Idaho
National
Engineering
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INEL-96/0155

Mixed Waste Focus Area Integrated Master Schedule (Current as of May 6, 1996)

Mixed Waste Focus Area

Lockheed
Idaho Technologies Company

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Published May 1996

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Idaho Falls, Idaho 83415

Prepared for the
U.S. Department of Energy

ABSTRACT

The mission of the Mixed Waste Characterization, Treatment, and Disposal Focus Area (MWFA) is to provide acceptable treatment systems, developed in partnership with users and with the participation of stakeholders, tribal governments, and regulators, that are capable of treating the Department of Energy's (DOE's) mixed wastes. The MWFA is targeting funding toward technology development projects that address the current list of deficiencies. A clear connection between the technology development projects and the EM-30 and EM-40 treatment systems that they support is essential for optimizing the MWFA efforts. The purpose of the Integrated Master Schedule (IMS) is to establish and document these connections and to ensure that all technology development activities performed by the MWFA are developed for timely use in those treatment systems.

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MIXED WASTE FOCUS AREA
INTEGRATED MASTER SCHEDULE
(Current as of May 6, 1996)

1. PURPOSE

The mission of the Mixed Waste Characterization, Treatment, and Disposal Focus Area (MWFA) is to provide acceptable treatment systems, developed in partnership with users and with the participation of stakeholders, tribal governments, and regulators, that are capable of treating the Department of Energy's (DOE's) mixed wastes. In support of this mission, the MWFA produced the *Mixed Waste Focus Area Integrated Technical Baseline Report*, Phase 1-Volume 1, January 16, 1996, which identified a prioritized list of 30 national mixed waste technology deficiencies. The MWFA is targeting funding toward technology development projects that address the current list of deficiencies. A clear connection between the technology development projects and the EM-30 and EM-40 treatment systems that they support is essential for optimizing the MWFA efforts. The purpose of the Integrated Master Schedule (IMS) is to establish and document these connections and to ensure that all technology development activities performed by the MWFA are developed for timely use in those treatment systems.

The IMS is a list of treatment systems from the Site Treatment Plans (STPs)/Consent Orders that have been assigned technology development needs with associated time-driven schedules. Technology deficiencies and associated technology development (TD) needs have been identified for each treatment system based on the physical, chemical, and radiological characteristics of the waste targeted for the treatment system. The schedule, the technology development activities, and the treatment system have been verified through the operations contact from the EM-30 organization at the site.

Coordination of TD work and end-user (EM-30/40/60/70) requirements is essential for success of the systematic MWFA multiyear program. The IMS is presently being used to connect the technology development project with end-user planning. Technology Development Requirements Documents are being written and refined based on end-user technical requirements established through this connection.

The IMS is a "living" tool that will be continually updated based on improvements in available data, better understanding of technology development obstacles and solutions, and site needs and input. Updates of the document will be published as deemed useful. For current information contact the MWFA.

2. DATA

The facility and waste stream data used for developing the IMS derives from the 1995 Mixed Waste Inventory Report (MWIR) and the 1995 Site Treatment Plan databases. The information in these databases is national-level data provided by all 48 DOE and U.S. Navy sites or shipyards that are storing or planning to treat mixed waste in the future. The STP database identifies the facility, preferred treatment options, and facility compliance dates. The sites develop their national-level waste stream data by combining the best available waste package-level information into general treatability groups and providing an information summary that allows the user to identify treatment technology needs for the

waste. Since a large quantity of the waste has been in storage for long periods, the waste stream characterization information may not always provide enough information to identify treatment technology needs. As the sites progress in characterizing waste, the information is updated on regular intervals and on an as-needed basis. The 1995 MWIR data was last updated in September 1995. The STP database was last updated in December 1995. Site specific changes have been provided to the MWFA during the spring of 1996 as the sites have completed additional characterization efforts.

3. PROCESS

The primary purpose of the IMS is to match the 30 technology development efforts to the needs of the end-users. The first step in developing the IMS was identifying potential TD needs for each of the treatment systems listed in the STP. Each of the 173 treatment systems were reviewed to identify potential TD needs. In total, 173 treatment systems and 2,158 mixed low-level waste (MLLW) and mixed transuranic waste (MTRU) streams, with a combined inventory of approximately 167,000 m^3 of waste, were evaluated.

The next step was identifying the date that each end-user needed the technology development completed. Estimated hot operation dates were assigned to each system based on the compliance dates identified in the STP. When dates were not listed in the STP, an estimate was obtained from a knowledgeable site contact. To assist the MWFA in determining the schedule associated with each TD, the amount of time required to develop a solution TD was estimated by the MWFA Technical Resource Team. In the IMS, these estimates are referred to as development time. The development time was reviewed and further refined during the Request for Information (RFI) review process. It was assumed some amount of time would be required to integrate the technology into the individual sites' treatment plan, and include it in permit or regulatory documents. This time period was defined as implementation time and was established by regulatory and other specialists in the MWFA. The technology delivery date was calculated by subtracting the implementation time from the estimated hot operations date. The date the TD activity should start to provide the technology on time was calculated by subtracting the development time from the technology delivery date.

The next step was reviewing the remaining treatment systems and eliminating systems that the MWFA could not support. Reasons for exclusion were that the system was currently operational and had no TD needs, it planned to become operational before the MWFA could provide timely support (i.e., the MWFA could not meet technical development, "window of opportunity") or required simple or existing technology, it was a generator treatment plan, or it operated on a very small scale.

In early April, the draft IMS was distributed to Site representatives for review and comment. Site representatives were asked to verify that the list of site facilities was valid, to update the estimated hot operations start dates, to review and modify the assignment of TD, and to comment on the estimated development and implementation time. These changes were entered into the IMS.

Throughout the development of the IMS, internal reviews were conducted by the Waste Type Teams and Site contacts. A number of systems were reintroduced after management review and site comments. The most striking result of the review process was the drop in the number of treatment systems that the MWFA proposed to support from 173 to 57, with the associated volume of targeted waste dropping from approximately 167,000 m^3 to 123,000 m^3. A complete list of treatment systems is included as Appendix A.

4. ASSUMPTIONS

Building the IMS required accepting a number of assumptions. Because the MWIR contains detailed waste stream data, it was used as the waste stream starting point. Preferred treatment options for each waste stream, treatment system data, and limited waste stream data were contained in the STP. To make use of both data sets it was necessary to link the two. This was easily accomplished because the STP was originally populated with MWIR data. More than 95% of the waste streams reported in the MWIR were reported in the STP. During the time period between populating the MWIR and the STP, a few sites redefined some waste streams. A few waste streams that were reported in the MWIR were not reported in the STP. In most cases, the waste was reported, but under a different waste stream. When MWIR and STP data conflicted, the STP was used because it was more recent then the MWIR. The STP contained a number of waste streams that are intended to track waste inventories through various steps in a treatment train process. For the IMS, all such treatment train streams were excluded. All other streams reported to the STP were used in the analysis.

Waste stream assignment to the treatment system was taken from the STP. To build the IMS, an assumption was made that the waste inventory for a stream would only be counted as input to one facility. For streams targeted to multiple treatment facilities, the inventory of the waste was associated with the primary treatment facility rather than the pre-treatment system.

5. IMS SUMMARY TABLES

Two summary tables generated from the IMS data have been provided for your review. Table 1 is a listing of all treatment systems for which the MWFA is attempting to provide TD solutions. Numerous data points are provided for each treatment system. The information listed below provides a description for each field in Table 1.

TS ID - Unique number for each treatment system as identified in the STP database.

Site - Site responsible for treatment systems, typically the site where the system will operate. (Appendix B includes a listing of sites and site codes.)

System Name - Name of the treatment system from the STP.

Targeted Inv (m^3) - The amount of waste targeted to be treated in the system. The inventory information was extracted from the STP database. Some assumptions were made in assigning the targeted wastes. See Section 4 for further clarification.

Contact - Name of person who supplied the original data to the MWIR/STP. If the information has been revised by site review, the contact supplying the updated information is listed.

Est. Hot Ops Start Date - Date the system is expected to start treating mixed waste.

Mortgaged Activities - Activities already being funded by the MWFA that are intended to address identified technologies. (Appendix D includes a list and description of mortgaged activities.)

Included - Whether the system is being targeted by the targeted MWFA.

Tech Def # - Technology deficiency identification number.

Tech Def Name - Name of technology deficiency. (See Appendix C for descriptions of the deficiency.)

TD Should Start By - The date the TD effort should start was calculated based on subtracting the estimated development and implementation time from the hot ops start date. In some cases, the site provided a required start date. Site-supplied dates are followed by an asterisk (*).

Est Dev Time (mo) - The number of months estimated for developing a solution for the technology deficiency.

TD Due Date - The date the TD solution transfers to the treatment system for implementation. For most deficiencies, this date was calculated by subtracting the estimated TD implementation time from the hot ops start date. In some cases, the site provided a required TD due date. Site-supplied dates are followed by an asterisk (*).

Est TD Impl. (mo) - Minimum time required by the site to implement the TD solution into the proposed treatment process.

Table 2 provides the list of treatment systems associated with each TD. The information listed below provides a description for each field in Table 2.

Tech Def # - Technology deficiency identification number.

Tech Def Name - Name of technology deficiency. (See Appendix C for descriptions of the deficiency.)

TD Dev Time (mo) - The length of time estimated by the Technical Resource Team to develop a solution for the deficiency.

TD Imp Time (mo) - The estimated length of time required to implement the technology into the Site Treatment Plan after completion of technology development.

TS ID - Unique number for each treatment system as identified in the STP database.

System Name - Treatment system name from the STP.

Site - Site responsible for treatment systems, typically the site where the system will operate.

Targeted Inv (m^3) - The amount of waste targeted to be treated in the system. The inventory information was extracted from the STP database. Some assumptions were

made in assigning the targeted wastes. See Section 4 for further clarification.

TD Should Start By - The date the TD effort should start was calculated based on subtracting the estimated development and implementation time from the hot ops start date. In some cases, the site provided a required start date. Site-supplied dates are followed by an asterisk (*).

Est. Hot Ops Start Date - Date the system is expected to start treating mixed waste.

TABLE 1.

IMS - Technology Deficiencies Assigned to Treatment Systems

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
AW-S007	AW	Remote Treatment Facility (RTF)	MLLW: 44.45 MTRU: 13.88		Stewart, Nancy	**9/30/2007**

Mortgaged Activities: **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
5	Material Handling	9/30/2004	0	9/30/2004	36

BN-S701	BN	Characterize to Determine Hazardous Constituents	MLLW: 16.4 MTRU: 0		Todzia, Glen	

Mortgaged Activities: **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
3	NDE/NDA Initial Characterization		30		24

DP-S001	DP	Central Neutralization Facility	MLLW: 0 MTRU: 0		Conley, Tom	**12/1/96**

Mortgaged Activities: **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
99	TD assignment being assessed	12/1/96	0	12/1/96	0

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
DP-S002	DP	TSCA Incinerator	MLLW:	2579	Conley, Tom	**6/30/97**
			MTRU:	0		

Mortgaged Activities: Denox
Russian Projects
WETO (Controlled Emissions Demo)

Included : Yes TD to enhance performance

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
1	Mercury Stabilization	6/30/95	12	6/30/96	12
2	Mercury Amalgamation	12/30/95	12	12/30/96	6
3	NDE/NDA Initial Characterization	12/30/92	30	6/30/95	24
8	Ash Stabilization	12/30/95	12	12/30/96	6
9	Mercury Monitoring	6/30/96	6	12/30/96	6
10	Alpha Monitoring	6/30/95	18	12/30/96	6
11	VOC Monitoring	6/30/95	18	12/30/96	6
12	Heavy Metal Monitoring	6/30/95	18	12/30/96	6

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
DP-S809	DP	Transportable Vitrification System (TVS)	MLLW:	783.3	Conley, Tom	6/30/96
			MTRU:	0		

Mortgaged Activities: Denox
PHP
Russian Projects
TVS
WETO (Controlled Emissions Demo)

Included : Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
1	Mercury Stabilization	4/1/97 *	12	4/1/98 *	12
2	Mercury Amalgamation	4/1/97 *	12	4/1/98 *	6
3	NDE/NDA Initial Characterization	3/30/95 *	30	9/30/97 *	24
6	Sorting/Segregation	9/30/97 *	0	9/30/97 *	36
9	Mercury Monitoring	10/1/97 *	6	4/1/98 *	6
11	VOC Monitoring	10/1/96 *	18	4/1/98 *	6
12	Heavy Metal Monitoring	10/1/96 *	18	4/1/98 *	6
14	Waste Form Performance	7/30/95 *	26	9/30/97 *	60
15	HEPA Filter Improvements	9/30/96 *	12	9/30/97 *	12
20	Refractory Performance	9/30/97 *	0	9/30/97 *	36

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
DP-S814	DP	Oak Ridge Commercial Treatment - Broad Spectrum	MLLW:	3731		
			MTRU:	0		

Mortgaged Activities: **Included :** Yes Added by Tom Conley

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
99	TD assignment being assessed		0		0

DP-S816	DP	Oak Ridge Commercial Treatment - Sludges	MLLW:	6964	Conley, Tom	**9/30/96**
			MTRU:	0		

Mortgaged Activities: Denox, PHP, Torch Study (WETO), TVS, WETO (Controlled Emissions Demo) **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
11	VOC Monitoring	9/30/94	18	3/30/96	6
13	Radionuclide Distribution/Partitioning	9/30/93	0	9/30/93	36
14	Waste Form Performance	7/30/89	26	9/30/91	60
15	HEPA Filter Improvements	9/30/94	12	9/30/95	12
20	Refractory Performance	9/30/93	0	9/30/93	36

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
ET-S701	ET	Characterization Required (MLLW)	MLLW:	0	Jaquay, Kenneth	
			MTRU:	5.201		
Mortgaged Activities:		RCRA NDE/NDA	**Included :**	Yes		

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
3	NDE/NDA Initial Characterization		30		24

FM-S801	FM	Ohio Option-Mobile Chem. Tmt Project	MLLW:	650.9	Sattler, John	**4/30/96**
			MTRU:	0		
Mortgaged Activities:		Delphi Detox PeroxydisIfate	**Included :**	Yes	Schedule Slip?	

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
18	Comparative Analysis/Aqueous	10/30/93	6	4/30/94	24
19	Aqueous Organic Nonthermal Destruction	4/30/92	24	4/30/94	24
28	Sludge Washing	10/30/92	30	4/30/95	12
30	Supercritical CO2	10/30/92	18	4/30/94	24

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
GJ-S801B	GJ	Mobile Thermal Desorption Process	MLLW:	87.81	Bounini, Larbi	**8/11/99**
			MTRU:	0		

Mortgaged Activities: Russian Projects
WETO (Controlled Emissions Demo)

Included : Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
3	NDE/NDA Initial Characterization	2/11/95	30	8/11/97	24
9	Mercury Monitoring	8/11/98	6	2/11/99	6
10	Alpha Monitoring	8/11/97	18	2/11/99	6
11	VOC Monitoring	8/11/97	18	2/11/99	6
15	HEPA Filter Improvements	8/11/97	12	8/11/98	12
16	Mercury Filter	8/11/97	12	8/11/98	12

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
GJ-S801C	GJ	Mobile Evaporative Oxidation Process	MLLW:	3.26	Bounini, Larbi	**10/23/2000**
			MTRU:	0		

Mortgaged Activities: Delphi Detox
Peroxydislfate
Russian Projects
WETO (Controlled Emissions Demo)

Included : Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
4	Mercury Separation/Removal	10/23/96	24	10/23/98	24
11	VOC Monitoring	10/23/98	18	4/23/2000	6
21	Nitrate Removal	4/23/98	18	10/23/99	12
23	Internal Drum Pressure Measurement	10/23/98	18	4/23/2000	6
25	Cyanide Destruction	10/23/98	12	10/23/99	12

IN-S005	IN	WERF: Incineration - Controlled Air Incinerator	MLLW:	115.7	Parsons, Les	**9/20/95**
			MTRU:	0		

Mortgaged Activities: Denox
WETO (Controlled Emissions Demo)

Included : Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
9	Mercury Monitoring	9/20/94	6	3/20/95	6
11	VOC Monitoring	9/20/93	18	3/20/95	6
12	Heavy Metal Monitoring	9/20/93	18	3/20/95	6
15	HEPA Filter Improvements	9/20/93	12	9/20/94	12

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
IN-S128	IN	WROC: Mercury Retort for High Mercury Subcat Waste	MLLW:	11.01	Parsons, Les	3/31/2000
			MTRU:	0		

Mortgaged Activities: **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
IN-S150	IN	Advanced Mixed Waste Treatment Project	MLLW:	24380	Anderson, Gary	6/30/2002
			MTRU:	38630		

Mortgaged Activities: Denox
PHP
RCRA NDE/NDA
Russian Projects
Torch Study (WETO)
TVS
WETO (Controlled Emissions Demo)

Included : Yes Hot Ops Date or Contract Date

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
1	Mercury Stabilization	6/30/2000	12	6/30/2001	12
2	Mercury Amalgamation	12/30/2000	12	12/30/2001	6
3	NDE/NDA Initial Characterization	12/30/97	30	6/30/2000	24
4	Mercury Separation/Removal	6/30/98	24	6/30/2000	24
5	Material Handling	6/30/99	0	6/30/99	36
6	Sorting/Segregation	6/30/99	0	6/30/99	36
7	Salt Stabilization	12/30/2000	12	12/30/2001	6
8	Ash Stabilization	12/30/2000	12	12/30/2001	6
9	Mercury Monitoring	6/30/2001	6	12/30/2001	6
10	Alpha Monitoring	6/30/2000	18	12/30/2001	6
11	VOC Monitoring	6/30/2000	18	12/30/2001	6
12	Heavy Metal Monitoring	6/30/2000	18	12/30/2001	6

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
	13	Radionuclide Distribution/Partitioning	6/30/99	0	6/30/99	36
	14	Waste Form Performance	4/30/95	26	6/30/97	60
	15	HEPA Filter Improvements	6/30/2000	12	6/30/2001	12
	16	Mercury Filter	6/30/2000	12	6/30/2001	12
	17	Molten Product - Recanting	6/30/99	0	6/30/99	36
	20	Refractory Performance	6/30/99	0	6/30/99	36

IN-S151	IN	Remote Treatment Facility - RH Preparation Unit	MLLW:	0		**12/31/2007**
			MTRU:	0		

Mortgaged Activities: **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
3	NDE/NDA Initial Characterization	6/30/2003	30	12/31/2005	24
5	Material Handling	12/31/2004	0	12/31/2004	36
6	Sorting/Segregation	12/31/2004	0	12/31/2004	36

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
IN-S152	IN	ICPP - RH Immobilization Facility	MLLW: 497.9 MTRU: 438.6		Olson, Arlin	10/1/2019

Mortgaged Activities: **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
5	Material Handling	10/1/2016	0	10/1/2016	36
10	Alpha Monitoring	10/1/2017	18	4/1/2019	6
12	Heavy Metal Monitoring	10/1/2017	18	4/1/2019	6
14	Waste Form Performance	8/1/2012	26	10/1/2014	60
17	Molten Product - Recanting	10/1/2016	0	10/1/2016	36
20	Refractory Performance	10/1/2016	0	10/1/2016	36

LA-S003	LA	Mobile Reactive Metals Skid	MLLW: 6.83 MTRU: 0		Bounini, Larbi	9/9/2003

Mortgaged Activities: **Included :** Yes Not Funded at this time

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
5	Material Handling	9/9/2000	0	9/9/2000	36

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)	Contact	Est. Hot Ops Start Date
LA-S004	LA	Mobile Plating Wastes Acids/Bases Skid	MLLW: 3.491 MTRU: 0	Bounini, Larbi	3/17/2000

Mortgaged Activities: Peroxydisulfate
Russian Projects

Included : Yes — Not Funded at this time

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
19	Aqueous Organic Nonthermal Destruction	3/17/96	24	3/17/98	24
21	Nitrate Removal	9/17/97	18	3/17/99	12
22	Fission Product Removal	9/17/97	18	3/17/99	12
25	Cyanide Destruction	3/17/98	12	3/17/99	12

LA-S701	LA	Further Characterization	MLLW: 340.5 MTRU: 0	Bounini, Larbi	9/30/98

Mortgaged Activities: RCRA NDE/NDA

Included : Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
3	NDE/NDA Initial Characterization	3/30/94	30	9/30/96	24
5	Material Handling	9/30/95	0	9/30/95	36
6	Sorting/Segregation	9/30/95	0	9/30/95	36

LA-S801	LA	Mobile Gas Scrubbing Skid	MLLW: 0.43 MTRU: 0	Bounini, Larbi	5/10/2002

Mortgaged Activities:

Included : Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
6	Sorting/Segregation	5/10/99	0	5/10/99	36

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)	Contact	Est. Hot Ops Start Date
LA-S833	LA	TRU Treatment Technology Development	MLLW: 0 MTRU: 3856		12/31/2002

Mortgaged Activities: Denox
PHP
Torch Study (WETO)
TVS

Included : Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
1	Mercury Stabilization	12/31/2000	12	12/31/2001	12
4	Mercury Separation/Removal	12/31/98	24	12/31/2000	24
5	Material Handling	12/31/99	0	12/31/99	36
9	Mercury Monitoring	12/30/2001	6	6/30/2002	6
10	Alpha Monitoring	12/30/2000	18	6/30/2002	6
11	VOC Monitoring	12/30/2000	18	6/30/2002	6
12	Heavy Metal Monitoring	12/30/2000	18	6/30/2002	6
14	Waste Form Performance	10/31/95	26	12/31/97	60
17	Molten Product - Recanting	12/31/99	0	12/31/99	36
20	Refractory Performance	12/31/99	0	12/31/99	36
24	Container Integrity Measurement	12/30/2000	18	6/30/2002	6

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
LL-S002	LL	Building 513 Solidification Unit	MLLW:	160.8	Bowers, John	
			MTRU:	0		

Mortgaged Activities: **Included :** Yes Existing??

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
7	Salt Stabilization		12		6
14	Waste Form Performance		26		60

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
LL-S701	LL	Characterization Required	MLLW:	0	Bowers, John	12/31/96
			MTRU:	196.5		

Mortgaged Activities: RCRA NDE/NDA **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
3	NDE/NDA Initial Characterization	6/30/92	30	12/31/94	24

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
NT-S701	NT	Characterize to Determine Rad/Haz Constituents	MLLW:	2.834		
			MTRU:	0.2		

Mortgaged Activities: **Included :** Yes Small Quantity

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
3	NDE/NDA Initial Characterization		30		24

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)	Contact	Est. Hot Ops Start Date
NT-S703	NT	Treatability Assessment	MLLW: 285.7 MTRU: 0		

Mortgaged Activities: **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
7	Salt Stabilization		12		6

TS ID	Site	System Name	Targeted Inv (m^3)	Contact	Est. Hot Ops Start Date
OR-S005	OR	TRU Processing Facility/WIPP Disposal	MLLW: 1246 MTRU: 1967	Gilpin, Jeff	**10/11/2014**

Mortgaged Activities: Denox
RCRA NDE/NDA
Russian Projects

Included : Yes Hot Ops Date or Earlier

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
1	Mercury Stabilization	10/11/2012	12	10/11/2013	12
3	NDE/NDA Initial Characterization	4/11/2010	30	10/11/2012	24
4	Mercury Separation/Removal	10/11/2010	24	10/11/2012	24
5	Material Handling	10/11/2011	0	10/11/2011	36
6	Sorting/Segregation	10/11/2011	0	10/11/2011	36
7	Salt Stabilization	4/11/2013	12	4/11/2014	6
13	Radionuclide Distribution/Partitioning	10/11/2011	0	10/11/2011	36
14	Waste Form Performance	8/11/2007	26	10/11/2009	60
22	Fission Product Removal	4/11/2012	18	10/11/2013	12

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
OR-S802	OR	Actions Driven by CERCLA Record of Decision - ORNL	MLLW:	1777		
			MTRU:	123		

Mortgaged Activities: **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
1	Mercury Stabilization		12		12
5	Material Handling		0		36

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
PA-S701	PA	Meets LDR Standard and/or Needs Sorting Charact.	MLLW:	502.5	Shadoan, W. Tom	**12/31/96**
			MTRU:	0		

Mortgaged Activities: RCRA NDE/NDA **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
3	NDE/NDA Initial Characterization	6/30/92	30	12/31/94	24
6	Sorting/Segregation	12/31/93	0	12/31/93	36

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
PA-S902	PA	Commercial Treatment and Disposal - Unassigned Ven	MLLW: 112.1 MTRU: 0		Shadoan, W. Tom	**12/31/2001**

Mortgaged Activities: RCRA NDE/NDA
Russian Projects

Included : Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
1	Mercury Stabilization	12/31/99	12	12/31/2000	12
3	NDE/NDA Initial Characterization	6/30/97	30	12/31/99	24
4	Mercury Separation/Removal	12/31/97	24	12/31/99	24
6	Sorting/Segregation	12/31/98	0	12/31/98	36
7	Salt Stabilization	6/30/2000	12	6/30/2001	6
14	Waste Form Performance	10/31/94	26	12/31/96	60

PI-S801	PI	Mobile Amalgamation Process (Bench Scale)	MLLW: 0.519 MTRU: 0		Bounini, Larbi	**6/5/2000**

Mortgaged Activities:

Included : Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
2	Mercury Amalgamation	12/5/98	12	12/5/99	6

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
PO-S802	PO	Pretreatment/Regeneration	MLLW:	135.5	Cole, Joanna	**12/31/2001**
			MTRU:	0		

Mortgaged Activities: **Included :** Yes Commercial

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
10	Alpha Monitoring	12/30/99	18	6/30/2001	6
11	VOC Monitoring	12/30/99	18	6/30/2001	6
12	Heavy Metal Monitoring	12/30/99	18	6/30/2001	6
26	Thermal Desorption	12/31/99	0	12/31/99	24

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
PO-S806	PO	Lab Packs Treatment	MLLW:	30.88	Cole, Joanna	6/30/2000
			MTRU:	0		

Mortgaged Activities: Delphi Detox
Denox
Peroxydislfate
Russian Projects
WETO (Controlled Emissions Demo)

Included : Yes Ship date for commerical

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
5	Material Handling	6/30/97	0	6/30/97	36
6	Sorting/Segregation	6/30/97	0	6/30/97	36
7	Salt Stabilization	12/30/98	12	12/30/99	6
8	Ash Stabilization	12/30/98	12	12/30/99	6
9	Mercury Monitoring	6/30/99	6	12/30/99	6
10	Alpha Monitoring	6/30/98	18	12/30/99	6
11	VOC Monitoring	6/30/98	18	12/30/99	6
12	Heavy Metal Monitoring	6/30/98	18	12/30/99	6
14	Waste Form Performance	4/30/93	26	6/30/95	60
18	Comparative Analysis/Aqueous	12/30/97	6	6/30/98	24
19	Aqueous Organic Nonthermal Destruction	6/30/96	24	6/30/98	24
21	Nitrate Removal	12/30/97	18	6/30/99	12

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
PO-S807	PO	Metal Recovery	MLLW:	62.25	Cole, Joanna	9/30/2001
			MTRU:	0		

Mortgaged Activities: Delphi Detox
Peroxydislfate

Included : Yes Hot Ops Date or later

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
18	Comparative Analysis/Aqueous	3/30/99	6	9/30/99	24
19	Aqueous Organic Nonthermal Destruction	9/30/97	24	9/30/99	24
21	Nitrate Removal	3/30/99	18	9/30/2000	12
29	Trace Metal Removal	3/30/99	18	9/30/2000	12

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
PO-S808	PO	Physical Chemical Treatment	MLLW:	77.96	Cole, Joanna	9/30/2001
			MTRU:	0		

Mortgaged Activities: Russian Projects

Included : Yes Hot Ops Date or later

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
22	Fission Product Removal	3/30/99	18	9/30/2000	12
27	Evaporator Design	9/30/99	0	9/30/99	24
29	Trace Metal Removal	3/30/99	18	9/30/2000	12

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
PO-S809	PO	On-Site Stabilization	MLLW: 5383 MTRU: 0		Cole, Joanna	9/30/2002

Mortgaged Activities: Delphi Detox
Peroxydisifate

Included : Yes — Would like to include under DP-S814

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
18	Comparative Analysis/Aqueous	3/30/2000	6	9/30/2000	24
19	Aqueous Organic Nonthermal Destruction	9/30/98	24	9/30/2000	24
28	Sludge Washing	3/30/99	30	9/30/2001	12

PO-S901	PO	Commercial Offsite Recycling Facility(s)	MLLW: 117.5 MTRU: 0			

Mortgaged Activities:

Included : Yes — Commercial

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
99	TD assignment being assessed		0		0

PO-S902	PO	Commercial Offsite Incinerator	MLLW: 1906 MTRU: 0			

Mortgaged Activities:

Included : Yes — Commercial

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
99	TD assignment being assessed		0		0

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* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
RF-S016	RF	CTMP System 3-LLW Miscellaneous Waste Forms Im	MLLW: MTRU:	3501 0	McKeown, Tim	**5/31/2005**

Mortgaged Activities: Russian Projects

Included : Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
7	Salt Stabilization	1/1/96 *	12	9/1/98 *	6
8	Ash Stabilization	10/1/96 *	12	9/1/98 *	6
25	Cyanide Destruction	1/1/96 *	12	10/1/98 *	12

RF-S017	RF	CTMP System 2/4B-LLW Buildings 374/774 Sludge Im	MLLW: MTRU:	524.5 0	McKeown, Tim	**6/1/2010**

Mortgaged Activities: Denox
Russian Projects

Included : Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
4	Mercury Separation/Removal	1/31/96 *	24	1/31/99 *	24
7	Salt Stabilization	7/31/98 *	12	7/31/2000 *	6
14	Waste Form Performance	1/31/94 *	26	1/31/96 *	60

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
RF-S019	RF	CTMP System 5-LLW Surface Organic Contaminant Re	MLLW:	2097	McKeown, Tim	4/1/2008
			MTRU:	0		

Mortgaged Activities: **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
4	Mercury Separation/Removal	8/31/95 *	24	8/31/98 *	24
5	Material Handling	8/31/94 *	0	8/31/97 *	36
6	Sorting/Segregation	8/31/95 *	0	8/31/97 *	36
7	Salt Stabilization	10/1/96 *	12	10/1/98 *	6
11	VOC Monitoring	10/1/96 *	18	10/1/98 *	6
19	Aqueous Organic Nonthermal Destruction	10/1/96 *	24	10/1/98 *	24
30	Supercritical CO2	10/1/96 *	18	10/1/98 *	24

RF-S020	RF	Residue Stabilization	MLLW:	0	McKeown, Tim	6/1/98
			MTRU:	0.1		

Mortgaged Activities: Russian Projects **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
7	Salt Stabilization	1/1/96 *	12	6/1/97 *	6
8	Ash Stabilization	10/1/96 *	12	12/1/98 *	6
14	Waste Form Performance	4/1/91	26	6/1/93	60

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
RF-S028	RF	CTMP System 6-LLW Pondcrete Remix	MLLW:	6794	McKeown, Tim	11/1/99
			MTRU:	0		

Mortgaged Activities: **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
5	Material Handling	10/1/96 *	0	5/1/98 *	36
6	Sorting/Segregation	10/1/96 *	0	5/1/98 *	36

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
RF-S801	RF	CTMP Path F System-Treatment of MTRU Wastes to	MLLW:	0	McKeown, Tim	10/1/2012
			MTRU:	547.8		

Mortgaged Activities: RCRA NDE/NDA **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
3	NDE/NDA Initial Characterization	10/21/97 *	30	10/21/2000 *	24
5	Material Handling	10/21/96 *	0	10/21/99 *	36
6	Sorting/Segregation	10/21/97 *	0	10/21/99 *	36
7	Salt Stabilization	10/1/98 *	12	10/1/2000 *	6
14	Waste Form Performance	10/21/95 *	26	10/21/97 *	60
23	Internal Drum Pressure Measurement	10/1/96 *	18	10/1/97 *	6
24	Container Integrity Measurement	10/1/96 *	18	10/1/98 *	6

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
RL-S802	RL	Amalgamation at Purex	MLLW:	0.01	Waring, Joe	
			MTRU:	0		

Mortgaged Activities: **Included :** Yes — No Hot Ops date available

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
2	Mercury Amalgamation		12		6
5	Material Handling		0		36

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
SA-S810	SA	Mobile Packed Bed Reactor/Silent Discharge Plasma T	MLLW:	23.07	Bounini, Larbi	12/23/98
			MTRU:	0		

Mortgaged Activities: **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
9	Mercury Monitoring	12/23/97	6	6/23/98	6
11	VOC Monitoring	12/23/96	18	6/23/98	6
12	Heavy Metal Monitoring	12/23/96	18	6/23/98	6

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
SA-S813	SA	TRU Treatment Technology Development	MLLW:	0	Guth, John	
			MTRU:	0.95		

Mortgaged Activities: RCRA NDE/NDA **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
3	NDE/NDA Initial Characterization		30		24

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
SR-S015	SR	M-Area Vendor Treatment Process	MLLW:	2451	Pickett, John	**4/20/96**
			MTRU:	0		

Mortgaged Activities: Denox
PHP
Russian Projects
TVS
WETO (Controlled Emissions Demo)

Included : Yes Existing?

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
13	Radionuclide Distribution/Partitioning	4/20/93	0	4/20/93	36
14	Waste Form Performance	2/20/89	26	4/20/91	60

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
SR-S018	SR	Consolidated Incineration Facility -Liquid &Solid Feeds	MLLW:	1379	Crook, Steven	12/30/96
			MTRU:	0		

Mortgaged Activities: Denox
WETO (Controlled Emissions Demo)

Included : Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
1	Mercury Stabilization	12/30/94	12	12/30/95	12
4	Mercury Separation/Removal	12/30/92	24	12/30/94	24
7	Salt Stabilization	6/30/95	12	6/30/96	6
8	Ash Stabilization	6/30/95	12	6/30/96	6
9	Mercury Monitoring	12/30/95	6	6/30/96	6
10	Alpha Monitoring	12/30/94	18	6/30/96	6
11	VOC Monitoring	12/30/94	18	6/30/96	6
12	Heavy Metal Monitoring	12/30/94	18	6/30/96	6
15	HEPA Filter Improvements	12/30/94	12	12/30/95	12
16	Mercury Filter	12/30/94	12	12/30/95	12
20	Refractory Performance	12/30/93	0	12/30/93	36
21	Nitrate Removal	6/30/94	18	12/30/95	12

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
SR-S701	SR	MTRU & 10-100 nCi/g Characterization/Treatment	MLLW:	2753		9/30/2008
			MTRU:	4940		

Mortgaged Activities: RCRA NDE/NDA **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
3	NDE/NDA Initial Characterization	3/30/2004	30	9/30/2006	24
5	Material Handling	9/30/2005	0	9/30/2005	36
6	Sorting/Segregation	9/30/2005	0	9/30/2005	36
23	Internal Drum Pressure Measurement	9/30/2006	18	3/30/2008	6
24	Container Integrity Measurement	9/30/2006	18	3/30/2008	6

SR-S804	SR	Offsite Vendor Treatment	MLLW:	82.2		9/30/98
			MTRU:	0		

Mortgaged Activities: **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
6	Sorting/Segregation	9/30/95	0	9/30/95	36

SR-S809	SR	RH Macroencaps-Containment Bldg. by Treat Variance	MLLW:	10.2		9/30/2002
			MTRU:	0		

Mortgaged Activities: **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
5	Material Handling	9/30/99	0	9/30/99	36
14	Waste Form Performance	7/30/95	26	9/30/97	60

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
SR-S811	SR	Further Characterization/Studies Required	MLLW:	260		
			MTRU:	0		
Mortgaged Activities:		RCRA NDE/NDA	**Included :**	Yes		

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
3	NDE/NDA Initial Characterization		30		24

WP-S001	WP	WIPP Option	MLLW:	0		**1/31/98**
			MTRU:	10.85		
Mortgaged Activities:		RCRA NDE/NDA	**Included :**	Yes		

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
3	NDE/NDA Initial Characterization	7/31/93	30	1/31/96	24

WS-S804	WS	Amalgamation	MLLW:	0.4		**12/31/95**
			MTRU:	0		
Mortgaged Activities:			**Included :**	Yes		

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
2	Mercury Amalgamation	6/30/94	12	6/30/95	6

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)		Contact	Est. Hot Ops Start Date
WV-S701	WV	Further Characterization Required to Determine Treatm	MLLW:	6.926		12/31/96
			MTRU:	0.042		

Mortgaged Activities: **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
3	NDE/NDA Initial Characterization	6/30/92	30	12/31/94	24
5	Material Handling	12/31/93	0	12/31/93	36
6	Sorting/Segregation	12/31/93	0	12/31/93	36

WV-S702	WV	Further Characterization Required to Determine Treatm	MLLW:	66.81		12/31/98
			MTRU:	0		

Mortgaged Activities: **Included :** Yes

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
3	NDE/NDA Initial Characterization	6/30/94	30	12/31/96	24
5	Material Handling	12/31/95	0	12/31/95	36
6	Sorting/Segregation	12/31/95	0	12/31/95	36

* indicates Site specified date.

TS ID	Site	System Name	Targeted Inv (m^3)	Contact	Est. Hot Ops Start Date
YP-S002	YP	Central Pollution Control Facility (CPCF)	MLLW: 402.5 MTRU: 0	Conley, Tom	**12/30/96**

Mortgaged Activities: **Included :** Yes TD enhancements to treat new wastes. (T Conley)

Tech Def #	Tech Def Name	TD Should Start By	Est. Dev Time (mo)	TD Due Date	Est. TD Impl. (mo)
2	Mercury Amalgamation	6/30/95	12	6/30/96	6
4	Mercury Separation/Removal	12/30/92	24	12/30/94	24
16	Mercury Filter	12/30/94	12	12/30/95	12
25	Cyanide Destruction	12/30/94	12	12/30/95	12
29	Trace Metal Removal	6/30/94	18	12/30/95	12

* indicates Site specified date.

TABLE 2.

IMS - Treatment System by TD Category

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
1	Mercury Stabilization	12	12

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
DP-S002	TSCA Incinerator	DP	MLLW:	2579	6/30/95	6/30/97
			MTRU:	0		
DP-S809	Transportable Vitrification System (TVS)	DP	MLLW:	783.3	4/1/97 *	6/30/96
			MTRU:	0		
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	6/30/2000	6/30/2002
			MTRU:	38630		
LA-S833	TRU Treatment Technology Development	LA	MLLW:	0	12/31/2000	12/31/2002
			MTRU:	3856		
OR-S005	TRU Processing Facility/WIPP Disposal	OR	MLLW:	1246	10/11/2012	10/11/2014
			MTRU:	1967		
OR-S802	Actions Driven by CERCLA Record of Decision - ORNL	OR	MLLW:	1777		
			MTRU:	123		
PA-S902	Commercial Treatment and Disposal - Unassigned Vendor	PA	MLLW:	112.1	12/31/99	12/31/2001
			MTRU:	0		
SR-S018	Consolidated Incineration Facility -Liquid &Solid Feeds	SR	MLLW:	1379	12/30/94	12/30/96
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
2	Mercury Amalgamation	12	6

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
DP-S002	TSCA Incinerator	DP	MLLW:	2579	12/30/95	6/30/97
			MTRU:	0		
DP-S809	Transportable Vitrification System (TVS)	DP	MLLW:	783.3	4/1/97 *	6/30/96
			MTRU:	0		
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	12/30/2000	6/30/2002
			MTRU:	38630		
PI-S801	Mobile Amalgamation Process (Bench Scale)	PI	MLLW:	0.519	12/5/98	6/5/2000
			MTRU:	0		
RL-S802	Amalgamation at Purex	RL	MLLW:	0.01		
			MTRU:	0		
WS-S804	Amalgamation	WS	MLLW:	0.4	6/30/94	12/31/95
			MTRU:	0		
YP-S002	Central Pollution Control Facility (CPCF)	YP	MLLW:	402.5	6/30/95	12/30/96
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
3	NDE/NDA Initial Characterization	30	24

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
BN-S701	Characterize to Determine Hazardous Constituents	BN	MLLW:	16.4		
			MTRU:	0		
DP-S002	TSCA Incinerator	DP	MLLW:	2579	12/30/92	6/30/97
			MTRU:	0		
DP-S809	Transportable Vitrification System (TVS)	DP	MLLW:	783.3	3/30/95 *	6/30/96
			MTRU:	0		
ET-S701	Characterization Required (MLLW)	ET	MLLW:	0		
			MTRU:	5.201		
GJ-S801B	Mobile Thermal Desorption Process	GJ	MLLW:	87.81	2/11/95	8/11/99
			MTRU:	0		
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	12/30/97	6/30/2002
			MTRU:	38630		
IN-S151	Remote Treatment Facility - RH Preparation Unit	IN	MLLW:	0	6/30/2003	12/31/2007
			MTRU:	0		
LA-S701	Further Characterization	LA	MLLW:	340.5	3/30/94	9/30/98
			MTRU:	0		
LL-S701	Characterization Required	LL	MLLW:	0	6/30/92	12/31/96
			MTRU:	196.5		
NT-S701	Characterize to Determine Rad/Haz Constituents	NT	MLLW:	2.834		
			MTRU:	0.2		
OR-S005	TRU Processing Facility/WIPP Disposal	OR	MLLW:	1246	4/11/2010	10/11/2014
			MTRU:	1967		
PA-S701	Meets LDR Standard and/or Needs Sorting Charact.	PA	MLLW:	502.5	6/30/92	12/31/96
			MTRU:	0		
PA-S902	Commercial Treatment and Disposal - Unassigned Vendor	PA	MLLW:	112.1	6/30/97	12/31/2001
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name			TD Dev Time (mo)	TD Imp Time (mo)
RF-S801	CTMP Path F System-Treatment of MTRU Wastes to Meet W	RF	MLLW: 0 MTRU: 547.8	4/21/98 *	10/1/2012
SA-S813	TRU Treatment Technology Development	SA	MLLW: 0 MTRU: 0.95		
SR-S701	MTRU & 10-100 nCi/g Characterization/Treatment	SR	MLLW: 2753 MTRU: 4940	3/30/2004	9/30/2008
SR-S811	Further Characterization/Studies Required	SR	MLLW: 260 MTRU: 0		
WP-S001	WIPP Option	WP	MLLW: 0 MTRU: 10.85	7/31/93	1/31/98
WV-S701	Further Characterization Required to Determine Treatmen	WV	MLLW: 6.926 MTRU: 0.042	6/30/92	12/31/96
WV-S702	Further Characterization Required to Determine Treatmen	WV	MLLW: 66.81 MTRU: 0	6/30/94	12/31/98

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
4	Mercury Separation/Removal	24	24

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
GJ-S801C	Mobile Evaporative Oxidation Process	GJ	MLLW:	3.26	10/23/96	10/23/2000
			MTRU:	0		
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	6/30/98	6/30/2002
			MTRU:	38630		
LA-S833	TRU Treatment Technology Development	LA	MLLW:	0	12/31/98	12/31/2002
			MTRU:	3856		
OR-S005	TRU Processing Facility/WIPP Disposal	OR	MLLW:	1246	10/11/2010	10/11/2014
			MTRU:	1967		
PA-S902	Commercial Treatment and Disposal - Unassigned Vendor	PA	MLLW:	112.1	12/31/97	12/31/2001
			MTRU:	0		
RF-S017	CTMP System 2/4B-LLW Buildings 374/774 Sludge Immobiliz	RF	MLLW:	524.5	1/31/97 *	6/1/2010
			MTRU:	0		
RF-S019	CTMP System 5-LLW Surface Organic Contaminant Removal	RF	MLLW:	2097	8/31/96 *	4/1/2008
			MTRU:	0		
SR-S018	Consolidated Incineration Facility -Liquid &Solid Feeds	SR	MLLW:	1379	12/30/92	12/30/96
			MTRU:	0		
YP-S002	Central Pollution Control Facility (CPCF)	YP	MLLW:	402.5	12/30/92	12/30/96
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
5	Material Handling	0	36

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
AW-S007	Remote Treatment Facility (RTF)	AW	MLLW:	44.45	9/30/2004	9/30/2007
			MTRU:	13.88		
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	6/30/99	6/30/2002
			MTRU:	38630		
IN-S151	Remote Treatment Facility - RH Preparation Unit	IN	MLLW:	0	12/31/2004	12/31/2007
			MTRU:	0		
IN-S152	ICPP - RH Immobilization Facility	IN	MLLW:	497.9	10/1/2016	10/1/2019
			MTRU:	438.6		
LA-S003	Mobile Reactive Metals Skid	LA	MLLW:	6.83	9/9/2000	9/9/2003
			MTRU:	0		
LA-S701	Further Characterization	LA	MLLW:	340.5	9/30/95	9/30/98
			MTRU:	0		
LA-S833	TRU Treatment Technology Development	LA	MLLW:	0	12/31/99	12/31/2002
			MTRU:	3856		
OR-S005	TRU Processing Facility/WIPP Disposal	OR	MLLW:	1246	10/11/2011	10/11/2014
			MTRU:	1967		
OR-S802	Actions Driven by CERCLA Record of Decision - ORNL	OR	MLLW:	1777		
			MTRU:	123		
PO-S806	Lab Packs Treatment	PO	MLLW:	30.88	6/30/97	6/30/2000
			MTRU:	0		
RF-S019	CTMP System 5-LLW Surface Organic Contaminant Removal	RF	MLLW:	2097	8/31/97 *	4/1/2008
			MTRU:	0		
RF-S028	CTMP System 6-LLW Pondcrete Remix	RF	MLLW:	6794	5/1/98 *	11/1/99
			MTRU:	0		
RF-S801	CTMP Path F System-Treatment of MTRU Wastes to Meet W	RF	MLLW:	0	10/21/99 *	10/1/2012
			MTRU:	547.8		
RL-S802	Amalgamation at Purex	RL	MLLW:	0.01		
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name				TD Dev Time (mo)	TD Imp Time (mo)
SR-S701	MTRU & 10-100 nCi/g Characterization/Treatment	SR	MLLW:	2753	9/30/2005	9/30/2008
			MTRU:	4940		
SR-S809	RH Macroencaps-Containment Bldg. by Treat Variance	SR	MLLW:	10.2	9/30/99	9/30/2002
			MTRU:	0		
WV-S701	Further Characterization Required to Determine Treatmen	WV	MLLW:	6.926	12/31/93	12/31/96
			MTRU:	0.042		
WV-S702	Further Characterization Required to Determine Treatmen	WV	MLLW:	66.81	12/31/95	12/31/98
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
6	Sorting/Segregation	0	36

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
DP-S809	Transportable Vitrification System (TVS)	DP	MLLW:	783.3	9/30/97 *	6/30/96
			MTRU:	0		
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	6/30/99	6/30/2002
			MTRU:	38630		
IN-S151	Remote Treatment Facility - RH Preparation Unit	IN	MLLW:	0	12/31/2004	12/31/2007
			MTRU:	0		
LA-S701	Further Characterization	LA	MLLW:	340.5	9/30/95	9/30/98
			MTRU:	0		
LA-S801	Mobile Gas Scrubbing Skid	LA	MLLW:	0.43	5/10/99	5/10/2002
			MTRU:	0		
OR-S005	TRU Processing Facility/WIPP Disposal	OR	MLLW:	1246	10/11/2011	10/11/2014
			MTRU:	1967		
PA-S701	Meets LDR Standard and/or Needs Sorting Charact.	PA	MLLW:	502.5	12/31/93	12/31/96
			MTRU:	0		
PA-S902	Commercial Treatment and Disposal - Unassigned Vendor	PA	MLLW:	112.1	12/31/98	12/31/2001
			MTRU:	0		
PO-S806	Lab Packs Treatment	PO	MLLW:	30.88	6/30/97	6/30/2000
			MTRU:	0		
RF-S019	CTMP System 5-LLW Surface Organic Contaminant Removal	RF	MLLW:	2097	8/31/97 *	4/1/2008
			MTRU:	0		
RF-S028	CTMP System 6-LLW Pondcrete Remix	RF	MLLW:	6794	5/1/98 *	11/1/99
			MTRU:	0		
RF-S801	CTMP Path F System-Treatment of MTRU Wastes to Meet W	RF	MLLW:	0	10/21/99 *	10/1/2012
			MTRU:	547.8		
SR-S701	MTRU & 10-100 nCi/g Characterization/Treatment	SR	MLLW:	2753	9/30/2005	9/30/2008
			MTRU:	4940		
SR-S804	Offsite Vendor Treatment	SR	MLLW:	82.2	9/30/95	9/30/98
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name			TD Dev Time (mo)	TD Imp Time (mo)
WV-S701	Further Characterization Required to Determine Treatmen	WV	MLLW:	6.926	12/31/93	12/31/96
			MTRU:	0.042		
WV-S702	Further Characterization Required to Determine Treatmen	WV	MLLW:	66.81	12/31/95	12/31/98
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
7	Salt Stabilization	12	6

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	12/30/2000	6/30/2002
			MTRU:	38630		
LL-S002	Building 513 Solidification Unit	LL	MLLW:	160.8		
			MTRU:	0		
NT-S703	Treatability Assessment	NT	MLLW:	285.7		
			MTRU:	0		
OR-S005	TRU Processing Facility/WIPP Disposal	OR	MLLW:	1246	4/11/2013	10/11/2014
			MTRU:	1967		
PA-S902	Commercial Treatment and Disposal - Unassigned Vendor	PA	MLLW:	112.1	6/30/2000	12/31/2001
			MTRU:	0		
PO-S806	Lab Packs Treatment	PO	MLLW:	30.88	12/30/98	6/30/2000
			MTRU:	0		
RF-S016	CTMP System 3-LLW Miscellaneous Waste Forms Immobiliz	RF	MLLW:	3501	9/1/97 *	5/31/2005
			MTRU:	0		
RF-S017	CTMP System 2/4B-LLW Buildings 374/774 Sludge Immobiliz	RF	MLLW:	524.5	7/31/99 *	6/1/2010
			MTRU:	0		
RF-S019	CTMP System 5-LLW Surface Organic Contaminant Removal	RF	MLLW:	2097	10/1/97 *	4/1/2008
			MTRU:	0		
RF-S020	Residue Stabilization	RF	MLLW:	0	6/1/96 *	6/1/98
			MTRU:	0.1		
RF-S801	CTMP Path F System-Treatment of MTRU Wastes to Meet W	RF	MLLW:	0	10/1/99 *	10/1/2012
			MTRU:	547.8		
SR-S018	Consolidated Incineration Facility -Liquid &Solid Feeds	SR	MLLW:	1379	6/30/95	12/30/96
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
8	Ash Stabilization	12	6

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
DP-S002	TSCA Incinerator	DP	MLLW:	2579	12/30/95	6/30/97
			MTRU:	0		
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	12/30/2000	6/30/2002
			MTRU:	38630		
PO-S806	Lab Packs Treatment	PO	MLLW:	30.88	12/30/98	6/30/2000
			MTRU:	0		
RF-S016	CTMP System 3-LLW Miscellaneous Waste Forms Immobiliz	RF	MLLW:	3501	9/1/97 *	5/31/2005
			MTRU:	0		
RF-S020	Residue Stabilization	RF	MLLW:	0	12/1/97 *	6/1/98
			MTRU:	0.1		
SR-S018	Consolidated Incineration Facility -Liquid &Solid Feeds	SR	MLLW:	1379	6/30/95	12/30/96
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
9	Mercury Monitoring	6	6

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
DP-S002	TSCA Incinerator	DP	MLLW:	2579	6/30/96	6/30/97
			MTRU:	0		
DP-S809	Transportable Vitrification System (TVS)	DP	MLLW:	783.3	10/1/97 *	6/30/96
			MTRU:	0		
GJ-S801B	Mobile Thermal Desorption Process	GJ	MLLW:	87.81	8/11/98	8/11/99
			MTRU:	0		
IN-S005	WERF: Incineration - Controlled Air Incinerator	IN	MLLW:	115.7	9/20/94	9/20/95
			MTRU:	0		
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	6/30/2001	6/30/2002
			MTRU:	38630		
LA-S833	TRU Treatment Technology Development	LA	MLLW:	0	12/30/2001	12/31/2002
			MTRU:	3856		
PO-S806	Lab Packs Treatment	PO	MLLW:	30.88	6/30/99	6/30/2000
			MTRU:	0		
SA-S810	Mobile Packed Bed Reactor/Silent Discharge Plasma Treat	SA	MLLW:	23.07	12/23/97	12/23/98
			MTRU:	0		
SR-S018	Consolidated Incineration Facility -Liquid &Solid Feeds	SR	MLLW:	1379	12/30/95	12/30/96
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
10	Alpha Monitoring	18	6

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
DP-S002	TSCA Incinerator	DP	MLLW:	2579	6/30/95	6/30/97
			MTRU:	0		
GJ-S801B	Mobile Thermal Desorption Process	GJ	MLLW:	87.81	8/11/97	8/11/99
			MTRU:	0		
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	6/30/2000	6/30/2002
			MTRU:	38630		
IN-S152	ICPP - RH Immobilization Facility	IN	MLLW:	497.9	10/1/2017	10/1/2019
			MTRU:	438.6		
LA-S833	TRU Treatment Technology Development	LA	MLLW:	0	12/30/2000	12/31/2002
			MTRU:	3856		
PO-S802	Pretreatment/Regeneration	PO	MLLW:	135.5	12/30/99	12/31/2001
			MTRU:	0		
PO-S806	Lab Packs Treatment	PO	MLLW:	30.88	6/30/98	6/30/2000
			MTRU:	0		
SR-S018	Consolidated Incineration Facility -Liquid &Solid Feeds	SR	MLLW:	1379	12/30/94	12/30/96
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
11	VOC Monitoring	18	6

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
DP-S002	TSCA Incinerator	DP	MLLW:	2579	6/30/95	6/30/97
			MTRU:	0		
DP-S809	Transportable Vitrification System (TVS)	DP	MLLW:	783.3	10/1/96 *	6/30/96
			MTRU:	0		
DP-S816	Oak Ridge Commercial Treatment - Sludges	DP	MLLW:	6964	9/30/94	9/30/96
			MTRU:	0		
GJ-S801B	Mobile Thermal Desorption Process	GJ	MLLW:	87.81	8/11/97	8/11/99
			MTRU:	0		
GJ-S801C	Mobile Evaporative Oxidation Process	GJ	MLLW:	3.26	10/23/98	10/23/2000
			MTRU:	0		
IN-S005	WERF: Incineration - Controlled Air Incinerator	IN	MLLW:	115.7	9/20/93	9/20/95
			MTRU:	0		
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	6/30/2000	6/30/2002
			MTRU:	38630		
LA-S833	TRU Treatment Technology Development	LA	MLLW:	0	12/30/2000	12/31/2002
			MTRU:	3856		
PO-S802	Pretreatment/Regeneration	PO	MLLW:	135.5	12/30/99	12/31/2001
			MTRU:	0		
PO-S806	Lab Packs Treatment	PO	MLLW:	30.88	6/30/98	6/30/2000
			MTRU:	0		
RF-S019	CTMP System 5-LLW Surface Organic Contaminant Removal	RF	MLLW:	2097	4/1/97 *	4/1/2008
			MTRU:	0		
SA-S810	Mobile Packed Bed Reactor/Silent Discharge Plasma Treat	SA	MLLW:	23.07	12/23/96	12/23/98
			MTRU:	0		
SR-S018	Consolidated Incineration Facility -Liquid &Solid Feeds	SR	MLLW:	1379	12/30/94	12/30/96
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
12	Heavy Metal Monitoring	18	6

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
DP-S002	TSCA Incinerator	DP	MLLW:	2579	6/30/95	6/30/97
			MTRU:	0		
DP-S809	Transportable Vitrification System (TVS)	DP	MLLW:	783.3	10/1/96 *	6/30/96
			MTRU:	0		
IN-S005	WERF: Incineration - Controlled Air Incinerator	IN	MLLW:	115.7	9/20/93	9/20/95
			MTRU:	0		
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	6/30/2000	6/30/2002
			MTRU:	38630		
IN-S152	ICPP - RH Immobilization Facility	IN	MLLW:	497.9	10/1/2017	10/1/2019
			MTRU:	438.6		
LA-S833	TRU Treatment Technology Development	LA	MLLW:	0	12/30/2000	12/31/2002
			MTRU:	3856		
PO-S802	Pretreatment/Regeneration	PO	MLLW:	135.5	12/30/99	12/31/2001
			MTRU:	0		
PO-S806	Lab Packs Treatment	PO	MLLW:	30.88	6/30/98	6/30/2000
			MTRU:	0		
SA-S810	Mobile Packed Bed Reactor/Silent Discharge Plasma Treat	SA	MLLW:	23.07	12/23/96	12/23/98
			MTRU:	0		
SR-S018	Consolidated Incineration Facility -Liquid &Solid Feeds	SR	MLLW:	1379	12/30/94	12/30/96
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
13	Radionuclide Distribution/Partitioning	0	36

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
DP-S816	Oak Ridge Commercial Treatment - Sludges	DP	MLLW:	6964	9/30/93	9/30/96
			MTRU:	0		
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	6/30/99	6/30/2002
			MTRU:	38630		
OR-S005	TRU Processing Facility/WIPP Disposal	OR	MLLW:	1246	10/11/2011	10/11/2014
			MTRU:	1967		
SR-S015	M-Area Vendor Treatment Process	SR	MLLW:	2451	4/20/93	4/20/96
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
14	Waste Form Performance	26	60

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
DP-S809	Transportable Vitrification System (TVS)	DP	MLLW:	783.3	7/30/95 *	6/30/96
			MTRU:	0		
DP-S816	Oak Ridge Commercial Treatment - Sludges	DP	MLLW:	6964	7/30/89	9/30/96
			MTRU:	0		
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	4/30/95	6/30/2002
			MTRU:	38630		
IN-S152	ICPP - RH Immobilization Facility	IN	MLLW:	497.9	8/1/2012	10/1/2019
			MTRU:	438.6		
LA-S833	TRU Treatment Technology Development	LA	MLLW:	0	10/31/95	12/31/2002
			MTRU:	3856		
LL-S002	Building 513 Solidification Unit	LL	MLLW:	160.8		
			MTRU:	0		
OR-S005	TRU Processing Facility/WIPP Disposal	OR	MLLW:	1246	8/11/2007	10/11/2014
			MTRU:	1967		
PA-S902	Commercial Treatment and Disposal - Unassigned Vendor	PA	MLLW:	112.1	10/31/94	12/31/2001
			MTRU:	0		
PO-S806	Lab Packs Treatment	PO	MLLW:	30.88	4/30/93	6/30/2000
			MTRU:	0		
RF-S017	CTMP System 2/4B-LLW Buildings 374/774 Sludge Immobiliz	RF	MLLW:	524.5	11/30/93 *	6/1/2010
			MTRU:	0		
RF-S020	Residue Stabilization	RF	MLLW:	0	4/1/91	6/1/98
			MTRU:	0.1		
RF-S801	CTMP Path F System-Treatment of MTRU Wastes to Meet W	RF	MLLW:	0	8/21/95 *	10/1/2012
			MTRU:	547.8		
SR-S015	M-Area Vendor Treatment Process	SR	MLLW:	2451	2/20/89	4/20/96
			MTRU:	0		
SR-S809	RH Macroencaps-Containment Bldg. by Treat Variance	SR	MLLW:	10.2	7/30/95	9/30/2002
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
15	HEPA Filter Improvements	12	12

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
DP-S809	Transportable Vitrification System (TVS)	DP	MLLW:	783.3	9/30/96 *	6/30/96
			MTRU:	0		
DP-S816	Oak Ridge Commercial Treatment - Sludges	DP	MLLW:	6964	9/30/94	9/30/96
			MTRU:	0		
GJ-S801B	Mobile Thermal Desorption Process	GJ	MLLW:	87.81	8/11/97	8/11/99
			MTRU:	0		
IN-S005	WERF: Incineration - Controlled Air Incinerator	IN	MLLW:	115.7	9/20/93	9/20/95
			MTRU:	0		
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	6/30/2000	6/30/2002
			MTRU:	38630		
SR-S018	Consolidated Incineration Facility -Liquid &Solid Feeds	SR	MLLW:	1379	12/30/94	12/30/96
			MTRU:	0		

16	Mercury Filter	12	12

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
GJ-S801B	Mobile Thermal Desorption Process	GJ	MLLW:	87.81	8/11/97	8/11/99
			MTRU:	0		
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	6/30/2000	6/30/2002
			MTRU:	38630		
SR-S018	Consolidated Incineration Facility -Liquid &Solid Feeds	SR	MLLW:	1379	12/30/94	12/30/96
			MTRU:	0		
YP-S002	Central Pollution Control Facility (CPCF)	YP	MLLW:	402.5	12/30/94	12/30/96
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
17	**Molten Product - Recanting**	0	36

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	6/30/99	6/30/2002
			MTRU:	38630		
IN-S152	ICPP - RH Immobilization Facility	IN	MLLW:	497.9	10/1/2016	10/1/2019
			MTRU:	438.6		
LA-S833	TRU Treatment Technology Development	LA	MLLW:	0	12/31/99	12/31/2002
			MTRU:	3856		

18	**Comparative Analysis/Aqueous**	6	24

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
FM-S801	Ohio Option-Mobile Chem. Tmt Project	FM	MLLW:	650.9	10/30/93	4/30/96
			MTRU:	0		
PO-S806	Lab Packs Treatment	PO	MLLW:	30.88	12/30/97	6/30/2000
			MTRU:	0		
PO-S807	Metal Recovery	PO	MLLW:	62.25	3/30/99	9/30/2001
			MTRU:	0		
PO-S809	On-Site Stabilization	PO	MLLW:	5383	3/30/2000	9/30/2002
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
19	Aqueous Organic Nonthermal Destruction	24	24

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
FM-S801	Ohio Option-Mobile Chem. Tmt Project	FM	MLLW:	650.9	4/30/92	4/30/96
			MTRU:	0		
LA-S004	Mobile Plating Wastes Acids/Bases Skid	LA	MLLW:	3.491	3/17/96	3/17/2000
			MTRU:	0		
PO-S806	Lab Packs Treatment	PO	MLLW:	30.88	6/30/96	6/30/2000
			MTRU:	0		
PO-S807	Metal Recovery	PO	MLLW:	62.25	9/30/97	9/30/2001
			MTRU:	0		
PO-S809	On-Site Stabilization	PO	MLLW:	5383	9/30/98	9/30/2002
			MTRU:	0		
RF-S019	CTMP System 5-LLW Surface Organic Contaminant Removal	RF	MLLW:	2097	10/1/96 *	4/1/2008
			MTRU:	0		

20	Refractory Performance	0	36

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
DP-S809	Transportable Vitrification System (TVS)	DP	MLLW:	783.3	9/30/97 *	6/30/96
			MTRU:	0		
DP-S816	Oak Ridge Commercial Treatment - Sludges	DP	MLLW:	6964	9/30/93	9/30/96
			MTRU:	0		
IN-S150	Advanced Mixed Waste Treatment Project	IN	MLLW:	24380	6/30/99	6/30/2002
			MTRU:	38630		
IN-S152	ICPP - RH Immobilization Facility	IN	MLLW:	497.9	10/1/2016	10/1/2019
			MTRU:	438.6		
LA-S833	TRU Treatment Technology Development	LA	MLLW:	0	12/31/99	12/31/2002
			MTRU:	3856		
SR-S018	Consolidated Incineration Facility -Liquid &Solid Feeds	SR	MLLW:	1379	12/30/93	12/30/96
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
21	Nitrate Removal	18	12

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
GJ-S801C	Mobile Evaporative Oxidation Process	GJ	MLLW:	3.26	4/23/98	10/23/2000
			MTRU:	0		
LA-S004	Mobile Plating Wastes Acids/Bases Skid	LA	MLLW:	3.491	9/17/97	3/17/2000
			MTRU:	0		
PO-S806	Lab Packs Treatment	PO	MLLW:	30.88	12/30/97	6/30/2000
			MTRU:	0		
PO-S807	Metal Recovery	PO	MLLW:	62.25	3/30/99	9/30/2001
			MTRU:	0		
SR-S018	Consolidated Incineration Facility -Liquid &Solid Feeds	SR	MLLW:	1379	6/30/94	12/30/96
			MTRU:	0		

22	Fission Product Removal	18	12

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
LA-S004	Mobile Plating Wastes Acids/Bases Skid	LA	MLLW:	3.491	9/17/97	3/17/2000
			MTRU:	0		
OR-S005	TRU Processing Facility/WIPP Disposal	OR	MLLW:	1246	4/11/2012	10/11/2014
			MTRU:	1967		
PO-S808	Physical Chemical Treatment	PO	MLLW:	77.96	3/30/99	9/30/2001
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
23	Internal Drum Pressure Measurement	18	6

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
GJ-S801C	Mobile Evaporative Oxidation Process	GJ	MLLW:	3.26	10/23/98	10/23/2000
			MTRU:	0		
RF-S801	CTMP Path F System-Treatment of MTRU Wastes to Meet W	RF	MLLW:	0	4/1/96 *	10/1/2012
			MTRU:	547.8		
SR-S701	MTRU & 10-100 nCi/g Characterization/Treatment	SR	MLLW:	2753	9/30/2006	9/30/2008
			MTRU:	4940		

24	Container Integrity Measurement	18	6

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
LA-S833	TRU Treatment Technology Development	LA	MLLW:	0	12/30/2000	12/31/2002
			MTRU:	3856		
RF-S801	CTMP Path F System-Treatment of MTRU Wastes to Meet W	RF	MLLW:	0	4/1/97 *	10/1/2012
			MTRU:	547.8		
SR-S701	MTRU & 10-100 nCi/g Characterization/Treatment	SR	MLLW:	2753	9/30/2006	9/30/2008
			MTRU:	4940		

25	Cyanide Destruction	12	12

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
GJ-S801C	Mobile Evaporative Oxidation Process	GJ	MLLW:	3.26	10/23/98	10/23/2000
			MTRU:	0		
LA-S004	Mobile Plating Wastes Acids/Bases Skid	LA	MLLW:	3.491	3/17/98	3/17/2000
			MTRU:	0		
RF-S016	CTMP System 3-LLW Miscellaneous Waste Forms Immobiliz	RF	MLLW:	3501	10/1/97 *	5/31/2005
			MTRU:	0		
YP-S002	Central Pollution Control Facility (CPCF)	YP	MLLW:	402.5	12/30/94	12/30/96
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
26	**Thermal Desorption**	0	24

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
PO-S802	Pretreatment/Regeneration	PO	MLLW:	135.5	12/31/99	12/31/2001
			MTRU:	0		

27	**Evaporator Design**	0	24

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
PO-S808	Physical Chemical Treatment	PO	MLLW:	77.96	9/30/99	9/30/2001
			MTRU:	0		

28	**Sludge Washing**	30	12

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
FM-S801	Ohio Option-Mobile Chem. Tmt Project	FM	MLLW:	650.9	10/30/92	4/30/96
			MTRU:	0		
PO-S809	On-Site Stabilization	PO	MLLW:	5383	3/30/99	9/30/2002
			MTRU:	0		

29	**Trace Metal Removal**	18	12

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
PO-S807	Metal Recovery	PO	MLLW:	62.25	3/30/99	9/30/2001
			MTRU:	0		
PO-S808	Physical Chemical Treatment	PO	MLLW:	77.96	3/30/99	9/30/2001
			MTRU:	0		
YP-S002	Central Pollution Control Facility (CPCF)	YP	MLLW:	402.5	6/30/94	12/30/96
			MTRU:	0		

* indicates Site specified date.

Tech Def #	Tech Def Name	TD Dev Time (mo)	TD Imp Time (mo)
30	Supercritical CO2	18	24

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
FM-S801	Ohio Option-Mobile Chem. Tmt Project	FM	MLLW:	650.9	10/30/92	4/30/96
			MTRU:	0		
RF-S019	CTMP System 5-LLW Surface Organic Contaminant Removal	RF	MLLW:	2097	4/1/97 *	4/1/2008
			MTRU:	0		

99	TD assignment being assessed	0	0

TS ID	System Name	Site	Targeted Inv (m^3)		TD Should start Dev.	Est. Hot Ops Date
DP-S001	Central Neutralization Facility	DP	MLLW:	0	12/1/96	12/1/96
			MTRU:	0		

* indicates Site specified date.

APPENDIX A

Listing all treatment systems from STP and disposition

TS ID	System Name	Include	Comment
AE-S801	Building 306, Precipitation/Filtration	No	Known process
AE-S802	Wet Oxidation System	No	Cannot assist due to schedule
AE-S803	Vitrification	No	Cannot assist due to schedule
AE-S804	Macroencapsulation	No	Commercially available process
AE-S805	Surface Decon Unit	No	No TD needs identified
AE-S806	Building 306, MTRU	No	Cannot assist due to schedule
AE-S001	Alkali Metal Passivation Booth (AMPB)	No	Cannot assist due to schedule, small scale
AW-S037	Sodium Process Facility	No	Cannot assist due to schedule, known process
AW-S092	Generator Treatment Plans at ANL-W	No	Generator treatment plan
AW-S007	Remote Treatment Facility (RTF)	Yes	
BN-S801	Elementary Neutralization	No	Existing, known process
BN-S802	Cyanide Destruction Treatability Study	No	Existing
BN-S701	Characterize to Determine Hazardous	Yes	
CI-S807	On-site Pretreatment of Sludge	No	Existing, known process
CI-S805	On-site Stabilization	No	Existing
DP-S801	Oak Ridge Commercial Option - B/C Pond	No	Commercial
DP-S809	Transportable Vitrification System	Yes	
DP-S813	Oak Ridge Commercial Disposal - B/C	No	Disposal only
DP-S814	Oak Ridge Commercial Treatment - Broad	Yes	
DP-S816	Oak Ridge Commercial Treatment -	Yes	
DP-S819	Commercial Disposal - TSCA Residues	No	Disposal only
DP-S820	Commercial Disposal - D018-D043 Debris	No	Disposal only
DP-S002	TSCA Incinerator	Yes	TD to enhance performance
DP-S001	Central Neutralization Facility	Yes	
DS-S001	DSSI Commercial Facility	No	Commercial
ET-S702	Technology Assessment	No	Small scale
ET-S701	Characterization Required (MLLW)	Yes	
ET-S001	RMDF - Treatability Study	No	Treatability study
EV-S003	Envirocare Commercial Facility	No	Commercial
FM-S802	FEMP Waste Water Treatment System	No	Existing
FM-S805	Thorium Nitrate Tank T-2	No	Existing
FM-S801	Ohio Option-Mobile Chem. Tmt Project	Yes	Schedule Slip
FM-S001	UNH Treatment Facility	No	Existing
GA-S801	On-site Neutralization	No	Commercially available process
GA-S701	Characterization Required	No	No TD needs identified
GJ-S804	Mobile Sort/Survey/Char./Decon.	No	Existing
GJ-S801C	Mobile Evaporative Oxidation Process	Yes	
GJ-S801B	Mobile Thermal Desorption Process	Yes	
IN-S005	WERF: Incineration - Controlled Air	Yes	
IN-S006	Portable Water Treatment Unit (PWTU)	No	Existing
IN-S013	WROC: Sizing	No	Existing
IN-S030	HEPA Filter Leaching System (HFLS)	No	Existing

TS ID	System Name	Include	Comment
IN-S033	ICPP Debris Treat & Containment Fac:	No	No TD needs identified
IN-S036	TAN Cask Dismantlement	No	Existing
IN-S046A	MWSF: Open/Blend/Repackage Liquids and	No	No TD needs identified
IN-S046B	MWSF: Open/Blend/Repack NonHalogenated	No	No TD needs identified
IN-S102	CPP659: Segregation	No	No longer planned
IN-S104	Lead Treatment Program: Commercial	No	Commercially available process
IN-S128	WROC: Mercury Retort for High Mercury	Yes	
IN-S130	Treatment of Waste Under 40 CFR 262.34	No	Generator treatment plan
IN-S132	Generator Treatment Plans at	No	Generator treatment plan
IN-S133	Generator Treatment Plans at	No	Generator treatment plan
IN-S149	Generator Treatment Plans at	No	Generator treatment plan
IN-S150	Advanced Mixed Waste Treatment Project	Yes	Hot Ops Date or Contract Date
IN-S151	Remote Treatment Facility - RH	Yes	
IN-S153	Generator Treatment Plans at	No	Generator treatment plan
IN-S501	SWEPP:Assay/Segregation	No	No TD needs identified
IN-S004	WROC/WERF: Stabilization - Portland	No	No TD needs identified
IN-S152	ICPP - RH Immobilization Facility	Yes	No TD needs identified
IN-S101	PWTU: PBF Evaporation Tank	No	No TD needs identified
IN-S226	WROC: Lead Recycling	No	Commercially available process
IN-S003	WROC: Macroencapsulation	No	No TD needs identified
LA-S804	Mobile Hydrothermal Processing	No	Unit canceled
LA-S812	Los Alamos Commercial Stabilization or	No	No TD needs identified
LA-S833	TRU Treatment Technology Development	Yes	
LA-S801	Mobile Gas Scrubbing Skid	Yes	
LA-S701	Further Characterization	Yes	
LA-S004	Mobile Plating Wastes Acids/Bases Skid	Yes	
LA-S003	Mobile Reactive Metals Skid	Yes	
LA-S001	Mobile Lead Decontamination Trailer	No	Commercially available process
LB-S702	Technology Assessment	No	Schedule, no defined technology
LB-S701	Characterization Required	No	Cannot assist due to schedule
LB-S004	Building 75: Unit 131 AFH	No	Existing
LL-S803	Treat. Tech. Demonstrated - Mixed	No	Treatability study
LL-S801	On-Site Small-Scale Treatment	No	Treatability study
LL-S701	Characterization Required	Yes	
LL-S702	Technology Assessment	No	No TD needs identified
LL-S004	Area 514 Waste Water Treatment Tank	No	Existing
LL-S002	Building 513 Solidification Unit	Yes	
NS-S003	NSSI Commercial Facility -	No	No TD needs identified
NT-S999	Already Meets LDR No	No	TD needs identified
NT-S802	Mixed Waste Treatment Facility (MWTF)	No	Commercial
NT-S703	Treatability Assessment	Yes	
NT-S702	Evaluate Regulatory Status	No	No TD needs identified
NT-S803	RFP for Stabilization	No	No TD needs identified

TS ID	System Name	Include	Comment
NT-S701	Characterize to Determine Rad/Haz	Yes	Small scale
OH-S001	Ohio Option - Stabilization Project	No	No TD needs identified
OR-S805	Oak Ridge Commercial Treatment -	No	No TD needs identified
OR-S804	Compressed Gases	No	No TD needs identified
OR-S803	ORNL Chemical Detonation Facility	No	No TD needs identified
OR-S802	Actions Driven By CERCLA Record of	Yes	
OR-S005	TRU Processing Facility/WIPP Disposal	Yes	Hot Ops Date or Earlier
PA-S001	C-400-D Lime Precipitation Unit	No	Existing
PA-S701	Meets LDR Standard and/or Needs	Yes	
PA-S902	Commercial Treatment and Disposal -	Yes	
PA-S903	Show no rad contam, then	No	No TD needs identified
PA-S904	Commercial Recycling	No	Commercial
PI-S801	Mobile Amalgamation Process (Bench	Yes	
PO-S805	Decontaminating Containers	No	No TD needs identified
PO-S806	Lab Packs Treatment	Yes	Ship date for commercial
PO-S807	Metal Recovery	Yes	Hot Ops Date or later
PO-S808	Physical Chemical Treatment	Yes	Hot Ops Date or later
PO-S809	On-Site Stabilization	Yes	Would like to include under DP-S814
PO-S901	Commercial Offsite Recycling	Yes	Commercial
PO-S902	Commercial Offsite Incinerator	Yes	Commercial
PO-S804	Deactivate Reactive Metals	No	Treatment will be completed by vendor in FY 96
PO-S803	Repackage	No	Activity will be complete by end of May 96
PO-S003	X-622 Groundwater Treatment Facility	No	Existing
PO-S005	X-705 Decontamination Facility:	No	No TD needs identified
PO-S701	Characterization of Highly Enriched	No	Characterization activity is complete
PO-S802	Pretreatment/Regeneration	Yes	Commercial
PX-S803	Mobile Macroencapsulation	No	No TD needs identified
PX-S004	Burning Ground: One Cage, One Tray,	No	Unit no longer used
PX-S801	Mobile Stabilization Treatment Process	No	No TD needs identified
QX-S004	Quadrex Commercial Disposal Facility	No	Commercial
RF-S028	CTMP System 6-LLW Pondcrete Remix	Yes	
RF-S801	CTMP Path F System-Treatment of MTRU	Yes	
RF-S020	Residue Stabilization	Yes	
RF-S019	CTMP System 5-LLW Surface Organic	Yes	
RF-S017	CTMP System 2/4B-LLW Buildings 374/774	Yes	
RF-S016	CTMP System 3-LLW Miscellaneous Waste	Yes	
RF-S013	Misc Aqueous Waste Handling &	No	Existing
RF-S004	Process Waste Treatment Facility:	No	No TD needs identified
RF-S001	Building 774 - Aqueous Process Waste	No	No TD needs identified
RL-S803	Commercial Thermal Treatment Facility	No	Commercial contract in place
RL-S802	Amalgamation at Purex	Yes	No Hot Ops date available

TS ID	System Name	Include	Comment
RL-S801	Encapsulation at Purex	No	No TD needs identified
RL-S701	Evaluating Treatment Options	No	Commercial
RL-S007	Waste Receiving and Processing	No	Commercial
RL-S006	Waste Receiving and Processing	No	No TD needs identified
SA-S813	TRU Treatment Technology Development	Yes	
SA-S812	Sorting of Hazardous Debris	No	Existing
SA-S811	Radionuclide Separation	No	No TD needs identified
SA-S810	Mobile Packed Bed Reactor/Silent	Yes	
SA-S807	Mobile Treatability Study:	No	Treatability study
SA-S806	TS: Chemically Deactivate Reactive	No	Treatability study
SA-S805	Treatability Study: Deactivate Water	No	Treatability study
SA-S804	Treatability Study: Chemical	No	Treatability study
SE-S005	Scientific Ecology Group (SEG)	No	Commercial
SR-S701	MTRU & 10-100 nCi/g	Yes	
SR-S801	Waste Already Meets Treatment Standard	No	No treatment required
SR-S802	ITP & LW Treatment - Treatability	No	Existing
SR-S803	Treatment of Lab Waste as a 90-Day	No	Treatability study
SR-S804	Offsite Vendor Treatment	Yes	
SR-S806	D-Area Heavy Water Reclamation Process	No	Existing
SR-S808	Macroencapsulation as a 90-Day	No	Generator treatment plan
SR-S809	RH Macroencaps-Containment Bldg. by	Yes	
SR-S810	Macroencapsulation in a Permitted	No	No TD needs identified
SR-S811	Further characterization/studies	No	No TD needs identified
SR-S019	Processes Requiring Further Evaluation	No	No TD needs identified
SR-S018	Consolidated Incineration Facility	Yes	
SR-S015	M-Area Vendor Treatment Process	Yes	Existing
SR-S007	Treatability Variance	No	No TD needs identified
SR-S004	SRL (SRTC) Ion Exchange Treatment	No	Existing
SR-S003	SRL (SRTC) Ion Exchange Treatment	No	Existing
SR-S002	F/H Area Effluent Treatment Facility	No	Existing
WP-S001	WIPP Option	Yes	
WS-S808	Macroencapsulation with CSS	No	No TD needs identified
WS-S804	Amalgamation	Yes	
WS-S807	Decontamination/Stabilization	No	Existing
WS-S803	Deactivation Followed by Stabilization	No	Cannot assist due to schedule
WS-S001	Site Water Treatment Plant Train 1	No	Existing
WS-S004	Chemical Stabilization/Solidification	No	Cannot assist due to schedule
WV-S803	Interim Waste Storage Facility	No	No TD needs identified
WV-S802	Contact Size Reduction Facility (CSRF)	No	No TD needs identified
WV-S702	Further Characterization Required to	Yes	
WV-S001	Integrated Radioactive Waste Treatment	No	Existing
WV-S701	Further Characterization Required to	Yes	
YP-S003	Cyanide Treatment Facility, Building	No	Small scale

TS ID	System Name	Include	Comment
YP-S002	Central Pollution Control Facility	Yes	TD enhancements to treat new wastes
YP-S001	Biodenitrification Unit, Building 9818	No	No TD needs identified
YP-S010	Mercury Treatment Facility/CPCF	No	Included as part of YP-S002
YP-S801	Actions Driven by CERCLA Record of	No	No TD needs identified

APPENDIX B

List of Site Codes and Names

Site	Site Name
AE	Argonne National Laboratory - East
AW	Argonne National Laboratory - West
BN	Brookhaven National Laboratory
CI	Colonie Interim Storage Site
DP	K-25 Site
DS	DSSI Commercial Facility
ET	Energy Technology Engineering Center - SSFL
EV	Envirocare Commercial Facility
FM	Fernald Environmental Management Project
GA	General Atomics
GJ	Grand Junction Projects Office
IN	Idaho National Engineering Laboratory
LA	Los Alamos National Laboratory
LB	Lawrence Berkeley Laboratory
LL	Lawrence Livermore National Laboratory
NS	Newport News Naval Shipyard
NT	Nevada Test Site
OR	Oak Ridge National Laboratory
PA	Paducah Gaseous Diffusion Plant
PI	Pinellas Plant
PO	Portsmouth Gaseous Diffusion Plant
PX	Pantex Plant
QX	Quadrex Commercial Disposal Facility
RF	Rocky Flats Environmental Technology Site
RL	Richland Site
SA	Sandia National Laboratory - Albuquerque
SE	Solar Energy Research Institute
SR	Savannah River Site
WP	Waste Isolation Pilot Project
WS	Weldon Spring Site
WV	West Valley Demonstration Plant
YP	Y-12 Plant

APPENDIX C

Prioritized Listing of Technology Deficiencies

Mixed Waste Technology Deficiencies

Technology deficiency	Description
1. Mercury stabilization	Toxic metal contaminants regulated under the Resource Conservation and Recovery Act (RCRA) contained in mixed wastes require removal or stabilization to control solubility under the conditions of the Toxic Characteristic Leach Procedure (TCLP) before the wastes can be disposed. Under RCRA, the "low mercury" contamination level, less than 260 ppm (>260 ppm requires retorting) requires stabilization to control mercury solubility to the Universal Treatment Standards (≤0.2 ppm). Verification of treatment, i.e. penetrating the entire matrix and stabilizing essentially all of the mercury in the system, is required.
2. Mercury amalgamation	Elemental mercury may be derived as a product of retorting high mercury (>260 ppm) wastes, or recovered from the off gas of a thermal treatment system, in addition to the elemental mercury streams in the DOE mixed waste inventory. Radioactive mercury can probably not be completely purified and verified for recycle. Disposal of the mercury will require amalgamation to form a stable, insoluble product for disposal. Methods and equipment designs are required for amalgamating bulk non-recyclable mercury.
3. NDE/NDA-initial characterization	Nondestructive examination (NDE) and nondestructive assay (NDA) techniques and equipment are required for the initial characterization of many hazardous wastes and all other (tramp) materials in waste drums and boxes. Obtaining representative samples of these heterogeneous wastes and materials is made much more difficult in a radioactive environment, which escalates costs dramatically. It is necessary to determine the nature of the waste matrix in any package, confirm the presence and concentration of RCRA regulated materials and radionuclides, and identify characteristics of concern for operational safety and process continuity. This is to be accomplished non invasively or with minimal penetration.

Technology deficiency	Description
4. Mercury separation/ removal	The presences of mercury complicates the design of off gas systems, stabilization of residuals, and monitoring of all effluents. It may be advantageous to remove the mercury as a pretreatment to simplify downstream operations. New techniques must be developed to physically or chemically remove the mercury for separate stabilization. Waste matrices from which mercury separation may be required include soil, all types of process residues or sludges and particulate materials, and debris. Processing methods must ensure adequate removal, and include measuring and monitoring methods to control and verify the process.
5. Material handling	Handling of DOE mixed waste must be accomplished safely in a radioactive environment, including containment for alpha contamination. Radioactive material containment limits access to the containers or wastes, and creates difficulties for opening of containers, removal of wastes, sorting, conditioning (feed preparation), and size reduction for feed to treatment. Many common industrial practices involving manual sorting, shredding, and conveying materials into and out of the process may not be possible due to the radioactive contamination of these wastes. Methods and equipment designs are required that will provide for handling all types of DOE waste materials in all process steps without undue risk of exposure of operating personnel to radioactivity.
6. Sorting/segregation	Mixed waste packages contain waste materials with many different matrices. It will often be necessary to sort or segregate materials such as debris from sludges, or different types of debris matrices, before the waste can be assigned to appropriate treatment. Efficient separation of nonradioactive, or radioactive only (no RCRA regulated constituents) from mixed wastes could produce substantial savings. Because these wastes are radioactive and may contain volatile hazardous materials, the sorting and segregation must be done with adequate containment to control potential releases.

Technology deficiency	Description
7. Salt stabilization	Some existing mixed wastes, and various types of waste residues that will be produced in treatment of other mixed wastes, will be high in salt content, typically chlorides, nitrates, and hydroxide sludges. These salts can be very difficult and expensive to stabilize in glass or standard Portland cement-based grouts. Polymeric compounds may contain higher concentrations of some salts in the near term, but do not chemically bind the contaminants, and an organic matrix may be undesirable for some disposal scenarios. Stabilization processes are required that increase waste loadings, improve durability and/or reduce the volume increase typical of today's standard practices. Significantly improved matrices such as new grouts based on innovative chemistries, polymers, etc. will be required.
8. Ash stabilization	Ash is routinely produced at DOE facilities incinerating mixed wastes. The Universal Treatment Standards have made leach resistance requirements more stringent for some heavy metals. Stabilization processes are required for this ash that increase waste loadings, improve durability and/or reduce the volume increase typical of today's standard practices. Significantly improved matrices such as new grouts based on innovative chemistries, polymers, etc. will be required.
9. Mercury monitoring	Mercury is present in a wide variety of mixed waste matrices and at widely varying concentrations. Monitoring methods for mercury vapors are required to ensure that mercury is not being released, particularly from processes operating at elevated temperatures. Though mercury monitors are commercially available, it would be advantageous to develop real-time monitors requiring minimal consumables and low maintenance, with operating ranges covering the emission limits typical of incinerators.

Technology deficiency	Description
10. Alpha monitoring	Processing of mixed wastes will require monitoring of wastes at all stages of handling to ensure that radioactivity, especially alpha radionuclides, are not being released, particularly with processes operating at elevated temperatures. Though alpha monitors are commercially available, it would be advantageous to develop real-time monitors requiring minimal consumables and low maintenance, with operating ranges covering the emission limits typical of alpha material processing facilities.
11. VOC monitoring	RCRA regulated volatile organic compounds (VOCs) are present in many mixed wastes. Because these contaminants are volatile, they are highly mobile, and will be released from newly opened packages and at any stage in processing that involves elevated temperatures. Monitoring of VOCs in the treatment facility effluent is necessary to ensure the facility is operating in accordance with environmental protection requirements. It would be advantageous to develop real-time monitors requiring minimal consumables and low maintenance, which can identify specific contaminants in operating ranges covering the emission limits typical of hazardous waste treatment facilities.
12. Heavy metal monitoring	RCRA regulated heavy metals are present in many mixed wastes. In high temperature processes some of these metals can be volatilized. Though most of these metals are readily captured, some may be carried through the off gas system as fine particles, or potentially as vapors as described above for mercury. It would be advantageous to develop real-time monitors requiring minimal consumables and low maintenance, which can identify specific metals in operating ranges covering the emission limits typical of hazardous waste incinerators.

Technology deficiency	Description
13. Radionuclide distribution/partitioning	During mixed waste treatment processes, particularly thermal systems, the distribution and migration of radionuclides throughout the processing system must be understood to ensure adequate control. Only limited data exist to predict the fractional distribution of radionuclides between the off gas, the final waste form, and any secondary waste streams. More complete information on the radionuclide distribution in high temperature mixed waste treatment processes is needed to support equipment design and process permitting.
14. Waste form performance	The performance criteria for regulated hazardous constituents are generally established in state and EPA regulations, such as TCLP requirements. No such requirements have been finalized for radionuclides, so the increased durability of vitrified, slagged, or encapsulated waste forms has not been incorporated into disposal facility permitting or performance assessments. An objective, technically defensible evaluation of the long-term performance of advance waste forms must be conducted. The evaluation must satisfy regulator and stakeholder concerns to allow flexibility in siting and operating low-level waste disposal facilities to best exploit the more durable, higher waste-loading forms.
15. HEPA filter improvements	High-efficiency particulate air (HEPA) filters are a vital part of the environmental protection systems for any facility processing radioactive materials. Discarding these filters contributes significantly to the net waste produced from waste treatment operations. The filters are also a potential point for accidental breakthrough and release of radionuclides. A stronger, high-temperature, longer lived HEPA filter, that can survive a greater pressure drop, and that requires less frequent replacement, or that can be cleaned and reused, is needed. New filter designs should be designed to replace standard filters with minimal retrofit of existing systems.

Technology deficiency	Description
16. Mercury filter	Mercury is present in a wide variety of mixed waste matrices and at widely varying concentrations. Mercury will be present in some wastes for which mercury treatment will not be indicated. At elevated temperatures in many waste treatment processes mercury will vaporize. Therefore, the off gas system for most, if not all, mixed waste treatment systems will require a step for mercury removal. Typically this step is a water quench, which condenses most volatiles, but creates a mixture in the blowdown stream that is difficult to treat. A potential enhancement to this traditional design would be a selective mercury removal step, which removes essentially all of the mercury from the off gas stream for separate treatment. Candidate processes exist, but have not been demonstrated on mixed waste off gas streams.
17. Molten product - decanting	Many treatment processes being developed for mixed wastes will operate with molten material. These processes require the transfer of a molten product from the furnace to another vessel for final handling/disposal. Usually separation of the molten material from untreated waste and perhaps a slag or metal phase is required. Operating techniques and equipment design are required to accomplish this decanting or transfer of molten phases in an effective, reliable, and safe manner applicable to a radioactive environment.
18. Comparative analysis/aqueous	A comparative analysis on the efficacy, reliability, applicability, and maintainability of the many processes now being developed for destruction of organic contamination in wastewater containing radionuclides must be done to select two or three processes to be developed in Item 19 below.

Technology deficiency	Description
19. Aqueous organic nonthermal destruction	Successful destruction/removal of regulated organic constituents in wastewater is necessary for many aqueous plant recycle streams, as well as mixed waste solutions currently being stored in the DOE inventory. Organic containing aqueous streams in treatment processes may contain dissolved and suspended solids along with any of a wide variety of organics. Of particular concern are halogenated and high molecular weight compounds. Several candidate technologies exist, but it remains to be demonstrated that any one or a combination can reliably treat all of the organic constituents expected to be present in mixed waste and be operated in a radioactive environment.
20. Refractory performance	Refractory lifetime is a limiting factor for operation of incinerators and most other thermal treatment processes. Refractories are degraded by acid and caustic conditions and thermal cycling, and sorb metals and radionuclides during operation. Replacement of refractories decreases operating time, adds to operating costs and personnel exposure, and generates a secondary mixed waste stream. Improved refractories, or operating techniques better suited to the DOE-specific processing conditions, are required for long-term processing success.
21. Nitrate removal	Most DOE chemical operations are conducted in nitrate based systems because of process simplicity and material compatibility. As a result, many of DOE mixed wastes contain nitrates. Nitrates are reactive oxidizers, which can cause complications in treatment processes and additional difficulties in waste stabilization processes. Methods are needed to destroy or remove residual nitrates from sludges and wastewaters.
22. Fission product removal	Some mixed wastes contain elevated levels of radionuclides requiring special handling and treatment. Techniques for selective removal of nuclides such as cesium, strontium, and tritium would simplify processing of the balance of the matrix. Methods are needed for removal or significant reduction of the concentrations of fission products from mixed waste, especially process residues and sludges.

Technology deficiency	Description
23. Internal drum pressure measurement	The occurrence of internal drum pressure is a hazard to operating personnel and to process equipment. Methods are needed to measure internal drum pressure without penetrating the drums.
24. Container integrity measurement	Many DOE wastes have been stored for a significant time period. Some of the waste containers have suffered measurable degradation. Containers at or near failure due to stress and corrosion are a potential hazard to personnel and operating systems. Methods are needed to test the integrity of stored containers to identify any that may require particularly careful handling or overpack in preparation for managing or processing of the contents.
25. Cyanide destruction	Cyanide occurs in DOE wastes primarily from metal cleaning and processing operations. RCRA regulations require the destruction of cyanide anion when it is present. This is normally done in a simple one step aqueous oxidation reaction. Not all DOE wastes containing cyanides are amenable to treatment by this aqueous based reaction. Methods are required to treat cyanide in the presence of interfering dissolved, suspended, and matrix materials.
26. Thermal desorption	Thermal desorption of organic hazardous constituents and mercury from process residues, sludges, soils, and debris has been commercialized, and is now proposed for a number of mixed waste streams. Many of these wastes are physically and chemically complex materials. Methods are required to minimize pretreatment to adequately prepare the wastes so that the contaminants can escape, to provide thermal processing such that cleanup levels can be attained while maintaining radionuclide containment, and to verify LDR compliance.
27. Evaporator design	Processes for treatment of mixed wastes will generate many aqueous streams for recycle within the plant. Recycling and final cleaning of water for discharge usually involves one or more evaporation steps. Evaporators are subject to fouling and corrosion and use fairly large quantities of energy. Better designs are needed for evaporators for DOE waste-specific treatment plant streams.

Technology deficiency	Description
28. Sludge washing	Sludge washing may be a key step in nonthermal treatment processes. This treatment is also potentially applicable to small quantities of waste. Organic removal requirements in RCRA regulations are generally well beyond that which has been demonstrated for any of the candidate processes. Alternative approaches are required, or methods are needed to enhance the performance of the candidate sludge washing technologies, to demonstrate feed preparation and washing of process residues, sludges, and particulates to RCRA requirements.
29. Trace metal removal	Some wastewater treatment facilities in the DOE complex are subject to new permitting requirements which mandate extremely low-levels for some metals in effluents (e.g., 0.001 mg/L cadmium, 0.003 mg/L lead, and 0.004 mg/L silver). Standard water polishing ion-exchange resins are not sufficiently specific to avoid depletion by other ions in the wastes. Other techniques are needed to meet permit requirements while minimizing secondary waste generation.
30. Supercritical CO_2	Supercritical CO_2 extraction similar to that commercially practiced for a variety of standard applications has been proposed for treatment of a number of mixed waste streams in lieu of thermal processing. Many of these wastes are physically and chemically complex materials. Methods are needed to enhance the effectiveness of supercritical CO_2 for removal of organics from process residues, sludges and particulates, soils, and debris (especially more complex pieces of debris). Techniques to minimize pretreatment to adequately prepare the wastes so that the organics can be removed, and the wastes can be fed and removed from the supercritical environment while maintaining radionuclide containment are required. Compliance with LDR must also be verified.

APPENDIX D

Mortgaged Activities

Mortgaged Activities

Mortgaged Activities	Description
Controlled Emissions Demo	Western Environmental Technologies Office (WETO) located in Butte, Montana, is currently engaged in an extensive testing program to significantly reduce air, fluid, and solid emissions from DOE thermal systems. This program is targeted at reducing air emissions to standards set in EPA's proposed combustion rule. Testing of Continuous Emissions Monitors (CEMs) to verify if and how much of a particular substance is being emitted continues.
Delphi Detox	Delphi is a small business that has developed a proprietary process for the destruction of organic wastes. This process uses a solution of ferric chloride, hydrochloric acid, water, and small amounts of other constituents to oxidize organic wastes. This technology will be demonstrated on surrogate wastes at Savannah River using a full scale treatment unit. Pending site approval, the unit will be moved to Rocky Flats for further waste testing and treatment.
Direct Chemical Oxidation	Direct Chemical Oxidation is a technology being developed at Lawrence Livermore National Laboratories (LLNL). The process is simple, using peroxydisulfide as an oxidant to destroy organic liquids and solids. After oxidation, the sulfide solution is recycled by electrolysis. The process operates at low temperature and pressure, and produces no severe corrosion by-products. A bench scale test is planned this year followed by pilot scale testing in FY 1997.
Macroencapsulation at Envirocare of Utah, Inc.	In FY 1997, Envirocare will complete treatment and disposal of the remainder of the 500,000 lbs capacity under the Cooperative Agreement with DOE-ID. This Cooperative Agreement procures polymer macroencapsulation of 500,000 lbs of mixed waste lead and debris, followed by disposal in the RCRA Subtitle C landfill at Envirocare. Waste streams from approximately 24 sites will be treated and disposed by Envirocare through the Cooperative Agreement. While treating these waste streams, Envirocare will scale its process up from 5 gal units to B-12 bins. This scale-up, which will complete this commercial feasibility study, will be completed in FY 1997.
PHP	The PHP activity will be used to demonstrate the treatment of mixed wastes using a plasma technology. This thermal approach for mixed waste treatment employs commercially-available technology from the nonradioactive specialty metals processing industry. The immediate challenge of this work is modification of the technology to accommodate the radioactive species in mixed waste. The resulting data and process system may be used by other facilities within the complex.
RCRA NDA Characterization	The purpose of this activity is to evaluate commercial noninvasive characterization technologies for RCRA-regulated metals and to make recommendations to the MWFA on any additional development needs required in this area. Performance

Mortgaged Activities	Description
	testing of the technologies will be conducted on both single blind surrogates and on inorganic sludge surrogates containing Cd, Hg, and Pb. This mortgaged activity addresses part of Technology Deficiency #12-Heavy Metal Monitoring.
Russian Denox	Scientists at the Boreskov Institute of Catalysis in Russia are working on a new catalyst to be used in off gas systems to improve NOx destruction efficiency, reduce ammonia slip, cost less than currently used catalysts, and to be disposable in non-RCRA landfills. DOE personnel at Lawrence Livermore National Laboratories and Western Environmental Technologies Office (WETO) are working with the Russians to develop and test the new catalysts.
Torch Life Extension	The purpose of this activity is to evaluate different torch concepts and models from four different manufacturers to help DOE focus on the most reliable type of torch for use in the mixed waste treatment systems. Work will be conducted with the torch manufacturers support, to increase electrode life and torch reliability. This activity was identified as a need in the DOE complex, although it was not one of the thirty prioritized deficiencies listed in the technical baseline, since a plasma process has not yet been identified as a primary treatment technology at any facility.
TVS	The Transportable Vitrification System, developed at Savannah River, and to be demonstrated on 80,000 kg of actual mixed waste sludge at Oak Ridge, consists of a joule-heated melter and associated equipment designed on skids for mobility. The original (first driving objective) for TVS was to demonstrate vitrification of actual mixed waste. As a consequence, operations of TVS will add data for correcting MWFA deficiencies addressing refractory performance, and molten product decanting. In contrast, the flexibility for TVS to take a wider range of waste feeds could be greatly increased by correcting the deficiencies addressing CEM (alpha, mercury, VOC, and heavy metals monitoring), mercury removal and stabilization.