this waste will be designated LLW following radiological characterization. In addition, waste has been categorized as transuranic by waste process knowledge rather than by assay. Also, all retrieveably stored RH waste (drum and box) is considered suspect because the capability to reliably determine (by assay) the transuranic waste content of these containers did not exist on the Hanford Site or the DOE complex. When the M-91 milestones were revised in 2003, the term RSW was defined in M-91-00 to refer to what was previously termed "suspect transuranic waste." In this PMP, the term RSW is used to be consistent with the current M-91 definition which reads:

- RSW is waste that is or was believed to be contaminated with significant concentrations of transuranic isotopes 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. During the retrieval process, containers of RSW will be segregated into two categories: (1) CH RSW and (2) RH RSW. Subsequent analysis and categorization of the RSW pursuant to *RCW Chapter 70.105*, the AEA, and the WIPP Land Withdrawal Act will result in most or all of this waste being classified as one of the following types of waste: CH LLW, RH LLW, CH MLLW, RH MLLW, CH TRU, CH TRUM, RH TRU, or RH TRUM. RSW does not include waste in containers that have deteriorated to the point that they cannot be retrieved and stabilized (e.g., placed in overpacks) 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, the decision as to how to move forward will be determined through the cleanup process set forth in RCRA, Chapter 70.105 of the RCW, and/or *CERCLA* as appropriate. Those processes may result in additional requirements for the remediation of such wastes.

2.1.3 Waste Designation

Designation as used in the M-91 milestones is the process for determining (1) which containers of LLW are MLLW, and (2) which containers of transuranic waste are transuranic mixed waste (CH TRUM or RH TRUM). Designation of waste will be performed pursuant to WAC 173-303-070 through 173-303-100. These regulations allow the use of "Knowledge" (in accordance with WAC 173-303-040), and other measures (i.e., testing such as Nondestructive Examination [NDE] for designation to minimize workers' radiation exposure and to reduce costs). Where applicable, DOE intends to use information gathered through the certification of transuranic waste in support of its designation of related LLW streams. Where appropriate, DOE will use measures allowed under state and federal regulations to perform accurate and cost-effective designations of LLW.

2.1.4 Land Disposal Restrictions

Pursuant to the *Hazardous and Solid Waste Amendments of 1984,* LDRs were promulgated beginning in 1986. Beginning in 1990, 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 2008 *Hanford Site Mixed Waste Land Disposal Restrictions Summary Report*. The report provides total waste volume for both the currently stored inventory and the waste forecast to be generated during the next five years by "Treatability Group." This 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.

2.1.5 Transportation of Waste

Mixed waste is currently transported on the Hanford Site by forklift, truck, and rail. 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. Department of Transportation (DOT). A 2003 memorandum of understanding (MOU) between the Western Governors' Association and DOE headquarters requires that DOE conduct transuranic 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 transuranic waste shipments as agreed to between DOE and the states. Shipments of transuranic waste to commercial firms utilizing 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.

2.1.6 Waste Acceptance Criteria

Solid Waste Operations Complex

The *Hanford Site Solid Waste Acceptance Criteria* (HSSWAC) HNF-EP-0063, defines the baseline criteria for acceptance of waste at the following Hanford Site Solid Waste Operations Complex (SWOC) treatment, storage, and disposal (TSD) units: the CWC, the Waste Receiving and Processing (WRAP) facility, T Plant, and the low-level burial grounds (LLBG) that include the Mixed Waste Disposal Trench (MWDT). The waste acceptance criteria (WAC) for each TSD unit have been established 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.

Environmental Restoration Disposal Facility

The Environmental Restoration Disposal Facility (ERDF) Waste Acceptance Criteria defines the baseline criteria for acceptance of waste at ERDF.

2.1.7 Data Sources

The amounts, characteristics, and locations of MLLW and transuranic waste were obtained by completing data sorts on the *Solid Waste Inventory Tracking System (SWITS)* and the *Solid Waste Integrated Forecast Technical (SWIFT)* databases. The SWITS database contains records for the majority of waste containers currently stored at Hanford, while the SWIFT database contains estimates for waste expected to be generated in the future.

The SWITS database contains data (e.g., volumes; container information; and radiological, physical, and dangerous waste characteristics) about each container of stored waste managed by the CH2M HILL Plateau Remediation Company (CHPRC) Waste and Fuels Management Project. Generator data, waste transfer data, or shipping records for the stored waste were used to extract waste information for input to the SWITS database. The SWITS database is a dynamic database and is updated frequently to reflect waste receipt, processing, and shipment volumes. Included in SWITS are waste containers that did not have a TSD acceptance date at the time the database was queried. The data contained in this PMP were obtained on January 8, 2009. Annual updates will use a point in time of approximately January 1 of each year.

The SWIFT database contains estimates of future waste volumes and characteristics forecasted by waste-generating units. The waste-generating units provide basic information that is incorporated into the SWIFT database. The generator specifies the containers in which the waste will be shipped, the projected number of containers, the physical form of the waste, the Waste Specification Record (WSRd), the dangerous characteristics of the waste, and the radionuclide activity in the waste. The SWIFT database is updated semi-annually and published in the SWIFT report. The data contained in this PMP correspond to the *SWIFT Report 2009.0* published in February 2009. The annual January SWIFT updates will be used for the annual PMP update.

The SWIFT data are obtained through formal meetings and contact with the individual generating units and are validated through a

quality control process that includes approval by appropriate authorities.

2.1.8 CERCLA Waste

Wastes generated during CERCLA cleanup actions that will be treated through "M-91 capabilities" will be identified as part of the records of decision (ROD) process, and will be integrated with M-91 through the *M-16-93 Implementation Work Plan*. RH wastes from the 618-10/11 have been identified and are included in the waste feed for the M-91 Project. As new waste streams are identified that will be processed through the M-91 capabilities, they will be included in future updates to the PMP. As specified in the M-91-03-01 Change Package, the M-91 series was revised specifically to address capabilities for RCRA waste. Because the M-91 series was not established to address CERCLA waste, a separate change package (M-16-03-03) was processed at the same time to include language in M-16-93 that provides an implementation work plan to describe the strategy for obtaining capabilities to process CERCLA TRU and TRUM. The M-16-93 work plan addresses how M-91 capabilities will be considered in the evaluation of processing new CERCLA wastes. Estimates of the volume of material containing transuranic radionuclides greater than 100 nCi/g that could result from future CERCLA actions are provided in Appendix C.

2.2 Waste Requiring Processing and Disposal

Waste that is RSW in the LLBG, in aboveground storage (primarily at CWC), and forecast to be generated during site cleanup requires processing and disposal. Figure 1 provides the volume of each type of waste.

Enlargements of Figures 1, 6, 7, 8, and 9 are provided in Appendix B along with applicable data sources and notes. Retrieval and storage inventory volumes are as of January 8, 2009. The following waste is not included:

- Waste that has already been treated/ processed or disposed
- Waste not forecast (i.e., potential waste from CERCLA or decontamination and decommissioning [D&D] cleanup actions not yet specified)
- Non-mixed LLW regulated by Toxic Substances Control Act (TSCA) requirements
- Waste known as "German Logs" (vitrified high-level waste). Includes packages CASTOR-GSF-001, -002, -003, -005, -006, -007, GNS-12-1, and GNS-12-2
- Waste from the "Liquid Radioactive Waste Storage Tanks"
- Waste suspected to be reactor-irradiated nuclear material (RINM)
- Increased waste volumes resulting from failed RSW containers (i.e., retrieval waste volumes are based on original container volumes)
- Defueled Naval Reactor Compartments

The SWITS retrieval and storage volumes are the internal volume of the waste package (e.g., a 55-gallon drum has an internal volume of 0.208 m^3 and an external volume of 0.257 m^3), reference *Hanford's Commonly Used Containers; Treatment, Storage, and Disposal Volumes*. Retrieved waste production volumes are external.

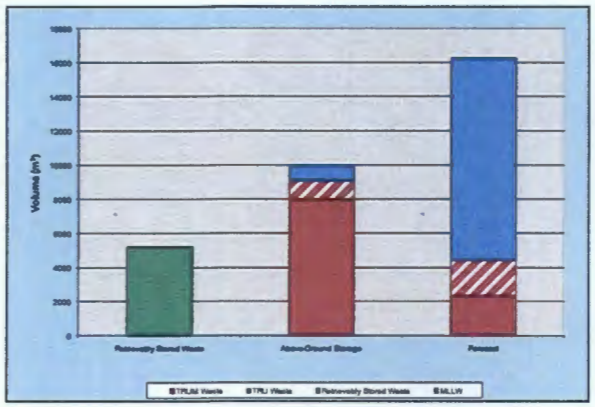

Figure 1: Hanford MLLW/Transuranic Waste Sources.

Initially it was assumed that 10 percent of the RSW drums (see Section 3.2, Planned Approach for MLLW and Transuranic Waste Management) would require overpacking due to waste container integrity issues (see Figures 2 and 3). RSW containers removed from the 218-W-4C burial ground were generally in good condition, although some contaminated and deteriorated packages were dealt with during retrieval. More frequent occurrences of degraded, failed, and contaminated containers or areas have been encountered as older containers in 218-W-4B and 218-W-3A were retrieved. In some of the 218-W-4B trenches more than 25 percent of the containers were structurally failed. Based on retrieval experience this PMP assumes that the remaining RSW drums are degraded and require overpacking or are failed and require packaging during retrieval (see Figures 4 and 5). Some of the larger-sized RSW containers will require overpacking and a few containers will require repackaging (see Section 3.2).

Figure 2: Waste Container Integrity Issues.

Figure 3: Waste Container Handling.

Figure 4: Waste Container Overpacking.

Figure 5: Failed RSW Drum.

Based on process experience, the volume of debris within RSW debris waste containers is assumed to be 99.5 percent of the overall waste and 0.5 percent is non-conforming waste. Approximately 80 percent of the non-conforming waste can be treated during routine processing by liquid sorption, pH neutralization, and aerosol-can puncturing, etc.; the remaining 20 percent of the non-conforming waste requires additional treatment (e.g., macro-encapsulation).

After retrieval and assay, a significant portion of the RSW will be designated as non-transuranic waste based on the change in definition of transuranic waste (currently defined as 100 nanocuries per gram versus the previous 10 nanocuries per gram). In addition, waste was often categorized transuranic waste as a conservative measure rather than by assay. Based on this change in definition, waste records, and field experience, it is assumed that 50 percent (by volume) of the remaining RSW will be managed as MLLW and 50 percent managed as transuranic waste (see Figure 6). As of April 20 2009, 55 percent of the 55-gallon drums retrieved have been transuranic waste and 70 percent of the non-drum containers have been transuranic waste. Most of the containers retrieved to-date have been from LLBG 218-W-4C, which contained the most recent RSW and is anticipated to have a higher percentage of transuranic waste.

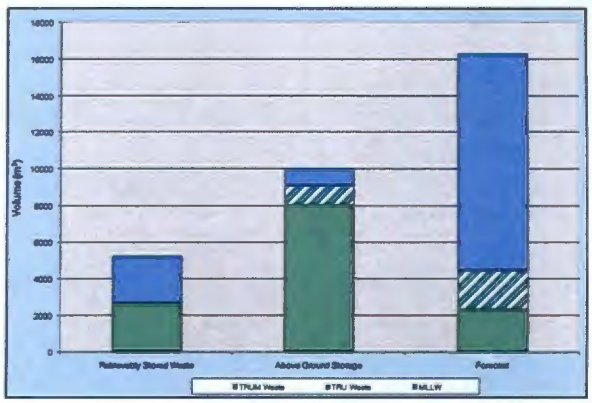

Figure 6: Hanford MLLW/Transuranic Waste with Retrieval Split.

Based on retrieval experience and a review of the remaining SWITS RSW inventory, 75 percent of the large CH RSW is assumed to

be transuranic waste. Fifty percent of the non-caisson RH RSW is assumed to be transuranic waste and 50 percent MLLW. All caisson waste is assumed to be RH transuranic waste. When a waste container is determined to potentially contain classified matter, the container will be segregated for storage and future disposition in a manner protective of human health and the environment and in accordance with DOE directives.

Forecast volumes are life-cycle from January 2009 through September 2035 (see Forecast Waste later in this section). Waste that is newly generated after Year 2035 has not been forecast. Forecast volumes do not include waste that goes directly to ERDF, MLLW processed and disposed of by the River Protection Project, or liquid waste. Forecast volumes are the maximum external dimensions of the waste package. CERCLA remediation decisions could result in additional waste requiring processing and disposal.

Currently two CERCLA actions have been identified with waste containing transuranic constituents. The proposed 618-10/11 burial grounds retrieval cleanup plan has identified approximately 220 m^3 of waste that is CH waste and 850 m^3 of RH waste that contains transuranic constituents requiring processing and disposal. A small quantity of waste potentially containing transuranic constituents has also been identified in the U Plant canyon and will be quantified as part of 221-U (U Plant canyon) closure.

Volume estimates of waste containing transuranic constituents at levels above 100 nCi/g that could result from current or future Hanford CERCLA waste site remediation are included in Appendix C. Additional CERCLA waste sites and facilities with waste containing transuranic constituents include the following areas:

- Liquid-waste disposal sites – cribs, trenches, reverse wells, ditches, ponds, unplanned release sites, and settling tanks
- Burial grounds – non-RSW
- Canyons, facilities, and associated tunnels.

If new waste streams identified during a TPA past-practice cleanup will be processed through M-91 capabilities, those newly identified waste streams will be added to future updates of the M-16-93 work plan.

2.2.1 MLLW Treatability Groups

The MLLW is categorized by the necessary treatment path to ensure that the waste, once treated, will meet LDR requirements for disposal. The *Calendar Year 2008 Hanford Site Mixed Waste Land Disposal Restrictions Summary Report* 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 (macro-encapsulation[1])
- MLLW-05 "Elemental Lead," Treatment Path: Non-thermal (macro-encapsulation)
- MLLW-06 "Elemental Mercury," Treatment Path: Mercury stabilization (i.e., amalgamation or grout stabilization)
- MLLW-07 "RH and Large Container," Treatment Path In-trench treatment, commercial, and future large container and RH waste processing capabilities
- MLLW-08 "Unique Wastes," Treatment Path: No path (lack of treatment capability)

1 Organic/carbonaceous (O/C) LDR inapplicability certification has been in affect since 1999 allowing for the treatment of the O/C debris by methods other than incineration.

- MLLW-09 "Lead Acid & Cadmium Batteries," Treatment Path: Macro-encapsulation
- MLLW-10 "Reactive Metals," Treatment Path: Deactivation of reactive component

The volume of the MLLW treatability group waste sources is summarized in Figure 7 based on processing plans discussed in Section 3.2, Planned Approach for MLLW and Transuranic Waste Management, and in Figure 7. The figure indicates significantly less RSW than one year ago. The large decrease in total MLLW-07 projected volume for processing is due to the update in the assumptions of RSW composition, as described in Appendix B. The MLLW-01, LDR-compliant waste is not addressed in this PMP because it is stored and disposed in compliance with WAC-173-303 requirements and the LDR storage prohibition requirements as specified in 40 Code of Federal Regulations (CFR) Part 268. Volumes of MLLW treated by Hanford generators prior to storage/disposal are included in MLLW-01.

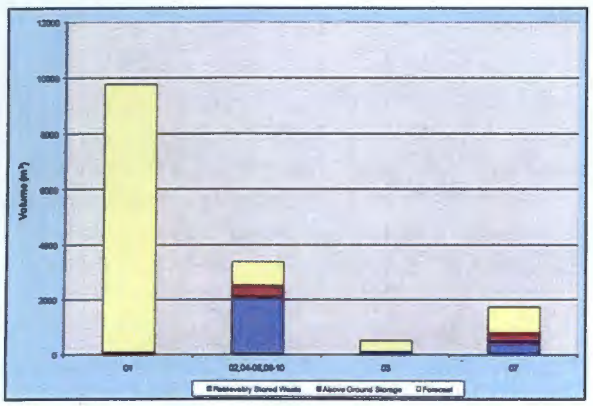

Figure 7: MLLW Treatability Group Sources.

A "Tree Chart" of MLLW and transuranic waste by treatability group requiring processing is included in Appendix D. The Tree Chart includes the following assumptions:

- Reassignment as RH of packages listed as CH in SWITS (These packages will be counted under M-91-43/M-91-44):
  - With a dose rate of >200 mR/hr
  - Containing shielding
  - Containing greater than 0.25 curies of cesium-137
- Suspect RINM marked as transuranic waste is not included.
- Waste marked as LLW TSCA is not included.
- RSW burial grounds consist of 218-W-3A, 218-W-4B, 218-W-4C, and 218-E-12B.
- Fifty percent of the retrieved RSW is assumed to be MLLW.
- Retrieval and storage data is as of January 8, 2009. Forecast data is the baseline case from *SWIFT 2009.0* for the period January 2009 through September 2035.
- Retrieval and storage numbers include packages without a TSD accept date.
- Retrieval and storage volumes in SWITS are internal volumes; volumes for forecast are external (e.g., a 55-gallon drum is 0.208 m^3 internal and 0.257 m^3 external)
- Shipped or already disposed waste is not included. Over 3,300 m^3 of CH transuranic waste has been certified to date.

The Tree Chart includes the volumes of the various wastes, which is helpful for grouping waste treatment/processing approaches discussed in Section 3.0.

Small and large containers have different meanings depending on whether they are used in reference to MLLW/LLW or transuranic waste. When referring to MLLW/LLW, small containers are containers less than 10 m^3, including 55-gallon drums. A large container is anything not defined as a small container.

Figure 8 provides the volumes of the MLLW-07 sources that are CH and RH.

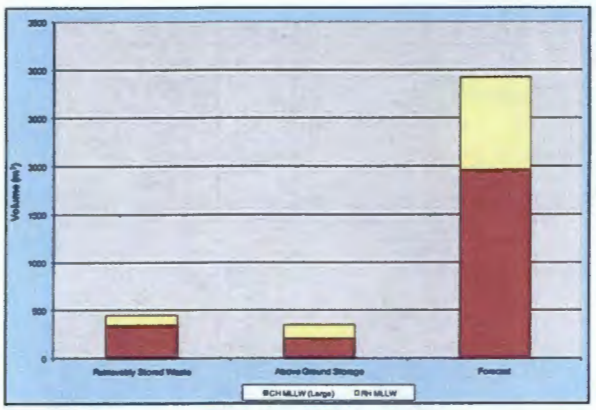

Figure 8: MLLW-07 Sources.

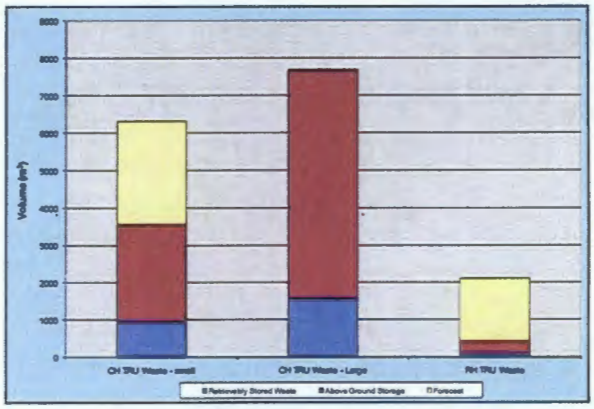

Figure 9: Transuranic Waste Sources.

2.2.2 Transuranic Waste Treatability Groups

Transuranic waste is categorized by the necessary treatment path to ensure that this waste, once processed, will meet WIPP WAC for disposal. The *Calendar Year 2008 Hanford Site Mixed Waste Land Disposal Restrictions Report* includes the following:

- TRUM CH Small Containers
- TRUM CH Large Containers
- TRUM RH.

When referring to transuranic waste, small containers are 55-gallon drums or smaller containers (even if overpacked in 85-gallon drums), and newly generated WIPP standard waste boxes (SWB). A large container is anything not defined as a small container.

Figure 9 provides the volume of transuranic waste in storage by treatability group.

2.2.3 Waste in Storage

As of January 2009, approximately 1,900 containers (940 m^3) of MLLW (95 m^3 is MLLW-01 LDR-compliant waste) and 10,500 containers (9,100 m^3) of transuranic waste are in aboveground storage.

The stored waste volume and the number of waste containers, by waste generator, are provided in Appendix E for MLLW and Appendix F for transuranic waste.

2.2.4 LLBG RSW

Hanford has more than 20,200 containers (5,200 m^3) of RSW temporarily stored in the 200 Area LLBG awaiting retrieval. Over 10,000 m^3 of RSW has been retrieved to date.

2.2.5 Forecast Waste

Approximately 12,000 m^3 (including MLLW-01) of CH and RH MLLW and 4,400 m^3 of CH and RH transuranic waste are forecast through FY 2035 (these are internal container volumes). There is no offsite MLLW forecast.

The volume of waste and the time frames of waste generation have varied considerably in the annual forecasts. This is due to changes in waste generator plans/estimates and overall Site cleanup plans. The volume of newly generated

transuranic waste has been less than the planning basis established in FY 2003. The near-term forecast (2009 through 2012) for transuranic waste generation is also significantly lower than the FY 2003 planning basis, due to changing remediation methods.

Remediation of the 618-10 and 618-11 burial grounds, located near the Energy Northwest Generating Station, is required in accordance with the *Record of Decision for the 300-FF-2 Operable Unit,* 2001. These burial grounds contain RH and CH transuranic waste, along with larger quantities of LLW and MLLW. Actual volumes will depend on the approaches taken in the remediation; significant changes in forecasts have occurred based on changing remediation proposals. DOE and EPA have yet to approve the cleanup approach, and the time frame for this waste generation may change.

The forecasted waste volume and the number of waste containers, by generator unit, are provided in Appendix E for MLLW and Appendix F for transuranic waste.

2.2.6 Number of Containers and Volumes

Appendix G provides the number of containers and volumes for different types of waste containers.

2.3 Mixed Waste Commercial Disposition

Commercial processing will be used on selected MLLW Treatability Groups, which are discussed in Section 3.2, Planned Approach for MLLW and Transuranic Waste Management.

2.4 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 CWC. The CWC buildings are designed to meet storage requirements for hazardous 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 ERDF. The facilities are built to RCRA standards and employ a double-liner leachate collection system as required for near-term containment. Leachate is treated for any contaminants that may be released from the waste. All disposed wastes have been treated to satisfy LDR requirements for hazardous constituents prior to disposal as defined in WAC 173-303.

2.5 Earlier Evaluations

2.5.1 CH MLLW Processing Studies

Non-Thermal Treatment

In 1991, the Strategy Assessment for Project W-100, WRAP Module 2, recommended that the WRAP 2 facility project be divided into smaller functional projects. Based on this study, the WRAP 2 Project split into WRAP 2A and WRAP 2B. The primary functions of WRAP 2A were to include processing, packaging, and certification of retrieved and newly generated CH MLLW using non-thermal treatment technologies. A Change Package to TPA milestone M-19-00 was submitted in October 1991 (M-19-91-1) to charter the separation of WRAP 2 into 2A and 2B. However, this Change Package was later deleted due to commercialization of WRAP 2A waste treatment functions.

Thermal Treatment

A commercial thermal treatment contract was recommended to provide waste treatment of the hazardous constituents by thermal destruction and subsequent immobilization of the radionuclides in a final grouted or slag/glass waste form. Commercial thermal treatment would process wastes regulated by TSCA and most listed and characteristic hazardous wastes restricted from land disposal under RCRA. In addition to TSCA-regulated polychlorinated biphenyls (PCB), a significant quantity of radioactive MLLW containing RCRA F-coded, ignitable, and reactive organic constituents is stored or will be generated at the Hanford Site. Thermal destruction is the best demonstrated available (treatment) technology for these RCRA LDR wastes with organic toxic constituents. DOE indicated an interest in considering thermal treatment as a primary option for the treatment of radioactive MLLW because significant volume reduction can be realized using thermal treatment.

A strategy for this activity was initially established that involved consideration and assessment of the following three treatment options:

- Installation and operation of an onsite thermal treatment facility (Project W-242)
- Treatment at another DOE site
- Contracting for commercial thermal treatment.

Each of the above options was investigated to a varying extent and resulted in supporting documentation, such as waste characterization studies, thermal treatment technology studies, Site-specific preliminary engineering designs and cost estimates, and hazard classification analyses.

The option of onsite thermal treatment was investigated in FY 1991 and 1992. An engineering study was performed to identify the preferred technologies for treating Hanford Site radioactive MLLW. A rotary kiln incinerator was the thermal treatment technology recommended for further evaluation and development. An engineering study for a Site-specific thermal treatment facility was partially completed in FY 1992. The Site-specific study included a facility design and equipment layout, as well as estimates of capital and operating costs.

The option of sending the waste to other DOE sites for treatment was investigated in detail for the specific case of treatment at Idaho National Engineering and Environmental Laboratory's (INEEL, now referred to as INL) Waste Experimental Reduction Facility (WERF), which was being refurbished and permitted for restart. The INL's WAC for offsite waste treatment was found to be too limited to be practical. Other sites, such as Savannah River and Oak Ridge National Laboratory, had thermal treatment facilities, but facility management at these sites indicated projected waste acceptance was at capacity.

The option of commercial thermal treatment provided the most desirable combination of technical feasibility and economic attractiveness. Commercial thermal treatment was initially investigated by surveying the industry's capability and interest in addressing the Hanford Site radioactive MLLW thermal treatment problem. In FY 1994, it was decided that industry interest and capability were sufficient to issue a request for proposal (RFP) to treat the thermally treatable CH MLLW inventory (existing and projected), and a thermal treatment contract was awarded in November 1995. The company that was awarded the contract proposed a vitrification process to thermally treat the combustible portion of the waste and produce a glass/slag final waste form for that portion of the waste. The noncombustible portion of the waste would be separated and treated with either microencapsulation (grouting) or macro-encapsulation.

The initial results derived from this procurement activity strongly suggested that thermal treatment by a commercial contractor provided acceptable technical risk accompanied by minimum financial risk to DOE, and that a unit cost-based thermal treatment service would be significantly more cost-effective than the construction of an onsite thermal treatment facility.

Studies concluded that the other two options (onsite facility and other DOE site facilities) would continue to be considered as possible alternatives until the uncertainty can be eliminated regarding privatizing thermal treatment. One concern was that a commercial offsite treatment facility might not be capable of thermally treating alpha-contaminated waste. The company that was awarded the thermal treatment contract indicated that the treatment of alpha-contaminated, non-transuranic, and radioactive mixed waste would be included in the design of its treatment facilities.

Commercial thermal treatment capabilities continue to be utilized to support M-91-42 commitments. There continues to be limited capabilities and capacities for commercial thermal treatment.

2.5.2 RH and Large Container CH MLLW and Transuranic Waste Processing Studies

Studies assumed that transfer for treatment of all RH MLLW and large-size CH MLLW would be by truck or rail in casks, whether the waste is directly from storage or a generator. The receiving function would have the capability to remove the waste container from the transport vehicle. Cask or overpack-handling capability would be required.

Size reduction would be performed if needed to make large items more manageable and able to fit into smaller containers. Waste would be sorted to group according to processing requirements. Items requiring thermal treatment would be segregated from those requiring non-thermal stabilization. Stabilization would consist of adding a reagent (e.g., grout mixture) to the waste to immobilize any hazardous constituents present. The contaminants are not removed or destroyed but the mobility of the contaminants is decreased by adding a stabilizing agent.

The RH MLLW would be packaged into containers for shipment and disposal. Waste would meet the acceptance criteria of the disposal site. Waste would either be transferred to storage awaiting disposal or would be transferred directly to disposal.

Initial efforts to identify capabilities for processing waste began in the mid-1980s. Continuing evaluation of waste treatability groups, waste acceptance criteria, cleanup schedules, and budget considerations, resulted in development of a new set of TPA milestones, the M-91 series. These evaluations resulted in establishing T Plant as the baseline for RH and CH large container processing.

In September 2005, an *Initial Engineering Study and Functions for Processing Mixed Low-Level Waste and Transuranic Mixed Waste that is either Contact-Handled in Boxes/Large Containers or Remote-Handled Waste in Various Packages* was issued. The report evaluated modifying T Plant to process large containers of CH waste and RH waste that cannot be processed at commercial facilities. New T Plant capabilities would include modular cells referred to as solid waste processing modules (SWPM) in the T Plant canyon that process both MLLW and transuranic waste and a Solid Waste Handling Facility (SWHF) added to the south end of the T Plant canyon. The strategy uses existing Hanford facilities (WRAP, CWC, 2706-T, the MWDTs, and ERDF) and commercial facilities to support waste staging, processing, and disposal.

The Initial Engineering Study and Functions report further stated that the ability to perform required basic functions (such as RH-72B cask payload container, RH transuranic waste loading and sealing, and handling and processing of large containers of CH waste/RH waste) will dictate the size and cost of the new T Plant SWPMs and SWHF. Processing capacity will be a function of the ability to routinely load-in and load-out containers with minimal contamination issues, maintain remote equipment in an operational condition, and staff for multi-shift operations.

In April 2006, Pacific Northwest National Laboratory (PNNL) assessed (*Solid Waste Processing Center Primary Opening Cell Remote Equipment Report)* and provided general guidance on the following issues:

- Remote processing feasibility
- What remote equipment would be required, and to what extent that equipment is available commercially off-the-shelf
- The extent to which technology development is required
- The feasibility of siting the proposed facility within T Plant.

PNNL concluded that, based on its analysis of the preliminary information of the processing requirements, remote processing within T Plant appears to be technically feasible. In performing this assessment, information was gathered on other remote-handling facilities across the DOE complex, including the West Valley Remote-Handled Waste Facility, the Idaho Advanced Mixed Waste Treatment Project, and the Oak Ridge Spallation Neutron Source Target Facility. Experts in the fields of hot cell operation, transuranic waste assay, and criticality safety were interviewed, and detailed discussions were conducted with major equipment vendors. PNNL stated that remote systems equipment/tool testing was essential to the success of the project.

In September 2006, the *Processing Hanford Remote-Handled and Large Package Mixed Low-Level Waste and Transuranic Waste Engineering Study* was issued. The Engineering Study further defined the strategy and the capabilities required to process the MLLW for disposal onsite in the MWDTs, ERDF, and/or the Integrated Disposal Facility (IDF), and the capabilities required to process transuranic waste for disposal at WIPP.

The 2006 Engineering Study identified modifications to Hanford's T Plant Complex required to enable it to process CH MLLW in packages greater than 35 m^3, large-size packages of CH transuranic waste, RH MLLW, and RH transuranic waste (RH waste containers are all sizes). The new processing capability would be called the T Plant Solid Waste Processing Center (SWPC). The T Plant SWPC would allow processing of packages measuring up to 20 ft x 13 ft x 11 ft, weighing up to 83,000 lb, having dose rates (unshielded at the container surface) up to 20,000 rem/hr, and containing up to 2,100 gallons of plutonium. Plans would process 600 m^3 per year of transuranic waste and 300 m^3 per year of MLLW through the upgraded complex.

The 2006 Engineering Study estimated the T Plant SWPC to cost $390M, including escalation and contingency. This cost estimate assumed a planned startup of the new SWPC as June 30, 2016.

The 2006 Engineering Study identified that commercial facilities are being used to process (e.g., macro-encapsulate, remove prohibited items, repackage) CH MLLW in packages up to 15 m^3. The study recommended that commercial facilities be expanded to treat CH MLLW in larger packages up to 35 m^3 and to continue to pursue in-trench treatment in Trenches 31 and 34 as applicable, and commercial usage be expanded to treat all large MLLW as possible.

Also in September 2006, the *T Plant Solid Waste Processing Center Functional Design*

Criteria was issued. The document provides the function and design requirements for a T Plant SWPC and supports acquisition of these new capabilities through the DOE capital project process.

DOE submitted documentation, in accordance with DOE Order 413.3A, for critical decision 0 (CD-0), "Approve Mission Need." Approval of CD-0 formally establishes a project and begins the process of conceptual planning and design used to develop alternative concepts and functional requirements. In addition, CD-0 approval allows the program to request project engineering and design funds for use in preliminary design, final design, and baseline development. CD-0 was approved in December 2007. The next steps required:

- CD-1 is the approval of alternative selection and of the cost range
- CD-2 is approval of the performance baseline
- CD-3 is the approval to start construction
- CD-4 is approval to start operations.

The amount of time between future CD-1 through CD-4 decisions will vary. Projects may quickly proceed through the early critical decisions due to lack of complexity, the presence of constraints that reduce available alternatives, or the absence of significant technology and development requirements. Due to the complexity of this project, an accelerated CD process is not expected.

In April 2008, a draft *M-91 Project Alternative Evaluation Study* was completed. This study identified and evaluated alternatives for acquisition of capabilities and/or facilities to process/treat Hanford MLLW and transuranic waste that is CH in large containers or RH. The study was performed to support the selection of a preferred alternative that was needed for the approval of alternative concepts in order to proceed with conceptual design of new facilities and/or modification of existing facilities. The study was performed by Fluor Hanford, Incorporated (FH) with guidance from the DOE.

The *2008 Evaluation Study* clarified a path-forward for acquiring these capabilities. The following are key elements of the path-forward:

- Using in-trench treatment in Trenches 31 and 34 of MLLW where possible
- Expanding use of commercial capabilities to process MLLW and transuranic waste
- Obtaining an SWPC to treat/certify the remaining MLLW and transuranic waste
- Establishing RH transuranic waste cask loading capability.

The Evaluation Study was based on the MLLW and transuranic waste data from SWITS and SWIFT databases. The data used was obtained as of January 3, 2007 consistent with Revision 3 of the PMP.

The Evaluation Study design and cost information was preconceptual, with cost estimates that included a 30 percent contingency. A wide variety of subject matter experts provided information to support this Study (FH organizations such as Engineering, Operations, Nuclear Safety, Radiological Protection, Waste Services, Plutonium Finishing Plant [PFP], Environmental, Quality Assurance, and Transportation; and from Fluor Federal Services, PNNL Remote Systems Integration, WIPP representatives, ex-Rocky Flats D&D, commercial vendors, Idaho Advanced Mixed Waste Treatment Plant, West Valley Remote Waste Treatment Facility, Savannah River Site, etc.).

A FH-sponsored independent assessment of option identification and the evaluation process was also performed in January 2008. In February 2008, the President's FY 2009 budget and management priorities were released. The alternative schedules and costs were not revised to reflect the new budget guidance. A brief

discussion on potential impacts is included in the Evaluation Study.

In early March 2008, DOE placed the project on hold due to the reduction in funds in the President's 2009 budget, and directed that the Alternatives Evaluation Study be completed as a draft. In accordance with DOE guidance, the executive summary, summary, conclusions and recommendation, and preferred alternative sections of the Study were not completed.

In this PMP, the following assumptions from the *2008 Evalutaion Study* are used:

- In-trench treatment in Trenches 31 and 34 will be used where possible
- Commercial facilities will process MLLW and transuranic waste that can be shipped and that meets their license requirements
- Future large container and RH waste processing capabilities will be designed and procured/constructed to treat/certify the remaining MLLW/transuranic waste. These capabilties will include RH transuranic waste loading capabilities
- Approximately 50 m^3 of RH transuranic waste in packages containing over 1,000 curies of cesium-137 is too concentrated to be shipped to WIPP for disposal and a plan to disposition this material will need to be developed.

Seismic evaluations conducted in 2008 have shown that the required T Plant upgrades to convert it for use as the SWPC are significantly more complex than assumed in the FY 2006 Engineering Study.

This PMP also assumes that transuranic waste can be sent to an offsite facility for disposal through Year 2050.

Other Evaluations

In 1990, *Contact-Handled Transuranic Waste Characterization Based on Existing Records* attempted to quantify the extent of the TRU/TRUM waste management work scope. This study concluded that there are uncertainties surrounding the projected waste volumes because of inadequate or incomplete records retained during early Hanford Site operations.

In 1995, the *Solid Waste and Materials System Alternatives Study* presented alternatives to provide the necessary facilities to satisfy TPA milestone M-33-00. M-33-00 established the requirement to submit a change package for acquisition of new facilities, modification of existing facilities, or modification of planned facilities for storage, processing, and/or disposal of solid waste and materials. Subsequent to this study, the *Trade Study for the Processing, Treatment, and Storage of Hanford Site Solid Waste Streams That Have No Current Path Forward* evaluated alternative locations or facilities for the processing, treatment, and storage of the Hanford Site solid waste streams.

The 1995 *Alternatives Study* identified several options for TRU/TRUM waste streams that could not be processed with current planned capabilities. This exhaustive study provided the bases for establishing the TPA M-91 milestones.

Five alternatives were evaluated in detail:

- Single new facility integrating storage and processing needs
- Multiple new modular facilities integrating storage and processing needs
- Multiple existing facilities integrating storage and processing needs
- Maximizing use of the Washington Nuclear Plant (WNP)-1 Facility (now Energy Northwest) integrating storage and processing needs
- Current planning baseline.

The alternative that utilized multiple existing facilities was identified as having the lowest programmatic or regulatory uncertainties and risk. It also had the lowest projected cost of the

alternatives, with the exception of the WNP-1 alternative.

In 1996, the *Solid Waste Program Technical Baseline Description,* described a program to receive, store, treat, decontaminate, and dispose of radioactive/nonradioactive waste and the required activities and technical challenges inherent in this process. This program addressed, in detail, the planned retrieval of transuranic waste from Trench 4 of the 218-W-4C LLBG and the planned removal of RH transuranic waste stored in dry caissons. Caisson waste is RSW in the 218-W-4B burial ground caissons alpha-1 through alpha-4.

218-E-12B Treatability Study

In 2006 a treatability study was conducted to assess field conditions related to RSW at the 218-E-12B burial ground (A report documenting the results of the treatability study was not issued). The treatability study was conducted in two phases.

During Phase 1, areas of the undisturbed burial ground containing RSW underwent geophysical, chemical, and radiological assessment to identify the most appropriate locations for examination of field conditions associated with waste retrieval. Geophysical assessments included electromagnetic induction, magnetic field, and ground-penetrating radar methods to survey and map the selected trenches. Chemical assessment included passive soil gas surveys to identify any hot spots of volatile organic constituents, which could indicate breached containers of waste containing organic constituents. Radiological assessment included surveys of the undisturbed trenches to determine if radiation readings could be used to identify waste locations and/or types.

During Phase 2 activities, the overburden layer was removed and waste containers in Trench T-17 and Trench T-27 were exposed. Radiological and industrial hygiene monitoring techniques were used to characterize the potential personnel exposure to hazardous constituents related to the activity of uncovering the waste containers and contact with the containers and adjacent soil. Visual examination of the condition of the buried wastes/waste containers verified the adequacy of existing burial-ground records and confirmed that the waste is RSW.

During the treatability study, no contamination was encountered that would have resulted in suspension of waste retrieval operations using the procedures in place for RSW retrieval at LLBG 218-W-4C. Some of the drums encountered showed damage due to historic waste management practices that included driving trucks across the waste trench to compact the buried waste. While original paint is still visible on some of the drums encountered, corrosion of some drum surfaces was also found (see Figure 10). Because of these observations, planning for RSW retrieval at the 218-E-12B burial ground must include contingencies for encountering drums in poor condition.

Figure 10: Treatability Study Excavation.

The treatability study successfully verified locations of waste containers in Trenches T-17 and T-27 within 218-E-12B burial ground using non-intrusive technologies; confirmed that the waste observed appeared to be RSW as defined in the TPA change package M-91-03-01; corroborated information provided by waste

disposal records (e.g., that metallic containers are detectable in areas where records indicate drums were buried); and confirmed that, with adequate precautions, the waste retrieval process currently in use at the 218-W-4C burial ground should be applicable for most RSW burial grounds.

2.6 Recent Evaluations

2.6.1 2009 Next Generation Retrieval Value Engineering Study

In March 2009 a Next Generation Retrieval Value Engineering Study was performed to develop the preferred path forward for the safe and compliant waste retrieval, characterization, packaging and transfer to disposal of remaining RSW in burial grounds 218-E-12B, 218-W-3A and 218-W4B.

The Next Generation Retrieval process concepts were identified to minimize staging/ storage/transfer of individual drums, perform all required processing steps as near to the retrieval activities as possible, and to produce a WIPP certifiable container in the LLBG. The draft Next Generation Retrieval process concept activities will include retrieval of suspect TRU drums from the trenches in a High-Efficiency Particulate Air (HEPA) filtered enclosure, packaging of failed drums into containers, assay and venting of the containers as necessary, segregation of TRU waste drums from MLLW drums, and repackaging of TRU waste to provide a WIPP compliant package that can be certified without significant further processing. Coordination with the WIPP Central Characterization Project (CCP) is required for Next Generation Waste Stream development and WIPP characterization. Next Generation Retrieval will reduce drum transfers, road closures, and secondary waste from current overpacking of drums associated with the current retrieval method.

The Next Generation Retrieval process will be used when failed containers are encountered. The current method of open air retrieval will be performed concurrently for containers in better condition. Most large containers and RH waste containers are assumed to be in better condition and not require a HEPA filtered enclosure for retrieval.

Phase I of the Next Generation Retrieval concept will provide capabilities by the end of December 2009 to retrieve failed containers, NDA containers using a quick sort method, vent containers, NDE and load containers into containers for future processing. Containers that can be processed commercially will be shipped via truck or rail. Initial planning for Phase II of the Next Generation Retrieval concept establishes capabilities by October 2010 for processing TRU waste into WIPP compliant packages (SWBs).

2.7 Specific Regulatory Requirements

2.7.1 Significant Applicable Statutes

Mixed waste management activities will consider the following requirements as well as any other applicable regulations or DOE requirements.

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

The Hanford Site air operating permit has been issued in accordance with Title V the *Clean Air Act Amendments of 1990*, 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 non-radioactive 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 Next Generation Retrieval,

Alpha Caissons 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.

Hazardous Materials Transportation Act of 1975 (49 U.S.C. 5101 et seq.)

Hazardous material transportation requirements include the preparation of shipping papers to identify and track hazardous materials, packaging and container design, marking, labeling, performance standards, and employee training programs. Specific requirements will be followed relating to mixed waste management activities and the shipment mode used (i.e., 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. Onsite waste movements must comply with DOE requirements, including the *Hanford Sitewide Transportation Safety Document*.

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

The Hanford Site Solid (Radioactive and Hazardous) Waste Environmental Impact Statement addresses the onsite and offsite treatment, storage, disposal, and transportation of MLLW and transuranic waste. A draft of the new Tank Closure and Waste Management Environmental Impact Statement is being prepared. No impacts to M-91 planning are anticipated from the new environmental impact statement (EIS).

Toxic Substance Control Act

Chemical Waste Landfill authorization is required for specific categories of TSCA waste. Currently the MWDTs do not have this authorization therefore alternative disposal capabilities will be utilized (i.e., ERDF, offsite commercial).

RCRA of 1976 as amended by the Hazardous and Solid Waste Amendments (42 U.S.C. 6901 et seq.) of 1984

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). EPA has authorized Washington State to administer the State's HWMA and associated regulations at WAC 173-303 in lieu of the Federal RCRA regulations.

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

CERCLA addresses spill cleanups and hazardous substances left at inactive and abandoned waste sites. Either EPA or Ecology are the lead regulatory agencies for cleanup actions at Hanford. DOE performs investigation and cleanup actions for operable units at Hanford through the CERCLA process. In September 2006, DOE submitted an M-16-93 implementation work plan to EPA for the acquisition of capabilities necessary to prepare TRU and 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 RODs and action memoranda at the Hanford Site, and will provide for updates and revisions as new information becomes available (i.e., after all 200 Area RODs are issued). As part of the approval process, the EPA will consult with Ecology to ensure that wastes from CERCLA operable units for which Ecology is the lead regulatory agency are properly planned.

In order to avoid duplicate requirements, the M-16-93 work plan is integrated with plans developed pursuant to the M-91 milestones to

provide capabilities for RCRA mixed and suspect mixed transuranic waste where such capabilities also can be used for CERCLA TRU/TRUM waste. The work plan was submitted pursuant to Section 11.6 of the TPA.

Washington State Hazardous Waste Management Act (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 the RCRA and dangerous waste permits under WAC 173-303 in order to operate. Existing permits are expected to address processing activities, with the exception of modification of T Plant.

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's Division of Radiation Protection regulates radioactive air emissions statewide as authorized by the EPA and Washington State legislative authority. The Washington State Department of Health implements the federal/state requirements under state regulation WAC 246-247. 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 to the Washington State Department of Health and the EPA. Typical requirements for radioactive air emission sources include ensuring adequate emission controls, emissions monitoring/ sampling, and/or annual reporting of air emissions.

3.0 PROJECT SCOPE

This PMP addresses Hanford processing of CH and RH MLLW and transuranic waste. Planning and volumes for TRU waste are included for DOE planning purposes. In this PMP, transuranic waste refers to both TRU and TRUM waste. Any data on TRU waste in this PMP is for information purposes only and is not subject to RCRA or HWMA. The hazardous and/or dangerous waste portion of mixed TRU waste is subject to the RCRA and HWMA. Statements and information related to radiological constituents in TRU and TRUM waste are not commitments enforceable under either RCRA or HWMA.

The M-91-series milestones do not include requirements to establish schedules for the management of radioactive waste disposed of prior to 1970. Before 1970, there was no transuranic waste to segregate because the definition was prospective in its application and/or implementation. Consequently, schedules for the management of radioactive waste disposed of prior to 1970 will be established pursuant to applicable provisions of the Hanford Federal Facility Agreement and Consent Order (HFFACO) TPA in other non-M-91-series milestones, following the issuance of operable unit ROD.

3.1 Description of Facilities

3.1.1 LLBGs Containing RSW

The RSW is placed in designated areas in the following four burial grounds:

- 218-E-12B
- 218-W-3A
- 218-W-4B
- 218-W-4C.

Burial ground 218-E-12B includes two trenches (T17 and T27) that contain CH RSW. Burial ground 218-W-3A includes 14 trenches (T1, T4, T5, T6, T6S, T8, T9S, T10, T15, T 17, T23, T30, T32, and T34) that contain RSW. Burial ground 218-W-4B includes three trenches (T7, T7V, and T11) that contain RSW. Burial ground 218-W-4C included five trenches (T1, T4, T7, T20, and T29) that contain RSW (most of the RSW in these trenches has been retrieved [i.e., T4 was completed in November 2006]). Burial ground 218-W-4B includes caissons containing RH RSW.

Approximately 37,000 RSW containers were placed in the retrievable storage 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-91.

The waste containers varied in size up to 20 ft x 13 ft x 11 ft, weights up to 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 (Figures 11 through 13).

Figure 11: RSW Drum Storage in the LLBG.

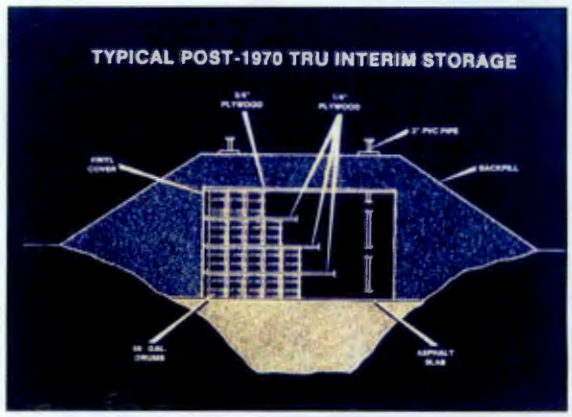

Figure 12: Typical Storage of RSW Drums in the LLBG.

Figure 13: Large Container Transuranic Waste Stored in the LLBG.

3.1.2 Onsite Mixed Waste Storage

Central Waste Complex

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

The storage facilities, located in the Hanford 200 West Area, now 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. Also, waste storage pads (paved and gravel) are part of the CWC.

The CWC provides indoor and outdoor aboveground storage (see Figure 14) for mixed waste, transuranic waste, and a small amount of LLW waiting processing or treatment and final disposition. The CWC operating indoor capacity is approximately 12,800 m^3. In addition to CWC, some non-mixed RH waste (54 m^3) is stored in burial ground 218-W-3AE and is included in aboveground inventories. As of April 2009 4,700 m^3 of waste was stored indoors at CWC and 4,700 m^3 of waste was stored outdoors.

Figure 14: Container Storage at CWC.

All newly generated waste must meet acceptance criteria set by the Hanford Site Solid Waste Acceptance Program. Waste is generally packaged in 55-gallon drums, unless alternate packages are dictated by size, shape, or other form of waste. Each drum is handled individually using a hand truck, forklift, or crane. Drums are placed on pallets banded together; the pallets are stored (see Figure 15). The storage buildings or pads have physical features that provide for segregated storage areas to maintain appropriate separation between groups of incompatible waste and to comply with fire code requirements.

Figure 15: Drum Storage in CWC.

The Hanford Site Solid Waste Acceptance Program requirements (i.e., RCRA Part A storage limitations) will dictate the volume of RSW waste containers and newly generated MLLW and transuranic waste containers that can be stored. Spacing of stored waste containers depends on the dose equivalent curies in the packages and criticality packaging types.

Mixed Waste Storage at the T Plant Complex/WRAP

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

WRAP

WRAP processes 55-gallon drums of CH transuranic waste for shipment to WIPP. WRAP has limited capabilities to process 85-gallon overpacks containing internal packages that potentially have intregrity issues. WRAP processing includes shipping and receiving; waste container handling; waste staging and storage; NDE and NDA; waste treatment; transuranic waste, MLLW and, LLW verification; packaging and repackaging; headspace gas sampling; drum venting; and TRUPACT II loading. WRAP does not have capabilities to process or ship RH waste. WRAP NDE and NDA processes are automated (see Figure 16) to examine and characterize waste using x-ray (NDE), gamma, and neutron assay (NDA) equipment. Two large-container storage buildings (2404-WB and 2404-WC) are part of WRAP. The 2404-WC building has been modified to provide insulation and climate control to facilitate head-space gas sampling operations. Repackaging waste is performed as required to meet WIPP certification requirements (See Figure 17). Some of the waste-handling operations are performed remotely to minimize exposure of personnel to radioactive materials.

Figure 16: WRAP.

WRAP also performs NDE of transuranic waste in standard waste boxes. Boxes not exceeding 2.74 m long by 1.6 m wide by 1.7 m high can be received for NDE and boxes not exceeding 2.43 m long by 1.5 m wide by 1.5 m high can be received for NDA screening.

Figure 17: WRAP Transuranic Waste Processing Line.

WRAP processing capabilities include amalgamation of mercury (not currently in use), neutralization for pH adjustment, solidification of free liquids, limited macro-encapsulation, and loading CH transuranic waste (see Figure 18) into the Transuranic Package Transporter Model 2 (TRUPACT II) for shipment to WIPP (see Figure 19).

Figure 18: Loading the TRUPACT II with Transuranic Waste Drums in WRAP.

Figure 19: TRUPACT II Arriving at WIPP.

T Plant

The T Plant Complex consists of the 221-T Canyon (see Figure 20), the 2706-T Facility, and several support structures. The canyon has internal dimensions of 37 ft wide by nearly 800 ft long. There is 26 ft of clearance between the canyon deck and the crane rails. T Plant processing cells are 17 ft long, 13 ft wide, and 21 ft deep. The T Plant Canyon crane can lift 90,000 lb. Container size in the canyon is limited to less than 22 ft long, 13 ft high, and 18 ft wide. Current activities in the canyon facility include storage, verification, treatment (e.g., pH neutralization, liquid absorption, macro-encapsulation), venting, sampling, and repackaging waste. T Plant capabilities provide capacity using Perma-Cons for MLLW and transuranic waste sorting, processing, and volume reduction. Perma-Cons are modular containment systems that are attached to make a rigid enclosure. T Plant has limited capabilities to process RH wastes.

Figure 20: Inside the T Plant Canyon.

Currently T Plant has the capability to repackage 55-gallon and 85-gallon CH transuranic waste. Approximately 10 percent of the 55-gallon drums overpacked into 85-gallon drums will not be processed through the T Plant PermaCons due to processing limitations (i.e., plutonium quantities, weight, sharp items, etc.). Modification of WRAP/T Plant will be evaluated for processing these containers.

The 2706-T Facility was upgraded in 1999 to provide secondary containment and leak detection for wet decontamination operations. Container size in the 2706-T Facility is limited to less than 40 ft long, 14 ft high, and 12 ft wide. The facility is limited to handling CH waste. Current activities at the facility include storage, verification, treatment, venting, sampling, and repackaging CH waste. Upgrading the 2706-T HVAC system has been evaluated to support future processing activities.

Future Large Container and RH Waste Processing Capabilities

The future capabilities will support RH as well as large-container CH MLLW and small-/large-container CH transuranic waste processing that cannot be provided by in-trench treatment, commercial facilities, WRAP and T Plant, or other facilities. These capabilities include mobile hot cells for retrieving and packaging Alpha Cassions RH TRU waste into WIPP complianr packaging. New RH TRU waste loadout capability for shipping RH-72B casks to WIPP is planned to initiate operations by December 31, 2018. A new large container and RH waste processing capability to process the remaining waste is planned to initiate operations by December 31, 2018.

3.1.3 MLLW Disposal

MLLW is disposed of in the Mixed Waste Disposal Trenches (LLBG 218-W-5, Trenches 31 and 34 and ERDF. A revision of the LLBG Part A Permit application was approved for treatment in-trench. Small quantities of MLLW could also be disposed of at an offsite commercial facility. Future waste disposal is planned at the IDF as well as the MWDTs and ERDF.

Mixed Low-Level Waste Disposal Trenches

The first MWDT (LLBG 218-W-5, Trench 34) was built in 1993, and the second MWDT (LLBG 218-W-5, Trench 31) was built in 1994. Waste storage in Trench 34 began in 1997, and disposal operations began in 1999 after the leachate that is generated from the cell was accepted for treatment at the 200 Area Effluent Treatment Facility (ETF). Waste storage in Trench 31 began in 2003, and disposal was initiated in September 2004. The MWDTs are RCRA-compliant and meet Subtitle-C disposal requirements (see Figures 21 and 22). They have a double-liner system with leachate collection. Trench 31 and 34 provide disposal for three operational layers of waste containers. The first operational layer of waste is filled in Trench 31 and by the end of calendar year (CY) 2009 the second layer is expected to be 25 percent full.

The first operational layer of waste is filled in Trench 34 and by the early CY 2010 the second layer is expected to be full.

Figure 21: MWDT.

A substantial portion of the Hanford Site's RCRA MLLW will be disposed in the MWDTs. Waste for disposal in these units must meet HNF-EP-0063. As of April 2009, 7,500 m^3 of the MWDTs' combined capacity of 22,300 m^3 has been used (or approximately 34 percent of the combined capacity).

RCRA treatment is authorized in the LLBG Part A permit 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. To date this authorization has not been utilized, however some of the RSW debris waste and RH MLLW will be treated by this capability.

Figure 22: Container Disposal in the MWDT.

Environmental Restoration Disposal Facility

ERDF (see Figure 23) 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., macro-encapsulation), and dispose of LLW or MLLW generated through remediation of the Hanford Site. The landfill opened in 1996 and currently has six cells. The original two cells are filled. Cells 5 and 6 are now in use. Additional cells can be added as needed. Construction of cells 7 and 8 is anticipated to be completed in mid-2009.

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.

Figure 23: ERDF.

Integrated Disposal Facility

IDF (see Figure 24) will consist of a single landfill with two separate, expandable cells. One cell will be permitted as a RCRA Subtitle-C-compliant landfill system; the other cell will not be permitted. Both landfill cells will include a double liner, a leachate collection and removal system, and a leak-detection system. The landfill liner system will comply with RCRA requirements for hazardous waste landfills. IDF will be designed to allow for future expansion. Each future liner construction project will connect the previously constructed liner and the operations systems, and then extend the disposal area. The disposal landfill cover will be designed and located to satisfy the dangerous waste disposal requirements, once a decision is made to construct the final cover over the landfill. IDF operations are required to begin prior to reaching the capacity of the current MWDTs. Projections show that the MWDTs not be filled prior until after CY 2020. This fill date assumes no new offsite waste and includes change in volume for stabilization and treatment.

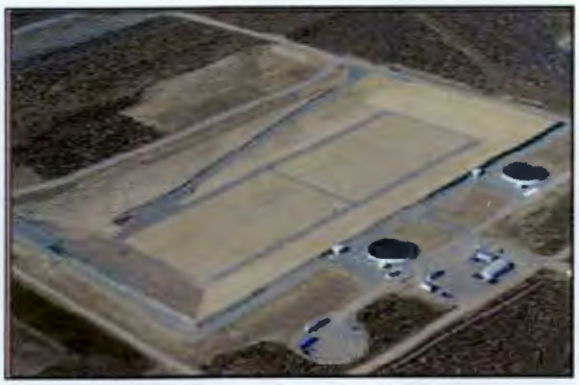

Figure 24: Integrated Disposal Facility.

3.2 Planned Approach for MLLW and Transuranic Waste Management

3.2.1 Retrieval of CH RSW

Retrieval of CH RSW includes uncovering CH wastes within DOE's RSW trenches, removing it from the trenches, and transferring it to a permitted and compliant treatment, storage, or disposal facility; to ERDF; or, for waste designated in accordance with WAC 173-303-070 through -100 as non-mixed to a storage or disposal unit that DOE determines is appropriate.

Section 2.6.1 includes a discussion of Next Generation Retrieval for the safe and compliant waste retrieval, characterization, packaging and transfer to disposal of remaining RSW in burial grounds 218-E-12B, 218-W-3A and 218-W4B.

CH RSW is being retrieved and designated. RSW does not include waste in containers that have deteriorated to the point that they cannot be retrieved and stabilized (e.g., placed in overpacks) in a manner that would allow them to be transported and designated without posing significant risks to workers, the public, or the environment. These containers and any released RSW will require a decision on how to move forward, which is determined through the cleanup process set forth in RCRA, Chapter 70.105 RCW, and/or CERCLA as appropriate.

DOE plans to meet with Ecology to jointly develop a plan for addressing non-RSW before that situation arises.

In the Base Case, 750 m^3 of RSW is retrieved during FY 2009. All CH RSW in the four burial grounds will be retrieved by December 31, 2013. Appendix H includes a flow chart of the waste retrieval process, assumptions, and an overview of the CH RSW retrieval process. The process flow chart identifies major activities and decision points.

In April 2006, concurrent retrieval was approved for all trenches at the four LLBGs (Change Control Form M-91-06-02).

Figure 25: First RSW Drums Retrieved From Trench T4 in January 2004.

The retrieval process begins when soil is carefully removed using excavation equipment (see Figures 25 through 27). Monitoring is performed during excavation to identify potential radiological and chemical hazards. Once the waste containers are exposed, they are inspected, verified against waste storage records, and removed from the storage modules for further processing (see Figure 28). Weather enclosures are being utilized to improve retrieval efficiencies (see Figures 29 and 30).

Figure 26: Excavation of RSW Drums.

Figure 27: Excavation of RSW Containers.

Figure 28: RSW Removal and Inspection.

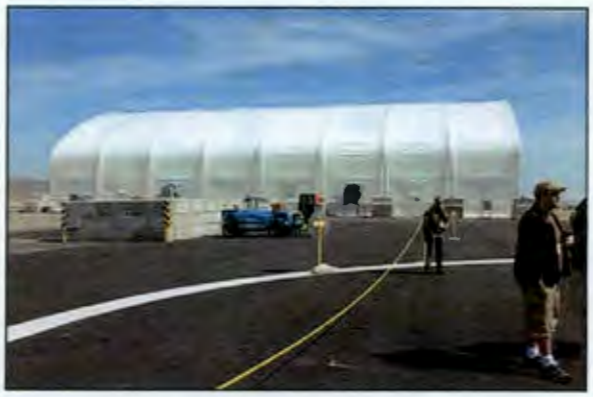

Figure 29: 218-E-12B Weather Enclosure.

Figure 30: RSW Shade Structure.

Once the containers are removed from the trench, measurements are performed to determine whether the waste is transuranic or LLW. Containers with low concentrations of transuranic radionuclides are non-destructively

assayed to establish the waste as either transuranic waste or LLW. If records show that gram levels are greater than 175 nCi/g of transuranic constituents, the container is assumed to be transuranic waste and measurements are not performed at the process area. Waste containers with records that show less than 10 nCi/g of transuranics constituents are assumed to be LLW. Any transuranic waste drum that is found not to be vented is vented, and a filter is installed to prevent pressurization of the transuranic waste drum. Both transuranic waste and MLLW containers are then moved to CWC for storage, or to processing at WRAP, T Plant, or an offsite facility.

Within 90 days from retrieval, both LLW and the transuranic waste generated are designated using the same process. In general, the designations of the retrievably stored debris waste are based on acceptable knowledge data packages that have been developed for use in certifying transuranic waste in accordance with the WIPP WAC. For non-debris waste including soils and containerized liquids, additional characterization may be performed in order to manage the waste in the most cost-effective and compliant manner. Containers that cannot be moved may be left in place temporarily with the approval of Ecology.

Fifty-five-gallon drums of transuranic waste being retrieved are in worse condition than previously assumed in FY 2003 and found in the field in 2004. These deterioriated drums require placement in 85-gallon overpacks for retrieval, transportation, and storage. However, WIPP does not accept 85-gallon drum overpacks because it would result in inefficient use of repository space.

The 85-gallon drums are being stored for reprocessing, which requires more resources than originally assumed in FY 2003 and found in 2004.

DOE has obtained concurrence from Ecology to use the 218-W-4C burial ground processing area to stage, sample, assay, designate, and handle the containers retrieved from the 218-W-3A, 218-E-12B, and 218-W-4B burial grounds. At a future date, the process area may be moved to a centralized location (e.g., 218-W-5). The 90-day designation clock for waste coming from these burial grounds to the processing area would not start until waste is transferred from the processing area to a permitted and compliant TSD. This will allow more efficient use of resources.

3.2.2 Retrieval of RH RSW

Retrieval of RH RSW is uncovering RH wastes within DOE's RSW trenches and caissons; removing such RH wastes from the trenches and caissons; and transferring it to permitted and compliant treatment, storage, or disposal units, ERDF, or, for waste designated in accordance with WAC 173-303-070 through -303-100 as non-mixed, to a storage or disposal unit that DOE determines is appropriate.

Retrieval of non-caisson RH RSW will be completed by December 31, 2014. Retrieval of caisson (see Figures 31 and 32) RSW in 218-W-4B burial ground will be completed by December 31, 2018. Mobile Hot Cell capabilities to retrieve RSW RH caisson waste are planned to initiate operations by 2013. Experience obtained from 618-10/11 retrieval activities will be utilized as applicable.

Figure 31: Partially Buried Caisson Loading Chute During Construction.

Figure 32: RSW in a Caisson.

3.2.3 MLLW Treatment

For processing waste, Hanford will use a combination of capabilities for in-trench treatment (Trenches 31 and 34), commercial capabilities, and future large container and RH waste processing capabilities. A process flow diagram for MLLW and transuranic waste is provided in Appendix I (Appendix J provides a summary of the volume changes between PMP Revision 5 and Revision 4). The current strategy is to use in-trench treatment when possible to minimize significant worker risks and physical infrastructure limitations associated with opening and processing some of the waste contained in Treatability Group MLLW-07. The majority of the MLLW containers in LDR Treatability Groups MLLW-02 through -07, and MLLW-09 will be treated using commercial capabilities. Waste that cannot be treated using any of the above capabilities will be processed through the future large container and RH waste processing capabilities.

In January 2008 a report was issued identifying MLLW in storage at CWC, WRAP, and T Plant with no current treatment available (NCTA) as of December 31, 2007. The NCTA waste packages were identified from data queries of the SWITS and sorted by the LDR Treatability Groups and physical state. The waste included RH MLLW packages, RH MLLW packages that were shielded to CH levels, TSCA PCB liquids and solids, large MLLW packages, F027-listed waste (dioxin), Special Nuclear Material (SNM) waste in which Safeguards and Security cannot confirm termination, and waste requiring specialized treatments.

The NCTA waste was based on specific factors affecting waste treatment as of January 2008. The first factor was the lack of permitted treatment facilities to accept and process the majority of the stored TSCA PCB wastes. The second factor was the limited commercial capability/capacity to accept and treat RH MLLW and large MLLW packages, which would count toward milestone M-91-43. The third factor was MLLW that will require alternatives to the existing treatment standards that can only be authorized by State and/or Federal regulating agencies. The waste in storage was reviewed again in January 2009 and the number of NCTA waste packages and associated volume by LDR Treatability Group are updated. Volumes are as follows:

LDR Treatability Group	Waste Volume (m^3)
MLLW-07 (RH and/or are DOT "Type-B" quantities)	97
MLLW-08 (Special Wastes)	1.4
MLLW-08 (TSCA-MLLW)	131
MLLW-10 (Sodium Metal)	21.4
Total	251

The NCTA waste disposition is dependent on external factors such as commercial treatment facility permitting and other regulatory agency actions. The number of NCTA waste packages will be dynamic in that disposition paths may be found for some of the waste packages currently on the list, and some of the waste packages with a current path forward will need to be added to the NCTA list due to discovery of additional waste attributes, such as radiation levels exceeding facilities or license limits.

DOE plans to complete milestone M-91-42 MLLW requirements by using available commercial capabilities and capacities. In the Base Case, DOE plans to complete treatment of M-91-42 MLLW (with an available treatment path) that was in storage as of December 31, 2002, and from retrieval and newly generated M-91-42 MLLW, by December 31, 2014. After this date, M-91-42 MLLW will be treated within one year of generation. DOE is working to establish a disposition path for all currently stored MLLW.

Commercial Stabilization – Treatment Path for LDR Treatability Group MLLW-02

The treatment path for inorganic non-debris MLLW is commercial stabilization and is represented in LDR Treatability Group MLLW-02. This waste consists of both solids and aqueous liquids and would primarily be regulated for toxic metal characteristics, corrosivity and/or inorganic Underlying Hazardous Constituents (UHC) above LDR treatment standards. The waste may also contain organic non-regulated constituents and/or organic regulated constituents below Universal Treatment Standard (UTS) levels.

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 (see Figure 33). 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.

Figure 33: Commercial Stabilization of MLLW.

There are several commercial treatment facilities in the United States that can accept the majority of Hanford's waste in the MLLW-02 Treatability Group. Inorganic non-debris waste that cannot be accepted at a commercial treatment unit due to excessively high radiological inventory (curie content and/or dose rate) are included in the MLLW-07 Treatability Group and will be treated at future large container and RH waste processing capabilities. Future large container and RH waste processing capabilities will separate non-conforming CH items from the RH waste and ship the items to commercial facilities for treatment. Onsite treatment of selected MLLW-02 wastes may also be performed.

Thermal Treatment of Organics – Treatment Path for LDR Treatability Group MLLW-03

The treatment path for organic non-debris MLLW is commercial thermal treatment (see

Figure 34) and is represented in LDR Treatability Group MLLW-03. This MLLW consists of both solids and liquids, and would primarily be regulated for hazardous organic constituents and/or TSCA PCBs for those waste packages with the treatment path forward. The waste may also contain inorganic regulated constituents that will require additional treatment after organic destruction.

Figure 34: MLLW and TSCA PCB Treatment is Performed at the DSSI Processing Facility.

Destruction of the organic constituents can be achieved by various treatment methods, including incineration, vitrification, steam reforming, thermal desorption, pyrolysis, chemical oxidation, and ultra-violet (UV) oxidation. Several pretreatment processes may be employed prior to thermal treatment, such as drying, shredding, screening, and chemical treatments.

Hanford began treating MLLW offsite by thermal treatment methods in 1998 with the treatment of Tri-Butyl Phosphate waste in Tennessee.

During 2000, organic/carbonaceous (O/C) MLLW debris was incinerated at WERF at the INL site; however, WERF has been closed and is not expected to operate again.

In 2001, Treatability Group MLLW-03 waste was treated at a commercial facility located in Richland, Washington. Treatment was performed by using a gasification-vitrification (GASVIT) unit. Due to operational problems of the GASVIT unit and financial problems within the commercial company, the unit was shut down in mid-year 2001. The GASVIT unit has not been restarted, and it is not known at this time if it will ever be restarted.

During 2003, commercial treatment of LDR Treatability Group MLLW-03 commenced at a commercial firm headquartered in Oak Ridge, Tennessee. Treatment was performed by using a combination of thermal desorption process and a combustion process. Waste has been treated each year since and is expected to continue.

Beginning in 2005, commercial treatment of LDR Treatability Group MLLW-03 commenced in Richland by means of treatability studies. Thermal desorption and plasma destruction technologies were used to treat the waste. Treatment of MLLW-03 waste continued through October 2006. Future thermal treatment relies on commercial success at obtaining operational permits for the thermal desorption and plasma systems.

The first 600 m^3 of production was counted against TPA milestones M-91-12 and M-91-12A, both complete. Waste volumes beyond 600 m^3 are tracked and counted against TPA milestone M-91-42.

The current barrier to treatment is the lack of a Treatment Storage Disposal Facility (TSDF) that is permitted for the receipt and treatment of TSCA PCB waste requiring thermal destruction. The following provides potential treatment paths:

- A commercial facility located in Tennessee obtained a TSCA PCB destruction permit in December 2008. They began to accept TSCA PCB MLLW in April 2009. CHPRC currently has a treatment contract with this firm for treatment of MLLW-03 waste, including waste regulated with TSCA PCBs.

The subject contract ends on September 30, 2009. The contract has options for extension beyond 2009.

- The TSCA Incinerator (TSCAI) located at DOE's Oak Ridge Site in Tennessee is scheduled to close in the summer of 2009. This facility is not accepting any new waste
- A commercial firm in Utah has the regulatory capability to accept and treat TSCA PCB regulated MLLW utilizing vacuum thermal disorber (VTD) technology. Waste acceptance is limited to Nuclear Regulatory Commission (NRC) Class-A waste, and the condensate that is generated from the VTD process has to be sent to either another treatment facility that can accept TSCA PCB MLLW liquids (e.g., DSSI in Tennessee), or to a hazardous waste (i.e., non-radiologically controlled) incinerator permitted to destroy TSCA PCB liquids. *DOE Order 435.1* commercial treatment and disposal facility exemption has been submitted by the CHPRC and approved by RL which allows use of the ES-Clive facility for treatment of TSCA MLLW.

Commercial Macro-Encapsulation – Treatment Path for LDR Treatability Groups MLLW-04, MLLW-05, and MLLW-09

The primary treatment path for MLLW debris and radioactive lead solids is commercial macro-encapsulation. These wastes are represented in LDR Treatability Groups MLLW-04 (Hazardous Debris), MLLW-05 (Elemental Lead) and MLLW-09 (Lead Acid and Cadmium Batteries). The waste consists of solids and may contain one or more organic and/or inorganic regulated characteristic and listed waste codes. UHC determination is not required since this waste is being treated by the macro-encapsulation specified treatment technology as defined in 40 CFR Part 268.42 (for MLLW-05) and 40 CFR Part 268.45 (for MLLW-04 and MLLW-09). Marco-encapsulation is sufficient for any contaminants of concern (COC) for debris because there are no contaminant restrictions. Much of the packaged debris waste contains items that are organic-based (e.g., paper, plastic, wood, rubber) in excess of 10 percent by volume. Ecology views these waste packages as meeting the definition of O/C waste that is restricted from land disposal by the State-Only O/C LDR, unless the waste is incinerated. Since there is not sufficient incineration capability/ capacity within 1,000 miles of Washington State's borders for this type of waste, Hanford qualifies for, and is currently covered by, the 1,000-mile inapplicability certification for O/C LDR specified in WAC 173-303-140(4)(d)(iii).

Macro-encapsulation consists of applying a surface coating of polymeric organics or using a jacket of inert inorganic materials (e.g., 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 normally sent through one or more size-reduction steps (e.g., sorting, cutting/shearing, compaction, super-compaction).

Hanford began treating MLLW debris onsite in 1996 (see Figure 35) and initiated offsite commercial treatment in 1999. Beginning in 2003, commercial macro-encapsulation of radioactive lead solids and drained radioactively contaminated lead acid batteries commenced. Hanford has macro-encapsulated 6,400 m^3 of MLLW through March 2009.

There are several commercial treatment facilities in the United States that can accept the majority of Hanford's waste in these treatability groups. Debris and radioactive lead solids that cannot be accepted at a commercial treatment unit due to having too high a radiological inventory (curie content and/or dose rate) are included in the MLLW-07 LDR Treatability Group and are planned for treatment onsite.

Figure 35: Onsite Macro-Encapsulation of MLLW.

Other debris treatment technologies may be used to process some of the Hanford Site's MLLW debris (e.g., sealing, micro-encapsulation, extraction methods).

Some MLLW-04 consists of hazardous debris comprised mainly of building rubble, piping, tanks, pumps, paper, plastic, wood, rubber, etc., that is contaminated with TSCA PCBs at a concentration exceeding 50 ppm. The current barrier to treatment is the lack of a TSDF that is permitted to accept and treat TSCA PCB MLLW. The following are potential treatment paths:

- A commercial firm in Washington is in the process of obtaining a TSCA PCB treatment permit for hazardous MLLW debris contaminated with TSCA PCB remediation waste. The firm submitted a Class-1 permit modification to Ecology and EPA during the fall of 2008, which would allow them to receive and macro-encapsulate MLLW debris with TSCA PCBs exceeding 50 ppm. During January 2009, the firm indicated that they anticipate receiving preliminary authorization to begin treating TSCA PCB MLLW debris by October 2009. Hanford currently has a treatment contract with this firm for treatment of MLLW-04A/B waste, including waste regulated with TSCA PCBs. This contract ends September 30, 2009 and has options for extension.
- A commercial firm in Utah has the regulatory capability to accept, treat, and dispose of MLLW debris with TSCA PCBs exceeding 50 ppm. Waste acceptance is limited to NRC Class-A waste, and the treated waste is required to be disposed at the Utah facility. Through the DOE-CH complex-wide treatment contract, CHPRC has contractual access to this firm for treatment and disposal of MLLW-04, provided the waste is packaged in boxes. An expansion of the current DOE Order 435.1 commercial treatment and disposal facility exemption would need to be authorized by the DOE to allow for receipt and treatment of NRC Class-A MLLW debris in drums.

Mercury Stabilization and Amalgamation – Treatment Path for LDR Treatability Group MLLW-06

Radioactively contaminated mercury waste requires either stabilization or amalgamation. The Hanford Site inventory of mercury-bearing waste is relatively small (represented in LDR Treatability Group MLLW-06), as is the case with the inventories at other sites across the DOE complex. Some of the mercury has already been amalgamated; however, since the amalgamation was done in response to mercury spills from broken equipment (e.g., manometers, thermometers, mercuric switches), no LDR certification is on record to allow disposal at this time. Offsite treatment will certify that the waste meets LDR.

There are a limited number of commercial treatment units in the United States capable of accepting and treating this waste. Most of Hanford high-concentration mercury wastes have been shipped for commercial treatment.

WRAP has processing capabilities for amalgamation of mercury. Disposition of the remaining mercury-bearing waste that cannot be accepted at one of the commercial treatment units because it has too high a radiological

inventory (curie content and/or dose rate) will be treated at future large container and RH waste processing capabilities as Treatability Group MLLW-07 waste. Future large container and RH waste processing capabilities will separate nonconforming CH items from the RH waste and ship the items to commercial facilities for treatment.

Treatment Path for LDR Treatability Group MLLW-07

Commercial facilities will be used to treat most CH MLLW in large containers and some RH MLLW. Future large container and RH waste processing capabilities will be used to process the remaining large container CH and RH MLLW. Nonconforming CH MLLW items found during future large container and RH waste processing capabilities unpackaging will be shipped to commercial facilities for treatment.

Due to significant worker risks and physical infrastructure limitations associated with opening and processing some of the waste contained in Treatability Group MLLW-07, treatment of a portion of MLLW-07 waste is best performed at the place it is to be disposed (e.g., LLBG 218-W-5 T31/T34, ERDF). Waste that falls into this category include 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 modified Part A permit was recently approved by Ecology to allow immobilization of this MLLW in the MWDTs. A Waste Analysis Plan (WAP) was completed in March 2008.

CHPRC has implemented significant commercial capability with firms in Washington and Utah to disposition a significant portion of this LDR treatability group. As of January 2009, 330 m^3 has been completed and applied toward TPA Milestone M-91-43. Another 270 m^3 is scheduled to be completed by the end of CY 2009, which would meet the second 300 m^3 increment in the M-91-43 milestone series.

There are seven MLLW-07 packages that are regulated for TSCA PCBs. The waste packages are scheduled to be dispositioned at commercial firms or future large container and RH waste processing capabilities. The two main issues affecting disposition of this waste at commercial TSDFs are: 1) the relatively high radiological inventories and associated dose rates with these waste packages limit processing at commercial treatment facilities due to lack of remote handling equipment, and 2) limited permitted commercial facilities (i.e., as of January 2009, the Tennessee and Utah firms are the only permitted facilities to accept TSCA PCB MLLW).

Disposition Path for LDR Treatability Group MLLW-08

LDR Treatability Group MLLW-08 (Unique Waste) is waste requiring treatment by unique specified treatment technologies (e.g., recovery of metals, recovery by thermal, TSCA-PCB destruction, etc), waste that cannot clear SNM controls, or MLLW with dioxins/furans-listed waste codes in which there is no known current treatment capability in the United States.

As of January 2009, there are 486 waste packages listed in this treatability group, mostly due to containing TSCA-PCBs. The following lists the proposed disposition path:

- One waste package is regulated for F027-listed waste (dioxin). CHPRC is in the process of redesignating this waste package

in accordance to new regulatory precedents associated with labatory standards. Once redesignated, the F027 listed waste code will not be applicable and the waste package will then be shipped to the appropriate treatment facility for thermal destruction.

- One waste package is regulated for P015-listed waste (beryllium dust). CHPRC has not been able to identify a treatment facility capable of accepting and treating this waste. CHPRC continues to investigate possible commercial disposition paths (e.g., a Utah firm); however, an alternative treatment method per 40 CFR 268.42 or treatment variance per 40 CFR 268.44 may need to be pursued by Hanford or by a commercial waste treatment firm to allow acceptance and treatment of the waste.
- Four waste packages contain specific radionuclides in amounts that exceed either DOT shipping limitations and/or acceptance limits at offsite commercial waste treaters. CHPRC will be including these waste packages in with LDR Treatability Group MLLW-07 waste due to the elevated radiological hazards associated with the waste.
- 480 of the packages are listed in LDR Treatability Group MLLW-08 due to containing TSCA-PCBs which will require TSCA and RCRA treatment prior to disposal. Now that there are two commercial treatment facilities authorized to accept and treat this type of waste, the waste will be reviewed for acceptance at these facilities and for that portion that is accepted, the waste will be transferred to LDR Treatability Group MLLW-03 and readied for shipment. Shipments are planned to begin in April 2009 and continue for several years as capacity is allows.

Deactivation – Treatment Path for LDR Treatability Group MLLW-10

Reactive metals containing radioactive contamination require deactivation as the specified treatment technology under RCRA. The Hanford Site inventory of reactive metal waste is relatively small (represented in LDR Treatability Group MLLW-10). The majority of the reactive metal waste is sodium that is packaged in drums and stored at the CWC. Some of this waste contains debris material (e.g., piping, pumps, valves) that are contaminated with reactive metals.

An attempt to treat this waste was undertaken in CY2007; however, the commercial treatment facility in which the waste was shipped to could only treat a limited number of the waste packages due to their limited throughput capabilities. The treatment facility returned the remaining untreated waste (40 waste packages) in late CY2008. The waste was placed back in to storage at the CWC until a more reliable disposition path can be obtained.

MLLW Process Flow Diagrams

Appendix K provides the estimated volumes generated from waste processing. Appendix L provides process flow diagrams for the MLLW treatability groups.

The waste processing flow diagrams contained in Appendix L depict the TSD paths of specific MLLW streams. Major TSD steps are identified and volume adjustments are indicated for processing steps when appropriate. The diagrams are intended to give a broad view of the TSD process while recognizing that individual containers within a waste stream may have unique characteristics or circumstances requiring a different TSD path. The flow diagrams were developed for waste streams with existing TSD paths, and for those still to be developed.

In developing the waste processing flow diagrams, wastes that had the same TSD paths were grouped into waste streams. The MLLW streams identified include the following:

- CH MLLW in small containers
- LDR Treatment Group MLLW-01, Direct Disposal
- CH MLLW in large containers (MLLW-07)
- RH MLLW (MLLW-07).

The first step common to all the waste streams is an internal volume conversion. The volumes used within this document are a combination of inventory waste data from SWITS, which are recorded using the internal container dimensions, and forecasted waste data, which use external container dimensions. The waste volumes are converted into internal volumes. The conversion factor is an averaged value, as the actual factor is container-dependant (e.g., a 55-gallon drum has a 23.5 percent increase, while a large box may have a 10 percent increase).

Steps involving volume increases or decreases are identified with a multiplier in the process step (e.g., 1.25x means the waste volume is increased by 25 percent). Volume increases can result from activities such as repacking, resulting in a discarded container or packing inefficiencies when placing waste in smaller containers.

It is assumed that during processing, especially involving waste streams that are sorted or unpacked, some of the waste may be reclassified. Steps resulting in either change in handling or change to waste type are identified in the flow diagram. A summary is included in Appendix K showing the waste volumes by waste stream and the estimated ending volume by waste type.

Base Case MLLW Assumptions

- Commercial treatment capability and capacity is available for LDR Treatability Groups MLLW-02, MLLW-03, MLLW-04, MLLW-05, MLLW-06, and MLLW-09. A treatment path has been established for disposition of most currently stored TSCA PCBs MLLW. By December 31, 2009 a date will be determined to establish a path forward for the remaining stored TSCA PCBs MLLW.
- Treatment/disposition path forward for MLLW-08 may require regulatory approval (i.e., treatment variances, alternative treatment methods).
- By December 31, 2009 a date will be determined to establish a path forward for MLLW-10.
- Commercial facilities can treat the majority of M-91-43 MLLW.
- Transportation of most M-91-43 containers to commercial facilities is viable.
- Future large container and RH waste processing capabilities will be obtained to treat containers that cannot be treated in-trench or commercially. Selected nonconforming CH MLLW items found during future large container and RH waste processing capabilities unpackaging will be shipped to commercial facilities for treatment.
- O/C LDR certification exemption will be maintained through the life-cycle of waste treatment.
- For RSW awaiting retrieval, the distribution will be within MLLW-03, MLLW-04, and MLLW-07 (see Tree Chart in Appendix D).

As-Soon-As-Feasible Compliance Case MLLW Assumptions

- All Base Case assumptions
- MLLW processing rate assumptions are provided in Section 3.4, Treatment and Storage Capability/Capacity and Processing Schedules.

3.2.4 Transuranic Waste Processing

The primary facilities in which transuranic waste processing operations take place are CWC, WRAP, and T Plant. Appendix M provides a flowchart of the Hanford CH transuranic waste process and assumptions used for WIPP

certification activites. CWC facilities include several warehouse buildings for the storage of waste containers. WRAP capabilities include drum and box NDE; drum and box NDA; gloveboxes for visual examination, repackaging and compaction of drums, TRUPACT II loading, and waste storage. The 2404-WC Building provides climate control to facilitate head-space gas-sampling operations. Head-space gas analysis is performed at the Waste Sampling and Characterization Facility (WSCF). T Plant capabilities include repackaging drums in Perma-Con structures in the T Plant canyon.

The degraded condition of virtually all the waste containers retrieved and the high percentage of containers that are discovered containing prohibited items or multiple layers of confinement have resulted in a significant increase in waste that requires processing than originally assumed. This labor-intensive process increases the cost of processing per cubic meter. Also, due to WIPP's non-acceptance of 85-gallon drums for disposal, it is planned that all 85-gallon drums produced from retrieval, until Next Generation Retrieval is operational, will require repackaging in T Plant/WRAP prior to being certified. DOE also plans to evaluate alternatives to establish offsite processing capability for selected M-91-42 CH transuranic waste.

Quickscan NDE is used to identify containers with prohibited items or other non-compliant conditions. It is assumed that 40 percent of the RSW drums (and 1 percent of newly generated waste) fall into this category; the percentage varies by waste stream. The rejected drums are repackaged at WRAP or T Plant.

In the Base Case, WRAP and T Plant operate through 2040 and 2028 respectively. Base Case and As-Soon-As-Feasible processing rates for M-91-42 transuranic waste would be ramped up during 2009 to a rate of 570 m^3 per year in 2010. Assumptions for achieving these rates are included in Appendix R. In the Base Case, after Year 2014, M-91-42 TRUM waste will be certified within one year of generation.

M-91-44 transuranic waste that cannot be commercially treated will be processed through future large container and RH waste processing capabilities. Future large container and RH waste processing capabilities would be operational by December 31, 2018.

In the Base Case, M-91-44 transuranic waste processing is completed in Year 2040. In the As-Soon-As-Feasible Compliance Case, M-91-44 transuranic waste processing is completed in FY 2038. This PMP assumes that transuranic waste can be sent to an offsite facility through CY 2050 for disposal.

WIPP Prohibited Items

Items prohibited from WIPP disposal include the following:

- Liquid Waste: Waste shall contain as little residual liquid as is reasonably achievable by pouring, pumping or aspirating, and internal containers shall contain less than one inch or 2.5 cm of liquid in the bottom of the container. Total residual liquid in any payload container (e.g., 55-gallon drum or SWB) shall not exceed 1 percent volume of that container. Residual liquids containing PCBs are prohibited at WIPP (Effort are underway to obtain a risk-based disposal approval from EPA to allow absorption of these liquids).
- Corrosives
- Reactives
- Ignitables
- Pyrophorics
- Explosives
- Compressed gases (pressurized containers)
- Sealed containers greater than four liters (nominal), except for Waste Materials Type II.2 packaged in metal containers
- PCBs not authorized under an EPA's PCB waste disposal authorization

- Non-transuranic hazardous waste
- Wastes incompatible with backfill, seal and panel closure materials, container and packaging materials, shipping container materials, or other wastes
- Sharp or heavy objects in the waste that are not blocked, braced, or suitably packaged as necessary to provide puncture protection for the payload container packaging those objects
- Waste that has ever been managed as high-level waste and waste from tanks specified in *HNF-2599*, Table B-8, unless specifically approved through a Class 3 permit modification.

Any containers found during the characterization process to contain any of the above prohibited items will be segregated and the condition will be corrected. Because no prohibited articles are allowed for shipment to WIPP, any container with these items will be repackaged or the prohibited item will be treated or removed prior to certification. Only certified containers will be shipped to WIPP for disposal.

WIPP-Approved Waste Streams

In order for transuranic waste to be disposed at WIPP, information is required on specific waste streams by WIPP. The extent of these efforts is significant, especially with the large number of small-volume waste streams. Approximately 60 percent of the M-91-42 CH TRU/TRUM waste currently in permitted storage is included in a WIPP-approved waste stream. In the As-Soon-As-Feasible Compliance Case plans are to obtain WIPP waste stream approval for an additional 33 percent of the currently stored waste by 2011. Approval of the remaining waste streams is required to support waste certification. Gaining waste stream approval for the remaining 40 percent of the stored waste will require a minumum of 12 solid sampling and analysis events, currently conducted at INL. WIPP-approved waste streams include the following:

- HMOX01 (Hanford Site Mixed Oxides)
- MHASH01 (Hanford Incinerator Ash)
- MPFPD (Mixed PFP Debris)
- MPUREXD (Mixed Plutonium Uranium Extraction [PUREX] Debris)
- NPFPD (Non-mixed PFP Debris)
- NPUREXD (Non-mixed PUREX Debris)
- RFETS01 (Rocky Flats Ash)
- RLCBWD (Consolidated Babcock and Wilcox Debris)
- RLCFFD (Kerr McGee Debris)
- RLETECD (ETEC/ESG Debris)
- RLKEBASIN01 (NLOP Sludge from K Basin)
- RLM209ED (Mixed 209E Debris)
- RLM231ZD (Mixed 231-Z Debris)
- RLM233SD (Mixed 233S Debris)
- RLM300D (Mixed 300 Area Debris)
- RLM308D (Mixed 308 Debris)
- RLM325D (Mixed 325 Debris)
- RLMGEVALD (Mixed GE Vallecitos Debris)
- RLEXXOD (Mixed waste from EXXON-Framatone-AREVA operations)
- RLMWARD (Westinghouse Advanced Reactor Division [WARD] Debris)
- RLSWOCD (Solid Waste Operations Complex Debris)
- RLVIPAC (Vibratory Packed Fuel Debris)
- SS&C01 (Sand, Slag, and Crucible)

The waste streams slated for approval include the following:

- RL216Z9 (Homogeneous Waste from 216Z-9 Crib) - not submitted
- RLMHANF10 (Unidentifiable drums) - not submitted
- RLMCFFS (Kerr McGee Debris) - not submitted
- RLMPFPCD (Mixed PFP Debris with F00X HWNs) - not submitted

- RLPUNIT (Absorbed Plutonium Nitrate Solutions from PFP) - submitted, not yet approved
- RLMPUREX-F00X (Mixed PUREX Debris with F00X HWNs) - not submitted
- S3000MPFP (Mixed PFP) - not submitted
- S3000RLM300 (Mixed 300 Area) - not submitted
- S3000RLM325 (Mixed 325) - not submitted

Transuranic Waste Process Flow Diagrams

Appendix K provides the estimated volumes generated after completion of waste processing. Appendix N provides process flow diagrams for the transuranic waste treatability groups.

The waste-processing flow diagrams contained in Appendix N depict the TSD paths of specific transuranic waste streams. Major TSD steps are identified and volume adjustments are indicated for processing steps when appropriate. The diagrams are intended to give a broad view of the TSD process while recognizing that individual containers within a waste stream may have unique characteristics or circumstances requiring a different TSD path. The flow diagrams were developed for waste streams with both existing TSD paths and for those still to be developed.

In developing the waste-processing flow diagrams, wastes that had the same TSD paths were grouped into waste streams. The transuranic waste streams identified include the following:

- CH transuranic waste in small containers
- CH transuranic waste in large containers
- RH transuranic waste.

The first step common to all the waste streams is an internal volume conversion. The volumes used within this document are a combination of inventory waste data from SWITS, which are recorded using the internal container dimensions, and forecast waste data, which use external container dimensions. The waste volumes are converted into internal volumes.

Steps involving volume increases or decreases are identified with a multiplier in the process step (i.e., 1.25x means the waste volume is increased by 25 percent). Volume increases can result from activities such as repacking resulting in a discarded container and/or packing inefficiencies when placing waste in a smaller container.

It is assumed that during processing, especially involving waste streams that are sorted and/or unpacked, some of the waste may be reclassified. Steps resulting in either change in handling or change to waste type are identified in the flow diagram. A summary of the waste volumes by waste stream and the estimated ending volume by waste type is included in Appendix K.

Base Case Transuranic Waste Assumptions

- Solids sampling and analysis necessary to support the development of new waste stream profiles will continue to be provided by INL. There is no significant increase in the number of waste streams requiring approval.
- TRU waste will be WIPP Compliant Packaged (or Certifiable Waste) and ready for CCP to characterize (i.e. a high confidence that it will pass NDE, and will assay as TRU waste). The rate of failure of WIPP Compliant Packaged waste characterized by CCP is assumed to be less than 10 percent. If the rate increases to greater than 10 percent, additional measures will be adopted to reduce it.
- Offsite processing capability is established for selected M-91-44 CH transuranic waste that can be shipped as low-specific activity.
- Any RH/large container waste certification prior to June 2012 can be counted towards M-91-44 first 300 m^3 increment.

- WIPP CCP provides resources for transuranic Waste Stream approval, NDA, NDE, and head space gas characterization.
- RH 72-B Cask shipping capability established by December 31, 2018 and operates through December 31, 2050.
- Future large container and RH waste processing capabilities are initiated by December 31, 2018 and operates through December 31, 2040.
- WIPP provides timely approval of waste streams, including waste stream consolidation, to support Hanford transuranic waste certification.
- More detailed assumptions are provided in Appendices M and N.

As-Soon-As-Feasible Compliance Case Transuranic Waste Assumptions

- All Base Case assumptions except:
  - RH 72-B Cask shipping capability is established by December 31, 2016.
  - Future large container and RH waste processing capabilities are initiated by December 31, 2016 and operates through December 31, 2038.
- Transuranic waste processing rate assumptions are provided in Section 3.4, Treatment and Storage Capability/Capacity and Processing Schedules.

3.3 Work Breakdown Structure

The following Work Breakdown Structure (WBS) elements are applicable to the MLLW and transuranic waste discussed in this PMP. The elements are included in the *Waste Management Project WBS Hierarchy for Project Baseline Summaries (PBS)* in RL-0013. The WBS dictionary sheets identify scope of activities covered under the WBS, planning assumptions applicable for planning the work scope, functions and requirements that define the WBS work scope, and source documents that drive the requirements. The WBS information below supports the Base Case, but is subject to changes resulting from contract revisions. Appendix O provides a brief description of each current WBS element. Appendix P provides the funding profile required to perform the Base Case and As-Soon-As-Feasible Compliance Case work in this PMP by WBS element.

WBS	Title
013.01	Project Management
013.04	Mixed Low Level Waste Treatment
013.05	TRU Retrieval
013.06	TRU Repackaging
013.07	Waste Receiving and Processing Facility (WRAP)
013.08	T-Plant
013.09	Central Waste Complex
013.09.05	LLBGs
013.10	Environmental Restoration Disposal Facility (ERDF)
013.12	Integrated Disposal Facility
013.15	TRU Disposition
013.21	Mixed Waste Disposal Trenches

3.4 Treatment and Storage Capability/Capacity and Processing Schedules

The MLLW and transuranic waste discussed in this document have varying treatment requirements and processing options. In order to demonstrate the path-forward for the MLLW and transuranic waste, the wastes have been categorized into groups having similar treatment or processing options, and annual processing rates for each group have been estimated. The annual processing rates were developed based on TPA milestone commitments, budget considerations, and treatment availability. The charts in Appendices Q, R, and S provide processing rates and available waste volumes in inventory for each waste group. A brief description is provided of how the rates were developed.

3.4.1 Volume Determination

The following descriptions clarify how volumes are determined in different cases:

- 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 m^3), even if in the process of retrieval, the drum needed to be overpacked into an 85-gallon drum.
- The volumes of "treated" MLLW are counted as the retrieval volume (for wastes generated from retrieval), or the MLLW pre-treatment container volume (for newly generated and stored waste).
- The volume of transuranic waste counted as "certified" is 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 is counted.
- The volume of waste in "storage" is listed as the container size the waste is stored within. For example, a 55-gallon drum overpacked in a 85-gallon drum is counted as 85 gallons in storage.

3.4.2 MLLW

LDR Treatability Groups MLLW-02 through MLLW-06, and MLLW-08 and MLLW-10

Base Case and As-Soon-As-Feasible Compliance Case processing schedules are provided in Appendix Q for M-91-42 CH MLLW (LDR 02-06 and 08-10).

The waste in this processing group includes newly generated CH MLLW, retrieved CH MLLW (excluding large boxes), and CH MLLW in aboveground storage (excluding large containers and LDR Treatment Group MLLW-01). Approximately 2,400 m^3 of waste is estimated to be part of this group with an additional 170 m^3 of waste that may be reclassified or generated during the processing of other waste streams.

LDR Treatability Group MLLW-07

Base Case and As-Soon-As-Feasible Compliance Case processing schedules are provided in Appendix Q for M-91-43 CH MLLW in large containers and RH MLLW. Commercial facilities will be used to process the M-91-43 containers of CH MLLW. Future large container and RH waste processing capabilities will be used to process RH MLLW that cannot be processed in-trench or offsite.

This processing group includes waste in LDR Treatment Group MLLW-07, which includes CH MLLW in large boxes (greater than 10 m^3) and RH MLLW requiring treatment prior to disposal. Approximately 800 m^3 of waste is estimated to be part of this group with additional waste that may be reclassified or generated during the processing of other waste streams. Processing of the remaining waste at future RH waste processing capabilities will begin by the end of CY 2020 and continue through 2021.

3.4.3 Transuranic Waste

M-91-42 CH Transuranic Waste

Appendix R includes Base Case and As-Soon-As-Feasible Compliance Case processing schedules for processing CH transuranic waste in drums and SWBs and CH TRUM waste in drums and SWBs.

This processing group includes CH transuranic waste in 55-gallon drums (including overpacked drums), containers smaller than a 55-gallon drum, and SWBs. Approximately 3,700 m^3 of waste is estimated to be part of this waste group.

Base Case annual WIPP compliant packaging rates for this group are 120 m^3 in 2009, 1,100 m^3 in 2010, 1,500 m^3 in 2011, 2,600 m^3 in 2012 and 500 m^3 in 2013.

M-91-44 Transuranic Waste

Appendix R includes Base Case and As-Soon-As-Feasible Compliance Case processing schedules for processing CH TRUM waste in large containers and RH TRUM waste, and CH transuranic waste in large containers and RH transuranic waste.

This processing group includes CH transuranic waste in containers larger than 55-gallon drums (excluding SWB and overpacked 55-gallon drums in 85-gallon drums) and RH transuranic waste. Approximately 9,800 m^3 of waste is estimated to be in this group.

Base Case WIPP Compliant packaging of waste in this group commences commercially in Year 2019 and continues through 2025. Waste that can not be processed commerically will be processed through future large container and RH waste processing capabilities beginning by December 31, 2018 (Base Case). Future large container and RH waste processing capabilities will process an additional 400 m^3 per year and operate through 2040.

Inventory of Non-Processed Waste

An inventory of WIPP compliant packaged waste and waste awaiting processing is provided in Appendix S. Most of this waste inventory is in storage at CWC and WRAP.

Appendix S provides the annual inventory of MLLW and transuranic waste in aboveground storage that is WIPP compliant packaged and ready for processing. Waste in retrievable storage is not included in the inventory until after it has been retrieved. CWC has adequate building storage capacity for waste. Storage of large containers and RH waste may require use of additional CWC space.

4.0 PROJECT CONSTRAINTS

4.1 M-91-Series Milestones

The TPA contains milestones for treatment of mixed waste, retrieval of RSW, and acquisition of capabilities and/or facilities to treat RH and large-container CH MLLW and large CH transuranic waste. Appendix T includes

The M-91-series milestones include 1) retrieval of RSW, 2) acquisition of capabilities and/or facilities to process/treat MLLW and transuranic waste, and 3) treatment/processing of MLLW and transuranic waste.

Since completion of M-91 negotiations in 2003, DOE has met 52 of the 59 M 91 requirements on or ahead of schedule. Accomplishments include retrieval of more than 9,800 m^3 of RSW, treatment of more than 7,500 m^3 of MLLW, and certification of more than 3,300 m^3 of transuranic waste.

4.2 Building Blocks of Scope and Cost for FY 2010

Two funding cases, a Base Case and an As-Soon-As-Feasible Compliance Case, are discussed for work scope planned to support M-91 milestones in Fiscal Years (FYs) 2009 through 2035. The Base Case funding profile is based on the FY 2009-2018 Plateau Remediation Contract (PRC) baseline and reflects incorporation of both the President's FY 2010 budget as well as additional American Recovery and Reinvestment Act funding in the FY 2009-2011 timeframe. Funding for FYs 2019 through 2035 was estimated based on assumptions regarding operations that support

achievement of M-91 milestone series and is subject to change as planning is refined.

Building blocks of scope and funding are estimated to assist possible adjustments needed if FY 2010 funding obtained is different than the identified funding profile. Life-cycle funding profiles are provided in Appendix P for the Base Case and the As-Soon-As-Feasible Compliance Case. Higher building blocks increase specific-activity Base Case funding toward the As-Soon-As-Feasible Compliance Case funding level. Lower building blocks reduce Base Case funding to lower levels. Building blocks for FY 2010, both higher and lower than the President's budget (including Recovery Act funding), are as follows:

Higher:

- M-91-43/44 – Increases funding to start large container and RH capabilities engineering, procurement and construction activities earlier at $1.9M.

Lower:

- M-91-41 – Stop alternative analysis and safety evaluation for retrieval of caisson RH RSW in 218 W 4B at $1M

4.3 External Schedule Requirements

4.3.1 Waste Volumes and Treatment Capacities

Total forecast volumes through Year 2035 and waste volumes currently in storage at the Hanford Site form the basis for the evaluation of transuranic waste and MLLW processing capabilities discussed in this PMP. This PMP assumes that transuranic waste can be sent to an offsite facility through Year 2050 for disposal. The evaluation determined that the current and planned capabilities for transuranic waste and MLLW processing are limited by the Base Case funding. There is inherent uncertainty associated with waste forecasts due to changes experienced in the waste generator's program baselines. The current forecast includes generator waste estimates through 2035. Future forecasts will be extended through 2050.

4.3.2 Regulatory Requirements

Regulatory requirements for permitting and *National Environmental Policy Act of 1969* (NEPA) documentation will be coordinated to minimize potential impacts to the TPA requirements. Environmental impacts from performing M-91-00 activities, such as construction or modification of a facility, have been analyzed in the *Hanford Site Solid Waste Program Environmental Impact Statement,* (HSW-EIS). The new Tank Closure and Waste Management Environmental Impact Statement is in development. No impacts to M-91 planning are anticipated from the new EIS. Revisions to air permits will be completed to support startup of operations.

4.3.3 Funding Constraints

Funding supports M-91 and non-M-91 activities (Appendix P). Base Case M-91 work prioritization is based on the following:

1. Provides minimum safe operations support for CWC, WRAP, LLBGs, MWDTs, T Plant, and Project Management.
2. CH RSW retrieval continues at a rate of 1,000 m^3 in FY 2010 and 2011 and increases in FY 2012 to support completion in Year 2013.
3. WRAP processes 90 m^3 in FY 2010 and T Plant processes 360 m^3 in FY 2010 of M-91-42 transuranic waste
4. Remaining funding supports M-91-42 and M-91-43 commercial MLLW treatment.
5. Activities to support acquisition of capabilities for RH RSW retrieval from the caissons starts in Year 2013. Retrieval of

RH RSW starts in 2013 and is completed in 2018.

6. WIPP CCP provides resources for VE, transuranic Waste Stream approval, NDA, NDE, and head space gas characterization.
7. Future large container and RH waste processing capabilities Project is started in Year 2019. RH 72-B Cask shipping capability established by December 31, 2018 and operates through December 31, 2050. Future large container and RH waste processing capabilities is operational by the end of 2018 and completes operations in 2040.

4.3.4 Technology Development/Constraints

Characterization Constraints

Characterization of some of the waste in storage, RSW, and waste from other cleanup operations is limited by available technology and facilities. Specifically, NDE (x-ray), RH NDA, and RH TRU dose to curie measurement capability for waste will need to be developed to support characterization efforts. Future large container and RH waste processing capabilities design will address this technology constraint.

Treatment Technology/Capacity Constraints

MLLW

Section 3.2 discusses treatment technology/capacity constraints for MLLW-03, Organic Non-Debris Wastes and MLLW-08, Unique Wastes.

Transuranic Waste

Critical to the successful design, construction, startup, and operation of future large container and RH waste processing capabilities is the selection, adaptation, testing, and integration of systems, equipment, and tools for processing the waste. While many of the systems and equipment that will be used to process this waste are commercially available, they are almost all custom manufactured for the payload size, type, and motion required for future large container and RH waste processing capabilities and have not all been used in an integrated fashion similar to the one being proposed. Selection of remote systems, equipment, and tools will require analysis of how a given system must interact with other systems and its mechanical, electrical/ utility, vision, communications, and operator interfaces. A cold mockup will be required for testing the integrated system, selecting and testing individual tools, operator training, and task/operational planning.

Technologies for retrieval and assay of RH RSW need to be developed.

5.0 SCHEDULE AND CRITICAL PATH ANALYSIS

5.1 Logic-Tied Life-Cycle Schedule

The M-91 Base Case PMP Schedule is presented in Appendix U. The schedule includes logic ties from Waste Retrieval and Acquisition of New Capabilities into the Waste Processing section of the schedule. The schedule is grouped into the four sections discussed below.

Impacts to M-91 TPA requirements for the Base Case and As-Soon-As-Feasible Compliance Case are included in Appendix V.

5.1.1 RSW Retrieval

Retrieval activities for CH and RH wastes are presented and are covered by TPA Milestones M-91-40 and M-91-41. The Base Case funding

delays existing TPA retrieval schedules and commitments. Retrieval operations will generate CH and RH wastes in a variety of packages, which feed into the Waste Processing section of the schedule.

5.1.2 Waste Processing

Waste processing activities are presented in the second section of the M-91 PMP schedule. TPA milestones M-91-42, M-91-43, and M-91-44 are included. Wastes to be processed are generated from retrieval operations, as well as waste already in storage and wastes to be generated. Production rates are included, as well as specific completion dates. The Base Case completion date for waste processing is 2040.

5.1.3 Acquisition of New Processing Capabilities

This section of the M-91 PMP schedule presents plans to acquire new processing capabilities. This includes commercial processing capabilities for treatment of MLLW and transuranic waste. Commercial capabilities for processing MLLW Treatability Groups 02-06 and MLLW Treatability Groups 08-10 are also being expanded under the M-91-42 milestone. This section also includes in-trench treatment of M-91-43 MLLW, establishing offsite capability to process CH transuranic waste in containers that can be shipped as low-specific activity waste and establishing onsite capability to process the remaining CH and RH waste at future large container and RH waste processing capabilities. Future large container and RH waste processing capabilities will include capability to load RH transuranic waste for shipment to WIPP.

5.1.4 Reporting

The fourth section of the M-91 PMP schedule provides a summary of significant reporting requirements for the M-91-series milestones.

5.2 Critical Path Analysis

The M-91 PMP schedule identifies the acquisition of future large container and RH waste processing capabilities as the critical path. Future large container and RH waste processing capabilities will begin operations by December 31, 2018. The scheduled date for completion of waste processing is 2040. RH 72-B Cask shipping capability established by December 31, 2018 and operates through December 31, 2050.

6.0 KEY DELIVERABLES /PRODUCTS

Key deliverables/products that will be developed in support of M-91 work scope include the following:

- Annual revisions of this PMP will be submitted on June 30 every year starting in 2008 and continuing until the M-91 milestones are completed. The President's budget, which is issued each February, will be incorporated in the June PMP revisions.

7.0 PERFORMANCE MEASUREMENT

7.1 Milestones and Accomplishments

Performance to complete M-91 milestones is measured using a combination of traditional project management metrics, such as cost and schedule performance. In addition, monthly metrics of MLLW and transuranic waste

retrieval, treatment, certification, and storage are tracked against the milestones.

8.0 PROJECT CONTROL

System and technical requirements will be made consistent and traceable throughout the 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.

8.1 Project Interface Control

Project interfaces are controlled by an interface control document, a Memorandum of Agreement, or the MOU process 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-91-03 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 with:

- Waste-Generating Programs
- Office of River Protection
- Pacific Northwest Site Office
- MWDTs 31 and 34
- WRAP Facility
- T Plant
- CWC
- RSW Retrieval
- ERDF
- IDF.

The waste forecasting system and the WAC are operating as interface controls.

8.2 Reporting and Notification Requirements and Processes

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-91 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-91-03 TRUM waste and MLLW. Status on M-91 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.

9.0 CHANGE MANAGEMENT

9.1 TPA Change Management

Changes to the M-91 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-91 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 shall include plans and schedules to address all the requirements set forth in the M-91 milestone series. Each revision of the M-91-03 PMP shall, after approval by Ecology, supersede previous M-91-03 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 shall implement the Plan as approved.

9.2 Life-Cycle Baseline Change Management

The Baseline Change Management process includes uniform mechanisms by which changes to the project are identified, quantified, approved, and implemented. The processes include the use of both Deviation Notices (DN) and Baseline Change Requests (BCR).

A DN is the formal documentation of a potential deviation from the CHPRC expected cost, schedule, or scope but does not change the CHPRC current baseline documents (technical baseline, cost baseline, schedule baseline, and related elements of the contract, i.e., the Plateau Remediation Contract plus approved changes). The DN is used as a communication tool and a decision-making tool. The deviation may be the result of changes in planned productivity or rates, or rework. The deviation may be an increase, a decrease, or a change in cost-time phasing. A DN may result in preparation of a BCR.

BCR is the formal documentation that identifies a change to the CHPRC baseline (technical baseline, cost baseline, schedule baseline, and related elements of the Plateau Remediation Contract). The BCR may be the result of DOE-initiated changes, changes to laws and other governing documents, the result of changed conditions (e.g., safety issues, preexisting conditions), or in accordance with other changes as defined in the Plateau Remediation Contract.

Logs are maintained to track changes documented in DNs and BCRs. The logs contain, at a minimum, the assigned numbers, description of the change, impacts, and document status dates. Other pertinent information is included as appropriate. A master log is maintained by the projects and/or functional organization code managers. Those BCRs that can be approved and implemented by CHPRC without DOE approval are referred to as internal BCRs. Those BCRs that require DOE approval are referred to as external BCRs.

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APPENDIX A

GLOSSARY AND DEFINITION OF ACRONYMS AND TERMS

Definitions as discussed in this plan are as follows:

- Small Containers and Large Containers

  Small containers and large containers have different meanings depending on whether they are used in reference to MLLW/LLW or transuranic waste.

  When referring to MLLW/LLW, small containers are containers less than 10 m^3, including 55-gallon drums. A large container is anything not defined as a small container.

  When referring to transuranic waste, small containers are 55-gallon drums or smaller containers even if over-packed in 85-gallon drums, and newly generated WIPP SWBs. A large container is anything not defined as a small container.

- Certification

  Certification is completion of all activities required for approval in the WIPP Waste Information System for acceptance into WIPP for disposal.

- Designation

  Designation is the process for determining: (1) which containers of LLW are MLLW; and, (2) which containers of transuranic waste are transuranic mixed waste (CH TRUM or RH TRUM). Designation of waste will be performed pursuant to WAC 173-303-070 through 100. These regulations allow the use of "Acceptable Knowledge," surrogate sampling and other measures for designation to minimize workers' radiation exposure and to reduce costs. Where applicable, DOE intends to use information gathered through the certification of transuranic waste in support of its designation of related LLW streams. Where appropriate, DOE will use measures allowed under state and federal regulations to perform accurate and cost effective designations of LLW.

- Low-Level Waste

  Low-level waste (LLW) is radioactive waste that is not spent fuel, high-level waste, transuranic waste, byproduct material, or naturally occurring radioactive material. LLW includes both MLLW and non-MLLW. LLW can be CH or RH.

- Mixed Low-Level Waste

  Mixed Low-Level Waste (MLLW) is LLW that is subject to RCRA or Chapter 70.105 of the RCW. Non-MLLW is LLW that is not subject to RCRA or Chapter 70.105 of the RCW. MLLW can be CH or RH.

- Contact-Handled Waste

  Contact-handled (CH) waste is a waste package with a surface dose rate of less than or equal to 200 millirem per hour.

- Remote-Handled Waste

  Remote-handled (RH) waste is a waste package with a surface dose rate greater than 200 millirem per hour.

- Retrievably Stored Waste

  Retrievably stored waste (RSW) is waste that is or was believed to be contaminated with significant concentrations of transuranic isotopes 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. During the retrieval process, containers of RSW will be segregated into two categories: (1) CH RSW and (2) RH RSW. Subsequent analysis and categorization of the RSW pursuant to Chapter 70.105 of the RCW, the Atomic

Energy Act, and the WIPP Land Withdrawal Act will result in most or all of this waste being classified as one of the following types of waste: CH LLW, RH LLW, CH MLLW, RH MLLW, CH TRU, CH TRUM, RH TRU, or RH TRUM. 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, the decision as to how to move forward will be determined through the cleanup process set forth in RCRA, Chapter 70.105 of the RCW, and/or CERCLA as appropriate. Those processes may result in additional requirements for the remediation of such wastes.

- Caisson Waste

  Caisson waste is RSW in the 218-W-4B burial ground caissons alpha-1 through alpha-4.

- Transuranic Waste

  Transuranic waste is waste that meets the definition in subsection (18) of Section 2 of the WIPP Land Withdrawal Act, Pub. L. 102-579. Transuranic waste includes both mixed transuranic (TRUM) waste and non-mixed transuranic (TRU) waste, and comprises the following categories: CH TRU, CH TRUM, RH TRU, and RH TRUM.

- Retrieval of CH RSW

  Retrieval of CH RSW is 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, ERDF or for waste designated in accordance with WAC 173-303-070 through -100 as non-mixed to a storage or disposal unit that DOE determines is appropriate.

- Retrieval of RH RSW

  Retrieval of RH RSW is uncovering RH wastes within DOE's RSW trenches and caissons, removing such RH wastes from the trenches and caissons, transferring the waste to a permitted and compliant treatment, storage or disposal unit, ERDF or for waste designated in accordance with WAC 173-303-070 through -100 as non-mixed to a storage or disposal unit that DOE determines is appropriate.

- WIPP Compliant Package or "Certifiable Waste"

  A WIPP Compliant Package or Certifiable Waste is packaged TRU waste that is ready for CCP to characterize (i.e. a high confidence that it will pass NDE, and will assay as TRU waste).

- Volume Determination

  The following descriptions are provided to clarify how volumes should be determined in different M-91 contexts, and to be consistent with the volumes of waste listed in the Hanford 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 towards "retrieval" would be 55-gallons (0.208 m^3), even if in the process of retrieval the drum needed to be over-packed into an 85-gallon drum.

  - The volumes of waste in "storage" will be listed as the container size that the waste is stored within. For example, a

55-gallon drum over-packed in an 85-gallon drum would be counted as 85-gallons in storage.

- The volume of MLLW "treated" will be counted as the retrieval volume (for RSW) or the MLLW pre-treatment container volume (for newly generated and stored waste).

- The volume of transuranic 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.

Acronyms and Definitions

AEA – *Atomic Energy Act*

AEC – Atomic Energy Commission

BCR – baseline change request

CBFO – Carlsbad Field Office

CCP – Central Characterization Project

CD – critical decision

CERCLA – *Comprehensive Environmental Response, Compensation and Liability Act*

CFFD – Kerr McGee

CFR – Code of Federal Regulations

CH – contact-handled

CHPRC – CH2M HILL Plateau Remediation Company

COC - contaminant of concern

CWC – Central Waste Complex

CY – calendar year

D&D – decontamination and decommissioning

DN – deviation notices

DOE – U.S. Department of Energy

DOE-RL – U.S. Department of Energy, Richland Operations Office

DOT – U.S. Department of Transportation

DQO – data quality objective

Ecology – Washington State Department of Ecology

EIS – environmental impact statement

EPA – U.S. Environmental Protection Agency

ERDF – Environmental Restoration Disposal Facility

ESG – Rockwell International Energy Systems

ETF – 200 Area Effluent Treatment Facility

FFTF – Fast Flux Test Facility

FH – Fluor Hanford, Incorporated

FY – fiscal year

GASVIT – gasification/vitrification

HASH – Hanford Incinerator Ash

HEPA – high-efficiency particulate air

HFFACO – *Hanford Federal Facility Agreement and Consent Order*

HIC – high-integrity container

HSGS – head-space gas sampling

HSSWAC – Hanford Site Solid Waste Acceptance Criteria

HSW-EIS – Hanford Solid Waste Environmental Impact Statement

HWMA – *Hazardous Waste Management Act*

IDF – Integrated Disposal Facility

INL – Idaho National Laboratory

KEBASIN01 – NLOP Sludge from K Basin

LDR – land disposal restriction

LLBG – Low-Level Burial Grounds

LLW – low-level waste

MLLW – mixed low-level waste

MOU – memorandum of understanding

MPFPD – Mixed PFP Debris

MWDT – Mixed Waste Disposal Trench

NDA – nondestructive assay

NDE – nondestructive examination

NEPA – *National Environmental Policy Act*

NOC – Notice of Compliance

NPFPD – Non-mixed PFP Debris

NPUREXD – Non-mixed PUREX Debris

NRC – U.S. Nuclear Regulatory Commission

O/C – organic/carbonaceous

PBS – project baseline summaries

PCB – polychlorinated biphenyl

PFP – Plutonium Finishing Plant

PMP – Project Management Plan

PNNL – Pacific Northwest National Laboratory

PRC - Plateau Remediation Contract

PUREX – Plutonium Uranium Extraction

RCRA – *Resource Conservation and Recovery Act of 1976*

RCW – *Revised Code of Washington*

RFP – request for proposal

RH – remote-handled

RINM – Reactor Irradiated Nuclear Material

RL216Z9 – Homogeneous Waste from 216Z-9 Crib

RLCBWD – Consolidated Babcock and Wilcox Debris

RLETECD – ETEC/ESG Debris

RLM209ED – Mixed 209E Debris

RLM231ZD – Mixed 231-Z Debris

RLM233SD – Mixed 233S Debris

RLM300D – Mixed 300 Area Debris

RLM308D – Mixed 308 Debris

RLM325D – Mixed 325 Debris

RLMGEVALD – Mixed GE Vallecitos Debris

RLMWARD – WARD Debris

RLSWOCD – Solid Waste Operations Complex Debris

ROD – record of decision

RSW – retrievably stored waste

SAP – sampling and analysis plan

SNM – special nuclear material

SWB – standard waste box (1.80 m in length, 1.38 m wide, and 0.94 m high)

SWHF – Solid Waste Handling Facility

SWIFT – Solid Waste Information Forecasting Tool

SWITS – Solid Waste Inventory Tracking System

SWOC – Solid Waste Operations Complex

SWPC – Solid Waste Processing Center

SWPM – Solid Waste Processing Module

TPA – Tri-Party Agreement

Transuranic or TRU(M) – TRU and TRUM Waste

TRU – non-mixed transuranic waste

TRUM – mixed transuranic waste

TRUPACT – Transuranic Package Transporter

TSCA – *Toxic Substances Control Act*

TSCAI – Toxic Substances Control Act Incinerator

TSD – treatment, storage, and/or disposal

TSDF – Treatment Storage Disposal Facility

UHC – underlying hazardous constituents

UTS – Universal Treatment Standards

UV – ultra-violet

VTD – Vacuum Thermal Disorber

WAC – Washington Administrative Code and Waste Acceptance Criteria

WAP – waste analysis plan

WARD – Westinghouse Advanced Reactor Division

WBS – work breakdown structure

WERF – Waste Experimental Reduction Facility

WHC – Westinghouse Hanford Company

WIPP – Waste Isolation Pilot Plant

WNP – Washington Nuclear Plant

WRAP – Waste Receiving and Processing Facility

WSCF – Waste Sampling and Characterization Facility

WSRd – Waste Specification Record

APPENDIX B

ENLARGEMENTS OF FIGURES 1, 6, 7, 8, AND 9

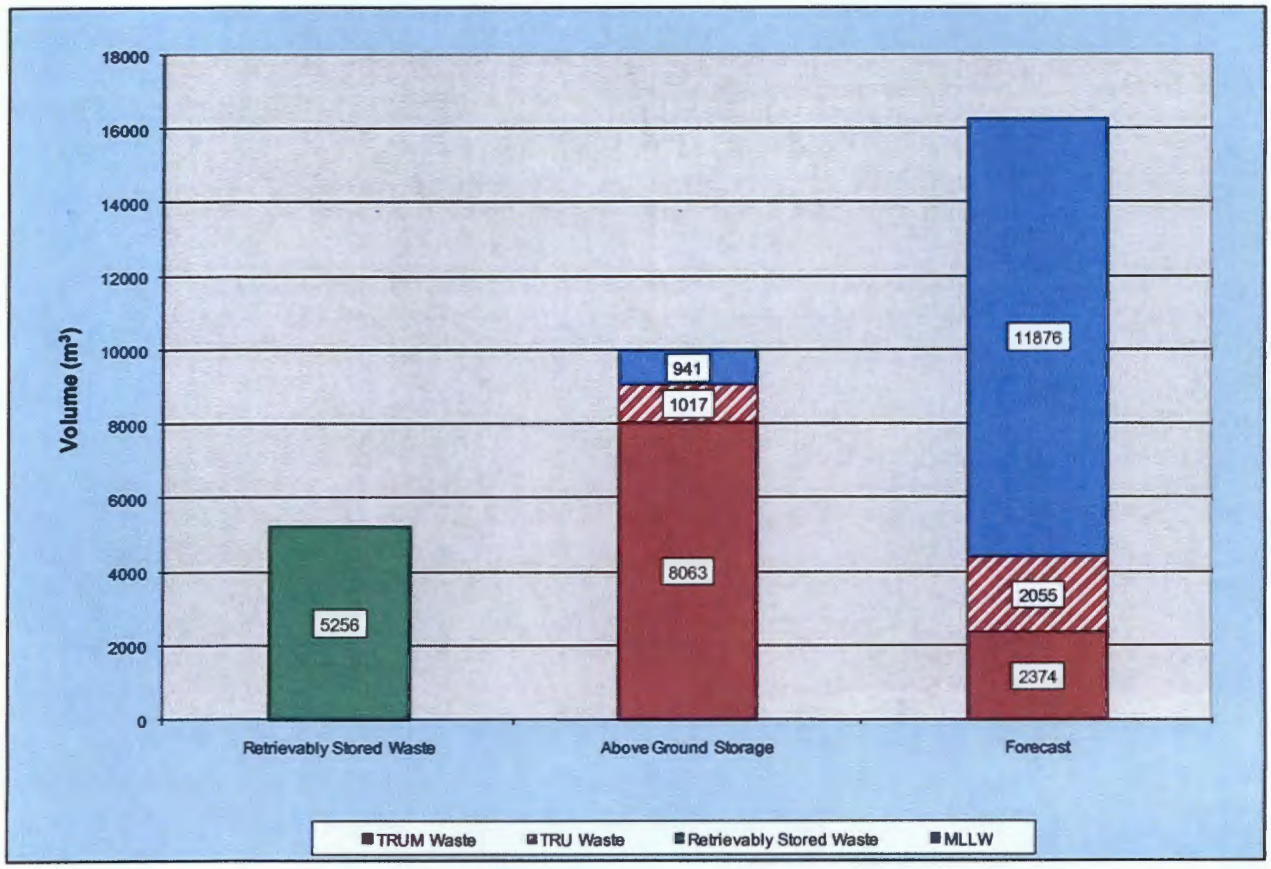


Figure 1. Hanford MLLW/Transuranic Waste Sources.

Data Sources:

- Retrievably Stored Waste and Above Ground Storage Data from SWITS as of January 8, 2009
- Waste marked as LLW TSCA is not included in the MLLW volumes
- Waste identified as "German Logs" is not included. Includes packages CASTOR-GSF-001, -002, -003, -005, -006, -007, GNS-12-1, and GNS-12-2
- Forecast data taken from SWIFT 2009.0, represents life-cycle forecast January 2009 through September 30, 2035 with the exception of transuranic tank waste
- Volumes are internal volumes (e.g., 55-gallon drum is 0.208 m^3 internal waste, 0.257 m^3 external)

Retrievably Stored Waste:

- Containers identified as RINM based on process knowledge and SWITS record information are excluded from RSW volume
- RSW consists of suspect transuranic waste in burial grounds 218-W-3A, 218-W-4B, 218-W-4C, and 218-E-12B

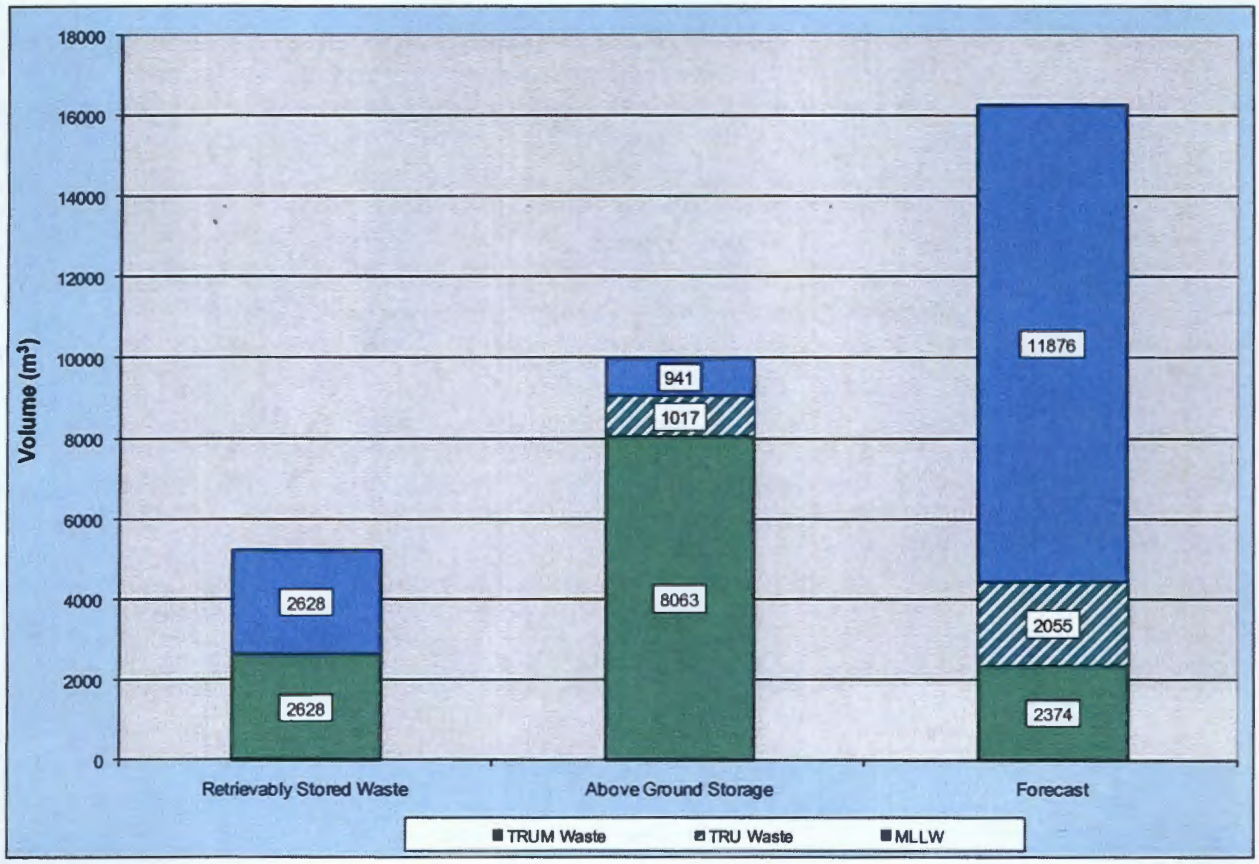


Figure 6. Hanford MLLW/Transuranic Waste with Retrieval Split.

Data Sources:

- Retrievably Stored Waste and Above Ground Storage Data from SWITS as of January 8, 2009
- Waste marked as LLW TSCA is not included in the MLLW volumes
- Waste identified as "German Logs" is not included. Includes packages CASTOR-GSF-001, -002, -003, -005, -006, -007, GNS-12-1, and GNS-12-2
- Forecast data taken from SWIFT 2009.0, represents life-cycle forecast January 2009 through September 30, 2035 with the exception of transuranic tank waste
- Volumes are internal volumes (e.g., 55-gallon drum is 0.208 m^3 internal waste, 0.257 m^3 external)

Retrievably Stored Waste:

- Containers identified as RINM based on process knowledge and SWITS record information are excluded from RSW volume
- Assumes an overall 50/50 MLLW/transuranic waste split by volume for RSW
- RSW consists of suspect transuranic waste in burial grounds 218-W-3A, 218-W-4B, 218-W-4C, and 218-E-12B

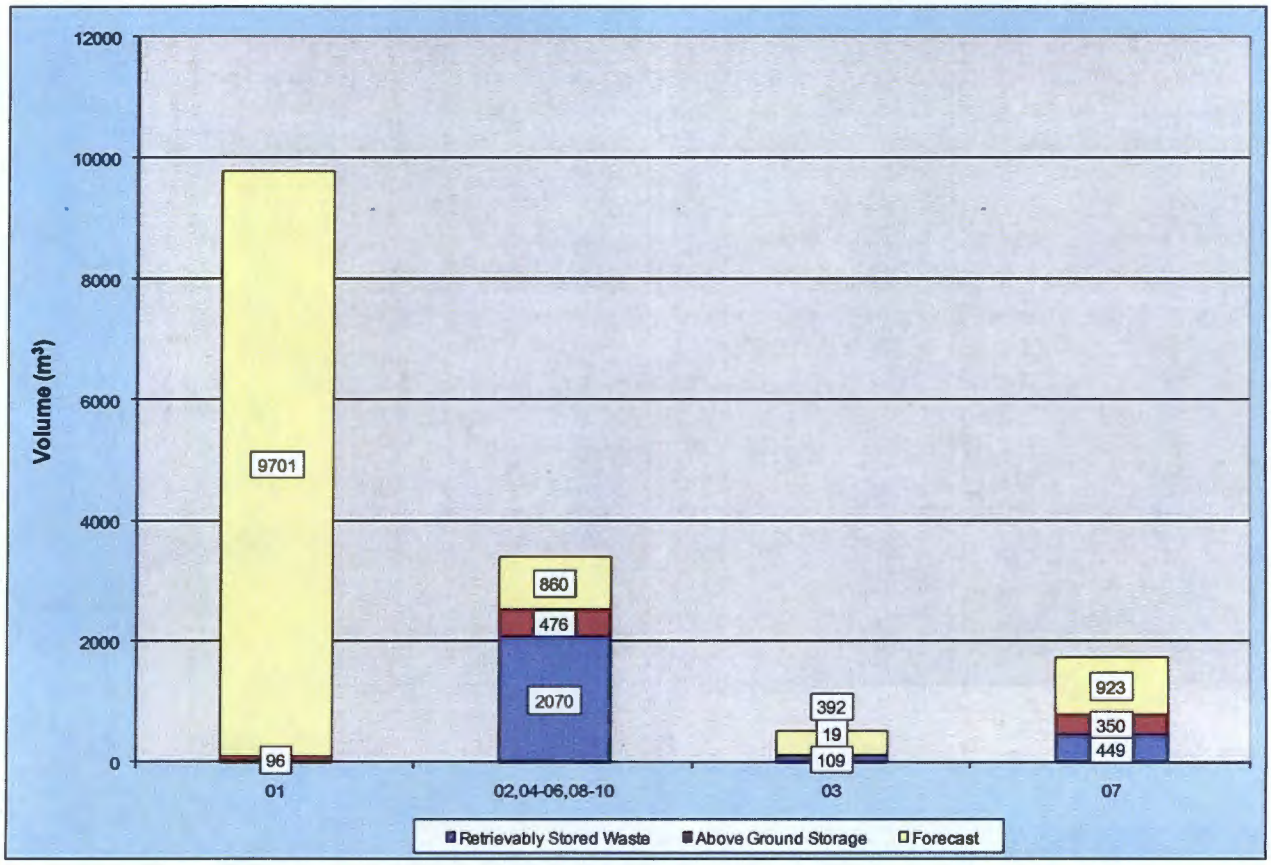


Figure 7. MLLW Treatability Group Sources.

Data Sources:

- Retrievably Stored Waste and Above Ground Storage Data from SWITS as of January 8, 2009
- Waste marked as LLW TSCA is not included in the MLLW volumes
- Forecast data taken from SWIFT 2009.0, represents life-cycle forecast January 2009 through September 30, 2035 with the exception of transuranic tank waste
- Volumes are internal volumes (e.g., 55-gallon drum is 0.208 m^3 internal waste, 0.257 m^3 external)
- Rules for re-assigning packages listed as CH in SWITS as RH are:
  1. Containers with a dose rate of >200 mR/hr
  2. Containers containing shielding
  3. Containers with greater than 0.25 curies of cesium-137
- Assumes all waste reclassified as RH is MLLW-07

Retrievably Stored Waste:

- Assumes 50/50 MLLW/transuranic waste split by volume for RSW
- Assumes 50 percent (by volume) of the RSW RH containers are transuranic waste and 50 percent are MLLW
- Assumes 75 percent (by volume) of the RSW CH large containers are transuranic waste and 25 percent are MLLW
- Assumes MLLW/transuranic waste split in RSW CH small containers results in an overall 50/50 MLLW/transuranic waste split by volume for RSW
- Assumes 95% of the CH MLLW small portion from transuranic waste retrieval is MLLW-04, 5% is MLLW-03
- RSW consists of suspect transuranic waste in burial grounds 218-W-3A, 218-W-4B, 218-W-4C, and 218-E-12B

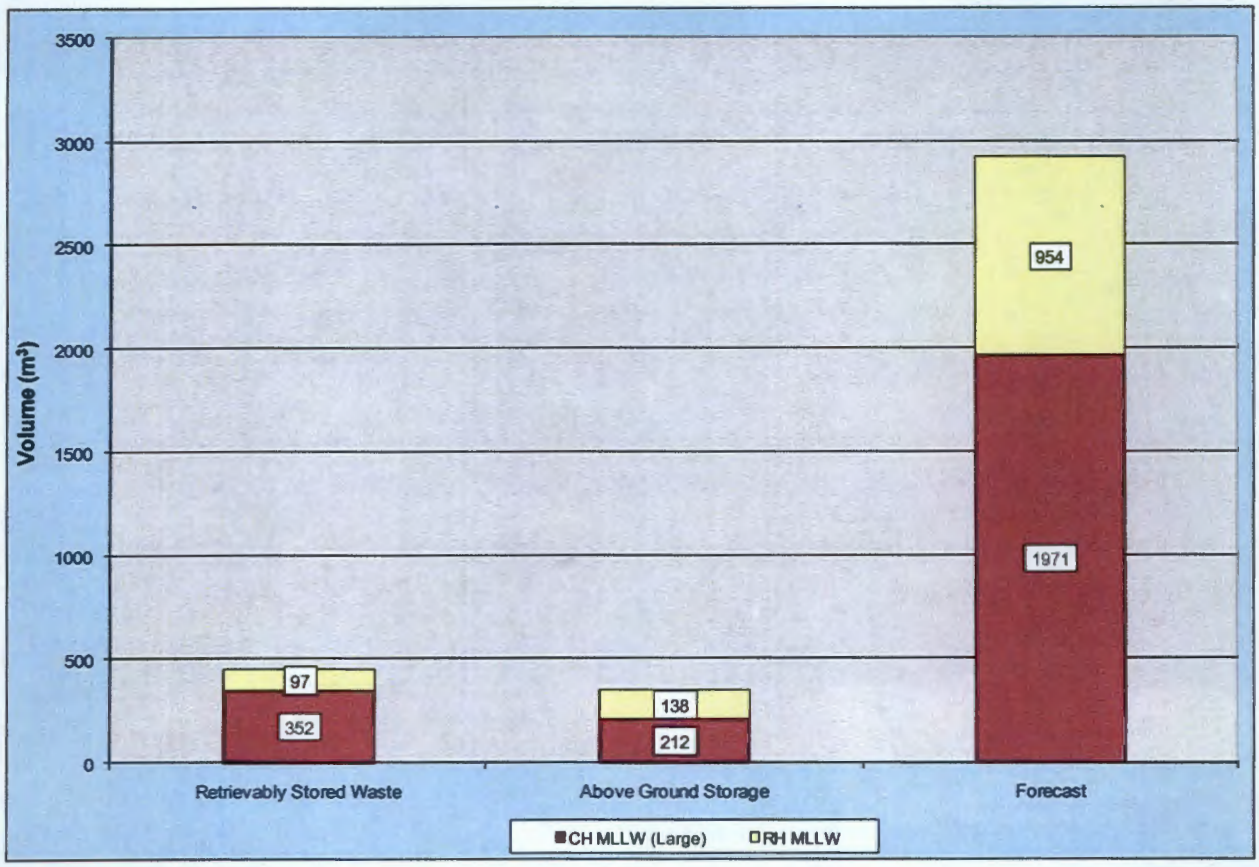


Figure 8. MLLW-07 Sources.

Data Sources:

- Retrievably Stored Waste and Above Ground Storage Data from SWITS as of January 8, 2009
- Waste marked as LLW TSCA is not included in the MLLW volumes
- Forecast data taken from SWIFT 2009.0, represents life-cycle forecast January 2009 through September 30, 2035 with the exception of transuranic tank waste
- Volumes are internal volumes (e.g., 55-gallon drum is 0.208 m^3 internal waste, 0.257 m^3 external)
- Rules for re-assigning packages listed as CH in SWITS as RH are:
  1. Containers with a dose rate of >200 mR/hr
  2. Containers containing shielding
  3. Containers with greater than 0.25 curies of cesium-137

Retrievably Stored Waste:

- Assumes 50/50 MLLW/transuranic waste split by volume for RSW
- RSW consists of suspect transuranic waste in burial grounds 218-W-3A, 218-W-4B, 218-W-4C, and 218-E-12B

Container Definitions:

- CH MLLW Large - Containers with a volume greater than 10 m^3

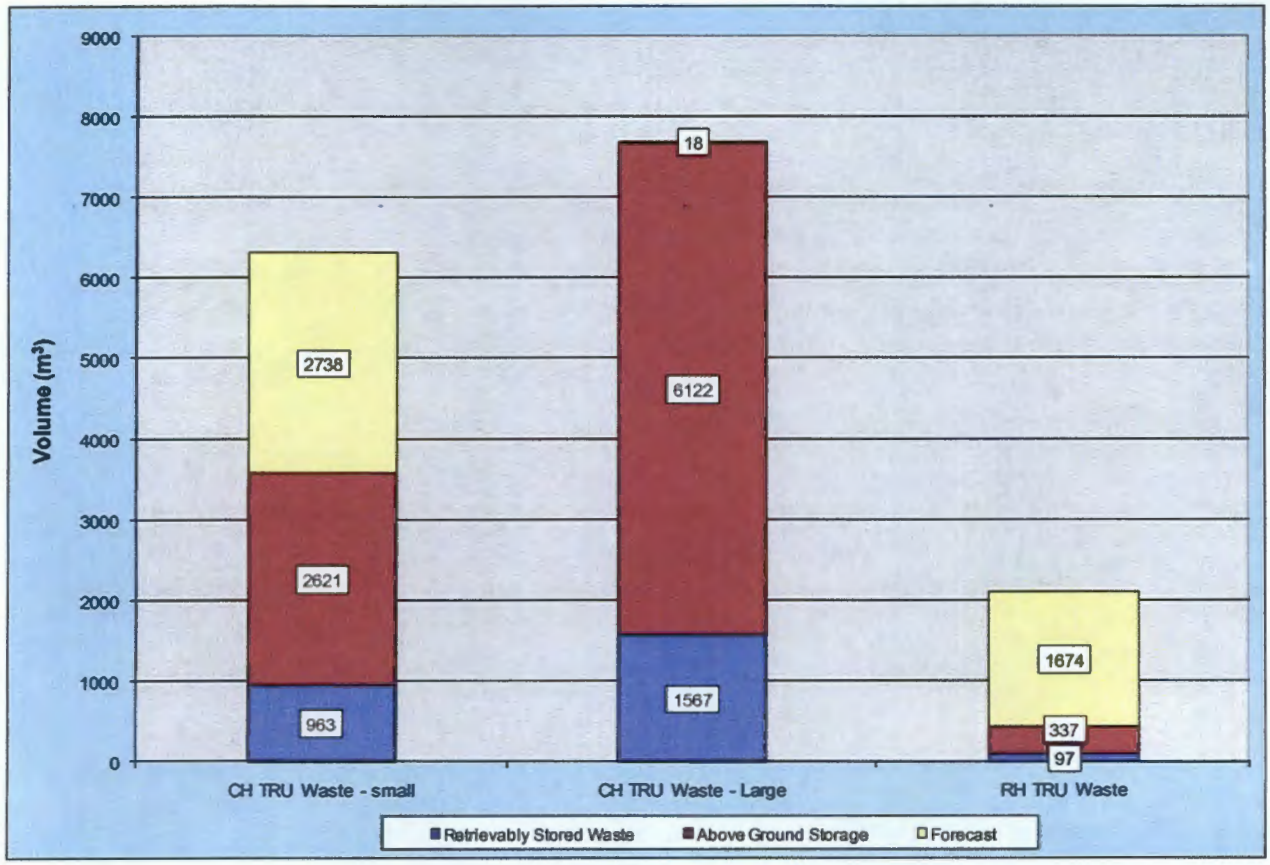


Figure 9. Transuranic Waste Sources.

Data Sources:

- Retrievably Stored Waste and Above Ground Storage Data from SWITS as of January 8, 2009
- Waste identified as "German Logs" is not included. Includes packages CASTOR-GSF-001, -002, -003, -005, -006, -007, GNS-12-1, and GNS-12-2
- Forecast data taken from SWIFT 2009.0, represents life-cycle forecast January 2009 through September 30, 2035 with the exception of transuranic tank waste
- Volumes are internal volumes (e.g., 55-gallon drum is 0.208 m^3 internal waste, 0.257 m^3 external)
- Rules for re-assigning packages listed as CH in SWITS as RH are:
  1. Containers with a dose rate of >200 mR/hr
  2. Containers containing shielding
  3. Containers with greater than 0.25 curies of cesium-137

Retrievably Stored Waste:

- Containers identified as Reactor Irradiated Nuclear Material based on process knowledge and SWITS record information
- Assumes 50/50 MLLW/transuranic waste split by volume for RSW
- Assumes 50 percent (by volume) of the RSW RH containers are transuranic waste and 50 percent are MLLW
- Assumes 75 percent (by volume) of the RSW CH large containers are transuranic waste and 25 percent are MLLW

- Assumes MLLW/transuranic waste split in RSW CH small containers results in an overall 50/50 MLLW/transuranic waste split by volume for RSW
- RSW consists of suspect transuranic waste in burial grounds 218-W-3A, 218-W-4B, 218-W-4C, and 218-E-12B

Container Definitions:

- Transuranic Waste Small – 55-gallon drums, containers smaller than a 55-gallon drum, 85-gallon over-packs, and SWBs
- Transuranic Waste Large – Non-small containers

APPENDIX C

ESTIMATES OF HANFORD CERCLA WASTE SITES CONTAINING TRANSURANIC CONSTITUENTS GREATER THAN 100 nCi/g

Estimates of Hanford CERCLA Waste Sites Containing Transuranic Constituents Greater than 100 nCi/g

CERCLA Sites	Area (acres)[1]	Estimated Volume (m^3)
		Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
Contaminated Soil Sites (from Liquid Disposal)	6.2	34,000
Landfills[2,3]	470	28,000
Canyon Facilities and Associated Tunnels	-	1,500
Tanks and Ancillary Equipment	-	33
Other 200 Area	-	91
300 Area	-	72
Total	-	64,000

1 Includes area of entire contaminated soil site or landfill
2 Estimated volumes are from historical Solid Waste Inventory Tracking System (SWITS) data and DOE/RL-2004-60 Draft B, *200-SW-1 Nonradioactive Landfills and Dumps Group Operable Unit and 200-SW-2 Radioactive Landfills and Dumps Group Operable Unit Remedial Investigation/Feasibility Study Work Plan*, September 2007.
3 618-10 and 618-11 landfills are not included. These sites are included in M-91 forecasts

Contaminated Soil Sites (from Liquid Disposal)[4,5]	Operable Unit	Area (acres)	Estimated Volume (m^3)[6]
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
216-B-5	200-TW-2	0.00035	64
216-B-7A&B	200-TW-2	0.077	430
216-B-53A	200-BC-1	0.017	24
216-E-15	200-IS-1	0.13	260
216-S-1&2	200-PW-2	0.173	1,700
216-T-3	200-TW-2	0.00027	2.9
216-T-6	200-TW-2	0.069	290
216-T-18	200-TW-1	0.57	590
216-T-32	200-TW-2	0.079	460
216-U-10	200-CW-1	0.15	190

4 Used values are from Table 2-15 in RHO-RE-ST-30 P, *Hanford Defense Waste Disposal Alternatives: Engineering Support Data for the Hanford Defense Waste- Environmental Impact Statement*, December 1985, DOE/RL-2007-27 Draft A, *Feasibility Study for the Plutonium/Organic-Rich Process Condensate/Process Waste Group Operable Unit: Includes the 200-PW-1, 200-PW-3, and 200-PW-6 Operable Units*, September 2007 and/or the *Waste Information Data System* (WIDS) unless otherwise noted. Another reference used was RHO-LD-114, *Existing Data on the 216-Z Liquid Waste Sites*, Owens K. W., 1981

5 Note a considerable quantity of liquid disposal site material is rock/gravel

6 These values will increase (from mixed with adjacent soils/solid waste) if the waste is removed

Contaminated Soil Sites (from Liquid Disposal)[4,5]	Operable Unit	Area (acres)	Estimated Volume (m^3)[6]
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
216-Z-1A[7]	200-PW-1	0.73	13,000
216-Z-1 and 216-Z-2	200-PW-1	0.009	550
216-Z-3	200-PW-1	0.14	1,500
216-Z-5	200-PW-6	0.052	210
216-Z-7	200-LW-2	0.19	590
216-Z-8	200-PW-6	0.00049	5.8
216-Z-9[8]	200-PW-1	0.13	3,700
216-Z-10	200-PW-6	0.000077	0.17
216-Z-12[9]	200-PW-1	0.47	1,300

7 Estimated from RHO-ST-17, *Distribution of Plutonium and Americium beneath the 216-Z-1A Crib: A Status Report*, Price S. M. , Kasper R. B., Additon M. K., Smith R. M., Last G. V., February 1979

8 Information was used from the characterization and soil removal including: Recent characterization efforts around and under 216-Z-9; ARH-2915, *Nuclear Reactivity Evaluations of 216-Z-9 Enclosed Trench*, A. E. Smith, December 1973; RHO-ST-21, *Report on Plutonium Mining Activities at 216-Z-9 Enclosed Trench,* J. D. Ludowise, September 1978; RHO-HS-EV-1 Addendum Number 3, *Addendum to ARH-LD-124 Final Safety Analysis Report Contaminated Soil Removal Facility 216-Z-9 Enclosed Trench*, R. C. Stupka, December 1981; HNF-31792, *Characterization Information for the 216-Z-9 Crib at the Plutonium Finishing Plant*, Teal J. A., March 2007

9 Estimated from RHO-ST-44, *216-Z-12 Transuranic Crib Characterization: Operational History and Distribution of Plutonium and Americium*, Kasper R. B., November 1982

Contaminated Soil Sites (from Liquid Disposal)[4,5]	Operable Unit	Area (acres)	Estimated Volume (m^3)[6]
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
216-Z-18	200-PW-1	0.57	5,700
216-Z Ditches (-1, -11, -19 and -20)[10]	200-CW-5	2.89	2,960
241-B-361	200-TW-2	0.0018	180
241-T-361	200-TW-2	0.0018	180
241-Z-361[11]	200-PW-1	0.0018	180
Subtotal		6.18	34,100

10 Information from characterization work by Hickey M. J.
11 Information was used from the characterization of the tank including HNF-1989 Rev. 0, *Tank 241-Z-361 Process and Characterization History*, Jones S. A., July 1998 and HNF-1692, *Tank 241-Z-361, Cores 263 and 264 Analytical Results and the Final Report*, Esch R. A., May 2000

Landfill12	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
218-E-1	200-SW-2	3.24	0
218-E-2	200-SW-2	5.49	0
218-E-5	200-SW-2	2.44	142
218-E-5A	200-SW-2	1.10	0
218-E-10	200-SW-2	70.2	0
218-E-12A	200-SW-2	28.2	0
218-E-12B	200-SW-2	217	121
218-W-1	200-SW-2	6.34	6,560
218-W-1A	200-SW-2	15.0	0
218-W-2	200-SW-2	7.05	8,240
218-W-2A	200-SW-2	20.4	178
218-W-3	200-SW-2	8.08	5,930
218-W-3A	200-SW-2	56.9	49.9

12 Estimates from Jesse Jensen

Landfill12	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
218-W-4A	200-SW-2	21.0	5,140
218-W-4B	200-SW-2	9.34	1,110
Subtotal		472	27,500

Canyon Facilities and Associated Tunnels	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
PUREX[13]	N/A	-	760
REDOX	N/A	-	TBD
T Plant	N/A	-	58
U Plant	N/A	-	TBD
PUREX Tunnel #1[14]	N/A	0.16	270
PUREX Tunnel #2[15]	N/A	0.13	360
224-B	200-BP-6	-	TBD
209-E	N/A	-	TBD
291-B Sand-filter	200-BP-6	-	TBD
Subtotal			1,450

13 Estimated waste volume (contaminated equipment) in PUREX canyon; WHC-IP-0977, *Estimation of PUREX Equipment and Materials that are Candidates for Waste Processing During PUREX Plant Closure*, January 1994.
14 Estimated waste volume on the railroad cars in the Tunnel #1; WHC-IP-0977, *Estimation of PUREX Equipment and Materials that are Candidates for Waste Processing During PUREX Plant Closure*, January 1994.
15 Estimated waste volume on the railroad cars in the Tunnel #2; WHC-IP-0977, *Estimation of PUREX Equipment and Materials that are Candidates for Waste Processing During PUREX Plant Closure*, January 1994.

Tanks and Ancillary Equipment[16]	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
200-E-111, Encased Pipeline From 241-ER-151 Diversion Box to 241-C Tank Farm and 244-AR Vault; 3-38 Encasement	200-IS-1	-	0.90
200-W-100, Encased Pipeline from 241-UX-154 to 241-SX-152 Diversion Box	200-IS-1	-	0.03
200-W-99, Encased Pipeline from 241-U-151 to 241-S-151 Diversion Boxes	200-IS-1	-	0.03
209-E-WS-3, Critical Mass Laboratory Valve Pit and Hold Up Tank (209-E-TK-111), IMUST, Inactive Miscellaneous Underground Storage Tank	200-MG-1	-	0.19
241-A-A, 241-A-A Diversion Box, 241-A-A Structural Valve Pit	200-PO-3	-	0.00
241-A-B, 241-A-B Diversion Box, 241-A-B Structural Valve Pit	200-PO-3	-	0.04
241-AN-A, 241-AN-A Diversion Box	200-PO-3	-	0.00
241-AN-B, 241-AN-B Diversion Box	200-PO-3	-	0.00
241-AP VP, 241-AP Valve Pit	200-PO-3	-	0.02
241-AR-151, 241-AR-151 Diversion Box	200-PO-3	-	0.00
241-AW-A, 241-AW-A Valve Pit, 241-AW-A Diversion Box	200-PO-3	-	0.03

16 Estimates prepared by Don LaRue

Tanks and Ancillary Equipment[16]	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
241-AW-B, 241-AW-B Valve Pit, 241-AW-B Diversion Box	200-PO-3	-	0.03
241-AX-151, 241-AX-151 Diversion Box, 241-AX-151 Diverter Station, IMUST, Inactive Miscellaneous Underground Storage Tank	200-PO-3	-	0.03
241-AX-152DS, 241-AX-152 Diverter Station, 241-AX-152-DS Diverter Station	200-PO-3	-	0.19
241-AX-155, 241-AX-155 Diversion Box	200-PO-3	-	0.00
241-AX-501, 241-AX-501 Valve Pit, 241-AX-501 Condensate Valve Pit	200-PO-3	-	0.00
241-AX-A, 241-AX-A Diversion Box, 241-AX-A Structural Valve Pit, 241-AX-A Valve Pit	200-PO-3	-	0.01
241-AX-B, 241-AX-B Diversion Box, 241-AX-B Structural Valve Pit, 241-AX-B Valve Pit	200-PO-3	-	0.00
241-AY-151, 241-AY-151 Diversion Box, 241-AY-151 Pump Out Pit	200-PO-3	-	0.00
241-AY-152, 241-AY-152 Diverter Station, 241-AY-152 Sluice Transfer Box	200-PO-3	-	0.07
241-AZ-151DS, 241-AZ-151-DS Diverter Station, 241-AZ-151 Diverter Station	200-PO-3	-	0.20
241-AZ-152, 241-AZ-152 Diversion Box, 241-AZ-152 Sluice Transfer Box	200-PO-3	-	0.01
241-B-151, 241-B-151 Diversion Box	200-BP-7	-	0.01

Tanks and Ancillary Equipment[16]	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
241-B-152, 241-B-152 Diversion Box	200-BP-7	-	0.21
241-B-153, 241-B-153 Diversion Box	200-BP-7	-	0.29
241-B-154, 241-B-154 Diversion Box	200-IS-1	-	0.30
241-B-252, 241-B-252 Diversion Box	200-BP-7	-	0.01
241-B-301, 241-B-301-B Catch Tank, 241-B-301B, IMUST, Inactive Miscellaneous Underground Storage Tank	200-BP-7	-	0.01
241-B-302B, 241-B-302-B Catch Tank, 241-B-302, IMUST, Inactive Miscellaneous Underground Storage Tank	200-IS-1	-	0.18
244-CR VAULT, 244-CR Vault	200-PO-3	-	0.42
244-S DCRT, 244-S Double-Contained Receiver Tank, 244-S RT, 244-S Receiver Tank, 244-S Catch Station, 244-S-TK/SMP	200-RO-4	-	0.05
244-TX DCRT, 244-TX Double-Contained Receiver Tank, 244-TX RT, 244-TX Receiver Tank, 244-TX Receiver Vessel, 244-TX-TK/SMP	200-TP-5	-	0.03
244-TXR VAULT, 244-TXR, 244-TXR Vault (Tanks TXR-001, -002, -003), IMUST, Inactive Miscellaneous Underground Storage Tank	200-TP-5	-	2.78

Tanks and Ancillary Equipment[16]	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
244-U DCRT, 244-U Double-Contained Receiver Tank, 244-U RT, 244-U Receiver Tank, 244-U Receiving Vault, 244-U-TK/SMP	200-UP-3	-	0.08
244-UR VAULT, 244-UR Vault, (Tanks -001 through -004), IMUST, Inactive Miscellaneous Underground Storage Tank	200-UP-3	-	1.49
241-BR-152, 241-BR-152 Diversion Box	200-BP-7	-	0.05
241-BX-153, 241-BX-153 Diversion Box	200-BP-7	-	0.02
241-BX-155, 241-BX-155 Diversion Box	200-IS-1	-	0.07
241-BX-302A, 241-BX-302-A Catch Tank, IMUST, Inactive Miscellaneous Underground Storage Tank	200-BP-7	-	0.01
241-BX-302C, 241-BX-302-C Catch Tank, IMUST, Inactive Miscellaneous Underground Storage Tank	200-IS-1	-	0.05
241-BXR-151, 241-BXR-151 Diversion Box	200-BP-7	-	0.07
241-BXR-152, 241-BXR-152 Diversion Box	200-BP-7	-	0.04
241-BXR-153, 241-BXR-153 Diversion Box	200-BP-7	-	0.04
241-BYR-152, 241-BYR-152 Diversion Box	200-BP-7	-	0.05
241-BYR-153, 241-BYR-153 Diversion Box	200-BP-7	-	0.05

Tanks and Ancillary Equipment[16]	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
241-BYR-154, 241-BYR-154 Diversion Box	200-BP-7	-	0.04
241-C-151, 241-C-151 Diversion Box	200-PO-3	-	0.01
241-C-152, 241-C-152 Diversion Box	200-PO-3	-	0.01
241-C-153, 241-C-153 Diversion Box	200-PO-3	-	0.01
241-C-154, 241-C-154 Diversion Box	200-IS-1	-	0.00
241-C-252, 241-C-252 Diversion Box	200-PO-3	-	0.01
241-C-301, 241-C-301-C Catch Tank, 241-C-301C, IMUST, Inactive Miscellaneous Underground Storage Tank	200-PO-3	-	0.22
241-CR-151, 241-CR-151 Diversion Box	200-PO-3	-	0.25
241-CR-152, 241-CR-152 Diversion Box	200-PO-3	-	0.01
241-CR-153, 241-CR-153 Diversion Box	200-PO-3	-	0.01
241-CX-70, 241-CX-TK-70 Tank, Strontium Hot Semi-works, IMUST, Inactive Miscellaneous Underground Storage Tank	200-IS-1	-	0.47
241-CX-71, 241-CX-TK-71, 241-CX Neutralization Tank, Strontium Hot Semi-works, IMUST, Inactive Miscellaneous Underground Storage Tank	200-IS-1	-	0.00

Tanks and Ancillary Equipment[16]	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
241-ER-151, 241-ER-151 Diversion Box	200-IS-1	-	0.21
241-ER-152, 241-ER-152 Diversion Box	200-IS-1	-	0.06
241-ER-153, 241-ER-153 Diversion Box	200-PO-3	-	0.01
241-EW-151, 241-EW-151 Vent Station Catch Tank, 241-EW-151 Vent Station, Vent Station, 200 Area East-West Vent Station	200-IS-1	-	1.22
241-S-151, 241-S-151 Diversion Box	200-RO-4	-	0.68
241-S-152, 241-S-152 Diversion Box	200-RO-4	-	0.00
241-S-302A, 241-S-302-A Catch Tank, IMUST, Inactive Miscellaneous Underground Storage Tank	200-RO-4	-	0.02
241-S-302B, 241-S-302-B Catch Tank, IMUST, Inactive Miscellaneous Underground Storage Tank	200-RO-4	-	0.01
241-S-304, 241-S-304 Catch Tank	200-RO-4	-	0.00
241-S-A, 241-S-A Valve Pit, 241-S-A Diversion Box	200-RO-4	-	0.00
241-S-B, 241-S-B Valve Pit, 241-S-B Diversion Box	200-RO-4	-	0.00
241-S-C, 241-S-C Valve Pit, 241-S-C Diversion Box	200-RO-4	-	0.00

Tanks and Ancillary Equipment[16]	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
241-S-D, 241-S-D Valve Pit, 241-S-D Diversion Box	200-RO-4	-	0.00
241-SX-151, 241-SX-151 Diversion Box	200-RO-4	-	0.02
241-SX-152, 241-SX-152 Diversion Box, 241-SX-152 Transfer Box	200-RO-4	-	0.01
241-SX-302, 241-SX-302 Catch Tank, SX-304, IMUST, Inactive Miscellaneous Underground Storage Tank	200-IS-1	-	0.32
241-SX-401, 241-SX-401 Condenser Shielding Building, 241-SX-401 Waste Disposal Condenser House	200-RO-4	-	0.02
241-SX-402, 241-SX-402 Condenser Shielding Building, 241-SX-402 Waste Disposal Condenser House	200-RO-4	-	0.02
241-SX-A, 241-SX-A Diversion Box	200-RO-4	-	0.00
241-SX-B, 241-SX-B Diversion Box	200-RO-4	-	0.00
241-SY-A, 241-SY-A Diversion Box, 241-SY-A Valve Pit	200-RO-4	-	0.00
241-SY-B, 241-SY-B Diversion Box, 241-SY-B Valve Pit	200-RO-4	-	0.00
241-TX-152, 241-TX-152 Diversion Box	200-IS-1	-	0.00
241-TX-153, 241-TX-153 Diversion Box	200-TP-5	-	0.07
241-TX-155, 241-TX-155 Diversion Box	200-IS-1	-	0.06

Tanks and Ancillary Equipment[16]	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
241-TX-302A, 241-TX-302-A Catch Tank, IMUST, Inactive Miscellaneous Underground Storage Tank	200-TP-5	-	0.01
241-TX-302B, 241-TX-302-B Catch Tank, IMUST, Inactive Miscellaneous Underground Storage Tank	200-IS-1	-	0.08
241-TX-302BR, 241-TX-302BR Catch Tank, 241-TXR-302BR, IMUST, Inactive Miscellaneous Underground Storage Tank	200-IS-1	-	0.06
241-TX-302XB, 241-TX-302B Catch Tank, 241-TX-302-X, 241-TX-302-X (B), IMUST, Inactive Miscellaneous Underground Storage Tank	200- TP-5	-	0.74
241-TXR-151, 241-TXR-151 Diversion Box	200-TP-5	-	0.06
241-TXR-152, 241-TXR-152 Diversion Box	200-TP-5	-	0.04
241-TXR-153, 241-TXR-153 Diversion Box	200-TP-5	-	0.05
241-TY-153, 241-TY-153 Diversion Box	200-TP-5	-	0.05
241-TY-302A, 241-TY-302-A Catch Tank, IMUST, Inactive Miscellaneous Underground Storage Tank	200-TP-5	-	0.03
241-TY-302B, 241-TY-302-B Catch Tank, IMUST, Inactive Miscellaneous Underground Storage Tank	200-TP-5	-	0.03
241-U-151, 241-U-151 Diversion Box	200-IS-1	-	0.01

Tanks and Ancillary Equipment[16]	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
241-U-152, 241-U-152 Diversion Box	200-IS-1	-	0.01
241-U-153, 241-U-153 Diversion Box	200-UP-3	-	0.01
241-U-252, 241-U-252 Diversion Box	200-UP-3	-	0.01
241-U-301, 241-U-301B	200-UP-3	-	0.01
241-U-A, 241-U-A Diversion Box, 241-U-A Valve Pit	200-UP-3	-	0.00
241-U-B, 241-U-B Diversion Box, 241-U-B Valve Pit	200-UP-3	-	0.00
241-U-C, 241-U-C Diversion Box, 241-U-C Valve Pit	200-UP-3	-	0.00
241-U-D, 241-U-D Diversion Box, 241-U-D Valve Pit	200-UP-3	-	0.00
241-UR-151, 241-UR-151 Diversion Box	200-UP-3	-	0.40
241-UR-152, 241-UR-152 Diversion Box	200-UP-3	-	0.04
241-UR-153, 241-UR-153 Diversion Box	200-UP-3	-	0.04
241-UR-154, 241-UR-154 Diversion Box	200-UP-3	-	0.04
241-WR VAULT, 241-WR Vault (Tanks -001 through -009), 241-WR-01 thru 09, 241-WR Diversion Station Vault, 244-WR Vault, 296-U-6 Stack, IMUST, Inactive Miscellaneous Underground Storage Tank	200-IS-1	-	10.77

Tanks and Ancillary Equipment[16]	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
242-B-151, 242-B Evaporator Building Diversion Box	200-BP-7	-	0.00
242-T, 242-T Evaporator Facility, 241-T Evaporator	200-TP-5	-	1.24
242-T-135, IMUST, Inactive Miscellaneous Underground Storage Tank	200-TP-5	-	0.00
242-T-151, 242-T-151 Diversion Box	200-TP-5	-	0.00
242-TA-R1, 242-TA, Receiver TK-Vault, 242-TA Receiver Tank Vault, Z Waste, Receiver Tank TK-R1, IMUST, Inactive Miscellaneous Underground Storage Tank	200-TP-5	-	0.58
244-A DCRT, 244-A Double-Contained Receiver Tank, 244-A RT, 244-A Receiver Tank, 244-A-TK/SMP	200-PO-3	-	0.02
244-A LS, 244-A Lift Station, 244-AR Lift Station, 244-AR LS	200-PO-3	-	0.00
244-AR VAULT, 244-AR Vault	200-PO-3	-	0.19
244-BX DCRT, 244-BX Double-Contained Receiver Tank, 244-BX RT, 244-BX Receiver Tank, 244-BX-TK/SMP, 244-BX Receiver Vault,	200-BP-7	-	0.17
244-BXR VAULT, 244-BXR Vault, 244-BXR Receiving Vault. (Subsites 244-BXR-001, 244-BXR-002, 244-BXR-003, 244-BXR-011), IMUST, Inactive Miscellaneous Underground Storage Tank	200-BP-7	-	6.16

Tanks and Ancillary Equipment[16]	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
Subtotal		-	33

Other 200 Area[17]	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g[18]
216-N-4, 216-N-2, 216-N-4 Swamp, 212-P Swamp	200-CW-3	-	4.53
216-N-6, 212-R Swamp, 216-N-6 Swamp	200-CW-3	-	2.09
216-B-10A, 222-B-1 Crib, 216-B-10 Crib, 292-B	200-LW-2	-	0.55
216-B-2-1, 216-B-1, B Swamp Ditch, 216-B-2, B Ditch	200-MG-1	-	59.48
200-W-92, Contaminated Mound of Soil and Debris, Soil Mound West of 241-TY Tank Farm	200-MG-1	-	0.89
200-W-94, Contaminated Soil at 241-TX/TY Tank Farm	200-TP-5	-	15.38
200-W-95, Contaminated Soil at 241-U Tank Farm	200-UP-3	-	5.96
216-A-22, 216-A-22 French Drain, 216-A-22 Crib	200-MG-2	-	0.61
216-C-7, 216-C-7 Crib	200-MG-1	-	0.93
216-U-4A, 216-U-4 Reverse Well/4a French Drain, 216-U-4 Dry Well	200-UW-1	-	0.00
216-U-4B, 216-U-4B Dry Well, 216-U-4B French Drain	200-UW-1	-	0.00
216-U-5, 216-U-4, 221-U Cold U Trench #2	200-UW-1	-	0.02

17 Estimates prepared by Don LaRue
18 Transuranic waste concentration is based on estimated plutonium concentration

Other 200 Area[17]	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g[18]
216-U-7, 221-U Counting Box French Drain, 221-U Vessel Vent Blower Pit French Drain	200-MG-2	-	0.00
241-U-361, 241-U-361 Settling Tank, 361-U-TANK, IMUST, Inactive Miscellaneous Underground Storage Tank	200-UW-1	-	0.28
2704-C-WS-1, 2704-C French Drain, Gatehouse French Drain	200-MG-2	-	0.00
UPR-200-W-33, Ground Contamination at 224-U, UN-200-W-33	200-UW-1	-	0.00
Subtotal		-	91

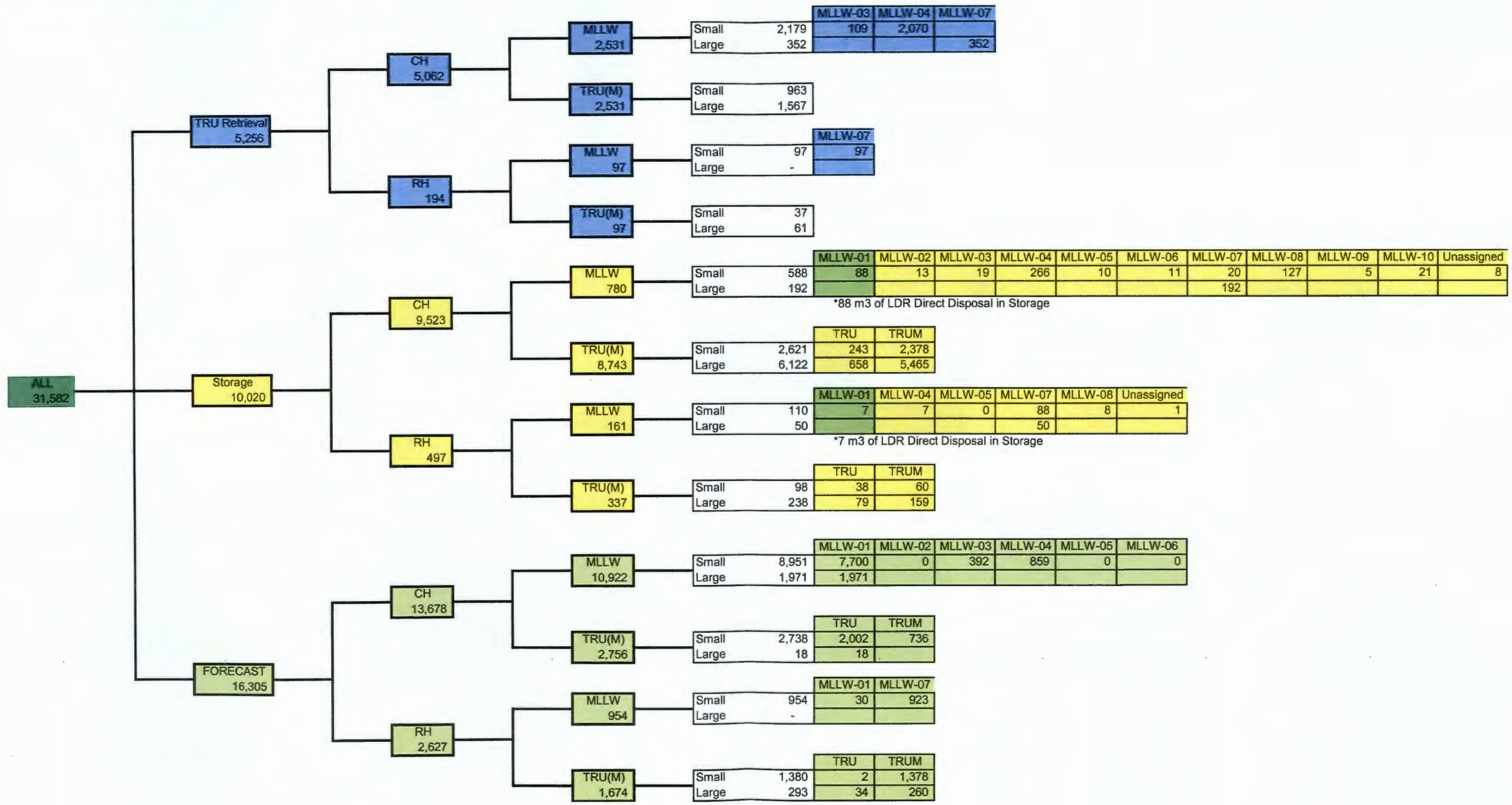
300 Area	Operable Unit	Area (acres)	Estimated Volume (m^3)
			Potential Amount of Material Greater than 100 nCi of Transuranic Constituents/g
Operable Unit 300-FF-2[19]	TBD	TBD	TBD
Subtotal		TBD	72

19 325 and 331 complexes are currently scheduled to remain operational through at least 2025. These facilities, included in EE/CA #3 for the 300 Area, have been removed from the associated Action Memorandum due to the long term operational status of these facilities

APPENDIX D

TREE CHART OF THE WASTE REQUIRING PROCESSING

TREE CHART (volumes in cubic meters)



TREE CHART ASSUMPTIONS:

- Waste forecast are through 2035. Future forecasts will be through 2050
- Transuranic Waste Retrieval/Storage Data taken from SWITS run dated January 8, 2009
- Forecast Data taken from SWIFT 2009.0 (excludes 1st quarter FY 2009)
- 5,365 m^3 of RH Waste from Tank Closure contractor is not included
- Large/Small Definitions are dependent on waste type:
  1. TRU(M) Small is 55-gallon drums, containers smaller than a 55-gallon drum, 85-gallon over-packs, and SWBs
  2. TRU(M) Large is non-small containers
  3. MLLW Small is containers with a volume of less than 10 cubic meters
  4. MLLW Large is containers with a volume of more than 10 cubic meters
- Rules for re-assigning packages listed as CH in SWITS as RH are:
  1. Containers with a dose rate of >200 mR/hr
  2. Containers containing shielding
  3. Containers with greater than 0.25 curies of cesium-137
- Assumes all MLLW reclassified as RH is MLLW-07
- Waste marked as LLW TSCA is not included in the MLLW volumes
- 50% of RSW is assumed to be MLLW
- Assumes 50 percent (by volume) of the RSW RH containers are transuranic waste and 50 percent are MLLW
- Assumes 75 percent (by volume) of the RSW CH large containers are TRU(M) waste and 25 percent are MLLW
- Assumes MLLW/transuranic waste split in RSW CH small containers results in an overall 50/50 MLLW/transuranic waste split by volume for RSW
- Assumes 95% of the CH MLLW small portion from TRU(M) Retrieval is MLLW-04, 5% is MLLW-03
- Containers identified as RINM based on process knowledge and SWITS record information are excluded from RSW volume
- Waste identified as "German Logs" is not included. Includes packages CASTOR-GSF-001, -002, -003, -005, -006, -007, GNS-12-1, and GNS-12-2
- Retrieval and storage numbers include packages without a TSD accept date
- Volumes are internal volumes (e.g., 55-gallon drum is 0.208 m^3 internal waste, 0.257 m^3 external)
- Does not include shipped or already disposed waste

APPENDIX E

MLLW TREATABILITY GROUPS DATA TABLES

Mixed Low-Level Waste Inventory
(Volumes in cubic meters)

CON_LOCN_FACIL_ID	MLLW-01	MLLW-02	MLLW-03	MLLW-04	MLLW-05	MLLW-06	MLLW-07	MLLW-08	MLLW-09	MLLW-10	Unassigned	Grand Total
214T		0.4					0.2	0.2				0.8
218W4B											1.1	1.1
218W4C			1.0	44.5							0.2	45.7
218W5	59.5			0.2				5.8			3.8	69.3
221T	13.6			35.5	8.4		8.4				3.8	65.6
2336W			0.2	2.7				0.2			0.2	3.4
2402WB	1.2						0.4	19.9				21.6
2402WC		0.5		0.4			1.9	22.2				25.0
2402WD		0.8		0.2		0.4	0.2	1.7				3.3
2402WE	0.2	2.5	0.4	0.8	2.3	0.2		7.3	0.8			14.4
2402WH	0.2	0.4		0.8			1.0	1.0	0.8			4.2
2402WJ			0.2	0.2		0.4	0.4	1.7	3.1			6.0
2403WA				9.0								9.0
2403WB	7.0		0.2	8.8			50.1	22.4				86.5
2403WC	3.1	2.1	0.3	2.1	0.4	2.9	40.2	8.9				59.9
2403WD	10.2	5.4	14.7	100.3	0.8	7.0	112.7	11.1	0.2			262.5
2404WA		0.2	1.2	1.7			0.2	23.7				27.0
2404WB	0.2			42.7	0.2			2.9	0.2			46.2
2404WC			0.4	21.2								21.6
243T	0.4	0.2		1.3								1.9
2706T							0.3					0.3
277T	0.2											0.2
AMW1										5.4		5.4
AMW2						0.2				3.3		3.5
AMW3										8.4		8.4
AMW4										4.3		4.3
CWC				21.2			114.9					136.0
FS01				0.2			0.8					0.8
FS04								0.4				0.4
FS06								0.2				0.2
FS07				0.2				0.2				0.4
FS08								0.8				0.8
FS09				0.1								0.1
FS12				0.2								0.2
FS18						0.0						0.0
FS20			0.2					0.2				0.4
FS21				0.2				0.2				0.4
FS23		0.2					0.2	2.5				2.9
FS24								0.6				0.6
Grand Total	95.8	12.8	18.9	292.1	10.1	11.2	329.8	134.2	5.2	21.4	9.2	940.7

Note: Unassigned waste volumes include waste in process at the time of the annual inventory.

Mixed Low-Level Waste Inventory
(Container Count)

CON_LOCN_FACIL_ID	MLLW-01	MLLW-02	MLLW-03	MLLW-04	MLLW-05	MLLW-06	MLLW-07	MLLW-08	MLLW-09	MLLW-10	Unassigned	Grand Total
214T		2					1	1				4
218W4B											1	1
218W4C			3	8							1	12
218W5	113			1				2			2	118
221T	3			6	1		1				3	14
2336W			1	14				1			1	17
2402WB	6						2	94				102
2402WC		2		2			1	105				110
2402WD		4		1		2	1	8				16
2402WE	1	12	2	3	11	1		35	4			69
2402WH	1	2		3			5	5	4			20
2402WJ			1	1		2	2	8	15			29
2403WA				43								43
2403WB	4		1	8			8	3				22
2403WC	15	10	1	10	2	15	13	13				79
2403WD	49	25	58	441	4	34	65	53	1			730
2404WA		1	6	8			1	114				130
2404WB	1			204	1			14	1			221
2404WC			2	101								103
243T	2	1		6								9
2706T							1					1
277T	1											1
AMW1										1		1
AMW2						1				16		17
AMW3										2		2
AMW4										21		21
CWC				3			10					13
FS01				1			3					4
FS04								2				2
FS06								1				1
FS07				1				1				2
FS08								4				4
FS09				1								1
FS12				1								1
FS18						1						1
FS20			1					1				2
FS21				1				1				2
FS23		1					1	12				14
FS24								3				3
Grand Total	196	60	76	866	19	56	115	481	25	40	8	1942

Mixed Low-Level Waste Forecast
(Volumes in cubic meters)

WG_NAME	MLLW-01	MLLW-02	MLLW-03	MLLW-04	MLLW-05	MLLW-06	MLLW-07	Grand Total
Ground Water Monitoring				12.9				12.9
Hanford Site Operations (Infrastructure)	0.2	0.2	0.5		0.2			1.1
K-Basins and Cold Vacuum Drying Facility			0.0			0.0		0.0
Lawrence Berkeley Laboratory	2.0							2.0
Liquid Waste Processing Facilities, 200 Area			31.8					31.8
Pacific Northwest National Laboratory	160.8							160.8
T Plant Operations, 221-T/2706-T			4.5	89.7				94.1
Tank Closure	2986.4						172.8	3159.2
U Plant			0.8		0.3			0.9
Waste Encapsulation & Storage Facility				0.1				0.1
Waste Receiving and Processing Facility, 2336-W			4.3					4.3
Waste Sampling & Characterization Facility, 6266			258.8					258.8
Waste Treatment Plant - Operations	6551.6		91.1	756.5			750.7	8149.8
Grand Total	9701.0	0.2	391.6	859.2	0.5	0.0	923.5	11876.0

Mixed Low-Level Waste Forecast
(Container Count)

WG_NAME	MLLW-01	MLLW-02	MLLW-03	MLLW-04	MLLW-05	MLLW-06	MLLW-07	Grand Total
Ground Water Monitoring				57				57
Hanford Site Operations (Infrastructure)	1	1	2		1			5
K-Basins and Cold Vacuum Drying Facility			1			1		2
Lawrence Berkeley Laboratory	10							10
Liquid Waste Processing Facilities, 200 Area			12					12
Pacific Northwest National Laboratory	506							506
T Plant Operations, 221-T/2706-T			7	162				169
Tank Closure	719						24	743
U Plant			3		1			4
Waste Encapsulation & Storage Facility				5				5
Waste Receiving and Processing Facility, 2336-W			19					19
Waste Sampling & Characterization Facility, 6266			1140					1140
Waste Treatment Plant - Operations	15183		1113	3324			1314	20934
Grand Total	16419	1	2297	3547	2	1	1338	23606

APPENDIX F

TRANSURANIC WASTE TREATABILITY GROUPS DATA TABLES

Transuranic Waste Inventory
(Volumes in cubic meters)

	CH TRU		CH TRUM		RH TRU		RH TRUM	
CON_LOCN_FACIL_ID	Small	Large	Small	Large	Small	Large	Small	Large
218W3AE					4.2	50.1		
221T	0.2	27.5	1.5	6.9		9.0	1.0	9.0
2336W	1.0	0.5	14.2	10.9				
2402W			72.2					
2402WC			0.6					
2402WD	0.6	6.5	0.2	38.3			0.2	0.3
2402WE	0.2		8.5	4.4				
2402WH			0.2	0.2			0.2	
2402WI		0.8		1.7	0.2	0.3		
2402WJ			9.8	10.5				
2402WK	1.2		3.3					
2402WL	68.7		1.5			0.6		0.4
2403WA	7.7	2.0	48.3	444.7	0.8	3.9	1.7	10.6
2403WB	1.0	166.4	8.0	1069.9		18.9	21.6	31.1
2403WC	10.6	76.4	143.5	108.2	5.4	1.9	5.6	21.4
2403WD	51.7	164.0	104.5	122.3	18.3	7.7	5.7	14.6
2404WA	34.2	5.0	207.1	19.3	12.3		19.9	62.0
2404WB	25.8	1.8	212.1	187.5	0.6	0.3	1.5	
2404WC	17.1	0.8	24.0	188.6			1.5	
2706T	1.0	0.6	2.5	50.6			0.8	
CWC		217.5		4143.1		36.3		10.1
FS05			0.6					
FS06			0.2					
FS11				0.5				
FS14				0.2				
FS20	0.2		0.4	1.0				
FS21				0.6				
FS23				0.3				
FS25			0.4					
243T		3.8	1.9	38.9			0.8	
Grand Total	221.4	673.6	865.6	6448.7	41.8	129.1	60.5	159.5

Transuranic Waste Inventory
(Container Count)

	CH TRU		CH TRUM		RH TRU		RH TRUM	
CON_LOCN_FACIL_ID	Small	Large	Small	Large	Small	Large	Small	Large
218W3AE					20	35		
221T	1	7	7	33		1	5	2
2336W	5	2	68	37				
2402W			344					
2402WC			3					
2402WD	3	6	1	26			1	1
2402WE	1		41	21				
2402WH			1	1			1	
2402WI		4		8	1	1		
2402WJ			47	11				
2402WK	6		8					
2402WL	330		7			2		1
2403WA	37	9	232	1905	4	12	8	33
2403WB	5	22	38	216		5	12	36
2403WC	51	15	689	361	27	7	27	10
2403WD	57	41	357	286	137	2	12	12
2404WA	164	20	986	17	59		95	12
2404WB	124	8	1016	900	3	1	7	
2404WC	36	4	92	818			7	
243T		3	9	187			4	
2706T	5	2	12	74			4	
CWC		6		117		1		1
FS05			3					
FS06			1					
FS11				2				
FS14				1				
FS20	1		2	3				
FS21				3				
FS23				1				
FS25			2					
Grand Total	826	149	3966	5028	251	67	183	108

Transuranic Waste Forecast
(Volumes in cubic meters)

	CH_TRU		CH_TRUM	RH_TRU		RH_TRUM		Grand Total
WG_NAME	Small	Large	Small	Small	Large	Small	Large	
618-10/11 Burial Grounds			219.8			841.7		1061.5
Balance of Sludge					33.8			33.8
Fast Flux Test Facility	0.0							0.0
Ground Water Monitoring			17.0					17.0
K-Basins and Cold Vacuum Drying Facility		17.5			0.0	0.0		17.5
Pacific Northwest National Laboratory	35.1		9.3	2.1		0.8		47.3
Plutonium Finishing Plant, 234-5 Z	1897.9							1897.9
River Corridor Closure Contract			66.6				0.9	67.5
T Plant Operations, 221-T/2706-T			66.5					66.5
Tank Closure			357.0				258.6	615.6
Waste Receiving and Processing Facility, 2336-W	69.0							69.0
Waste Treatment Plant - Operations						535.7		535.7
Grand Total	2002.0	17.5	736.2	2.1	33.8	1378.3	259.5	4429.5

Transuranic Waste Forecast
(Container Count)

	CH_TRU		CH_TRUM	RH_TRU		RH_TRUM		Grand Total
WG_NAME	Small	Large	Small	Small	Large	Small	Large	
618-10/11 Burial Grounds			885			3708		4593
Balance of Sludge					30			30
Fast Flux Test Facility	0							0
Ground Water Monitoring			75					75
K-Basins and Cold Vacuum Drying Facility		2			0	0		2
Pacific Northwest National Laboratory	134		41	98		39		312
Plutonium Finishing Plant, 234-5 Z	7550							7550
River Corridor Closure Contract			37				1	38
T Plant Operations, 221-T/2706-T			293					293
Tank Closure			1572				72	1644
Waste Receiving and Processing Facility, 2336-W	304							304
Waste Treatment Plant - Operations						2360		2360
Grand Total	7988	2	2903	98	30	6107	73	17201

APPENDIX G

NUMBER OF CONTAINERS AND VOLUMES

Volume (in cubic meters) by Container Type

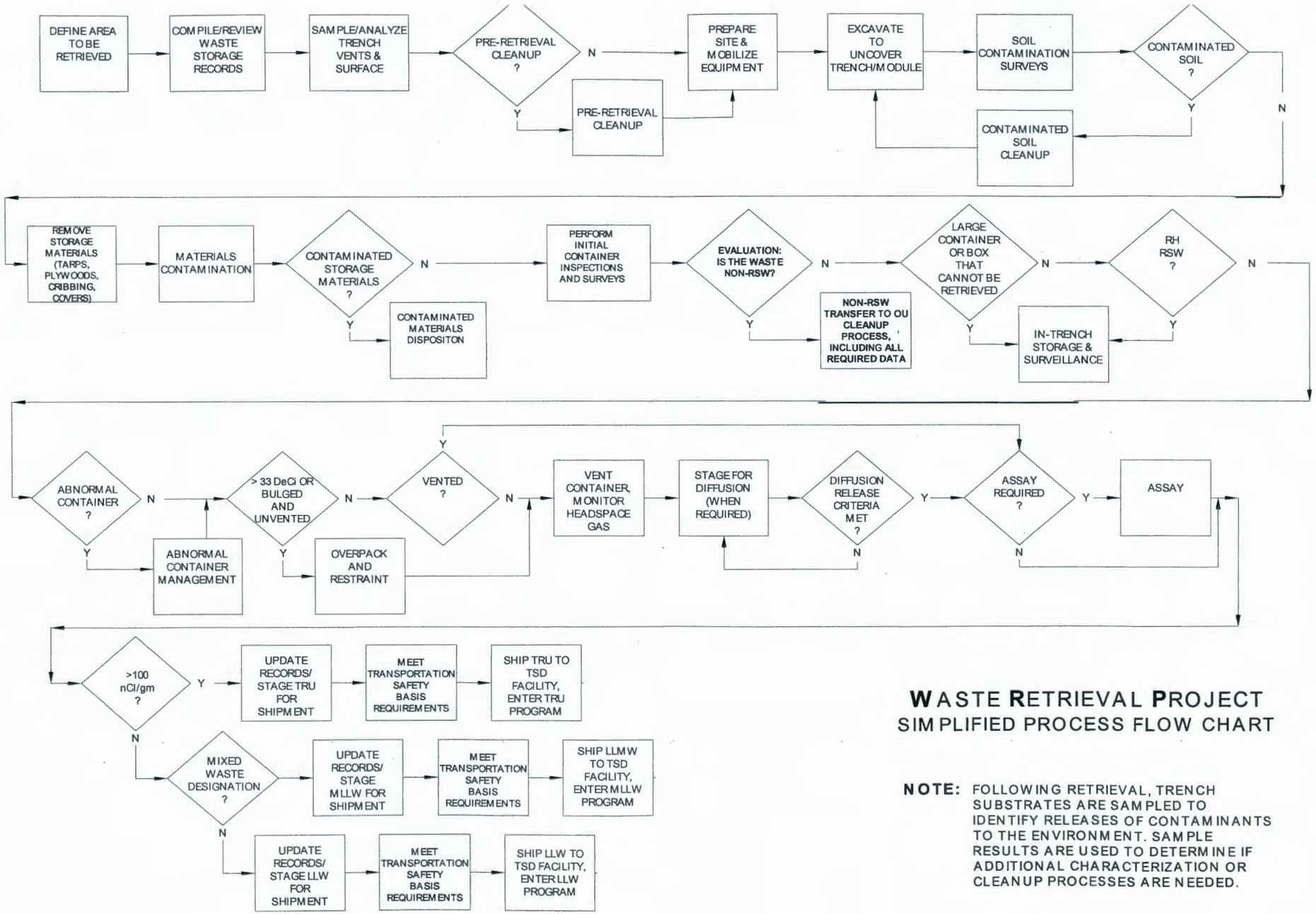
CON_RAD_CD	TC_LVL1	Modified Handling	Size Group	5320 CASK	BURLAP, CLOTH, PAPER OR PLASTIC BAGS, WRAP	CONCRETE BOXES	CONCRETE CYLINDERS, CASKS	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	GLOVE BOXES	HEPA FILTERS	ION EXCHANGE COLUMNS	METAL CYLINDER, CASKS	METAL DRUMS, BARRELS, KEGS	METAL, CONTAINERS	MISC. SMALL METAL CONTAINERS	MISCELLANEOUS SCRAP	OAK RIDGE CONCRETE VAULT	SELF CONTAINED, EQUIPMENT	SPECIAL CONFIGURATION CONTAINER	TANKS, PORTABLE	TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	WOODEN BOXES, CARTONS, CASES	Grand Total
TRU	STORAGE	CH	>10 m3						3433.8						1202.2			14.9						4650.8
			SWB < x < 10 m3				9.3		47.1				9.0		1312.7					21.9	17.0			1417.0
			55 Gal < x < SWB			1.5								995.3	57.6									1054.4
			55 Gallon											989.6										989.6
			SWB												97.2									97.2
			<55 Gallon	0.1																				0.1
		RH	>10 m3			10.1									36.3									46.4
			SWB < x < 10 m3										9.0		116.4								8.7	134.1
			55 Gal < x < SWB											30.7	27.3									58.0
			55 Gallon											69.5										69.5
			SWB												28.8									28.8
	RETRIEVAL	CH	>10 m3			94.2	13.1		1231.4	25.5					265.5						15.6			1645.2
			SWB < x < 10 m3			17.9			87.4	31.3		2.2			171.8				8.2		8.5		35.3	362.6
			55 Gal < x < SWB		0.3	8.5				4.0	12.5			32.6	31.3		2.0		6.3		1.0			98.6
			55 Gallon											3159.6										3159.6
			<55 Gallon					2.9						10.5			0.8		0.0		1.1			15.3
		RH	SWB < x < 10 m3			5.4			19.0		7.1		68.0		6.0								24.9	130.4
			55 Gal < x < SWB			9.9		1.0					50.7	0.3	1.5							0.7		64.1
			55 Gallon											30.0										30.0
			<55 Gallon					0.4						1.9		21.6	0.2		0.1					24.1
TRU Total				0.1	0.3	147.6	22.4	4.3	4818.7	60.8	19.6	2.2	136.7	5319.9	3354.5	21.6	3.0	14.9	14.5	21.9	43.2	0.7	68.9	14075.7
LLW	STORAGE	CH	>10 m3						58.0						134.5									192.5
			SWB < x < 10 m3		5.8				8.4						171.9								7.3	193.4
			55 Gal < x < SWB								1.0			100.6	14.5					6.8	3.8			126.8
			55 Gallon											266.5										266.5
			<55 Gallon											0.9										0.9
		RH	>10 m3												50.1									50.1
			SWB < x < 10 m3			9.5									79.0									88.4
			55 Gal < x < SWB		1.1								0.3	1.5	2.2									5.2
			55 Gallon											16.8										16.8
LLW Total					6.9	9.5			66.4		1.0		0.3	386.4	452.3					6.8	3.8		7.3	940.7
Grand Total				0.1	7.2	157.1	22.4	4.3	4885.1	60.8	20.6	2.2	137.0	5706.3	3806.8	21.6	3.0	14.9	14.5	28.8	47.0	0.7	76.2	15016.4

Number of Containers by Type

CON_RAD_CD	TC_LVL1	Modified Handling	Size Group	5320 CASK	BURLAP, CLOTH, PAPER OR PLASTIC BAGS, WRAP	CONCRETE BOXES	CONCRETE CYLINDERS, CASKS	FIBERBOARD/PLASTIC BOXES, CARTONS, CASES	FIBERGLASS REINFORCED PLYWOOD (FRP) BOXES	GLOVE BOXES	HEPA FILTERS	ION EXCHANGE COLUMNS	METAL CYLINDER, CASKS	METAL DRUMS, BARRELS, KEGS	METAL, CONTAINERS	MISC. SMALL METAL CONTAINERS	MISCELLANEOUS SCRAP	OAK RIDGE CONCRETE VAULT	SELF CONTAINED, EQUIPMENT	SPECIAL CONFIGURATION CONTAINER	TANKS, PORTABLE	TRUCKS, FLATBEDS, COMPACTOR, LOADLUGGER	WOODEN BOXES, CARTONS, CASES	Grand Total
TRU	STORAGE	CH	>10 m3						86						50			1						137
			SWB < x < 10 m3				2		6				1		228					13	6			256
			55 Gal < x < SWB			2								4740	41									4783
			55 Gallon											4737										4737
			SWB												54									54
			<55 Gallon	1																				1
		RH	>10 m3			1									1									2
			SWB < x < 10 m3										1		22								1	24
			55 Gal < x < SWB											96	18									114
			55 Gallon											399										399
			SWB												16									16
	RETRIEVAL	CH	>10 m3			2	1		27	1					17						1			49
			SWB < x < 10 m3			3			26	8		1			35				2		1		8	84
			55 Gal < x < SWB		1	14				7	18			121	51		2		6		1			221
			55 Gallon											15048										15048
			<55 Gallon					23						93			13		1		6			136
		RH	SWB < x < 10 m3			3			6		1		11		3								13	37
			55 Gal < x < SWB			13		1					36	1	1							1		53
			55 Gallon											143										143
			<55 Gallon					3						142		5372	17		6					5540
TRU Total				1	1	38	3	27	151	16	19	1	49	25520	537	5372	32	1	15	13	15	1	22	31834
LLW	STORAGE	CH	>10 m3						5						7									12
			SWB < x < 10 m3		2				1						32								2	37
			55 Gal < x < SWB								1			467	11					6	3			488
			55 Gallon											1281										1281
			<55 Gallon											13										13
		RH	>10 m3												4									4
			SWB < x < 10 m3			3									13									16
			55 Gal < x < SWB		1								1	6	2									10
			55 Gallon											81										81
LLW Total					3	3			6		1		1	1848	69					6	3		2	1942
Grand Total				1	4	41	3	27	157	16	20	1	50	27368	606	5372	32	1	15	19	18	1	24	33776

APPENDIX H

WASTE RETRIEVAL PROCESS FLOW CHART & PROCESS OVERVIEW AND NEXT GENERATION RETRIEVAL CONCEPT



WASTE RETRIEVAL PROJECT
SIMPLIFIED PROCESS FLOW CHART

NOTE: FOLLOWING RETRIEVAL, TRENCH SUBSTRATES ARE SAMPLED TO IDENTIFY RELEASES OF CONTAMINANTS TO THE ENVIRONMENT. SAMPLE RESULTS ARE USED TO DETERMINE IF ADDITIONAL CHARACTERIZATION OR CLEANUP PROCESSES ARE NEEDED.

WASTE RETRIEVAL PROCESS OVERVIEW

Retrieval end-points are identified and estimates of the waste volumes to be generated by the project are summarized. Some process steps may be performed in a different order or in combination with other steps as determined by site-specific conditions. For example, retrieved drums may be non-destructively assayed prior to venting in some instances to balance and expedite the overall processing schedule. Also, some steps such as trench excavation may be performed iteratively to provide improved access and safety of container recovery operations. Nonetheless, the flow chart depicts the general process used to retrieve CH RSW from each of the suspect transuranic waste storage trenches. A description of each activity and decision point follows:

Define Area to be Retrieved – The project team maintains a production plan including the locations and rates of future retrieval operations based on achieving the M-91-40 enforceable milestones. Production plans are frequently updated to respond to changing site conditions and other performance risks, and to respond to the needs of downstream waste disposition programs such as the TRU Program or Mixed Waste Treatment Program. Authorizations, including nuclear facility safety basis requirements, facility startup requirements, air permits, etc. must be in place before work may be performed in each location. Support facility needs are determined. Work planning is initiated.

Compile/Review Waste Storage Records – Archived waste storage records are reviewed for each container or waste stream to be retrieved. The records are researched to identify special safety or handling requirements and to begin the waste designation process. The processes of the waste generating facility are reviewed or personnel familiar with the targeted waste stream are interviewed to gather additional information. Data packages are developed for use by retrieval personnel and by waste disposition programs.

Sample/Analysis Trench Vents & Surface – As retrieval proceeds, the M-91-40 requires that burial ground vents and substrate be sampled and analyzed after retrieval to determine whether or not releases of contaminants to the environment have occurred. A Sample and Analysis Plan must be submitted and approved, and results documented and transmitted to the regulators. In addition, chemical and radiation surveys are conducted of the trench surface to identify worker industrial hygiene or radiological concerns that must be addressed prior to initiation of retrieval.

Pre-Retrieval Cleanup Decision – The results of burial ground vent/substrate sample analysis and trench surface field surveys are reviewed to determine if additional cleanup work is required. The objective of additional cleanup is to remove hazards prior to safely performing retrieval operations, or to address a newly discovered contamination release that posses a threat to human health and the environment. Information about a newly discovered contamination release is communicated to regulatory agencies and other affected cleanup programs.

Pre-Retrieval Cleanup – Common pre-retrieval cleanup issues include radiological or volatile organic compound releases from historic burial ground operations. Minor surface contamination cleanup is typically resolved by removal of contaminated soils, packaging, and disposition as secondary waste utilizing facility operation authorities and procedures. Cleanup objectives are established to protect worker safety and health during retrieval operations. Response actions for a newly discovered contamination release that posses a threat to human health and the environment are coordinated with effected programs that have remediation responsibilities, e.g., Groundwater Protection, CERCLA cleanup. The authority, objectives, and approach to perform cleanup of releases to the environment are

negotiated with regulatory agencies. Secondary waste generated by pre-retrieval cleanup is documented, designated, staged, and transferred to a TSD facility for final disposition.

Prepare Site and Mobilize Equipment – Retrieval equipment, support facilities, and personnel are mobilized to the retrieval site(s). Support utilities and services are provided, and access control is established. Readiness activities are completed and operation startup is performed. Site clearing is completed to access retrieval trenches.

Excavate to Uncover Trench/Module – Overburden soil is removed to access trenches. Conventional construction equipment including excavators, front-end loaders, and dump trucks are typically utilized and operated using procedures that minimize the potential of damaging waste containers or spreading contamination. Excavation continues to access the specific storage module where containers will be retrieved. Incidental excavation may occur to support placement of support structures, construct storage pads, or other operational needs. Excess soils are hauled to spoil piles or used as backfill materials. Excavation activities may include trench sidewall stability features, (e.g., shoring), etc.

Soil Contamination Surveys – Chemical and radiological monitoring is performed during the excavation of trench/module overburden materials. Survey plans are developed, based on historical information about contamination levels and any information derived from pre-retrieval sample/analysis of trench vents/substrate and surface surveys.

Contaminated Soil Decision – Soil contamination survey data is evaluated to determine whether or not any overburden material is contaminated and must be segregated and managed as secondary waste.

Contaminated Soil Cleanup – Small volumes of contaminated soil that are identified during trench/ module excavation are segregated, packaged, a waste designation is completed (note: this may require sampling/analysis), and the secondary waste is transferred to an appropriate TSD facility for treatment/disposal. In the event that a large release to the environment is identified, a response action is followed similar to that described under Pre-Retrieval Cleanup for a contamination release that poses a threat to human health and the environment.

Remove Storage Materials – Various storage configurations were used during the period in which RSW was placed in the LLBG. Some configurations utilized storage materials including tarps, plywood, cribbing, metal cover, etc. to facilitate the safe placement of RSW and/or to improve the effectiveness of long-term storage. The removal of common storage materials such as plywood between container storage levels or tarp covers is integrated into retrieval operations procedures. The removal of storage materials that could impact the structural integrity of containers or the safety of workers such as pilings, cribbing, metal covers, etc. requires the development of engineered demolition and/or hoisting and rigging plans. Excavation is often necessary during the removal process to facilitate access.

Materials Contamination Surveys – Chemical and radiological monitoring is performed during the removal of storage materials. Survey plans are developed based on known or anticipated contamination levels within the trench/module.

Contaminated Storage Materials Decision – Storage materials contamination survey data are evaluated to determine whether or not any of the materials are contaminated and must be segregated and managed as secondary waste.

Contaminated Storage Materials Disposition – Contaminated storage materials are segregated, packaged, a waste determination is completed (note: this may require sampling/analysis), and the secondary waste is transferred to an appropriate TSD facility for treatment/disposal.

Perform Initial Container Inspection & Surveys – An initial inspection of the uncovered RSW containers is performed. Radcon/IH surveys are completed to identify contamination and radiological dose rate information. Container integrity is evaluated to determine if structural repairs or special handling is needed to facilitate retrieval. Container identification markings (when available) are compared with historical record data packages to identify the container.

Non-Retrievably Stored Waste Decision – Waste with no container or containers that have deteriorated to the point that they cannot be retrieved without posing significant risks to workers, the public or the environment are not considered RSW, (i.e., non-RSW). The extent of non-RSW containers is determined and may include RSW containers below or adjacent to the non-RSW containers that cannot be retrieved without disturbing the non-RSW.

Non-Retrievably Stored Waste Transfer to Cleanup Process – Disposition of non-RSW will be determined through the cleanup process set forth in RCRA, Chapter 70.105 RCW, and/or CERCLA as appropriate.

Large Container or Box That Cannot be Retrieved Decision – Large containers or boxes that are determined to be unsafe for retrieval and/or storage until future processing facilities are available will be left in the trenches, with concurrence from Ecology as specified in M-91-40. These containers must be uncovered, 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 must not indicate the presence of free liquids. The extent of non-retrievable large containers and boxes is determined and may include RSW containers below or adjacent to them that cannot be retrieved without disturbing the large containers and boxes.

In-Trench Storage & Surveillance – Large containers or boxes determined to be non-retrievable will be left in the trenches. Regulatory agencies will be notified and a plan will be developed for the safe storage of the containers in the LLBG including surveillance plans, repairs, over-packing, and/or covers necessary to prevent releases to the environment pending ultimate disposition of the waste.

Remote-Handled Retrievably Stored Waste Decision – RH RSW is not currently being retrieved and may remain in the trenches until future handling capabilities are available. In some circumstances shielding may be used or over-packing to allow handling of RH RSW containers as CH RSW (Note: These containers will be processed as RH).

RH RSW In-Trench Storage & Surveillance – RH RSW that will not be retrieved during the CH retrieval process will be left in the trenches. A plan will be developed for the safe storage of the containers in the LLBG including surveillance plans, repairs, over-packing, and/or covers necessary to prevent releases to the environment.

Abnormal Container Decision – Each waste container is inspected in accordance with safety criteria to determine whether or not it has abnormal conditions (e.g., bulged, breached, heavily corroded). Containers with abnormal conditions are entered into the Abnormal Container Management Program (ACMP).

Abnormal Container Management – Containers placed in the ACMP are evaluated and mitigation actions selected and applied to address the safety hazards of the container (e.g., install bracing fixtures, bagging, over-packing). ACMP containers are tracked until the abnormal condition is remedied. The container is returned to processing after the safety hazards are addressed.

Greater than 33 DE-Ci or Bulged, and Unvented Decision – Waste containers are reviewed to identify containers having high radionuclide inventories (>33 DeCi) or that are bulged AND are unvented. These containers are considered a special safety concern due to the increased potential consequences of a drum deflagration event during venting operations.

Over-pack and Restraint Installed – Waste containers that pose special safety concerns due to high radionuclide inventory or bulging are over-packed and an engineered restraint device is installed. These additional safety features remain on the container until it is vented, and flammable gas diffusion criteria are met.

Vented Decision – Each waste container is inspected to determine whether or not it is vented in accordance with safety criteria. Containers with functioning vent clips or vent filter devices, or that are visibly breached are considered vented.

Vent Container, Monitor Head-Space Gas – Containers that require venting are staged for venting unit operations. Venting is achieved by inserting a nuclear filter device utilizing equipment designed to minimize the potential of igniting any flammable head-space gasses. Techniques include cold drilling, sparkless dart gun, sparkless hole saw drilling, etc. A head-space gas sample is collected at the time of venting to determine initial flammable gas concentrations.

Stage for Diffusion (when required) – Newly vented containers that exceed flammable head-space gas safety criteria are placed in a gas diffusion zone where container movement is minimized. A diffusion period is selected and tracked based on the measured initial gas concentration of the container and factors that control the rate of diffusion, e.g., container type, filter, etc. Containers that do not exceed safety criteria at time of venting are immediately released for further processing.

Diffusion Release Criteria Met Decision – Containers staged for diffusion are reviewed to determine if flammable head-space gas diffusion criteria have been met and the containers can be released for further processing. The determination may be made through re-sampling of the container or through calculated diffusion curves.

Assay Required Decision – Acceptable knowledge data packages from RSW generation/storage records are reviewed to determine if sufficient information exists to designate the waste as transuranic. Containers that cannot conclusively be designated as transuranic waste are assayed to complete the transuranic waste or LLW designation.

Assay – NDA is performed using gamma and/or neutron detection equipment. The data is analyzed and reviewed through the project quality assurance process. Assay data records are generated for use by the waste disposition programs (e.g., TRU Program, LLW Program).

Greater than 100 nCi/g Decision – NDA data, or acceptable knowledge data packages from waste generation/storage records are reviewed to determine if the waste meets the criteria for transuranic waste or LLW designation (i.e., >100 nCi/g = Transuranic waste).

Mixed Waste Designation Decision – Waste generation and storage records for LLW are reviewed to determine if any Washington State dangerous waste codes apply. Waste designations are updated and MLLW is segregated from LLW for further disposition. A receiving TSD facility is determined.

Update Records/Stage TRU Waste or LLW for Shipment – Waste containers are sorted based on transuranic waste vs. LLW designation. Waste container labeling and SWITS database records are updated.

Meet Transportation Safety Basis Requirements – Each waste container is reviewed against transportation requirement documents to determine preparation needs and method of transport from the LLBG. Preparations may include over-packing, placing in shipping containers (e.g., IP-2, install cribbing/blocking materials). Selection of transport method may include road closure plans, selection of conveyance, and scheduling of transportation resources.

Ship TRU Waste to TSD Facility, Enter TRU Program – Retrieved transuranic waste containers are transported to an appropriate TSD facility and enter the TRU Program for further processing and certification for shipment to the WIPP facility for permanent disposal. Transfer to the TRU Program is the WRP end point for CH transuranic waste.

Ship LLW to TSD Facility, Enter LLW Program – Retrieved LLW containers are transported to an appropriate TSD facility and enter the LLW Program for further processing and disposition at an on-site disposal facility selected by the DOE. Transfer to the LLW Program is the WRP end-point for CH LLW.

Ship MLLW to TSD Facility, Enter MLLW Program – Retrieved MLLW containers are transported to an appropriate TSD facility and enter the MLLW Program for further processing and disposition. Transfer to the MLLW Program is the WRP end-point for CH MLLW.

Post-Retrieval Trench Substrate Sampling and Analysis – Following retrieval, trench substrates are sampled to determine whether or not releases of contaminants to the environment have occurred, and if so, the nature and extent of contamination. A sample and analysis plan is developed and submitted to the state for approval prior to sampling. Sampling and analysis results are reported to the state. If contamination is identified a determination is made whether or not follow-on characterization or cleanup response actions are needed.

Assumptions:

1. Retrieval is defined as uncovering CH waste within the trenches and removing the CH waste from the trenches to a permitted and compliant TSD unit, or, for non-mixed waste, to a storage or disposal facility that DOE determines is appropriate.

2. Waste is designated no later than 90 days following transfer from the LLBG.

3. Environmental documents (NEPA, CERCLA, NTCRA, Notice of Compliance [NOC], TAPs, and FHA SB) required to retrieve waste are completed and approved.

4. The requirements of DOE-EIS-0113-SA04, *Supplement Analysis, Waste Retrieval from the 218-W-4C, 218-E-12B, 218-W-3A and 218-W-4B Low-Level Burial Grounds, 200 Area Hanford Site, Richland, Washington*, remain valid for drums and boxes.

5. Where waste designation cannot be made based on Acceptable Knowledge (AK) data, additional activities are performed:
   - Processing at T Plant, WRAP, or future SWPC
   - Transfer between WRAP and T Plant/future SWPC
   - NDE/Linear Detector Array (LDA) analysis at WRAP
   - Sample analysis at 222-S/WSCF
   - Characterization & processing will be performed at T Plant, WRAP, or future SWPC

6. Fiberglass Reinforced Plywood (FRP) boxes and plywood boxes will be evaluated and reinforced as required to be structurally stable to ensure safe lifting, transporting, and long-term storage while exposed to the environment.

7. Plans will be developed to address non-RSW before it is encountered in Waste Retrieval operations.

8. Sampling of non-RSW for use in the 200-SW-2 data collection will be in accordance with the 200-SW-2 Data Quality Objective (DQO) Sampling and Analysis Plan (SAP) or other applicable agreements. Opportunistic sampling may be conducted as appropriate based on the plans and objectives specified in those documents.

9. Drums with greater than 1 g fissile gram equivalent (FGE) transuranic content, based on SWITS records, and drums containing only uranium are handled as transuranic waste and do not have to be assayed.

10. Container movements within a burial ground will be treated as intra-facility transfers and are not subject to DOT criteria.
11. Container management, retrieval, movement and shipment can be accomplished using commercial practices (e.g., wood pallets, standard fuel powered equipment, standard transfer/trailer systems) and associated generally accepted risks.

12. Wastes will normally be designated via process knowledge and burial record information. When process knowledge is not adequate, sampling will be conducted as required.

13. For remaining RSW, 100 percent of the drums will require over-pack. Most RSW boxes will require repair/stabilization or over-packing prior to retrieval.

Next Generation Retrieval Concept

The Next Generation Retrieval concept is a process for the retrieval and treatment of earth-covered, CH suspect transuranic waste containers located in the LLBG using enhanced methods and equipment. Phase I of Next Generation Retrieval includes uncovering and retrieval of waste containers, assay, venting, Non Destructive Evaluation/Radiography and direct loading of drums into SWB's. Next Generation Phase II operations are envisioned to include repacking, shredding, and SWB load-out. The project intent is to bring the Phase I operations online by the end of CY 2009, followed at a later date by the more complex equipment and field modules required to implement the Phase II processing.

The goal for Next Generation Retrieval is to produce a WIPP compliant container in the LLBG by performing all required processing steps as near to the retrieval activities as possible. This will minimize staging/storage/transfer of individual drums between multiple facilities to complete processing and preparation for transportation to final disposal at WIPP. The activities performed will include retrieval of suspect transuranic containers from the trenches, assay and vent of the containers as necessary, segregation of transuranic waste from MLLW, and repackaging and treatment of container contents to provide a WIPP compliant package that can be certified without further processing. The certification process will be performed by a separate entity that is qualified and equipped to complete the required WIPP documentation.

The Next Generation Retrieval process is targeted at the large majority of waste containers, specifically drums, and is not directly applicable to large boxes. Equipment and techniques used for the Next Generation Retrieval will also to some extent be applicable to small boxes or similar waste containers intermingled with drums and retrieved at the same time.

The specific trenches where retrieval activities will occur include:

- 218-W-4B trenches 7 and 11
- 218-E-12B parts of trenches 17 and 27
- 218-W-3A parts of trenches 1, 4, 5, 6, 8, 10, 15, 23, 30, 32, 34, 6S, 9S

Selected RH suspect transuranic waste containers intermingled with the CH waste may also be retrieved based on ALARA and efficiency considerations.

Draft Process Overview

Retrieval of waste containers to date has been performed in an open air environment, with the objective to transfer containers to another TSD for further processing to provide a WIPP compliant container. Containers removed from 218-W-4C were generally in good condition, although some contaminated and deteriorated packages were dealt with during retrieval. More frequent occurrences of degraded, failed, and contaminated containers or areas have been encountered as older containers in 218-W-4B and 218-W-3A were retrieved.

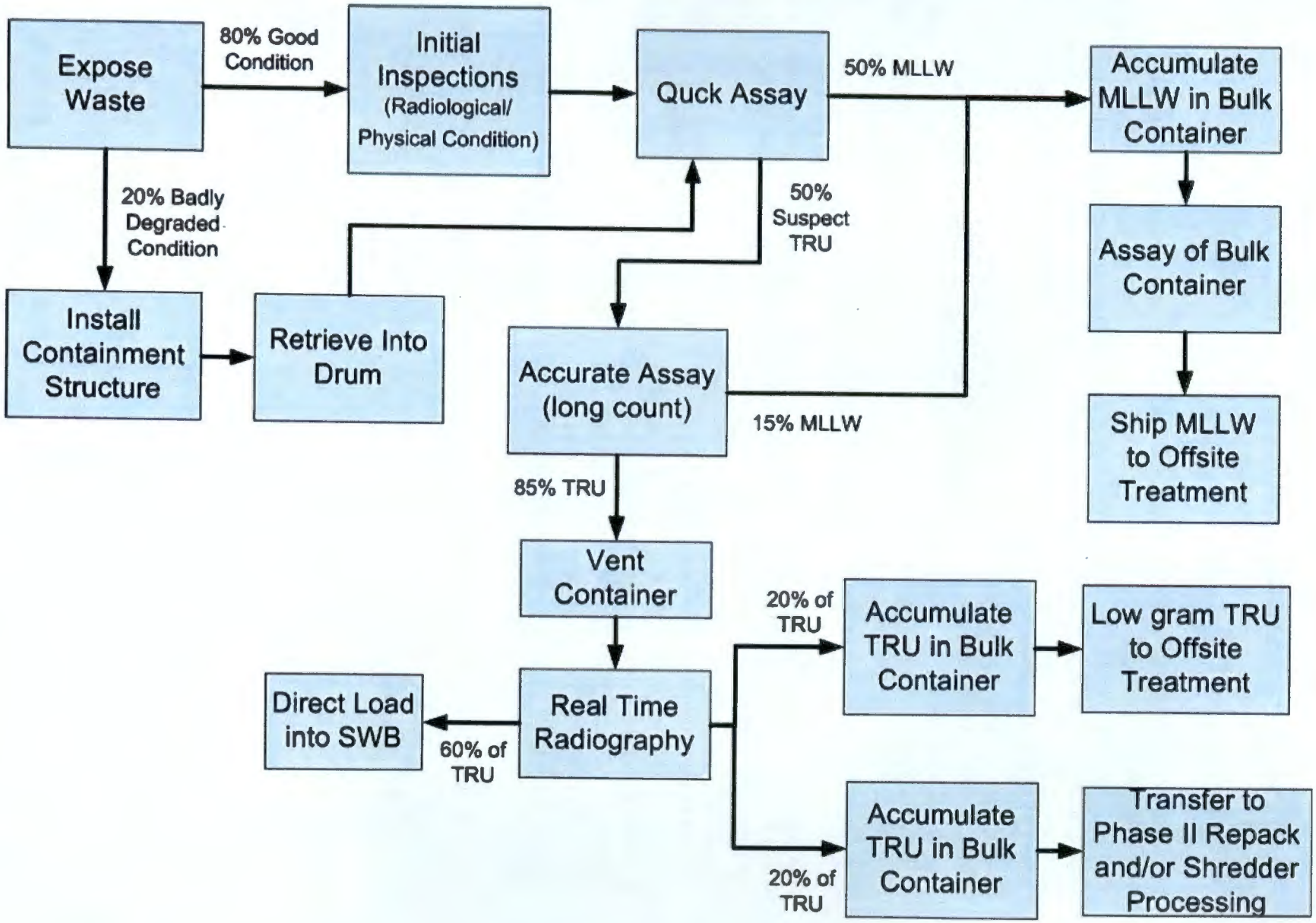
A general process overview for the retrieval of earth-covered transuranic waste containers was established in the Next Generation Retrieval Value Engineering Workshop held in March 2009 and shown in the following Process Flow Diagram. Prior to performing field activities, historical records will be reviewed for each trench or section of a trench scheduled for retrieval. The initial field activity is site set-up and preparation. Equipment will be staged in or near the trenches chosen for retrieval. Staging and work areas will be defined and set up.

Following completion of site set-up, the excavation of the trench will be initiated. The overburden soil will be removed to expose the waste containers. The extent of containers exposed will be controlled to assure applicable safety basis limits on material at risk are met. Uncontaminated soil will be placed in a spoil pile for reuse within the LLBG. Contaminated soils will be managed in accordance with approved procedures which meet applicable requirements and regulations. Tarp covers and plywood, when present, will be removed and managed appropriately. A radiological survey of the exposed containers will be performed to identify dose and potential contamination, and the containers will be visually inspected.

Where required for contamination control or to minimize the potential for environmental impacts, a containment structure will be installed. This approach is likely to be required for areas where highly degraded drums are encountered. The size/coverage of the containment structure will be based on the extent of the damaged drums or contaminated material.

Retrieval activities will be monitored to identify any radiological or hazardous conditions that may be present and to minimize impacts to worker health and safety. Retrieval will be achieved with a combination of manual methods and equipment assistance, including cranes, drum handling devices, and remote handling crawlers to address a variety of dose rates and container weights/sizes.

Value Engineering Workshop Process Flow Diagram for Next Generation Retrieval Phase I



A Quick Sort NDA will be performed as close as feasible to the retrieval activity to sort the transuranic waste from the non-transuranic waste. Containers determined to be non-transuranic will be evaluated and characterized for disposal as MLLW.

A subsequent, more accurate NDA will be performed on suspect transuranic waste containers immediately after the Quick Sort Assay, again as close as feasible to the retrieval activity, to further segregate the MLLW stream. The unvented containers that are determined to be transuranic waste will be vented. The newly vented containers will have their movement minimized until any flammable gas hazard(s) have been determined to be abated (less than five percent hydrogen and less than flammable levels for other flammable gases.

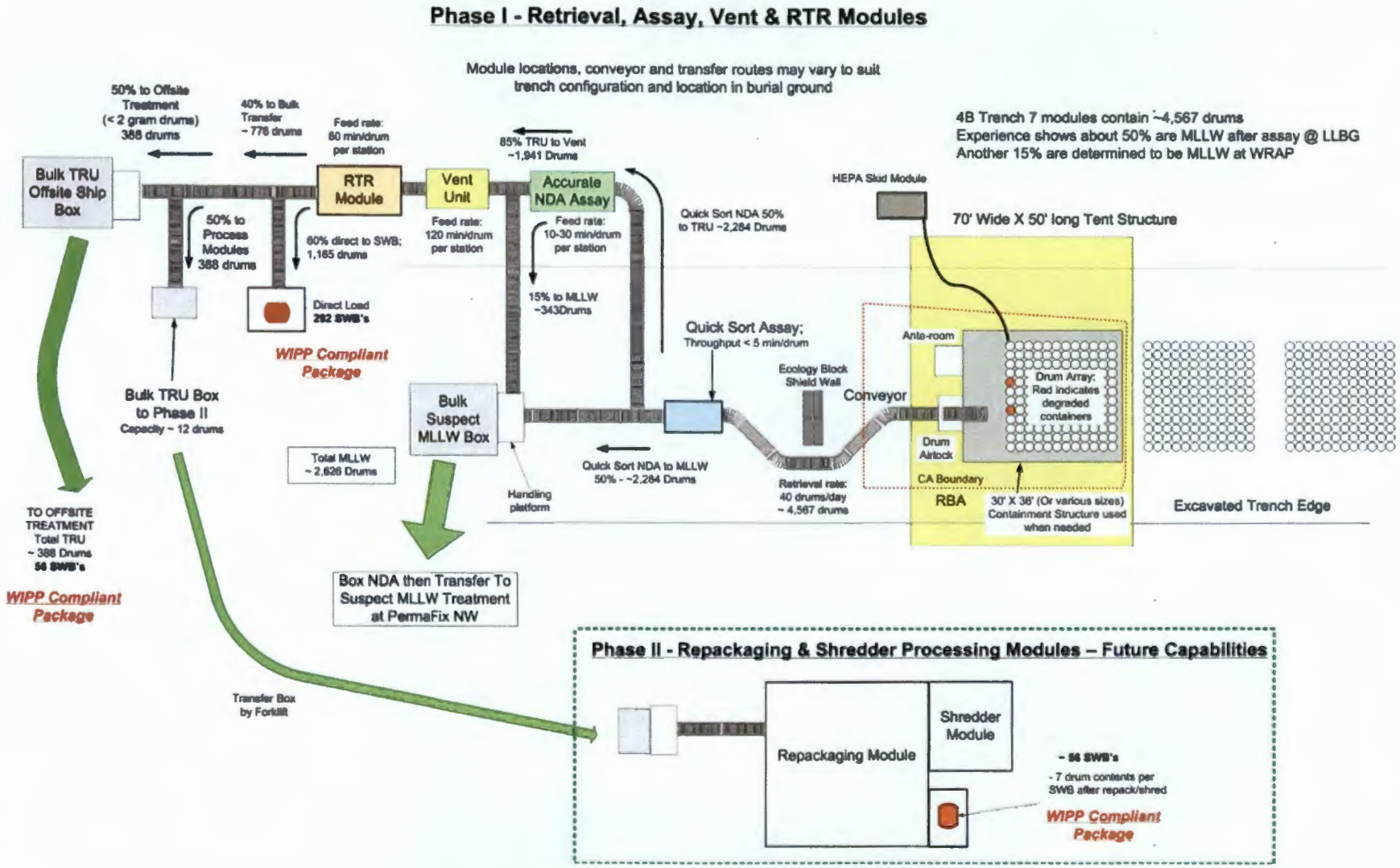
The transuranic waste drums will be moved to a NDE module located nearby in the LLBG. Those drums identified as containing prohibited items or otherwise not meeting WIPP criteria will be segregated into two groups, one with low fissile gram content to be accumulated and transferred for offsite treatment, and a high fissile gram drum group to be placed into bulk transfer boxes for later Next Generation Phase II processing.

The TRU drums which demonstrate compliance with WIPP criteria will be direct loaded into SWB's. These SWB's may be staged or transferred to another TSD for subsequent processing for final certification for WIPP disposal.

The next three figures show schematics of the process for the three burial grounds where retrieval activities will take place, including conceptual layouts and flow rates. The layout is meant to illustrate relative sizes and transfer routes, with the understanding that the unit operations may be connected in a flexible manner to optimize the process flow. Transfers may be accomplished with conveyors, forklifts, or other drum handling equipment. Estimates of the number of drums to be processed and partition fractions through the various unit operations are preliminary and may change with operational experience.

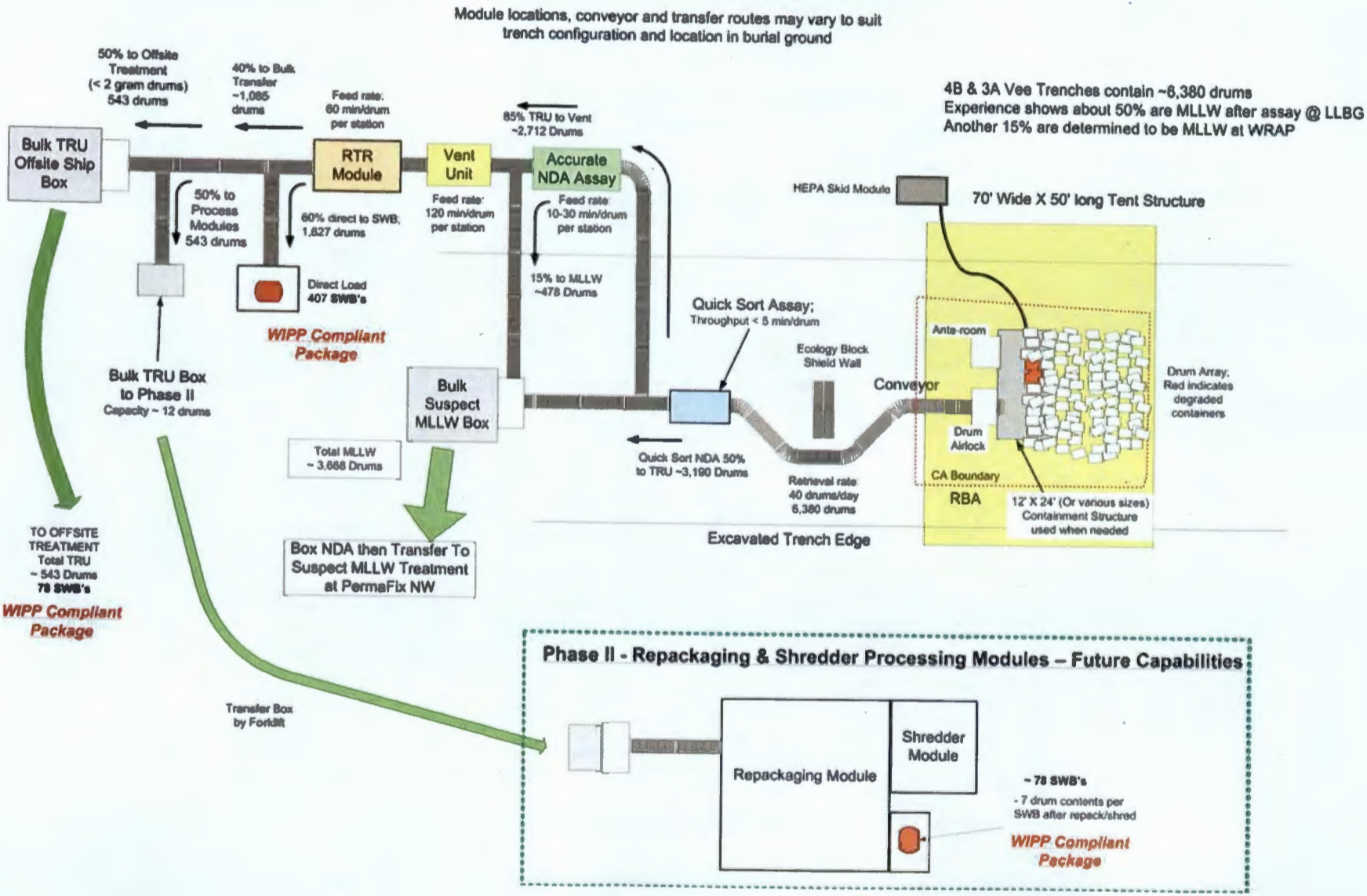
Based on initial plans, the retrieval process at 218-E-12B may include only Phase I operations, as shown in the last figure since records indicate that a very high proportion of the drums buried there are expected to be MLLW. TRU drums will be transferred to 200 West Area and staged until Phase II processing is available.

Draft Next Generation Retrieval Phase I Schematic – 218-W-4B 12X12 Modules



Draft Next Generation Retrieval Phase I Schematic – 218-W-4B & 3A Vee Trenches

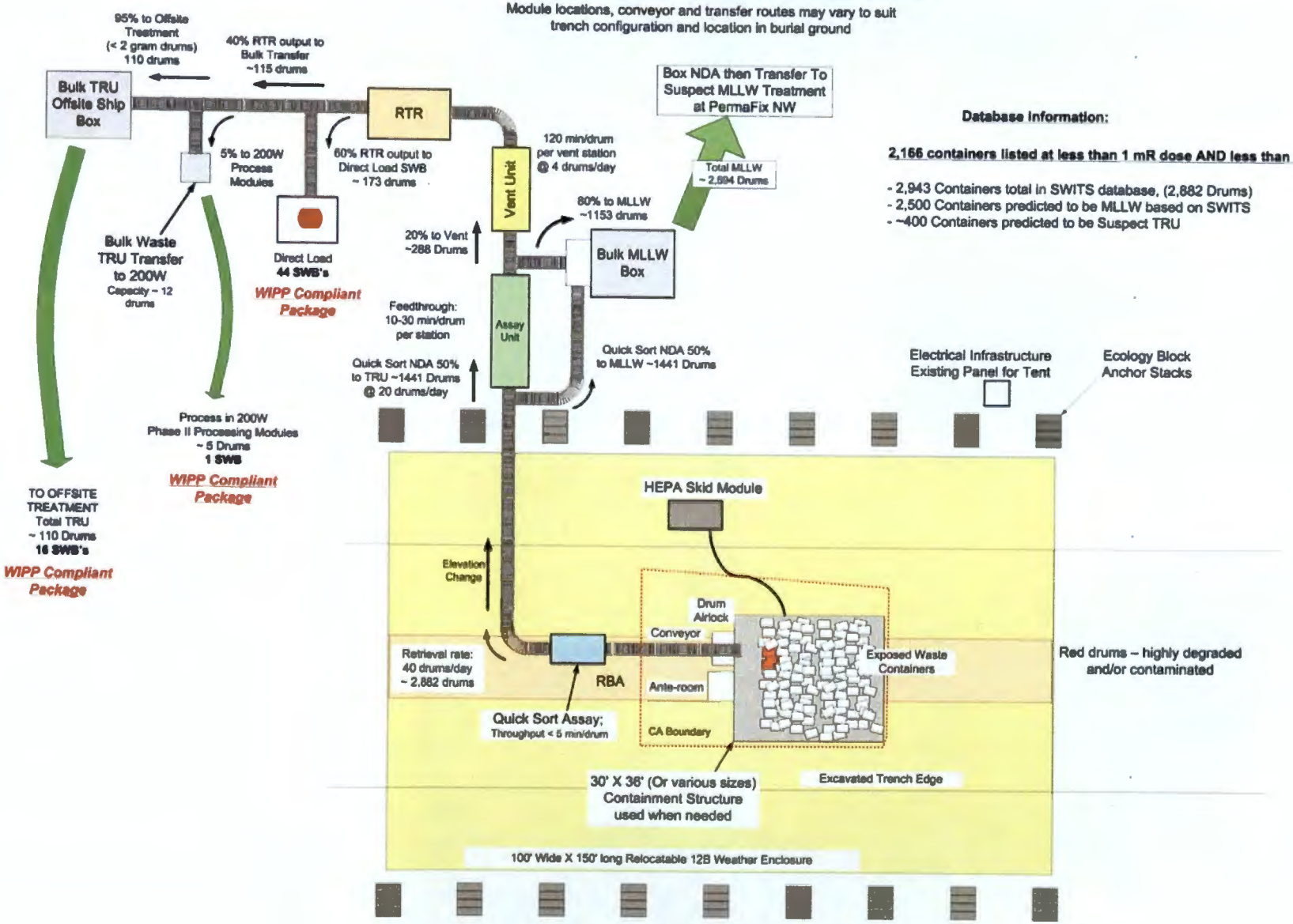
Phase I - Retrieval, Assay, Vent & RTR Modules



Draft Next Generation Retrieval Phase I Schematic – 218-E-12B Vee Trenches

Phase I - Retrieval, Assay, Vent & RTR Modules

Module locations, conveyor and transfer routes may vary to suit trench configuration and location in burial ground



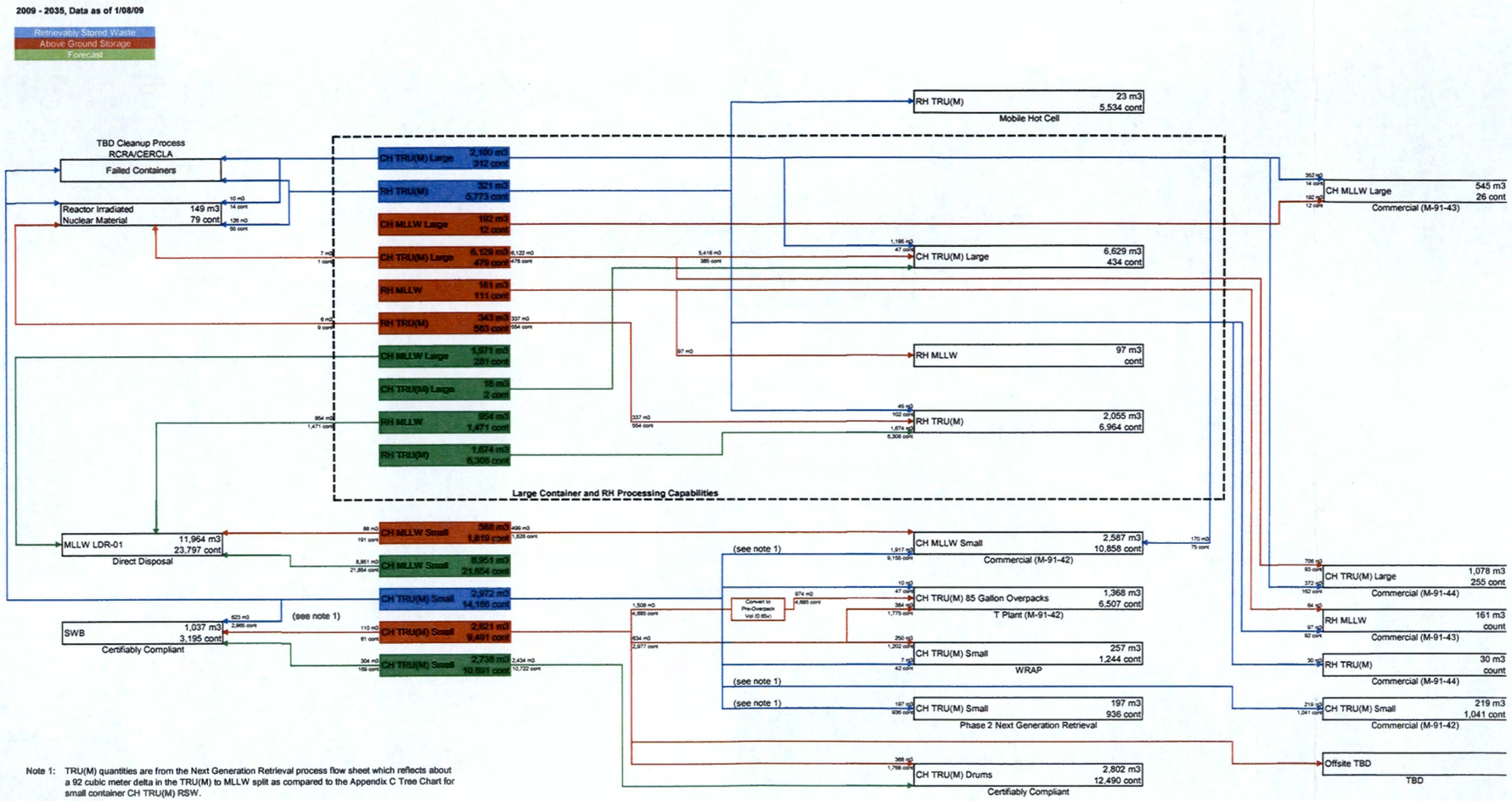
Database Information:

2,166 containers listed at less than 1 mR dose AND less than 0.001 DE-Ci

- 2,943 Containers total in SWITS database, (2,882 Drums)
- 2,500 Containers predicted to be MLLW based on SWITS
- ~400 Containers predicted to be Suspect TRU

APPENDIX I

PROCESSING FLOW DIAGRAM



Note 1: TRU(M) quantities are from the Next Generation Retrieval process flow sheet which reflects about a 92 cubic meter delta in the TRU(M) to MLLW split as compared to the Appendix C Tree Chart for small container CH TRU(M) RSW.

YELLOW CHART ASSUMPTIONS

Data Sources:

- Transuranic Waste Retrieval and Storage Data from SWITS as of January 8, 2009
- Rules for re-assigning packages listed as CH in SWITS as RH are:
    1. Containers with a dose rate of >200 mR/hr
    2. Containers containing shielding
    3. Containers with greater than 0.25 curies of cesium-137
- Waste marked as LLW TSCA is not included in the MLLW volumes
- Waste identified as "German Logs" is not included. Includes packages CASTOR-GSF-001, -002, -003, -005, -006, -007, GNS-12-1, and GNS-12-2
- Forecast data taken from SWIFT 2009.0, represents life-cycle forecast January 2009 through September 30, 2035 with the exception of RH transuranic tank waste
- Volumes are internal volumes (e.g., 55-gallon drum is 0.208 m^3 internal waste, 0.257 m^3 external)

Transuranic Waste Retrieval:

- Containers identified as Reactor Irradiated Nuclear Material based on process knowledge and SWITS record information. Capabilities and processing of this material is a non-M-91 activity.
- Assumed 50/50 MLLW/transuranic waste split by volume for retrieved RSW
- Assumes 50 percent (by volume) of the RSW RH containers are transuranic waste and 50 percent are MLLW
- Assumes 75 percent (by volume) of the RSW CH large containers are transuranic waste and 25 percent are MLLW
- Assumes that all caisson waste is RH transuranic
- Although there are assumed to be failed containers from transuranic waste retrieval burial grounds, no assumptions regarding volume or count of containers have been made
- Transuranic waste retrieval burial grounds consist of 218-W-3A, 218-W-4B, 218-W-4C, and 218-E12B
- Next Generation Retrieval Process concept will be applied to retrieval and processing of small container (drums) RSW starting in FY 2010.

Other:

- All forecast MLLW will be shipped LDR-01 compliant by the generating facility
- Container definitions are as follows:
    1. MLLW Small is containers with a volume less than 10 m^3
    2. MLLW Large is containers with a volume greater or equal to 10 m^3
    3. TRU(M) Small is 55-gallon drums, containers smaller than a 55-gallon drum, 85-gallon over-packs, and SWBs
    4. TRU(M) Large is non-small containers

APPENDIX J

VOLUME CHANGES BETWEEN PMP REVISION 5 AND REVISION 4

Location	Waste Streams	2008 Volume (m^3)	Waste Retrieved	MLLW Disposal/TRU(M) Certification	Reclassified/Newly Generated	2009 Volume (m^3)
STORAGE	CH MLLW Small	821	N/A	816	335	588
STORAGE	CH MLLW Large	443	N/A			192
STORAGE	RH MLLW	107	N/A	0	54	161
STORAGE	CH TRU(M) Small	2,733	N/A	430	365	2,621
STORAGE	CH TRU(M) Large	3,919	N/A	0	2,203	6,122
STORAGE	RH TRU(M)	267	N/A	0	71	337
RSW RETRIEVAL	CH RSW Small	3,592	463	N/A	(96)	2,972
RSW RETRIEVAL	CH RSW Large (<10m^3)	3,881	123	N/A		2,090
RSW RETRIEVAL	CH RSW Large (>10m^3)		1,906	N/A		
RSW RETRIEVAL	RH RSW	206	5	N/A		194
FORECAST	CH MLLW Small	11,248				8,951
FORECAST	CH MLLW Large	866				1,971
FORECAST	RH MLLW	946				954
FORECAST	CH TRU(M) Small	5,258				2,738
FORECAST	CH TRU(M) Large	72				18
FORECAST	RH TRU(M)	2,087				1,674

Assumptions/Notes

1. The data sources for the 2008 and 2009 volumes are:
   a. Inventory - SWITS with data queries performed on January 3, 2008 and January 8, 2009
   b. Forecast - SWIFT 2008.0 and SWIFT 2009.0 datasets
   c. Waste retrieval, disposal, and certification numbers are as reported by the contractor.
2. Waste in the "Reclassified/Newly Generated" includes:
   a. Waste assayed and/or recalculated resulting in change in waste type designation (e.g. TRU(M) assayed as to MLLW or LLW)
   b. Waste surveyed and/or recalculated resulting in change in change in waste handling designation
   c. Waste moved to another location (e.g. waste retrieved and placed in storage)
   d. Newly generated waste received for storage

APPENDIX K

ESTIMATED VOLUMES GENERATED FROM WASTE PROCESSING

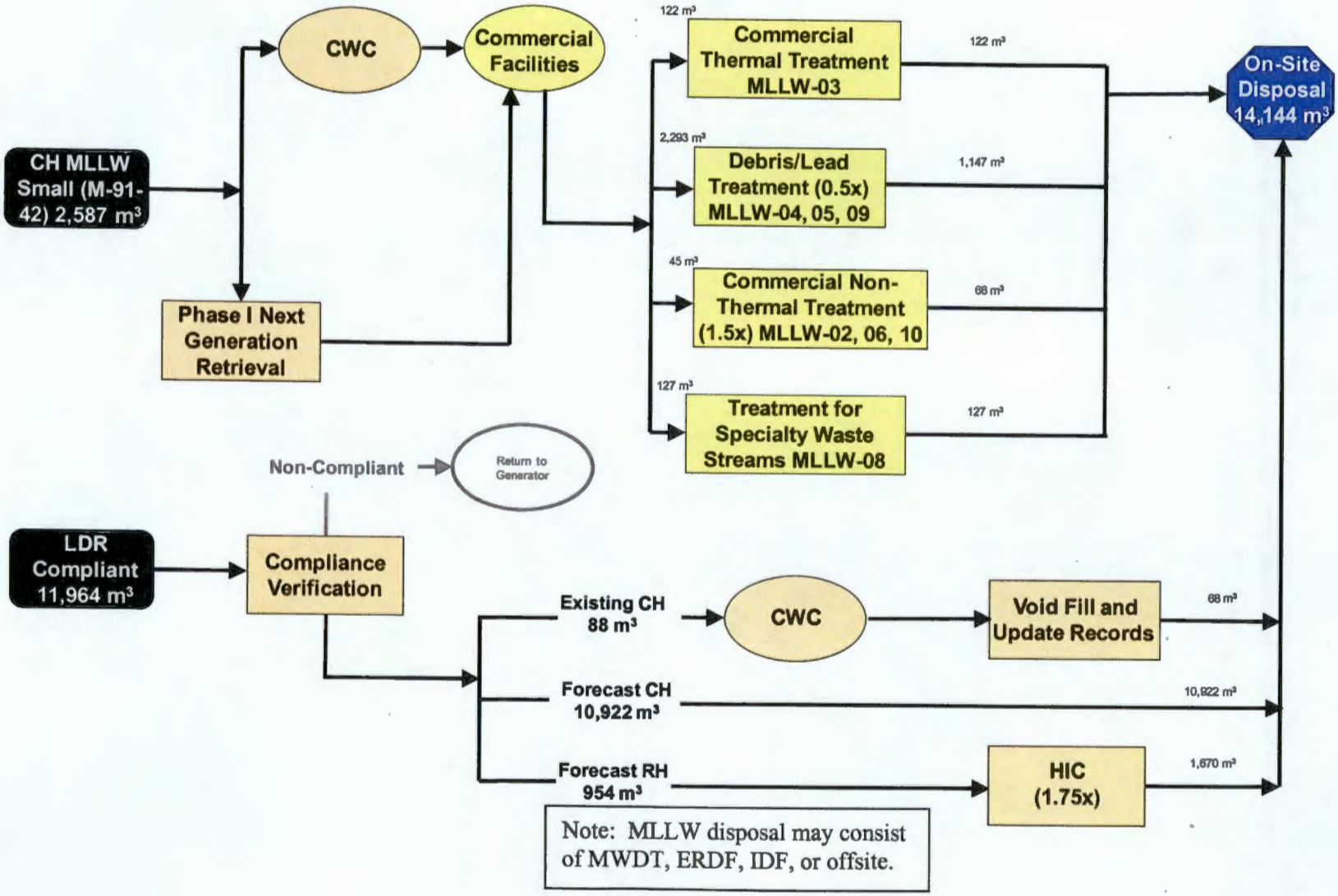
Estimated Volumes (in Cubic Meters)

Category	Feed Volumes	Ending Volumes (Internal)					
		MLLW LDR-01	CH MLLW	RH MLLW	CH TRU(M)	RH TRU(M)	Totals
MLLW LDR-01	11,964	12,680					12,680
CH MLLW Small	2,587		1,464				1,464
CH MLLW Large	545		627				627
RH MLLW	258		48	328			376
CH TRU(M) Small	7,193		130		6,821		6,951
CH TRU(M) Large	7,707		2,442		8,180	33	10,655
RH TRU(M)	2,108		221			3,159	3,380
	32,362	12,680	4,932	328	15,001	3,192	36,133

APPENDIX L

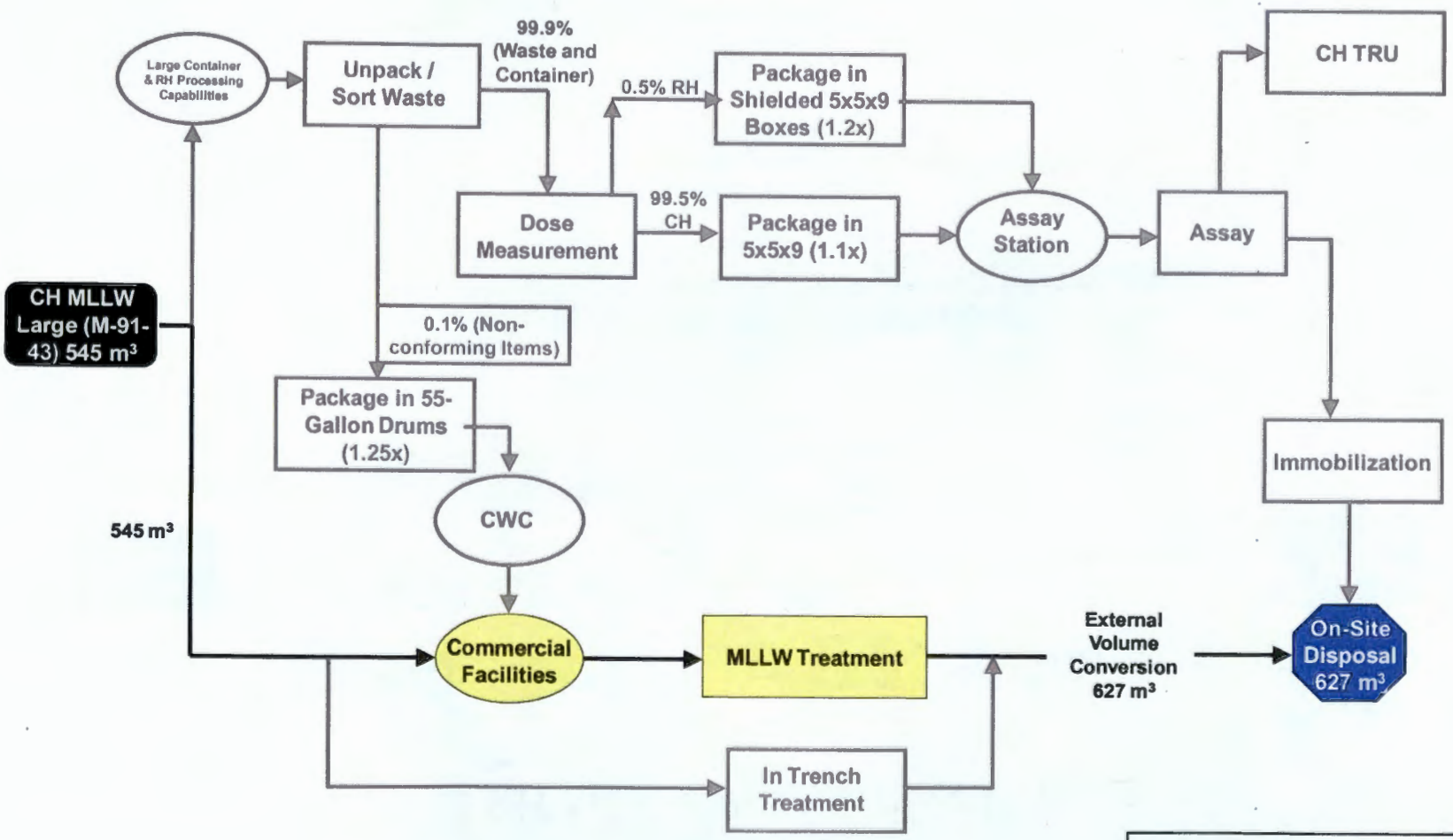
MLLW TREATABILITY GROUPS PROCESS FLOW DIAGRAMS

M-91-42 MLLW Process Flow Diagram



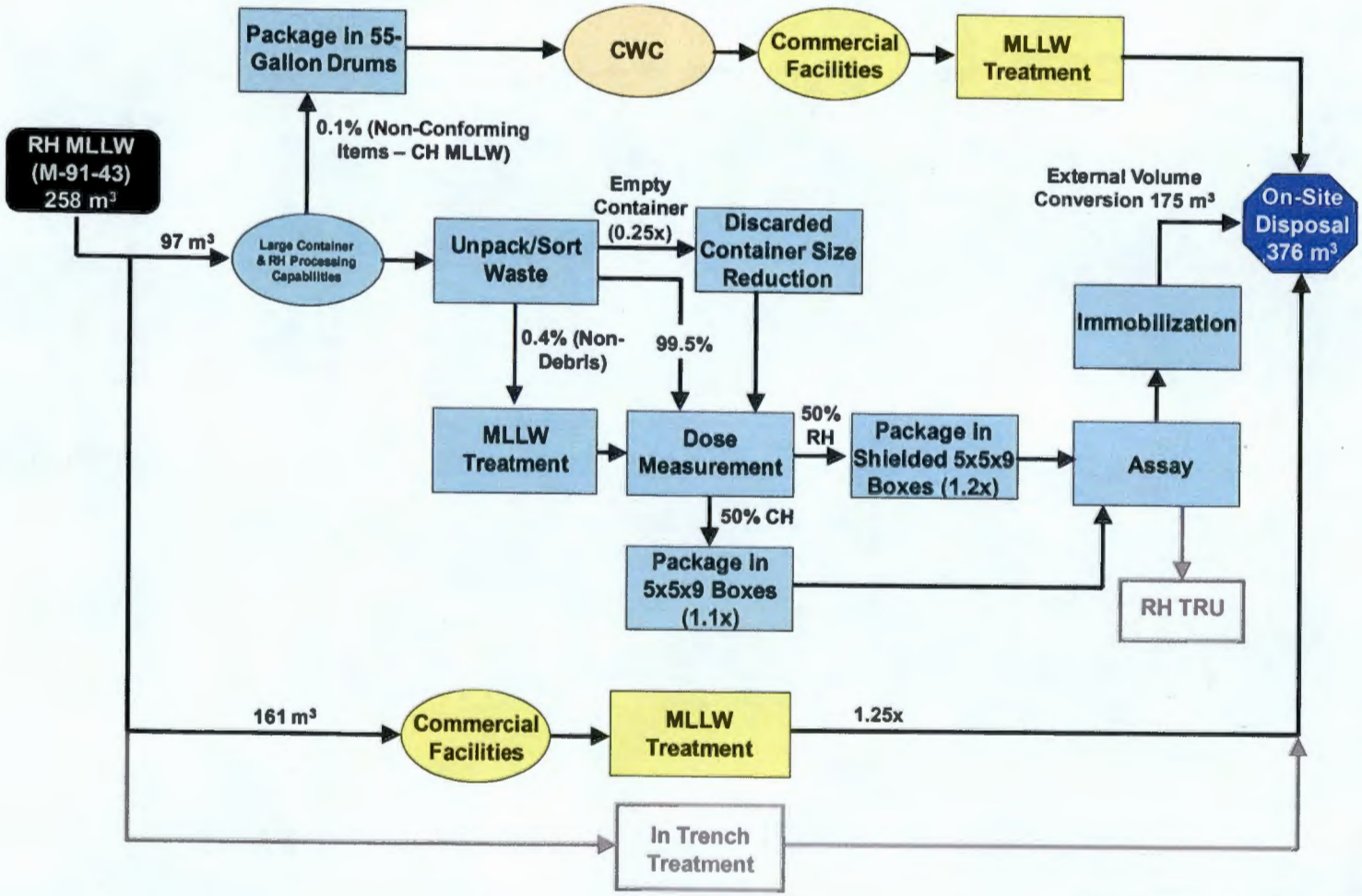
Note: MLLW disposal may consist of MWDT, ERDF, IDF, or offsite.

M-91-43 CH MLLW Process Flow Diagram



Note: MLLW disposal may consist of MWDT, ERDF, IDF, or offsite.

M-91-43 RH MLLW Process Flow Diagram



Note: MLLW disposal may consist of MWDT, ERDF, IDF, or offsite.

Assumptions for MLLW Treatability Groups Process Flow Diagrams

CH MLLW Small (M-91-42)

- Twenty percent of newly generated or stored waste requires NDE before processing
- Volume multipliers are dependant on LDR waste code. Multipliers based on prior experience with current treatment techniques if applicable

LDR Compliant

- Waste is assumed to be disposed directly to the MWDT (or ERDF, IDF) with the exception of RH waste, which requires placement in a high-integrity container (HIC)
- Multiplier on HIC accounts for increased volume required in the MWDT

CH MLLW Large (M-91-43)

- Most CH MLLW containers are assumed to be able to be treated commercially. Experience with similar containers indicates no net increase or decrease in disposal volume
- In-trench treatment is suitable for a portion of this waste stream

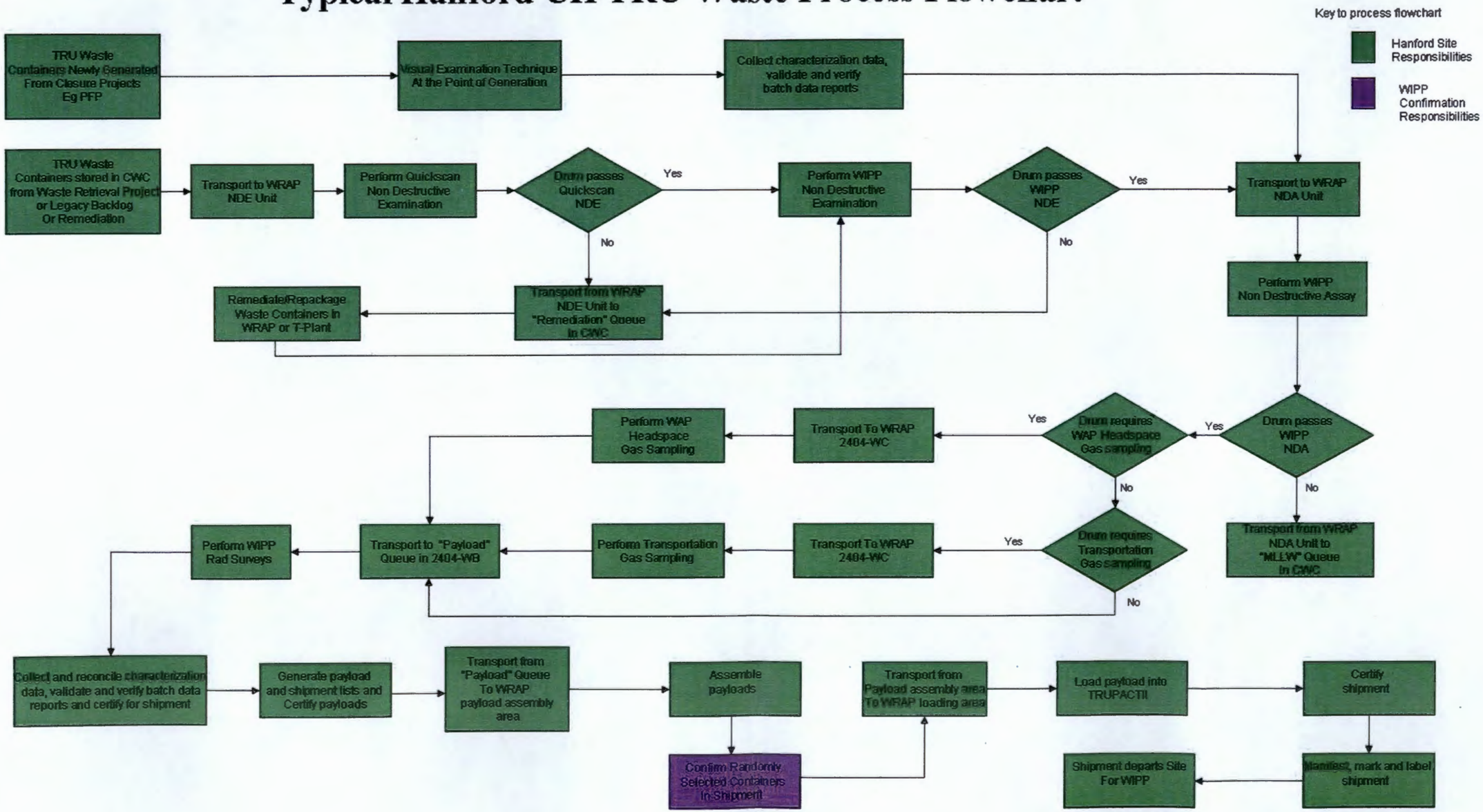
RH MLLW (M-91-43)

- All RH MLLW is unpacked and sorted with the discarded container
- Waste unpacked from containers are assumed to be approximately 50 percent RH and 50 percent CH
- The waste will then be treated using immobilization techniques

APPENDIX M

WIPP CERTIFICATION CH TRANSURANIC WASTE PROCESS FLOWCHART AND ASSUMPTIONS

Typical Hanford CH TRU Waste Process Flowchart



Base Case Assumptions for FY 2009:

1. WIPP Certification is maintained

2. Resources are maintained for WRAP NDE, NDA, HSG, and associated drum movement

3. Sufficient resources are available to prepare the waste streams slated for near-term approval

4. Solids sampling and analysis performed at INL

5. WIPP provides TRUPACT trailers and shipping containers at a rate sufficient to meet shipping requirements (i.e., shipments to WIPP and shipments to other sites such as INL for coring and analysis)

6. Newly generated waste will be repackaged in 55-gallon drums and SWBs

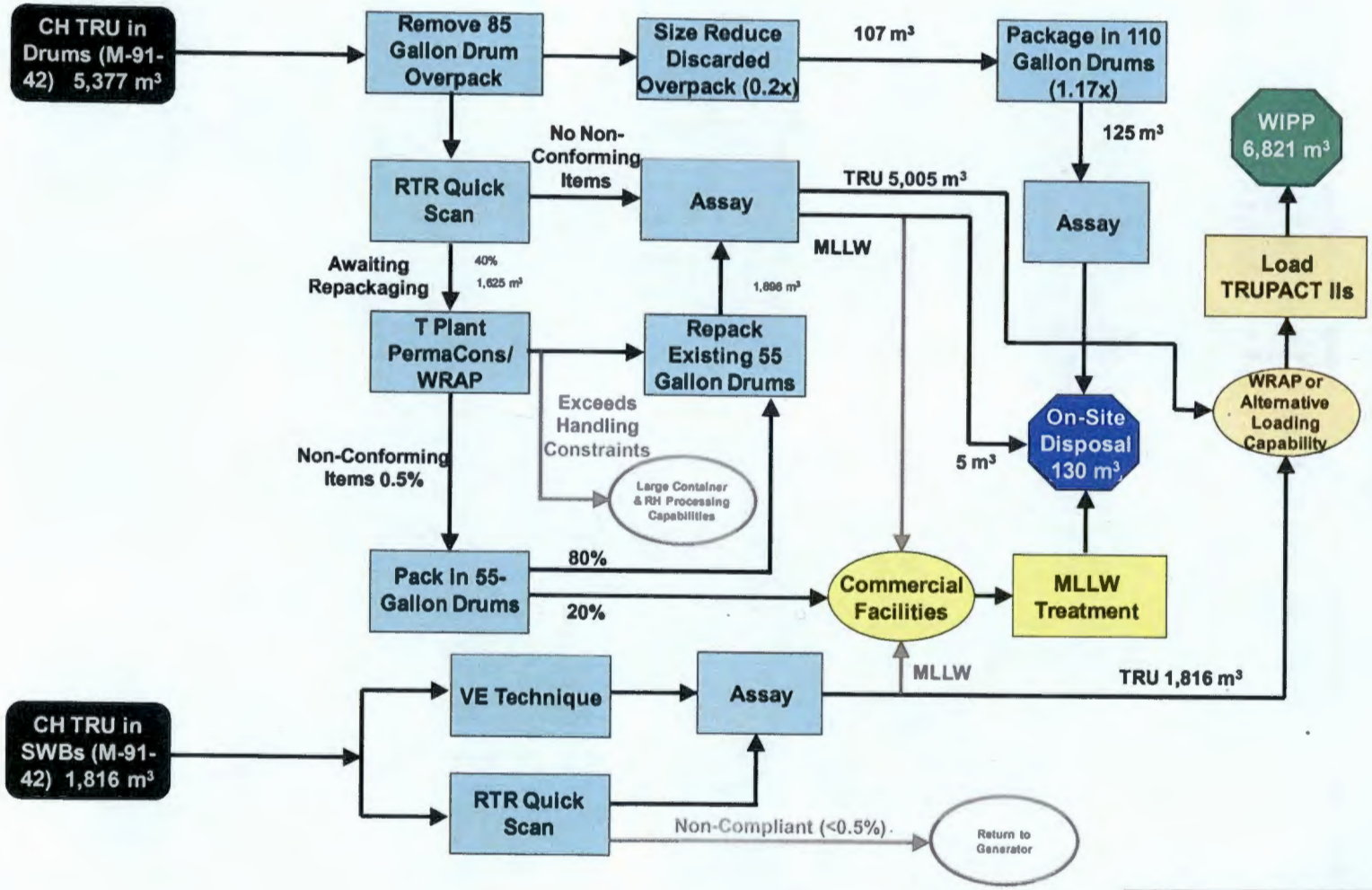
7. CH transuranic waste is acceptable for WIPP and does not include:
   a. Shielded containers to CH levels
   b. RH waste
   c. LabPacks

8. There are no significant revisions to the regulatory and requirements documents that are relevant to WIPP processing and shipping

APPENDIX N

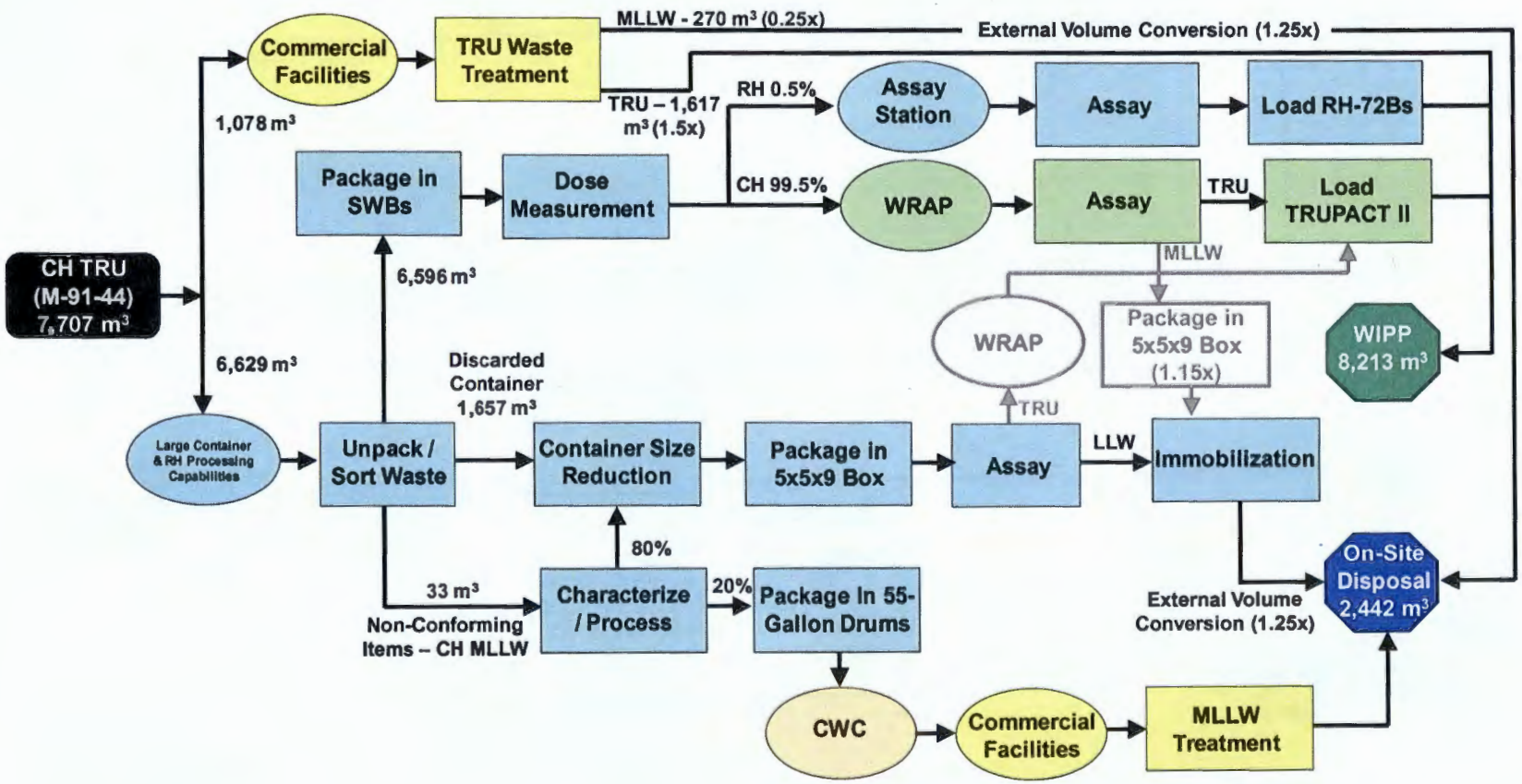
TRANSURANIC WASTE TREATABILITY GROUPS PROCESS FLOW DIAGRAMS

M-91-42 Transuranic Waste Process Flow Diagram



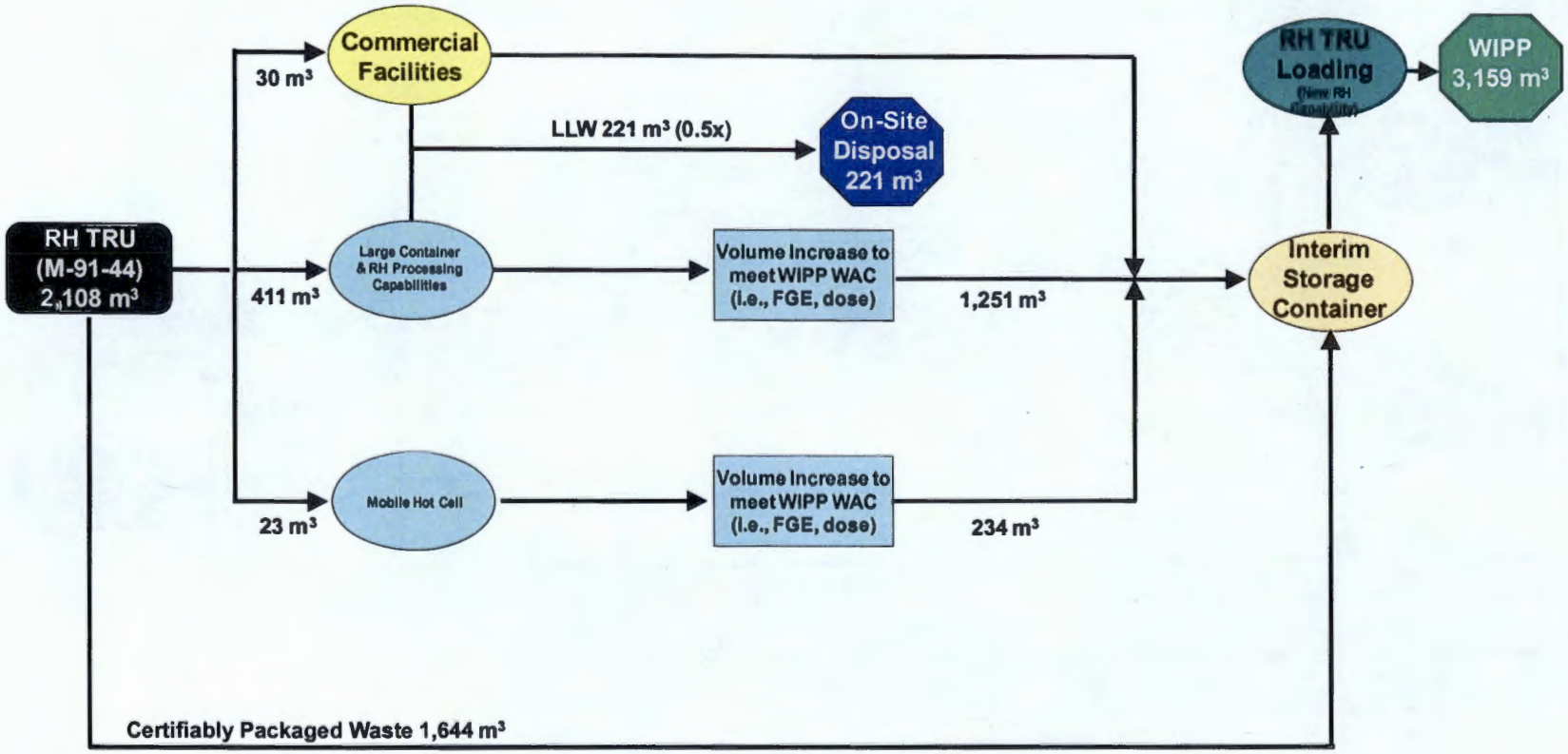
Note: MLLW disposal may consist of MWDT, ERDF, IDF, or offsite.

M-91-44 CH Transuranic Waste Process Flow Diagram



Note: MLLW disposal may consist of MWDT, ERDF, IDF, or offsite.

M-91-44 RH Transuranic Waste Process Flow Diagram



Note: MLLW disposal may consist of MWDT, ERDF, IDF, or offsite.

Assumptions for Transuranic Waste Treatability Groups Process Flow Diagrams

CH Transuranic Waste 85-Gallon Overpacks (M-91-42)

- Overpacks are separated from the 55-gallon drum, size reduced, and disposed as non-transuranic waste
- The remainder of the processing steps for the 55-gallon drum removed from the overpack are identical for drums in storage/retrieval

CH Transuranic Waste 55-Gallon Drums (M-91-42)

- Forty percent of the drums from storage/retrieval and one percent of newly generated drums are assumed to require sorting/repackaging following a NDE quick scan

CH Transuranic Waste SWB (M-91-42)

- All newly generated SWBs are assumed to be packaged using Visual Examination and do not require NDE or rework. SWBs not packaged using Visual Examination require an NDE

CH Transuranic Waste Large (M-91-44)

- Waste to be treated either commercially or through the future SWPC
- Volume increases from commercial processing are due to waste generated from the discarded container, failed process equipment, and processing consumables (protective clothing, plastic, etc.)
- Waste processed through the future SWPC is unpacked and sorted, with the discarded container size reduced and treated as MLLW. The remainder of the waste is packaged in SWBs
- 0.5 percent of the repackaged waste is assumed to be RH
- A possibility exists that a portion of the waste could be identified as transuranic following assay and that repackaged waste could assay as MLLW. It is assumed the likelihood of this occurring is small

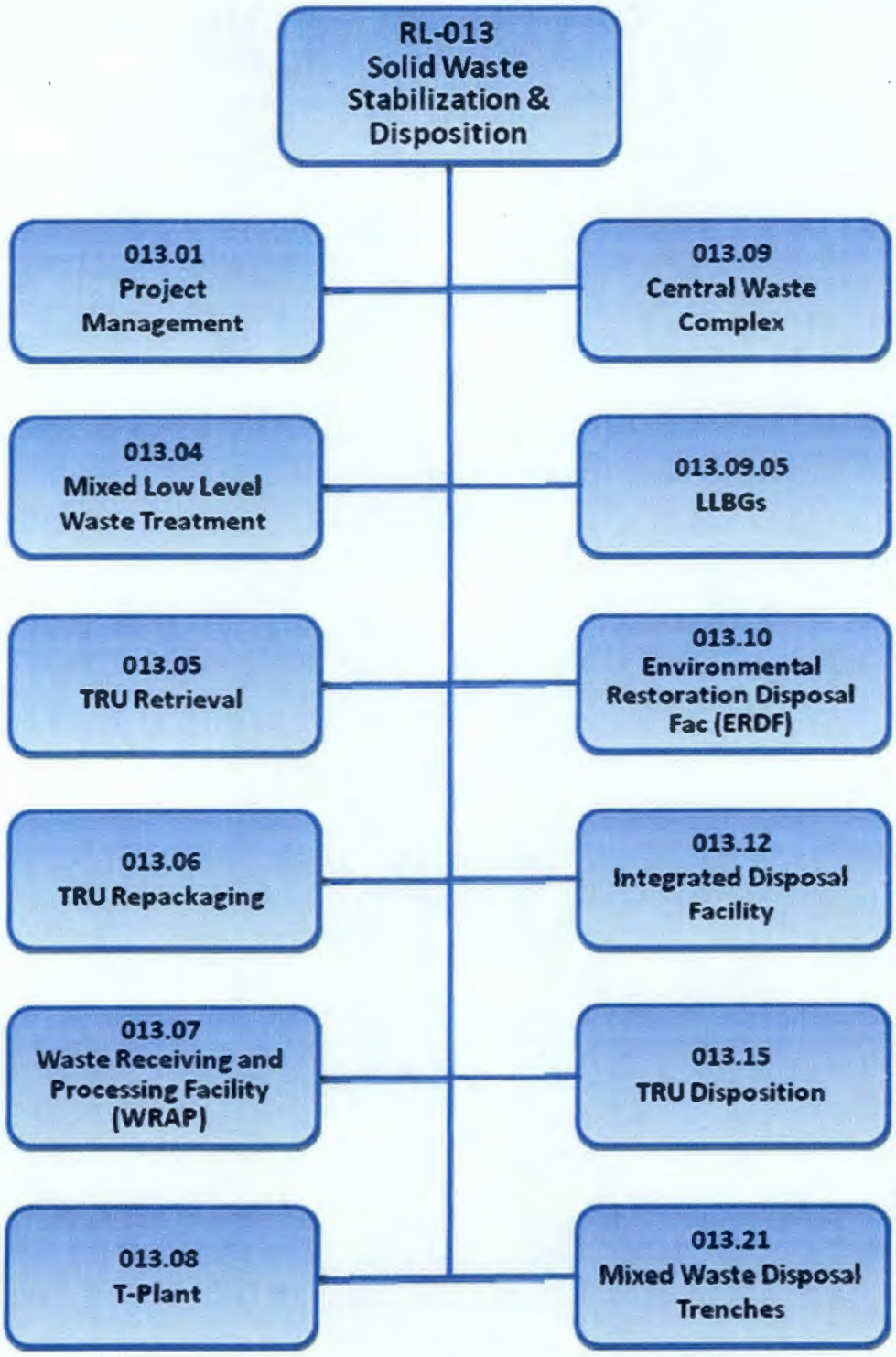
RH Transuranic Waste (M-91-44)

- A portion of the forecasted RH waste will be certified and can be loaded into 10-160Bs or RH-72Bs for disposal without rework
- Most RH transuranic waste is assumed to be processed at the SWPC
- Discarded containers and non-conforming items are assumed to be CH MLLW
- Shielding from existing containers is assumed to be MLLW
- Waste requiring repackaging into 55-gallon drums, with 50 percent is assumed to be CH transuranic and 50 percent RH transuranic
- A possibility exists that a portion of the waste could be identified as transuranic following assay and that repackaged waste could assay as MLLW. It is assumed the likelihood of this occurring is small

APPENDIX O

WBS ELEMENTS APPLICABLE TO THE PROJECT MANAGEMENT PLAN

WBS Hierarchy



Description of Work Scope

WBS 013.01 Project Management – 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).

Figure O-1. MLLW Treatment.

In specific, this scope includes support management and staff to the overall Project, such as M&EC Management Team, who are contracted to manage CWC, T-Plant and LLBG operations, as well as provide Waste Support Services to Hanford generators, Human Relations, Buyer/Procurement staff, and Project Controls (e.g., schedulers/cost analysts). In addition, safety, health and quality technical support and oversight is performed to support implementation of key programs such as 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, CSER development, etc.

Strategic Planning and Integration is another critical scope element that provides on-site 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 on and off site shipments of regulated waste and materials and non-regulated materials.

Waste and Fuels Management Program activities continue through FY 2035.

WBS 013.04 MLLW Treatment – This scope provides for M-91-42 MLLW and M-91-43 MLLW treatment (SWPC M-91-43 MLLW processing is included in WBS 013.15). Processing includes thermal and non-thermal treatment. Activities consist of managing off-site 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. Figure O-1 shows MLLW treatment.

Figure O-2. Waste Retrieval

WBS 013.05 TRU Retrieval – This scope provides for retrieval of suspect transuranic (TRU) waste from the LLBG (218-W-4C, 218-W-4B, 218-E-12B, and 218-W-3A). Retrieval (see Figure O-2) consists of:

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

Additional scope that is contained in this element includes the retrieval of remote-handled waste from burial grounds 218-E-12B, 218-W-3A, and 218-W-4B (including the alpha caissons). Coordination efforts with DOE Idaho and the Savannah River Site (SRS) to transport 12 drums of waste containing Pu-238 to the SRS are also included in this activity.

WBS 013.06 TRU Repackaging – This scope provides support for meeting the requirements for the characterization of TRU waste for disposal at the WIPP. In addition, this scope includes activities required to maintain WIPP certification, compliant with Carlsbad field Office requirements, to allow shipments of waste to New Mexico (see Figure O-3)

Figure O-3. Waste Shipments to WIPP

Also included in this scope is the labor and material necessary to package stored TRU waste from CWC and T-Plant into compliant waste packages for certification by the Central Characterization Project for shipment to WIPP.

WBS 013.07 WRAP – This scope provides for the safe and compliant receipt, verification, storage, repackaging or treatment (if necessary), certification, and shipment of LLW, MLLW and transuranic waste. WRAP (see Figure O-4) receives containers of CH waste from generators, staging areas, CWC, Waste Retrieval Operations, LLBG, and T Plant.

Figure O-4. WRAP

WRAP is staffed to perform necessary shipping and receiving and floor operations to support any one of the following activities:

- TRUPACT II loading
- Characterization (including NDE/NDA, HSGS)
- Process area (includes glovebox activities such as removal of compliant items and repackaging)

This scope also includes funding to potential upgrades to waste processing equipment, systems, components, and computer interface
equipment at the WRAP facility. In addition, funding for any Capital Equipment Not Related to Construction that may be required to maintain the facility in a ready-to-operate condition and any activities required to ensure that the WRAP Complex is maintained at a minimal and safe condition and ready to serve status are also included.

WBS 013.08 T Plant – This scope includes all operational activities required to maintain T-Plant in compliance with applicable requirements, including any necessary physical upgrades to the facility. Activities that are supported at T-Plant included receipt, storage, sampling, verification and treatment of low level and mixed low level wastes for final disposal, repackaging, sampling, venting, etc. of TRU waste for shipment to WIPP and receipt and interim storage of treated K-Basin sludge.

WBS 013.09 CWC – This scope provides for the minimum safe operations for compliant interim storage of CH LLW, MLLW, transuranic waste, and waste from onsite and offsite generators at the CWC (see Figure O-5). Also included in this scope is completion of an alternative TRU Shipping Facility that would provide additional capability for loading CH TRU waste into the TRUPACT II.

Figure O-5. Central Waste Complex

WBS 013.09.05 LLBGs – This scope provides for activities to maintain safe and compliant conditions with the LLBGs, including surveillance and maintenance of structures, systems, components and processes to ensure operations within the approved safety and compliance requirements envelope..

The LLBG contains two lined mixed waste trenches (#31 and #34) which are included in WBS 013.21. The formerly active unlined trenches, within seven burial grounds, are no longer used. The unlined trenches are monitored and maintained. Maintenance includes subsidence, contamination control, caisson filter maintenance, access control, and fire control.

WBS 013.10 ERDF – This scope includes activities that support ERDF cell expansion, construction of interim covers for two ERDF cells, and long term stewardship (includes leachate collection and sampling, monitoring and reporting and cap maintenance and weed control). The costs for disposal and transportation of waste will be borne by the generators.

WBS 013.12 IDF – This scope provides for a minimum level of required maintenance of the facility prior to initiation of operations scheduled to begin after 2014. The remaining scope includes the development of the final authorization basis for IDF, which will authorize the equipment, activities and operations required to support disposal of MLLW and LLW in the facility.

WBS 013.15 TRU Disposition – This scope include all activities to provide facility upgrades necessary to ensure the safe and compliant processing and treatment of M-91-43/M-91-44 RH MLLW, RH transuranic waste, MLLW in large containers, and transuranic waste in large containers. Also included in this scope are activities to provide RH TRU waste Cask Loading Station that will be used to direct load 30- and 55-gallon drums of RH TRU into an appropriate cask for shipment to WIPP for disposal.

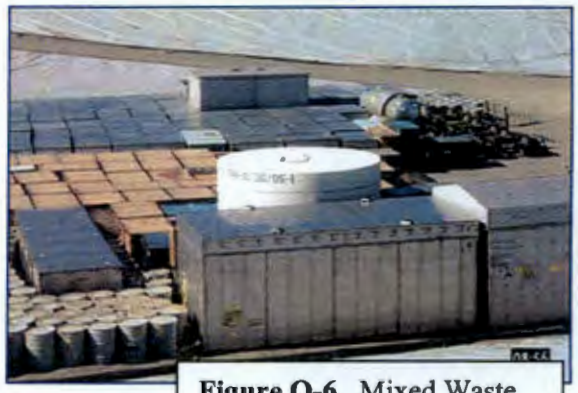


Figure O-6. Mixed Waste Disposal Trenches.

WBS 013.21 MWDTs – This scope includes activities required for the minimum safe and compliant operation of the MWDT (see Figure O-6) located wthin the 218-W-5 Burial Ground, 200 West Area for receipt and/or disposal of LLW and MLLW from generators approved by DOE-RL, management of leachate generated at the MWDT. In addition, the design and construction of operational covers for the two operational trenches, Trench 34 and Trench 31, is also included in this scope.

APPENDIX P

M-91 PMP FUNDING PROFILES

M-91 PMP 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
M-91	013.01	Project Management -PBS RL-13	202,400	19,620	19,206	20,502	17,087	16,366	14,847	14,430	13,990	13,527	13,040	13,000	13,260	13,525
	013.04	Mixed Low Level Waste Treatment	73,123	16,760	15,768	13,956	13,957	8,650	4,032	0	0	0	0	0	0	0
	013.05	TRU Retrieval	291,153	18,725	33,980	40,348	47,003	51,608	22,577	20,272	20,610	21,087	14,943	0	0	0
	013.06	TRU Repackaging	201,359	8,251	12,638	12,022	6,221	6,346	52,398	78,962	4,046	4,127	4,209	1,970	4,036	6,133
	013.07	Waste Receiving and Processing Facility (WRAP)	113,435	7,234	9,359	9,776	9,811	11,069	9,538	7,804	7,961	8,119	8,282	8,000	8,160	8,323
	013.08	T-Plant	142,055	12,514	12,919	12,523	13,793	12,805	17,405	8,148	10,246	15,483	8,138	5,902	6,020	6,158
	013.09	Central Waste Complex	84,029	7,689	8,970	9,105	6,951	7,217	5,275	5,280	5,332	5,397	5,535	5,646	5,759	5,874
	013.10	Environmental Restoration Disposal Fac (ERDF)	27,137	1,839	2,374	2,122	30	30	68	1,213	32	1,262	40	1,020	1,056	16,052
	013.12	Integrated Disposal Facility	14,480	313	271	278	1,235	1,260	1,296	1,322	1,348	1,375	1,403	1,431	1,460	1,489
	013.15	TRU Disposition	90,969	1,740	1,177	1,210	1,191	1,214	1,920	1,607	2,977	1,691	1,243	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
M-91 Subtotal			1,253,688	98,036	117,857	122,439	117,872	117,824	129,706	139,397	66,910	74,020	58,824	52,469	65,261	93,073
Non-M91 Subtotal			424,480	37,669	34,413	31,924	36,977	41,068	43,432	51,901	43,954	41,135	44,637	4,908	8,598	3,861
Other Subtotal			682,294	46,036	62,738	61,413	50,562	52,871	58,451	60,489	45,780	48,651	48,772	47,746	48,835	49,949
TOTAL			2,360,462	181,741	215,008	215,776	205,411	211,764	231,590	251,787	156,645	163,805	152,233	105,124	122,694	146,884

	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
M-91	013.01	Project Management -PBS RL-13	220,372	13,796	14,072	14,353	14,640	14,933	15,232	15,536	15,847	16,164	16,487	16,817	17,153	17,496	17,846
	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	133,276	8,386	8,507	8,677	8,851	9,028	9,209	9,393	9,581	9,772	9,968	10,167	10,370	10,578	10,789
	013.07	Waste Receiving and Processing Facility (WRAP)	135,613	8,490	8,659	8,833	9,009	9,189	9,373	9,561	9,752	9,947	10,146	10,349	10,556	10,767	10,982
	013.08	T-Plant	44,095	6,246	6,000	6,120	6,242	6,367	6,495	6,624	0	0	0	0	0	0	0
	013.09	Central Waste Complex	95,709	5,992	6,111	6,234	6,358	6,485	6,615	6,747	6,882	7,020	7,160	7,304	7,450	7,599	7,751
	013.10	Environmental Restoration Disposal Fac (ERDF)	37,250	15,229	1,500	1,530	1,561	1,592	1,624	1,656	1,689	1,723	1,757	1,793	1,828	1,865	1,902
	013.12	Integrated Disposal Facility	24,257	1,519	1,549	1,580	1,611	1,644	1,677	1,710	1,744	1,779	1,815	1,851	1,888	1,926	1,964
	013.15	TRU Disposition	570,270	35,700	36,414	37,142	37,885	38,643	39,416	40,204	41,008	41,828	42,665	43,518	44,388	45,276	46,182
	013.21	Mixed Waste Disposal Trenches	12,789	531	541	552	563	574	586	598	609	622	634	647	660	673	5,000
M-91 Total			2,527,318	95,888	83,354	85,021	86,721	88,456	90,225	92,029	87,113	88,855	90,632	92,445	94,294	96,180	102,417
Non-M91 Total			628,156	5,640	1,288	5,113	15,430	15,800	16,179	16,568	16,965	17,373	17,789	18,216	18,654	19,101	19,560
Other Total			1,514,000	51,089	52,254	53,447	54,666	55,914	57,191	58,497	59,832	61,199	62,597	64,027	65,490	66,986	68,517
TOTAL			4,669,474	152,617	136,896	143,580	156,818	160,170	163,595	167,094	163,911	167,427	171,019	174,688	178,437	182,267	190,494

M-91 PMP As-Soon-As-Feasible 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
M-91	013.01	Project Management -PBS RL-13	202,400	19,620	19,206	20,502	17,087	16,366	14,847	14,430	13,990	13,527	13,040	13,000	13,260	13,525
	013.04	Mixed Low Level Waste Treatment	73,123	16,760	15,768	13,956	13,957	8,650	4,032	0	0	0	0	0	0	0
	013.05	TRU Retrieval	291,153	18,725	33,980	40,348	47,003	51,608	22,577	20,272	20,610	21,087	14,943	0	0	0
	013.06	TRU Repackaging	210,189	8,251	12,638	12,022	54,819	80,593	6,097	6,219	6,343	6,470	6,599	1,970	3,036	5,133
	013.07	Waste Receiving and Processing Facility (WRAP)	113,435	7,234	9,359	9,776	9,811	11,069	9,538	7,804	7,961	8,119	8,282	8,000	8,160	8,323
	013.08	T-Plant	142,055	12,514	12,919	12,523	13,793	12,805	17,405	8,148	10,246	15,483	8,138	5,902	6,020	6,158
	013.09	Central Waste Complex	84,029	7,689	8,970	9,105	6,951	7,217	5,275	5,280	5,332	5,397	5,535	5,646	5,759	5,874
	013.10	Environmental Restoration Disposal Fac (ERDF)	27,137	1,839	2,374	2,122	30	30	68	1,213	32	1,262	40	1,020	1,056	16,052
	013.12	Integrated Disposal Facility	14,480	313	271	278	1,235	1,260	1,296	1,322	1,348	1,375	1,403	1,431	1,460	1,489
	013.15	TRU Disposition	90,969	1,740	1,177	1,210	1,191	1,214	1,920	1,607	2,977	1,691	1,243	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
M-91 Subtotal			1,262,518	98,036	117,857	122,439	166,470	192,072	83,406	66,654	69,207	76,362	61,213	52,469	64,261	92,074
Non-M91 Subtotal			424,480	37,669	34,413	31,924	36,977	41,068	43,432	51,901	43,954	41,135	44,637	4,908	8,598	3,861
Other Subtotal			682,294	46,036	62,738	61,413	50,562	52,871	58,451	60,489	45,780	48,651	48,772	47,746	48,835	49,949
TOTAL			2,369,292	181,741	215,008	215,776	254,009	286,011	185,289	179,044	158,941	166,148	154,623	105,124	121,694	145,884

	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
M-91	013.01	Project Management -PBS RL-13	220,372	13,796	14,072	14,353	14,640	14,933	15,232	15,536	15,847	16,164	16,487	16,817	17,153	17,496	17,846
	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	119,276	7,386	7,507	7,677	7,851	8,028	8,209	8,393	8,581	8,772	8,968	9,167	9,370	9,578	9,789
	013.07	Waste Receiving and Processing Facility (WRAP)	135,613	8,490	8,659	8,833	9,009	9,189	9,373	9,561	9,752	9,947	10,146	10,349	10,556	10,767	10,982
	013.08	T-Plant	44,095	6,246	6,000	6,120	6,242	6,367	6,495	6,624	0	0	0	0	0	0	0
	013.09	Central Waste Complex	95,709	5,992	6,111	6,234	6,358	6,485	6,615	6,747	6,882	7,020	7,160	7,304	7,450	7,599	7,751
	013.10	Environmental Restoration Disposal Fac (ERDF)	37,250	15,229	1,500	1,530	1,561	1,592	1,624	1,656	1,689	1,723	1,757	1,793	1,828	1,865	1,902
	013.12	Integrated Disposal Facility	24,257	1,519	1,549	1,580	1,611	1,644	1,677	1,710	1,744	1,779	1,815	1,851	1,888	1,926	1,964
	013.15	TRU Disposition	570,270	35,700	36,414	37,142	37,885	38,643	39,416	40,204	41,008	41,828	42,665	43,518	44,388	45,276	46,182
	013.21	Mixed Waste Disposal Trenches	12,789	531	541	552	563	574	586	598	609	622	634	647	660	673	5,000
M-91 Total			2,522,148	94,888	82,354	84,020	85,721	87,456	89,225	91,030	86,113	87,855	89,633	91,445	93,294	95,180	101,417
Non-M91 Total			628,156	5,640	1,288	5,113	15,430	15,800	16,179	16,568	16,965	17,373	17,789	18,216	18,654	19,101	19,560
Other Total			1,514,000	51,089	52,254	53,447	54,666	55,914	57,191	58,497	59,832	61,199	62,597	64,027	65,490	66,986	68,517
TOTAL			4,664,305	151,616	135,896	142,580	155,818	159,170	162,595	166,094	162,911	166,426	170,019	173,688	177,437	181,268	189,494

M-91 PMP BASE CASE FUNDING PROFILE ASSUMPTIONS

1. FY 2009 escalated dollars
2. Based on the FY 2009-2018 Plateau Remediation Contract (PRC) baseline and reflects incorporation of both the President's FY 2010 budget as well as additional American Recovery and Reinvestment Act (ARRA) funding in the FY 2009-2011 timeframe. Funding for FYs 2019 through 2035 was estimated based on assumptions regarding operations that support achievement of M-91 milestone series and is subject to change as planning is refined.
3. ARRA funding is received and maintained at the levels identified for the Waste and Fuels Management Project in the FY 2009-2018 PRC baseline.
4. Non-91 activities include: Maintain Safe and Compliant WESF, Disposition of Capsules, Canister Storage Building, 200 Area Liquid Effluent Facilities, 300 Area Liquid Effluent Facilities, Disposition of Spent Nuclear Fuel, Spent Nuclear Fuel Support
5. Other activities include: RL Reserve, Project Management Reserve, Closure Services, Fee
6. Waste and Fuels Management supports M-91 and non-91 activities
7. ERDF is transferred to PBS RL-0013 in FY 2014
8. FY 2010 funding provides minimum safe operations of CWC, WRAP, MWDTs, and WIPP compliant packaging
9. WIPP CCP provides visual examination for WIPP compliant packaging starting in June 2009. Shipment of transuranic waste in TRUPACT-II's to WIPP beginning in FY 2014 will be at a rate of 1,000 m^3 per year
10. ERDF and IDF funding only includes minimum safe operations. Generators provide funding for disposal
11. Large container and RH waste capabilities is funded in FY 2014 and begins operations by 12/31/2018. RH transuranic waste shipping capabilities begin operations by 12/31/18
12. T Plant is maintained in ready-to-serve until FY 2028. T Plant processes M-91-42 transuranic waste until complete
13. WRAP is maintained in ready-to-serve until CH transuranic waste shipments are complete
14. FY 2009 funding provides retrieval of 750 m^3 of CH RSW, treatment of 270 m^3 of M-91-43 MLLW, treatment of 850 m^3 of M-91-42 MLLW, and WIPP compliant packaging of 120 m^3 of M-91-42 transuranic waste

M-91 PMP AS-SOON-AS FEASIBLE COMPLIANCE CASE FUNDING PROFILE ASSUMPTIONS

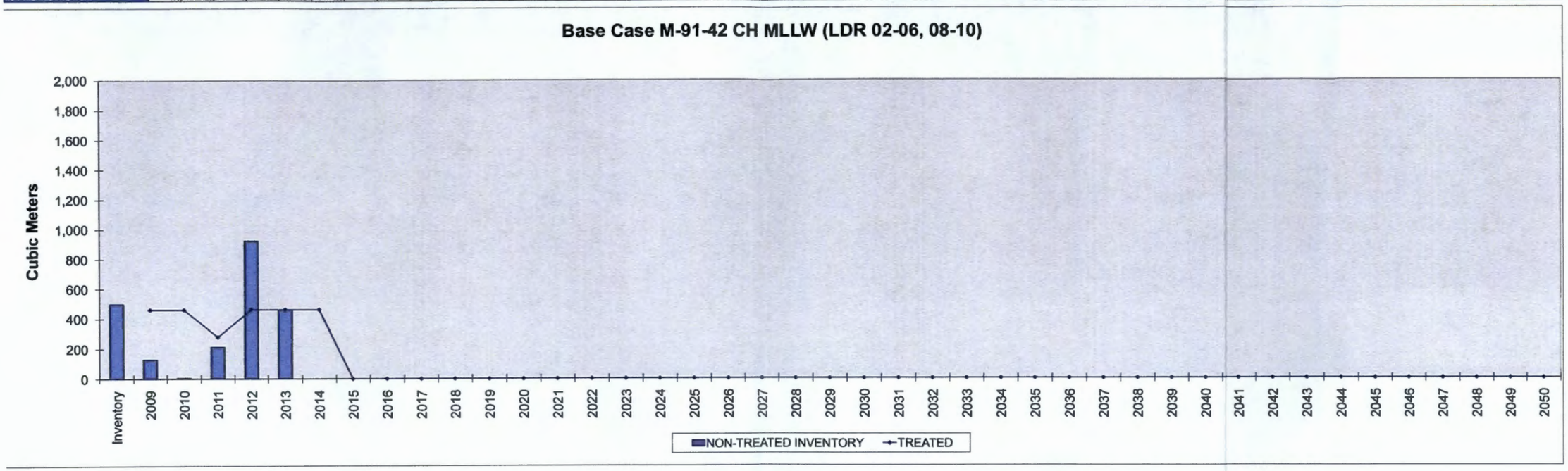
1. Same as BASE Case except:
   a. Increased funding
   b. Large container and RH waste capabilities is funded and starts design in FY 2012 and begins operations by 12/31/2016 (two years earlier). RH transuranic waste shipping capabilities begin operations by 12/31/16 (two years earlier)
   c. Treatment of M-91-42F CH MLLW is completed by 12/31/2013 (one year earlier)

d. WIPP compliant packaging of the first 300 m^3 on large container and RH waste is completed by 12/31/2016

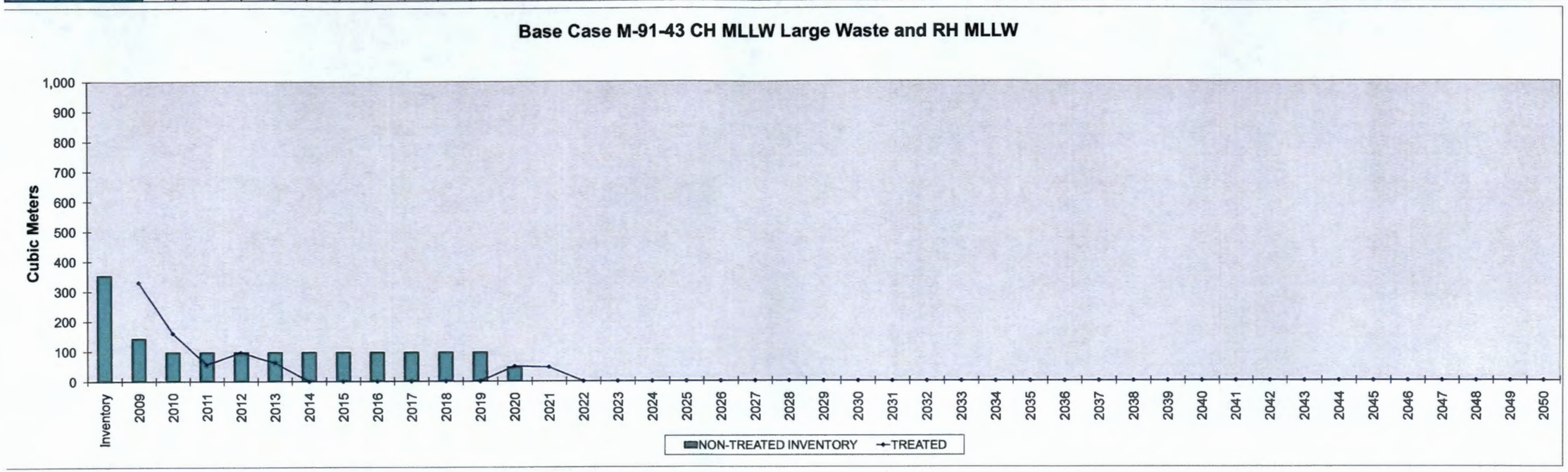
APPENDIX Q

M-91 MLLW PROCESSING SCHEDULES

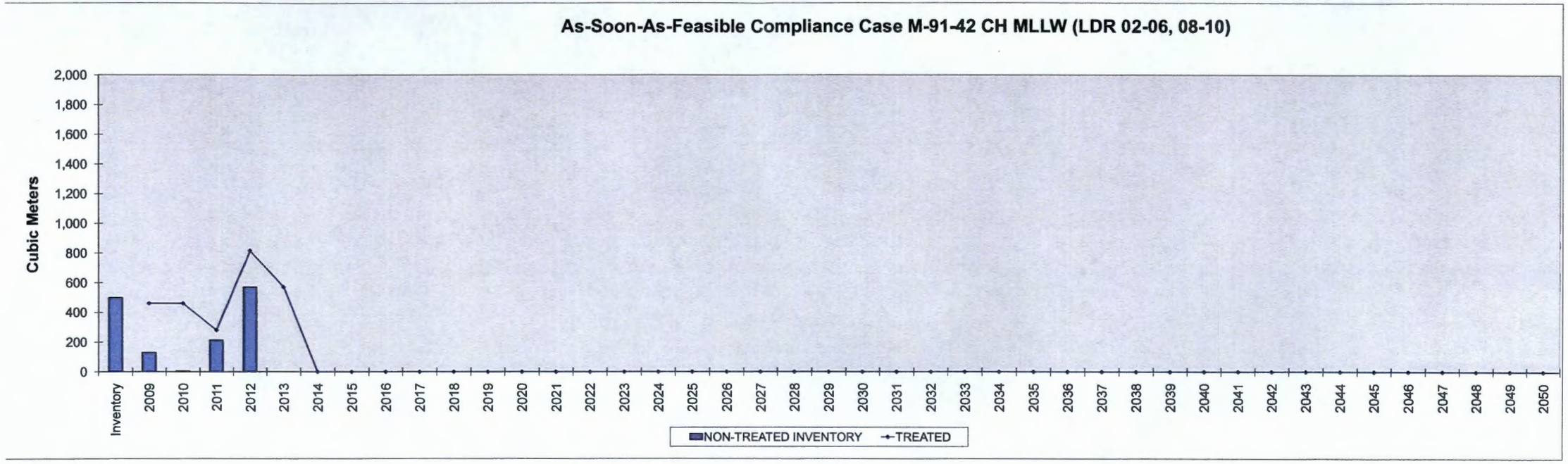
FEED	Inventory	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Retrieval		31	281	462	1143																																						
Storage	499																																										
Forecast																																											
From Retrieval of Suspect M-91-44 Waste		58	55	26	30																																						
TREATED																																											
[illegible]		460	460	280	462	462	462																																				
[illegible]		460	460	280	462	462	462	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NON-TREATED INVENTORY	499	129	5	213	924	462	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



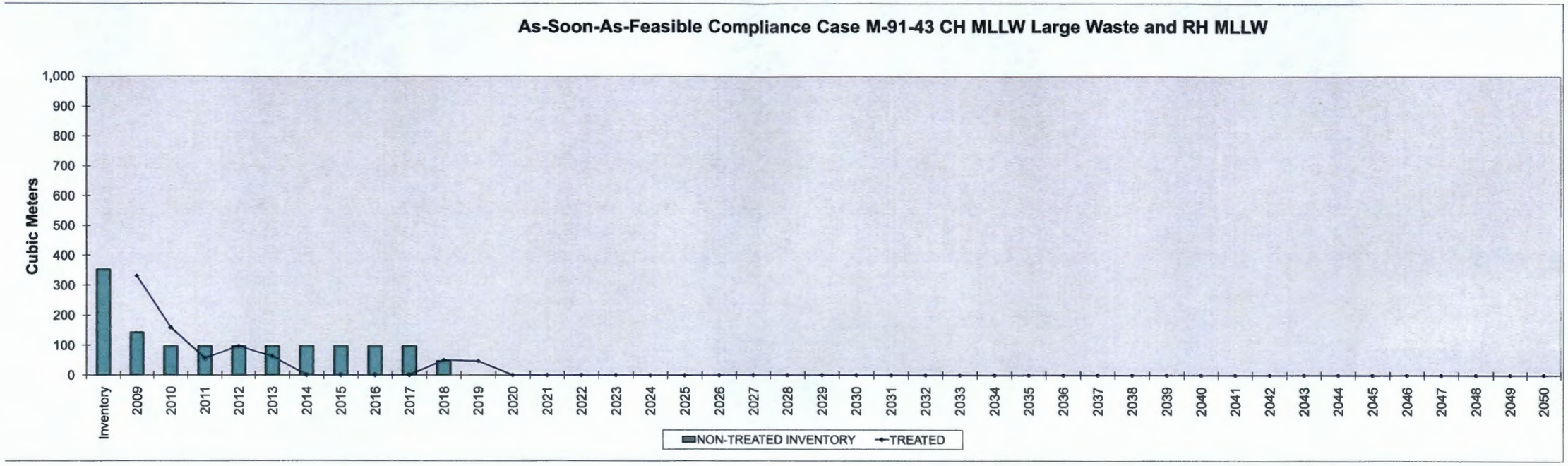
FEED	Inventory	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Retrieval		120	114	56	97	62																																					
Storage	353																																										
Forecast																																											
TREATED																																											
Commercial		330	160	56	97	62																																					
Large Container & RH Capacities													50	47																													
Actual		330	160	56	97	62	0	0	0	0	0	0	50	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NON-TREATED INVENTORY	353	143	97	97	97	97	97	97	97	97	97	97	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



FEED	Inventory	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Retrieval		31	281	462	1143																																						
Storage	499																																										
Forecast																																											
From Retrieval of Suspect M-91-44 Waste		59	55	26	30																																						
TREATED																																											
Commercial		460	460	280	818	570	0																																				
Total		460	460	280	818	570	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NON-TREATED INVENTORY	499	129	5	213	570	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



FEED	Inventory	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Retrieval		120	114	56	97	62																																					
Storage	353																																										
Forecast																																											
TREATED																																											
Commercial		330	160	56	97	62																																					
Large Container & RH Capabilities											50	47																															
Actual		330	160	56	97	62	0	0	0	0	50	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NON-TREATED INVENTORY	353	143	97	97	97	97	97	97	97	97	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Assumptions for the Base Case M-91 MLLW Treatment Schedules (CY)

M-91-42 MLLW and M-91-43

- Base Case funding supports treatment using prioritization rationale in Section 4.3 section on Funding Constraints

Assumptions for the As-Soon-As Feasible Compliance Case M-91 MLLW Processing Schedules

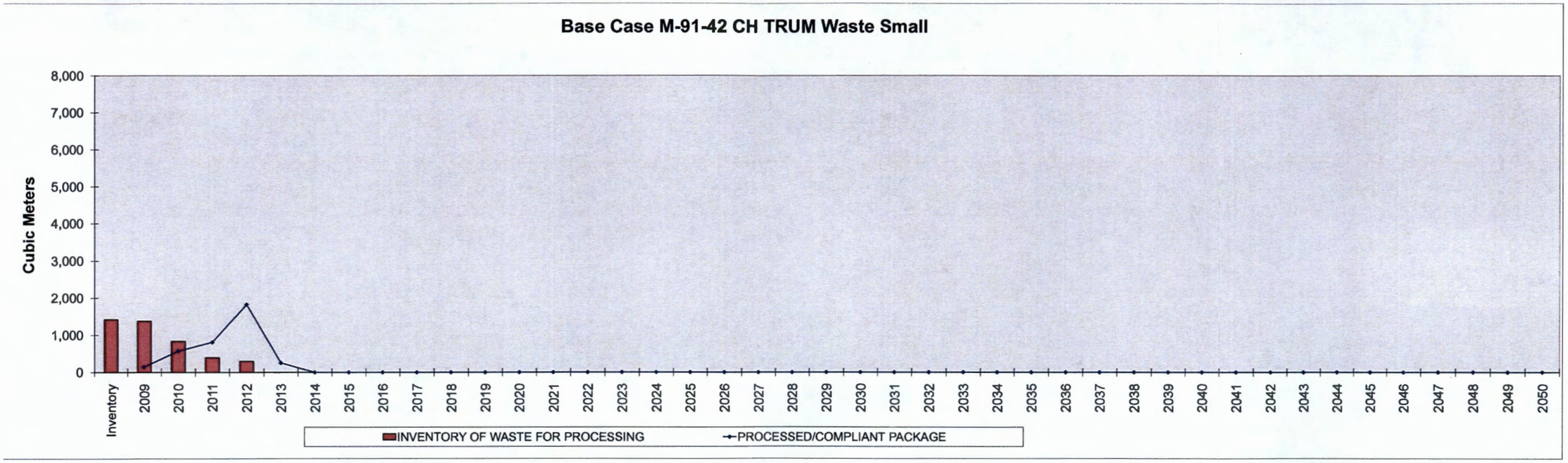
M-91-42 MLLW and M-91-43

- As-Soon-As Feasible Compliance Case funding supports completion of CH MLLW in small containers a year earlier

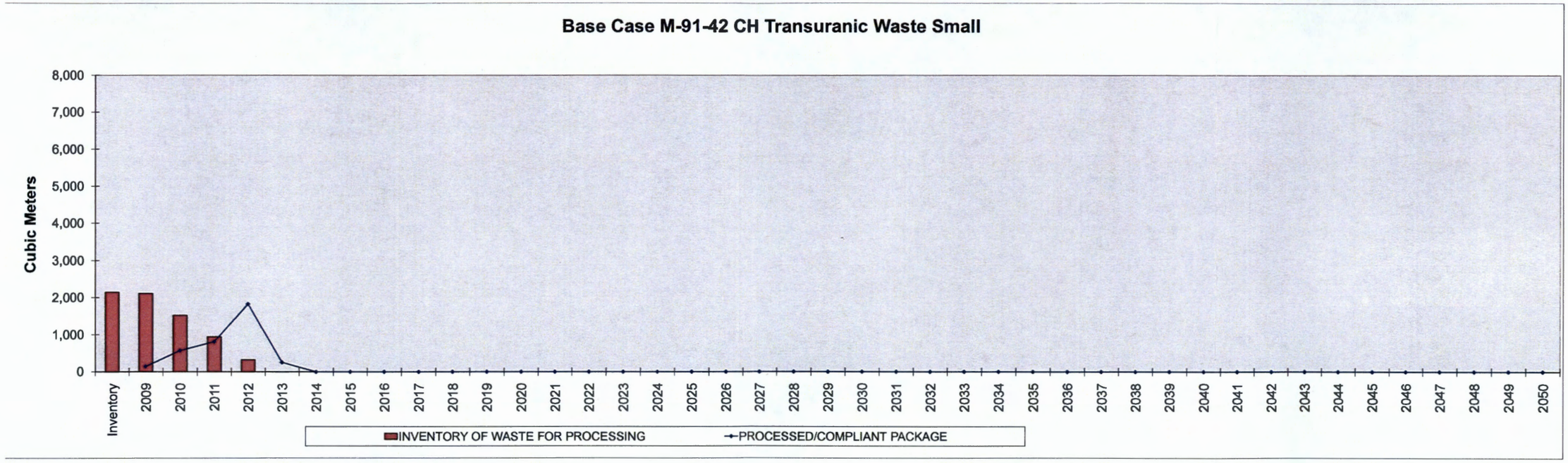
APPENDIX R

M-91 TRANSURANIC WASTE PROCESSING SCHEDULES

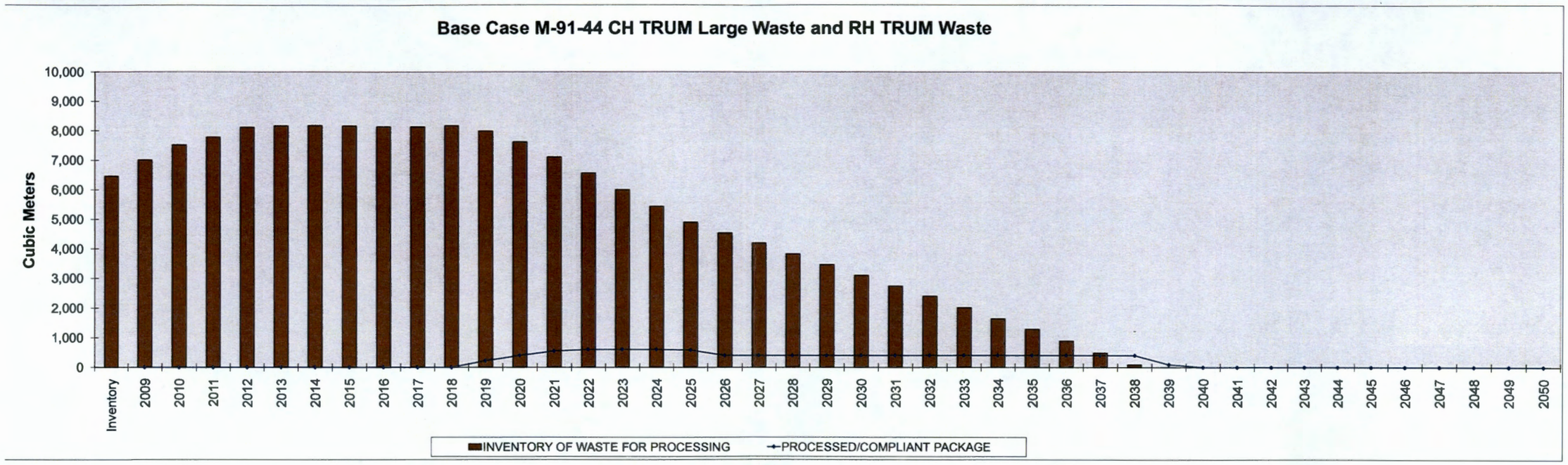
FEED	Inventory	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Retrieval		0	0	1	4																																						
Storage	1,846																																										
Forecast																																											
PROCESSED/COMPLIANT PACKAGE																																											
1-Pass		94	330	324	322	184																																					
WRAP		24	83	51	51	29																																					
Commercial			30	70	119																																						
Phase I Next Generation Retrieval (SWBs)				2	8																																						
Phase II Next Generation Retrieval																																											
Off-Site																																											
Total		129	484	484	537	234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROCESSED CERTIFABLE BY GENERATORS		30	142	187	209	66	22	22	22	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1															
COMPLIANT PACKAGE INVENTORY	424	583	1,209	1,879	2,626	2,926	1,948	969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INVENTORY OF WASTE FOR PROCESSING	1,422	1,379	835	396	298	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



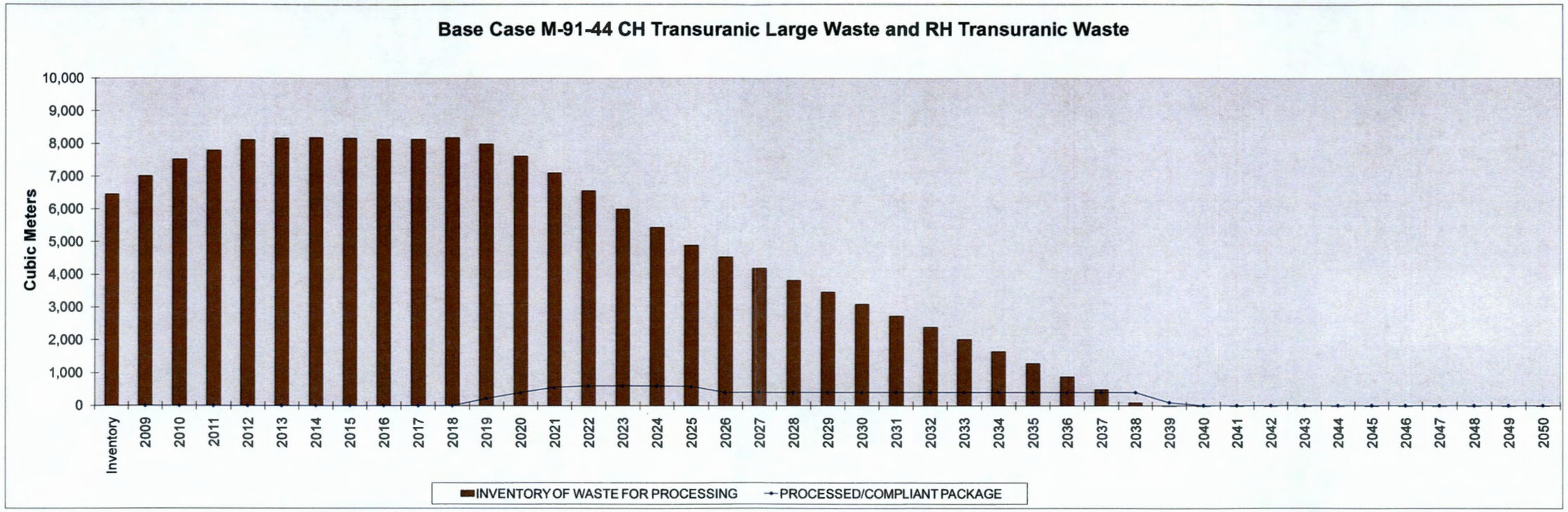
FEED	Inventory	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Retrieval		17	50	200	789																																						
Storage	2,621																																										
Forecast																																											
PROCESSED/COMPLIANT PACKAGE																																											
2 Pack		103	363	352	350	200																																					
WRAP		26	90	55	55	31																																					
Commercial			30	70	119																																						
Phase I Next Generation Retrieval (SWBs)			45	293	1,064																																						
Phase II Next Generation Retrieval					197																																						
Off-Site																																											
Remote		142	573	810	1,826	254	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROCESSED CERTIFABLE BY GENERATORS		111	527	695	779	246	81	81	81	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	3	3	3															
COMPLIANT PACKAGE INVENTORY	478	731	1,832	3,337	5,942	6,442	5,523	4,605	3,686	2,694	1,703	711	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INVENTORY OF WASTE FOR PROCESSING	2,143	2,111	1,518	942	326	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



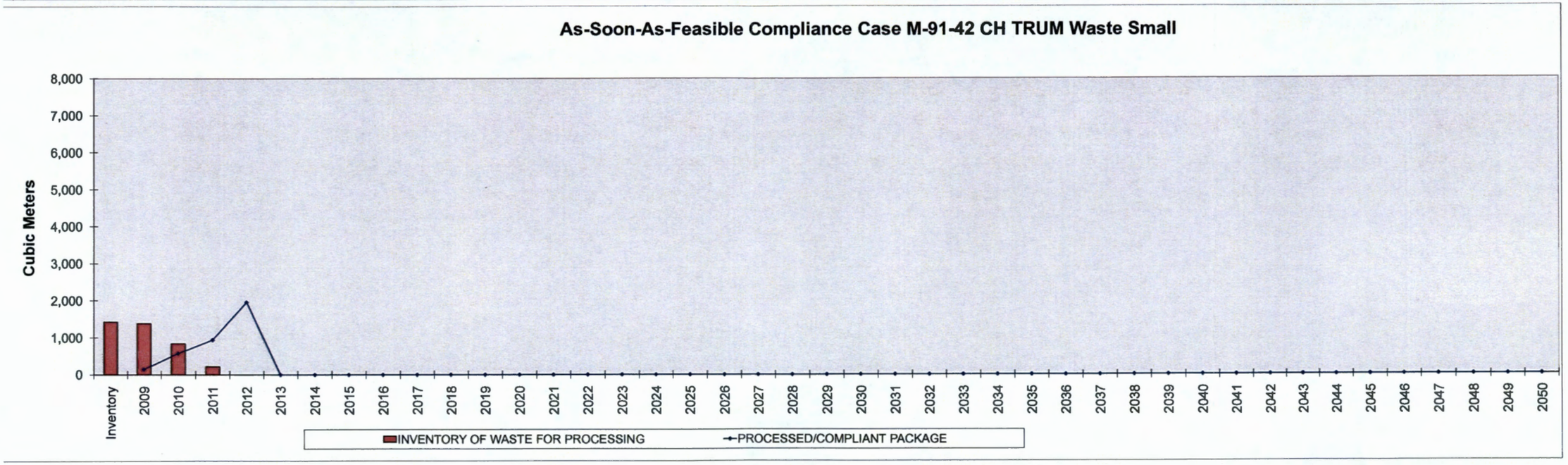
FEED	Inventory	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Retrieval		134	128	66	83	13	6	7	7																																		
Storage	5,684																																										
Forecast		8	12	11	11	11	226	226	364	68	35	35	36	35	58	36	35	35	36	58	35	36	35	35	59	25	25	47															
PROCESSED/COMPLIANT PACKAGE																																											
Commercial												39	79	118	158	158	158	140																									
Large Container & RH Capabilities												134	237	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	207	0	0	0										
Mobile Hot Cell						3	6	7	7																																		
Annual		0	0	0	0	3	6	7	7	0	0	173	315	434	473	473	473	456	315	315	315	315	315	315	315	315	315	315	315	315	207	0	0	0	0	0	0	0	0	0	0	0	0
COMPLIANT PACKAGE INVENTORY	0	0	0	0	0	30	223	415	590	812	1,049	1,384	1,479	1,146	1,052	950	920	950	986	1,032	1,099	1,038	936	834	732	630	630	630	612	613	583	433	283	133	0	0	0	0	0	0	0	0	0
INVENTORY OF WASTE FOR PROCESSING	5,684	5,826	5,967	6,043	6,137	6,158	6,141	6,123	6,087	6,091	6,126	5,988	5,709	5,311	4,896	4,459	4,021	3,601	3,322	3,064	2,784	2,505	2,225	1,945	1,688	1,397	1,106	838	523	207	0	0	0	0	0	0	0	0	0	0	0	0	0



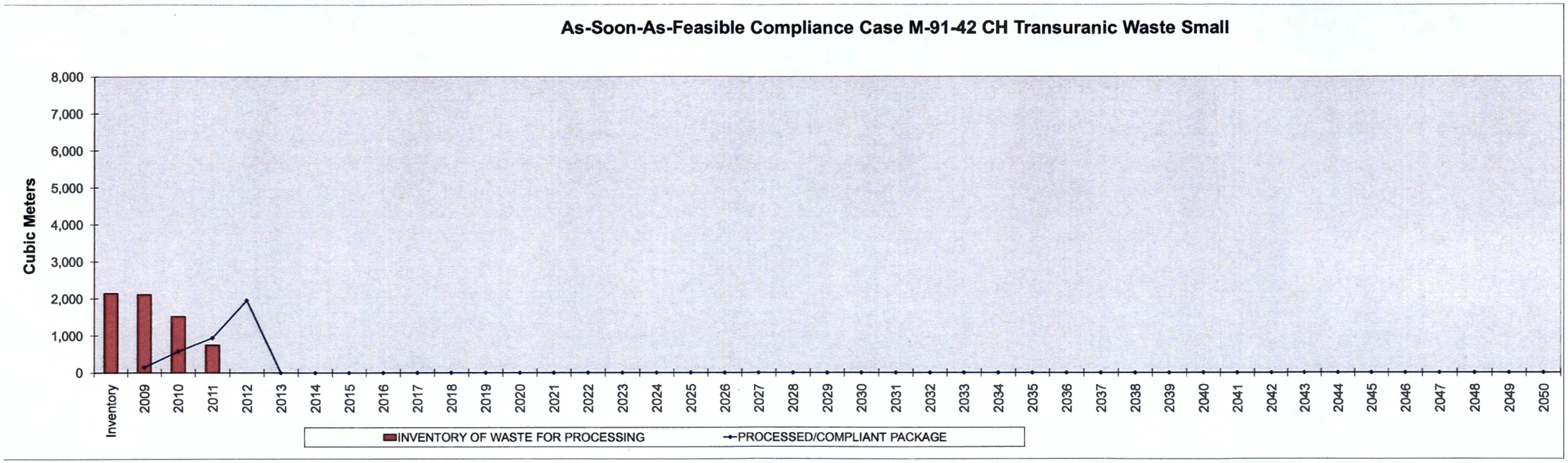
FEED	Inventory	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Retrieval		523	500	256	324	42	6	7	7																																		
Storage	6,459																																										
Forecast		26	12	11	11	11	254	233	364	68	36	36	36	36	58	36	36	36	36	58	36	36	35	35	59	25	25	47															
PROCESSED/COMPLIANT PACKAGE																																											
Commercial												50	100	150	200	200	200	178																									
Large Container & RH Capabilities												170	300	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	91	0	0	0	0	0	0	0				
Mobile Hot Cell																																											
Annual		0	0	0	0	3	6	7	7			220	400	550	600	600	600	578	400	400	400	400	400	400	400	400	400	400	400	400	400	91	0	0	0	0	0	0	0	0	0	0	0
COMPLIANT PACKAGE INVENTORY	0	0	0	0	0	30	223	415	590	812	1,058	1,436	1,819	1,193	1,052	950	920	950	986	1,032	1,099	1,038	936	834	732	630	630	630	612	613	563	433	283	133	0	0	0	0	0	0	0	0	0
INVENTORY OF WASTE FOR PROCESSING	6,459	7,006	7,520	7,787	8,122	8,172	8,181	8,171	8,135	8,139	8,174	7,990	7,626	7,112	6,570	6,006	5,442	4,899	4,536	4,194	3,829	3,466	3,101	2,736	2,395	2,020	1,644	1,291	891	491	91	0	0	0	0	0	0	0	0	0	0	0	0



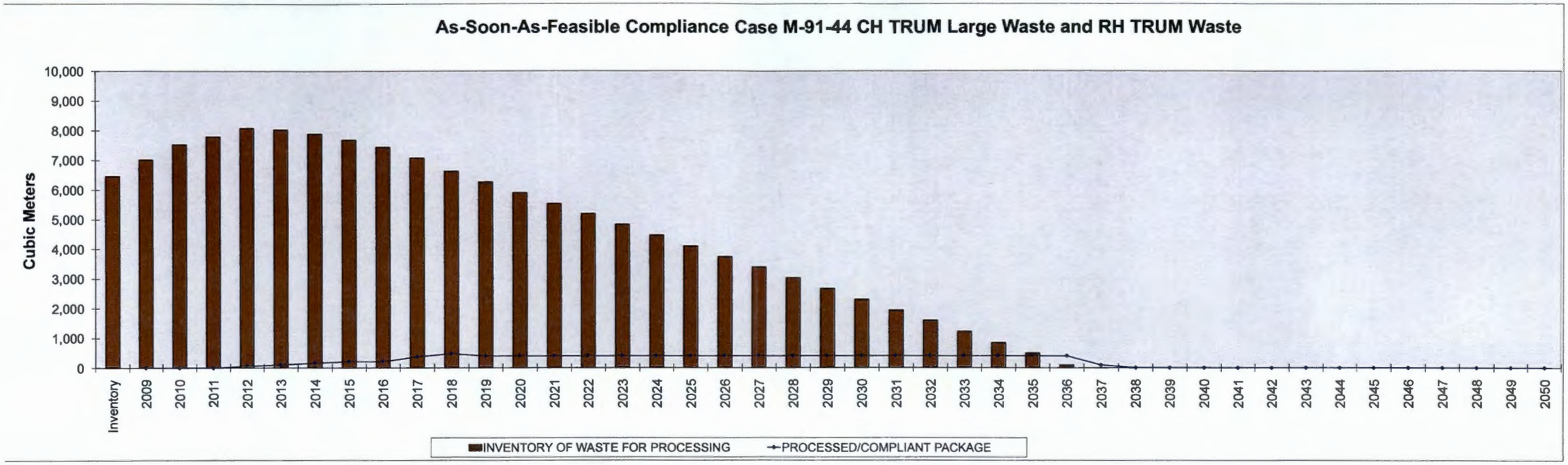
FEED	Inventory	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Retrieval		0	0	1	4																																						
Storage	1,846																																										
Forecast																																											
PROCESSED/COMPLIANT PACKAGE																																											
T Plant		94	330	416	416																																						
WRAP		24	83	66	65																																						
Commercial			30	70	119																																						
Phase I Next Generation Retrieval (SWBs)				2	8																																						
Phase II Next Generation Retrieval																																											
Off-Site																																											
Annual		129	484	602	656	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROCESSED CERTIFABLE BY GENERATORS		30	142	187	209	66	22	22	22	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1															
COMPLIANT PACKAGE INVENTORY	424	583	1,209	1,998	2,863	2,929	1,951	973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INVENTORY OF WASTE FOR PROCESSING	1,422	1,379	835	217	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



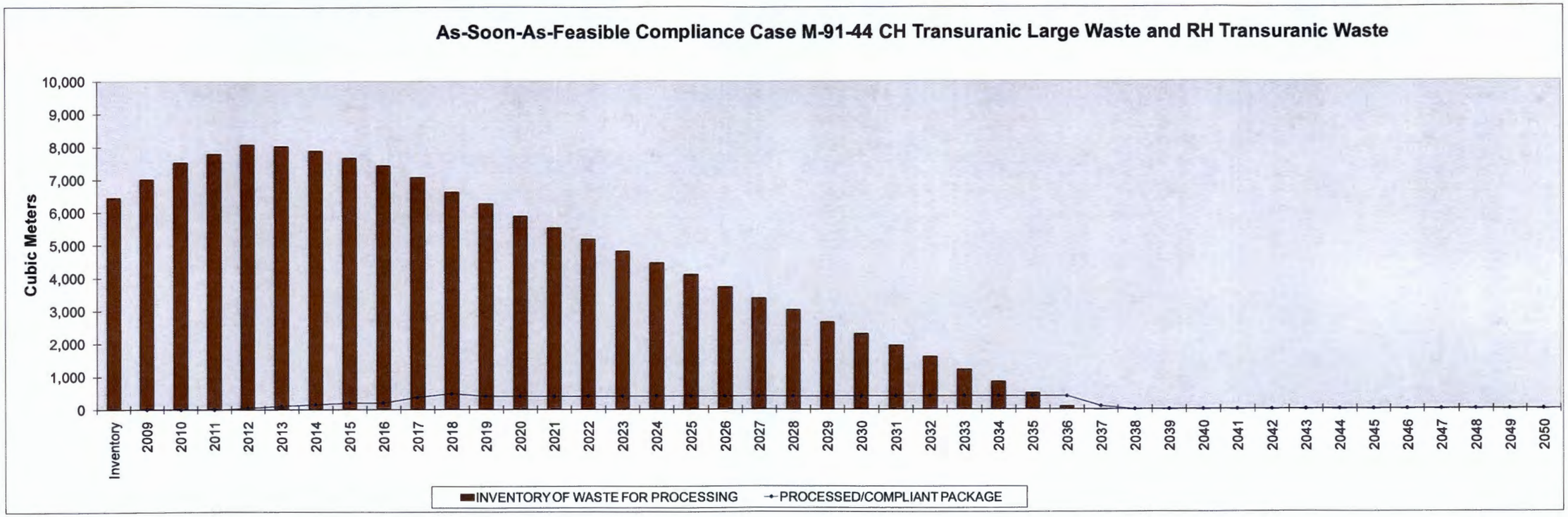
FEED	Inventory	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Retrieval		17	50	200	789																																						
Storage	2,621																																										
Forecast																																											
PROCESSED/COMPLIANT PACKAGE																																											
T Plant		103	363	452	450																																						
WRAP		26	90	71	70																																						
Commercial			30	70	119																																						
Phase I Next Generation Retrieval (SWBs)			45	293	1,064																																						
Phase II Next Generation Retrieval					197																																						
Off-Site																																											
Admin		142	573	938	1,952	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PROCESSED CERTIFABLE BY GENERATORS		111	527	695	779	246	81	81	81	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	3	3	3															
COMPLIANT PACKAGE INVENTORY	478	731	1,832	3,465	6,196	6,442	5,523	4,605	3,686	2,694	1,703	711	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INVENTORY OF WASTE FOR PROCESSING	2,143	2,111	1,518	748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



FEED	Inventory	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Retrieval		134	128	68	83	13	6	7	7																																		
Storage	5,684																																										
Forecast		8	12	11	11	11	226	226	364	68	35	35	36	35	58	36	35	35	36	58	35	36	35	35	58	25	25	47															
PROCESSED/COMPLIANT PACKAGE																																											
Commercial					39	79	118	158	158	158	140																																
Contact Handled & Non Capacitated										134	237	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	207	0	0	0												
Mobile Hot Cell						3	6	7	7																																		
Total		0	0	0	39	82	124	165	165	292	377	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	315	207	0	0	0	0	0	0	0	0	0	0	0	0	0	0
COMPLIANT PACKAGE INVENTORY	0	0	0	0	59	207	689	1,239	1,946	2,382	2,829	3,144	3,179	2,494	1,810	1,125	820	650	686	732	799	738	636	534	432	330	330	330	312	313	283	133	0	0	0	0	0	0	0	0	0	0	0
INVENTORY OF WASTE FOR PROCESSING	5,684	5,826	5,967	6,043	6,098	6,040	5,904	5,729	5,535	5,247	4,905	4,625	4,346	4,066	3,809	3,530	3,250	2,970	2,691	2,433	2,153	1,874	1,594	1,314	1,057	767	476	207	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



FEED	Inventory	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Retrieval		323	500	256	324	42	8	7	7																																		
Storage	8,459																																										
Forecast		26	12	11	11	11	254	233	364	68	36	36	36	36	58	36	36	36	36	58	36	36	35	35	58	25	25	47															
PROCESSED/COMPLIANT PACKAGE																																											
Commercial					50	100	150	200	200	200	178																																
Hanford Cover & Ion Capacitors										170	300	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	91														
Mobile Hot Cell						3	6	7	7																																		
ARTisan		0	0	0	50	103	156	207	207	370	478	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	91	0	0	0	0	0	0	0	0	0	0	0	0	0
COMPLIANT PACKAGE INVENTORY	0	0	0	0	75	255	784	1,398	2,168	2,858	3,150	3,451	3,420	2,670	1,920	1,170	620	650	686	732	799	738	638	534	432	330	330	330	312	313	283	133	0	0	0	0	0	0	0	0	0	0	0
INVENTORY OF WASTE FOR PROCESSING	8,459	7,008	7,520	7,787	8,072	8,022	7,881	7,871	7,435	7,069	6,626	6,262	5,898	5,534	5,192	4,828	4,464	4,099	3,736	3,394	3,029	2,666	2,301	1,936	1,595	1,220	844	491	91	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Assumptions for the Base Case M-91 Transuranic Waste WIPP Compliant Packaging/Processing Schedules (CY)

M-91-42 and M-91-44 Transuranic Waste

- Base Case funding supports WIPP compliant packaging using prioritization rationale in Section 4.3 section on Funding Constraints
- T Plant will process M 91 42 transuranic waste using two processing lines operating two shifts for one process line and one shift for the other process line starting in FY 2010 (350 m^3 per year). WRAP continues to process M 91 42 transuranic waste with one operating shift

Assumptions for the As-Soon-As Feasible Compliance Case M-91 Transuranic Waste Certification/Processing Schedules

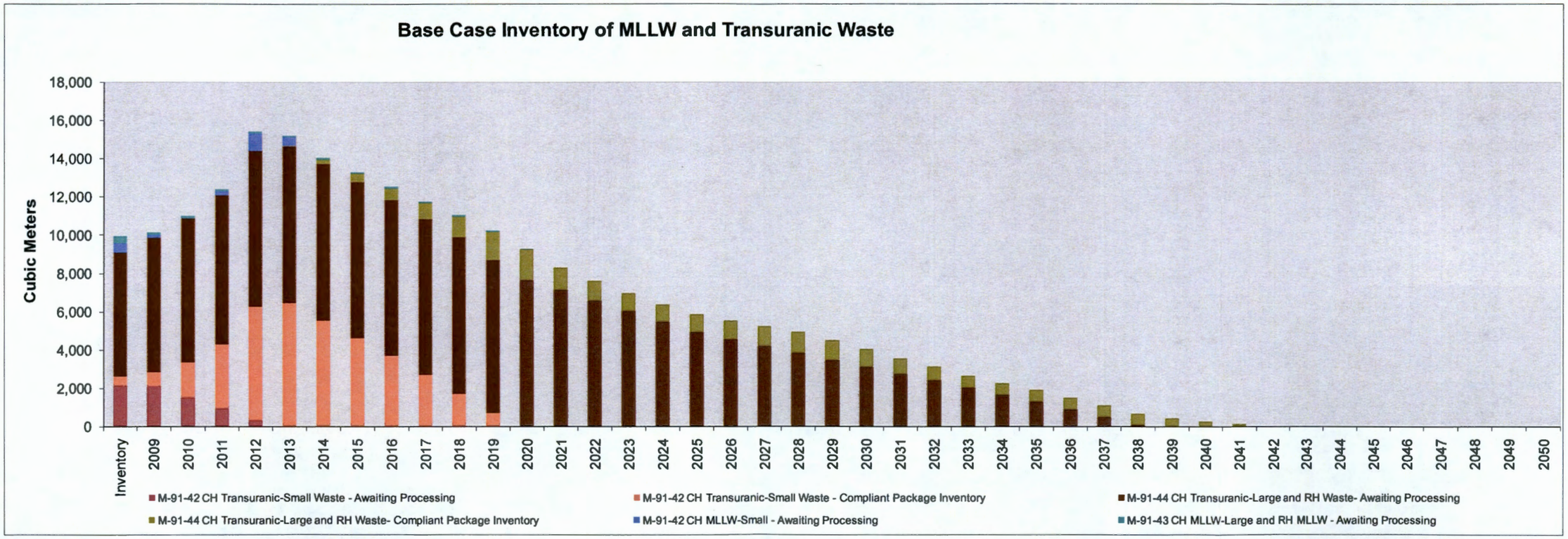
M-91-42 and M-91-44 Transuranic Waste

- As-Soon-As Feasible Compliance Case funding supports processing rates increases in FY 2011 by adding an additional shift at T Plant (to three shifts) and WRAP (to two shifts). DOE plans to evaluate alternatives to establish offsite processing capability for selected M 91 42 CH transuranic waste.

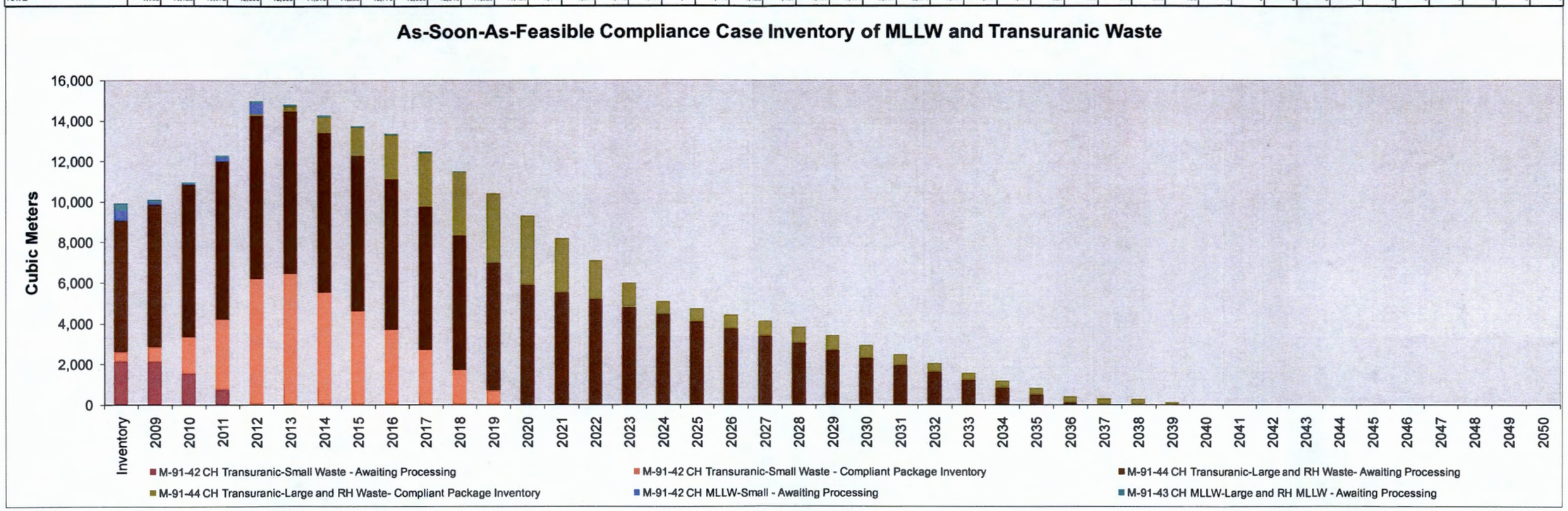
APPENDIX S

M-91 INVENTORY OF NON-TREATED MLLW AND NON-CERTIFIED TRANSURANIC WASTE

	Inventory	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
M-91-42 CH Transuranic-Small Waste - Awaiting Processing	2,143	2,111	1,518	942	326	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M-91-42 CH Transuranic-Small Waste - Compliant Package Inventory	478	731	1,832	3,337	5,942	6,442	5,523	4,605	3,686	2,694	1,703	711	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M-91-44 CH Transuranic-Large and RH Waste- Awaiting Processing	6,459	7,008	7,520	7,787	8,122	8,172	8,181	8,171	8,135	8,139	8,174	7,990	7,628	7,112	6,570	6,006	5,442	4,899	4,536	4,194	3,829	3,466	3,101	2,736	2,395	2,020	1,644	1,291	891	491	91	0	0	0	0	0	0	0	0	0	0	0	0
M-91-44 CH Transuranic-Large and RH Waste- Compliant Package Inventory	0	0	0	0	0	30	223	415	590	812	1,058	1,436	1,619	1,193	1,052	950	920	950	986	1,032	1,099	1,038	936	834	732	630	630	630	612	613	583	433	283	133	0	0	0	0	0	0	0	0	0
M-91-42 CH MLLW-Small - Awaiting Processing	499	129	5	213	924	462	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M-91-43 CH MLLW-Large and RH MLLW - Awaiting Processing	353	143	97	97	97	97	97	97	97	97	97	97	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	9,932	10,122	10,972	12,376	15,411	15,202	14,024	13,287	12,508	11,742	11,031	10,233	9,292	8,304	7,621	6,956	6,361	5,849	5,521	5,225	4,928	4,503	4,037	3,570	3,127	2,649	2,274	1,921	1,503	1,104	674	433	283	133	0	0	0	0	0	0	0	0	0



	Inventory	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
M-91-42 CH Transuranic-Small Waste - Awaiting Processing	2,143	2,111	1,518	748	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M-91-42 CH Transuranic-Small Waste - Compliant Package Inventory	478	731	1,832	3,465	6,196	6,442	5,523	4,605	3,686	2,694	1,703	711	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M-91-44 CH Transuranic-Large and RH Waste- Awaiting Processing	6,459	7,008	7,520	7,787	8,072	8,022	7,881	7,671	7,435	7,069	6,626	6,262	5,898	5,534	5,192	4,828	4,464	4,099	3,736	3,394	3,029	2,666	2,301	1,936	1,595	1,220	844	491	91	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M-91-44 CH Transuranic-Large and RH Waste- Compliant Package Inventory	0	0	0	0	75	255	784	1,398	2,168	2,658	3,150	3,451	3,420	2,670	1,920	1,170	620	650	686	732	799	738	636	534	432	330	330	330	312	313	283	133	0	0	0	0	0	0	0	0	0	0	0
M-91-42 CH MLLW-Small - Awaiting Processing	499	129	5	213	570	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
M-91-43 CH MLLW-Large and RH MLLW - Awaiting Processing	353	143	97	97	97	97	97	97	97	97	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	9,932	10,122	10,972	12,309	15,009	14,816	14,286	13,770	13,386	12,518	11,526	10,423	9,318	8,204	7,112	5,998	5,084	4,749	4,422	4,126	3,828	3,404	2,937	2,470	2,027	1,550	1,174	821	403	313	283	133	0	0	0	0	0	0	0	0	0	0	0



APPENDIX T

DRAFT M-91 CHANGE PACKAGE M-91-08-05

Change Number M-91-08-05	Federal Facility Agreement and Consent Order *Change Control Form* Do not use blue ink. Type or print using black ink.	**Date** 02/2/2009

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-91 Interim Milestones

Description/Justification of Change
DOE has submitted this change request to reach agreement on adjustments in workscope and milestones consistent with currently anticipated available funding ($1.018 Billion for FY09) and with a shift of resources to the river corridor and other high priority work. This shift of resources is expected to require modification of several M-91 interim milestone requirements.

The Parties will continue to work together per HFFACO Article, XLVIII. Cost Schedule, Scope, Integration, Planning and Reporting to establish due dates for the milestones that are being identified in this change package with to be determined due dates.

The proposed changes provide for reduced levels of waste retrieval and treatment for the next few years. The agencies will negotiate a new schedule for completion of this work in the fall of 2009.

Impact of Change
This change aligns the impacted milestone requirements with 2009 Continuing Resolution funding levels.

Affected Documents
The Hanford Federal Facility Agreement and Consent Order, as amended and Hanford Site internal planning management, and budget documents (e.g., USDOE contractor Baseline Change Control documents; M-91-03 Hanford Site TRU mixed/mixed low level waste Project Management Plan, and LDR Report).

Approvals

_____	_____	_____ Approved	_____ Disapproved
Ecology	Date		
_____	_____	_____ Approved	_____ Disapproved
DOE-RL	Date		
_____	_____	_____ Approved	_____ Disapproved
EPA	Date		

Modifications to existing Tri-Party Agreement milestones are denoted with ~~strikeout~~; new milestone/text are denoted with shading.

M-091-00	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 MIXED AND SUSPECT MIXED LOW-LEVEL WASTE AND RCRA MIXED AND SUSPECT MIXED TRANSURANIC WASTE. DEFINITIONS THE FOLLOWING DEFINITIONS APPLY TO THIS SERIES OF MILESTONES "SMALL CONTAINERS" AND LARGE CONTAINERS" AS USED HEREIN HAVE DIFFERENT MEANINGS DEPENDING ON WHETHER THEY ARE USED IN REFERENCE TO MLLW/LLW OR TRANSURANIC WASTE. WHEN REFERRING TO MLLW/LLW, 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 TRANSURANIC WASTE, SMALL CONTAINERS ARE 55 GALLON DRUMS OR SMALLER CONTAINERS EVEN IF OVER-PACKED IN 85 GALLON DRUMS, AND NEWLY GENERATED WIPP STANDARD WASTE BOXES (SWB). A WIPP SWB IS A 1.8 CUBIC METER STEEL CONTAINER THAT IS APPROXIMATELY O.94 METERS IN HEIGHT, 1.8 METERS IN LENGTH, AND 1.4 METERS IN WIDTH AND WAS QUALIFIED BY THE U.S. DEPARTMENT OF ENERGY (USDOE) IN 1988 AS MEETING THE U.S. DEPARTMENT OF TRANSPORTATION REQUIREMENTS FOR SPECIFICATION 7A TYPE A PACKAGINGS. A LARGE CONTAINER IS ANYTHING NOT DEFINED AS A SMALL CONTAINER. "CERTIFICATION" AS USED HEREIN IS DEFINED AS COMPLETION OF ALL ACTIVITIES ~~REQUIRED FOR APPROVAL IN THE WIPP WASTE INFORMATION SYSTEM FOR ACCEPTANCE~~	To Be Determined*

	~~INTO WIPP FOR DISPOSAL.~~NECESSARY FOR WASTE TO BE PACKAGED SUCH THAT IT CAN MEET WIPP WASTE ACCEPTANCE CRITERIA (WAC). IF SUBSEQUENT WIPP CERTIFICATION REVEALS THE WASTE CANNOT BE SHIPPED TO WIPP THIS WASTE WILL NOT COUNT TOWARDS MEETING THE MILESTONE VOLUME REQUIREMENTS (AND WILL BE SUBTRACTED FROM MEETING SUCH REQUIREMENTS) UNTIL SUCH TIME AS IT HAS BEEN DETERMINED TO MEET WIPP WASTE ACCEPTANCE CRITERIA, IT HAS BEEN SHIPPED TO IDAHO SUBJECT TO THE SENTENCE BELOW, OR IT HAS OTHERWISE BEEN TREATED TO MEET LDR REQUIREMENTS. TRANSURANIC (TRU) 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. "DESIGNATION" AS USED HEREIN IS DEFINED AS THE PROCESS FOR DETERMINING: (1) WHICH CONTAINERS OF LOW-LEVEL WASTE ARE MLLW; AND, (2) WHICH CONTAINERS OF TRANSURANIC WASTE ARE MIXED TRANSURANIC WASTE (CH-TRUM OR RH-TRUM). DESIGNATION OF WASTE WILL BE PERFORMED PURSUANT TO WAC 173-303-070 THROUGH 100. THESE REGULATIONS ALLOW THE USE OF "ACCEPTABLE KNOWLEDGE," SURROGATE SAMPLING AND OTHER MEASURES FOR DESIGNATION TO MINIMIZE WORKERS' RADIATION EXPOSURE AND TO REDUCE COSTS. WHERE APPLICABLE, DOE INTENDS TO USE INFORMATION GATHERED THROUGH THE CERTIFICATION OF TRANSURANIC WASTE IN SUPPORT OF ITS DESIGNATION OF RELATED LOW-LEVEL WASTE STREAMS. WHERE APPROPRIATE, DOE WILL USE MEASURES ALLOWED UNDER STATE AND FEDERAL REGULATIONS TO PERFORM ACCURATE AND COST EFFECTIVE DESIGNATIONS OF LOW-LEVEL WASTE. "LOW-LEVEL WASTE" AS USED HEREIN IS DEFINED AS RADIOACTIVE WASTE THAT IS NOT SPENT FUEL, HIGH-LEVEL WASTE, TRANSURANIC WASTE, BYPRODUCT MATERIAL, OR NATURALLY OCCURRING RADIOACTIVE MATERIAL. LOW-LEVEL WASTE INCLUDES BOTH "MIXED LOW-LEVEL WASTE" AND "NON-MIXED LOW-LEVEL WASTE." "MIXED LOW-LEVEL WASTE" (MLLW) IS LOW-LEVEL WASTE THAT IS SUBJECT TO RCRA OR 70.105 RCW. "NON-MIXED LOW-LEVEL WASTE" (LLW) IS LOW-LEVEL WASTE THAT IS NOT SUBJECT TO RCRA OR 70.105 RCW. LLW AND MLLW CAN BE CONTACT-HANDLED (CH),	

	I.E., CH-LLW OR CH-MLLW, OR REMOTE-HANDLED (RH), I.E., RH-LLW OR RH-MLLW. "CONTACT HANDLED" (CH) WASTE IS A WASTE PACKAGE WITH A SURFACE DOSE RATE LESS THAN OR EQUAL TO 200 MILLIREM PER HOUR. "REMOTE HANDLED" (RH) WASTE IS A WASTE PACKAGE 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 BE CONTAMINATED WITH SIGNIFICANT CONCENTRATIONS OF TRANSURANIC ISOTOPES 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. DURING THE RETRIEVAL PROCESS, CONTAINERS OF RSW WILL BE SEGREGATED INTO TWO CATEGORIES: (1) CH RSW AND (2) RH RSW. SUBSEQUENT ANALYSIS AND CATEGORIZATION OF RSW PURSUANT TO CH. 70.105 RCW, THE ATOMIC ENERGY ACT, AND THE WIPP LAND WITHDRAWAL ACT WILL RESULT IN MOST OR ALL OF THIS WASTE BEING CLASSIFIED AS ONE OF THE FOLLOWING TYPES OF WASTE: CH-LLW, RH-LLW, CH-MLLW, RH-MLLW, CH-TRU, CH-TRUM, RH-TRU OR RH-TRUM. RSW DOES NOT INCLUDE WASTE IN CONTAINERS THAT HAVE DETERIORATED TO THE POINT THAT THEY CANNOT BE RETRIEVED AND STABILIZED (E.G. PLACED IN OVERPACKS) 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, THE DECISION AS TO HOW TO MOVE FORWARD WILL BE DETERMINED THROUGH THE CLEANUP PROCESS SET FORTH IN RCRA, CH. 70.105 RCW, AND/OR CERCLA AS APPROPRIATE. THOSE PROCESSES MAY RESULT IN ADDITIONAL REQUIREMENTS FOR THE REMEDIATION OF SUCH WASTES. "CAISSON WASTE" AS USED HEREIN IS DEFINED AS RSW IN THE 218-W-4B BURIAL GROUND CAISSONS ALPHA-1 THROUGH ALPHA-4. "TRANSURANIC WASTE" AS USED HEREIN IS DEFINED AS WASTE THAT MEETS THE DEFINITION IN SUBSECTION (18) OF	

	SECTION 2 OF THE WASTE ISOLATION PILOT PLANT LAND WITHDRAWAL ACT, PUB. L. 102-579. TRANSURANIC WASTE INCLUDES BOTH MIXED TRANSURANIC (TRUM) WASTE AND NON-MIXED TRANURANIC (TRU) WASTE, AND COMPRISES THE FOLLOWING CATEGORIES: CH-TRU, CH-TRUM, RH-TRU, AND RH-TRUM. "RETRIEVAL OF CH RSW" IS DEFINED AS UNCOVERING CH WASTES WITHIN DOE'S RSW TRENCHES, REMOVING SUCH CH WASTES FROM THE TRENCHES, AND TRANSFERING THE WASTE TO A PERMITTED AND COMPLIANT TREATMENT, STORAGE OR DISPOSAL UNIT, THE ENVIRONMENTAL RESTORATION AND DISPOSAL FACILITY (ERDF) OR FOR WASTE DESIGNATED IN ACCORDANCE WITH WAC 173-303-070 THROUGH 100 AS NON-MIXED TO A STORAGE OR DISPOSAL UNIT THAT DOE DETERMINES IS APPROPRIATE. "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, TRANSFERING THE WASTE TO A PERMITTED AND COMPLIANT TREATMENT, STORAGE OR DISPOSAL UNIT, THE ENVIRONMENTAL RESTORATION AND DISPOSAL FACILITY (ERDF) OR FOR WASTE DESIGNATED IN ACCORDANCE WITH WAC 173-303-070 THROUGH 100 AS NON-MIXED TO A STORAGE OR DISPOSAL UNIT THAT DOE DETERMINES IS APPROPRIATE. TO PROVIDE FURTHER CLARIFICATION OF HOW VOLUMES SHOULD BE DETERMINED IN DIFFERENT M-91 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 (.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 NEWLY GENERATED AND STORED WASTE). • THE VOLUME OF TRANSURANIC 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. NOTE: THE REQUIREMENTS OF THIS MILESTONE WITH REGARD TO THE ACQUISTION OF NEW FACILITIES, MODIFICATION OF EXISTING FACILITIES, AND MODIFICATION OF PLANNED FACILITIES NECESSARY FOR TREATMENT/PROCESSING OF RCRA MIXED AND SUSPECT MIXED TRANSURANIC WASTE APPLY AS SET FORTH IN THE SETTLEMENT AGREEMENT BETWEEN THE UNITED STATES AND THE STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY, DATED OCTOBER 23, 2003. *NOTE: THE M-91 SERIES MILESTONES (INCLUDING THIS NOTE) DO NOT INCLUDE ANY REQUIREMENTS TO ESTABLISH SCHEDULES FOR THE MANAGEMENT OF PRE-1971 TRU/TRUM. SCHEDULES FOR THE MANAGEMENT OF PRE-1971 TRU/TRUM WILL BE ESTABLISHED, PURSUANT TO APPLICABLE PROVISIONS OF THE HFFACO OTHER THAN THE M-91 SERIES MILESTONES, FOLLOWING THE ISSUANCE OF OPERABLE UNIT RECORDS OF DECISION (RODS).	
M-091-01	COMPLETE THE 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 POST 1970 RH TRUM AND SUSPECT RH TRUM, TRUM IN LARGE CONTAINERS, AND SUSPECT TRUM IN LARGE CONTAINERS. NOTE: THE REQUIREMENTS OF THIS MILESTONE WITH REGARD TO COMPLETING THE ACQUISITION OF NEW FACILITIES, MODIFICATION OF EXISTING FACILITIES AND/OR MODIFICATION OF PLANNED FACILITIES NECESSARY FOR	~~06/30/2012~~ TBD per M-091-45

	TREATMENT/PROCESSING OF HANFORD SITE POST 1970 RH TRUM AND SUSPECT RH TRUM, TRUM IN LARGE CONTAINERS, AND SUSPECT TRUM IN LARGE CONTAINERS APPLY AS SET FORTH IN THE SETTLEMENT AGREEMENT BETWEEN THE UNITED STATES AND THE STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY, DATED OCTOBER 23, 2003.	
M-091-03	SUBMIT REVISION OF THE HANFORD SITE TRUM AND MIXED LOW-LEVEL WASTE 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 MIXED AND SUSPECT MIXED TRANSURANIC AND LOW LEVEL WASTE AND WILL CONSIDER AND EXPRESSLY EVALUATE THE IMPACT ON M-91 RETRIEVAL, TREATMENT AND PROCESSING CAPABILITIES, THAT MAY RESULT FROM RETRIEVAL, TREATMENT AND/OR PROCESSING OF ANY OTHER TRANSURANIC OR SUSPECT TRANSURANIC WASTE INCLUDING BUT NOT LIMITED TO OFF-SITE TRANSURANIC WASTE AND HANFORD SITE TRANSURANIC WASTE GENERATED AFTER 1/1/03. ANNUAL REVISIONS OF THE PMP WILL BE SUBMITTED ON JUNE 30 EVERY YEAR STARTING IN 2008 AND CONTINUING UNTIL THE M-91 MILESTONES ARE COMPLETED. THE PMP REVISIONS SHALL INCLUDE PLANS AND SCHEDULES TO MEET ALL THE REQUIREMENTS SET FORTH IN THE M-91 MILESTONE SERIES. EACH REVISION OF THE M-91-03 PMP SHALL, UPON APPROVAL BY ECOLOGY, SUPERSEDE PREVIOUS M-91-03 PMPS. EACH REVISION IS A DISTINCT WORK REQUIREMENT INDEPENDENTLY SUBJECT TO THE ENFORCEMENT PROVISIONS OF THIS AGREEMENT. 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-91 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.	DUE DATES AS INDICATED IN THE DESCRIPTIVE TEXT OF THIS MILESTONE

	WITH RESPECT TO RH TRUM, RH SUSPECT TRUM AND MIXED WASTE AND TRUM, SUSPECT TRUM, AND MIXED WASTE IN LARGE CONTAINERS, THE PMP SUBMITTED YEARLY WILL SPECIFICALLY INCLUDE AT LEAST ONE MEASURABLE ACTION(S) TO BE TAKEN BY DOE TO ACQUIRE CAPABILITIES TO MANAGE SUCH WASTES. THE PMP SUBMITTED ON 12/31/2003 WILL NOT BE REQUIRED TO CONTAIN PLANS AND SCHEDULES FOR THE LDR TREATMENT (OR CERTIFICATION IN LIEU OF SUCH TREATMENT AS PROVIDED FOR IN M-91-42 AND M-91-44)OF TRUM WASTE. DOE SHALL REVISE THE PMP TO INLCUDE PLANS AND SCHEDULES FOR LDR TREATMENT (OR CERTIFICATION IN LIEU OF SUCH TREATMENT AS PROVIDED IN M-91-42 AND M-91-44) OF TRUM WASTE BY 12/28/06. 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. NOTE: WITH RESPECT TO PMP REVISIONS, THE REQUIREMENTS OF THIS MILESTONE CONCERNING PMP REVISIONS TO ADDRESS TRUM SHALL APPLY AS SET FORTH IN THE ACCOMPANYING SETTLEMENT AGREEMENT BETWEEN THE UNITED STATES AND THE STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY, DATED OCTOBER 23, 2003.	
M-091-40	REGARDING THE RETRIEVAL AND DESIGNATION OF CONTACT-HANDLED (CH) RETRIEVABLY STORED WASTE (RSW) AND TREATMENT OF SUCH WASTES DESIGNATED AS MIXED TO MEET APPLICABLE FEDERAL AND STATE LAND DISPOSAL RESTRICTION (LDR) STANDARDS (ALL CH RSW WASTE REGARDLESS OF PACKAGE SIZE): 1. DOE SHALL RETRIEVE ALL CH-RSW WITHIN BURIAL GROUNDS 218-W-4C, 218-W-4B, 218-W-3A, AND 218-E-12B ~~BY DECEMBER 31, 2010~~. IN ACHIEVING THIS RETRIEVAL REQUIREMENT, DOE SHALL FIRST INITIATE RETRIEVAL AT ITS BURIAL GROUND 218-W-4C NO LATER THAN NOVEMBER 15, 2003, AND SHALL RETRIEVE RSW AT THE FOLLOWING RATES : - 1,200 CUBIC METERS (CUMULATIVE) BY 12/31/04, - 2,700 CUBIC METERS (CUMULATIVE) BY 12/31/05,	DUE DATES AS INDICATED IN THE DESCRIPTIVE TEXT OF THIS MILESTONE

	- 4,700 CUBIC METERS (CUMULATIVE) BY 12/31/06, - 7,200 CUBIC METERS (CUMULATIVE) BY 12/31/07, - 9,700 CUBIC METERS (CUMULATIVE) BY 12/31/08, - TARGET DATE ~~12,200~~ 9,950 CUBIC METERS (CUMULATIVE) BY ~~12/31/09~~ 9/30/09, - TARGET DATE 10,700 CUBIC METERS (CUMULATIVE) BY 09/30/10, - TARGET DATE 1000 CUBIC METERS PER YEAR UNTIL COMPLETED. COMPLETE RETRIEVAL OF CH-RSW BY ~~12/31/2010~~DATE TO BE DETERMINED PER M-091-45. CONCURRENT RETRIEVAL ACTIONS CAN BE CONDUCTED IN MULTIPLE BURIAL GROUNDS. 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 CONTAINER 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 CONTAINER 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). THE SAP WILL BE DEVELOPED USING A DQO PROCESS TO ESTABLISH SAMPLING REQUIREMENTS FOR SAMPLING OF BURIAL GROUND VENT RISERS AND SUBSTRATE SOILS. ECOLOGY APPROVED THE 218-W-4C SAP SEPTEMBER 12, 2003, THE 218-E-12B SAP JANUARY 20, 2005, THE 218-W-3A SAP JUNE 15, 2006, AND THE 218-W-4B SAP JULY 25, 2006. 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 BY LETTER REPORTS QUARTERLY. 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 WAC 173-303-070 THROUGH 100, OR SHALL SPECIFICALLY IDENTIFY INDIVIDUAL LARGE CONTAINERS THAT CANNOT BE DESIGNATED BASED ON AVAILABLE PROCESS KNOWLEDGE. FOR THE LARGE CONTAINERS DETERMINED TO BE LOW- LEVEL WASTE THAT CANNOT BE DESIGNATED BASED ON THE AVAILABLE PROCESS KNOWLEDGE, DOE SHALL DESIGNATE SAID WASTE ACCORDING TO THE REQUIREMENTS OF WAC 173-303-070 THROUGH 100, BY DECEMBER 31, 2008. FOR LARGE CONTAINERS DETERMINED TO BE TRANSURANIC WASTE THAT CANNOT BE DESIGNATED BASED ON THE AVAILABLE PROCESS KNOWLEDGE, DOE SHALL DESIGNATE SAID WASTE ACCORDING TO THE REQUIREMENTS OF WAC 173-303-070 THROUGH 100, BY DATE ~~DECEMBER 31, 2012~~ TO BE DETERMINED PER M-091-45. 4. FOR ALL RETRIEVED CH-RSW DETERMINED TO BE LOW LEVEL WASTE AND DESIGNATED IN ACCORDANCE WITH WAC 173-303-070 THROUGH 100, AS MIXED AND AS CONTAINING LDR RESTRICTED CONSTITUENTS, DOE SHALL TREAT SUCH WASTES TO MEET LDR REQUIREMENTS IN ACCORDANCE WITH THE SCHEDULE PROVIDED IN MILESTONE M-91-42(2) AND M-91-43(3). 5. IN REGARD TO THE CARBON TETRACHLORIDE VAPOR PLUME IN THE VADOSE ZONE IN THE VICINITY OF TRENCH 4 IN BURIAL GROUND 218-W-4C, DOE SHALL:	

	• START VAPOR EXTRACTION BY NOVEMBER 15, 2003, TO REDUCE CARBON TETRACHLORIDE VAPORS. • START RETRIEVAL IN TRENCH 4 BY JANUARY 15, 2004 • COMPLETE RETRIEVAL OF TRENCH 4 BY DECEMBER 31, 2006. (WITH THE EXCEPTION OF THOSE LARGE CONTAINERS THAT THE PARTIES HAVE AGREED, IN WRITING, MAY BE RETRIEVED OUT OF SEQUENCE.) RETRIEVAL WILL CONTINUE IN TRENCH 4 UNTIL IT IS COMPLETE. VAPOR EXTRACTION AND RETRIEVAL OPERATIONS IN TRENCH 4 WILL BE INTEGRATED BY DOE TO MINIMIZE POTENTIAL WORKER EXPOSURE TO CARBON TETRACHLORIDE VAPORS, AND TO MITIGATE ANY POSSIBLE RELEASES OF CARBON TETRACHLORIDE FROM TRENCH 4 CONTAINERS. 6. FOR ALL RETRIEVED CH-RSW DETERMINED TO BE TRANSURANIC WASTE AND DESIGNATED IN ACCORDANCE WITH WAC 173-303-070 THROUGH 100, AS MIXED AND AS CONTAINING LDR RESTRICTED CONSTITUENTS, DOE SHALL TREAT SUCH WASTES TO MEET LDR REQUIREMENTS IN COMPLIANCE WITH THE SCHEDULE IN M-91-42(4) AND M-91-44(3). DOE MAY CHOOSE TO COMPLETE CERTIFICATION OF CH TRANSURANIC WASTE FOR DISPOSAL AT WIPP IN LIEU OF LDR TREATMENT, PROVIDED THAT ECOLOGY IS NOTIFIED IN WRITING OF SUCH COMPLETION OF CERTIFICATION, AND ONLY IF, AS OF THE TIME OF CERTIFICATION, SUCH WASTE IS EXEMPT FROM LDR TREATMENT REQUIREMENTS WHEN DISPOSED AT WIPP. IF DOE CHOOSES TO CERTIFY IN LIEU OF TREATMENT, IT MAY MEET THE VOLUME REQUIREMENTS SPECIFIED IN THIS MILESTONE FOR ANY GIVEN YEAR BY CERTIFYING CH TRU OR CH TRUM. NOTIFICATION OF CERTIFICATION IN LIEU OF TREATMENT WILL BE PROVIDED ANNUALLY AS PART OF THE CERTIFICATION VOLUME COMPLETION LETTER. NOTE: THE REQUIREMENTS OF ITEM 6 OF THIS MILESTONE APPLY AS SET FORTH IN THE SETTLEMENT AGREEMENT BETWEEN THE UNITED STATES AND THE STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY, DATED OCTOBER	

	23, 2003. 7. EACH REQUIREMENT OF THIS MILESTONE IS CONSIDERED A DISTINCT WORK REQUIREMENT INDEPENDENTLY SUBJECT TO THE ENFORCEMENT PROVISIONS OF THE AGREEMENT.	
M-091-41	REGARDING THE RETRIEVAL AND DESIGNATION OF REMOTE HANDLED (RH) RSW (ALL RSW RH WASTE REGARDLESS OF PACKAGE SIZE, INCLUDING THE 200 AREA CAISSONS), AND LDR TREATMENT OF SUCH WASTES DETERMINED TO BE MIXED. 1. DOE SHALL INITIATE FULL SCALE RETRIEVAL OF RH RSW BY TARGET DATE JANUARY 1, 2011. RETRIEVAL OF NON-CAISSON RH RSW SHALL BE COMPLETED BY DECEMBER 31, 2014. RETRIEVAL OF THE 200 AREA CAISSONS RH RSW IN THE 218-W-4B BURIAL GROUND SHALL BE COMPLETED BY DECEMBER 31, 2018. 2. DOE SHALL DESIGNATE ALL RETRIEVED RH RSW PURSUANT TO WAC 173-303-070 THROUGH 100, WITHIN 90 DAYS OF RETRIEVAL. 3. FOR ALL RETRIEVED RH-RSW DETERMINED TO BE LOW-LEVEL WASTE AND DESIGNATED IN ACCORDANCE WITH WAC 173-303-070 THROUGH 100, AS MIXED AND AS CONTAINING LDR RESTRICTED CONSTITUENTS, DOE SHALL TREAT SUCH WASTE TO MEET LDR REQUIREMENTS IN ACCORDANCE WITH THE SCHEDULE PROVIDED IN MILESTONE M-91-43(3). 4. FOR ALL RETRIEVED RH-RSW DETERMINED TO BE TRANSURANIC WASTE AND DESIGNATED IN ACCORDANCE WITH WAC 173-303-070 THROUGH 100, AS MIXED AND AS CONTAINING LDR RESTRICTED CONSTITUENTS, DOE SHALL TREAT SUCH WASTES TO MEET LDR REQUIREMENTS IN ACCORDANCE WITH THE SCHEDULE PROVIDED IN MILESTONE M-91-44(3). DOE MAY CHOOSE TO COMPLETE CERTIFICATION OF SUCH WASTES FOR DISPOSAL AT WIPP IN LIEU OF LDR TREATMENT, PROVIDED THAT ECOLOGY IS NOTIFIED IN WRITING OF SUCH COMPLETION OF CERTIFICATION, AND ONLY IF, AS OF THE TIME OF CERTIFICATION, SUCH WASTE IS EXEMPT FROM LDR TREATMENT REQUIREMENTS WHEN DISPOSED AT WIPP.	DUE DATES AS INDICATED IN THE DESCRIPTIVE TEXT OF THIS MILESTONE

	NOTE: THE REQUIREMENTS OF ITEM 4 OF THIS MILESTONE APPLY AS SET FORTH IN THE SETTLEMENT AGREEMENT BETWEEN THE UNITED STATES AND THE STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY, DATED OCTOBER 23, 2003. 5. EACH REQUIREMENT OF THIS MILESTONE IS CONSIDERED A DISTINCT WORK REQUIREMENT INDEPENDENTLY SUBJECT TO THE ENFORCEMENT PROVISIONS OF THE AGREEMENT.	
M-091-42	REGARDING SMALL CONTAINERS OF: (1) NEWLY GENERATED CH WASTE; AND (2) CH RSW; AND (3) CH WASTE CURRENTLY IN ABOVE-GROUND STORAGE. 1. DOE SHALL DESIGNATE ALL NEWLY GENERATED CH WASTE AT THE POINT OF GENERATION. SUCH DESIGNATION SHALL COMPLY WITH THE REQUIREMENTS OF WAC 173-303-070 THROUGH 100. 2. THERE WERE 5,066 CUBIC METERS OF CH-MLLW IN PERMITTED STORAGE AT DOE'S CENTRAL WASTE COMPLEX (CWC) AND ELSEWHERE AT HANFORD AS OF 12/31/02 (AS IDENTIFIED IN DOE HFFACO MILESTONE M-26-01 LDR REPORT MLLW TREATABILITY GROUPS MLLW-02 THROUGH MLLW-10, EXCLUDING MLLW-07) THAT HAD NOT BEEN TREATED TO MEET LDR REQUIREMENTS. (THIS VOLUME DOES NOT INCLUDE 600 CUBIC METERS OF WASTE REQUIRING THERMAL TREATMENT, AS THAT WASTE HAS SEPARATE TREATMENT REQUIREMENTS PER M-91-12 AND M-91-12A). APPROXIMATELY 4422 CUBIC METERS OF MLLW SUBJECT TO M-91-42 WAS TREATED BETWEEN 12/31/02 AND 12/31/05. DOE'S 2002 LDR REPORT ESTIMATED GENERATION OF AN ADDITIONAL ANNUAL VOLUME OF APPROXIMATELY 330 CUBIC METERS OF CH-MLLW (AS WASTE TYPES IDENTIFIED IN DOE HFFACO MILESTONE M-26-01 LDR REPORT MLLW TREATABILITY GROUPS MLLW-02 THROUGH MLLW-10, EXCLUDING MLLW-07). IT WAS ALSO ESTIMATED IN 2002 THAT DOE WOULD RETRIEVE APPROXIMATELY 800 CUBIC METERS OF CH-MLLW BY 2010. BASED ON THE CY2005 LDR SUMMARY REPORT AS OF 12/31/05 FOR MLLW SUBJECT TO M-91-42, THERE WERE APPROXIMATELY 2100 CUBIC METERS IN PERMITTED STORAGE, AND 280 CUBIC METERS	DUE DATES AS INDICATED IN THE DESCRIPTIVE TEXT OF THIS MILESTONE

	FORECAST TO BE GENERATED BY THE END OF CY2009. ACCORDING TO THE M-91-PMP (HNF-19169 REV 2) APPROXIMATELY 2550 CUBIC METERS OF M-91-42 MLLW WAS EXPECTED TO BE RETRIEVED BETWEEN 12/31/05 AND 12/31/09. IN ADDITION TO MEETING THE REQUIREMENTS OF M-91-12 AND M-91-12A, DOE SHALL TREAT THE WASTE DESCRIBED ABOVE TO MEET LDR REQUIREMENTS ON A SCHEDULE MEETING, AT MINIMUM, THE FOLLOWING CUMULATIVE TOTALS BASED ON A START DATE OF 12/31/02: A. 1630 CUBIC METERS (CUMULATIVE) SHALL BE TREATED BY 12/31/04, B. 3260 CUBIC METERS BY (CUMULATIVE) SHALL BE TREATED BY 12/31/05, C. 4890 CUBIC METERS (CUMULATIVE) SHALL BE TREATED BY 12/31/06, D. 6520 CUBIC METERS (CUMULATIVE) SHALL BE TREATED BY 12/31/07, E. 7,220 CUBIC METERS (CUMULATIVE) SHALL BE TREATED BY 12/31/08, ~~AND~~ F. TARGET DATE 7,600 METERS (CUMULATIVE) SHALL BE TREATED BY 12/31/09, AND G. COMPLETE TREATMENT OF ALL CH-MLLW (5066 CUBIC METERS IN STORAGE AS OF 12/31/02 AS DESCRIBED ABOVE, AND RETRIEVED CH-MLLW AND NEWLY GENERATED CH-MLLW IN THE TREATABILITY GROUPS DESCRIBED ABOVE, AS OF 6/30/09), BY ~~12/31/09~~ DATE TO BE DETERMINED PER M-091-45. IF CH-MLLW IN THE TREATABILITY GROUPS SUBJECT TO THIS MILESTONE GENERATED DURING THE PERIOD FROM 12/31/02 THROUGH 6/30/09 IS TREATED TO LDR STANDARDS PRIOR TO DELIVERY TO STORAGE OR DISPOSAL, THE ORIGINAL PRE-TREATMENT VOLUME OF THAT WASTE SHALL BE COUNTED TOWARD MEETING THE VOLUME REQUIREMENTS OF THIS MILESTONE. EXCEPT FOR WASTE ALREADY IN PERMITTED STORAGE AS OF 12/31/02, TREATMENT OF CERCLA WASTE 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. IF THE ACTUAL VOLUME OF NEWLY GENERATED OR 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. IF THE ACTUAL VOLUME OF NEWLY GENERATED OR RETRIEVED CH-MLLW COVERED BY THIS MILESTONE IS SIGNIFICANTLY MORE THAN THE ESTIMATED VOLUMES THE PARTIES' MAY AGREE TO REVISE THESE REQUIREMENTS. 3. AFTER JUNE 30, 2009, DOE SHALL TREAT TO MEET LDR TREATMENT REQUIREMENTS ALL SMALL CONTAINTERS OF NEWLY GENERATED CH-MLLW CONTAINING LDR CONSTITUENTS IN COMPLIANCE WITH WAC 173-303-140. 4. THERE ARE APPROXIMATELY 440 CUBIC METERS OF CH-TRUM IN PERMITTED STORAGE AT DOE'S CENTRAL WASTE COMPLEX (CWC) AND ELSEWHERE AT HANFORD AS OF 12/31/02. DOE'S CY 2002 LDR REPORT ESTIMATES THAT IT WILL GENERATE AN ADDITIONAL ANNUAL VOLUME OF APPROXIMATELY 220 CUBIC METERS OF CH-TRUM AND DOE ESTIMATES THEY WILL RETRIEVE APPROXIMATELY 1600 CUBIC METERS OF CH-TRUM BY 2010. CONSIDERING THESE ESTIMATES AND THE CONSIDERABLE UNCERTAINTY ASSOCIATED WITH THEM DOE SHALL TREAT THE WASTE CATEGORIES DESCRIBED ABOVE TO MEET LDR REQUIREMENTS ON THE FOLLOWING SCHEDULE: - 700 CUBIC METERS BY 12/31/04; - 1,800 CUBIC METERS (CUMULATIVE) BY 12/31/05; - 3,000 CUBIC METERS (CUMULATIVE) BY 12/31/06; ~~- 4,200 CUBIC METERS (CUMULATIVE) BY 12/31/07;~~ - 600 CUBIC METERS BETWEEN 10/1/2007 AND 9/30/2008; - TARGET DATE 200 ~~6,600~~ CUBIC METERS ~~(CUMULATIVE)~~ BY ~~12/31/09~~ 9/30/09; - TARGET DATE 200~~7,600~~ CUBIC METERS ~~(CUMULATIVE)~~ BY ~~12/31/10~~ 9/30/10; - ~~8,600 CUBIC METERS (CUMULATIVE)~~ BY 12/31/11 CUBIC METER VOLUME TO BE DETERMINED PER M-091-45.	

	IF THE ACTUAL VOLUME OF NEWLY GENERATED OR RETRIEVED CH-TRUM 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. IF THE ACTUAL VOLUME OF NEWLY GENERATED OR RETRIEVED CH-TRUM COVERED BY THIS MILESTONE IS SIGNIFICANTLY MORE THAN THE ESTIMATED VOLUMES THE PARTIES' MAY AGREE TO REVISE THESE REQUIREMENTS. 5. FOR CH TRANSURANIC WASTE NEWLY GENERATED ON OR AFTER 7/1/11 THAT IS DESIGNATED IN ACCORDANCE WITH WAC 173-303-070 THROUGH 100 AS MIXED AND AS CONTAINING LDR RESTRICTED CONSTITUENTS, DOE SHALL TREAT SUCH WASTES TO MEET LDR REQUIREMENTS PURSUANT TO WAC 173-303-140 WITHIN ONE YEAR OF GENERATION. DOE MAY CHOOSE TO COMPLETE CERTIFICATION OF CH TRANSURANIC WASTE FOR DISPOSAL AT WIPP IN LIEU OF LDR TREATMENT, PROVIDED THAT ECOLOGY IS NOTIFIED IN WRITING OF SUCH COMPLETION OF CERTIFICATION, AND ONLY IF, AS OF THE TIME OF CERTIFICATION, SUCH WASTE IS EXEMPT FROM LDR TREATMENT REQUIREMENTS WHEN DISPOSED AT WIPP. IF DOE CHOOSES TO CERTIFY IN LIEU OF TREATMENT, IT MAY MEET THE VOLUME REQUIREMENTS SPECIFIED IN THIS MILESTONE FOR ANY GIVEN YEAR BY CERTIFYING CH TRU OR CH TRUM, PROVIDED THAT ALL CH TRUM IN PERMITTED STORAGE AS OF 7/1/11 IS TREATED TO MEET LDR REQUIREMENTS OR IS CERTIFIED BY DATE TO BE DETERMINED PER M-091-45 ~~12/31/2011~~. NOTE: THE REQUIREMENTS OF ITEMS 4 AND 5 OF THIS MILESTONE APPLY AS SET FORTH IN THE SETTLEMENT AGREEMENT BETWEEN THE UNITED STATES AND THE STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY, DATED OCTOBER 23, 2003. NOTE: IN THE EVENT THAT ITEMS 4 OR 5 BECOME APPLICABLE, AMOUNTS OF CH TRUM CERTIFIED BETWEEN 12/31/02 AND THE DATE ON WHICH ITEMS 4 OR 5 BECOME APPLICABLE SHALL COUNT TOWARDS SATISFACTION OF THE OBLIGATIONS IN	

	ITEMS 4 AND 5. 6. EACH REQUIREMENT OF THIS MILESTONE IS CONSIDERED A DISTINCT WORK REQUIREMENT INDEPENDENTLY SUBJECT TO THE ENFORCEMENT PROVISIONS OF THE AGREEMENT.	
M-091-43	REGARDING: MLLW TREATABILITY GROUP MLLW-07 WASTE AS DEFINED IN THE LDR REPORT WHICH INCLUDES THE MLLW PORTION OF: (1) NEWLY GENERATED RH LOW-LEVEL WASTE; (2) NEWLY GENERATED LARGE CONTAINERS OF CH LOW-LEVEL WASTE; (3) RH LOW-LEVEL WASTE CURRENTLY IN ABOVE-GROUND STORAGE; (4) LARGE CONTAINERS OF CH LOW-LEVEL WASTE CURRENTLY IN ABOVE-GROUND STORAGE; AND (5) RH OR LARGE CONTAINER CH LOW-LEVEL WASTE FROM RETRIEVAL. THERE WERE 81 CUBIC METERS OF RH-MLLW IN PERMITTED STORAGE AT DOE'S CENTRAL WASTE STORAGE COMPLEX (CWC) AND ELSEWHERE AT HANFORD AS OF 12/31/02 (AS IDENTIFIED IN DOE HFFACO MILESTONE M-26-01 LDR REPORT MLLW TREATABILITY GROUPS MLLW-07) THAT HAS NOT BEEN TREATED TO MEET LDR REQUIREMENTS. DOE'S 2002 LDR REPORT ESTIMATED THAT DOE WOULD GENERATE AN ADDITIONAL YEARLY VOLUME OF 280 CUBIC METERS OF WASTE IN THIS TREATABILITY GROUP. IT WAS ALSO ESTIMATED IN 2002 THAT DOE WOULD RETRIEVE APPROXIMATELY 800 CUBIC METERS BY 2010. PER THE 2005 LDR REPORT, AS OF 12/31/05 THERE WERE APPROXIMATELY 305 CUBIC METERS OF RH AND LARGE CONTAINER MLLW (LDR TREATABILITY GROUP MLLW-07) IN PERMITED STORAGE. APPROXIMATELY 66 CUBIC METERS OF THE RH AND LARGE CONTAINER MLLW WAS FORECAST TO BE GENERATED BETWEEN 12/31/05 AND 12/31/11. IN ADDITION, APPROXIMATELY 2728 CUBIC METERS OF MLLW-07 WAS EXPECTED TO BE OBTAINED FROM RETRIEVAL BETWEEN 12/31/05 AND 12/31/11. 1. DOE SHALL DESIGNATE ALL RH LOW-LEVEL WASTE AND LARGE CONTAINERS OF CH LOW-LEVEL WASTE CURRENTLY IN ABOVE-GROUND PERMITTED STORAGE (AS OF JUNE 30, 2003) ACCORDING TO THE REQUIREMENTS OF WAC 173-303-070 THROUGH 100, BY DECEMBER 31, 2008.	DUE DATES AS INDICATED IN THE DESCRIPTIVE TEXT OF THIS MILESTONE

	2. DOE SHALL DESIGNATE ALL NEWLY GENERATED RH LOW-LEVEL WASTE AND NEWLY GENERATED LARGE CONTAINERS OF CH-LOW-LEVEL WASTE AT THE POINT OF GENERATION. SUCH DESIGNATION SHALL COMPLY WITH THE REQUIREMENTS OF WAC 173-303-070 THROUGH 100. 3. DOE SHALL BEGIN TREATING RH MLLW AND LARGE CONTAINERS OF CH MLLW TO MEET LDR TREATMENT REQUIREMENTS AT: • 300 CUBIC METERS BY 6/30/09 • TARGET DATE 300 CUBIC METERS ADDITIONAL BY 6/30/10 • TARGET DATE ANNUAL RATE OF 300 CUBIC METERS BEGINNING NO LATER THAN DATE TO BE DETERMINED PER M-091-45. ~~A MINIMUM RATE OF 300 CUBIC METERS PER YEAR BEGINNING NO LATER THAN JUNE 30, OF 2008. HOWEVER, TREATMENT MAY BE STARTED EARLY SUCH THAT ANY TREATABILITY GROUP MLLW-07 WASTE TREATED BETWEEN 12/31/02 AND 6/30/09 SHALL COUNT TOWARD ACHIEVING THE FIRST 300 CUBIC METERS OF TREATMENT TO BE COMPLETED BY 6/30/09.~~ IF THERE ARE NOT 300 CUBIC METERS OF RH MLLW AND LARGE CONTAINERS OF CH MLLW IN STORAGE IN ANY GIVEN YEAR, THIS MILESTONE REQUIRES THAT DOE TREAT ONLY THAT AMOUNT THAT IS IN STORAGE. IF RH-MLLW IN THE TREATABILITY GROUPS SUBJECT TO THIS MILESTONE GENERATED DURING THE PERIOD FROM 12/31/02 THROUGH 6/30/09 IS TREATED TO LDR STANDARDS PRIOR TO DELIVERY TO STORAGE OR DISPOSAL, THE ORIGINAL PRE-TREATMENT VOLUME OF THAT WASTE SHALL BE COUNTED TOWARD MEETING THE VOLUME REQUIREMENTS OF THIS MILESTONE. EXCEPT FOR WASTE ALREADY IN PERMITTED STORAGE AS OF 12/31/02, TREATMENT OF CERCLA WASTE WILL NOT BE COUNTED TOWARD MEETING THE VOLUME REQUIREMENTS OF THIS MILESTONE. IF ACTUAL VOLUMES OF NEWLY GENERATED OR RETRIEVED RH AND LARGE CONTAINER MLLW ARE SIGNIFICANTLY MORE THAN THE ESTIMATED VOLUMES, THIS MILESTONE WILL BE REVISED TO REFLECT ACTUAL VOLUMES.	

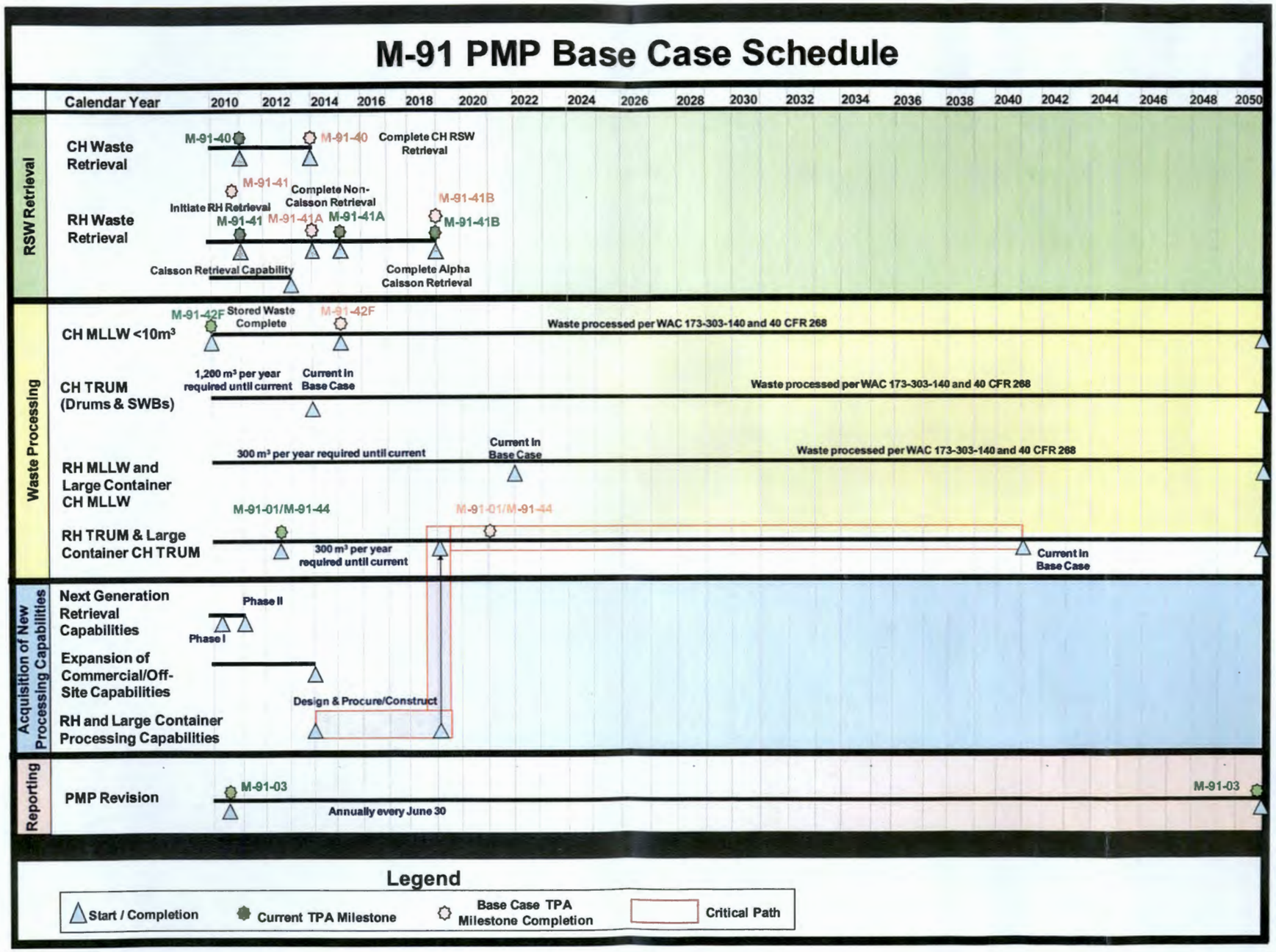
	4. EACH ELEMENT OF THIS MILESTONE IS CONSIDERED A DISTINCT WORK REQUIREMENT INDEPENDENTLY SUBJECT TO THE ENFORCEMENT PROVISIONS OF THE AGREEMENT.	
M-091-44	REGARDING:(1) NEWLY GENERATED RH TRANSURANIC WASTE; (2) NEWLY GENERATED LARGE CONTAINERS OF CH-TRANSURANIC WASTE; (3) RH TRANSURANIC WASTE CURRENTLY IN ABOVE GROUND STORAGE; 4) LARGE CONTAINERS OF CH TRANSURANIC WASTE CURRENTLY IN ABOVE-GROUND STORAGE; AND (5) LARGE CONTAINER OR RH TRANSURANIC WASTE FROM RETRIEVAL; 1. DOE SHALL DESIGNATE ALL RH TRANSURANIC WASTE AND LARGE CONTAINERS OF CH TRANSURANIC WASTE CURRENTLY IN ABOVE- GROUND STORAGE (AS OF JUNE 30, 2003) ACCORDING TO THE REQUIREMENTS OF WAC 173-303-070 THROUGH 100, BY TARGET DATE DECEMBER 31, 2012. 2. DOE SHALL DESIGNATE ALL NEWLY GENERATED RH TRANSURANIC WASTE AND LARGE CONTAINERS OF TRANSURANIC WASTE AT THE POINT OF GENERATION. SUCH DESIGNATION SHALL COMPLY WITH THE REQUIREMENTS OF WAC 173-303-070 THROUGH 100. 3. DOE SHALL BEGIN TREATING RH TRUM AND LARGE CONTAINERS OF CH TRUM TO MEET LDR TREATMENT REQUIREMENTS AT A MINIMUM RATE OF 300 CUBIC METERS PER YEAR BEGINNING NO LATER THAN TARGET DATE JUNE 30, 2012. IF THERE ARE NOT 300 CUBIC METERS OF RH TRUM AND LARGE CONTAINERS OF CH TRUM IN STORAGE IN ANY GIVEN YEAR, THIS MILESTONE REQUIRES THAT DOE TREAT ONLY THAT AMOUNT THAT IS IN STORAGE. IF ACTUAL VOLUMES OF NEWLY GENERATED OR RETRIEVED RH TRUM AND LARGE CONTAINER TRUM ARE SIGNIFICANTLY MORE THAN THE ESTIMATED VOLUMES, THIS MILESTONE WILL BE REVISED TO REFLECT ACTUAL VOLUMES. 4. AS TO NEWLY GENERATED RH TRUM GENERATED AFTER 12/31/18 THAT IS DESIGNATED IN ACCORDANCE WITH WAC 173-303-070 THROUGH –100 AS MIXED AND AS CONTAINING LDR RESTRICTED CONSTITUENTS, DOE SHALL TREAT OR CERTIFY IN LIEU OF TREATMENT TO MEET LDR	DUE DATES AS INDICATED IN THE DESCRIPTIVE TEXT OF THIS MILESTONE

	REQUIREMENTS WITHIN ONE YEAR OF GENERATION. DOE MAY CHOOSE TO COMPLETE CERTIFICATION OF CH TRANSURANIC WASTE FOR DISPOSAL AT WIPP IN LIEU OF LDR TREATMENT, PROVIDED THAT ECOLOGY IS NOTIFIED IN WRITING OF SUCH COMPLETION OF CERTIFICATION, AND ONLY IF, AS OF THE TIME OF CERTIFICATION, SUCH WASTE IS EXEMPT FROM LDR TREATMENT REQUIREMENTS WHEN DISPOSED AT WIPP. 5. DOE MAY CHOOSE TO COMPLETE CERTIFICATION OF RH AND LARGE CONTAINER TRANSURANIC WASTE FOR DISPOSAL AT WIPP IN LIEU OF LDR TREATMENT, PROVIDED THAT ECOLOGY IS NOTIFIED IN WRITING OF SUCH COMPLETION OF CERTIFICATION, AND ONLY IF, AS OF THE TIME OF CERTIFICATION, SUCH WASTE IS EXEMPT FROM LDR TREATMENT REQUIREMENTS WHEN DISPOSED AT WIPP. NOTE: THE REQUIREMENTS OF ITEMS 3,4, AND 5 OF THIS MILESTONE APPLY AS SET FORTH IN THE SETTLEMENT BETWEEN THE UNITED STATES AND THE STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY, DATED OCTOBER 23, 2003. 6. EACH REQUIREMENT OF THIS MILESTONE IS CONSIDERED A DISTINCT WORK REQUIREMENT INDEPENDENTLY SUBJECT TO THE ENFORCEMENT PROVISIONS OF THE AGREEMENT. 7. IF DOE CHOOSES TO CERTIFY IN LIEU OF TREATMENT, (PER REQUIREMENTS IN M-91-44 (4)) IT MAY MEET THE VOLUME REQUIREMENTS SPECIFIED IN M-91-44 FOR ANY GIVEN YEAR BY CERTIFYING RH OR LARGE CONTAINER TRU OR RH OR LARGE CONTAINER TRUM. NOTIFICATION OF CERTIFICATION IN LIEU OF TREATMENT WILL BE PROVIDED ANNUALLY AS PART OF THE CERTIFICATION VOLUME COMPLETION LETTER.	
M-091-45	THE PARTIES WILL COMPLETE NEGOTIATIONS AND DOE WILL SUBMIT A CHANGE PACKAGE FOR INTERIM MILESTONES TO REPLACE ALL "TO BE DETERMINED" ("TBD") DATES IN M-091-01, M-091-40 PARAGRAPHS 1 AND 3, M-091-42 PARAGRAPHS 2.G AND 5, M-91-43 PARAGRAPH 3; AND A CUBIC METER VOLUME	12/31/2009

	FIGURE TO REPLACE "CUBIC METER VOLUME TO BE DETERMINED" IN M-91-42 PARAGRAPH 4. THESE NEGOTIATIONS WILL ALSO ADDRESS REMAINING M-91-42 "NO PATH" AND TSCA WASTE.	

APPENDIX U

M-91 BASE CASE PMP SCHEDULE


M-91 PMP Base Case Schedule
Calendar Year
2010 2012 2014 2016 2018 2020 2022 2024 2026 2028 2030 2032 2034 2036 2038 2040 2042 2044 2046 2048 2050
RSW Retrieval
CH Waste Retrieval
M-91-40
M-91-40
Complete CH RSW Retrieval
RH Waste Retrieval
M-91-41
Initiate RH Retrieval
Complete Non-Caisson Retrieval
M-91-41
M-91-41A
M-91-41A
M-91-41B
M-91-41B
Caisson Retrieval Capability
Complete Alpha Caisson Retrieval
Waste Processing
CH MLLW <10m³
M-91-42F
Stored Waste Complete
M-91-42F
Waste processed per WAC 173-303-140 and 40 CFR 268
CH TRUM (Drums & SWBs)
1,200 m³ per year required until current
Current in Base Case
Waste processed per WAC 173-303-140 and 40 CFR 268
RH MLLW and Large Container CH MLLW
300 m³ per year required until current
Current in Base Case
Waste processed per WAC 173-303-140 and 40 CFR 268
RH TRUM & Large Container CH TRUM
M-91-01/M-91-44
M-91-01/M-91-44
300 m³ per year required until current
Current in Base Case
Acquisition of New Processing Capabilities
Next Generation Retrieval Capabilities
Phase II
Phase I
Expansion of Commercial/Off-Site Capabilities
Design & Procure/Construct
RH and Large Container Processing Capabilities
Reporting
PMP Revision
M-91-03
Annually every June 30
M-91-03
Legend
Start / Completion
Current TPA Milestone
Base Case TPA Milestone Completion
Critical Path

APPENDIX V

M-91 MILESTONE COMPLETION DATES

Milestone	Due Date	Base Case Date	As-Soon-As Feasible Compliance Case Date	Milestone Title
M-091-00	-	-	-	Complete all Facilities for Handling TRU/TRUM and MLLW
M-091-01	06/30/12	12/31/18	12/31/16	Complete Facilities Prior to Disposal of Post-1970 TRU/TRUM
M-091-03C	06/30/09	06/30/09	06/30/09	Submit Annual Revision of TRUM Waste and MLLW PMP To Ecology
M-091-03D-01	06/30/10	06/30/10	06/30/10	Submit Annual Revision of TRUM Waste and MLLW PMP To Ecology
M-091-03E	06/30/11	06/30/11	06/30/11	Submit Annual Revision of TRUM Waste and MLLW PMP To Ecology
M-091-03F	06/30/12	06/30/12	06/30/12	Submit Annual Revision of TRUM Waste and MLLW PMP To Ecology
M-091-03G	06/30/13	06/30/13	06/30/13	Submit Annual Revision of TRUM Waste and MLLW PMP To Ecology
M-091-03H	06/30/14	06/30/14	06/30/14	Submit Annual Revision of TRUM Waste and MLLW PMP To Ecology
M-091-03I	06/30/15	06/30/15	06/30/15	Submit Annual Revision of TRUM Waste and MLLW PMP To Ecology
M-091-03J	06/30/16	06/30/16	06/30/16	Submit Annual Revision of TRUM Waste and MLLW PMP To Ecology
M-091-03K	06/30/17	06/30/17	06/30/17	Submit Annual Revision of TRUM Waste and MLLW PMP To Ecology
M-091-03L	06/30/18	06/30/18	06/30/18	Submit Annual Revision of TRUM Waste and MLLW PMP To Ecology
M-091-03M	06/30/19	06/30/19	06/30/19	Submit Annual Revision of TRUM Waste and MLLW PMP To Ecology
M-091-03N	06/30/20	06/30/20	06/30/20	Submit Annual Revision of TRUM Waste and MLLW PMP To Ecology
M-091-03O	06/30/21	06/30/21	06/30/21	Submit Annual Revision of TRUM Waste and MLLW PMP To Ecology
M-091-03P	06/30/22	06/30/22	06/30/22	Submit Annual Revision of TRUM Waste and MLLW PMP To Ecology
M-091-40	-	-	-	Complete Retrieval of CH RSW and Substrate Sampling
M-091-40G	12/31/09	12/31/12	12/31/12	Retrieve CH RSW 12,200 m^3 (Cumulative)
M-091-40G-001	12/31/10	12/31/13	12/31/12	DOE shall Retrieve all CH RSW within Burial Grounds
M-091-40L-022	06/15/09	06/15/09	06/15/09	Submit Jan-Mar 2nd Quarter FY 2009 Burial Ground Sample Results
M-091-40L-023	09/15/09	09/15/09	09/15/09	Submit Apr-Jun 3rd Quarter FY 2009 Burial Ground Sample Results
M-091-40L-024	12/15/09	12/15/09	12/15/09	Submit Jul-Sep 4th Quarter FY 2009 Burial Ground Sample Results

Milestone	Due Date	Base Case Date	As-Soon-As Feasible Compliance Case Date	Milestone Title
M-091-40L-025	03/15/10	03/15/10	03/15/10	Submit Oct-Dec 1st Quarter FY 2010 Burial Ground Sample Results
M-091-40L-026	06/15/10	06/15/10	06/15/10	Submit Jan-Mar 2nd Quarter FY 2010 Burial Ground Sample Results
M-091-40L-027	09/15/10	09/15/10	09/15/10	Submit Apr-Jun 3rd Quarter FY 2010 Burial Ground Sample Results
M-091-40L-028	12/15/10	12/15/10	12/15/10	Submit Jul-Sep 4th Quarter FY 2010 Burial Ground Sample Results
M-091-40L-029	03/15/11	03/15/11	03/15/11	Submit Oct-Dec 1st Quarter FY 2011 Burial Ground Sample Results
M-091-40L-030	06/15/11	06/15/11	06/15/11	Submit Jan-Mar 2nd Quarter FY 2011 Burial Ground Sample Results
M-091-40L-031	09/15/11	09/15/11	09/15/11	Submit Apr-Jun 3rd Quarter FY 2011 Burial Ground Sample Results
M-091-40L-032	12/15/11	12/15/11	12/15/11	Submit Jul-Sep 4th Quarter FY 2011 Burial Ground Sample Results
M-091-40L-033	03/15/12	03/15/12	03/15/12	Submit Oct-Dec 1st Quarter FY 2012 Burial Ground Sample Results
M-091-40L-034	06/15/12	06/15/12	06/15/12	Submit Jan-Mar 2nd Quarter FY 2012 Burial Ground Sample Results
M-091-40L-035	09/15/12	09/15/12	09/15/12	Submit Apr-Jun 3rd Quarter FY 2012 Burial Ground Sample Results
M-091-40L-036	12/15/12	12/15/12	12/15/12	Submit Jul-Sep 4th Quarter FY 2012 Burial Ground Sample Results
M-091-40L-037	03/15/13	03/15/13	03/15/13	Submit Oct-Dec 1st Quarter FY 2013 Burial Ground Sample Results
M-091-40L-038	06/15/13	06/15/13	06/15/13	Submit Jan-Mar 2nd Quarter FY 2013 Burial Ground Sample Results
M-091-40L-039	09/15/13	09/15/13	09/15/13	Submit Apr-Jun 3rd Quarter FY 2013 Burial Ground Sample Results
M-091-40L-040	12/15/13	12/15/13	12/15/13	Submit Jul-Sep 4th Quarter FY 2013 Burial Ground Sample Results
M-091-40L-041	03/15/14	03/15/14	03/15/14	Submit Oct-Dec 1st Quarter FY 2014 Burial Ground Sample Results
M-091-40L-042	06/15/14	06/15/14	06/15/14	Submit Jan-Mar 2nd Quarter FY 2014 Burial Ground Sample Results
M-091-40L-043	09/15/14	09/15/14	09/15/14	Submit Apr-Jun 3rd Quarter FY 2014 Burial Ground Sample Results
M-091-40L-044	12/15/14	12/15/14	12/15/14	Submit Jul-Sep 4th Quarter FY 2014 Burial Ground Sample Results
M-091-40L-045	03/15/15	03/15/15	03/15/15	Submit Oct-Dec 1st Quarter FY 2015 Burial Ground Sample Results
M-091-40L-046	06/15/15	06/15/15	06/15/15	Submit Jan-Mar 2nd Quarter FY 2015 Burial Ground Sample Results
M-091-40L-047	09/15/15	09/15/15	09/15/15	Submit Apr-Jun 3rd Quarter FY 2015 Burial Ground Sample Results

Milestone	Due Date	Base Case Date	As-Soon-As Feasible Compliance Case Date	Milestone Title
M-091-40L-048	12/15/15	12/15/15	12/15/15	Submit Jul-Sep 4th Quarter FY 2015 Burial Ground Sample Results
M-091-40L-049	03/15/16	03/15/16	03/15/16	Submit Oct-Dec 1st Quarter FY 2016 Burial Ground Sample Results
M-091-40L-050	06/15/16	06/15/16	06/15/16	Submit Jan-Mar 2nd Quarter FY 2016 Burial Ground Sample Results
M-091-40L-051	09/15/16	09/15/16	09/15/16	Submit Apr-Jun 3rd Quarter FY 2016 Burial Ground Sample Results
M-091-40L-052	12/15/16	12/15/16	12/15/16	Submit Jul-Sep 4th Quarter FY 2016 Burial Ground Sample Results
M-091-40L-053	03/15/17	03/15/17	03/15/17	Submit Oct-Dec 1st Quarter FY 2017 Burial Ground Sample Results
M-091-40L-054	06/15/17	06/15/17	06/15/17	Submit Jan-Mar 2nd Quarter FY 2017 Burial Ground Sample Results
M-091-40L-055	09/15/17	09/15/17	09/15/17	Submit Apr-Jun 3rd Quarter FY 2017 Burial Ground Sample Results
M-091-40L-056	12/15/17	12/15/17	12/15/17	Submit Jul-Sep 4th Quarter FY 2017 Burial Ground Sample Results
M-091-40L-057	03/15/18	03/15/18	03/15/18	Submit Oct-Dec 1st Quarter FY 2018 Burial Ground Sample Results
M-091-40L-058	09/15/18	09/15/18	09/15/18	Submit Apr-Jun 3rd Quarter FY 2018 Burial Ground Sample Results
M-091-40L-059	09/15/18	09/15/18	09/15/18	Submit Apr-Jun 3rd Quarter FY 2018 Burial Ground Sample Results
M-091-40L-060	03/15/18	03/15/18	03/15/18	Submit Jul-Sep 4th Quarter FY 2018 Burial Ground Sample Results
M-091-40M	-	-	-	Designate All CH RSW Retrieved from the RSW Trenches
M-091-40O	12/31/12	12/31/13	12/31/12	Designate Large Containers Determined to be TRU Waste
M-091-41	01/01/11	9/30/10	09/30/10	Initiate Full Scale Retrieval Of RH RSW
M-091-41A	12/31/14	12/31/13	12/31/13	Complete Retrieval of Non-Caisson RH RSW
M-091-41 B	12/31/18	12/31/18	12/31/17	Complete Retrieval of Caisson RH RSW in 218-W-4B
M-091-42	12/31/11	12/31/13	12/31/13	Complete the Treatment or Certification of CH TRUM Waste
M-091-42F	12/31/09	12/31/14	12/31/13	Complete Treatment of All CH-MLLW by 12/31/09
M-091-42J	12/31/07	12/31/11	12/31/11	Treat 4,200 m^3 CH TRUM Waste (Cumulative)
M-091-42L	12/31/09	N/A	N/A	Treat 6,600 m^3 CH TRUM Waste (Cumulative)
M-091-42M	12/31/10	N/A	N/A	Treat 7,600 m^3 CH TRUM Waste (Cumulative)

Milestone	Due Date	Base Case Date	As-Soon-As Feasible Compliance Case Date	Milestone Title
M-091-42N	12/31/11	N/A	N/A	Treat 8,600 m^3 CH TRUM Waste (Cumulative)
M-091-43D	06/30/10	12/31/09	12/31/09	Treat 300 m^3 per Year RH MLLW and Large Containers CH MLLW
M-091-43E	06/30/11	12/31/13	12/31/13	Treat 300 m^3 per Year RH MLLW and Large Containers CH MLLW
M-091-43F	06/30/12	N/A	N/A	Treat 300 m^3 per Year RH MLLW and Large Containers CH MLLW
M-091-43G	06/30/13	N/A	N/A	Treat 300 m^3 per Year RH MLLW and Large Containers CH MLLW
M-091-43H	06/30/14	N/A	N/A	Treat 300 m^3 per Year RH MLLW and Large Containers CH MLLW
M-091-43I	06/30/15	N/A	N/A	Treat 300 m^3 per Year RH MLLW and Large Containers CH MLLW
M-091-43J	06/03/16	N/A	N/A	Treat 300 m^3 per Year RH MLLW and Large Containers CH MLLW
M-091-43K	06/30/17	N/A	N/A	Treat 300 m^3 per Year RH MLLW and Large Containers CH MLLW
M-091-43L	06/30/18	N/A	N/A	Treat 300 m^3 per Year RH MLLW and Large Containers CH MLLW
M-091-43M	06/30/19	N/A	N/A	Treat 300 m^3 per Year RH MLLW and Large Containers CH MLLW
M-091-43N	06/30/20	N/A	N/A	Treat 300 m^3 per Year RH MLLW and Large Containers CH MLLW
M-091-43O	06/30/21	N/A	N/A	Treat 300 m^3 per Year RH MLLW and Large Containers CH MLLW
M-091-43P	06/30/22	N/A	N/A	Treat 300 m^3 per Year RH MLLW and Large Containers CH MLLW
M-091-43Q	06/30/23	N/A	N/A	Treat 300 m^3 per Year RH MLLW and Large Containers CH MLLW
M-091-43R	06/30/24	N/A	N/A	Treat 300 m^3 per Year RH MLLW and Large Containers CH MLLW
M-091-43S	06/30/25	N/A	N/A	Treat 300 m^3 per Year RH MLLW and Large Containers CH MLLW
M-091-44	12/31/12	12/31/12	12/31/12	Designate all RH TRU Waste and Large Containers of CH TRU Waste Above Ground
M-091-44A	06/30/12	12/31/18	12/31/12	Begin Treating RH TRUM Waste and Large Containers of CH TRUM Waste
M-091-44B	-	-	-	Treat Newly Generated RH TRUM Waste Generated After 12/31/18
M-091-44C	06/30/13	12/31/20	12/31/16	Treat RH TRUM Waste and CH TRUM Waste at Minimum Rate of 300 m^3 Per Year
M-091-44D	06/30/14	12/31/21	12/31/17	Treat RH TRUM Waste and CH TRUM Waste at Minimum Rate of 300 m^3 Per Year
M-091-44E	06/30/15	12/31/22	12/31/18	Treat RH TRUM Waste and CH TRUM Waste at Minimum Rate of 300 m^3 Per Year

Milestone	Due Date	Base Case Date	As-Soon-As Feasible Compliance Case Date	Milestone Title
M-091-44F	06/30/16	12/31/23	12/31/19	Treat RH TRUM Waste and CH TRUM Waste at Minimum Rate of 300 m^3 Per Year
M-091-44G	06/30/17	12/31/24	12/31/20	Treat RH TRUM Waste and CH TRUM Waste at Minimum Rate of 300 m^3 Per Year
M-091-44H	06/30/18	12/31/25	12/31/21	Treat RH TRUM Waste and CH TRUM Waste at Minimum Rate of 300 m^3 Per Year
M-091-44I	06/30/19	12/31/26	12/31/22	Treat RH TRUM Waste and CH TRUM Waste at Minimum Rate of 300 m^3 Per Year
M-091-44J	06/30/20	12/31/27	12/31/23	Treat RH TRUM Waste and CH TRUM Waste at Minimum Rate of 300 m^3 Per Year
M-091-44K	06/30/21	12/31/28	12/31/24	Treat RH TRUM Waste and CH TRUM Waste at Minimum Rate of 300 m^3 Per Year
M-091-44L	06/30/22	12/31/29	12/31/25	Treat RH TRUM Waste and CH TRUM Waste at Minimum Rate of 300 m^3 Per Year
M-091-44M	06/30/23	12/31/30	12/31/26	Treat RH TRUM Waste and CH TRUM Waste at Minimum Rate of 300 m^3 Per Year
M-091-44N	06/30/24	12/31/31	12/31/27	Treat RH TRUM Waste and CH TRUM Waste at Minimum Rate of 300 m^3 Per Year
M-091-44O	06/30/25	12/31/32	12/31/28	Treat RH TRUM Waste and CH TRUM Waste at Minimum Rate of 300 m^3 Per Year
M-091-44X	-	12/31/40	12/31/38	Treat Newly Generated RH TRUM Waste Within One Year of Generation