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Project Management Plan for Low-Level Mixed Waste and Greater-Than-Category 3 Waste per Tri-Party Agreement M-91-10

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EXECUTIVE SUMMARY

The objective of this project management plan is to define the tasks and deliverables that will support the treatment, storage, and disposal of remote-handled and large container contact-handled low-level mixed waste, and the storage of Greater-Than-Category 3 waste. The plan is submitted to fulfill the requirements of the Hanford Federal Facility Agreement and Consent Order Milestone M-91-10.

The plan was developed in four steps: (1) the volumes of the applicable waste streams and the physical, dangerous, and radioactive characteristics were established using existing databases and forecasts; (2) required treatment was identified for each waste stream based on land disposal restriction treatment standards and waste characterization data; (3) alternatives for providing the required treatment were evaluated and the preferred options were selected; and (4) an acquisition plan was developed to establish the technical, schedule, and cost baselines for providing the required treatment capabilities. The major waste streams are summarized in the table below, along with the required treatment for disposal.

Waste Form	Waste Volumes (cubic meters)		Treatment
	Stored	Forecast	
Remote-handled low-level mixed waste (all containers)	61	30,897	Macroencapsulation
Large container contact-handled low-level mixed waste	196	0	Sort/repack followed by macroencapsulation or thermal treatment
Greater-Than-Category 3	1.3	0	Storage only
Total Volume	**258**	**30,897**	**Not applicable**

This plan calls for a sort/repack facility at the T Plant Complex for contact-handled waste in large boxes (up to 25 cubic meters). The waste would be reduced in size to fit into standard waste boxes. Organic debris and polychlorinated biphenyl waste would be sorted and repackaged for thermal treatment at a commercial facility, under an existing contract. A macroencapsulation facility would be set-up at the T Plant Complex to treat inorganic debris from the sorting operation and remote-handled waste packaged in shielded containers.

Long-length equipment retrieved from the high-level waste tanks will be macroencapsulated and grouted by the River Protection Project at the tank farms, and delivered to Waste Management Hanford for disposal. Equipment for this operation is located in the 200 East Area and is ready for use. The disposition plan falls under the River Protection Project--Vitrification operations.

Also for future resolution is a disposition plan for failed equipment in the PUREX Storage Tunnels. The existing 1.3 cubic meters of Greater-Than-Category 3 waste will be stored at the Central Waste Complex until a disposition path is determined.

The schedule for the needed modifications at T Plant Complex include completion of functional design criteria by September 1999; assessment of space, utilities, and permitting requirements beginning in October 2002; technology evaluation beginning in January 2003; equipment procurement and installation by March 2005; and startup by June 2005.

Estimated project costs, incurred during fiscal years 2003 through 2005, include $520K of expense funding for project support and $580K in capital funds. In addition, an estimated $2.8M would be required annually to restore full operational status of T Plant.

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GLOSSARY

ALARA	as low as reasonably achievable
ATG	Allied Technology Group, Incorporated
BHI	Bechtel Hanford, Incorporated
CERCLA	*Comprehensive Environmental Response Compensation and Liability Act of 1980*
CDR	conceptual design report
CFR	Code of Federal Regulations
CH	contact-handled
CTT	commercial thermal treatment
CWC	Central Waste Complex
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations Office
Ecology	Washington State Department of Ecology
EHS&Q	Environmental Health, Safety, and Quality
EIS	environmental impact statement
EM-30	DOE Office of Environmental Management
EM-40	Environmental Restoration Program
EPA	United States Environmental Protection Agency
ER	environmental restoration (also refers to the Environmental Restoration program)
ERC	environmental restoration contractor
ERDF	Environmental Restoration Disposal Facility
FDC	functional design criteria
FDH	Fluor Daniel Hanford, Inc.
FFCA	*Federal Facilities Compliance Act of 1992*
FY	fiscal year
GTC3	Greater-Than-Category 3
Hg	mercury
HNF	Hanford Nuclear Facility (document identifier)
INEEL	Idaho National Engineering and Environmental Laboratory
ISB	integrated site baseline
Kg	kilogram
LDR	land disposal restrictions
LEC	large equipment container

GLOSSARY (cont)

LLBG	Low-Level Burial Grounds
LLE	long-length equipment
LLMW	low-level mixed waste
LLW	low-level waste
mrem	millirem
MYWP	multi-year work plan
nCi	nanocurie
N/A	not available or not applicable
NEPA	*National Environmental Policy Act of 1969*
ORP	Office of River Protection (DOE)
PCB	polychlorinated biphenyl
PHMC	Project Hanford Management Contract
PMP	project management plan
PNNL	Pacific Northwest National Laboratory
Pu	plutonium
PUREX	plutonium-uranium extraction (Plant)
QA	quality assurance
REDOX	reduction-oxidation (Plant)
RCRA	*Resource Conservation and Recovery Act of 1976*
RH	remote-handled
RPP	River Protection Project
ROD	record of decision
S/U	start up
SWB	standard waste box
SWIFT	Solid Waste Integrated Forecast Technical
SWITS	Solid Waste Inventory Tracking System
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
TRU	transuranic
TSCA	*Toxic Substances Control Act of 1976*
TSD	treatment, storage, and/or disposal
WAC	Washington Administrative Code
WBS	work breakdown structure
WIPP	Waste Isolation Pilot Plant
WMH	Waste Management Federal Services of Hanford, Inc.
w/o	without (i.e., w/o Hg means without mercury)

1.0 INTRODUCTION

Change Number M-91-96-01 of the *Hanford Federal Facilities Agreement and Consent Order*, known as the Tri-Party Agreement (Ecology et al. 1999), established a new major milestone, M-91-00, "to complete the acquisition of new facilities, modification of existing facilities necessary for storage, treatment/processing, and disposal of all Hanford Site transuranic, transuranic-mixed, low-level mixed (LLMW), and Greater-Than-Category 3 (GTC3) wastes." Life-cycle forecast and stored volumes, as well as other relevant information for these waste streams, were obtained from the *1998 Solid Waste Integrated Forecast Technical* (SWIFT) report (HNF-EP-0918, Rev. 4). This Project Management Plan (PMP) fulfills the requirements of Tri-Party Agreement M-91-10 to submit a PMP that establishes all major tasks and deliverables related to the treatment, storage, and disposal (TSD) of Hanford Site remote-handled (RH) and large container contact-handled (CH) LLMW, and storage of GTC3 waste. A schedule with major milestones and decision points is included in this PMP. Draft Tri-Party Agreement Change Control Forms (change requests) are a required attachment to this PMP. The identified change requests are included in Appendix A.

1.1 PROJECT MANAGEMENT PLAN OBJECTIVES

In accordance with the Tri-Party Agreement, the objectives are to establish treatment, storage, and disposal capacity for RH and Large Container CH LLMW, and storage of GTC3 waste through use of commercial treatment, construction of new facilities, or modification of existing facilities. Waste streams and volumes are defined and options are developed and analyzed using a systems engineering approach, as discussed in Section 3.2, to identify commercial treatment opportunities and the need for facility acquisition to meet Tri-Party Agreement objectives.

1.1.1 Technical Objectives

Specific technical objectives include identifying the treatment and pre-treatment process required for the given waste streams to meet land disposal restriction (LDR) standards per 40 Code of Federal Regulations (CFR) 268 and Washington Administrative Code (WAC) 173-303-140, acquiring treatment capacity by establishing links to the commercial sector, making optimal use of the existing commercial contracts and existing Hanford Site facilities, and the designing/building of new facilities or the retrofitting of existing facilities. In the absence of a conceptual design report (CDR) for new treatment capacity, the work breakdown structure (WBS) included in this PMP forms the technical baseline for future planning, design, and budgeting activities. Waste streams, projected volumes, and treatment processes necessary to dispose of waste to meet regulatory, environmental, safety, and health requirements, are defined in this PMP.

1.1.2 Schedule Objectives

The schedule objectives are to define activities and timeframes to meet the M-91-00 subelement milestones, to identify the critical path for the startup of a treatment facility, to define dates for the deliverables, and to identify issues that may affect the schedule and require submission of Tri-Party Agreement Change Control Forms (change requests) for resolution. The project schedule presented in Section 4.0 will be used for performance measurement and will provide a means by which progress can be measured.

1.1.3 Cost Objectives

Costs developed are order-of-magnitude costs that will be used to establish budget-funding levels. The costs are developed using the top-level WBS, project schedule, and a preliminary cost estimate of needed onsite TSD units and offsite TSD Facility capacity. This estimate is within planning level degree of accuracy, and cost numbers will be refined during the engineering phase. The degree of risk, or contingency, was considered during the estimate development.

2.0 BACKGROUND

WHC-SD-WM-ES-341, Rev. 0, *Solid Waste and Materials System Alternatives Study* presented alternatives to provide the necessary facilities to satisfy Tri-Party Agreement M-33-00. Alternatives were arrived at using a systems engineering approach. However, waste streams and materials that had significant uncertainties regarding disposition were not evaluated.

HNF-2063, *Trade Study for the Processing, Treatment, and Storage of Hanford Site Solid Waste Streams That Have No Current Path Forward,* evaluated the following alternative locations or facilities for the processing, treatment, and storage of the Hanford Site solid waste streams (these waste streams were identified by Tri-Party Agreement M-91-00):

- 2706-T Facility plus external modules
- T Plant Complex plus internal modules
- T Plant Complex conversion
- New modular facilities
- Washington Nuclear Power Plant 1
- Maintenance and Storage Facility conversion.

The trade study concluded that the use of the 2706-T/TA Facility plus newly constructed external processing modules, and the use of all newly constructed modular processing facilities, warranted further consideration. However, this study became irrelevant to the present situation because the study did not differentiate between transuranic (TRU) and LLMW facilities, waste streams volume forecast data were uncertain, and the required LLMW treatments were not defined.

The Canyon Disposal Initiative is an ongoing study under the purview of the Environmental Restoration Contractor (ERC), Bechtel Hanford, Inc. (BHI). The initiative is to evaluate the feasibility of using the canyons within the five chemical reprocessing facilities [U Plant, T Plant Complex, B Plant Complex, Reduction-Oxidation (REDOX) Plant, and Plutonium-Uranium Extraction (PUREX) Plant] for waste disposal. The conclusion and recommendations from this study are not anticipated until fiscal year 2001. Canyon disposal is considered an unlikely disposition pathway for LLMW under the M-91-10 project scope as discussed under Assumption 6 in Section 3.1. In the event that the canyons become a viable disposition pathway, the canyons will only enhance the disposition options for LLMW.

2.1 APPLICABLE WASTE STREAMS

The LLMW stream, as defined in M-91-10, is obtained by completing data sorts on the waste storage and forecast databases. The LLMW waste streams in storage on the Hanford Site are identified as a subset of waste contained in the latest annual LDR Report prepared in accordance with TPA Milestone M-26 (DOE/RL-99-01). The solid waste inventory tracking system (SWITS) database contains reliable detailed data (e.g., volumes; container information; and radiological, physical, and dangerous waste characteristics) on each container of waste stored at the Central Waste Complex (CWC). Waste shipping records for the stored waste were used to extract detailed waste information as needed. Additional information can be found in the M-26 annual LDR Report (DOE-RL-99-01). TRU mixed waste is not addressed in this PMP as TRU mixed waste will be covered under the PMP for M-91-03.

The solid waste integrated forecast technical (SWIFT) database is used to forecast future waste stream volumes and characteristics using waste generator input. The waste generator enters basic information

directly to the SWIFT, such as the life cycle and the waste classes, and defines any nonstandard container or 'combined' dangerous waste characteristics. For each waste class, the waste generator specifies the containers in which the waste will be stored, the projected volume of waste, the physical form of the waste, the dangerous characteristics of the waste, and the radionuclides in the waste. The SWIFT database is updated annually and the data published in the SWIFT report (e.g., HNF-EP-0918, Rev. 4).

The SWIFT data are validated through a stringent quality assurance (QA) process that includes sign off by appropriate authorities, checking for completeness of the computer generated form, and conducting intensive and extensive peer reviews. Significant changes in waste volume from previous years are identified and issues resolved before the report is published. Other waste streams that are not included in SWIFT and that could be LLMW were identified by consulting the River Protection Project (RPP) vitrification program and reviewing the *1999 Report on Hanford Site Land Disposal Restrictions for Mixed Waste* (DOE/RL-99-01).

2.1.1 Overview

Waste included in M-91-10 scope generally is created from activities related to facility stabilization and cleanup, including maintenance of process equipment, laboratory operations, and RPP--Tank Farms cleanup operations.

The EM-40 waste generated by the Environmental Restoration (ER) Program on the Hanford Site is managed separately under the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) *of 1980* regulations and therefore is dispositioned under the ER Program milestones. The ER baseline currently identifies the Environmental Restoration Disposal Facility (ERDF) as the ultimate disposal site for all low-level waste (LLW) and LLMW removed during remedial actions/facility decommissioning and decontamination (D&D). However, newly generated LLMW from ER operations is included in the M-91-10 scope if the waste is stored and required to be described in the annual LDR report.

Most of the M-91-10 waste consists of debris (refer to definition in Section 2.4) with minor amounts of granular waste and soil/gravel. Debris includes paper, plastic, protective clothing items, metals, lead shielding, and pieces of equipment. Soil/gravel and granular materials are generated by the ER Program and laboratory operations. M-91-10 debris varies in physical and chemical characteristics. Packages might contain inorganic debris (metal, concrete, etc.), organic debris (paper, plastic, wood) or a mixture of both organic and inorganic debris (heterogeneous).

All of the LLMW forecast volumes are expected to be generated between the current year and the year 2035, after which no waste is expected to be generated. The stored inventory of LLMW is included in the M-91-10 scope as discussed in Section 2.2. The forecast waste has been characterized by onsite generator personnel for matrix composition and dangerous/radioactive constituents based on past and current activities.

The waste streams in storage on the Hanford Site are identified as a subset of waste contained in the latest annual LDR Report prepared in accordance with the TPA Milestone M-26 (DOE/RL-99-01). Forecasted mixed waste is identified through the SWIFT and other programmatic documents.

2.1.2 Applicable Waste Stream Volumes

Life-cycle forecast and stored volumes, as well as other relevant information, for large-container CH LLMW, RH LLMW, and GTC3 waste obtained from the 1998 SWIFT Report (HNF-EP-0918, Rev 4) and a SWITS search are presented in Appendix B. These data are updated annually, however this PMP is a point in time document which uses only the referenced version of the reports. This section discusses the 1998 data in comparison with the 1996 projected data that were used as the basis for establishing the M-91-10 milestone.

The 1996 forecast volumes have changed from a total volume of 158,736 cubic meters to 29,405 cubic meters in 1998 as projected by SWITS/SWIFT and are summarized in Table 2-1. The primary reasons for the volume changes are attributed to the total elimination of GTC3 waste (89,189 cubic meters) from the forecast, the redefinition of large and small containers (reducing the forecast from 29,583 cubic meters to 196 cubic meters), and the RPP--Tank Farms revised forecast for large equipment containers (LEC) (from 32,983 cubic meters to 25,508 cubic meters). These three factors account for 126,050 cubic meters out of the total difference of 129,331 cubic meters between the original M-91 scope and the 1998 forecast. The RH LLMW other containers 3,281 cubic meters decrease is due to a revised forecast of volume.

At the time of the M-91 milestone negotiations, large containers were defined as boxes of any size, and small containers as drums. Large containers currently are defined as only boxes greater than 360 cubic feet or 10 cubic meters and small containers are defined as drums and boxes less than 10 cubic meters in volume. The total volume for CH, RH, and GTC3 waste shown in Table 2-1 is broken down by Program and discussed individually in the following sections.

Table 2-1. M-91-10 Waste Volume Comparison of 1996 Versus 1998 SWITS/SWIFT Projections.

Waste classification	1996 projected volumes (cubic meters)	1998 volumes (cubic meters)	
		Stored	Forecast
Large container CH LLMW			
RPP--Tank Farms LEC	32,983	0	0
Large containers	29,583*	196	0
Total CH LLMW	**62,566**	**196**	**0**
RH LLMW			
RPP--Tank Farms LEC	0	0	25,508
Other containers	6,981	61	3,639
Total RH LLMW	**6,981**	**61**	**29,147**
GTC3 waste			
Total GTC3 waste	**89,189**	**1**	**0**
Total waste volumes	**158,736**	**258**	**29,147**
Total Projected Volume	**158,736**	**29,405****	

* Large portion of waste went to M-19 because of redefinition of large containers.

** SWITS/SWIFT data do not include low-activity melter projections (approximately 1,750 cubic meters)

2.1.2.1 Large Container Contact-Handled Low-Level Mixed Waste Volumes

The large container CH LLMW volumes in the 1996 and 1998 SWITS/SWIFT projections are summarized by Program in Table 2-2. There are 196 cubic meters of large container CH LLMW currently stored at CWC and there currently is no additional large container CH LLMW forecast. This represents a volume decrease of 99.7% from the projected waste volumes in 1996.

Table 2-2. M-91-10 Large Container Contact-Handled Low-Level Mixed Waste Volumes From 1996 Versus 1998 Volumes (SWITS/SWIFT)

Program	M-91-10 waste volumes in 1996 (cubic meters)	M-91-10 waste volumes in 1998 (cubic meters)
RPP--Tank Farms (LEC)	32,983	0
RPP--Tank Farms, Other	6,064	0
Environmental Restoration	7,590	0
Non-Programmatic	7,167	0
Facility Transitions	978	0
Solid Waste	7,254	0
Pacific Northwest National Laboratory (PNNL)	105	0
Resource Conservation and Recovery Act (RCRA) *of 1976*	425	0
Stored at CWC	NA	196
CH LLMW Total	**62,566**	**196**

A volume decrease of 32,983 cubic meters is a result of the reclassification of scrap long-length equipment (LLE) from CH LLMW to RH LLMW. At the time of the M-91 negotiations, the generator classified LLE as CH. As additional waste characterization information became available, this waste stream was reclassified as RH and the RPP--Tank Farms revised forecast changed from 32,983 cubic meters to 25,508 cubic meters.

A volume decrease for large containers from 29,583 cubic meters in 1996 to 196 cubic meters in 1998 is attributed to a redefinition of large waste containers in 1998 to include only those boxes with a volume greater than 10 cubic meters as discussed earlier. M-91-10 specifically states "large-container CH LLMW" only, thus small container CH LLMW is excluded from the M-91-10 scope. Small container CH LLMW treatment falls under the purview of Tri-Party Agreement M-19-00 (refer to Change Number M-19-95-01).

2.1.2.2 Remote-Handled Low-Level Mixed Waste Volumes

The RH LLMW waste volumes in 1996 are broken down by Program and compared to the current 1998 SWITS/SWIFT projected volumes in Table 2-3. The 1998 life-cycle volume projection for RH LLMW is 29,208 cubic meters, of which 61 cubic meters are stored at CWC.

Table 2-3. Remote-Handled Low-Level Mixed Waste From 1996 Versus 1998 Volumes (SWITS/SWIFT).

Program	M-91-10 waste volumes projected in 1996 (cubic meters)	M-91-10 waste volumes in 1998 (cubic meters)
Environmental Restoration	3,696	0
Non-Programmatic	2	0
PNNL	105	67
Solid Waste	90	80
Facility Transitions	4	0
RPP--Tank Farms (LEC)	0	25,508
RPP--Tank Farms, Other	3,084	3,492
Stored at CWC	19	61
RH LLMW Total	**6,981**	**29,208**

Table 2-3 shows that the projected 22,227 cubic meters volume increase in RH LLMW results mainly from the reclassification of CH LEC to RH LEC and better forecast information (as discussed in the previous section). Specifically, RH LEC increased from 0 cubic meters to 25,508 cubic meters, not 32,983 cubic meters, because of better forecast information. The 3,696 cubic meters volume decrease from the ER Program is attributed to the RH LLMW generated from ER activities, falling under the direct purview of the ERC. The less significant volume decreases identified for other Programs also are attributed to adjustments in the current forecasts based on more accurate information.

2.1.2.3 Greater-Than-Category 3 Waste Volumes.

The projected GTC3 waste volumes in 1996 and 1998 are broken down by Program in Table 2-4 and shows that the 1998 life-cycle volume projection for GTC3 waste is 1 cubic meter, which is nearly a 100% reduction from the GTC3 volume projected in 1996. Current waste generator forecasts do not identify any GTC3 waste. Most of the GTC3 waste (88,024 cubic meters in Table 2-4) was forecast by ER/D&D Programs in the form of CH and RH LLW/LLMW. According to assumptions that the ER Program used in the baseline to define waste that can be transferred from EM-40 to EM-30, all LLW and LLMW from remedial action and D&D will go to ERDF. This implies that, even if GTC3 waste is forecast by EM-40 (which does not appear likely), the GTC3 waste will go to ERDF as if the waste were LLW/LLMW.

Table 2-4. Greater-Than-Category 3 Waste Volumes in 1996 Versus 1998 Volumes.

Program	Projected volumes in 1996 (cubic meters)	Waste volumes in 1998 (cubic meters)
Environmental Restoration (CH LLW)	39,942	0
Facility Transitions (CH LLW)	2,384	0
Environmental Restoration (CH LLMW)	4,259	0
PNNL (CH LLMW)	14	0
Offsite (CH LLMW)	34	0
Solid Waste	69	0
Environmental Restoration (RH LLW)	39,900	0
PNNL (RH LLW)	33	0
Environmental Restoration (RH LLMW)	1,539	0
PNNL	14	0
Stored at CWC	NA	1
GTC3 Total Waste Volume	**89,189**	**1**

2.1.2.4 Failed Low-Activity Melters

This waste stream, which is not included in the 1998 SWIFT forecast, could be LLMW and therefore needs to be addressed in this PMP. This waste stream has unique handling requirements because of size, shape, and radiological properties. Low-activity melters are glass melting equipment that will be used in the RPP--Vitrification Facility. Preliminary information indicates that the vitrification process will replace three melters every 3-year cycle, producing on average, one failed melter per year. The failed melters will be characterized by the generator and dispositioned accordingly. Preliminary information indicates that each failed melter will likely be packaged in a 175-cubic meter container and will weigh about 300 metric tons. Ten failed melters (1,750 cubic meters) tentatively are projected over the life cycle of the RPP--Vitrification Facility once operations have commenced.

2.1.2.5 PUREX Storage Tunnels

Some of the waste stored in the tunnels, which is not included in the 1998 SWIFT forecast, potentially could be LLMW and therefore needs to be addressed in this PMP. A review of records indicated approximately 242 cubic meters of RH LLMW in the PUREX Storage Tunnels (Appendix B). This volume represents only a small fraction of the waste stored in the tunnels. The PUREX Storage Tunnels waste consists primarily of failed or obsolete equipment, and therefore is considered debris. The issues surrounding the PUREX Storage Tunnels and waste disposition are discussed in Section 3.1. Information concerning the PUREX Storage Tunnels waste inventory is contained in the Hanford Facility RCRA Permit, Part III, Chapter 3.

2.1.3 Waste Characterization

Detailed waste information including the physical forms, characteristics, numbers, types, container information, and the dangerous properties for each stored/forecast waste stream is provided in Appendix B. The classification of the waste was based on the categories in the DOE Waste Treatability Group Guidance Document (DOE/LLW-217). The dangerous properties assigned to the waste were based on the Washington State Department of Ecology (Ecology) *Dangerous Waste Regulations*,

Washington Administrative Code (WAC) Chapter 173-303. Several dangerous properties might be present in a particular waste (e.g., a 208-liter drum might contain both ignitable and corrosive waste).

2.2 WASTE STREAM STABILITY AND CONTAMINANT MIGRATION

The applicable LLMW waste is either currently stored in CWC or will be newly generated. The stored waste is containerized and maintained within compliant conditions for dangerous and/or mixed waste governed by WAC 173-303 regulations and radioactive waste governed by DOE Orders. The integrity of the containment is monitored and inspected to ensure that release to the environment does not occur. Forecast waste will be received in containers and will be subject to all waste acceptance criteria and applicable inspection procedures. Any waste treated by the generator is assumed to be radiologically, chemically, and physically stable.

2.2.1 Radiological Stability of Waste Forms

The waste forms are solid and dry debris and this physical form does not readily allow migration or spread of radioactive contamination. Accidental release of radionuclides is prevented by the use of approved packaging methods and containers, the integrity of which is monitored closely. Criticality occurrence is not a credible scenario for LLW, which, by definition, contain less than 100 nanocuries per gram concentrations of TRU radionuclides.

Other areas of possible concerns when treating and storing mixed waste, include gas and heat generation. Under special conditions, gas generation may occur when radiolytic decay is strong enough to cause release of hydrogen from organic material such as plastics. Gas generation is a concern relevant to waste containing quantities of TRU radionuclides greater than can be found in LLW; hence, gas generation is not a credible concern for LLMW. Similarly, heat generation is a concern for certain isotopes, including plutonium-238; however, little or no inventory of plutonium-238 is expected in the LLMW. SWITS database contains the provisions to automatically perform calculations of suspect waste to identify those with heat or gas generation potential.

2.2.2 Chemical Stability of Waste Forms

Waste is segregated by waste type and chemical characteristics into containers at the point of generation in adherence with procedures and permit requirements. Waste Management Federal Services of Hanford, Inc. (WMH) further segregates the waste containers received into different areas at the CWC based on chemical hazards. Incompatible waste or waste with special storage requirements is segregated to reduce the risk of accidental events such as chemical reactions, explosion, and/or fire. Therefore, acidic waste is stored in separate areas from caustics, and flammable materials are stored in accordance with safety requirements.

2.2.3 Areas of Contamination

No known releases have occurred from the storage of waste types discussed in this PMP.

2.3 EXISTING TREATMENT CAPACITY AND OPTIONS CONSIDERED

There is no existing commercial or DOE treatment capacity for RH LLMW.

There are two existing commercial contracts for the treatment of small container CH LLMW between WMH and Allied Technology Group, Inc. (ATG) that involve thermal destructive treatment and non-thermal treatment of debris and non-debris. The CH LLMW thermal treatment contract requires that ATG begin treating waste by November 2000, 5 years from contract award. The 5-year startup period is to be used by ATG to complete a *National Environmental Policy Act* (NEPA) *of 1969* environmental assessment, obtain required licenses and permits, and design and construct treatment facilities. WMH is committed to have 120 cubic meters of CH LLMW treated per year for 5 consecutive years starting in fiscal year (FY) 2001. WMH has the option of having up to 597 cubic meters of additional waste treated during each of the 5 years. After the 5 years, WMH has the option of having up to 310 cubic meters per year treated for 5 additional years.

The non-thermal treatment contract with ATG was amended in July 1998 to accommodate a delay in the ATG RCRA permit application. The contract calls for treatment to start in June 1999 (currently forecast for July-August 1999) and specifies that 560 cubic meters of debris and/or non-debris waste be treated to meet LDR in FY 1999. WMH has the option to treat up to an additional 700 cubic meters of debris and 100 cubic meters of non-debris in FY 2000, and an additional 500 cubic meters of debris in FY 2001.

The Waste Experimental Reduction Facility (WERF) incinerator at the Idaho National Engineering and Environmental Laboratory (INEEL), Idaho Falls, Idaho, is not a viable option for Hanford Site waste because of low plutonium acceptance limits, and the inability of WERF to accept/manage RH waste. Similarly, the Oak Ridge National Laboratory, Oak Ridge, Tennessee, incinerator accepts only liquids. The waste acceptance criteria for the Consolidated Incinerator Facility at the Savannah River Site does not allow for the acceptance of non-Savannah River waste.

Four LLMW processing alternatives were evaluated in DOE/EA-1135, *Environmental Assessment for Offsite Thermal Treatment of Low-Level Mixed Waste*. All four alternatives were considered infeasible. Alternatives included: (1) no treatment, (2) construction of a treatment facility in the 200 West Area of the Hanford Site, (3) treatment of the waste at either an existing facility or a proposed facility at INEEL, and (4) treatment at a proposed facility at Oak Ridge, Tennessee.

The T Plant Complex, currently permitted for RCRA treatment (including sorting and repackaging), will be an option considered during evaluation for processing discussed in this PMP. Non-thermal treatment processes have been performed at T Plant Complex in the past, including stabilization, decontamination and macroencapsulation.

2.4 REGULATORY REQUIREMENTS

Facilities for LLMW must meet the requirement for TSD units under the following applicable regulations.

WAC 173-303 is the primary regulation controlling dangerous waste management of the waste discussed in this PMP. WAC 173-303 regulations encompass cradle to grave management of mixed waste. Compliant storage area and transportation systems are in place on the Hanford Site. This PMP discusses a means of treating the waste to meet applicable treatment standards set forth in the WAC-173-303-140.

The LDR regulations (40 CFR 268) establish treatment standards by constituent concentration levels or by designated treatment for waste and debris. 40 CFR 268 also provides for treatability variances or the ability to prepare an application demonstrating an alternate treatment method is achievable for certain wastes. Petition provisions are also contained in the WAC-173-303 similar to the 40 CFR 268 provisions.

Debris is defined [40 CFR 268.2(g)] as solid material exceeding a 60 millimeter particle size that is intended for disposal and that is a manufactured object, or plant or animal matter, or natural geologic material. Debris is also defined in WAC 173-303-040. When a waste meets the definition of debris and is a hazardous debris, the treatment standards in 40 CFR 268.45 must be used. A mixture of debris and waste are subject to regulation as debris if the mixture consists primarily of debris, by volume, based on visual inspection.

WAC 173-303-140 (4)(d) prohibits the land disposal of organic/carbonaceous waste as defined in WAC 173-303-140 (3)(c). Organic/carbonaceous waste must be incinerated as a minimum management method according to the dangerous waste priorities in WAC 173-303-140 (1)(d). Currently in effect as of December 1998, the state-only LDR does not apply to Hanford Site mixed waste based on proper execution of the 1,609 kilometers certification described in WAC 173-303-140 (4)(d)(iii). When ATG begins operations, it is expected that Ecology will determine that treatment capacity is available for CH LLMW. The state-only LDR will not apply to RH LLMW because ATG does not have RH treatment capacity.

All applicable DOE requirements for nuclear controls and safety will be implemented and are expected to have minimal impact on LLMW.

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3.0 PROJECT SCOPE

This M-91-10 PMP has been developed using the following approach.

3.1 ASSUMPTIONS AND BASES

The following key assumptions and bases were developed for the PMP using the best available engineering, operations, waste treatment, and regulatory experience.

1. The FY 1998 forecast waste volumes in the SWIFT report (HNF-EP-0918, Rev. 4) are an accurate baseline for M-91-10 PMP.

Rationale: The supplied data have undergone adequate levels of review (refer to Section 2.1). Current efforts integrate supplied data with the onsite disposition waste mapping effort. The SWIFT report is used by waste management contractors and by WMH for planning and business decisions.

2. DOE Complex EM Integration waste streams are not included in this project.

Rationale: EM Integration is not established as a baseline. Equity issues among States remain to be resolved. The impact for this PMP is minimal, because no offsite waste stream is scheduled to be shipped to a M-91-10 RH treatment facility. *Federal Facility Compliance Act* (FFCA) *of 1992* waste has been considered, but these waste streams do not fit within the M-91-10 category. Forecasts to be used are the 1998 SWIFT report baseline volumes.

3. RPP--Tank Farms LLE will be macroencapsulated by RPP and will be disposed directly onsite in an existing Subtitle C Landfill, or additional Subtitle C units if greater capacity is needed.

Rationale: This assumption is based on the current RPP--Tank Farms retrieval project baseline as described in *Long-Length Contaminated Equipment Disposal Process Path Document*, HNF-SD-WM-ER-730. RPP--Tank Farms will use treatment-by-generator provisions to perform debris rule macroencapsulation of the LLE upon generation. As a backup position, existing T Plant Complex concrete pad areas, which have been used to macroencapsulate LLE, could also be used in the future. The T Plant Complex Part A, Form 3, Permit Application allows treatment activity within the area boundary or 'fence line' (DOE/RL-88-21). Landfill disposal space requirements will be determined for the overall solid waste operation, taking into account all programmatic needs and annual rate of waste disposal.

4. The failed low-activity melters, if characterized as LLMW, will be treated by RPP--Vitrification and will be disposed directly onsite in an existing Subtitle C landfill, or additional Subtitle C units if greater capacity is needed.

Rationale: Maintenance, removal, and treatment of the low-activity melters are within the purview of RPP--Vitrification once operations have commenced. Agreements for treatment of low-activity melters do not exist, but the vitrification generator is required to meet the onsite waste acceptance criteria. If classified as LLMW, treatment will meet LDR requirements and disposal will occur in a Subtitle C landfill. Therefore, this PMP does not address the treatment of this waste stream. The waste stream is discussed in Section 2.0. Landfill disposal space requirements will be determined for the overall solid waste operation, taking into account all programmatic needs and annual rate of waste disposal.

5. Contaminated soil and gravel from cleanup of RPP--Tank Farms will meet LDR (or contained-in) concentration limits for the listed constituents as-is, and treatment will not be required.

Rationale: Historical data from tank waste analysis indicated that the dangerous waste constituents in the tank waste are at concentrations below the LDR treatment standards. Analytical data on existing soil waste also indicated that the radioactive components are at concentration limits below treatment standards. It follows, therefore, that soil contaminated from occasional spills from tank farm cleanup activities will meet LDR standards. The soil and gravel will be sampled and analyzed before disposal in a Subtitle C Landfill. The waste stream will be managed as a mixed waste and might undergo a 'contained-in' determination process, if required.

6. The Canyon Disposal Initiative will not be used as a disposition pathway for waste identified in this PMP.

Rationale: The Canyon Disposal Initiative is speculative at this time but, if implemented, will increase disposal capacity and could mitigate disposal space constraints.

7. This PMP does not provide plans for acquiring a facility that will accommodate treatment of the PUREX Storage Tunnels waste.

Rationale: Any retrieval and treatment options for the PUREX Storage Tunnels waste will require major decisions from DOE, Project Hanford Management Contract (PHMC) management, regulators, and stakeholders. Planning a treatment facility for this waste before policy decisions are made is highly speculative and would incur high risk. Major technical issues need to be resolved, and if retrieval of waste from the tunnels were conducted, a large facility with specific capabilities for the retrieval project would be required.

The PUREX Storage Tunnels Closure Plan (Hanford Facility RCRA Permit, Part III, Chapter 3) states that closure of the PUREX Storage Tunnels requires coordination with closure of the PUREX Plant to ensure a cost effective closure for both units. The PUREX Storage Tunnels will continue to be managed as a RCRA storage unit until closure can be coordinated with the final closure plan for the PUREX Plant.

8. Solid Waste Environmental Impact Statement (EIS) Record of Decision (ROD) will cover the implementation of the PMP objectives.

Rationale: The options in the EIS are general, allowing for practical means of implementing dispositions. A draft project work plan will be available before the EIS is finalized and before the draft ROD is initiated in Winter 1999-2000, as currently scheduled. Furthermore, this PMP will be submitted before the final ROD is issued, thus providing a window of opportunity for alignment.

9. B Plant Containment Building Storage waste will be addressed in M-20-21A.

Rationale: The B Plant Containment Building Storage waste (as described in DOE/RL-98-09) is estimated at 97,000 kilograms of failed equipment (e.g., process jumpers, pumps, etc.). This waste must be properly characterized and packaged before treatment can be performed and is presently covered under M-20-21A, "Submit B Plant Pre-Closure Plan". A portion of this waste will be RH LLMW and will be fully characterized and packaged to meet onsite waste acceptance criteria and will be macroencapsulated under M-91-00.

10. Disposition of waste stored at the T Plant Complex will occur on a similar path as the PUREX Facility and the B Plant Complex.

Rationale: The T Plant Complex being a canyon facility on the Hanford Site, should be managed as such, pursuant to Key Facility provisions of the Tri-Party Agreement.

3.2 OVERALL APPROACH

A systems engineering graded approach was applied to derive the desired outcome of a disposition plan for each applicable LLMW stream as required by the Tri-Party Agreement. Systems engineering is 'a generalized, systematic methodology for defining large, complex, and/or first of a kind problems, and evaluating and implementing solutions'. The M-91-10 project has a relatively small scope, but the regulatory, technical, and technological issues involved are of moderate to high complexity. Project planning, outlined as follows, was structured to include all the elements of the systems engineering methodology. These include mission analysis, functional analysis, requirements analysis, system synthesis and integration, and alternative evaluation. The project mission was established by the Tri-Party Agreement major milestone M-91-10 and consists of developing TSD for applicable LLMW and GTC3 waste. The project was developed using the following steps.

1. Define the waste streams. The physical, dangerous, and radiological characteristics of the applicable LLMW and GTC3 waste streams were defined and bounded based on the Tri-Party Agreement terms and requirements, and the assumptions described in Section 3.1. Using the established waste characteristics as search parameters, the SWITS/SWIFT databases were searched to obtain a sitewide listing of waste streams and associated attributes including volumes, dangerous and radiological characteristics, type of packaging, shielding, and container size. In the case of stored waste, packaging records were accessed to obtain detailed information on container contents and characteristics. Waste streams that are not included in SWITS or SWIFT (e.g., low-activity melters, PUREX Storage Tunnels waste, and waste stored in other facilities) were identified by consultation with the programs responsible for the waste, the annual LDR Report, and the regulators. The applicable waste streams are presented in Section 2.1.

2. Define required treatment to meet applicable LDR standards. Required treatment was identified for each waste stream, regardless of size, based on LDR treatment standards and waste characterization data (available or forecast). The waste streams were divided into treatability groups, i.e., waste streams with similar physical, chemical, and radiological characteristics that can be treated to LDR standards with the same process. The number of treatability groups defines the number of treatment processes required.

3. Define and evaluate options for providing the required treatment. The development of treatability groups, the aggregate waste volumes, and the corresponding number of treatment processes made it possible to determine the type and size of the required treatment facilities. A regulatory exemption or exclusion will be proposed if the treatment is not appropriate for a given waste stream. Treatment options were evaluated and selected based on waste volume to be treated, availability of planned commercial/site treatment facilities, and potential impact on public and labor relations.

4. Plan acquisition. An acquisition plan was developed for the selected options that include creation of new treatment capacity, as well as the use of existing Hanford Site facilities or planned commercial treatment opportunities. The acquisition plan includes a schedule with major decision points and milestones, and a preliminary cost estimate that could be used to develop the project funding profile.

The acquisition plan also serves to establish the technical, schedule, and cost baselines for the project.

3.3 REQUIRED TREATMENT

Using the approach described in Section 3.2, the required LDR treatment was assigned to each waste based on available or forecasted physical, chemical, and radiological characteristics. Waste types with similar characteristics and treatment requirements were grouped and assigned the same treatment process. The required treatment processes were identified for all M-91-00 waste, regardless of volume. A brief and generic description of the selected treatment processes are provided for information.

Macroencapsulation. This is an LDR treatment standard for hazardous debris and has no contaminant restrictions. This is an immobilization technology consisting of an application of surface coating materials such as polymeric organics (e.g., resins and plastics) or use of a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media. A process must be selected among the various existing technologies and must be compatible with the physical, chemical, and radiological properties of the waste. The encapsulating material must completely encapsulate debris and be resistant to degradation by the debris and the contaminants and materials into which the debris might come into contact after placement (leachate, other waste, microbes). Polyethylenes and commercially developed resins are examples of suitable encapsulating materials.

Stabilization. Chemical stabilization is a treatment technology for (non-debris) waste that contains heavy metals or other specific dangerous components. A stabilization process could be used for neutralization and solidification of liquid waste. The objective of stabilization is immobilizing the dangerous constituents through fixation, low solubility, and encapsulation. Stabilization is accomplished by mixing the waste with Portland cement or pozzolanic materials at a pre-selected ratio. The stabilized waste must meet the standards in the toxic characteristics leaching procedure (WAC 173-303-090) before land disposal.

Thermal treatment. Thermal treatment is a process where organic matter is destroyed in high temperature processes including combustion, such as incineration, boilers, industrial furnaces, and gasification processes that perform under reducing atmospheres. The energy requirement for the systems could be derived from combustion, electrical power, high temperature plasma, or a combination of energy sources. The energy source might act on the waste directly or the waste could be added to a heated medium such as molten glass. Thermal treatments must comply with stringent requirements of 40 CFR 268.42 and Subpart O.

Thermal treatment is a technology-based treatment standard for organic/carbonaceous waste containing dangerous components. Sampling and system monitoring must prove that mandatory destruction efficiency levels are met. Residues from thermal processes (bottom ash, slag, glass, and air pollution control residues) might require stabilization to meet LDR requirements before disposal.

Organic destruction. Organic destruction is a generic process that could be used to destroy organic dangerous constituents that have a concentration-based treatment standard. Such a process could be selected from available technologies including chemical oxidation, chemical reduction, or thermal treatment depending on the volume and characteristics of the waste. The residues from this process might require further treatment that could include stabilization, solidification, or reactant recovery.

Drain and rinse. This is a *Toxic Substance Control Act* (TSCA) *of 1976* treatment standard for polychlorinated biphenyls (PCB) contaminated (greater than 500 parts/million) transformers. The treatment consists of draining the transformers and conducting an 18 hour rinse with an organic solvent that is at least 5% soluble with PCB oil according to prescribed methodology. The rinsate can be treated thermally.

3.3.1 Remote-Handled Low-Level Mixed Waste

The required treatments for RH LLMW are shown in Table 3-1 for each waste stream.

Table 3-1. M-91-10 Required Land Disposal Restriction Treatment Categories.

Waste form	Waste volumes (cubic meters)		Treatment
	Stored	Forecast	
RH LLMW			
Debris - inorganic	61	2,904.5	Macroencapsulation
Debris - organic	0	576.4	Macroencapsulation
Inorganic homogeneous solids	0	20.0	Stabilization
Inorganic homogeneous solids	0	11.2	Organic destruction
Lab packs	0	0.1	Stabilization/neutralization
Lab packs	0	0.1	Organic destruction
Organic homogeneous solids	0	11.2	Organic destruction
Organic homogeneous solids	0	36.1	Stabilization/neutralization
Soil/gravel	0	78.6	Disposal
Soil/gravel	0	0.9	Stabilization
Special waste	0	0.1	Stabilization/neutralization
LLE	0	25,508	Macroencapsulation
Low-activity melters	0	1,750	Macroencapsulation*
RH LLMW Total	**61**	**30,897**	
Large Container CH LLMW			
Debris-heterogeneous	64	0	Sort/macroencapsulation/ Thermal treatment
Debris-organic w/PCB	11	0	Thermal treatment
Debris-heterogeneous w/PCB	12	0	Sort/macroencapsulation/ Thermal treatment
Debris-inorganic	91	0	Macroencapsulation
PCB transformer	18	0	Drain and rinse
CH Total	**196**	**0**	
GTC3 Waste			
GTC3 waste	1.3	0	n/a (storage only)
GTC3 Waste Total	**1.3**	**0**	
Total Volume	**258**	**30,897**	

*Macroencapsulation is needed only if low-activity melters are designated as LLMW by the generator, refer to Section 3.1, Assumption 4.

Figure 3-1 shows a block diagram identifying the waste feed streams, the stored and forecast total volumes for each waste stream, the required LDR treatment, and the annual volume rates for each treatment process.

Macroencapsulation. Macroencapsulation is selected as a LDR treatment for both inorganic and organic/carbonaceous RH debris. This is based on the assumption that the WAC 173-303 LDR on organic/carbonaceous waste (refer to Section 2.4) will not apply because no RH thermal treatment process is known to be available within a 1,609 kilometer radius from the borders of Washington State. Heat and hydrogen gas generation is not a concern for macroencapsulation of these wastes (refer to discussion in Section 2.2.1).

The LLE also will require treatment by macroencapsulation in LEC. However, because of the size, configuration, and specific handling requirements, the RPP--Tank Farms will use a specially designed macroencapsulation system to treat LLE debris. Therefore, it is apparent that this LLE treatment system is not suitable to treat other M-91-10 debris.

The low-activity melters are considered for RH macroencapsulation as a baseline assumption. However the ultimate disposal path has not yet been defined, as described in Section 3.1, Assumption 4.

Stabilization. As shown in Figure 3-1, stabilization is the selected technology for all of the RH organic and inorganic homogeneous solids, and other non-debris waste that contains heavy metals. Included in this category are special wastes, soil/gravel, and lab packs as listed in Table 3-1. The residue from the organic destruction process also is identified for stabilization and/or solidification if heavy metals are present or the residual stream is liquid.

Organic Destruction. Organic destruction is the selected technology for all of the RH organic and inorganic homogeneous solids and lab packs that contain organic dangerous constituents. This selection is presented as alternate treatment to thermal treatment because the volumes are small and a chemical destruction process will be more amenable to RH operation. Residues from organic destruction will be evaluated to determine if stabilization/neutralization is required prior to land disposal.

Direct Disposal. Because it is expected that some soil and gravel meet LDR (or contained-in) concentration limits (Assumption 5, Section 3.1) for the listed constituents as received, direct disposal of such waste to a Hanford Site Subtitle C Landfill could be made without having to perform treatment.

3.3.2 Large Container Contact-Handled Low-Level Mixed Waste

The required treatment categories for the various large container CH LLMW forms identified in Table 3-1 are drain and rinse, thermal treatment, and macroencapsulation. Figure 3-2 is a block diagram identifying the required treatment, the feed waste streams, the stored and forecast total volumes for each waste stream, and the annual volume rates for each treatment process.

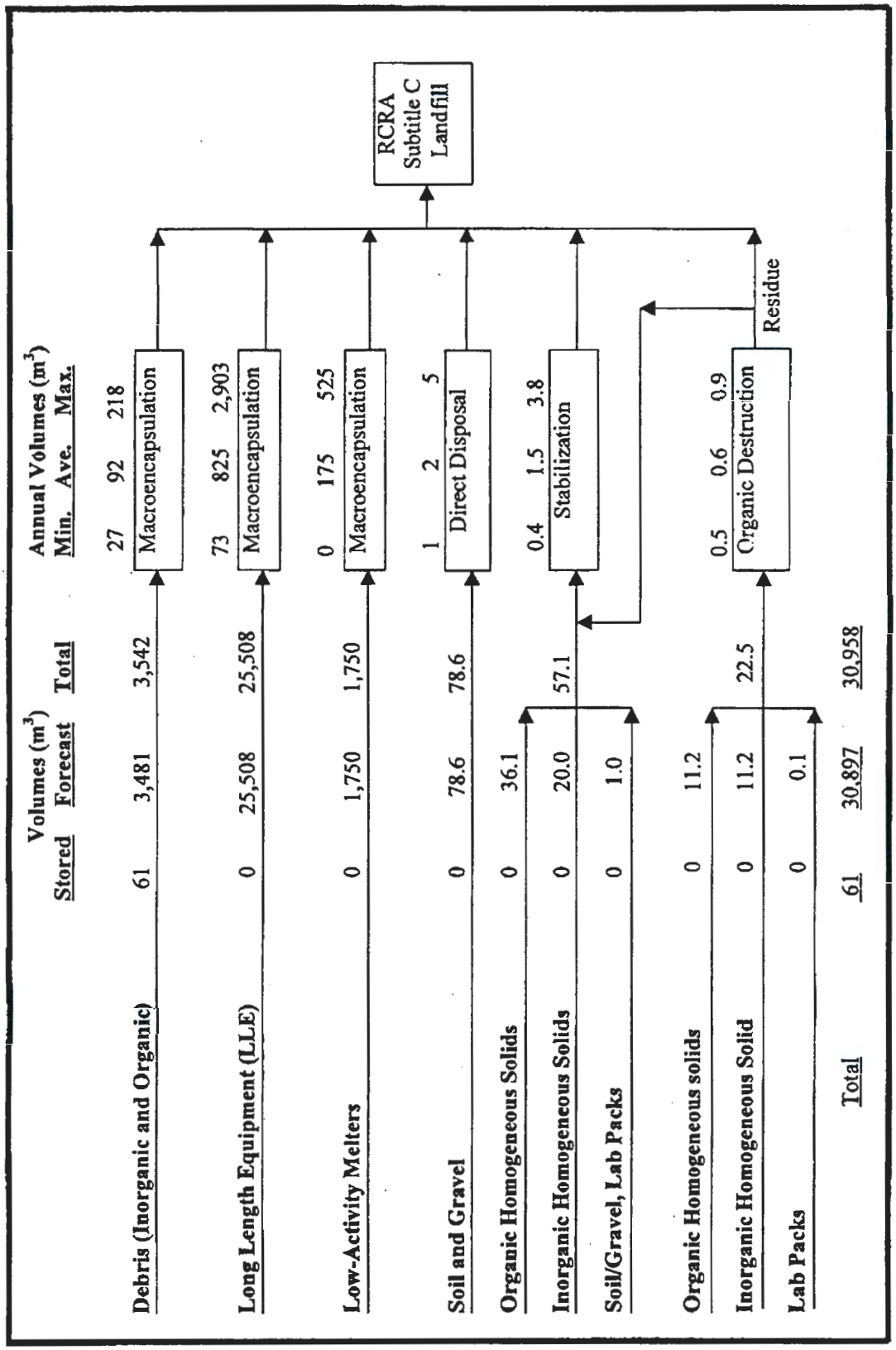

Figure 3-1. Required Land Disposal Restriction Treatment for the Projected Volumes of Remote-Handled Low-Level Mixed Waste.

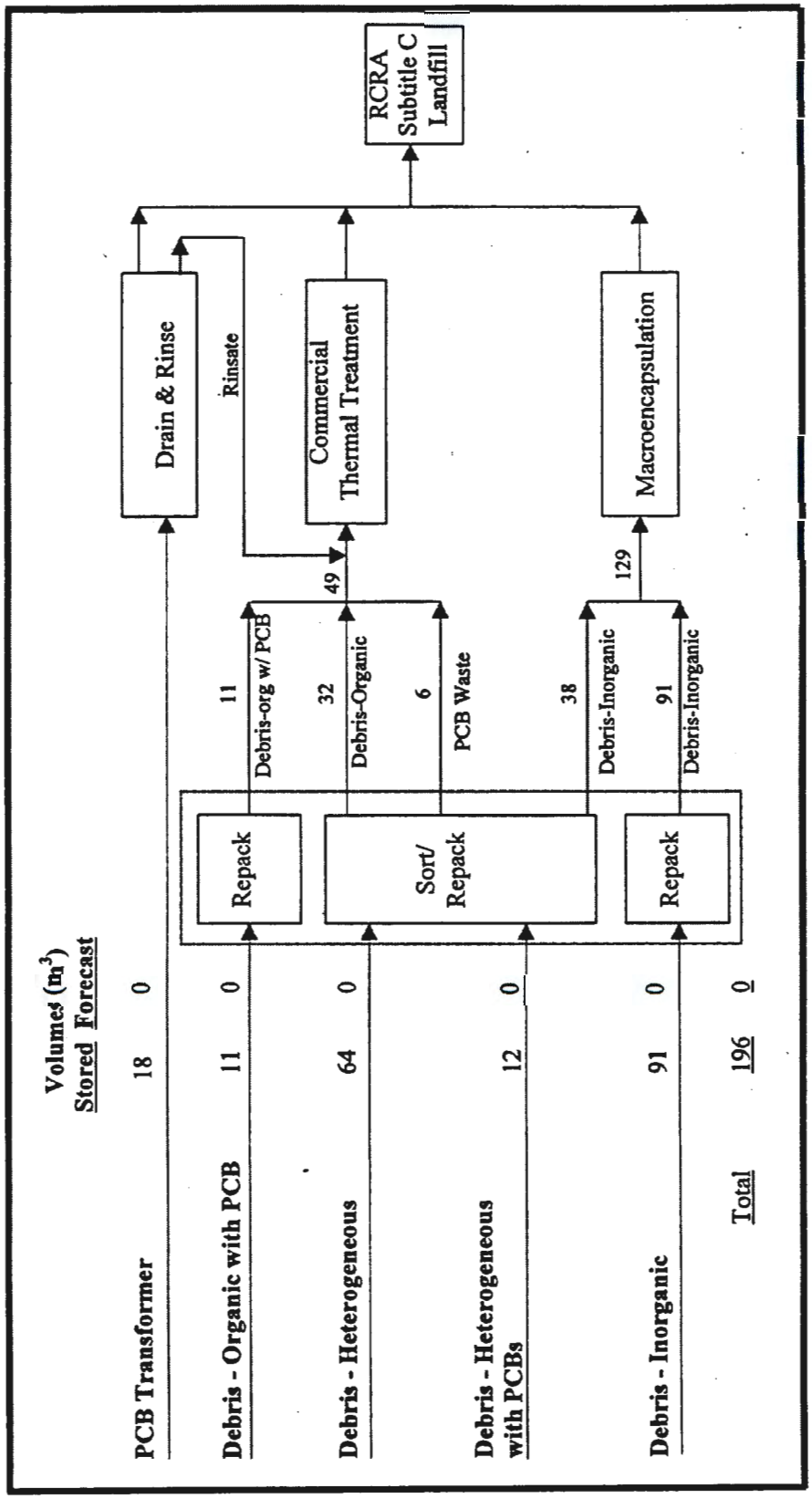

Figure 3-2. Pretreatment and Required Land Disposal Restriction Treatment for the Projected Volumes of Large Container Contact-Handled Low-Level Mixed Waste.

Sort/Repackage. Sorting is selected for heterogeneous debris streams to separate organic/carbonaceous debris (organic) from non-organic/carbonaceous (inorganic) debris. According to records, one heterogeneous debris container includes PCB sludge that requires separation as an additional PCB waste stream. The heterogeneous debris will be sorted and repackaged into inorganic and organic debris streams. The heterogeneous debris with PCB will be sorted into inorganic debris, organic debris, and PCB waste.

Because all the CH LLMW is packaged in large containers, repackaging the waste in small containers is performed to accommodate subsequent treatment processing.

Drain and Rinse. There is one PCB transformer stored at CWC that may require drain and rinse treatment per TSCA regulations. The rinsed transformer will be disposed in a Subtitle C Landfill in compliance with TSCA checklist requirements and the rinsate sent for thermal treatment. Records indicate that this transformer has been drained and rinsed, but it is not clear whether the method used satisfies TSCA regulations. The issue will be investigated before deciding on the final disposition path.

Commercial Thermal Treatment (CTT). CTT is selected for organic/carbonaceous and PCB waste resulting from the sort/repack operation to satisfy the state-only LDR on organic/carbonaceous waste and TSCA regulations.

Macroencapsulation. Macroencapsulation is the selected LDR treatment for the inorganic debris streams obtained from the sort/repack operation.

3.3.3 Greater-Than-Category 3 Waste

All GTC3 waste will be stored per the Tri-Party Agreement until appropriate guidelines for disposal are issued by DOE, or appropriate reviews are performed in accordance with DOE Orders.

3.3.4 PUREX Storage Tunnels Waste

As discussed in Section 3.1, this PMP does not provide plans for the option of removal and treatment of the PUREX Storage Tunnels failed equipment. The final disposition plan will be developed as described in Section 3.1, Assumption 7.

3.4 TREATMENT, STORAGE, AND/OR DISPOSAL PLANNED ACTIONS

This section defines and describes the programs, planned actions, and existing or new facilities required for the TSD of large container CH LLMW, RH LLMW, and GTC3 waste described in Section 2.0 and treated according to Section 3.3. The planned actions/facilities were defined by evaluating waste disposition options based on required treatment, waste generation rates, and available/planned commercial treatment. Environmental, Health, Safety, and Quality (EHS&Q), as low as reasonably achievable (ALARA) principles, impact on public/labor relations, and relative cost were accounted for during the evaluation process.

3.4.1 Macroencapsulation of Long-Length Equipment from Tank Farms

The required treatment for RPP--Tank Farms LLE was identified as macroencapsulation followed by disposal in a Hanford Site Subtitle C Landfill. The disposition plan for LLE is based on the baseline assumption that RPP--Tank Farms activities will treat and deliver the LLE in LECs to WMH for disposal. The baseline description is anecdotal, as no programmatic baseline documentation is available at this time. The disposition plan has been confirmed at the project level with RPP--Tank Farms project managers. The plan and facilities are described in *Long-Length Contaminated Equipment Disposal Process Path Document,* HNF-SD-WM-ER-730.

The planned disposition pathway as described in HNF-SD-WM-ER-730 calls for RPP--Tank Farms to macroencapsulate the LLE at the tank farms, under treatment-by-generator provisions. This will be accomplished by first retrieving the LLE from the tank, placing the LLE into a flexible receiver, and tying it off. The packaging and treatment will occur when the waste item is captured by a receiver trailer (HO-64-4283) tilt assembly and transition to the horizontal position, pushing the LLE into the burial container, filling the void space with grout, and sealing the container ends. The macroencapsulated LLE potentially could be RH and there is no provision in the system design to incorporate shielding into the LEC. Accordingly, the LEC will be placed on a shielded transportation trailer (HO-64-4280) and delivered to WMH for disposal. The equipment described is designed, built, and located near the 2704-HV Building.

Based on the 1998 SWIFT forecast, generation of LECs was projected to start in FY 1999 and continue through 2028, with peak generation rates reaching over 2,000 cubic meters per year between FY 2009 to 2014 (refer to Table 3-2, second column). Acquisition of specialized handling equipment could be required to unload and dispose the RH LECs.

3.4.2 Failed Low-Activity Melters Macroencapsulation and Disposal

The disposition plan for the failed low-activity melters is described in Section 3.1, Assumption 4.

Presently available information indicates that the first forecast for the low-activity melters is due in June 1999, but the total disposal rate is expected to be 10 packages generated over a 10-year period starting in FY 2007. Each package is expected to weigh 300 metric tons and have a volume of 175 cubic meters, yielding a total life-cycle volume of 1,750 cubic meters that must be accommodated in a new or existing disposal facility. No information currently is available for the high-level melters.

3.4.3 PUREX Storage Tunnels Waste Disposition

As discussed in Section 3.1, this PMP does not provide plans for the option of removal and treatment of failed equipment in the PUREX Storage Tunnels. The final disposition plan will be developed as described in Section 3.1, Assumption 7.

1

Table 3-2. Remote-Handled Low-Level Mixed Waste: Solid Waste Integrated Forecast Technical (HNF-EP-0918, Rev. 4) Annual Report Volumes by Treatment Type (in cubic meters).

Calendar Year	Direct disposal	Macroencapsulation		Stabilization/ neutralization	Organic destruction	Total
		LLE	RH-LLMW			
1998	0.0	0.0	39.06	3.73	0.73	44
1999	4.4	85.1	113.45	3.67	0.71	207
2000	18.8	54.3	207.16	3.72	0.71	285
2001	14.5	699.8	210.45	3.63	0.67	929
2002	11.6	693.2	199.49	3.60	0.67	909
2003	12.9	115.2	164.66	3.61	0.67	297
2004	12.9	663.7	154.96	3.77	0.67	836
2005	3.5	1,154.5	122.42	3.52	0.67	1,285
2006		783.4	39.75	3.48	0.67	827
2007		1,083.0	44.51	3.48	0.67	1,132
2008		1,584.2	57.82	3.48	0.67	1,646
2009		2,136.3	114.04	3.48	0.67	2,255
2010		2,108.8	119.78	3.48	0.67	2,233
2011		2,593.9	123.90	0.42	0.67	2,719
2012		2,009.6	193.19	0.42	0.67	2,204
2013		2,676.1	192.03	0.42	0.67	2,869
2014		2,902.8	214.47	0.42	0.74	3,118
2015		690.8	189.59	0.42	0.86	882
2016		1,229.2	217.69	0.42	0.86	1,448
2017		798.5	204.64	0.42	0.86	1,004
2018		152.4	162.77	0.42	0.86	316
2019		196.2	34.68	0.42	0.67	232
2020		196.2	33.59	0.42	0.65	231
2021		214.1	33.59	0.42	0.65	249
2022		98.1	27.34	0.42	0.52	126
2023		98.1	27.34	0.42	0.52	126
2024		98.1	27.34	0.42	0.52	126
2025		98.1	28.16	0.62	0.52	127
2026		98.1	28.16	0.62	0.52	127
2027		98.1	28.16	0.62	0.52	127
2028		98.1	28.16	0.62	0.52	127
2029			26.93	0.31	0.52	28
2030			26.93	0.31	0.52	28
2031			26.93	0.31	0.52	28
2032			14.08	0.31	0.26	15
2033			1.23	0.31		2
2034			1.23	0.31		2
2035			1.23	0.31		2
Total	79	25,508	3,481	57	22	29,148

3.4.4 Greater-Than-Category 3 Waste Storage

Providing storage capacity is the only action required for GTC3 waste under the Tri-Party Agreement. The existing 1.3 cubic meters of GTC3 waste will be stored in CWC until disposal per DOE Orders. No future generation of GTC3 waste is forecast; however, storage capacity in CWC will be available to accommodate this type of waste if the need arises.

3.4.5 Commercial Thermal Treatment

The required treatment for the large container CH LLMW is sorting/repackaging and thermal treatment for organic/carbonaceous and PCB waste. ATG is planning a CTT unit in the Tri-Cities area (Richland, Kennewick, and Pasco) that will accept DOE LLMW and TSCA waste. As described in Section 2.3, WMH has a contract with ATG to treat a maximum of 3,585 cubic meters LLMW (Contract MW6-SBV-357079). As shown in Figure 3-3, the applicable waste volumes are listed for CH LLMW organic/carbonaceous debris and the PCB waste obtained from the sort/repack operation to be sent to ATG for thermal treatment.

3.4.6 New Treatment Capacity

The planned actions described previously cover the major portion of the large container CH LLMW, RH LLMW, and all of the GTC3 waste discussed in this M-91-10 PMP. Acquiring new treatment capacity is required to address the remainder of waste discussed in this PMP. The new treatment capacity for these waste streams will include sorting/repackaging and macroencapsulation for the CH waste (Figure 3-2), and macroencapsulation for the RH debris and homogenous solids contaminated with regulated metals and organics (Figure 3-1). The preferred treatment processes, capabilities, and preliminary design parameters are discussed in the following.

Sort/Repack. A facility will be provided to sort and repackage the large container CH LLMW streams shown in Figure 3-2. The sorting and repackaging operation will be short-term because the process feed stream consists of only 178 cubic meters (12 packages) of stored waste and no future generation is forecast for this waste stream. The facility will have size reduction capabilities for large debris.

Macroencapsulation. Having established separate macroencapsulation pathways for the LLE and the failed low-activity melters, the remaining waste streams that require macroencapsulation are the RH LLMW debris stream (Figure 3-1), and the 129 cubic meters of stored CH LLMW inorganic debris from the sorting operation (Figure 3-2). The LLE macroencapsulation process cannot be used for this waste because, as discussed previously, the process is designed with special capabilities for bagging long equipment (up to 18 meters long), placing the bagged equipment into a burial container, sealing, and grouting.

Because the stored RH debris (61 cubic meters) was received in shielded CH containers and future RH waste will be placed into CH shielded containers at the point of generation, the CH shielded containers of RH debris will be macroencapsulated without opening the containers. Such a system will provide for a CH operation that adheres to the ALARA principles of minimizing personnel exposure risk, enhancing environmental and public protection, while reducing capital and operating costs. The macroencapsulation facility will function for both CH and shielded RH waste.

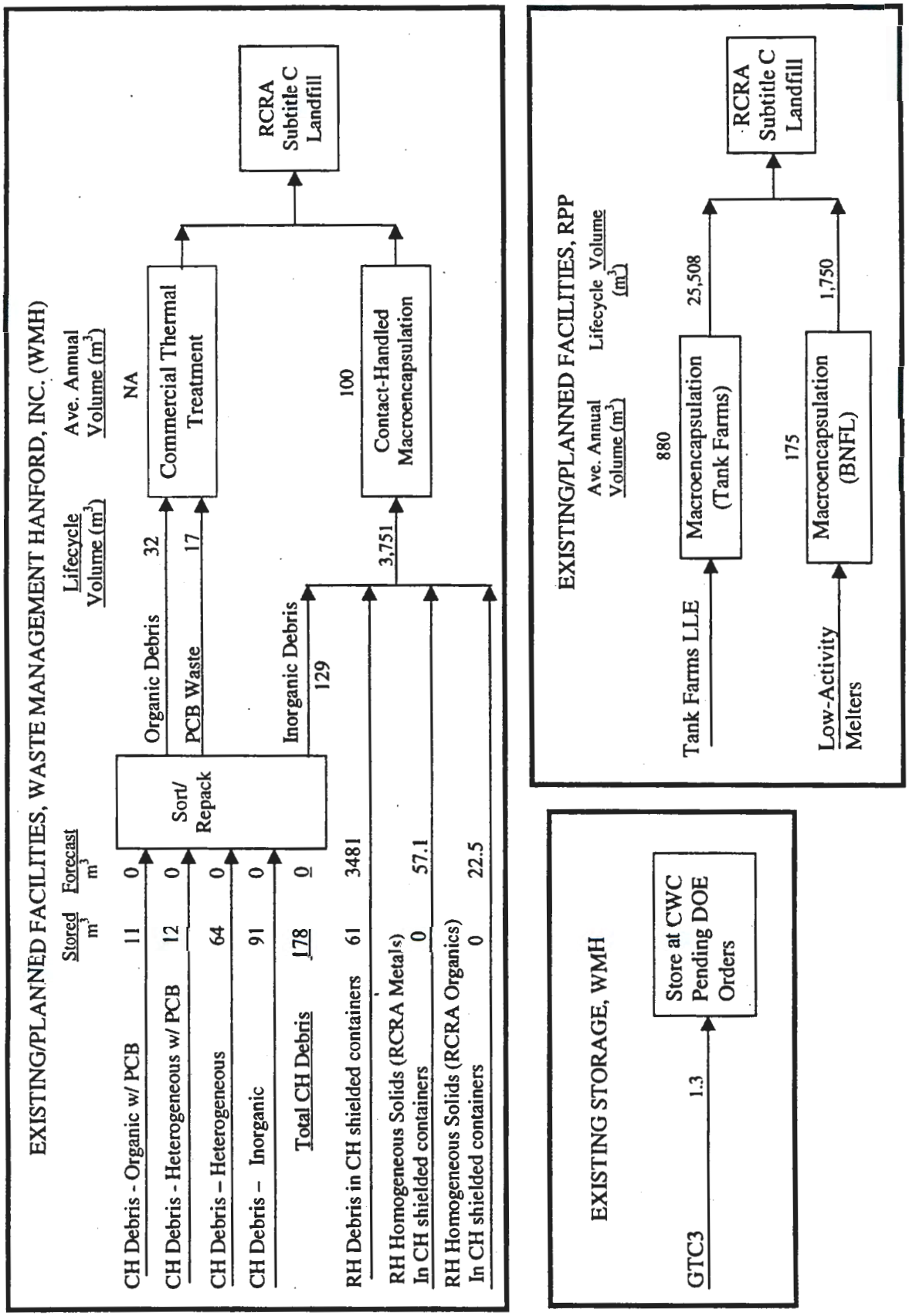

Figure 3-3. Existing/Planned Treatment and Storage Facilities for Low-Level Mixed Waste.

The life-cycle forecast volume for RH homogeneous solids and lab packs with regulated metals is 57.2 cubic meters and with regulated organics is 22.4 cubic meters. The annual forecast volumes vary from 0.3 cubic meter to 3.7 cubic meters per year for the waste with regulated metals and 0.3 cubic meter to 0.7 cubic meter per year for the waste with regulated organics. The LDR treatment standards for these waste streams are stabilization/neutralization and organic destruction, respectively. Given these relatively small waste volumes, it is not cost effective to build new facilities to achieve the LDR treatment standard. Without this capacity, this would necessitate the need for long-term storage requiring a waiver, while increasing risk and cost.

Accordingly, it is proposed that these two RH LLMW waste streams alternately be treated via macroencapsulation in CH shielded containers. Such immobilization technology does not increase the risk to the environment and compares favorably to macroencapsulation of debris contaminated with regulated organics and metals, the LDR treatment standard for these waste streams. This would minimize the EHS&Q risks, lessen cost from storage and inspection fees, and decrease overall waste inventory awaiting treatment (Figure 3-3). A waiver for treatability variance via macroencapsulation for these two RH LLMW in CH shielded container waste streams will be submitted for approval once waste is received and the treatment facility has started operating.

Several acceptable methods for performing macroencapsulation could be used. The specific method will be further defined during the conceptual design phase. The method could employ a commercial, off-the-shelf technique. Waste packages will be placed into the macroencapsulation overpack (or high-integrity container), packed with fill material to eliminate void space, and sealed. The fill material and the structural integrity of the macroencapsulation container will mitigate concerns for landfill subsidence.

The annual waste feed rate for this process is shown in Table 3-2 and reaches over 190 cubic meters per year between FY 2000 an 2002, and again between 2012 and 2015. The average annual volume to be processed through this facility is only 100 cubic meters per year or 0.4 cubic meter per day (based on 250 operating days per year).

3.5 TREATMENT, STORAGE, AND/OR DISPOSAL CAPABILITY

The TSD pathways for the applicable waste streams have been discussed in the preceding section and are illustrated in Figure 3-3. The TSD pathways include use of ATG planned CTT and Hanford Site TSD units. The Hanford Site TSD units are expected to allow storage of small volumes of waste in CWC, planned facilities by RPP, and planned facilities by WMH. The volume and type of waste, in the current inventory and the projected estimates, formed the basis for treatment processes and facility selection. The planned TSD facilities must have the capacity to treat the applicable waste stream volumes and meet the requirements set forth in WAC 173-303. All TSD activities must occur within the boundaries of a permitted TSD facility. The design parameters will be developed further during the conceptual design phases. However, enough information has been developed and presented in the previous sections to warrant setting the following general requirements for the facilities.

3.5.1 Performance Requirements and Specifications

The TSD facilities (Figure 3-3) must be designed and built to meet performance and/or permit conditions as set forth in WAC 173-303 and 40 CFR 268. Waivers to specific regulatory requirements, such as the LDR for organic/carbonaceous rule, could be granted by Ecology. Functional and regulatory requirements for the different options are discussed in the following sections.

3.5.1.1 Waste Management Federal Services of Hanford, Inc. Planned Facilities

The sort/repack facility will be designed to handle a total of 178 cubic meters of CH stored waste consisting of 12 boxes, ranging in weight from 1,091 kilograms to 5,428 kilograms, and in size from 10 cubic meters to 24.6 cubic meters. The facility will be designed to allow for manual operation and will be located inside a contamination control area to contain the potential for the spread of radioactivity. The facility will include material handling equipment to move, open, and empty boxes. Large inorganic debris material that does not fit in standard containers will be reduced mechanically in size using manually operated tools. Sorting devises will be used to segregate organic debris and PCB waste that will be treated thermally in a commercial TSCA-permitted facility. Non-mixed waste, such as uncontaminated packaging, empty containers, and personnel protective equipment, will be packaged in standard containers and staged for onsite disposal. Repackaged waste will be separated for shipment to the CTT facility or for macroencapsulation.

This sort/repack facility will process 12 individual crates of stored LLMW (another crate containing a drained and rinsed PCB transformer will go directly to a Subtitle C Landfill). The facility will be located at T Plant Complex and fall within the envelope of the existing TSD permit.

The macroencapsulation facility will be designed to treat a life-cycle waste volume of 3,751 cubic meters of containerized waste. The facility will accept the following:

- CH inorganic debris from the sorting operation
- RH debris (organic and inorganic) packaged in shielded CH containers
- RH homogeneous solids with regulated metals and organics packaged in shielded CH containers.

The macroencapsulation facility must be able to encapsulate different shape containers including boxes and drums. A viable method consists of placing the waste packages into a macroencapsulation overpack, filling the void space with grout or other fill material, and sealing. The encapsulating material and the fill material will be selected to provide structural integrity to the macroencapsulated product so as to mitigate concerns for landfill subsidence. The specific macroencapsulation method will be further defined during the technology selection phase. The facility will be located at T Plant Complex and fall within the envelope of existing TSD permit.

The facility will be designed to process approximately 100 cubic meters per year of containerized debris based on one shift per day operation and 250 operating days per year. This throughput corresponds to the approximate average annual volume generation of the applicable waste stream (Table 3-2). At this throughput, the facility could handle the peak annual volume of 219 cubic meters per year (Table 3-2) by operating multiple shifts per day.

3.5.1.2 Office of River Protection Existing and Planned Facilities

LLE Macroencapsulation. As described in Section 3.1, this facility was designed and built to meet RPP--Tank Farm operational and regulatory requirements.

Failed Low-Activity Melters Macroencapsulation. As described in Section 3.1and 3.4.2, the disposition pathway is within the purview of the RPP--Vitrification. No information currently is available on high-level melters.

3.5.2 Commercial Thermal Treatment

The CTT contract will be used to treat 49 cubic meters of organic/carbonaceous debris and PCB waste from the sorting/repackaging operation of the large container CH LLMW as shown in Figure 3-2. A contract between WMH and the ATG was negotiated for thermal-destructive treatment of CH LLMW including debris, dangerous, and TSCA waste (#MW6-SBV-357079). The CTT contract requires that ATG begin treating waste by November 2000. WMH is committed to treating 120 cubic meters per year for 5 consecutive years starting in fiscal year 2001. WMH has the option to treat 597 cubic meters of additional waste in each of the 5 base years. After the 5 base years, WMH has the option to treat up to 310 cubic meters per year for 5 additional years.

3.6 WORK BREAKDOWN STRUCTURE

The WBS defines the activities by relating elements of work to each other and the end product. Each element is a discrete portion of hardware, service, or data. Descending levels provide increasing detail and definition of the end objective. The number of levels depends on the scope and complexity of the individual element and the degree of control desired. As described in Section 3.5, the scope includes RPP--Tank Farm existing and RPP--Vitrification planned facilities, WMH planned facilities, and CTT. The need for a WBS and level of WBS for each of the facilities are addressed in the following sections.

3.6.1 River Protection Project--Tank Farm Facilities

The LLE macroencapsulation facility is constructed (Section 3.1). Therefore, no WBS is needed.

3.6.2 River Protection Project--Vitrification Facility

The generation and subsequent management of the failed low-activity melters will be addressed under RPP--Vitrification and therefore, no WBS is needed.

3.6.3 Central Waste Complex Storage

The latest phase of CWC was built and operations were initiated in June 1997 per Milestone M-91-09 (Project W-112). Waste projections (Figure 3-3) indicate that CWC should have ample storage for the duration of these activities. Because CWC already exists, no WBS needs to be developed.

3.6.4 Waste Management Federal Services of Hanford, Inc. Planned Facilities

WMH planned facilities will consist of sorting, repackaging, and size reduction being accomplished in T Plant Complex and macroencapsulation to be performed in an area in the T Plant Complex that falls within the envelope of the TSD permit. No new building will be required and all macroencapsulation handling equipment will be leased from vendors. Premixed grout and other materials will be purchased as necessary, and therefore no grout mixing or pouring equipment will be needed.

Landfill capacity will be planned as part of the overall solid waste management program. However, based on current information, disposal capacity for failed low-activity melters will be addressed separately.

The summary WBS in Figure 3-4 depicts the elements for modification of the existing T Plant Complex as described previously. The top three levels of the WBS depict the elements for standard construction projects. Because these projects relatively will be simple, the WBS level shown is sufficient to carry out all planned activities.

The WBS Dictionary (Appendix C) lists and defines the WBS elements. The Dictionary includes anticipated identification and change and reporting numbers, along with an element task description. As activities proceed, the Dictionary will be updated to reflect current information.

3.6.5 Commercial Thermal Treatment

The contract for CTT with ATG is in place (Section 3.4.5) and will initiate thermal treatment of currently stored and newly generated CH LLMW by December 2000 (per Milestone M-91-12). No WBS needs to be developed.

3.7 INTEGRATION WITH OTHER PROGRAMS

Interface among the M-91-00 LLMW activities and other onsite programs is essential for successful execution, including waste generating programs for inventory tracking, project planning, and capacity configuration purposes. The M-91-00 LLMW oversight of treatment practices also is required for waste streams that are treated. A brief description of the interface requirements follows.

Environmental Impact Statement. The Solid Waste EIS currently is being drafted and will result in the ROD that will cover the M-91-00 LLMW. The Tri-Party Agreement organization will apprise the EIS Project Team on the scope and planning for M-91-00 LLMW treatment options during the draft EIS preparation phase.

Waste Generator Programs. Interface with the generator is conducted through inquiries to the SWIFT database and direct contact with project managers and/or engineers to ensure that the waste volume forecast continues to support the design capacity of the TSD facilities. The SWIFT database, described in Section 2.0, is maintained by WMH via interface with waste generators who forecast waste stream volumes and characteristics. Reports generated by the SWIFT database form the basis for capacity planning for M-91-00 LLMW.

RPP--Vitrification. The RPP--Vitrification will generate and treat most of the waste volume of M-91-00 LLMW. WMH will treat the smaller portion of waste and manage the disposal of all waste. Integration of the two programs is essential to ensure that the TSD capacity is provided for all onsite LLMW streams.

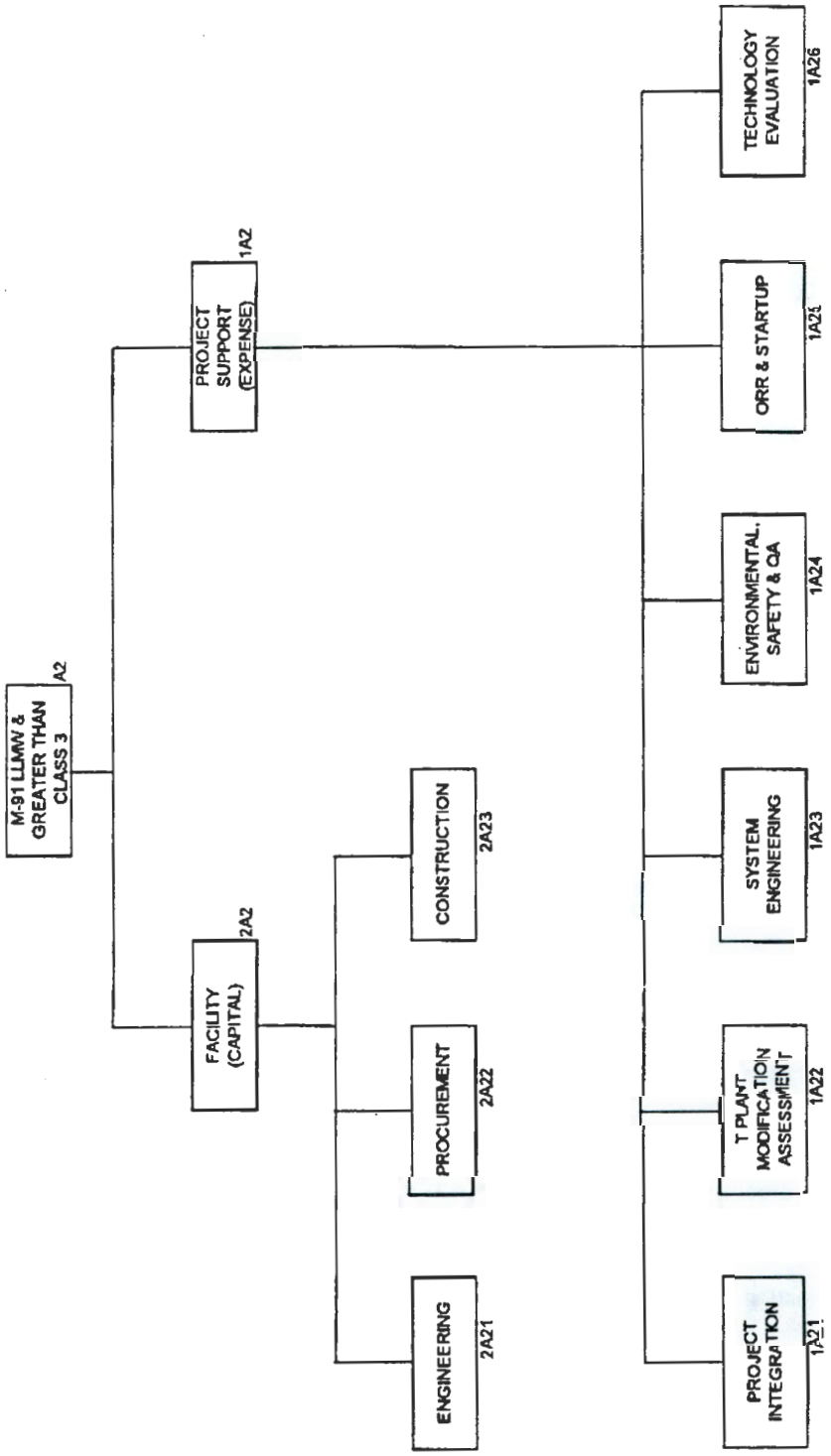

Figure 3-4. Summary Work Breakdown Structure.

Commercial Thermal Treatment Contract. The CTT contract with ATG will be used to treat repackaged CH organic/carbonaceous waste. An interface will be maintained with the CTT contract manager to ensure that these waste types are addressed.

Tri-Party Agreement M-19 Projects. Tri-Party Agreement M-19 encompasses the non-thermal treatment and disposal of small container CH LLMW. Some repackaged small containers of LLMW under M-91-00 will be handed-off for subsequent treatment, management, and disposal under M-19. This specific waste stream is anticipated to be produced from sorting and size reduction activities.

Burial Ground Operations. Treated LLMW will be disposed in a Hanford Site Subtitle C Landfill. The M-91-00 LLMW activities will provide sufficient volume forecasts to burial ground operations to allow proper planning, management, and disposal of LLMW. Present annual volume projections for M-91-10 waste streams can be accommodated by existing landfill capacity. Future landfill capacity will be addressed as part of the overall solid waste management program needs.

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4.0 M-91-00 SCHEDULE

The schedule for the different facilities within the M-91-00 LLMW activities scope is described in the following sections.

4.1 RIVER PROTECTION PROJECT--TANK FARM FACILITIES

As described in Section 3.1, the RPP--Tank Farm LLE macroencapsulation facility is constructed. Failed low-activity melters will be treated by RPP--Vitrification to meet onsite waste acceptance criteria. No schedule is needed in this document.

4.2 CENTRAL WASTE COMPLEX

The latest phase of CWC was built and operations were initiated in June 1997 per Milestone M-91-09 (Project W-112). The CWC has existing storage capacity for all waste accumulated under M-91-00 LLMW activities and a schedule therefore is not necessary.

4.3 COMMERCIAL THERMAL TREATMENT

Contract MW6-SBV-357079 for commercial treatment with ATG is in place and thermal treatment of currently stored and newly generated CH LLMW will be initiated by December 2000 (per M-91-12). Therefore , a schedule is not necessary.

4.4 WASTE MANAGEMENT FEDERAL SERVICES OF HANFORD, INC. PLANNED FACILITIES

WMH planned facilities will consist of sorting, repackaging, and size reduction to be accomplished in 2706-T of T Plant Complex (Section 3.5.1.1). Macroencapsulation will be performed on an existing concrete pad in the T Plant Complex area that is within the envelope of the existing TSD permit. The following sections discuss the schedule for this activity.

4.4.1 Logic-Tied Life-Cycle Schedule

The project summary schedule is depicted in Table 4-1 and provides major milestones and decision points for the WMH planned facilities acquisition. A more detailed schedule is shown in Figure 4-1. In 1999, the PMP and functional design will be completed. The acquisition phase has a delayed start date of FY 2003 because of funding profile constraints.

Table 4-1. M-91-00 Summary Schedule.

Project activity	Start	Finish
Project management plan	June 1998	June 1999
Functional design criteria	June 1999	September 1999
T Plant Complex		
Modification assessment	October 2002	March 2003
Technology evaluation/budget process	January 2003	December 2003
Equipment specification	January 2004	March 2004
Equipment procurement	April 2004	September 2004
Equipment installation	October 2004	March 2005
Startup	April 2005	June 2005

The T Plant Complex modification assessment consists of evaluating space, utilities, permitting requirements, and EHS&Q concerns. The technology evaluation will include the selection of macroencapsulation, sorting, size reduction, repackaging technologies, and preparation of bid specifications. The equipment selection will involve choosing the size, number, specification, and mix of equipment. The equipment procurement will involve the award of contract for the equipment. The equipment installation will include the transport to and setup of the equipment at the site. The startup will be the actual operation of the equipment to demonstrate it will perform as designed.

4.4.2 Critical Path Analysis

The critical path for the schedule, as shown in Figure 4-1, is depicted as a hatched line. The functional design criteria (FDC) for this PMP presents no problems as long as funding and approval by Tri-Party Agreement participants occur as needed. The FDC approval in a timely manner will be crucial. The T Plant Complex modification assessment will involve concurrence for proposed use from operations, EHS&Q, and other organizations as appropriate. Because the T Plant Complex mission currently is uncertain, these proposed modifications would require a change in mission. Planned outyear resources are adequate at this time to support the scope, but changes in priorities could affect funding and result in delays. Equipment selection and installation will require review and concurrence such that acquisition could proceed in a timely manner to support startup as scheduled.

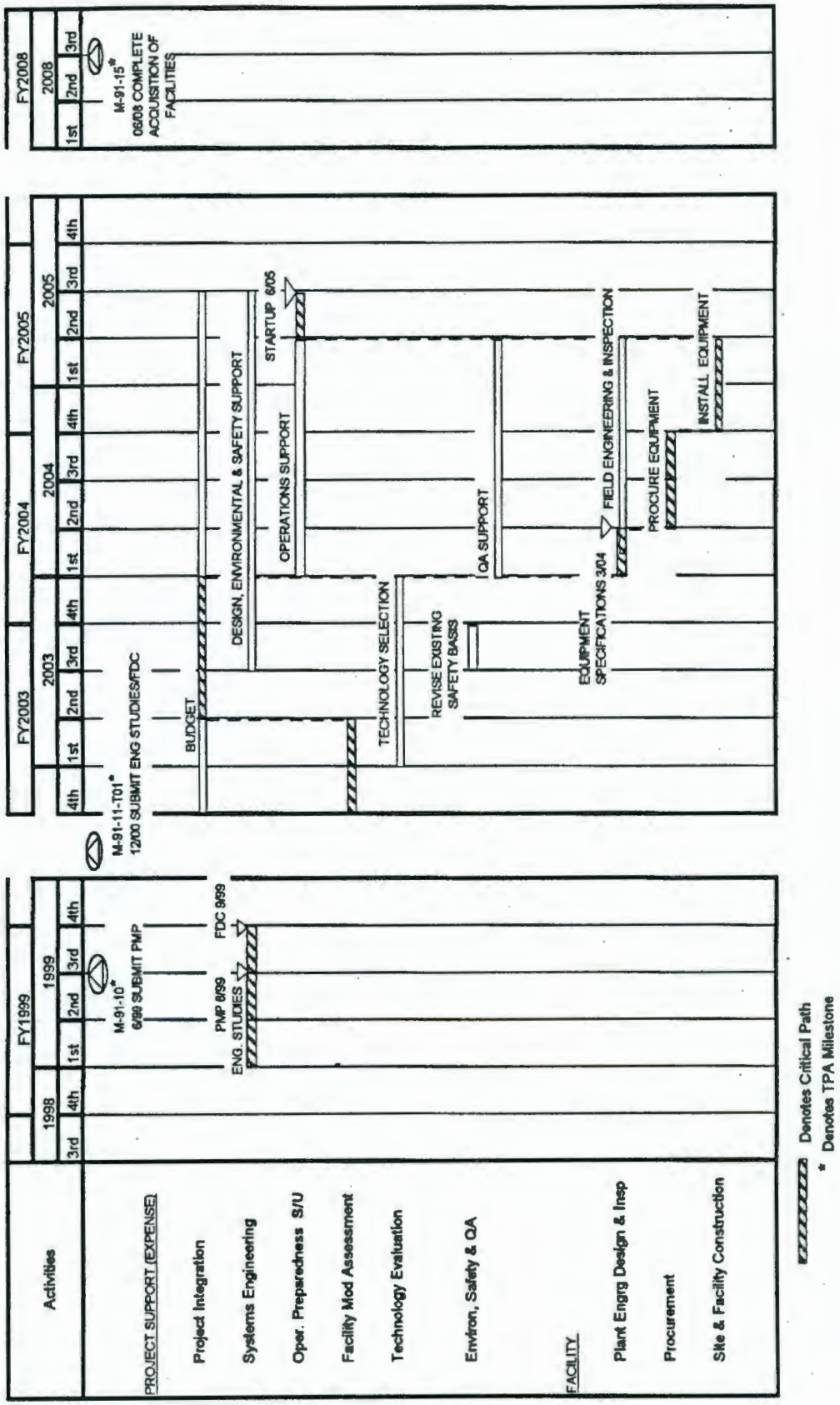

Figure 4-1. Project Summary Schedule.

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5.0 COST AND RESOURCE PLAN

Budgetary estimates have been developed for Project Capital and Expense planning. The cost details are found in Appendix D. This discussion presents a high-level summary. The funding profile estimates the life-cycle projection of annual funding required in accordance with the summary WBS and schedule. The project will consist of sorting, repackaging, and size reduction being accomplished in 2706-T/TA of T Plant Complex. Macroencapsulation will be performed on an existing concrete pad in the T Plant Complex area and will fall within the envelope of an existing TSD permit. Macroencapsulation equipment will be leased from a vendor. All consumables will be purchased as necessary (such as grout), therefore, no equipment for material preparation is included (e.g., mixers for grout) in this cost estimate.

Table 5-1 shows 1A2 project support engineering and management cost for FY 2003 through 2005. These costs include the T Plant modification assessment, technology evaluation, and EHS&Q analysis for $220K in FY 2003; the safety, QA, operational support, and budget preparation for $120K in FY 2004; and the safety, QA, and operational startup for $180K in FY 2005. Facility element 2A2 (Capital) includes the purchase and installation of equipment for size reduction, sorting, and repackaging; and the engineering, procurement, and construction costs of $580K spread from FY 2004 through 2005. Starting in FY 2005, the fixed cost of $2,800K per year for T Plant Complex operations will be added into the cost basis for this project.

Table 5-1. Total Project Cost ($K).

	FY 2003	FY 2004	FY 2005	TOTAL
Project Support	220	120	180	520
Facility (Capital)	0	480	100	580
Total T Plant Complex Modification	220	600	280	1,100
T Plant Full Operations	N/A	N/A	2,800	2,800
Total Project	**220**	**600**	**3,080**	**3,900**

The cost estimate is based on the parametric technique of using information available from other projects similar to the current project scope. As the project proceeds through each phase and more detailed information becomes available, the estimate will evolve to be detail-based. Escalation is applied to the scheduled mid-point of activities for design, inspection, and construction. Contingency guidance for an estimate at this phase ranges from 20 to 30%, and under special conditions, up to 40%. The contingency levels used for this project ranged from 20% to 30% depending on the WBS element evaluated.

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6.0 M-91-00 CONSTRAINTS

The number, description, and due dates of Tri-Party Agreement milestones associated with TSD of RH LLMW, large container CH LLMW, and storage of GTC3 waste were compared to the M-91-00 schedule. The comparison indicates that no conflicts are anticipated and all milestones will be met before the scheduled Tri-Party Agreement due date if planned funding remains available.

6.1 WASTE VOLUMES AND TREATMENT CAPACITIES

Annual and total forecast volumes and waste volumes currently in storage at the Hanford Site (Section 2.0) form the basis for the treatment alternatives and capacities described in this PMP (Section 3.0). There is inherent uncertainty associated with any given waste forecast because the assumptions, goals, and missions driving a waste generator program baseline could change, thereby changing the assumptions that drive the forecast volume estimates. Although uncertainties cannot be entirely eliminated, these are minimized to the extent practicable by validating the SWIFT data through a stringent QA process that includes conducting intensive and extensive peer reviews (Section 2.2). Additionally, the minimum and maximum volume forecasts provided by the waste generators will support facility design considerations to minimize impacts during conceptual design.

A potential impact of these uncertainties is that the planned facility capacities possibly could be over estimated. In this case, the facility might need to be maintained in a standby mode. This scenario most likely would reduce the annual operational costs for a given year, but would increase treatment cost/unit volume.

If the treatment capacity is under estimated, the planned facility would be unable to meet all of the waste processing needs based on a 40 hour per week processing schedule. In this case, the facility could be operated up to 24 hours per day to meet additional processing needs. Increasing facility operation would increase the annual cost of operation and maintenance, but could decrease the cost per unit volume. If treatment capacity is severely under estimated, additional storage space for the waste might need to be provided and/or constructed.

6.2 COMPLIANCE/PERMIT CONSTRAINTS

As discussed in Section 3.1, the Solid Waste EIS ROD will bound implementation of M-91-00 activities. Regulatory requirements for RCRA permitting and NEPA documentation will be met and are not anticipated to impede the Tri-Party Agreement schedule and fulfillment of M-91-00 LLMW milestones. The ROD could be issued early in calendar year 2000.

6.3 FUNDING CONSTRAINTS

The cost and resource plan, discussed in Section 5.0, provides the estimates to be used for budget requests for M-91-00 LLMW funding. The detailed costs are outlined in Appendix D. At this time, the planned budget is adequate to carry out all M-91-00 LLMW related activities. Because of funding constraints, the acquisition phase has been delayed until FY 2003.

However, the schedule for performance and completion of the planned activities will slip should funding not be available. Competition for funding among Tri-Party Agreement projects and the long-lead times associated with obtaining an approved budget could impact the schedule for activities. Any significant schedule delay would likely escalate the cost of performing and completing the activities. Substantial schedule delays would increase environmental risk because of the necessity to stockpile waste.

7.0 KEY DELIVERABLES

The following key deliverables identify major items that are required for acquiring TSD facilities for RH and large container CH LLMW. These onsite facilities include RPP--Tank Farms, CWC, and modification of existing T Plant Complex areas, and providing offsite CTT.

- Submit this PMP, which includes all elements as required by Agreement Action Plan, Section 11.5, by June 1999.

- CTT contract agreement #MW6-SBV-357079 demonstrates capacity for this waste stream. The contract or equivalent capability must remain current until compliance is attained.

- Document WMH planned facilities for accomplishing size reduction, sorting, and repackaging as follows.

  - FDC: will describe the technical basis for the design of the facility to accomplish size reduction, sorting, and repackaging and will address the scope and design parameters to meet applicable codes and standards.

  - Bid specifications: will be prepared for the Request for Proposal to purchase the equipment. This document will describe performance requirements and specifications for the sort/repack process.

  - Startup plan: will be written to describe planned activities and procedures required for the initial operation of the unit after installation.

  - Acceptance test plan: will describe tests/criteria the equipment must meet before the unit becomes operational.

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8.0 PERFORMANCE MEASUREMENT

Performance will be measured for PHMC team activities according to the principles of well known project management practices, e.g., cost/schedule control performance criteria, in which work accomplished, schedule, and budget are monitored and reported. Technical performance measurement will be accomplished by a comparison of actual achievement against the technical baseline. An analysis will be performed periodically of the differences between the achievement to date, the current estimate, and the technical baseline, with any new problems and risk areas identified.

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9.0 ORGANIZATION AND RESPONSIBILITIES

The organization of the agencies, programs, and projects responsible for management and performance of the work described in this PMP are depicted in Figure 9-1.

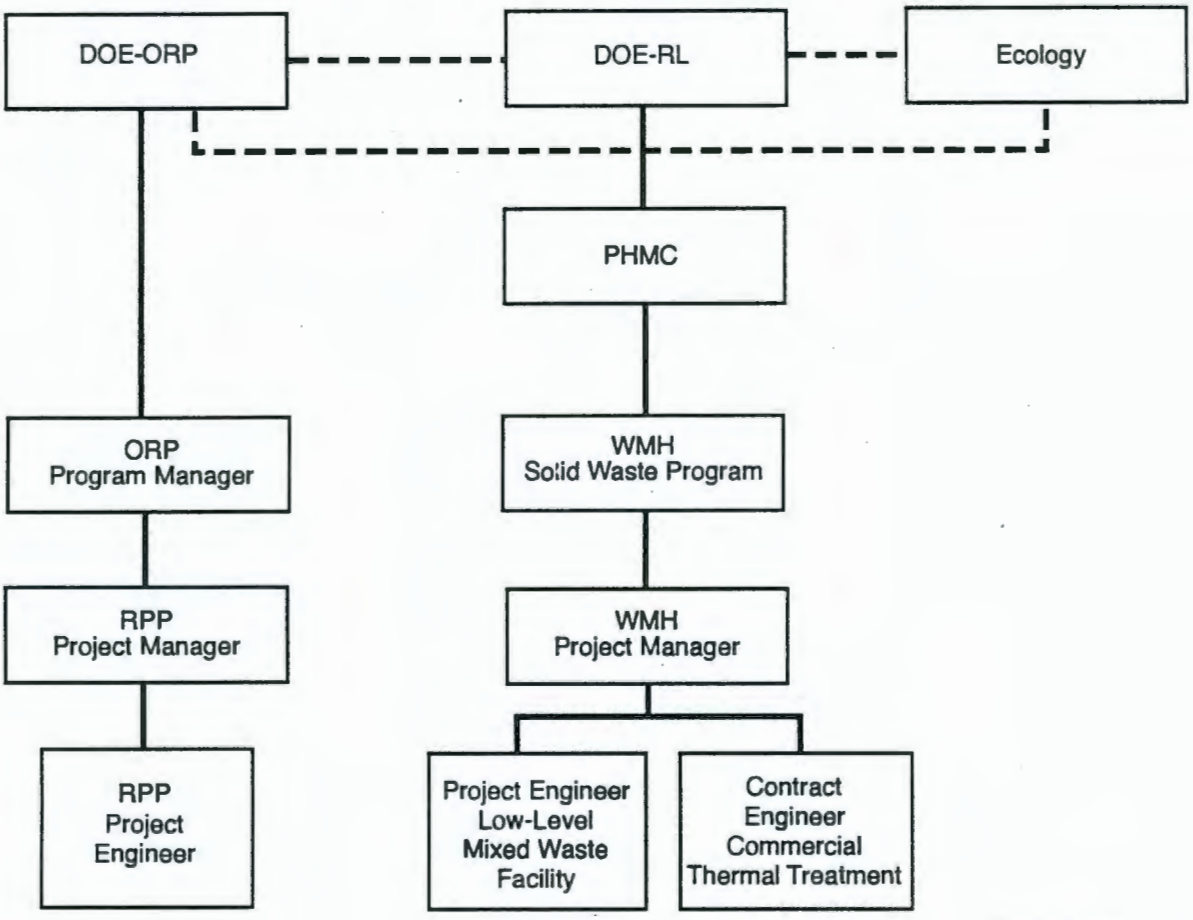

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Figure 9-1. Organizational Chart for M-91-10 Project Team.

A comprehensive discussion regarding the roles and responsibilities of the DOE-RL and Ecology project managers is delineated in Section 4.1 of the Tri-Party Agreement as revised in Change Order L-96-01. Project managers for DOE-RL and Ecology are responsible for maintaining contact with the projects and reviewing near-term plans for the projects and milestones. Additionally, DOE-RL is responsible for making funding available and preparing the PHMC Work Authorization.

Fluor Daniel Hanford (FDH) is the integrating contractor that provides oversight of WMH projects and other services among PHMC contractors. FDH also is responsible for preparing project authorization directives and for facilitating funds distribution and management.

The WMH Project Manager is responsible for identifying the scope, schedule, and required budget, and for performing and/or completing the project and tasks delineated in Figure 3-4 and the project schedule (Section 4.0). The WMH Project Manager interfaces with FDH, DOE-RL and Ecology to status progress, address issues, and review near-term plans. The WMH Project Manager also is responsible for

project-specific budget management and is accountable for the project engineers performing and supporting the scheduled activities.

DOE-ORP is responsible for RPP--Tank Farms and RPP--Vitrification specific projects.

Project engineers primarily will be responsible for the technical aspects of a given project and the activities associated with it as delineated in the project schedule.

10.0 PROJECT INTERFACE CONTROL SYSTEM

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 related project management activities.

10.1 BASELINE CONTROL

The technical baseline will form the approved and documented technical and functional requirements that must be met. These requirements will be defined further during the engineering phase and formally controlled as the technical baseline. The approved design media (e.g., drawings, specifications, work plans) become the controlling technical documents. Baseline changes are accomplished using formalized PHMC team procedures, requiring approval of change requests. Any change to the estimated cost or schedules must be approved.

10.2 INTERFACE CONTROL

The change control process requires approval of all impacted contractors. Specific criteria establishing requirements for PHMC team, DOE-RL, and regulator (if appropriate) approval will be developed during planning phases of the project.

10.3 DOCUMENTATION CONTROL

Each organization that maintains documents will be required to implement document control in accordance with their QA plan. Copies of project related documents will be sent to the responsible project organization, in accordance with PHMC team procedures.

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11.0 REPORTING AND NOTIFICATION REQUIREMENTS

A reporting system will be implemented to provide the status relative to meeting all Tri-Party Agreement milestones associated with M-91-10 LLMW and GTC3 waste. The system will maintain a standardized structure to provide adequate comparisons among all facets of the activities, the established schedule, and technical objectives.

11.1 NOTIFICATION TO DOE-RL

Parameters for required notification to DOE-RL will be developed during the planning phases. Terms to be agreed upon could include the following events:

- Advance notice of anticipated schedule slippage
- Baseline changes
- System efficiencies or technical improvements
- Organizational changes.

11.2 NOTIFICATION TO ECOLOGY

Notifications to Ecology regarding M-91 Tri-Party Agreement milestones, as described in this PMP, and associated change requests will be performed in accordance with established agreements and procedures.

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12.0 PROJECT CHANGE MANAGEMENT

Fiscal year planning under the multi-year work plan (MYWP) will provide the year-to-year control of scope and schedule as allowed by approved FY funding levels. Unless otherwise agreed to by DOE-RL, EPA, and Ecology, MYWPs and sitewide systems engineering control documents must maintain or achieve compliance with all applicable regulations and Tri-Party Agreement requirements.

Changes to procedures, facility systems, or documentation that support the TSD of M-91-10 LLMW and/or GTC3 waste will be managed in accordance with current PHMC team policies/procedures and reviewed and approved by the appropriate organizations (e.g., management, safety, and quality) before implementation. All approved change documentation will be maintained in accordance with PHMC team record management guidelines.

12.1 TECHNICAL BASELINE CHANGE CONTROL

The technical baseline will be defined during the engineering and construction planning phases. A formal change control system will be adhered to in accordance with DOE Orders and onsite procedures to maintain integrated change control.

12.2 SCHEDULE CHANGE CONTROL

Required schedule or Tri-Party Agreement milestone revisions are subject to Class 1 change control. The impact of said changes can be readily assessed when a WBS is used, as all start and completion dates for elements are integrated. This allows expedited review and approval by DOE-RL and Ecology of contractor proposed schedule changes.

12.3 DOCUMENTATION

A documentation management plan will be established to ensure that documentation is processed in accordance with activity needs and applicable federal, state, and onsite data management requirements.

Baseline Performance Analysis and Reporting provides a basis for the evaluation of execution success and measurement of progress towards the technical, schedule, and cost objectives. The DOE-RL establishes performance measures for assessing subcontractor performance using key work activities that relate to the achievement of the Hanford Site cleanup mission and its continuous improvement process. A hierarchy of control points is established and tied to performance-based contracts that stress cost efficiency and productivity. Earned value methods and best business practices are used to measure performance against the Integrated Site Baseline (ISB).

FDH and DOE-RL jointly participate in the development, execution, and reporting of performance evaluation against the ISB and performance-based subcontracts. This results in awareness, understanding, and ownership of the process by all parties. FDH provides to DOE-RL a monthly report that communicates performance data for the current and cumulative reporting period. The report compares actual performance against planned activities in the ISB. The report includes cost and schedule trends, variance analysis, identification of issues, and planned corrective actions to ensure conformance to the technical, schedule and cost baselines.

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13.0 REFERENCES

DOE Order 5700.6C, "Quality Assurance".

DOE/EA-1135, *Environmental Assessment for Offsite Thermal Treatment of Low-Level Mixed Waste*.

DOE/LLW-217, *DOE Waste Treatability Group Guidance Document*.

DOE/RL-88-21, *Hanford Facility Dangerous Waste part A Permit Application*.

DOE/RL-99-01, *1999 Report on Hanford Site Land Disposal Restrictions for Mixed Waste*.

Ecology, EPA, and DOE-RL, 1999, *Hanford Federal Facility Agreement and Consent Order*.

HNF-2063, *Trade Study for Processing, Treatment, and Storage of Hanford Site Solid Waste Streams That Have No Current Path Forward*.

HNF-EP-0918, Rev. 4, *Solid Waste Integration Forecast Technical Report*.

HNF-SD-WM-ER-730, *Long-Length Contaminated Equipment Disposal Process Path Document*.

WHC-SD-WM-ES-341, *Solid Waste and Materials System Alternatives Study*, June 1995.

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APPENDIX A

DRAFT TRI-PARTY AGREEMENT CHANGE CONTROL FORM

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DRAFT

Change Number	Federal Facility Agreement and Consent Order **Change Control Form** Do not use blue ink. Type or print using black ink.	Date
M-91-99-01		June 24, 1999

Originator Helen E. Bilson **Phone** 376-1366

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

Change Title
Revise milestones for the treatment, storage and disposal (TSD) facilities for low level mixed waste (LLMW) and greater than category 3 (GTC3) waste streams.

Description/Justification of Change
(See attached)

Impact of Change
Approval of this change request will ensure acquisition of TSD facilities for LLMW, acknowledge proposed and existing treatment capabilities, and be protective of environmental and human health. This change request provides a potential for accelerating LLMW disposal with a positive impact on M-26 Milestone Annual Report on Hanford Site Land Disposal Restrictions for Mixed Waste.

Affected Documents
Hanford Federal Facility Agreement and Consent Order, as amended, Hanford site internal planning and budget documents (e.g., Sitewide System Engineering control documents, Project Management Plans and Multi Year Work Plans).

Approvals

_____	_____	___ Approved	___ Disapproved
DOE	Date		
_____	_____	___ Approved	___ Disapproved
EPA	Date		
_____	_____	___ Approved	___ Disapproved
Ecology	Date		

This change request is based on waste data, options analysis and project schedule described in detail in document HNF-4293-1, Project Management Plan (PMP) for Low Level Mixed Waste and Greater than Category 3 Waste per Tri-Party Agreement M-91-10 (M-91-10 PMP). The type and size of TSD facilities described in this PMP were based on projected waste volumes that are subject to change. This PMP is therefore considered a living document to be evaluated every three years and revised as necessary, in order to update the basis and the need for the required TSD capacity.

This change request will also serve to clarify the role and relationship of M-26, M-91, M-19 and other milestones pertaining to the treatment of Hanford site wastes. It is understood that the purpose of milestones M-91 and M-19 is to establish waste treatment capacities by different means including commercial contracts, on-site treatment and disposal. These facilities and commercial contracts will be used to treat Hanford site LLMW following a treatment schedule to be negotiated under the M-26 Milestone.

The change requests and milestones for the creation of TSD capacity for M-91 LLMW are described in the following paragraphs and table.

This change request will establish an Interim Milestone to conduct a triennial review (to occur every three years) of the PMP scope and assess impact on the facilities. This review will result in an update of the PMP, if required, and results of the review will be submitted to Ecology. In addition, two Target Dates are proposed to deal with the PUREX Storage Tunnels LLMW, and the submittal of the equipment specification for LLMW sort/re-pack facility.

The primary justification for this change request is based on a better definition of the waste streams, volumes and treatment processes compared to the original M-91 negotiations data as described in M-91-10 PMP. This information was used to better define the scope for the required treatment facilities and select optimal waste management options with respect to cost and risk. The proposed Interim Milestones and Target Dates in this change request are tied to specific activities that may be undertaken by different projects in order to create treatment capacity for all of the LLMW generated on the Hanford Site, specifically:

- DOE-RL will provide: 1) A system for sorting and repackaging of large container contact handled (CH) LLMW debris and 2) A single CH macroencapsulation system to treat non-carbonaceous CH LLMW debris, remote handled (RH) LLMW debris and RH non-debris LLMW contaminated with dangerous waste constituents. The treatment systems and justification for their selection are described in detail in M-91-10 PMP. In summary, the RH waste will be received in shielded CH containers which will be macroencapsulated unopened. This treatment option will reduce the risk of personnel exposure, save capital and operating costs.

  Although the LDR treatment standards for the non-debris RH LLMW waste streams are stabilization/neutralization and organic destruction respectively, the small waste stream volumes do not justify the cost of building new RH facilities to achieve the LDR treatment standard. Accordingly, it is proposed that these RH non-debris LLMW waste streams be alternately treated by macroencapsulation in CH shielded containers. Macroencapsulation is an LDR treatment standard for debris contaminated with Resource Conservation and Recovery Act (RCRA) organics and RCRA metals and such an immobilization technology is expected to provide the same degree of environmental protection when used to treat and dispose of small volumes of non- debris RH LLMW. This treatment will also reduce personnel exposure risk. A treatability variance to allow alternative treatment by macroencapsulation of the non-debris RH LLMW waste streams will be submitted once waste is received and the treatment facility has started up.

- ATG will provide commercial thermal treatment for a portion of the repackaged CH LLMW organic/carbonaceous and polychlorinated biphenyl (PCB) waste streams. Waste Management Federal Services of Hanford, Inc. (WMH) has a contract with Allied Technology Group, Inc. (ATG) to treat LLMW.
- The M-91-10 PMP does not currently identify specific facilities that will accommodate the removal and treatment of large size LLMW from the PUREX Tunnels. Any waste retrieval and treatment operations of the PUREX Tunnels waste will require major decisions by the regulators, DOE, and stakeholders. The disposition path for the PUREX LLMW must be negotiated before a project can be formulated and a schedule with milestones developed. The PUREX Storage Tunnels will continue to be managed as a RCRA storage unit until closure can be coordinated with the final plan for the PUREX Plant.
- River Protection Project (RPP)--Tank Farms will macroencapsulate the long length equipment (LLE) in long equipment containers (LECs) at the Tank Farm and will deliver the LECs to WMH for disposal in a Hanford Site RCRA Subtitle C Landfill. This LLE planned disposition pathway is described in Document #HNF-SD-WM-ER-730, Rev. 0, *Long Length Contaminated Equipment Disposal Process Path Document.* This document describes the process and operations to be utilized to retrieve, macroencapsulate and transport the LLE to a RCRA Subtitle C Landfill for disposal using a system built on two mobile trailers. It also confirms that the treatment and transportation trailers are built (Receiver Trailer HO-64-4283 and Transport Trailer HO-64-4280). Therefore the completed acquisition of the LLE treatment and transportation trailers should be considered a partial fulfillment of milestone M-91-15.

The Interim Milestone, and associated Target Dates established by approval of this change request are as follows:

Milestone	Description	Date
M-91-10A	Conduct a triennial review (every three years), of the PMP scope and assess impact on the facilities. Update the PMP, if required, and submit results of the review to Ecology.	6/30/2002 and triennially thereafter.
M-91-10A-T01	On every triennial review (every three years), address the current operating status of facilities, such as the PUREX Storage Tunnels, the T-Plant Complex and other waste streams when identified. Determine the disposal path for the LLMW and incorporate into the M-91-10 PMP as appropriate, and submit to Ecology.	6/30/2002 and triennially thereafter.
M-91-11-TO2	Submit to Ecology the Equipment Specification for LLMW sort/re-pack facility.	3/31/2004

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APPENDIX B

LOW-LEVEL MIXED WASTE DATA

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STORED

Large Containers CH LLMW

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Stored Large Container CH-LLMW

CH-MLLW stored large containers

PIN	CON VOL	LOC	CON SIZE	TSD ACCEPT	WASTE WGT	WSRd	PWTYP	PHYS STATE	GROSS WGT	CON TYP	SWTYP	DOSE RATE	RH/CH
9519114	66	CWC	17.7*9.7*13.6	9/29/95 0:00	3,575.00	601	M	S	6,895.00	CM	LLW	11	C
105N-89-001120	10.899	CWC	8*8*6	1/3/90 0:00	4,545.00	TSC	RP	S	5,520.19	CM	LLW	0.1	C
221T-92-000093	24.64	CWC	10*8.4*10	9/28/92 0:00	4,272.70		R	S	6,090.90	CM	LLW	0.5	C
221T-92-000094	24.64	CWC	10*8.4*10	9/28/92 0:00	4,681.88		R	S	6,500.08	CM	LLW	0.5	C
C5027F	17.925	CWC	10.5*7.9*7.6	8/24/89 0:00	4,938.75	SOW	RP	S	6,272.75	CM	LLW	0.5	C
EFSG-95-1666	12.1	CWC	12*6*6	12/15/95 0:00	1,153.01	315	MP	S	2,551.00	CM	LLW	0.5	C
ETFF-92-356-02	10.03	CWC	9.4*5.8*6.5	8/10/94 0:00	2,450.00	BLD	M	S	3,675.00	CM	LLW	10	C
ETFF-93-055-05	14.27	CWC	12*7*6	8/10/94 0:00	1,593.00	BLD	M	S	3,266.00	CM	LLW	0.5	C
HEXO-93-000300	15	CWC	9.7*8.6*6.2	9/28/93 0:00	5,373.00	DBL	M	S	7,948.00	CM	LLW	1	C
	195.504				32,582.34								

Stored Large Container CH-LLMW

Waste description	Hazard	Waste Form	Treatment 1	Treatment
SS, asbestos, filters, plastic	Organics, metals	Debris-Inorganic	Repack/ATG contract	Macroencapsultation
Transite & soil	PCB	Debris-Organic w/ PCB	Repack/ATG contract	Thermal Treatment
HEPA filters, scrap metal, foam	None	Debris-Heterogeneous	Repack/ATG contract	Sort/Macro/Thermal
HEPA filters, scrap metal, foam	None	Debris-Heterogeneous	Repack/ATG contract	Sort/Macro/Thermal
Transformer	PCB	PCB transformer	ATG contract	Drain/Rinse
Metal debris, absorbed PCB	PCB, metal,	Debris-Heterogeneous w/ PCB	Repack/ATG contract	Sort/Macro/Thermal
Metal debris	Organic, metal, WP	Debris-Inorganic	Repack/ATG contract	Macroencapsultation
Metal debris, wood	Organic, WA	Debris-Heterogeneous	Repack/ATG contract	Sort/Macro/Thermal
Metal debris, fiberglass	Organic, WA	Debris-Inorganic	Repack/ATG contract	Macroencapsultation

STORED RH LLMW

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RH-MLLW Stored Containers

PIN	CON VOL	LOC	Container Type	CON SIZE	TSD ACCEPT	WASTE WGT	WSRD	PWTYP	PHYS STATE	GROSS WGT	CON TYP	SWTYP	DOSE RATE
9400001	0.2082	CWC	Drum	55 GALLON	1/26/95 0:00	155.30	HRW	M	S	186.10	DM	LLW	100
9503194	11.62	CWC	Box	9*8*5.7	4/20/95 0:00	4030.00	DBL	M	S	5990.00	CM	LLW	70
9503206	11.62	CWC	Box	9.2*8.2*5.7	1/31/95 0:00	5428.00	HRW	M	S	7385.00	CM	LLW	150
9514459	8.3	CWC	Box	9.7*5.7*5.6	6/15/95 0:00	1601.00	601	M	S	2395.00	CM	LLW	140
9519229	0.6796	CWC	Box	6*2*2	3/22/96 0:00	150.00	601	M	S	417.00	CM	LLW	220
9521102	0.3218	CWC	Drum	322 LITER	10/11/96 0:00	415.53	801	M	S	454.00	DM	LLW	200
9607991	0.208	CWC	Drum	208 LITER	11/12/97 0:00	83.00	601	M	S	107.00	DM	LLW	120
9701825	0.208	CWC	Drum	208 LITER	12/16/97 0:00	78.30	601	M	S	102.30	DM	LLW	100
222S-92-000304	0.2	CWC	Drum	55 GALLON	6/30/92 0:00	85.80	DBR	M	S	115.80	DM	LLW	99.9
ETF-241-900444	0.21	CWC	Drum	55 GALLON	6/20/90 0:00	67.20	HRW	M	S	90.22	DM	LLW	160
ETFF-92-281-01	13.3	CWC	Box	8*7.8*7.5	6/22/93 0:00	1780.00	HRW	M	S	3007.00	CM	LLW	100
WTFF-91-148-02	0.3218	CWC	Drum	85 GALLON	6/6/94 0:00	103.00	HRW	M	S	138.00	DM	LLW	100
WTFF-96-261-04	13.59	CWC	Box	8*8*7.5	12/3/96 0:00	1091.00	601	M	S	1951.00	CM	LLW	105
	60.79					15068.13				22338.42			

Stored RH-LLMW containers

CON RH/CH	Waste RH/CH	Waste Form	Hazard	Treatment
C	RH	Lab Packs	Corrosive, metals	Stabilization/Neutralization
C	RH	Debris-Inorganic	Organics/Metals	Macroencapsulation
C	RH	Debris-Inorganic	Organics/Metals	Macroencapsulation
C	RH	Debris-Inorganic	Organics/Metals	Macroencapsulation
R	RH	Debris-Inorganic	Organics/Metals	Macroencapsulation
C	RH	Debris-Inorganic	Metals	Macroencapsulation
C	RH	Lab Packs	Organics	Organic destruction
C	RH	Debris-Heterogeneous	Orgnics/Metals	Macroencapsulation
C	RH	Debris-Heterogeneous	Organics/Metals	Macroencapsulation
C	RH	Debris-Organic	Organics/Metals	Macroencapsulation
C	RH	Debris-Heterogeneous	Orgnics/Metals	Macroencapsulation
C	RH	Debris-Inorganic	Organics/Metals	Macroencapsulation
C	RH	Debris-Inorganic	Orgnics/Metals	Macroencapsulation

FORECAST RH LLMW

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Waste Class	Waste Form	Container	Hazardous Characteristic	Volume	Primary Treatment	Secondary Treatment
RH_MLLW	Debris - Inorganic	Boxes		2,292	Macroencapsulation	
RH_MLLW	Debris - Inorganic	Drums	Reactive	0.03	Macroencapsulation	
RH_MLLW	Debris - Inorganic	Drums		613	Macroencapsulation	
RH_MLLW	Long Equipment	LEC		25,508	Direct Disposal	
RH_MLLW	Debris - Organic	Boxes		412	Macroencapsulation	
RH_MLLW	Debris - Organic	Drums	Reactive	0.02	Macroencapsulation	
RH_MLLW	Debris - Organic	Drums		165	Macroencapsulation	
RH_MLLW	Inorganic H. Solids	Boxes	Metals w/o Hg	0.1	Stabilization/Neutralization	
RH_MLLW	Inorganic H. Solids	Boxes	Organic	11	Organic destruction	
RH_MLLW	Inorganic H. Solids	Drums	Corr+Met w/o Hg+WA State	20	Stabilization/Neutralization	
RH_MLLW	Inorganic H. Solids	Drums	Corrosive	0.004	Stabilization/Neutralization	
RH_MLLW	Inorganic H. Solids	Drums	Ignitable	0.008	Organic destruction	
RH_MLLW	Inorganic H. Solids	Drums	Metals w/o Hg	0.02	Stabilization/Neutralization	
RH_MLLW	Inorganic H. Solids	Drums	Organic	0.03	Organic destruction	
RH_MLLW	Inorganic H. Solids	Drums	WT-WP-WSC2	0.005	Direct Disposal	
RH_MLLW	Lab Packs	Drums	Corr+Met w/o Hg	0.02	Stabilization/Neutralization	
RH_MLLW	Lab Packs	Drums	Corrosive	0.02	Stabilization/Neutralization	
RH_MLLW	Lab Packs	Drums	Ignitable	0.004	Organic destruction	
RH_MLLW	Lab Packs	Drums	Metals w/o Hg	0.06	Stabilization/Neutralization	
RH_MLLW	Lab Packs	Drums	Organic	0.05	Organic destruction	
RH_MLLW	Lab Packs	Drums	Reactive	0.004	Stabilization/Neutralization	
RH_MLLW	Lab Packs	Drums	WT-WP-WSC2	0.05	Direct Disposal	
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	0.1	Stabilization/Neutralization	
RH_MLLW	Organic H. Solids	Boxes	Organic	11	Organic destruction	
RH_MLLW	Organic H. Solids	Drums	Corr+Met w/o Hg+Org+WA State	20	Stabilization/Neutralizat	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	8	Stabilization/Neutralization	
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	8	Stabilization/Neutralizat	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Organic	0.03	Organic destruction	
RH_MLLW	Organic H. Solids	Drums	WT-WP-WSC2	0.003	Direct Disposal	
RH_MLLW	Soil/Gravel	Drums	Corrosive	0.02	Stabilization/Neutralization	
RH_MLLW	Soil/Gravel	Drums	Metals w/o Hg	0.8	Stabilization/Neutralization	
RH_MLLW	Soil/Gravel	Drums	Organic	79	Direct Disposal	
RH_MLLW	Soil/Gravel	Drums	WT-WP-WSC2	0.008	Direct Disposal	
RH_MLLW	Special Wastes	Drums	Corr+Met w/o Hg	0.01	Stabilization/Neutralization	
RH_MLLW	Special Wastes	Drums	Corrosive	0.02	Stabilization/Neutralization	
RH_MLLW	Special Wastes	Drums	Metals w/ Hg	0.02	Stabilization/Neutralization	
RH_MLLW	Special Wastes	Drums	Metals w/o Hg	0.06	Stabilization/Neutralization	
RH_MLLW	Special Wastes	Drums	WT-WP-WSC2	0.03	Direct Disposal	

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Waste Class	Waste Form	Container	Hazardous Characteristic	YEAR	Volume	Treatment
_I_MLLW	Debris - Inorganic	Boxes		1998	21	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		1999	80	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2000	119	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2001	139	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2002	139	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2003	100	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2004	80	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2005	80	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2006	21	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2007	21	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2008	21	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2009	80	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2010	80	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2011	80	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2012	139	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2013	139	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2014	141	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2015	145	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2016	145	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2017	145	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2018	145	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2019	21	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2020	20	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2021	20	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2022	16	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2023	16	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2024	16	Macroencapsulation
H_MLLW	Debris - Inorganic	Boxes		2025	16	Macroencapsulation
H_MLLW	Debris - Inorganic	Boxes		2026	16	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2027	16	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2028	16	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2029	16	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2030	16	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2031	16	Macroencapsulation
RH_MLLW	Debris - Inorganic	Boxes		2032	8	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	Reactive	1998	0.009	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	Reactive	1999	0.009	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	Reactive	2000	0.009	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		1998	3	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		1999	13	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		2000	44	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		2001	34	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		2002	28	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		2003	31	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		2004	41	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		2005	23	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		2006	6	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		2007	11	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		2008	24	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		2009	21	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		2010	27	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		2011	31	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		2012	41	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		2013	40	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		2014	59	Macroencapsulation
H_MLLW	Debris - Inorganic	Drums		2015	28	Macroencapsulation
H_MLLW	Debris - Inorganic	Drums		2016	56	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums		2017	43	Macroencapsulation

RH_MLLW	Debris - Inorganic	Drums	2018	0.7	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2019	0.7	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2020	0.7	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2021	0.7	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2022	0.7	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2023	0.7	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2024	0.7	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2025	1	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2026	1	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2027	1	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2028	1	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2029	0.5	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2030	0.5	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2031	0.5	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2032	0.5	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2033	0.5	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2034	0.5	Macroencapsulation
RH_MLLW	Debris - Inorganic	Drums	2035	0.5	Macroencapsulation
RH_MLLW	Long Equipment	LEC	1999	81	Direct Disposal
RH_MLLW	Long Equipment	LEC	2000	52	Direct Disposal
RH_MLLW	Long Equipment	LEC	2001	694	Direct Disposal
RH_MLLW	Long Equipment	LEC	2002	691	Direct Disposal
RH_MLLW	Long Equipment	LEC	2003	114	Direct Disposal
RH_MLLW	Long Equipment	LEC	2004	659	Direct Disposal
RH_MLLW	Long Equipment	LEC	2005	1,153	Direct Disposal
RH_MLLW	Long Equipment	LEC	2006	783	Direct Disposal
RH_MLLW	Long Equipment	LEC	2007	1,083	Direct Disposal
RH_MLLW	Long Equipment	LEC	2008	1,584	Direct Disposal
RH_MLLW	Long Equipment	LEC	2009	2,135	Direct Disposal
RH_MLLW	Long Equipment	LEC	2010	2,107	Direct Disposal
RH_MLLW	Long Equipment	LEC	2011	2,587	Direct Disposal
RH_MLLW	Long Equipment	LEC	2012	2,002	Direct Disposal
RH_MLLW	Long Equipment	LEC	2013	2,668	Direct Disposal
RH_MLLW	Long Equipment	LEC	2014	2,895	Direct Disposal
RH_MLLW	Long Equipment	LEC	2015	683	Direct Disposal
RH_MLLW	Long Equipment	LEC	2016	1,222	Direct Disposal
RH_MLLW	Long Equipment	LEC	2017	791	Direct Disposal
RH_MLLW	Long Equipment	LEC	2018	145	Direct Disposal
RH_MLLW	Long Equipment	LEC	2019	186	Direct Disposal
RH_MLLW	Long Equipment	LEC	2020	186	Direct Disposal
RH_MLLW	Long Equipment	LEC	2021	203	Direct Disposal
RH_MLLW	Long Equipment	LEC	2022	93	Direct Disposal
RH_MLLW	Long Equipment	LEC	2023	93	Direct Disposal
RH_MLLW	Long Equipment	LEC	2024	93	Direct Disposal
RH_MLLW	Long Equipment	LEC	2025	93	Direct Disposal
RH_MLLW	Long Equipment	LEC	2026	93	Direct Disposal
RH_MLLW	Long Equipment	LEC	2027	93	Direct Disposal
RH_MLLW	Long Equipment	LEC	2028	93	Direct Disposal
RH_MLLW	Debris - Organic	Boxes	1998	13	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes	1999	12	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes	2000	12	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes	2001	12	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes	2002	12	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes	2003	12	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes	2004	12	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes	2005	12	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes	2006	12	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes	2007	12	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes	2008	12	Macroencapsulation

_MLLW	Debris - Organic	Boxes		2009	12	Macroencapsulation
_MLLW	Debris - Organic	Boxes		2010	12	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2011	12	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2012	12	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2013	12	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2014	14	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2015	16	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2016	16	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2017	16	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2018	16	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2019	12	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2020	12	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2021	12	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2022	10	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2023	10	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2024	10	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2025	10	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2026	10	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2027	10	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2028	10	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2029	10	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2030	10	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2031	10	Macroencapsulation
RH_MLLW	Debris - Organic	Boxes		2032	5	Macroencapsulation
RH_MLLW	Debris - Organic	Drums	Reactive	1998	0.005	Macroencapsulation
RH_MLLW	Debris - Organic	Drums	Reactive	1999	0.005	Macroencapsulation
RH_MLLW	Debris - Organic	Drums	Reactive	2000	0.005	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		1998	1	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		1999	8	Macroencapsulation
_MLLW	Debris - Organic	Drums		2000	32	Macroencapsulation
_MLLW	Debris - Organic	Drums		2001	25	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2002	20	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2003	22	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2004	22	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2005	7	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2006	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2007	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2008	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2009	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2010	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2011	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2012	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2013	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2014	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2015	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2016	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2017	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2018	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2019	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2020	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2021	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2022	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2023	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2024	0.9	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2025	1	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2026	1	Macroencapsulation
RH_MLLW	Debris - Organic	Drums		2027	1	Macroencapsulation
H_MLLW	Debris - Organic	Drums		2028	1	Macroencapsulation
H_MLLW	Debris - Organic	Drums		2029	0.7	Macroencapsulation

RH_MLLW	Lab Packs	Drums	Organic	2000	0.02	Organic destruction
RH_MLLW	Lab Packs	Drums	Reactive	1998	0.001	Stabilization/Neutralization
RH_MLLW	Lab Packs	Drums	Reactive	1999	0.001	Stabilization/Neutralization
RH_MLLW	Lab Packs	Drums	Reactive	2000	0.001	Stabilization/Neutralization
RH_MLLW	Lab Packs	Drums	WT-WP-WSC2	1998	0.003	Direct Disposal
RH_MLLW	Lab Packs	Drums	WT-WP-WSC2	1999	0.003	Direct Disposal
RH_MLLW	Lab Packs	Drums	WT-WP-WSC2	2000	0.003	Direct Disposal
RH_MLLW	Lab Packs	Drums	WT-WP-WSC2	2004	0.04	Direct Disposal
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	1998	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	1999	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2000	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2001	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2002	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2003	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2004	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2005	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2006	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2007	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2008	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2009	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2010	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2011	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2012	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2013	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2014	0.004	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2015	0.004	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2016	0.004	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2017	0.004	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2018	0.004	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2019	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2020	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2021	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2022	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2023	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2024	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2025	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2026	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2027	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2028	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2029	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2030	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2031	0.003	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Metals w/o Hg	2032	0.001	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Boxes	Organic	1998	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	1999	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2000	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2001	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2002	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2003	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2004	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2005	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2006	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2007	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2008	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2009	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2010	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2011	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2012	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2013	0.3	Organic destruction

_MLLW	Organic H. Solids	Boxes	Organic	2014	0.4	Organic destruction
_MLLW	Organic H. Solids	Boxes	Organic	2015	0.4	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2016	0.4	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2017	0.4	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2018	0.4	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2019	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2020	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2021	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2022	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2023	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2024	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2025	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2026	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2027	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2028	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2029	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2030	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2031	0.3	Organic destruction
RH_MLLW	Organic H. Solids	Boxes	Organic	2032	0.1	Organic destruction
RH_MLLW	Organic H. Solids	Drums	Corr+Met w/o Hg+Org+WA State	1998	2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corr+Met w/o Hg+Org+WA State	1999	2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corr+Met w/o Hg+Org+WA State	2000	2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corr+Met w/o Hg+Org+WA State	2001	2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corr+Met w/o Hg+Org+WA State	2002	2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corr+Met w/o Hg+Org+WA State	2003	2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corr+Met w/o Hg+Org+WA State	2004	2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corr+Met w/o Hg+Org+WA State	2005	2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corr+Met w/o Hg+Org+WA State	2006	2	Stabilization/Neutralization
_MLLW	Organic H. Solids	Drums	Corr+Met w/o Hg+Org+WA State	2007	2	Stabilization/Neutralization
_MLLW	Organic H. Solids	Drums	Corr+Met w/o Hg+Org+WA State	2008	2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corr+Met w/o Hg+Org+WA State	2009	2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corr+Met w/o Hg+Org+WA State	2010	2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	1998	0.3	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	1999	0.3	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2000	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2001	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2002	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2003	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2004	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2005	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2006	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2007	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2008	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2009	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2010	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2011	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2012	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2013	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2014	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2015	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2016	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2017	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2018	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2019	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2020	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2021	0.2	Stabilization/Neutralization
_MLLW	Organic H. Solids	Drums	Corrosive	2022	0.2	Stabilization/Neutralization
_MLLW	Organic H. Solids	Drums	Corrosive	2023	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2024	0.2	Stabilization/Neutralization

RH_MLLW	Organic H. Solids	Drums	Corrosive	2025	0.3	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2026	0.3	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2027	0.3	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2028	0.3	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2029	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2030	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2031	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2032	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2033	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2034	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Corrosive	2035	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	1998	0.3	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	1999	0.3	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2000	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2001	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2002	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2003	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2004	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2005	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2006	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2007	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2008	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2009	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2010	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2011	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2012	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2013	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2014	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2015	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2016	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2017	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2018	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2019	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2020	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2021	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2022	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2023	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2024	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2025	0.3	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2026	0.3	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2027	0.3	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2028	0.3	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2029	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2030	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2031	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2032	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2033	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2034	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Met w/o Hg+Org+WA State	2035	0.2	Stabilization/Neutralization
RH_MLLW	Organic H. Solids	Drums	Organic	1998	0.009	Organic destruction
RH_MLLW	Organic H. Solids	Drums	Organic	1999	0.009	Organic destruction
RH_MLLW	Organic H. Solids	Drums	Organic	2000	0.009	Organic destruction
RH_MLLW	Organic H. Solids	Drums	WT-WP-WSC2	1998	0.001	Direct Disposal
RH_MLLW	Organic H. Solids	Drums	WT-WP-WSC2	1999	0.001	Direct Disposal
RH_MLLW	Organic H. Solids	Drums	WT-WP-WSC2	2000	0.001	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	1999	0.4	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2000	0.3	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2001	0.6	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2002	0.2	Direct Disposal

_MLLW	Long Equipment	LEC	Metals w/o Hg	2003	0.1	Direct Disposal
_MLLW	Long Equipment	LEC	Metals w/o Hg	2004	0.5	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2005	0.1	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2009	0.1	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2010	0.1	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2011	0.7	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2012	0.8	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2013	0.8	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2014	0.8	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2015	0.8	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2016	0.8	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2017	0.8	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2018	0.8	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2019	1.0	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2020	1.0	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2021	1	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2022	0.5	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2023	0.5	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2024	0.5	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2025	0.5	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2026	0.5	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2027	0.5	Direct Disposal
RH_MLLW	Long Equipment	LEC	Metals w/o Hg	2028	0.5	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	1999	4	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2000	2	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2001	5	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2002	2	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2003	1	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2004	4	Direct Disposal
_MLLW	Long Equipment	LEC	Organic	2005	1	Direct Disposal
_MLLW	Long Equipment	LEC	Organic	2009	1	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2010	1	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2011	6	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2012	7	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2013	7	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2014	7	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2015	7	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2016	7	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2017	7	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2018	7	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2019	9	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2020	9	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2021	10	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2022	4	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2023	4	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2024	4	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2025	4	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2026	4	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2027	4	Direct Disposal
RH_MLLW	Long Equipment	LEC	Organic	2028	4	Direct Disposal
RH_MLLW	Soil/Gravel	Drums	Corrosive	1998	0.005	Stabilization/Neutralization
RH_MLLW	Soil/Gravel	Drums	Corrosive	1999	0.005	Stabilization/Neutralization
RH_MLLW	Soil/Gravel	Drums	Corrosive	2000	0.005	Stabilization/Neutralization
RH_MLLW	Soil/Gravel	Drums	Metals w/o Hg	1998	0.02	Stabilization/Neutralization
RH_MLLW	Soil/Gravel	Drums	Metals w/o Hg	1999	0.06	Stabilization/Neutralization
RH_MLLW	Soil/Gravel	Drums	Metals w/o Hg	2000	0.2	Stabilization/Neutralization
RH_MLLW	Soil/Gravel	Drums	Metals w/o Hg	2001	0.1	Stabilization/Neutralization
RH_MLLW	Soil/Gravel	Drums	Metals w/o Hg	2002	0.1	Stabilization/Neutralization
RH_MLLW	Soil/Gravel	Drums	Metals w/o Hg	2003	0.1	Stabilization/Neutralization

RH_MLLW	Soil/Gravel	Drums	Metals w/o Hg	2004	0.1	Stabilization/Neutralization
RH_MLLW	Soil/Gravel	Drums	Metals w/o Hg	2005	0.04	Stabilization/Neutralization
RH_MLLW	Soil/Gravel	Drums	Organic	1998	0.003	Direct Disposal
RH_MLLW	Soil/Gravel	Drums	Organic	1999	4	Direct Disposal
RH_MLLW	Soil/Gravel	Drums	Organic	2000	19	Direct Disposal
RH_MLLW	Soil/Gravel	Drums	Organic	2001	15	Direct Disposal
RH_MLLW	Soil/Gravel	Drums	Organic	2002	12	Direct Disposal
RH_MLLW	Soil/Gravel	Drums	Organic	2003	13	Direct Disposal
RH_MLLW	Soil/Gravel	Drums	Organic	2004	13	Direct Disposal
RH_MLLW	Soil/Gravel	Drums	Organic	2005	4	Direct Disposal
RH_MLLW	Soil/Gravel	Drums	WT-WP-WSC2	1998	0.003	Direct Disposal
RH_MLLW	Soil/Gravel	Drums	WT-WP-WSC2	1999	0.003	Direct Disposal
RH_MLLW	Soil/Gravel	Drums	WT-WP-WSC2	2000	0.003	Direct Disposal
RH_MLLW	Special Wastes	Drums	Corr+Met w/o Hg	2004	0.01	Stabilization/Neutralization
RH_MLLW	Special Wastes	Drums	Corrosive	1998	0.003	Stabilization/Neutralization
RH_MLLW	Special Wastes	Drums	Corrosive	1999	0.003	Stabilization/Neutralization
RH_MLLW	Special Wastes	Drums	Corrosive	2000	0.003	Stabilization/Neutralization
RH_MLLW	Special Wastes	Drums	Corrosive	2004	0.01	Stabilization/Neutralization
RH_MLLW	Special Wastes	Drums	Metals w/ Hg	1998	0.005	Stabilization/Neutralization
RH_MLLW	Special Wastes	Drums	Metals w/ Hg	1999	0.005	Stabilization/Neutralization
RH_MLLW	Special Wastes	Drums	Metals w/ Hg	2000	0.005	Stabilization/Neutralization
RH_MLLW	Special Wastes	Drums	Metals w/o Hg	1998	0.008	Stabilization/Neutralization
RH_MLLW	Special Wastes	Drums	Metals w/o Hg	1999	0.008	Stabilization/Neutralization
RH_MLLW	Special Wastes	Drums	Metals w/o Hg	2000	0.008	Stabilization/Neutralization
RH_MLLW	Special Wastes	Drums	Metals w/o Hg	2004	0.04	Stabilization/Neutralization
RH_MLLW	Special Wastes	Drums	WT-WP-WSC2	2004	0.03	Direct Disposal

APPENDIX C

WORK BREAKDOWN STRUCTURE AND DICTIONARY

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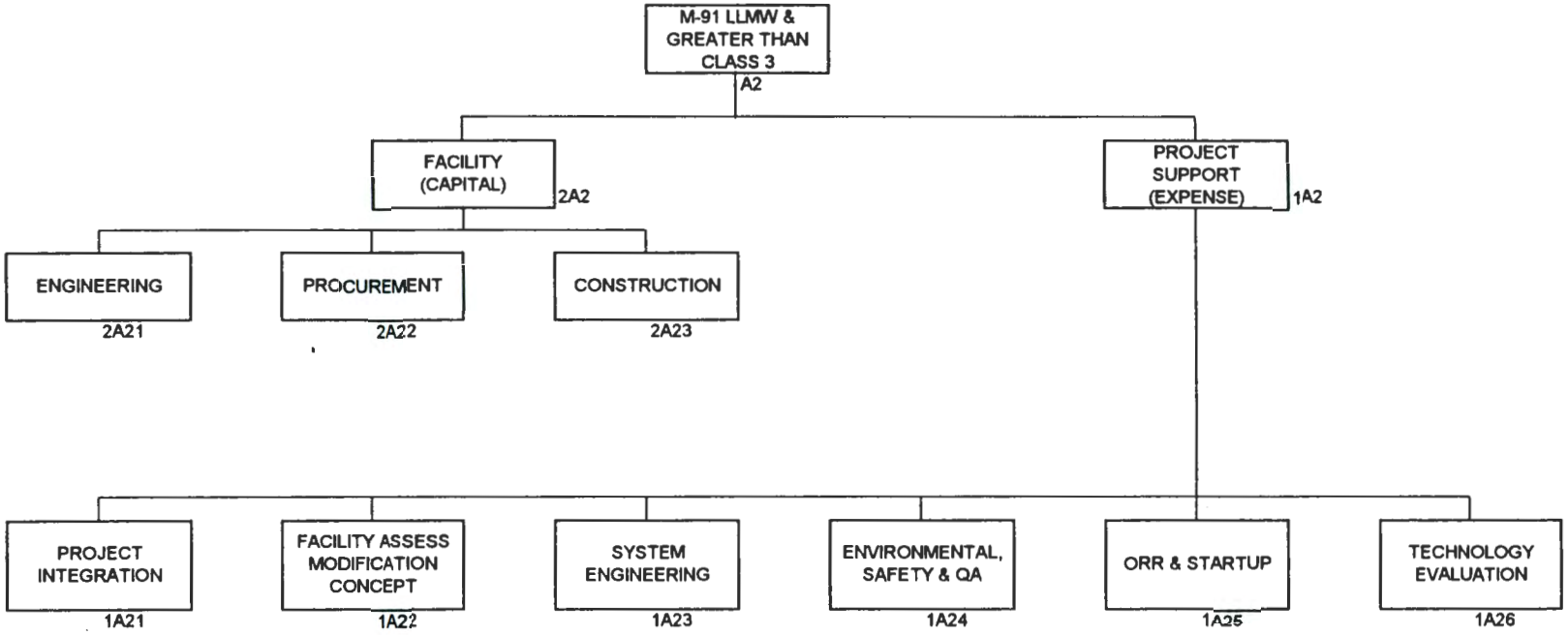

M-91 PROJECT SUMMARY WORK BREAKDOWN STRUCTURE

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PROJECT SUMMARY WORK BREAKDOWN STRUCTURE DICTIONARY
ELEMENT DEFINITION

1. Project Title: M-91 LLMW & Greater-Than-Category 3
2. Date: January 18, 1999
3. Identification Number:
4. WBS Element Code: A2
5. WBS Element Title: M-91 LLMW & Greater-Than-Category 3
6. Index Line No:
7. Approved Changes:
8. System Description:
9. Budget and Reporting Number:

---

10. Element Task Description:

a) Cost Content:
- Engineering & Design
- Labor
- Procurement
- Travel
- Project Management
- Other Hanford Contractor Services:
  - Document Control
- Subcontract Efforts
  - Offsite Architect-Engineer
  - Fixed-Price Construction Contractor
- Reproduction
- Computer Services
- Overhead

b) Technical Content:
- Engineering and Design
- Improvement to Land
- Buildings
- Utilities
- Special Equipment/Process Systems
- Office Furniture/Equipment
- Shop Equipment

c) Work Statement: The M-91 LLMW Greater-Than-Category 3 facilities will receive, sort, process, repackage, and load CH LLMW and Macroencapsulate and load RH LLMW for shipment to disposal. As the highest level WBS element, all of the project work is included in this element.

PROJECT SUMMARY WORK BREAKDOWN STRUCTURE DICTIONARY
ELEMENT DEFINITION

1. Project Title: M-91 LLMW & Greater-Than-Category 3
2. Date: January 18, 1999
3. Identification Number:
4. WBS Element Code: 1A2
5. WBS Element Title: Project Support
6. Index Line No:
7. Approved Changes:
8. System Description:
9. Budget and Reporting Number:

---

10. Element Task Description:

a) Cost Content: Labor
Miscellaneous Services
Travel
PO Contract
Computers
Office Supplies
Duplicating

b) Technical Content: Provide project integration, systems engineering, operations preparedness and startup, conceptual development, technology evaluation, and environmental, safety and QA support for the M-91 LLMW & Greater-Than-Category 3 project.

c) Work Statement: Integrate the work of all project participants and provide data management for the project. Provide engineering support for process definition. Develop procedures and specifications for plant startup and operation. Develop project scope, cost estimate, schedule and design parameters. Evaluate and select processes to be used for the project. Prepare the project safety related reports and oversee the project QA requirements.

PROJECT SUMMARY WORK BREAKDOWN STRUCTURE DICTIONARY
ELEMENT DEFINITION

1. Project Title: M-91 LLMW & Greater-Than-Category 3
2. Date: January 18, 1999
3. Identification Number:
4. WBS Element Code: 1A21
5. WBS Element Title: Project Integration
6. Index Line No:
7. Approved Changes:
8. System Description:
9. Budget and Reporting Number:

---

10. Element Task Description:

a) Cost Content: Labor
Travel
Miscellaneous Services
Commercial Interface
Office Supplies
Duplicating
Microfilming

b) Technical Content: Provide project management and control during construction and startup at the M-91 facilities. Provide contractual support for commercial interface. Provide document control and engineering support for the project.

c) Work Statement: Integrate the interfacing of all project participants including scheduling, budgeting, performance measurement, baseline charge control administration and project plans and procedures. Administer project data management activities and provide engineering support for the statement of work safety documentation and reviews. Provide contractual support for the placement of commercial contracts.

PROJECT SUMMARY WORK BREAKDOWN STRUCTURE DICTIONARY
ELEMENT DEFINITION

1. Project Title: M-91 LLMW & Greater-Than-Category 3
2. Date: January 18, 1999
3. Identification Number:
4. WBS Element Code: 1A22
5. WBS Element Title: Facility Assessment Modification Concept
6. Index Line No:
7. Approved Changes:
8. System Description:
9. Budget and Reporting Number:

---

10. Element Task Description:

a) Cost Content: Labor
AE Contract

Technical Content: Perform a proof of concept design of the M-91 LLMW Greater-Than-Category 3.

b) Work Statement: Develop a project scope, assure project feasibility and attainable performance levels, and develop a project cost estimate, schedules, and design parameters. Identify modifications required in selected facility to develop project baselines.

PROJECT SUMMARY WORK BREAKDOWN STRUCTURE DICTIONARY
ELEMENT DEFINITION

1. Project Title: M-91 LLMW & Greater-Than-Category 3
2. Date: January 18, 1999
3. Identification Number:
4. WBS Element Code: 1A23
5. WBS Element Title: System Engineering
6. Index Line No:
7. Approved Changes:
8. System Description:
9. Budget and Reporting Number:

---

10. Element Task Description:

    a) Cost Content: Labor
    Material
    Travel
    PO Contract
    Other Hanford Contractor Services

    b) Technical Content: Provide the M-91 LLMW & Greater-Than-Category 3 waste disposal plan and definition.

    c) Work Statement: Support flow sheet and functional design criteria/engineering study preparation, and support all plant process system interfacing requirements. Prepare operations startup documents.

PROJECT SUMMARY WORK BREAKDOWN STRUCTURE DICTIONARY
ELEMENT DEFINITION

1. Project Title: M-91 LLMW & Greater-Than-Category 3
2. Date: January 18, 1999
3. Identification Number:
4. WBS Element Code: 1A24
5. WBS Element Title: Environmental, Safety & QA
6. Index Line No:
7. Approved Changes:
8. System Description:
9. Budget and Reporting Number:

---

10. Element Task Description:

    a) Cost Content: Labor
    Travel
    Consultant Services

    b) Technical Content: Provide environmental, safety, and QA technical support to the M-91 project.

    c) Work Statement: Prepare the revision to existing safety basis. Oversee project environmental, safety, and QA requirements.

PROJECT SUMMARY WORK BREAKDOWN STRUCTURE DICTIONARY
ELEMENT DEFINITION

1. Project Title: M-91 LLMW & Greater-Than-Category 3
2. Date: January 18, 1999
3. Identification Number:
4. WBS Element Code: 1A25
5. WBS Element Title: Operational Readiness Review & Startup
6. Index Line No:
7. Approved Changes:
8. System Description:
9. Budget and Reporting Number:

---

10. Element Task Description:

a) Cost Content: Labor
Material
Travel
PO Contract
Overhead

b) Technical Content: Provide operational and startup planning including staffing and training. Provide operability and maintainability input to design and construction.

c) Work Statement: Review and monitor activities to assure designs meet programmatic/operational needs. Begin planning for operational startup including training preparations, planning, and operating procedure planning.

PROJECT SUMMARY WORK BREAKDOWN STRUCTURE DICTIONARY
ELEMENT DEFINITION

1. Project Title: M-91 LLMW & Greater-Than-Category 3
2. Date: January 18, 1999
3. Identification Number:
4. WBS Element Code: 1A26
5. WBS Element Title: Technology Evaluation
6. Index Line No:
7. Approved Changes:
8. System Description:
9. Budget and Reporting Number:

---

10. Element Task Description:

    a) Cost Content: Labor
    Material
    Travel
    PO Contracts

    b) Technical Content: Plan the M-91 LLMW equipment evaluation and provide technical direction to interface with the A/E for mechanical equipment systems.

    c) Work Statement: Evaluate vendor demonstrations for applicability to waste stream. Select technology for macroencapsulation.

PROJECT SUMMARY WORK BREAKDOWN STRUCTURE DICTIONARY
ELEMENT DEFINITION

1. Project Title: M-91 LLMW & Greater-Than-Category 3
2. Date: January 18, 1999
3. Identification Number:
4. WBS Element Code: 2A2
5. WBS Element Title: Facility
6. Index Line No:
7. Approved Changes:
8. System Description:
9. Budget and Reporting Number:

---

10. Element Task Description:

a) Cost Content: Labor
A/E Services
Travel
Construction Contractor
Other Hanford Contractor Services:
Construction Management and Administration
Procurement

b) Technical Content: Provide design. Perform site facility construction and provide construction management services. Procure equipment.

c) Work Statement: Perform design of the M-91 facilities modifications, including all drawings, specifications and test procedures for utilities and equipment. Provide construction management services and modify the M-91 facilities in accordance with the detailed design and perform testing to verify that the construction and equipment conform to design requirements. Prepare procurement documents for and procure the equipment.

PROJECT SUMMARY WORK BREAKDOWN STRUCTURE DICTIONARY
ELEMENT DEFINITION

1. Project Title: M-91 LLMW & Greater-Than-Category 3
2. Date: January 18, 1999
3. Identification Number:
4. WBS Element Code: 2A21
5. WBS Element Title: Engineering
6. Index Line No:
7. Approved Changes:
8. System Description:
9. Budget and Reporting Number:

---

10. Element Task Description:

    a) Cost Content: A/E Contract

    b) Technical Content: Provide design of the M-91 LLMW Greater-Than-Category 3. Provide Construction Engineering and Inspection.

    c) Work Statement: Provide design for the M-91 LLMW Greater-Than-Category 3 facility modifications, including utilities and equipment. This includes preparation of drawings, specifications, and test procedures. Provide field engineering and inspection services during the construction phase.

PROJECT SUMMARY WORK BREAKDOWN STRUCTURE DICTIONARY
ELEMENT DEFINITION

1. Project Title: M-91 LLMW & Greater-Than-Category 3
2. Date: January 18, 1999
3. Identification Number:
4. WBS Element Code: 2A22
5. WBS Element Title: Procurement
6. Index Line No:
7. Approved Changes:
8. System Description:
9. Budget and Reporting Number:

---

10. Element Task Description:

    a) Cost Content: Equipment

    b) Technical Content: Procure equipment in accordance with applicable drawings and specifications.

    c) Work Statement: Prepare procurement documents and bid packages, evaluate the bids, award the contracts, administer the contracts and provide for warehousing and maintenance of the procured equipment.

PROJECT SUMMARY WORK BREAKDOWN STRUCTURE DICTIONARY
ELEMENT DEFINITION

1. Project Title: M-91 LLMW & Greater-Than-Category 3
2. Date: January 18, 1999
3. Identification Number:
4. WBS Element Code: 2A23
5. WBS Element Title: Construction
6. Index Line No:
7. Approved Changes:
8. System Description:
9. Budget and Reporting Number:

---

10. Element Task Description:

    a) Cost Content: Construction Contractor

    b) Technical Content: Perform facility modifications and testing in accordance with approved design media.

    c) Work Statement: Modify an existing facility for the M-91 LLMW including all utilities and equipment. Perform test procedures to verify that construction and equipment conform to the design media.

APPENDIX D

COST

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M-91-15 LLMW Facility Project: Total Project Cost ($1,000)				
	FY 2003	FY 2004	FY 2005	Total
1A2 Project Support	$220	$120	$180	$520
2A2 Facility (Capital)	$0	$480	$100	$580
Total T-Plant Modification	$220	$600	$280	$1,100
T-Plant Full Operations	$0	$0	$2,800	$2,800
Total Project Cost	$220	$600	$3,080	$3,900

M-91-15 LLMW Facility Project: Project Support Cost Resource Plan ($1,000)				
1A2 Project Support	**FY 2003**	**FY 2004**	**FY 2005**	**Total**
1A21 Project Integration	$60	$40	$20	$120
1A22 T-Plant Modification Assessment	$40	$0	$0	$40
1A23 System Engineering	$20	$10	$20	$50
1A24 Environmental Safety & QA	$60	$20	$20	$100
1A25 ORR & Startup	$0	$30	$120	$150
1A26 Technology Evaluation	$40	$20	$0	$60
Total	**$220**	**$120**	**$180**	**$520**

M-91-15 LLMW Facility Project: Capital Cost Resource Plan ($1,000)			
2A2 Facility (Capital)	**FY 2004**	**FY 2005**	**Total**
2A21 Engineering	$80	$0	$80
2A22 Equipment Procurement	$400	$0	$400
2A23 Construction	$0	$100	$100
Total	**$480**	**$100**	**$580**

FLUOR DANIEL NORTHWEST, INC.
WASTE MANAGEMENT HANFORD CO.
JOB NO. A-29/65100730
FILE NO. Z643SAA3

** IEST - INTERACTIVE ESTIMATING **
M-91 - LLM FACILITY
PLANNING / FEASIBILITY ESTIMATE
PHMCR01 - PROJECT COST SUMMARY

DATE 01/19/99 10:21:44
BY SMF,JLG,DKH

SORT	DESCRIPTION	ESCALATED TOTAL COST	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
FDNW	FLUOR DANIEL NORTHWEST	285,000	27	78,000	363,000
	SUBTOTAL	285,000	27	78,000	363,000
SITE	SITE ALLOCATIONS	87,000	27	24,000	111,000
	(ADJUSTED/ROUNDED)	-2,000		-2,000	-4,000
	PROJECT TOTAL	370,000	27	100,000	470,000

TYPE OF ESTIMATE STUDY ESTIMATE JANUARY 19,1999

FDNW LEAD ESTIMATOR JLG

ESTIMATING MANAGER

PROJECT MANAGER

CLIENT

REMARKS:

(ROUNDED/ADJUSTED TO THE NEAREST " 1,000 / 10,000 " - PERCENTAGES NOT RECALCULATED TO REFLECT ROUNDING)

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS
110000	TITLE II DESIGN	25041	5.22	1307	26348	15	3952	30300	9329	39629
SUBTOTAL 11	TITLE II DESIGN	25041	5.22	1307	26348	15	3952	30300	9329	39629
120000	TITLE III DESIGN	19786	7.44	1472	21258	15	3188	24446	7527	31973
SUBTOTAL 12	TITLE III E/I	19786	7.44	1472	21258	15	3188	24446	7527	31973
321000	BUILDING EQUIPMENT	24300	7.44	1807	26107	30	7832	33940	10365	44305
321004	BLDG. EQUIPMENT	196730	7.44	14636	211367	30	63410	274777	83916	358694
SUBTOTAL 32100	BUILDING EQUIPMENT	221030	7.44	16444	237475	30	71242	308717	94282	402999
SUBTOTAL 32	FIXED PRICE CONSTRUCTION	221030	7.44	16444	237475	30	71242	308717	94282	402999
PROJECT TOTAL		265,857	7.23	19,223	285,081	27	78,383	363,464	111,138	474,603

1. ESTIMATE PURPOSE
==========
PLANNING / FEASIBILITY ESTIMATE: THIS ESTIMATE SHOULD NOT BE USED FOR BUDGETING.

2. ESTIMATE TECHNICAL BASIS
==========
A. THIS ESTIMATE HAS BEEN PREPARED FOR THE M-91-LLMW PROJECT PROJECT AS REQUESTED BY THE PROJECT MANAGER.
B. A DESCRIPTION OF THE TECHNICAL SCOPE OF WORK MAY BE FOUND IN THE FOLLOWING REFERENCE DOCUMENTS:
REQUEST FOR ESTIMATE DATED ON NOVEMBER 11, 1998,PROJECT SUMMARY WORK BREAKDOWN STRUCTURE DICTIONARY
ELEMENT DEFINITION.A SCOPE ON CH-LLMW AND RH-LLMW LARGER CONTAINER PROCESSING FACILITY. (NO DATE)
SKETCHES,CADD FILE SK-M91 ON TWO FACILITIES.
C. THIS ESTIMATE ALSO UTILIZES A STANDARD FDNW DEFINED CODE OF ACCOUNTS.
D. THIS ESTIMATE WAS REVISED FROM Z643SAA2,AS PER ESTIMATE REQUEST DATED:JANUARY 18,1999.

3. ESTIMATE METHODOLOGY
==========
A. DIRECT COSTS:
PARAMETRIC TECHNIQUE,TREND INFORMATION,COST FOR SOME EQUIPMENT WAS USED FROM A SIMILAR QUOTE FROM UNITED ENGINEERS & CONSTRUCT
FROM THE WRAP PROJECT. THOSE COSTS WERE ESCALATED FROM 1992 TO 1998 (BY 34%).

(1) TITLE II DESIGN IS BASED ON 11.3% PERCENT OF TOTAL CONSTRUCTION COST,INCLUDING EQUIPMENT COST.

(2) TITLE III DESIGN IS BASED ON 9% PERCENT OF TOTAL CONSTRUCTION COST,INCLUDING EQUIPMENT COST.

(3) CONSTRUCTION LABOR, MATERIAL AND EQUIPMENT UNITS HAVE BEEN ESTIMATED BASED UPON ONE OR MORE OF THE FOLLOWING STANDARD
IN HOUSE DATABASES,R.S. MEANS,MC MASTER CARR,

(4) FLUOR DANIEL HANFORD & PROJECT HANFORD MANAGEMENT CONTRACT (PHMC) SUBCONTRACTOR DIRECT COSTS FOR WASTE MANAGEMENT HANFORD
INC.INTO THIS ESTIMATE.

B. DIRECT COST FACTORS:
(1) SALES TAX HAS BEEN APPLIED TO ALL MATERIALS AND EQUIPMENT PURCHASES AT 8%.
(2) CONTRACT ADMINISTRATION FACTOR OF 21.50% HAS BEEN APPLIED TO THE DIRECT CONTRACT VALUE WHICH
INCLUDES COSTS FOR BID PACKAGE PREPARATION, CONTRACT MANAGEMENT & ADMINISTRATION AND PROJECT MANAGEMENT & PLANNING
SUPPORT
(3) A FACTOR OF .25% HAS BEEN APPLIED TO DIRECT LABOR ENGINEERING TO ALLOW FOR USAGE OF
GOVERNMENT OWNED EQUIPMENT CONTROLLED BY DYNCORP.

C. INDIRECT COSTS:
FIXED PRICE CONTRACTOR OVERHEAD, PROFIT, BOND AND INSURANCE COSTS HAVE BEEN APPLIED ARE THE FOLLOWING PERCENTAGES:
LABOR = 26.5%, EQUIPMENT USE = 10%, MATERIAL = 26.5%, SUBCONTRACT = 26.5%; LOWER TIER SUBCONTRACTORS: LABOR = 39.0%,
EQUIPMENT USE = 10%,(EXCEPT ELECTR. 0.0%), MATERIAL = 39.0%, ARE REFLECTED IN THE "OH&P/B&I" COLUMN OF THE ESTIMATE
DETAIL REPORT.

D. RATES:

(1) FOR ESTIMATING PURPOSES, AVERAGE FDNW RATES BY OPERATIONS CODE HAVE BEEN DEVELOPED BASED UPON RECENT COST HISTORY AND ADJUSTED TO REFLECT INDUSTRY AVERAGE AE.CM RATES.

(2) FIXED PRICE CONSTRUCTION RATES ARE THOSE LISTED IN APPENDIX A TO THE HANFORD SITE. STABILIZATION AGREEMENT (HSSA). THE HSSA RATES INCLUDE BASE WAGE, FRINGE BENEFITS AND OTHER COMPENSATION AS NEGOTIATED BETWEEN FLUOR DANIEL HANFORD, INC. AND THE NATIONAL BUILDING AND CONSTRUCTION TRADES DEPARTMENT AFL-CIO. FLUOR DANIEL NORTHWEST COST ESTIMATING INCORPORATES FACTORS TO COVER ADDITIONAL COSTS FOR WORKMAN COMPENSATION, FICA, STATE AND FEDERAL UNEMPLOYMENT INSURANCE.

E. SITE ALLOCATIONS FACTORS:

SITE ALLOCATION FACTORS ARE DEVELOPED AND PROVIDED BY FLUOR DANIEL HANFORD (FDH) FOR ESTIMATING USE.

(1) DYNCORP EQUIPMENT USAGE: 0.25% APPLIED TO HOME OFFICE ENGINEERING AND CONSTRUCTION MANAGEMENT LABOR.

(2) FDH GFS/G&A CONST. MGMT: GFS (7%) AND G&A (22.0%) COMPOUNDED AND APPLIED TO FIXED PRICE CONSTRUCTION MANAGEMENT, 30.54%.

(3) FDH GFS/G&A - LABOR: GFS (7%) AND G&A (22.0%) COMPOUNDED AND APPLIED TO HOME OFFICE ENGINEERING, CONSTRUCTION MANAGEMENT LABOR, FDNW MATERIAL PURCHASES AND FDNWS CONSTRUCTION LABOR, 30.54%.

4. ESCALATION

ESCALATION PERCENTAGES WERE CALCULATED FOR DEFINITIVE DESIGN,ENGRG/INSPECTION AND CONSTRUCTION.

DEFINITIVE DESIGN	- MID-POINT MARCH 1, 2001	ESCALATION 5.22
ENGRG/INSPECTION	- MID-POINT JANUARY 1, 2002	ESCALATION 7.44
CONSTRUCTION	- MID-POINT JANUARY 1, 2002	ESCALATION 7.44

5. CONTINGENCY

A. DEFINITION OF CONTINGENCY AS PROVIDED BY DOE

"CONTINGENCY COVERS COSTS THAT MAY RESULT FROM INCOMPLETE DESIGN, UNFORESEEN AND UNPREDICTABLE CONDITIONS, OR UNCERTAINTIES WITHIN THE DEFINED PROJECT SCOPE. THE AMOUNT OF CONTINGENCY WILL DEPEND ON THE STATUS OF DESIGN, PROCUREMENT, AND CONSTRUCTION; AND THE COMPLEXITY AND UNCERTAINTIES OF THE COMPONENT PARTS OF THE PROJECT. CONTINGENCY IS NOT TO BE USED TO AVOID MAKING AN ACCURATE ASSESSMENT OF EXPECTED COST" (OFFICE OF WASTE MANAGEMENT (EM-30) COST AND SCHEDULE GUIDE.

B. CONTINGENCY ALLOWANCE GUIDELINES

THE DOE GUIDELINE CONTINGENCY ALLOWANCE FOR A PLANNING ESTIMATE IS 20% TO 30% AND UNDER SPECIAL CONDITIONS UP 40%.

C. METHODOLOGY

CONTINGENCY IS EVALUATED AT THE LOWEST WORK BREAKDOWN STRUCTURE (WBS) LEVEL WITHIN THE COST ESTIMATE DETAILS. IT IS SUMMARIZED AT UPPER WBS LEVELS AND REPORTED ON THE SUMMARY REPORTS.

D. ANALYSIS

AN ASSESSMENT OF DESIGN MATURITY, WORK COMPLEXITY AND PROJECT UNCERTAINTIES HAS BEEN PERFORMED. AN EXPLANATION OF THIS ASSESSMENT AND CONTINGENCY RATES WHICH HAVE BEEN ADDED TO THE COST OF WORK ARE AS FOLLOWS:

WBS 11 A CONTINGENCY OF 15% HAS BEEN APPLIED CONSISTENT WITH DOE GUIDELINES FOR THIS STAGE OF DESIGN. THE DESIGN DOES NOT APPEAR COMPLICATED.

WBS 12 A CONTINGENCY OF 15% HAS BEEN APPLIED TO E&I,AND IS SIMILAR TO THE CONTINGENCY USED FOR CONSTRUCTION.

WBS 32 A CONTINGENCY OF 30% HAS BEEN APPLIED AS THE DESIGN PROVIDED FOR THE ESTIMATE IS STILL CONCEPTUAL. EQUIPMENT AND EXHAUST SYSTEM PRICES ARE NOT BASED ON MUCH DETAIL. EQUIPMENT SPECIFICATIONS & HENCE DEVELOPMENT COSTS COULD VARY WIDELY AS MANY ITEMS ARE NOT OFF THE SHELF. ASSOCIATED SUPPORT ITEMS (LIKE THE EXHAUST SYSTEM, ELECTRICAL AND THE BUILDINGS) CAN CHANGE AS THE EQUIPMENT CHANGES. THE EXHAUST MATERIAL, GAUGE, METHOD OF FABRICATION, CAPACITY, SUPPORTS AND CONFIGURATION COULD CHANGE.

6. ROUNDING
========
THE PROJECT COST SUMMARY REPORT IS SUMMARIZED AND ADJUSTED/ROUNDED AS FOLLOWS:
THE ESCALATED TOTAL COST COLUMN, CONTINGENCY TOTAL COLUMN AND TOTAL DOLLARS COLUMN SUB-TOTALS ARE SUMMARIZED BY CONTRACTOR. THE COLUMN SUBTOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST $1,000/$10,000. THE PROJECT TOTAL SUMMARY LINE TOTALS ARE ADJUSTED/ROUNDED TO THE NEAREST $10,000/$100,000.

7. REMARKS
=======
MAJOR ASSUMPTIONS WHICH HAVE BEEN MADE IN THE PREPARATION OF THIS ESTIMATE ARE AS FOLLOWS:

A.) EQUIPMENT COST BY UNITED ENGINEERS & CONSTRUCTORS ON WRAP MODULE 2A WAS FURNISHED BY ENGINEERING WAS USED TO DETERMINE COST.

B.) ESTIMATOR ASSUMES THAT CONSTRUCTION WILL BE A FIXED PRICE CONTRACTOR AND THAT NO SPECIAL REQUIREMENTS FOR RADIATION WILL BE REQUIRED.

C.) ALL EQUIPMENT PURCHASED BY CONTRACTOR.

D.) ALLOWANCE WAS USED FOR EQUIPMENT ELECTRICAL COST.

E.) THE BUILDING TO SET EQUIPMENT IN HAS NOT BEEN INDENTIFIED AT THIS TIME.ESTIMATE ASSUMES THAT BUILDING WILL HAVE THE ELECTRICAL CAPACITY REQUIRED FOR THE EQUIPMENT.

SORT CODE/WBS	DESCRIPTION	ESTIMATE SUBTOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	SUB TOTAL	SITE ALLOCAT'N	TOTAL DOLLARS
FDNW	FLUOR DANIEL NORTHWEST									
110000	TITLE II DESIGN	25041	5.22	1307	26348	15	3952	30300	9329	39629
	SUBTOTAL 11 TITLE II DESIGN	25041	5.22	1307	26348	15	3952	30300	9329	39629
120000	TITLE III DESIGN	19786	7.44	1472	21258	15	3188	24446	7527	31973
	SUBTOTAL 12 TITLE III E/I	19786	7.44	1472	21258	15	3188	24446	7527	31973
321000	BUILDING EQUIPMENT	24300	7.44	1807	26107	30	7832	33940	10365	44305
321004	BLDG. EQUIPMENT	196730	7.44	14636	211367	30	63410	274777	83916	358694
	SUBTOTAL 32100 BUILDING EQUIPMENT	221030	7.44	16444	237475	30	71242	308717	94282	402999
	SUBTOTAL 32 FIXED PRICE CONSTRUCTIO	221030	7.44	16444	237475	30	71242	308717	94282	402999
	TOTAL FDNW FLUOR DANIEL NORTHWEST	265857	7.23	19223	285081	27	78383	363464	111138	474603
PROJECT TOTAL		265,857	7.23	19,223	285,081	27	78,383	363,464	111,138	474,603

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	CONSTRUCTION %	MANAGEMENT TOTAL	OTHER COSTS	SUB TOTAL	TOTAL
110000	TITLE II DESIGN	25041	0.00	0	0	0	25041
SUBTOTAL 11	TITLE II DESIGN	25041		0	0	0	25041
120000	TITLE III DESIGN	19786	0.00	0	0	0	19786
SUBTOTAL 12	TITLE III E/I	19786		0	0	0	19786
321000	BUILDING EQUIPMENT	20000	21.50	4300	0	4300	24300
321004	BLDG. EQUIPMENT	161918	21.50	34812	0	34812	196730
SUBTOTAL 32100	BUILDING EQUIPMENT	181918		39112	0	39112	221030
SUBTOTAL 32	FIXED PRICE CONSTRUCTION	181918		39112	0	39112	221030
PROJECT TOTAL		226,745		39,112	0	39,112	265,857

WBS	DESCRIPTION	ESTIMATE SUBTOTAL	DYN EQ.USAGE	FDH GFS/G&A CONST.MGMT	FDH MPR F.P./S.C.	FDH GFS/G&A LABOR	FDH MPR/G&A MATERIAL	SITE ALLOC SUBTOTAL
110000	TITLE II DESIGN	25041	62	0	0	7647	0	7710
SUBTOTAL 11	TITLE II DESIGN	25041	62	0	0	7647	0	7710
120000	TITLE III DESIGN	19786	49	0	0	6042	0	6092
SUBTOTAL 12	TITLE III E/I	19786	49	0	0	6042	0	6092
321000	BUILDING EQUIPMENT	20000	0	1313	6108	0	0	7421
321004	BLDG. EQUIPMENT	161918	0	10631	49449	0	0	60081
SUBTOTAL 32100	BUILDING EQUIPMENT	181918	0	11944	55557	0	0	67502
SUBTOTAL 32	FIXED PRICE CONSTRUCTION	181918	0	11944	55557	0	0	67502
PROJECT TOTAL		226,745	112	11,944	55,557	13,690	0	81,304

WBS	DESCRIPTION	SITE ALLOC SUBTOTAL	ESCALATION %	ESCALATION TOTAL	SUB TOTAL	CONTINGENCY %	CONTINGENCY TOTAL	TOTAL DOLLARS
110000	TITLE II DESIGN	7710	5.22	402	8112	15	1216	9329
SUBTOTAL 11	TITLE II DESIGN	7710	5.22	402	8112	15	1216	9329
120000	TITLE III DESIGN	6092	7.44	453	6545	15	981	7527
SUBTOTAL 12	TITLE III E/I	6092	7.44	453	6545	15	981	7527
321000	BUILDING EQUIPMENT	7421	7.44	552	7973	30	2392	10365
321004	BLDG. EQUIPMENT	60081	7.44	4470	64551	30	19365	83916
SUBTOTAL 32100	BUILDING EQUIPMENT	67502	7.44	5022	72524	30	21757	94282
SUBTOTAL 32	FIXED PRICE CONSTRUCTION	67502	7.44	5022	72524	30	21757	94282
PROJECT TOTAL		81,304	7.23	5,877	87,182	27	23,956	111,138

FLUOR DANIEL NORTHWEST, INC.
WASTE MANAGEMENT HANFORD CO.
JOB NO. A-29/65100730
FILE NO. Z643SAA3

** IEST - INTERACTIVE ESTIMATING **
M-91 - LLM FACILITY
PLANNING / FEASIBILITY ESTIMATE
PHMCR08 - ESTIMATE DETAIL BY WBS / COST CODE

DATE 01/19/99 10:21:54
BY SMF,JLG,DKH

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
110000	TITLE II DESIGN										
110000.90	HOME OFFICE										
110000.9020000	TITLE II DESIGN,IS APPROX. 11.3% OF TOTAL CONSTRUCTION COST.NO CONSTRUCTION IN THIS ESTIMATE,EXCEPT FOR ELECT.	000	1 LS	305	25041	0	0	0	0	0	25041
SUBTOTAL	HOME OFFICE			305	25,041	0	0	0	0	0	25,041
TOTAL	COST CODE 00090 WBS 110000 (ESCALATION 5.22% - CONTINGENCY 15.00 %)			305	25,041	0	0	0	0	0	25,041
TOTAL WBS 110000 TITLE II DESIGN				305	25,041	0	0	0	0	0	25,041

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
120000	TITLE III DESIGN										
120000.90	HOME OFFICE										
120000.9020000	ENGINEERING & INSPECTION IS APPRO 9% OF THE TOTAL CONSTRUCTION COST.	000	1 LS	241	19786	0	0	0	0	0	19786
SUBTOTAL	HOME OFFICE			241	19,786	0	0	0	0	0	19,786
TOTAL	COST CODE 00090 WBS 120000 (ESCALATION 7.44% - CONTINGENCY 15.00 %)			241	19,786	0	0	0	0	0	19,786
TOTAL WBS 120000 TITLE III DESIGN				241	19,786	0	0	0	0	0	19,786

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
321000	BUILDING EQUIPMENT										
321000.60	ELECTRICAL										
321000.6010003	********** ELECTRICAL FOR EQUIPMENT **********	501	0	0	0	0	0	0	0	0	0
321000.6010021	ELECTRICAL ALLOWANCE FOR EQUIPMENT MOUNTED IN ANOTHER BUILDING.	501	1 LS	0	0	0	0	20000	0	0	20000
SUBTOTAL	ELECTRICAL			0	0	0	0	20,000	0	0	20,000
TOTAL	COST CODE 50160 WBS 321000 (ESCALATION 7.44% - CONTINGENCY 30.00 %)			0	0	0	0	20,000	0	0	20,000
TOTAL WBS 321000 BUILDING EQUIPMENT				0	0	0	0	20,000	0	0	20,000

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
321004	BLDG. EQUIPMENT										
321004.47	OTHER PROCESS EQUIPMENT										
321004.4700080	**********	700	0	0	0	0	0	0	0	0	0
321004.4700082	EQUIPMENT **********	700	0	0	0	0	0	0	0	0	0
321004.4700102	SORTING TABLE 10' X 12'	700	1 EA	16	521	0	20100	0	0	5465	26086
321004.4700104	PIPE SHEAR (PRICE ESCALATED FROM 1992 UNITED ENGR.S EQUIPMENT LIST TO 1998 AT 5%/ YR - TYPICAL)	700	1 EA	16	521	0	73700	0	0	19669	93890
321004.4700106	BAND SAW	700	1 EA	16	521	0	3350	0	0	1026	4897
321004.4700108	VACUUM FOR REMOVING ABSORB'T	700	1 EA	24	782	0	10000	0	0	2857	13639
321004.4700110	GRAPPLE FOR HOIST	700	1 EA	2	65	0	100	0	0	44	209
321004.4700116	CUT OFF SAW ELECTRIC	700	1 EA	2	65	0	2400	0	0	653	3118
321004.4700122	CUTING TORCH	700	1 EA	2	65	0	1000	0	0	282	1347
321004.4700126	DRUM GRAPPLE	700	1 EA	1	33	0	200	0	0	62	295
321004.4700128	SET OF ELECTRIC POWER TOOLS	700	1 EA	2	65	0	1500	0	0	415	1980
321004.4700130	CONTAINER HANDLING SLINGS...	700	1 EA	24	782	0	3000	0	0	1002	4784
SUBTOTAL	OTHER PROCESS EQUIPMENT			105	3,420	0	115,350	0	0	31,475	150,245
	SALES TAX 8.00 %						9228		0		9228
	OH&P (ON MARKUPS ONLY)									2445	2445
TOTAL	COST CODE 70047			105	3,420	0	124,578	0	0	33,920	161,918
	WBS 321004										
	(ESCALATION 7.44% - CONTINGENCY		30.00 %)								
TOTAL WBS 321004 BLDG. EQUIPMENT				105	3,420	0	124,578	0	0	33,920	161,918

ACCOUNT NUMBER	DESCRIPTION	COST CODE	QUANTITY	MANHOURS	LABOR	EQUIP USAGE	MATERIAL	SUB-CONTRACT	EQUIP-MENT	OH&P / B & I	TOTAL DOLLARS
REPORT TOTAL				651	48,247	0	124,578	20,000	0	33,920	226,745

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