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TITLE: Mixed Waste Focus Area Alternative Technologies Workshop

AUTHOR(S): Leon C. Borduin
Byron A. Palmer
John A. Pendergrass

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Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

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Mixed Waste Focus Area

Alternative Technologies Workshop

Salt Lake City, Utah
January 24-27, 1995

Prepared for:

Stephen L. Domotor
Technical Analysis Division (EM-332)
Office of Program Integration
Office of Waste Management
U.S. Department of Energy

Prepared By:

Leon C. Borduin
Byron A. Palmer
John A. Pendergrass
Los Alamos National Laboratory
Technology Analysis Group

Los Alamos National Laboratory

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1.0 INTRODUCTION

This report documents the Mixed Waste Focus Area (MWFA)-sponsored Alternative Technology Workshop held in Salt Lake City, Utah, from January 24–27, 1995. The primary workshop goal was identifying potential applications for emerging technologies within the Options Analysis Team (OAT) "wise" configuration.[1] The workshop was initiated by Stephen Domotor, Department of Energy (DOE) EM-332, with organizational and technical support from a technology analysis group at Los Alamos National Laboratory. Workshop invitees included members of the MWFA Technology Resource Team, supplemented by two senior waste operations staff from the Idaho National Engineering Laboratory (INEL) and the Oak Ridge National Laboratory K-25 Plant.

Consistent with the scope of the OAT analysis, the review was limited to the Mixed Low-Level Waste (MLLW) fraction of DOE's mixed waste inventory. The Los Alamos team prepared workshop materials (databases and compilations) to be used as bases for participant review and recommendations. These materials derived from the Mixed Waste Inventory Report (MWIR)[2] data base (May 1994), the Draft Site Treatment Plan (DSTP)[3] data base, and the OAT treatment facility configuration of December 7, 1994.

In reviewing workshop results, the reader should note several caveats regarding data limitations. Link-up of the MWIR and DSTP data bases, while representing the most comprehensive array of mixed waste information available at the time of the workshop, requires additional data to completely characterize all waste streams. A number of changes in waste identification (new and redefined streams) occurred during the interval from compilation of the MWIR data base to compilation of the DSTP data base with the end result that precise identification of radiological and contaminant characteristics was not possible for these streams. To a degree, these shortcomings compromise the workshop results; however, the preponderance of waste data was linked adequately, and therefore, these analyses should provide useful insight into potential applications of alternative technologies to DOE MLLW treatment facilities.

Additional information regarding the identified alternative technologies may be obtained from the workshop sponsor, Stephen Domotor; Dirk Gombert of the Mixed Waste Lead Organization; or the workshop report authors. Detailed contact information for these individuals is included in Appendix C of this report. Additional reference materials, including the Technical Area Status Reports and the Technology Summaries, also known as the "rainbow books,"[4] are available through the Mixed Waste Lead Organization.

2.0 WORKSHOP OVERVIEW

2.1 Purpose

An MWFA-sponsored Alternative Technology Workshop was held in Salt Lake City, Utah, on January 24–27, 1995, with the primary goal of identifying potential applications for emerging technologies within the OAT "wise" configuration. Workshop participants (Appendix C) included members of the MWFA Technology Resource Team, supplemented by senior waste operations staff from INEL and K-25. Stated objectives of the workshop were to

(1) determine the potential for application of emerging technologies within the OAT configuration,

(2) establish technology development priorities based on assessment of technology applicability and level of need,

(3) identify technology development gaps,

(4) develop recommendations for redirection of efforts having little apparent applicability,

(5) evaluate the appropriateness of OAT waste stream assignments to facilities, and

(6) determine the impact of the EPA Universal Treatment Standards (UTS) Rule.[5]

Viewgraphs presented at the workshop outset are in Appendix D. In preparing for the workshop, the Los Alamos team used waste stream nomenclature guidelines provided by MACTEC to link the MWIR and DSTP data bases. Creation of this new, linked MWIR-DSTP data base allowed the contaminant, radionuclide, and handling data contained in the MWIR to be correlated to the more recent, but less comprehensive, waste stream data contained in the DSTP. This capability provided the most current and complete information set available for DOE mixed waste streams and served as the basis for all subsequent workshop analyses.

2.2 Materials

To facilitate analysis of the OAT configuration, a series of data compilations was prepared and bound in three volumes for use by workshop participants. The primary workshop tool consisted of a tabular listing of the individual waste management facilities from the OAT December 7, 1994, configuration. (See Appendix A for facility listing.) Individual waste streams assigned to each facility were entered with volumetric data, contaminant, and radiological characteristics. The table format included treatment capacity, permit status, and radiological waste acceptance descriptors (e.g., alpha or non-alpha, contact-handled or remote) as recorded in the DSTP data base. Unit operations prescribed for treatment of each waste stream by the Programmatic Environmental Impact Statement (PEIS)[6] analysis models (see below) also were listed in this table. Finally, volumetric capacity requirements were summarized by waste matrix type.

The Site Treatment Plans (STPs) did not provide adequate definition of the expected treatment technologies for evaluation in this workshop. Information regarding site-selected treatment technology for each facility is not uniformly available in the data bases; therefore, available data were supplemented by review of the individual Proposed Site Treatment Plan documents and by flowsheet analyses developed for the PEIS project. Waste streams assigned to each facility were "processed" through the three primary calculational flowsheets.

- The Base Case flowsheet simulates current DOE treatment scenarios using a mix of existing processes and grout stabilization to achieve LDR treatment requirements. The primary organic destruction technology is incineration and the primary stabilization technologies are grout and polymer encapsulation.

- The Thermal flowsheet uses high-temperature treatment processes (incineration) to treat toxic organics, vitrification or metal melting stabilize treatment residues.
- The Non-Thermal flowsheet uses low-temperature (< 350°C) treatment operations to process waste in the absence of thermal treatment options. Grout and polymer encapsulation are used for stabilization.

Output from the PEIS models provides insight into treatment technologies required for each individual waste stream and each treatment facility under the three scenarios. See Sec. 3.3 for the three flowsheets used and for descriptions of the unit operations.

Additional workshop materials included compilations of DOE emerging technologies, site-selected technologies from the Proposed Site Treatment Plans (PSTPs),[7] and OAT treatment facility capacities.

2.3 Approach

The OAT list of treatment facilities were divided into three approximately equitable sets based on geography and similarity of sites. Each set of facilities was given to a team to review; each team had a chairperson to guide the review and to report results.

Participants were asked to evaluate new facilities first, followed by undefined facilities, and finally existing facilities. The teams reviewed each facility for the three separate PEIS cases described above. Treatment selection criteria[8] were used to evaluate the needed technologies for each facility. Individual waste streams were examined in detail when necessary to determine treatment needs. The teams then cited alternative and/or supplemental technologies for waste streams and facilities.

In addition, teams examined the waste streams for compatibility with the facilities and recorded issues for possible misassignment separately. The results of this effort are given in Sec. 3.4.

Using the preceding analyses and data compilations, workshop participants evaluated the OAT treatment technology assignments for most facilities and waste streams included in the configuration. Time limitations precluded examination of all facilities and waste streams; however, most remaining facilities have been reviewed in a follow-on action.

New Environmental Protection Agency (EPA) standards for waste treatment and disposal also were considered by the workshop participants. The effect of the recently promulgated UTSs on waste disposal were considered in selecting supplemental and alternative technologies.

Workshop comments for each facility were recorded on the workshop data sheets shown in Appendix D.3. These summaries were then used in preparation of the results shown in Sec. 3.

2.4 Results Summary

We anticipate that the results of the workshop will prove useful to a broad spectrum of DOE and non-DOE users. The primary users of this information are expected to be the MWFA program managers, the MWFA lead organization, and the technical support staff of the MWFA. The workshop results are an initial examination of the operations/technology development issues central to the MWFA charter. The results also should be useful to site waste operations and planning staff in helping identify alternative technologies to be considered for new and upgraded mixed waste treatment operations.

During the workshop, participants were able to review essentially all new treatment facilities as well as many existing installations within the OAT configuration. Table 2.1 summarizes the results and indicates that the workshop review produced no unexpected technology need categories. Two areas in which increased emphasis was observed are stabilization technology and non-thermal technologies. The EPA UTS rule will require additional development and testing of stabilization

Table 2.1. Summary of Technology Types Cited by MWFA Workshop

Technology Opportunity or Need	Volume (m^3)*	Number of Facilities*
Stabilization	262,155	66
Aqueous Organic Destruction	251,096	68
Washing Technologies	101,096	24
Vitrification	82,609	48
Offgas Monitoring	78,829	27
Gas-Phase Mercury Monitoring and Capture	50,630	17
Mercury Separation	32,824	17
Thermal Desorption	32,102	8
Plasma	31,114	41
Steam Reforming	21,616	10
Mercury Stabilization	17,776	24
Metal Melting	16,268	21
Gas Phase Organic Destruction	11,059	7
Molten Metal	1,299	9
Molten Salt	880	9
Total Volume and Facilities	**320,618**	**138**

* based on November 1994 DSTP data

technologies to meet the often more stringent final-form leach standards. Non-thermal technologies received more attention in response to stakeholder opposition to incineration and perhaps other thermal technologies. Adequate substitutes must be identified and evaluated as unit operations and systems to permit comparative evaluation of associated costs and performance. Detailed workshop results are in Sec. 3.0.

A grid-based presentation of the technology results is included in Table 2.2. Selected technologies (broadly grouped) are identified for each facility. A letter in a cell indicates that that technology was suggested as either a technology need based on the waste feed, an opportunity for technology replacement, or as a suggestion for implementation that might be considered. It should be understood that the workshop participants are not recommending particular technologies over others but suggesting possible technologies that could work based on the waste feed description. Except for the cases of a true technology need, such as mercury processing for a facility lacking that capability, the workshop is only suggesting alternatives. The following codes are used in Table 2.2.

- A Applies to all cases
- B Applies to the PEIS Base Case analysis
- N Applies to the PEIS Non-Thermal Case
- T- Applies to the PEIS Thermal Case
- S Indicates a supplemental technology need

Table 2.2 Alternative Technologies Workshop Summary by Facility

Shaded Column
Non-Thermal Technology

Shaded Row
Facility Waste Volume > 5000 m³

Technology Codes
T: Thermal N: Non-Thermal
S: Supplemental A: All

Facility ID	Site Selected Technology	Treat Vol (m3)	Pre-Treatment				Thermal Organic Destruction					Non-Thermal Organic Destruction										Offgas Capture			Offgas Monitoring					Stabilization									
			Mercury Separation	Sludge Washing	Debris Washing	Thermal Desorption	Steam Reforming	Plasma Technologies	Molten Metal	Molten Salt	General	Acid Digestion	DETOX	Wet Oxidation	Supercritical Water Oxidation	Ultraviolet Peroxide	MFD-S	Ultrasonic	E-Beam	CEPOD	Gas-Phase	General	Mercury	Tritium	Iodine	Mercury	Organics	Tritium	Iodine	General	Metal	Macro	Micro	Salt	Mercury	Phosphate	Grout	Vitrification	Metal Melting	General
AE-S001	Reactive Deactivation	7.6																																					
AE-S801	Precipitation/Filtration	13.1																																					
AE-S802	Wet Oxidation System	6.7					BT	T	T	T		N	N									N							S										
AE-S803	Vitrification System	20.6		N				T					C	N	N	N																	S	S		T			
AE-S804	Stabilization-Macroencapsulation Unit	6.1			N			T																							N	N					T	T	
AE-S805	Portable CO2 Surface Decontamination Un	94.5						T																							N							T	
AP-S901	Commercial Incineration	0.5																																					
AW-S007	Melt, Drain, and Evaporate Sodium Contan	7.6																																					
AW-S037	React sodium to Na2CO3; thin film evapor	304.1																															S						
BN-S701	Characterization	95.7								T		N		N								N							S	A					A	T		
BN-S801	Elementary Neutralization	1.1																				S													S			
BN-S802	Cyanide Destruction Treatability Study	0.1						T						N																						T		
CM-S801	Oak Ridge Commercial Option - No Proce	21887.7		N		A																N								S			S					
DP-S001	Neutralization, Precipitation, Centrifugatio	403.3																																					
DP-S002	Incineration	14446.1	S	N			T	T																					S										
DP-S701	Characterization	183.8			N			T					N																						A				
DP-S804	Bench Scale Explosives Treatment	<0.1																																					
DP-S805	Process not specified	0.5																																A					
DP-S806	Pilot scale decontamination and grouting	45.0			S	S		T														S									A							
DP-S807	Mercury Thermal Desorption	184.1	N																				S			S			S				S			T	T	
DP-S808	Pilot scale grouting	163.5																													A				A		T		

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Non-Thermal Technology

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Facility Waste Volume > 5000 m³

Technology Codes
T: Thermal N: Non-Thermal B: Baseline
S: Supplemental A: All

			Pre-Treatment					Thermal Organic Destruction					Non-Thermal Organic Destruction										Offgas Capture			Offgas Monitoring					Stabilization										
Facility ID	Site Selected Technology	Treat Vol (m3)	Mercury Separation	Sludge Washing	Debris Washing	Thermal Desorption		Steam Reforming	Plasma Technologies	Molten Metal	Molten Salt	General	Acid Digestion	DETOX	Wet Oxidation	Ultraviolet	MEO	Ultrasonic	E-Beam	CEPOD	Gas-Phase	General	Mercury	Tritium	Iodine	Mercury	Organics	Tritium	Iodine	General	Metal	Macro	Micro	Salt	Mercury	Phosphate	Grout	Vitrification	Metal Melting	General
DP-S809	Process not specified	7.1							T																					A							T		
DS-S001	Commercial Incineration	171.5							T													N	S						S	S	S		S	S			T		
EH-S701	Characterization	6.4									BT		N									N							S				A						
ET-S001	Neutralization/Stabilization	0.1							T																										A	A	T		
ET-S701	Characterization	<0.1											N																S	A	A								
EV-S003	Commercial Stabilization/Disposal	16848.3																																		T		
FM-S001	Neutralization, Precipitation, Filtration	1072.0																																		S		S
FM-S801	Amalgamation/Chemical Oxidation/Wet Ai	1033.1	N		N			BT	BT				N	N							S	N				S	S			A	A		A	A	A		T		
FM-S802	Wastewater Treatment	12.3													S	S		S	S																				
FM-S803	Neutralization, Precipitation, Filtration	16.8																																					
FM-S804	Incineration/Stabilization	505.3							T				N																								T		
GA-S701	Characterization -- Process not selected	31.8	A		N				T													N											A	A			T	T	
GA-S801	Neutralization	1.4																																S						
GJ-S701	Characterization -- Process not selected	0.1																																A						
GJ-S801B	Thermal Desorption	183.8			N			BT	BT				N		N														S							T	T	
GJ-S803	Evaporation	<0.1										S										S											S		S				
GJ-S804	Sort/Survey/Decon	31.5	A		N				T				N		N																A						T	T	A
GJ-S805	Process not specified	<0.1																												A					A	A			
IN-S004	Stabilization - Portland Cement	56.6							T			S										S														T		A
IN-S005	Incineration - Controlled Air Incinerator	1327.5		N	N				T													N	S			S			S					S		T	T	
IN-S006	Ion exchange, neutralization, carbon adsorp	6.3																			S	A								S			S						

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Non-Thermal Technology

Shaded Row
Facility Waste Volume > 5000 m³

Technology Codes
T: Thermal N: Non-Thermal B: Baseline
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			Pre-Treatment				Thermal Organic Destruction					Non-Thermal Organic Destruction										Offgas Capture			Offgas Monitoring					Stabilization									
Facility ID	Site Selected Technology	Treat Vol (m3)	Mercury Separation	Sludge Washing	Debris Washing	Thermal Desorption	Steam Reforming	Plasma Technologies	Molten Metal	Molten Salt	General	Acid Digestion	DETOX	Wet Oxidation	Ultraviolet	MEO	Ultrasonic	E-Beam	CEPOD	Gas-Phase	General	Mercury	Tritium	Iodine	Mercury	Organics	Tritium	Iodine	General	Metal	Macro	Micro	Salt	Mercury	Phosphate	Grout	Vitrification	Metal Melting	General
IN-S008	Ion exchange	106																											S									
IN-S010	Amalgamation	16.0																							S													
IN-S011	Stabilization	336.1									S										S													A				
IN-S014	Mercury Amalgamation	11.1																			S												A					
IN-S015	CH-Incineration/Thermal Desorption	40258.4		N								N									N	S						S		S	S							
IN-S018	CH - Vitrification	21833.8																			N													A				
IN-S030	HEPA Filter Leaching System	85.6				S														S	S									S								
IN-S033	Water Washing System	203.1	S																											S			S					S
IN-S034	C02 Decontamination	406.1																												S								S
IN-S036	Cask Dismantlement	203.7																																				
IN-S043	Incineration/stabilization	2073.3																																A				
IN-S044	BlendingRepackaging	13.8																																				
IN-S128	Hg Retort	16.4				A					S									S	S				S								S					
IN-S130	Macroencapsulation	6.4																																		T		
IN-S132	Stabilization	1.2																																				
IN-S133	Stabilization	56.7																																		T		
IN-S139	Waste Water Treatment	0.4																																				S
IN-S140	Stabilization	3.7						T													N															T		
LA-S001	Surface Decontamination	620.7				S					S										S																	
LA-S003	Water-Reactive Metals Skid	20.4												S	S	S																				S		
LA-S004	Chemical Plating Waste Skid	70.2										S		S																						S		S

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Facility ID	Site Selected Technology	Treat Vol (m3)	Pre-Treatment				Thermal Organic Destruction					Non-Thermal Organic Destruction										Offgas Capture			Offgas Monitoring					Stabilization										
			Mercury Separation	Sludge Washing	Debris Washing	Thermal Desorption	Steam Reforming	Plasma Technologies	Molten Metal	Molten Salt	General	Acid Digestion	DETOX	Wet Oxidation	Ultraviolet	MEO	Ultrasonic	E-Beam	CEPOD	Gas-Phase	General	Mercury	Tritium	Iodine	Mercury	Organics	Tritium	Iodine	General	Metal	Macro	Micro	Salt	Mercury	Phosphate	Grout	Vitrification	Metal Melting	General
LA-S005	Catalyzed wet oxidation	9.9					BT	BT	BT	BT		N																						S					
LA-S006	Incineration (Controlled Air)	55.3																			N																	
LA-S007	Incineration	284.1							B	B											N																	
LA-S801	Water Scrubbing, Neutralization	2.2																																					
LA-S804	Supercritical Water Oxidation	73.7			N		T	T				N	N	N	N																S		S		S				S
LB-S004	Neutralization	3.1																																					
LL-S002	Stabilization	161.5									S										S																	
LL-S004	Neutralization, Precipitation	1375.0																																					
LL-S801	Small-scale treatment	0.5																																					
LL-S803	Mediated Electro-chemical Oxidation (ME	442.8					T	T	T	T		N	N								N														S				
MD-S001	Vitrification	73.3						T				N	N																										
MD-S801	Packed Bed Reactor/Silent Discharge Plasn	1.1					B	B	B	B		N	N										S			S													
MS-S801	No process selected	24480.0																											A						T			
NO FACILITY SELECTED		2404.6	A	N	N	A		T													A						S	A	A		A	A		T			
NS-S003	Commercial Incineration	3.9																			N																	
NT-S001	Waste water treatment, stabilization	4160.0					BT							N		N			N																T		A
OH-S001	No process selected	801.0			N			T												S	N									A				A	T	T	
OR-S001	Grout stabilization	1414.0																																	T			
OR-S004	PrecipitationClarificationFiltrationDewater	44.2																																	S	S		
OR-S802	CERCLA ROD	1372.0	S																										S				S		S			
PA-S902	Commercial -- process not selected	39.6																										S					A		T		A

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Facility ID	Site Selected Technology	Treat Vol (m3)	Pre-Treatment				Thermal Organic Destruction					Non-Thermal Organic Destruction										Offgas Capture			Offgas Monitoring					Stabilization									
			Mercury Separation	Sludge Washing	Debris Washing	Thermal Desorption	Steam Reforming	Plasma Technologies	Molten Metal	Molten Salt	General	Acid Digestion	DETOX	Wet Oxidation	Ultraviolet	MEO	Ultrasonic	E-Beam	CEPOD	Gas-Phase	General	Mercury	Tritium	Iodine	Mercury	Organics	Tritium	Iodine	General	Metal	Macro	Micro	Salt	Mercury	Phosphate	Grout	Vitrification	Metal Melting	General
PA-S903	Recycling	32.7																																				
PI-S801	Amalgamation	21.6	S		S																								A									
PO-S003	Carbon adsorption	136.2													N		N	N																				
PO-S008	Waste water treatment, incineration, stabili	7858.0	S	N	N							N	N	N						S								S				A	A	A		T	T	
PO-S901	Commercial Recycling	275.5	S					T														S						S		S						S		
PP-S801	Stabilization	14.7						T	S	S			S	S														S			S				T	T	
PP-S802	Recycling	5.5																												A						T	
PX-S004	Explosives Burning Ground	66.0										N																	S									
PX-S801	Stabilization	3.7						T			S										S					S												
PX-S802	BaSO4 precipitation	38.1						T																				S							T		
PX-S803	Macroencapsulation	451.1			N			T																													T	
QX-S004	Commercial Incineration	9.4																			N																	
RF-S004	Precipitation, Neutralization	3255.6																			S																	
RF-S016	Immobilization	5689.0										S																				A		A				
RF-S017	Immobilization	511.0										S		S																					T			
RF-S019	Surface Organic Contaminant Removal/Lea	1258.5		N	N	A	T													S	S				S												
RF-S028	Stabilization	7223.0		S									S	S																				A	T			
RL-S005	Filtration/Chemical Oxidation/Reverse Os	114600.0																			S											S						
RL-S007	Macroencapsulation	5783.9				S						S		S										X				S							T			
SA-S804	Deactivation, Stabilization	0.3						T				N																							T	T	A
SA-S806	Deactivation	<0.1						BT																											T	T	

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Shaded Column
Non-Thermal Technology

Shaded Row
Facility Waste Volume > 5000 m³

Technology Codes
T: Thermal N: Non-Thermal B: Baseline
S: Supplemental A: All

Facility ID	Site Selected Technology	Treat Vol (m3)	Pre-Treatment				Thermal Organic Destruction					Non-Thermal Organic Destruction										Offgas Capture			Offgas Monitoring					Stabilization										
			Mercury Separation	Sludge Washing	Debris Washing	Thermal Desorption	Steam Reforming	Plasma Technologies	Molten Metal	Molten Salt	General	Acid Digestion	DETOX	Wet Oxidation	Ultraviolet	MEO	Ultrasonic	E-Beam	CEPOD	Gas-Phase	General	Mercury	Tritium	Iodine	Mercury	Organics	Tritium	Iodine	General	Metal	Macro	Micro	Salt	Mercury	Phosphate	Grout	Vitrification	Metal Melting	General
SA-S807	Solidification, neturalization	<0.1			S																													A			
SE-S005	Process not specified in database	91.6																																			
SR-S002	Neutralization, Precipitation, Ion Exchange	<0.1																																			
SR-S003	SRTC Ion Exchange	452.4																																			
SR-S004	SRTC Ion Exchange	446.5																																			
SR-S007	Controlled Air Incineration	1520.4		N	N			T				N										S			S										T		
SR-S008	Grout Stabilization	462.0																																		T		
SR-S015	Vitrification	2076.6	T					T				N					N					T			T								A			T		
SR-S018	Controlled Air Incineration	504.2							T					N	N	N									S	S							S				T	
SR-S019	Macroencapsulation	100.2						T																												T	T	
SR-S801	Waste Already Meets LDR Treatment Star	20.0	A																										A			A					
SR-S802	Acid Washing, Containerization	16.3	A		N				T												S	T			T					A		A					
SR-S804	Decontamination	116.4						T																						S		S				T	
SR-S806	Ion Exchange, Recycling	9.6																												S		S					
SR-S808	Macroencapsulation	13.0	A																			A	A		A		A					A				T	
SR-S809	Grout and macroencapsulation	13.3																																			
SR-S810	Macroencapsulation in S.S. Container	116.4																												A							
SR-S811	Further Characterization	2824.4	A					T				N										A	A		A		A									T	
SR-S812	Storage for decay	18.8							T	T												S	S		S		S										
WS-S001	Neutralization/Carbon Adsorption/Chemica	19.4												N			N	N														A					
WS-S004	Chemical Stabilization/Solidification	359.1						T				S		S								T			T								T	A	A	T	T	

Table 2.2 Alternative Technologies Workshop Summary by Facility

Shaded Column
Non-Thermal Technology

Shaded Row
Facility Waste Volume > 5000 m^3

Technology Codes
T: Thermal N: Non-Thermal B: Baseline
S: Supplemental A: All

Facility ID	Site Selected Technology	Treat Vol (m3)	Pre-Treatment				Thermal Organic Destruction					Non-Thermal Organic Destruction										Offgas Capture			Offgas Monitoring					Stabilization									
			Mercury Separation	Sludge Washing	Debris Washing	Thermal Desorption	Steam Reforming	Plasma Technologies	Molten Metal	Molten Salt	General	Acid Digestion	DETOX	Wet Oxidation	Ultraviolet	MEO	Ultrasonic	E-Beam	CEPOD	Gas-Phase	General	Mercury	Tritium	Iodine	Mercury	Organics	Tritium	Iodine	General	Metal	Macro	Micro	Salt	Mercury	Phosphate	Grout	Vitrification	Metal Melting	General
WS-S803	Deactivation and stabilization	21.5																																	T		
WS-S804	Amalgamation	0.4																															A				
WS-S807	Decontamination/Stabilization	14.2										S	S									T			T								A	A		T		A
WS-S808	Deactivation (Sodium Metabisulfite or Ferr	1360.2						T																						A						T	
WV-S001	Waste Water Treatment** Stabilization of I	1.6																																				
WV-S701	Characterization -- No process selected	11.9	A		N			T				N		N															S	A	A		A	A			T		
WV-S802	Size Reduction	2.1																																				
WV-S803	Interim Storage -- No process selected	2.6																			A												A			T		
YP-S001	Biodenitrification after CPCF Neutralizatio	8.8																																				
YP-S002	NeutralizationPrecipitation** Oil/Water Se	3.3												S																								
YP-S003	Alkaline Oxidation** PH Adjustment	3.8																																				
YP-S801	CERCLA ROD -- No process selected	44.0																																				

3.0 WORKSHOP RESULTS

The following set of four tables contain the detailed workshop results. Table 3.1 is the primary workshop product, the Alternative/Innovative Technology Recommendations and Issues, listed by treatment facility in alphabetical order. Assessment of the impact of the new EPA UTS rule is very preliminary and is integrated into technology issues in Table 3.1. Table 3.2 contains a list of waste streams that are potential treatability candidates. Issues relevant to OAT waste stream assignments to specific facilities are listed in Table 3.3. Finally, waste matrix issues associated with potential inconsistencies in the MWIR and DSTP data bases are listed in Table 3.4.

3.1 Alternative/Innovative Technologies

The following table summarizes emerging technologies and technology issues from the Mixed Waste Focus Area Technology Workshop held in Salt Lake City. The purpose of this evaluation was to identify potential alternative applications of emerging technologies for each listed facility.

In the "Site Technology" column, the ** entries are ones that have been entered directly from the 1994 MWIR database. Other entries originated from workshop participants based on their knowledge of the facility or were obtained directly from review of the PSTPs. The "Treat Volume" column is the summation of the inventory volume, the projected volume, and the future volume in cubic meters.

Entries in the "Alternative and Supplemental Technology" column are workshop recommendations based on review of the data base compilations. The comments indicate either an emerging technology alternative or a supplemental treatment needed to meet compliance with Land Disposal Restriction (LDR) requirements.

Alternative and Supplemental Technology comments were categorized and coded as follows.

A	Applies to all cases
B	Applies to the PEIS Base Case analysis
N	Applies to the PEIS Non-Thermal Case
T	Applies to the PEIS Thermal Case
S	Indicates a supplemental technology need

The "Technology Issues" column lists a range of concerns from workshop participants that do not fall into the alternative or supplemental technology column. Problem waste streams, treatability potential, and other unique concerns may be listed here.

Again, caveats regarding data limitations must be emphasized for the results provided in the following tables. Current technology information for each of the facilities is not complete within the data bases, and waste stream descriptions needed to determine the appropriateness of an assignment often lack the detail required to reach a definitive conclusion. The results represent the workshop participants' best efforts to assess the OAT mixed waste treatment configuration within those constraints.

Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
AE-S001	Alkali Metal Passivation Booth (AMPB)	7.6	** Reactive deactivation	No technologies cited	No issues cited.
AE-S801	Bldg. 306, Precipitation/ Filtration Unit	13.1	Precipitation Filtration	No technologies cited	No issues cited.
AE-S802	Wet Oxidation System	6.7	Wet oxidation	**B** Steam Reforming **N** Aqueous Phase Oxidation Detox Acid Digestion **T** Steam Reforming Chem-Char Molten Metal Oxidation Molten Salt Oxidation **S** Offgas Monitoring Technologies Silent Discharge Plasma High Energy Corona Discharge	**A** Consider treatability study . Selected technology must effectively treat halocarbons. **N** Effective low-temperature secondary destruction is a technology need.
AE-S803	Vitrification	20.6	Vitrification	**N** Sludge Washing Wet Oxidation UV/Peroxide MEO (Mediated Electrochemical Oxidation) **T** Vitrification Plasma **S** Organic Destruction Hg Stabilization Sulfur Polymer Cement Phosphate Bonded Ceramics	**A** Consider treatability study . Universal Treatment Standards may require improved stabilization for organics and metals. **T** Thermal treatment system must include Hg removal and a secondary combustion operation.
AE-S804	Macroencapsulation	6.1	Macroencapsulation	**B** Macroencapsulation **N** Debris Washing	**S** Secondary technologies include wash water treatment

A applies to all cases
T applies to the PEIS Thermal Case
B applies to the PEIS Base Case analysis
S indicates a supplemental technology need
N applies to the PEIS Non-Thermal Case

Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
				Macro/Microencapsulation T Vitrification for AE-W023 Metal Melter for AE-W026 Plasma Could ProcessAll	and stabilization of residues.
AE-S805	Portable Surface Decontamination Unit	94.5	Process not specified in database	B Plasma N Macroencapsulation T Metal Melter	A Processing/stabilization of decontamination solutions may need development.
AP-S901	Aptus Environmental Commercial Facility	0.5	Incineration	To Be Reviewed	To be reviewed. Facility Waste Acceptance Criteria (WAC) required.
AW-S007	Remote Mixed Waste Treatment Facility (RMWTF)	7.6	Melt, drain, and evaporate sodium-contaminated metals	A Remote Handling Equipment Enhanced Sodium Treatment	No issues cited.
AW-S037	Sodium Processing Facility	304.1	React sodium to Na_2CO_3. Remove water by thin film evaporation.	S Salt Stabilization for RCRA Metals	Thin-film evaporation must be demonstrated in a radiation environment.
BN-S701	Characterize to Determine Hazardous Constituents	95.7	No process selected	A Metals Stabilization Improved Grouting N Aqueous Oxidation: possibly Acid Digestion or Wet Oxidation Gas Phase Secondary Destruction T Vitrification Molten Salt for BN-W009 S Continuous Emissions Monitoring	Evaporator bottoms may require alternative stabilization if salt content is high.
BN-S801	Elementary Neutralization	1.1	Neutralization	S Grout Formulation Destruction of Organics Molten Salt	A Consider treatability study. Inorganic ignitable components cited in

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
					database; if present in high concentrations, require deactivation.
BN-S802	Cyanide Destruction Treatability Study	0.1	Process not specified in database	**N** Wet Oxidation **T** Vitrification	Small CN- destruction unit may have broad application.
CM-S801	Oak Ridge Commercial Option	21,887.7	Processes not selected	**A** Thermal Desorption **N** Sludge Washing Aqueous Oxidation **S** Metals Stabilization Salt Stabilization	No issues cited.
DP-S001	Central Neutralization Facility	403.3	Neutralization Precipitation ** Centrifugation	**S** Batteries Handling	No issues cited.
DP-S002	TSCA Incinerator—Liquids and Combustible Solids	14,446.1	Incineration	**N** Sludge Washing **T** Steam Reforming Plasma **S** Mercury Removal Sludge Dewatering Offgas Monitoring	**B** Mercury removal technology should be added for waste treatment before incineration.
DP-S701	12/9 Newly Defined Facility Additional Characterization Required	183.8	No process selected	MultipleTechnologies Cited Including: **A** Handling of Labpacks Phosphate Bonded Ceramics Compressed Gas Skid Handling of Batteries **N** Debris Washing DETOX **T** Plasma	**A** Onsite facility required for battery handling and opening.
DP-S804	Bench-Scale Treatments	<0.1	Process not specified in database	No Technologies Cited	No issues cited.

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
DP-S805	12/9 Newly Defined Facility	0.5	Process not specified in database	**A** Mercury Solidification and Stabilization	No issues cited.
DP-S806	12/9 Newly Defined Facility	45.0	Pilot-scale decontamination and grouting	**A** Polymer Macroencapsulation **T** Plasma **S** Debris Washing Thermal Desorption Aqueous Oxidation	No issues cited.
DP-S807	12/9 Newly Defined Facility	184.1	Thermal desorption of mercury	**N** Mercury Removal **T** Vitrification Metals Melting **S** Mercury Solidification Offgas Monitoring Offgas Mercury Capture	No issues cited.
DP-S808	12/9 Newly Defined Facility	163.5	Pilot-scale grouting	**T** Vitrification **A** Phosphate Bonding Macroencapsulation	**A** Need research in stabilization of beryllium wastes.
DP-S809	12/9 Newly Defined Facility	7.1	Process not specified in database	**A** Metals Stabilization **S** Vitrification Plasma	No issues cited.
DS-S001	DSSI Commercial Facility	171.5	Incineration	**N** Aqueous Phase Oxidation **T** Plasma Vitrification **S** Stabilization of Metal and Halide Residues Macroencapsulation Mercury Capture and Stabilization Continuous Emissions Monitoring	Mercury should be separated before incineration unless facility contains mercury capture technology.
EH-S701	Additional Characterization	6.4	No process selected	**A** Chloride Stabilization	Must determine best method for

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S indicates a supplemental technology need
N applies to the PEIS Non-Thermal Case

Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
	Needed to Determine Treatment			**B,T** Molten Salt **N** Acid Digestion Aqueous Phase Oxidation **S** Continuous Emissions Monitoring	nonthermal oxidation of solid biological specimens and residues.
ET-S001	RMDF— Neutralization Process	0.1	Aqueous neutralization ** Reactive deactivation ** Stabilization of metals	**A** Neutralization in Plating Waste Skid Grout Formulation Phosphate Bonded Ceramics **T** Vitrification Plasma	Consider treatability study.
ET-S701	Additional Characterization Needed To Determine Treatment	<0.1	No process selected	**A** Macroencapsulation Enhanced Metal Stabilization **N** Acid Digestion **S** Continuous Emissions Monitoring	Composition of paint chips will determine whether organic destruction is advisable. Consider treatability study.
EV-S003	Envirocare Commercial Facility	16,848.3	Stabilization and disposal	**T** Vitrification	No issues cited.
FM-S001	UNH Treatment Facility	1,072.0	Neutralization Precipitation Filtration	**S** Vitrification of Filter Cake Stabilization of Filter Cake	**A** Nitrate destruction, possibly biodenitrification, required.
FM-S801	Chemical Treatment Project	1,033.1	Process not specified in database	Multiple Technologies are Cited Including: **A** Lead Decontamination Stabilization of Salts and Metals Mercury Amalgamation Macroencapsulation Phosphate Bonded	Some wastes will require desorption to separate mercury and PCBs. Chloride salt immobilization technology is required. Amalgamation is required for se[illegible]ated mercury. Require decontamination

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
				Ceramics Thermal Desorption **BT** Steam Reforming High Energy Corona Thermatrix Plasma Chem Char **N** Aqueous Oxidation: possibly Acid Digestion or DETOX Debris Washing Mercury Removal **T** Vitrification **S** Continuous Offgas Monitoring of Mercury and Organics	technology for lead wastes followed by macroencapsulation. Offgas systems need to deal with highly combustible organics (kerosene, diesel fuel, etc.). Offgas systems must provide secondary treatment and monitoring of volatile organics (kerosene, diesel oil, etc.).
FM-S802	FEMP Waste Water Treatment System	12.3	Process not specified in database	**S** UV/Peroxide Wet Oxidation E-Beam Ultrasonic	Aqueous-phase organic destruction required for FM-W138, FM-W286.
FM-S803	HF Neutralization System	16.8	Neutralization Precipitation Filtration	No Technologies Cited	Solid fluoride residues require stabilization.
FM-S804	Stabilization Project	505.3	Incineration	**N** Acid Digestion **T** Vitrification Plasma	No issues cited.
GA-S701	Additional Characterization Needed To Determine/ Confirm Alpha	31.8	No process selected	**A** Chloride Stabilization Mercury Stabilization Mercury Separation from Sludge **N** Aqueous Oxidation Debris Washing	Alpha characterization of waste will influence facility assignment. Consider treatability studies for some waste streams.

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B applies to the PEIS Base Case analysis
S indicates a supplemental technology need
N applies to the PEIS Non-Thermal Case

Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
				T Metal Melter Vitrification Plasma	
GA-S801	On-Site Neutralization	1.4	Neutralization	**S** Stabilization of Salt Residues	No issues cited.
GJ-S701	Characterize to Determine Radioactivity	0.1	Process not selected	**A** Salt Stabilization	Consider treatability study
GJ-S801B	Mobile Thermal Desorption Process	183.8	Heated vacuum desorption Adsorption of gases	**B,T** Plasma Steam Reforming **N** Debris Washing Acid Digestion Wet Oxidation **T** Vitrification Metals Melting **A** Continuous Emissions Monitoring	**A** Not clear that Vaxtrax (the planned process) can achieve temperatures required for PCB desorption or mercury retorting. Incineration followed by stabilization may be better for SA-W010, SA-W054, SA-W102, SA-W114, and SA-W115. **N** Nonthermal secondary destruction development needed (SDP, corona discharge, UV). **S** Continuous emissions monitoring for organics and radionuclides required.
GJ-S803	Mobile Treated Water Evaporation	<0.1	Evaporation	**S** Chloride Stabilization Organic Destruction Phosphate Bonded Ceramics	Consider treatability study. Ensure that the concentrations of perchlorates and organics are not sufficient to cause a reaction. Stabilization of chloride salt residues should be developed.
GJ-S804	Sort/Survey/ Decontamination	31.5	Process not specified in database	Multiple Technologies Cited Including:	Consider treatability studies for some streams .

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S indicates a supplemental technology need

Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
				A Stabilization Macroencapsulation Mercury Separation **BT** Mercury Retorting **N** Catalyzed Wet Oxidation Debris Washing Acid Digestion **T** Vitrification Metal Melting Plasma	Continuous offgas monitoring and of organics and radionuclides should be provided along with some of the proposed technologies.
GJ-S805	Generator Treatment Plan	<0.1	Process not specified in database	**A** Stabilization of Metals: Grout Formulation Phosphate Bonded Ceramics	Grout formulation must be adequate to stabilize metals.
IN-S004	WERF: Stabilization—Portland Cement	56.6	Cement stabilization	**A** Enhanced Stabilization **T** Vitrification Plasma **S** Organic Destruction	Universal Treatment Standards may dictate different stabilization technology. Split and processed streams make it impossible to review supplemental technology requirements and validity of stream assignments. Thermal technologies could treat complete waste streams.
IN-S005	WERF: Incineration—Controlled Air Incinerator	1,327.5	Incineration	**N** Aqueous Oxidation Sludge Washing Debris Washing **T** Plasma Vtrification Metals Melting **S** Mercury Stabilization Offgas Mercury Capture and Monitoring	Require Facility WAC. Split and processed streams make it impossible to review validity of stream assignments.

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S indicates a supplemental technology need
N applies to the PEIS Non-Thermal Case

Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
				Continuous Emissions Monitoring	
IN-S006	PWTU: Separation; Neutralization, Ion Exchange, Carbon Absorption	6.3	** Ion exchange ** Neutralization ** Carbon adsorption	**A** Aqueous Phase Oxidation **S** Stabilization of Metals and Salts Plasma for Secondary Organic Destruction	Universal Treatment Standards may dictate destruction of organics adsorbed on carbon.
IN-S008	TAN 726A: Separation Ion Exchange	106.0	** Ion exchange	**S** Enhanced Metals Stabilization	No issues cited.
IN-S010	WEDF: Amalgamation	16.0	Amalgamation	**S** Treatment and Monitoring of Retort Offgases	Universal Treatment Standards may indicate that retorting is the method of choice for DP-W079. DP-W114 may need additional treatment for its lead contamination Universal Treatment Standards may make current amalgamation technology obsolete. New amalgamation technology may be needed. Technology to manage tritiated mercury requires development.
IN-S011	WEDF: Stabilization	336.1	Portland cement Sulfur polymer cement	**A** Phosphate Bonded Ceramics **S** Aqueous Oxidation Organic Destruction	Split and processed streams make it impossible to review supplemental technology requirements and validity of stream assignments.
IN-S014	IWPF: Amalgamation System	11.1	Amalgamation	**A** Enhanced Amalgamation	Universal Treatment Standards may make current amalgamation technology obsolete. Enhanced amalgamation technology may be needed.

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
IN-S015	IWPF: Thermal Destruction	40,258.4	Incineration	**N** Sludge Washing Aqueous Phase Oxidation: Direct Chemical Oxidation Acid Digestion **S** Continuous Emissions Monitoring Macroencapsulation Microencapsulation Offgas Mercury Recovery Gold Ceramic Filter	No issues cited.
IN-S018	IWPF: Stabilization System	21,833.8	Vitrification and polymer stabilization	**A** Phosphate Bonded Ceramics	Consider processing sludges directly in a vitrifier rather than incineration followed by stabilization. For metal, vitrification is not a good option. Suggest evaluating decontamination of simple shapes and melting of complex shapes.
IN-S030	HEPA Filter Leaching System (HFLS) (CPP-659)	85.6	** Chemical extraction	**S** Macroencapsulation of Treated Filters Thermal Desorption Aqueous Organic Destruction	No issues cited.
IN-S033	ICPP Debris Treatment and Containment Facility	203.1	Surface decontamination with water, chemicals, and steam.	**S** Residue Stabilization Macroencapsulation Separation and Stabilization of Mercury	Split and processed streams make it impossible to review supplemental technology requirements and validity of stream assignments.
IN-S034	ICPP Debris Treatment and Containment Facility (Unit 2)	406.1	** Decontamination by CO_2	**S** Residue Stabilization Macroencapsulation	Split and processed streams make it impossible to review

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
					supplemental technology requirements and validity of stream assignments.
IN-S036	TAN 607: Cask Dismantle	203.7	Process not specified in database	No Technologies Cited	Require process description. Split and processed streams make it impossible to review supplemental technology requirements and validity of stream assignments.
IN-S043	IWPF: Remote-Handled Waste Treatment Cell	2,073.3	Incineration Stabilization	**A** Phosphate Bonded Ceramics	No issues cited.
IN-S044	MWSF: Blend/Repackage Liquid Waste for Incineration at WERF	13.8	Blending Repackaging	No Technologies Cited	No issues cited.
IN-S128	WEDF: Mercury Retort for High Mercury Subcategory Wastes	16.4	Mercury retorting	**A** Thermal Desorption Sulfur Polymer Microencapsulation **N** Aqueous Oxidation **S** Destruction of Organics Continuous Emissions Monitoring for Mercury	Volatile organics may be a problem for IN-B075A and IN-W053A. Organic destruction and continuous emissions monitoring are required in offgas.
IN-S130	Treatment of Waste Under 40CFR263-GTPS At Test Reactor Area	6.4	Macroencapsulation	**T** Vitrification	Ensure stabilization of mercury contaminants.
IN-S132	Generator Treatment Plans at SMC/Stabilization	1.2	Stabilization	No Technologies Cited	Consider treatability studies.
IN-S133	Generator Treatment Plans at ICPP/Stabilization	56.7	Stabilization	**T** Vitrification	The waste stream is described as "characteristic sludge" with no further detail provided. Actual waste characteristics will affect treatment.

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
IN-S139	GTP at NRF/Separation	0.4	Process not specified in database	**S** Residue Stabilization	Consider treatability studies.
IN-S140	GTP at NRF/Stabilization	3.7	Stabilization	**N** Aqueous Phase Oxidation **T** Plasma Vitrification	Consider treatability studies.
LA-S001	Lead Decontamination Trailer	620.7	** Decontamination ** Solidification	**S** Thermal Desorption Aqueous Phase Oxidation Thermal Organic Destruction	No issues cited.
LA-S003	Hazardous Waste Treatment Facility (HWTF): Reactive Metals Skid	20.4	Controlled hydration Neutralization	**S** Wet Oxidation, Direct Chemical Oxidation, UV/Peroxide, Mediated Electrochemical Oxidation for YP-W126 after Deactivation. Vitrification of All Residues after Deactivation.	Consider treatability studies for some streams . Reactive metals skid technology is not mature.
LA-S004	HWTF: Plating Wastes Acids/Bases Skid	70.2	Neutralization Filtration Precipitation Grouting ** Chemical Oxidation/reduction	**S** Stabilization of Residues Wet Oxidation, Acid Digestion for IN-W119A, IN-W120A Vitrification of All Residues	Consider treatability studies for some streams .
LA-S005	HWTF: Detoxification Skid	9.9	Catalyzed wet oxidation	**BT** Plasma Steam Reforming Molten Salt Oxidation Molten Metal Oxidation **N** Acid Digestion **S** Phosphate Bonded Ceramics	Re-examine status of facility. Consider treatability study. **N** Requires low-temperature secondary destruction of vapor-phase organics. Requires stabilization of chloride residues.
LA-S006	Controlled Air Incinerator—	55.3	** Incineration	**N** Aqueous Phase Oxidation	No issues cited.

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N applies to the PEIS Non Thermal Case

Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
	Solid Feed System				
LA-S007	Controlled Air Incinerator—Liquid Feed System	284.1	** Incineration	**B,T** Molten Salt Oxidation Molten Metal Oxidation **N** Aqueous Phase Oxidation	No issues cited.
LA-S801	Gas Cylinder Skid	2.2	Water scrubbing Neutralization	No Technologies Cited	Consider treatability study.
LA-S804	Mobile Hydrothermal Processing	73.7	High-temperature SCWO	**N** Wet Oxidation UV Treatment Acid Digestion Debris Washing Detox **T** Steam Reforming Plasma **S** Stabilization of Halides: Macroencapsulation Phosphate Bonded Ceramics Sulfur Polymer Cement	Must separate inert solids before SCWO. Consider treatability studies for some streams .
LB-S004	Building 75: Unit 131 AFH	3.1	Wastewater Treatment ** Aqueous Neutralization	No Technologies Cited	No issues cited.
LL-S002	Building 513 Solidification Unit	161.5	Solidification	**S** Aqueous Phase Oxidation Thermal Organic Destruction	**O** Organic destruction required before stabilization.
LL-S004	Area 514 Wastewater Treatment Tank Farm	1,375.0	Precipitation Filtration ** Reduction ** Flocculation ** Carbon adsorption ** Deactivation ** Coagulation	No Technologies Cited	No issues cited.

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
			** Ion exchange ** Chelation ** Emulsion breaking ** Sulfite reduction ** Sulfide reduction		
LL-S801	Treatability Study No. 1—Lithium Metal	0.5	Deactivation	**A** Reactive Metals Skid	No issues cited.
LL-S803	Mixed Waste Management Facility	442.8	Molten salt or CEPOD	**BT** Steam Reforming **N** Acid digestion Detoxification Chemical Oxidation **T** Plasma Molten Salt Oxidation Molten Metal Oxidation **S** Phosphate Bonded Ceramics	Consider treatability study for some streams . Requires effective stabilization of chloride residues.
MD-S001	Mound Glass Melter Thermal Treatment Unit	73.3	Vitrification ** Organic destruction	**N** Detoxification Acid Digestion **T** Super Critical Water Oxidation Plasma	No issues cited.
MD-S801	Mobile Packed Bed Reactor/Silent Discharge Plasma Treatment	1.1	Silent discharge plasma	**B** Steam Reforming SCWO Molten Salt Oxidation Molten Metal Oxidation **T** Plasma **N** Acid Digestion Detoxification **S** Tritium Capture and Monitoring	No issues cited.
MS-S801	Assessment of Technologies	24,480.0	Soil treatment	**A** Enhanced Metal Stabilization	No issues cited.

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
				T Vitrification	
NO FACILITY SELECTED	No Facility Selected	2404.6	No process selected	**A** Aqueous Phase Oxidation Chloride and Metals Stabilization Macroencapsulation Amalgamation Mercury Separation Thermal Desorption **N** Soil Washing Sludge Washing Debris Washing **T** Vitrification Plasma **S** Continuous Emissions Monitoring	Technologies listed are appropriate to one or more of the unrelated waste streams in this category. Technology types were selected through use of the PEIS flowsheet analysis.
NS-S003	NSSI Commercial Facility—Incineration	3.9	Incineration	**N** Aqueous Phase Oxidation	No issues cited.
NT-S001	Liquid Waste Treatment Facility	4,160.0	Wastewater treatment ** Metal removal from aqueous streams (evaporation) ** Stabilization of metals	**A** Stabilization of Residues **BT** Steam Reforming **N** Chemical Oxidation CEPOD/MEO **T** Vitrification of Residues	Need stabilization of metals in treatment residues.
OH-S001	Ohio Option (at an Unspecified DOE Facility in Ohio)	801.0	Processes not selected	Multiple Technologies Cited Including: **A** Improved Grouting Technology Macroencapsulation Reactive Metals Skid Chemical Passivation **T** Vitrification Plasma Metal Melter	Consider treatability study for individual waste streams .

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N applies to the PEIS Non-Thermal Case

Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
				Thermal Denitration N Chemical Oxidation Debris Washing Chemical Denitration	
OR-S001	Melton Valley Low-Level Waste Immobilization Facility	1,414.0	Grout stabilization	T Vitrification	Must treat high NOx in offgas produced by decomposition of nitrate wastes.
OR-S004	Non-Radiological Waste Water Treatment Plant	44.2	Precipitation Clarification Filtration Dewatering Air Stripping Carbon adsorption Neutralization	S Grout Formulation Vitrification	No issues cited.
OR-S802	CERCLA ROD	1,372.0	No processing planned	S Metals Stabilization Amalgamation Mercury Separation from Sludge Vitrification	Technologies cited are appropriate assuming further treatment becomes necessary.
PA-S902	Commercial Treatment and Disposal—Unassigned Vendor	39.6	Process not specified in database	A Enhanced Solidification Phosphate Bonded Ceramics T Vitrification S Continuous Offgas Monitoring	Stabilization technology needs development. Particularly, improved stabilization for Se is required under UTS.
PA-S903	Show No Added Radiation, Then Recycle	32.7	Decontamination and recycling	A Gas Cylinder Skid Battery Decontamination S Decontamination of Aerosol Cans	Suggest portable skid for gas treatment to handle aerosol cans.
PI-S801	Amalgamation Bench Scale	21.6	Amalgamation	A Triple Distillation Macroencapsulation	No issues cited.

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S indicates a supplemental technology need
N applies to the PEIS Non-Thermal Case

Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
				S Debris Washing Mercury Separation	
PO-S003	X-622 Groundwater Treatment Facility	136.2	** Carbon adsorption	**A** Ultrasonic Organic Destruction E-Beam Organic Destruction UV Photo-Oxidation **BT** Supercritical Water Oxidation	No issues cited.
PO-S008	Waste Treatment Facility	7,858.0	Wastewater Treatment Facility ** Incineration ** Deactivation ** Amalgamation ** Stabilization ** Neutralization ** Filtration ** Thermal desorption	**A** Phosphate Bonded Ceramics Salt Stabilization Mercury Stabilization Thermal Desorption **N** Wet Oxidation Detoxification Acid Digestion **T** Vitrification Plasma Metal Melting High Energy Corona **S** Continuous Offgas Monitoring Mercury Separation	Streams PO-W006 and PO-W061 need pretreatment to remove mercury. Need waste water treatment capability for existing waste as well as recycle streams. Consider Reactive Metals Skid for sodium waste (PO-W074). Consider Gas Cylinder Skid for PO-W067 and PO-W070.
PO-S901	Commercial Off-Site Recycling Facility	275.5	Recycling	This Designation Includes Many Unrelated Streams. Applicable Technologies Include: **S** Sulfur Polymer Macroencapsulation (all) Continuous Monitoring of Offgas (PO-W004)	No issues cited.

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
				Steam Reforming (PO-W068) Plasma (PO-W068) KI_3 for Mercury Removal (PO-W004) Noble Metal Reclamation (PO-W068)	
PP-S801	Solidification/Stabilization	14.7	Stabilization	**A** Enhanced Debris Decontamination Salt Stabilization **T** Vitrification Plasma Metal Melting **S** Wet Oxidation DETOX Molten Metal Oxidation Molten Salt Oxidation Continuous Offgas Monitoring	Consider treatability studies for some streams . Organic destruction required before stabilization for PP-W001, PP-W005, PP-W008. Debris washing should precede stabilization for PP-W006 and PP-W007
PP-S802	Store Material for Reuse	5.5	Recycling	**A** Macroencapsulation **T** Metal Melter	Lead debris (PP-W003) may be unsuitable for reuse and require stabilization.
PX-S004	Burning Ground: One Cage, One Tray, and One Pan	66.0	Detonation ** Reactive deactivation	**N** Acid Digestion **S** Continuous Offgas Monitoring	No issues cited.
PX-S801	Stabilization Skid	3.7	Stabilization	**S** Plasma Organic Destruction Enhanced Stabilization of Organics Continuous Offgas Monitoring	Consider treatability studies Need improved grouting technology for stabilization of organics.

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
PX-S802	Sulfate Precipitation of Barium	38.1	$BaSO_4$ precipitation.	**T** Vitrification Plasma **S** Enhanced Solidification	No issues cited.
PX-S803	Mobile Macroencapsulation Process	451.1	Macroencapsulation	**N** Debris Washing **T** Plasma Metal Melting	Simple washing and disposing of debris wastes is an alternative. Need for enhanced macroencapsulation technology.
QX-S004	Quadrex Commercial Facility	9.4	Incineration	**N** Aqueous Phase Oxidation	No issues cited.
RF-S004	Process Waste Treatment Facility: Building 374	3,255.6	** Chemical Precipitation ** Neutralization ** Filtration ** Evaporation ** Immobilization	**S** Aqueous Phase Oxidation	No issues cited.
RF-S016	CTMP System #3: Immobilization of Miscellaneous Waste Forms	5,689.0	Polymer cementation	**A** Ceramic Final Forms Salt Stabilization **S** Acid Digestion	A variety of matrices and contaminants have been directed to this facility. For a nonthermal treatment option, a number of differing technologies will be required. Universal Treatment Standards will require new stabilization technologies. Ceramic forms may address this problem.
RF-S017	CTMP System 2/4B: Building 374/774: Solidified Bypass Sludge	511.0	** Immobilization	**T** Vitrification Microwave Vitrification **S** Direct Chemical Oxidation Wet Oxidation Acid Digestion	Desorption or organic desorption required for RF-W043.
RF-S019	CTMP System 5—Surface Organic Contaminant	1,258.5	Steam stripping Supercritical CO_2	**A** Supercritical CO_2 Desorption	No issues cited.

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
	Removal		Solvation Thermal desorption Macroencapsulaton	N Low-Temperature Thermal Desorption Sludge Washing Debris Washing T Steam Reforming S Nonthermal Organic Vapor Destruction Continuous Emissions Monitoring	
RF-S028	CTMP Systems 6/2/4b	7,223.0	Stabilization	A Phosphate Bonded Ceramics T Vitrification High-Temperature Powder Technology for Ceramic Solidification S Sludge Washing DETOX Wet Oxidation	Better description of the possibility of organic contamination is necessary to determine pretreatment requirements.
RL-S005	200 Area Effluent Treatment Facility (ETF)	114,600.0	** Filtration ** Chemical oxidation ** Reverse osmosis ** Ion exchange ** Neutralization	A Aqueous Phase Oxidation S Salt Stabilization	No issues cited.
RL-S007	Waste Receiving and Processing Facility (WRAP IIA)	5,783.9	Polyethylene grout stabilization Macroencapsulation Amalgamation	T Vitrification S Acid Digestion for Organic Contaminants Silver-Saddle Treatment for Iodine Capture Wet Oxidation Thermal Desorption	The Westinghouse Hanford Company-referenced plan for waste requiring thermal treatment is treatment at a commercial facility. The waste acceptance criteria for this facility will probably exclude the following types of wastes. • Process residues, soils, and

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
					labpacks containing lead and contaminated with organic hazardous constituents • Process residues, soils, and labpacks containing mercury and contaminated with organic hazardous constituents. • Process residues, soils, and labpacks contaminated with asbestos. Technology development activities are needed for these wastes.
SA-S804	Treatability Study: Chemical Destruction/Explosives	0.3	Deactivation of explosives	**A** Explosives Deactivation **T** Plasma Vitrification Metal Melter **N** Base Hydrolysis Followed by SCWO Acid Digestion **S** Enhanced Stabilization	No issues cited.
SA-S806	TS: Chemically Deactivate Reactive Pyrophoric Metals	<0.1	Deactivation	**T** Vitrification Metal Melter Plasma	No issues cited.
SA-S807	Treatability Study: Solidification/Neutralization	<0.1	Solidification Neutralization	**A** Enhanced Grouting/ Solidification Technology **S** Debris Washing	No issues cited.
SE-S005	Scientific Ecology Group (SEG) Commercial Facility	91.6	Process not specified in database	To Be Reviewed	To be reviewed.
SR-S002	F/H Area Effluent Treatment Facility (ETF)	<0.1	Neutralization Precipitation	No Technologies Cited	No issues cited.

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
			Ion exchange ** Filtration ** Evaporation ** Carbon adsorption ** Membrane separation		
SR-S003	SRL (SRTC) Ion Exchange Treatment Probe - High Activity	452.4	Ion exchange in high-level waste	No Technologies Cited	No issues cited.
SR-S004	SRL (SRTC) Ion Exchange Treatment Probe—Low Activity	446.5	Ion exchange	No Technologies Cited	No issues cited.
SR-S007	Consolidated Incineration Facility (CIF)—Solid Feed	1,520.4	Controlled air incineration	**N** Acid Digestion Sludge Washing Debris Washing **T** Plasma Vitrification **S** Control and Monitoring of Mercury in Offgas Cleanable HEPA Filters	No issues cited.
SR-S008	Consolidated Incineration Facility (CIF)—Ashcrete	462.0	Grout stabilization	**T** Vitrification	Polymer solidification is a logical alternative. Blowdown requires evaporation/ precipitation treatment before salt stabilization.
SR-S015	M-Area Vendor Treatment Process	2,076.6	Vitrification	**A** Mercury Stabilization **N** Acid Digestion Ultrasonic Destruction **T** Vitrification Stirred Melter Plasma **S** Mercury Extraction Capture and Monitoring of	Should separate mercury from soil stream before vitrification. Require control of high NOx in offgas stream.

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
				Offgas Mercury	
SR-S018	Consolidated Incineration Facility—Liquid Feed System	504.2	Controlled air incineration	N Wet Oxidation UV Oxidation MEO T Molten Metal Oxidation S Continuous Emission Monitoring Organics by Tunable Diode Laser Mercury by UV Adsorption Fourier Transform IR. Salt Stabilization	Mercury-containing wastes require separation pretreatment. Detoxification is a nonthermal alternative
SR-S019	M-Area LETF: 313-M/321-M	100.2	Macroencapsulation Packaging ** Precipitation ** Neutralization	T Vitrification Plasma Metal Melting	Consider treatability studies for vitrification, plasma, and/or metal melting .
SR-S801	Waste Already Meets Treatment Standard	20.0	No processing planned	A Mercury Separation Mercury and Metal Stabilization	Universal Treatment Standards may dictate further treatment of waste
SR-S802	Treatment Variance Reqquired/Obtained to Treat the Waste	16.3	HCW melter	A Macroencapsulation Mercury Separation Mercury Stabilization N Debris Washing T Molten Metal Oxidation S Aqueous Phase Oxidation Capture and Monitoring of Mercury in Offgas	No issues cited.
SR-S804	Onsite/Offsite Vendor Treatment	116.4	Lead decontamination and recycle	T Plasma Metal Melter S Macroencapsulation Mercury Stabilization	Some components of the waste stream, such as lead gloves, lead aprons, and light bulbs, will require additional or different treatment than specified for the

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
					facility.
SR-S806	Ion Exchange/D-Area Heavy Water Reclamation Process	9.6	Ion exchange Heavy water recycling	**S** Macroencapsulation of Mercury	No issues cited.
SR-S808	Tritium Facility 234-H: Macroencapsulation As 90-Day Generator	13.0	Macroencapsulation	**A** Enhanced Amalgamation **S** Mercury Separation Monitoring and Capture of Tritium and Mercury	No issues cited.
SR-S809	Remote-Handling Macroencapsulation-Containment Building	13.3	Grout Macroencapsulation	**A** Polymer Encapsulation **S** Plasma Acid Digestion Offgas Monitoring and Capture of Silver and Iodine-129	Will require continuous offgas monitoring and capture of silver and iodine.
SR-S810	Wet Oxidation and LLW Lead Macroencapsulation—Containment Building	116.4	Lead decontamination and recycle	**A** Macroencapsulation CO_2 Decontamination	No issues cited.
SR-S811	Further Characterization/ Studies Required	2,824.4	No process selected	**A** Mercury Separation **N** Acid Digestion **T** Metal Melting Plasma **S** Monitoring and Capture of Mercury and Tritium in Offgas	No issues cited.
SR-S812	Storage of Tritiated Oil for Decay	18.8	Storage for decay	**S** Continuous Monitoring and Capture of Mercury and Tritium in Offgas	Eventual destruction process should include removal of mercury from oil before oxidation.
WS-S001	Site Water Treatment Plant Train 1	19.4	** Chemical Precipitation ** Filtration ** Ion exchange	**A** Salt Stabilization **N** Wet Oxidation Ultrasonic Oxidation E-Beam	No issues cited.

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
			** Adsorption (activated carbon, Activated alumina) ** Neutralization		
WS-S004	Chemical Stabilization/ Solidification Facility	359.1	** Immobilization - Stabilization via cement/fly ash addition	**A** Improved Grouting Macroencapsulation Phosphate Bonded Ceramics Sulfur Polymer Cement **T** Vitrification Metal Melter Plasma Monitoring and Capture of Mercury in Offgas **S** Acid Digestion Wet Oxidation	May need development of stabilization matrix to handle organics and metals to meet Universal Treatment Standards
WS-S803	Deactivation Followed by Stabilization	21.5	Deactivation Stabilization	**T** Vitrification	Consider treatability study .
WS-S804	Amalgamation	0.4	Amalgamation	**A** Enhanced Amalgamation **S** Triple Distillation for Recycle	Amalgamation of large volumes of Hg may require further development for mixing, verification of complete reaction.
WS-S807	Decontamination/ Stabilization	14.2	Decontamination Stabilization	**A** Decontamination Stabilization Polyethylene Encapsulation Mercury Stabilization Phosphate Bonded Ceramics **T** Vitrification Capture of Mercury in Offgas	**A** PCB content of drum and effluents must be analyzed to determine TSCA regulatory status. **T** Offgas monitoring and recovery of mercury needed.

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
				S Chemical Oxidation Acid Digestion Detoxification	
WS-S808	Microencapsulation	1,360.2	Process is macroencapsulation, not microencapsulation as shown	**A** Macroencapsulation Decontamination for Recycle/Reuse **T** Plasma Metal Melting	**T** Thermal technologies will require development to minimize Pb, Cd volatility.
WV-S001	IRTS: SMWS; LWTS; STS; CSS; Drum	1.6	Wastewater Treatment ** Stabilization of metals (cement, polymer)	No Technologies Cited	No issues cited.
WV-S701	Needs Further Characterization	11.9	No process selected	**A** Macroencapsulation Enhanced Metal Stabilization Halide Stabilization Amalgamation Mercury Separation and Stabilization **N** Acid Digestion Debris Washing Aqueous Phase Oxidation **T** Vitrification Plasma **S** Continuous Emissions Monitoring	Technologies cited are based on flowsheet of analysis of the database waste stream descriptions. Characterization may alter waste stream descriptions and technology needs.
WV-S802	Contact Size Reduction Facility (CSRF)	2.1	Size reduction	No Technologies Cited	No issues cited.
WV-S803	Interim Waste Storage Facility	2.6	No process selected	**A** Halide Stabilization Aqueous Phase Oxidation **T** Vitrification of Residues	Consider treatability studies
YP-S001	Biodenitrification Unit,	8.8	Biodenitrification after	No Technologies Cited	No issues cited.

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Table 3.1. Alternative Technologies Recommendations and Issues

Facility ID	Facility Name	Treat Vol(m^3)	Site Selected Technology	Alternative and Supplemental Technology	Technology Issues
	Building 9818		CPCF Neutralization ** PH adjustment		
YP-S002	Central Pollution Control Facility (CPCF)	3.3	Neutralization Precipitation ** Oil/water separation ** Filtration ** Carbon adsorption ** Sludge dewatering	S Aqueous Phase Oxidation	No issues cited.
YP-S003	Cyanide Treatment Facility, Building 9201-5N	3.8	Alkaline oxidation ** PH adjustment	No Technologies Cited	No issues cited.
YP-S801	CERCLA ROD	44.0	No process selected	No Technologies Cited	No issues cited.

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3.2. Treatability Study Summary

Table 3.2 is a compilation of waste streams that were suggested for treatability studies as opposed to treatment in a formal facility. Although treatability studies are not officially intended to be a method for completely treating and eliminating a facility's waste streams, regulators have been receptive to that approach for small streams as a way to accelerate treatment. Volume limitations applicable to a treatability study are defined in the Code of Federal Regulations (40 CFR Section 261.4) as:

> *(2) The exemption in paragraph (e)(1) of this section is applicable to samples of hazardous waste being collected and shipped for the purpose of conducting treatability studies provided that:*
>
> *(i) The generator or sample collector uses (in ``treatability studies'') no more than 10,000 kg of media contaminated with non-acute hazardous waste, 1000 kg of non-acute hazardous waste other than contaminated media, 1 kg of acute hazardous waste, 2500 kg of media contaminated with acute hazardous waste for each process being evaluated for each generated waste stream*

The workshop suggested reassignment of a waste stream to a treatability study when the stream was potentially within the volume limitations and met one or more of the following criteria.

- The waste stream was being shipped offsite to a treatment facility, and an onsite treatability study potentially featured less cost or risk.
- The waste stream was marginally acceptable or unacceptable to the assigned treatment facility.
- The waste stream was not yet assigned to a facility.
- Assignments to a facility consisted solely of waste streams suitable for treatability studies.

Further analysis would be useful to determine which streams assigned to each facility actually meet the volume limitations cited in the CFR above; analysis would require evaluation of EPA contaminant codes of each stream to determine which volume limitation (acute or non-acute, media or other) applies.

Table 3.2 Treatability Study Summary

Treatment Facility ID	Treatment Facility Name	Vol (m^3)	Technology used in Treatment Facility
AE-S802	Wet Oxidation System	6.7	Wet oxidation
AE-S803	Vitrification	20.6	Vitrification
BN-S801	Elementary Neutralization	1.1	Neutralization
BN-S802	Cyanide Destruction Treatability Study	.1	Process not specified in database
ET-S001	RMDF—Neutralization Process	0.1	Aqueous neutralization ** Reactive deactivation ** Stabilization of metals
ET-S701	Additional Characterization Needed to Determine Treat.	<0.1	No process selected
GA-S701	Additional Characterization Needed to Determine/Confirm Alpha	31.8	No process selected
GJ-S701	Characterize to Determine Radioactivity	.1	Process not selected
GJ-S803	Mobile Treated Water Evaporation	<0.1	Evaporation
GJ-S804	Sort/Survey/Decontaminate	31.5	Process not specified in database
IN-S132	Generator Treatment Plans (GTPs) at SMC/ Stabilization	1.2	Process not specified in database
IN-S139	GTP at NRF/Separation	0.4	Process not specified in database
IN-S140	GTP at NRF/Stabilization	3.7	Process not specified in database
LA-S003	Hazardous Waste Treatment Facility (HWTF): Reactive Metals Skid	20.4	Controlled Hydration Neutralization
LA-S004	HWTF: Plating Wastes Acids/Bases Skid	70.2	Neutralization Filtration Precipitation Grouting ** Chemical oxidation/reduction
LA-S005	HWTF: Detoxification Skid	9.9	Catalyzed Wet Oxidation
LA-S801	Gas Cylinder Skid	2.2	Water scrubbing Neutralization
LA-S804	Mobile Hydrothermal Processing	73.7	High-temperature SCWO
LL-S801	Treatability Study No.1—Lithium Metal	.5	Process not specified in database
LL-S803	Mixed Waste Management Facility	442.8	Molten salt or CEPOD

Table 3.2 Treatability Study Summary

Treatment Facility ID	Treatment Facility Name	Vol (m^3)	Technology used in Treatment Facility
OH-S001	Ohio Option (at an Unspecified DOE Facility in Ohio)	801.0	Process not specified in database
PP-S801	Solidification/Stabilization	14.7	Process not specified in database
PX-S801	Stabilization Skid	3.7	Process not specified in database
SA-S804	Treatability Study: Chemical Destruction/Explosives	.3	Process not specified in database
SA-S807	Treatability Study: Solidification/Neutralization	<0.1	Solidification Neutralization
SR-S019	M-Area LETF: 313-M/321-M	100.2	Macroencapsulation Packaging ** Precipitation ** Neutralization
WS-S803	Deactivation Followed by Stabilization	21.5	Deactivation Stabilization
WV-S803	Interim Waste Storage Facility	2.6	No process selected

3.3 OAT Facility/Waste Stream Issues

Table 3.3 lists potential waste stream issues relevant to the December 7, 1994 OAT mixed waste treatment facility configuration. Workshop participants compared waste stream characteristics with available waste acceptance criteria (WAC) of the assigned facility. If there was an apparent mismatch, the assignment was listed below. As an example, the second entry in Table 3.3 is for a wet oxidation system. The waste stream, AE-W015, consists of organic solvents. The workshop suggested that this small stream should be incinerated rather than using wet oxidation.

The table format includes individual headers (shaded areas) identifying each facility for which an issue was identified. Specific waste streams are identified by ID code and name immediately following the header. The issue or comment is contained in the fourth column, accompanied by the associated inventory volume of the waste stream.

The workshop attempted to identify all possible issues with the understanding that some will be readily resolved when more complete information is available. One source of such difficulty lies with waste streams that were split or represent secondary wastes. These revisions were entered in the DSTP data base and therefore are not fully linked with the MWIR data. The result is that these streams may not be characterized sufficiently to fully resolve questions concerning their OAT facility assignment. Nonetheless, the issues listed should prove useful as an envelope of potential mismatches between waste streams and the facilities to which they are assigned.

Table 3.3: Oat Facility/Waste Stream Issues

Facility ID	Facility Name / Waste ID	Waste Name	Issue	Vol (m^3)
AE-S801	Bldg. 306, Precipitation/Filtration Unit			
	AE-W027	Glass with metals	Given available facility and waste stream data, waste steam appears to be misassigned.	0.2
AE-S802	Wet Oxidation System			
	AE-W015	Organic solvents	This small waste stream should be considered for incineration.	6.7
AE-S803	Vitrification			
	AE-W017	Retention tank sludges	Organic destruction required for this stream.	7.5
AE-S804	Macroencapsulation			
	AE-W018	Paint chips	This waste stream appears to be inappropriately assigned. Requires organic destruction.	3.9
AP-S901	Aptus Environmental Commercial Facility			
	WV-W039B	PCB capacitors	Need facility waste acceptance criteria (WAC), particularly for radionuclides.	0.4
AW-S037	Sodium Processing Facility			
	AW-N025	Sodium stored in Bldg. 703	The large volume of this stream (292 m^3) suggests that it may not be pure sodium and therefore may require pretreatment or be inappropriately assigned. Additional stream information required.	302.7
	IN-W045	EBR I NAK	◆[1]—RH waste to CH facility	0.6
DP-S001	Central Neutralization Facility			
	DP-W031		electroless nickel not currently accepted at DP-S001	0.8
DP-S002	TSCA Incinerator—Liquids and Combustible Solids			
	IN-W038A	TAN decontamination solvents wastes	◆ — alpha waste to non-alpha facility.	5.8
	FM-N388	Contaminated non-burnables	Waste appears to be inappropriately assigned.	0.8
	FM-N383	Neural laboratory waste from the analysis of samples	1000 wastes are marginally acceptable at TSCA incinerator.	2.4
	DP-W103		Waste streams are 1000 and 8000 matrices with	0.0

[1] The ◆ indicates an issue that was not assigned by the workshop but came from Los Alamos follow up review of the database.

Table 3.3: Oat Facility/Waste Stream Issues

Facility ID	Facility Name			Vol (m^3)
	Waste ID	Waste Name	Issue	
	FM-W101B		organic contaminants; assignment to TSCA incinerator is questionable.	20.0
	FM-W110			31.2
	FM-W308			19.2
	GJ-W004			0.2
	PA-W017			11.5
	RM-W007			5.8
	IN-W038A			5.8
	FM-N384		Waste streams are 1000 and 8000 matrices without organic contaminants. Probably should not be sent to TSCA incinerator.	0.6
	DP-A106			0.0
	DP-A112			0.4
	DP-B106			0.0
	DP-B112			0.0
	DP-W085			3.0
	DP-W091			0.0
	DP-W102			23.8
	DP-W116			2.4
	FM-W008			0.2
	FM-W094			1.2
	FM-W315			0.4
	PA-W010			1.8
	PA-W006			55.3
	PA-W011			14.3
	PA-W032			2.1
	PA-W036			2.8
	RM-W002			0.7
	YP-A095			1.4
	YP-A107			2.3
	YP-B095			1.2
	YP-B107			15.3
	YP-W086			0.0
	YP-W112			0.0
	YP-W117			1.6
	FM-N382	Caustic laboratory waste from analysis of samples	1000 wastes are marginally acceptable at TSCA incinerator.	1.6

Table 3.3: Oat Facility/Waste Stream Issues

Facility ID	Facility Name			Vol (m^3)
	Waste ID	Waste Name	Issue	
DP-S805	12/9 Newly Defined Facility			
	OR-W032 YP-W125	Heterogeneous debris (with mercury) corrosive solids contaminated with mercury and other metals	The two small mercury could go to an ER facility, if RCRA wastes can be accepted at the CERCLA facility	0,2 0.3
DP-S806	12/9 Newly Defined Facility			
	DP-W065	Asbestos-covered lead pipe	Macroencapsulation or recycling suggested for lead pipe stream.	1.5
DP-S809	12/9 Newly Defined Facility			
	YP-W075	Dioxin solids	Dioxin waste stream needs special organic destruction.	0.0
DS-S001	DSSI Commercial Facility			
	WV-W006	Pu scintillation	Alpha MLLW to non-alpha facility. Are wastes within WAC?	0.0
	RF-W046	Organics discard level/LLM	◆ —Alpha waste to non-alpha facility.	52.1
	RF-W015	FBI oil/LLM	◆ —Alpha waste to non-alpha facility.	90.3
	PX-W040	Organics, miscellaneous	◆ —Alpha waste to non-alpha facility.	0.3
	PX-W032	Paint waste (organic liquid)	◆ —Alpha waste to non-alpha facility.	0.5
	PX-W024	Spent solvents	◆ — Alpha waste to non-alpha facility.	3.6
	PX-W020	Scintillation fluids	◆ — Alpha waste to non-alpha facility.	4.7
	IT-W001	Actinide LSC vial waste	Alpha MLLW to non-alpha facility. Are wastes within WAC?	0.9
EV-S003	Envirocare Commercial Facility			
	YP-W068	Organic sludges	Can Envirocare accept organic sludges for stabilization and do they meet the new UTS?	24.2
	PX-W027	Lead-contaminated waste, solid	This is an alpha waste -- Envirocare facility cannot accept alpha waste (per DSTP data base).	5.8
	BN-W003	Reactive Waste	Can Envirocare accept lab pack reactive waste?	0.1
FM-S802	FEMP Wastewater Treatment System			
	FM-W319	Plant 1 Drum Painting Booth contaminated water/sump liquor	Organic destruction suggested for FM-W319 paint sludge.	0.2
GA-S801	On-Site Neutralization			

Table 3.3: Oat Facility/Waste Stream Issues

Facility ID	Facility Name			Vol (m^3)
	Waste ID	Waste Name	Issue	
	GA-W016	Hydrochloric acid	Wastes have organic contaminants; uncharacterized. Organic treatment may be required.	0.4
	GA-W015	Phosphoric acid	Wastes have organic contaminants; uncharacterized. Organic treatment may be required.	0.2
GJ-S801B	Mobile Thermal Desorption Process			
	PX-W025	Metal scrap contaminated	Explosives coding—reconsider assignment	28.5
	PX-W023	Heterogeneous debria	◆—Alpha waste to non-alpha facility.	52.1
	PX-W021	Solvent-contaminated solid material	◆—Alpha waste to non-alpha facility.	66.1
	LA-W008	Decontamination waste—mercury	May require mercury retorting	4.6
	LA-W003	Debris—arsenic	Debris with metals-not properly assigned	0.5
	GJ-W002	PCB/pesticide extraction residue	If desorber can't reach 600°C-PCBs won't desorb and stream will not be properly treated.	0.0
GJ-S803	Mobile Treated Water Evaporation			
	SA-W072	Waste solution	BDAT is incineration for this organic liquid—consider reassignment of stream.	0.0
IN-S004	WERF: Stabilization—Portland Cement			
	IN-B122B	Contaminated debris	◆— Remote-handled waste to CH facility. Require process and split stream information.	1.8
	IN-A110B	Mercury-contaminated solids	◆— Remote-handled waste to CH facility. Require process and split stream information.	0.0
IN-S005	WERF: Incineration—Controlled Air Incinerator			
	IN-B122A	Contaminated debris	◆— Remote-handled waste to CH facility. Require process and split stream information.	94.8
	IN-A110A	Mercury-contaminated solids	◆—Remote-handled waste to CH facility. Require process and split stream information.	4.9
IN-S010	WEDF: Amalgamation			
	BN-W007	Inorganic debris with mercury waste	Consider treating as debris	0.1
	RL-W006	PUREX storage tunnels mercury waste	Alpha waste going to non alpha facility. Remote-handled waste going to CH facility.	0.0
IN-S011	WEDF: Stabilization			

Table 3.3: Oat Facility/Waste Stream Issues

Facility ID	Facility Name			Vol (m^3)
	Waste ID	Waste Name	Issue	
	IN-W038B	TAN decontamincation solvents wastes	◆ — Alpha waste to non-alpha facility. Require split stream information.	294.3
	IN-N384	Equipment pit decontaminated waste	◆ —PCBs to non-PCB facility.	0.2
IN-S014	IWPF: Amalgamation System			
	RF-W085	Excess chemicals non-laboratory packs W/D009/LLM	Non-alpha waste going to an alpha facility.	11.0
	IN-B191	Uncemented inorganic sludge (a-LLW): second-stage sludge	Does separation into A & B streams remove the organic contaminant from the B191? If not, organic destruction is required.	0.0
IN-S015	IWPF: Thermal Destruction			
			Many waste streams directed to IN-S015 have no LDR organic contaminant and could instead be treated by stabilization (e.g., at IN-S018). Consider whether non-alpha waste should be commingled with alpha waste.	
	IN-W340A	Unknown (a-LLW): ANL-W analytical chemistry laboratory glassware, paper, poly, and miscellaneous hardware	u - Remote-handled waste to CH facility. Remote-handled designation should be reevaluated.	0.4
	IN-W274A	Non-metal molds and crucibles (a-LLW): graphite	Macroencapsulate after shape destruction..	18.4
	IN-W273A	Non-metal molds and crucibles (a-LLW): graphite cores	Macroencapsulate after shape destruction.	1.2
	IN-W219A	Uncemented inorganic sludge (TRU): solidified grinding sludge, etc.	◆ —Remote-handled waste to CH facility.	9.5
	IN-W193A	Uncemented inorganic sludge (a-LLW): solidified grinding sludge, etc.	u - Remote-handled waste to CH facility. Remote handled designation should be reexamined	0.4
	IN-W162A	Concrete—brick (a-LLW): firebrick	Should consider macroencapsulation.	183.5
	IN-A381A	Non-debris solids	◆ —Remote-handled waste to CH facility. Remote handled designation should be reexamined. Require process and split stream information.	3.1

Table 3.3: Oat Facility/Waste Stream Issues

Facility ID	Facility Name			Vol (m^3)
	Waste ID	Waste Name	Issue	
	IN-A268A	Particulate wastes (a-LLW): laboratory waste	◆ —Remote-handled waste to CH facility. Remote-handled designation should be reexamined. Require process and split stream information.	3.6
	IN-A122A	Contaminated debris	◆ —Remote-handled waste to CH facility. Remote-handled designation should be reexamined. Require process and split stream information.	349.8
	AW-B028A	TRU waste used prefilters	◆ —Remote-handled waste to CH facility. Require process and split stream information.	0.1
	AW-B024A	Spent HEPA filters and prefilters	◆ —Remote-handled waste to CH facility. Remote-handled designation should be reexamined. Require process and split stream information.	0.14
IN-S018	IWPF: Stabilization System			
	IN-W340B	Unknown (a-LLW): ANL-W analytical chemistry laboratory glassware, paper, poly, and miscellaneous hardware	Remote-handled to CH facility, needs to be checked. Require process and split stream information.	0.2
	IN-W219B	Uncemented Inorganic Sludge (TRU): solidified grinding sludge, etc.	◆ —Remote-handled waste to CH facility. Require process and split stream information.	9.5
	IN-W193B	Uncemented Inorganic Sludge (a-LLW): solidified grinding sludge, etc.	Remote-handled to CH facility, needs to be checked. Require process information.	0.4
	IN-A381B	Nondebris solids	Remote-handled to CH facility, needs to be checked. Require process and split stream information.	3.09
	IN-A268B	Particulate Wastes (a-LLW): laboratory waste	Remote-handled to CH facility, needs to be checked. Require process and split stream information.	3.6
	IN-A122B	Contaminated debris	Remote-handled to CH facility, needs to be checked. Require process and split stream information.	349.8
	AW-B028B	TRU waste used prefilters	◆ —Remote-handled waste to CH facility. Require process and split stream information.	0.0

Table 3.3: Oat Facility/Waste Stream Issues

Facility ID	Facility Name			Vol (m^3)
	Waste ID	Waste Name	Issue	
	AW-B024B	Spent HEPA filters and prefilters	Remote-handled to CH facility, needs to be checked. Require process and split stream information.	0.0
IN-S033	ICPP Debris Treatment & Containment Facility: Water Washing			
	IN-C111 IN-C122 IN-D110		Remote-handled to CH facility; needs to be checked. . Require process stream information.	1.8 29.6 0.1
	IN-D110	Mercury-contaminated solids	This stream needs to be checked to ensure that it is debris. Require process stream information.	0.1
IN-S034	ICPP Debris Treat & Containment Fac: CO2 Decon (Unit 2)			
	IN-D352	Uncategorized (a-LLW): pre-73 drums	◆—Alpha waste to non-alpha facility. Require split stream information.	4.5
	IN-D307	Uncategorized (a-LLW): not recorded—unknown	◆—Alpha waste to non-alpha facility. Require split stream information.	0.2
	IN-D297	Metals (a-LLW): tantalum	◆—Alpha waste to non-alpha facility. Require split stream information.	0.1
	IN-D295	Metals (a-LLW): non-special source metal	◆—Alpha waste to non-alpha facility. Require split stream information.	0.3
	IN-D293	Metals (a-LLW): leached non-special source metal	◆—Alpha waste to non-alpha facility. Require split stream information.	0.0
	IN-B282	Miscellaneous(paper, metal, etc.) (a-LLW): americium process residue	◆—Alpha waste to non-alpha facility. Require split stream information.	1.1
	IN-A301	Radioactive Sources (a-LLW): combustible laboratory waste	◆—Alpha waste to non-alpha facility. Require split stream information.	0.05
IN-S039	IWPF Pretreatment			
	IN-B309A	Uncemented Organic Sludge (TRU): organic setips, oil solids	◆—PCBs to non-PCB facility. Require process and split stream information.	355.9
IN-S043	IWPF: Remote Handled Waste Treatment Cell			
	IN-E110	Mercury-contaminated solids	Hg handling capability not present at this facility. Require split stream information.	0.1
	IN-D122	Contaminated debris	Concern for mixing large volume of non-alpha with alpha waste. Require split stream	118.6

Table 3.3: Oat Facility/Waste Stream Issues

Facility ID	Facility Name			Vol (m^3)
	Waste ID	Waste Name	Issue	
			information.	
	IN-B110	Mercury-contaminated solids	Hg handling capability not present at this facility. Require split stream information.	1.30
IN-S140	GTP at NRF/Stabilization			
	IN-N394	Oil with heavy metals	Stabilization seems inappropriate for this stream. Recommend incineration or alternative organic destruction technology.	0.8
	IN-N393	Zirconium chips	Waste will require remote handling	2.9
LA-S003	Haz Waste Treat Fac (HWTF): Reactive Metals Skid			
	YP-W126	Commercial chemical cyanide solids	Stream requires both cyanide and organic treatment. Consider reassignment.	0.7
LA-S004	HWTF: Plating Wastes Acids/Bases Skid			
	IN-W120A	Liquid High Chloride Corrosive MW	Requires additional treatment for destruction of organics. Waste stream split must be described.	8.8
	IN-W119A	Liquid acid/mercury mixed waste	Requires additional treatment for destruction of organics. Waste stream split must be described.	7.2
LA-S804	Mobile Hydrothermal Processing			
	LA-W001	Oxidizers—nitrates and nitrated compound	Concern for solid(rag) feed to hydrothermal process. Consider acid digestion or DETOX.	5.0
LB-S004	Building 75: Unit 131 AFH			
	LB-W002	Aqueous liquids (bases) (also Matrix 6130—solid laboratory packs)	Not clear if this facility can accept listed organics.	1.8
	LB-W001	Aqueous liquids (acids) (also matrix 6130—solid laboratory packs)	Not clear if this facility can accept listed organics.	1.3
LL-S002	Building 513 Solidification Unit			
			Waste streams contain listed organics that will require organic destruction.	137.5
MD-S001	Mound Glass Melter Thermal Treatment Unit			
	MD-W013	Waste oils	◆—Alpha waste to non-alpha facility. Needs PCB screening	30.1
	MD-W001	Scintillation cocktail	◆—Alpha waste to non-alpha facility.	43.2
NS-S003	NSSI Commercial Facility—Incineration			

Table 3.3: Oat Facility/Waste Stream Issues

Facility ID	Facility Name			Vol (m^3)
	Waste ID	Waste Name	Issue	
	WV-W038	Fluorescent lightbulbs	Wastes appear to be improperly assigned. Need NSSI WAC.	0.0
	WV-W020	Mercury wastes	Wastes appear to be improperly assigned. Need NSSI WAC.	3.9
NT-S001	Liquid Waste Treatment Facility			
	NT-W002	Contaminated slurries and wastewaters (also Matrix 1190)	Stream appears to be misassigned. Organic destruction/stabilization required. Possible waste misdescription: is it a small volume sludge stream in current inventory or a large volume liquid stream in projected inventory?	4160.0
PI-S801	Amalgamation Bench Scale			
	SA-W071	Wastes contained in tennymite	Sort and segregate should precede amalgamation—balance should go to debris treatment	0.0
	PX-N041	Liquid mercury	◆—Alpha waste to non-alpha facility.	0
	LA-W021	Mercury—scrap metal	Sort and segregate should precede amalgamation—balance should go to debris treatment	21.6
PO-S008	Waste Treatment Facility			
	PO-W074	Waste sodium	Consider treatability study or assignment to other facility.	0.6
PO-S901	Commercial Off-Site Recycling Facility			
	PO-W068	Circuit boards and related items	Consider internal recycle program at SR.	2.9
PP-S801	Solidification/Stabilization			
	PP-W008	Halogenated oils	Not properly assigned; requires organic destruction	1.0
	PP-W005	Pure organic liquids (vacuum pump oil)	Not properly assigned; requires organic destruction	4.0
	PP-W001	Organic liquids	Not properly assigned; requires organic destruction	0.2
PX-S004	Burning Ground: One Cage, One Tray, and One Pan			
	PX-W036	Explosive wastewater sludge	Alpha waste to non-alpha facility	1.9

Table 3.3: Oat Facility/Waste Stream Issues

Facility ID	Facility Name			Vol (m^3)
	Waste ID	Waste Name	Issue	
PX-S801	Stabilization Skid and Bench Scale			
	SL-W002	Metals with tritium and uranium	Description indicates California listed oils. This could complicate stabilization.	3.7
PX-S802	Sulfate Precipitation of Barium			
	PX-W010	Ash, burning grounds	Possible misassignment; organic treatment may be required.	22.4
PX-S803	Mobile Macroencapsulation Process			
	SA-W069	Contaminated equipment and batteries	Batteries may require retorting to remove mercury.	0.0
	SA-W020	Experimental debris	Description indicates waste stream is not eligible for debris treatment (insufficient size). This may be true for many of the SA waste streams.	0.0
	RL-W004	PUREX canyon/storage tunnel lead waste	Remote-handled waste cannot be accepted at this facility.	0.6
	PX-W029	Heterogeneous debris/metals	Suggest enhanced stabilization because of the beryllium and the potential effect of the UTS.	10.8
	MI-N010	Batteries and film packs with mercury	Batteries may require retorting to remove mercury.	0.2
	IN-C110	Mercury-contaminated solids	◆—Remote-handled waste to CH facility	0.4
	IN-B111	Radioactive-contaminated lead	◆—Remote-handled waste to CH facility	5.6
	IN-A111	Radioactive-contaminated lead	◆—Remote-handled waste to CH facility	27.2
RF-S013	Miscellaneous Aqueous Waste Handling and Solidification Bldg. 774			
	RF-W063	Miscellaneous liquids/TRM	◆—TRU waste to non-TRU facility.	2.7
RF-S016	CTMP System #3: Immobilization of Miscellaneous Waste Forms			
	RF-W082	PCB solids— non combustibles/ILLM	PCB waste going to a non-PCB facility with no organic destruction capability.	0.4
	RF-W081	PCB solids— combustibles/LLM	PCB waste going to a non-PCB facility with no organic destruction capability.	9.0
	RF-W019	Saltcrete/LLM	Need an organic destruction process to address the organic contaminant. Consider UTS.	5265.9
RF-S019	CTMP System 5—Surface Organic Contaminant Removal			
	RF-W062	Solidified Organics/LLM	Stabilized organics may have a problem under	7.1

Table 3.3: Oat Facility/Waste Stream Issues

Facility ID	Facility Name			Vol (m^3)
	Waste ID	Waste Name	Issue	
			the UTS. This may require organic destruction of the entire waste stream.	
RF-S028	CTMP Systems 6/2/4B			
	RF-W088	Solar Pond Sludge/LLM	Large waste stream may be alpha; if no,t then should reconsider where it is treated.	1211.7
RL-S007	Waste Receiving And Processing Facility (WRAP IIA)			
	RL-W038	Mercury sludges/dry part. (Hg>260mg/kg)	RCRA requires retorting for this waste. Technology won't be in WRAP IIA.	0.3
	RL-W005	PUREX storage tunnels silver waste	u - RH waste to CH facility	0.2
	RL-W001	Hexone	The WRAP IIA does not have organic destruction, which is required for this waste stream.	1.9
SA-S807	Treatability Study: Solidification/Neutralization			
	SA-W104	Acid (liquid)	Possible NO_x and nitrate problems from the neutralization.	0.0
SE-S005	Scientific Ecology Group (SEG) Commercial Facility			
	WV-W024B	TRU lead	◆ —Alpha waste to non-alpha facility. ◆ —TRU waste to non-TRU facility. Need facility WAC. Review stream split.	0.1
SR-S007	Consolidated Incineration Facility (CIF)—Solid Feed			
	BT-W017	Ion exchange resin	This remote-handled waste is unacceptable at SR-CIF with the present WAC	0.0
SR-S008	Consolidated Incineration Facility (CIF—Ashcrete)			
	SR-W046	Consolidated Incinerator (CIF) ash	Ash stream (SR-W046) is a good candidate for vitrification.	62.0
SR-S018	Consolidated Incineration Facility—Liquid Feed System			
	SR-W022	DWPF benzene	This stream is a secondary waste from the HLW treatment system. A secondary organic destruction unit for the HLW plant might be better.	380.0
WP-S001	WIPP Option			
	IN-B309B	Uncemented organic sludge (TRU): Organic	◆ —PCBs to non-PCB facility. Because of	355.9

Table 3.3: Oat Facility/Waste Stream Issues

Facility ID	Facility Name			Vol (m^3)
	Waste ID	Waste Name	Issue	
		setups, oil solids	stream split and prior processing, review facility assignment.	
WS-S001	Site Water Treatment Plant Train 1			
	WS-W050	Liquids With Metals and Trichloroethylene (D007,D008,D040)	Activated carbon with adsorbed organics may require organic destruction.	0.4
	WS-W015	Trichloroethylene-contaminated water	Activated carbon with adsorbed organics may require organic destruction.	2.1
	WS-W014	Benzene-Contaminated Water (DO18)	Activated carbon with adsorbed organics may require organic destruction.	8.7
WS-S004	Chemical Stabilization/Solidification Facility			
	WS-W073	Raffinate Pit Sludge Samples (D004, D030-sludge)	Organic content could impede stabilization and may require organic destruction.	6.1
	WS-W053	Paint And Miscellaneous Sludges with Metals (D005,D006,D007,D008)	Organic content could impede stabilization and may require organic destruction.	0.8
	WS-W024	Paint, sodium fluoride with lead	Organic content could impede stabilization and may require organic destruction.	0.8
	WS-W008	Paint sludge with mercury	Organic content could impede stabilization and may require organic destruction.	0.4
WV-S001	IRTS: SMWS; LWTS; STS; CSS; Drum			
	WV-W007	Pyridine/cyanide waste	Organic contamination requires destruction for RCRA compliance and MWIR lists treatment technology as only stabilization.	0.0
YP-S003	Cyanide Treatment Facility: Building 9201-5N			
			Facility is not permitted to take out-of-state wastes. In-state wastes are expected to be sent to the facility but are not listed in the OAT configuration.	3.7

3.4 Database Issues

In the course of compiling data base reports for the Alternative Technologies Workshop, Los Alamos staff performed a cross-match between listed waste matrix code and the descriptions for waste streams contained within the MWIR and DSTP databases. Table 3.4 lists matrix and name for those waste streams that appeared to contain discrepancies. The accuracy of the table is limited by the utility of the waste stream name and description given in the database. In addition, possible changes to the waste streams resulting from splits and treatment processes reflected in the DSTP database were not considered because of limited data describing the changes and the characteristics of the resultant streams. The table format includes a header that identifies the waste matrix and matrix name. Beneath this header is a list of waste streams that appear to differ from the definition of the waste matrix. Waste stream ID, name, and the specific issue are listed for each stream.

Table 3.4. Database Issues

Matrix #	**Matrix Name**	
WS-ID	Description	Issues
1000	**Aqueous Liquids/Slurries**	
YP-W033	Ignitable mercury liquids	Should be a 2000
YP-W036	Ignitable corrosive reactive liquids	A mix of matrices
YP-W046	Ignitable corrosive metallic liquids	A mix of matrices
YP-W048	Ignitable reactive metallic liquids	A mix of matrices
1200	**Aqueous Slurries**	
FM-W206A	Contaminated soil, rocks, debris w/	Unclear, may be soil or debris
2000	**Organic Liquids**	
FM-W104	Contaminated water non-chloride	Should be 1000
FM-W107	Non-chloride contaminated water or sump	Should be 1000
FM-W208A	Thorium waste slurries	No organics, sludge
FM-W216	Non-recoverable trash	Not a liquid, may contain liquid
LB-W002	Aqueous liquids (bases) (also Matrix 6130 - solid lab packs)	1000 or 6000
LB-W003	Aqueous liquids (cyanide)	Should be 1000
2100	**Aqueous/Organic Liquids**	
BN-W002	Corrosive waste	May be 1000, total org. < 10%?
3114	**Absorbed Organic Liquids**	
IN-W378A	Solvent-contaminated rags	Could be 5330
3121	**Wastewater Treatment Sludges**	
SR-W018	Filter Paper Take-Up Rolls (FPTUR)	Should be 5400
3124	**Plating Waste Sludges**	
SR-W028	Mark 15 filter paper— F006	Filter paper-80#
3129	**Uncategorized Inorganic Sludges**	
PO-W005	Waste metal turnings	Possible 3190

Table 3.4. Database Issues

Matrix #	Matrix Name	
WS-ID	Description	Issues
3200	**Organic Process Residues**	
FM-N355	Solvent-contaminated waste oil	Organic liquid
FM-W301	Plant 1 drum painting booth contaminated water/sump liquid	Organic liquid
FM-W319	Plant 1 drum painting booth contaminated water/sump liquid	Organic liquid
FM-W339A	Non-chloride furnace salt	May not be organic
3210	**Organic Particulates Non-Halogenated**	
PO-W072	Clean-up debris	May be debris
3213	**Organic Absorbents Non-Halogenated**	
PO-W024	Floor sweepings	Could be debris
3230	**Organic Chemicals Halogenated**	
WS-W010	Trichloroethylene (u228)	2000 waste
WS-W017	Liquid chlorinated hydrocarbons	2000 waste
WS-W037	Liquid 2,4-D (D016-Liquid)	2000 waste
3290	**Uncategorized Organic Process Residues**	
PO-W051	Film/microfilm/x-ray	Could be debris
4000	**Soils**	
FM-W122	Grass on the soil	Unknown
FM-W190	Contaminated soil, rocks, bricks	May be debris
IN-E027	Lead-contaminated debris	May be soil after separation
PO-W069	Clean-up and spill response residues	Matrix 3113 or 3114
4100	**Contaminated Soils**	
IN-A075A	Heavy-metal-contaminated solids	May be sludge
IN-B075A	Heavy-metal-contaminated solids	May be sludge
YP-W151	Solids contaminated with mercury and other metals	Could be debris
4900	**Uncategorized Soils**	
GJ-N018	acetone/bromoform	New, no description
GJ-N019	xylol/tar	New, no description
5100	**Metal Debris**	
CN-W007	Flammable organic debris	5300
RF-W082	PCB solids—non combustibles/LLM	Unknown
5200	**Inorganic Non-Metal Debris**	
FM-W291	Mercury-spill residue/batteries	May not be debris
FM-W322	Plant 2/3 barium carbonate	May not be debris
FM-W345	THO2 powder refinery feed	May not be debris
5220	**Glass Debris**	
PX-W028	Mercury-contaminated solid	Includes glass light bulbs

Table 3.4. Database Issues

Matrix #	Matrix Name	
WS-ID	Description	Issues
SR-W058	Mixed sludge waste with mercury—DWPF treatability studies	Matrix 3120
5290	**Uncategorized Inorganic Non-Metal Debris**	
LA-W001	Oxidizers—nitrates and nitrated compound	Matrix 5300
5300	**Combustible Debris**	
IN-W257A	Radioactive Sources (TRU): Solidified Fuel Sludge	May be sludges
RM-W010	Die head residue (hazardous)	Matrix 5100
YP-W003	Uranium-contaminated residues and combustibles	May not be debris
YP-W013	Ignitable solids	May not be debris
YP-W018	Ignitable solids—PCB	May not be debris
YP-W029	Ignitable solvent and commercial chemical product solids	May not be debris
YP-W030	Ignitable commercial chemical product solids	May not be debris
YP-W050	Ignitable metallic solids	May not be debris
YP-W106	Mercury- and silver-contaminated solids	May not be debris
YP-W118	Corrosive mercury solids	May not be debris
YP-W169	Organic commercial chemical product solids	Should be heterogeneous debris
5310	**Plastic/Rubber Debris**	
IN-W256A	Glovebox gloves (TRU): box gloves and O-rings	Matrix 5311
5330	**Paper/Cloth Debris**	
BT-W001	Oil-containing heavy metals #1	Matrix 2000
5400	**Heterogeneous Debris**	
FM-W186	Scrap salts and floor sweepings	May not be debris
YP-W077	Commercial chemical product (u) solids	May not be debris
YP-W083	Organic solids—PCB	May not be heterogeneous
YP-W131	Plating process (F008) spill liquids	May not be debris
YP-W158	Arsenic solids	May not be debris
YP-W160	Arsenic solids contaminated with mercury—PCB	May not be debris
YP-W162	Arsenic solids requiring stabilization	May not be debris
YP-W165	Arsenic solids contaminated with mercury and other metals	May not be debris
5410	**Composite Filters**	
PO-W020	Lead solids	Heterogeneous debris
6000	**Special Waste**	
LL-W011	Lithium metal	Matrix 6200
6110	**Organic Lab Packs**	
WV-W006	Pu scintillation	Matrix 6140
6130	**Solid Lab Packs**	

Table 3.4. Database Issues

Matrix #	**Matrix Name**	
WS-ID	Description	Issues
WS-W013	Reactive Metals (D003)	Matrix 6200
6200	**Reactive Metals**	
YP-W167	Reactive sludges	May be a sludge
7200	**Elemental Lead**	
GA-W014	Miscellaneous Scrap Metal	May be debris

4.0 CONCLUSIONS AND RECOMMENDATIONS

The primary workshop goal—identification of potential applications for emerging technologies within the OAT "wise" configuration—was realized and documented in Table 3.1. Workshop participants used the linked MWIR and DSTP data bases to identify potential technology applications and supplemental treatment needs. In comparing these most recent results with earlier studies, the review did not produce unexpected technology need categories; however, there is a discernible shift in emphasis to enhanced stabilization technology and non-thermal treatment alternatives. The UTSs will require additional development and testing of stabilization technologies to meet more stringent leach standards. Increasing stakeholder opposition to incineration and other thermal technologies drive the need for development of technologies that operate at or below the 350°C fiducial.

The list of alternative technology opportunities and needs (Table 3.1) should prove to be a useful baseline for site operations staff, DOE program managers, and the MWFA lead organization. The results are immediately relevant to operations/technology development issues central to the MWFA. Data base shortcomings have been noted earlier; however, this compilation can be in iteratively to highlight both technology needs and required data collection enhancements.

Several other useful products resulted from the workshop preparation and implementation. Waste streams and treatment facilities that could be considered for treatability studies (Table 3.2) were identified by the workshop and may suggest a more cost-effective approach. PEIS process calculational models for the baseline, thermal, and non-thermal flowsheets were applied to each waste stream and treatment facility to produce a set of projected treatment requirements (Appendix E). This analysis represents yet another tool for determining the adequacy and completeness of the overall mixed waste treatment configuration.

For the first time, the DSTP and MWIR data bases were linked to provide the most current and complete waste status picture available in a single data source. In the workshop time frame, the DSTP data base contained the most current waste stream identification and volumetric data, whereas the MWIR held more detailed radiological and contaminant data. As data quality improves with subsequent updates, this linked capability can become an ever more powerful tool to support both planning and analysis. In the course of reviewing these data bases, two other tables were generated: Table 3.3, Apparent OAT Facility/Waste Stream Mismatches, and Table 3.4, Other Data Base Matrix/Waste Stream Issues. It is anticipated that a number of the issues in these latter two tables will be readily resolved with access to additional information; however, each issue indicates either a bona fide mismatch or a need to improve detail in the data bases.

Improved waste stream data, planning changes, and stakeholder input can be expected to drive the need to examine the appropriateness of emphasis within the technology development program. The core set of tables contained in this report can serve as a baseline and template for continued assessment of the operations/ technology development interface.

REFERENCES

1. S. Loftus and M. Martin, "Operations Analysis Team (OAT) Revised Configuration," memorandum to L. Borduin (January 6, 1995).

2. "Mixed Waste Inventory Report" (May 1994).

3. "Draft Site Treatment Plans" (August 31, 1994).

4. "Technical Area Status Reports and Technical Summaries" ("Rainbow Books"), US Department of Energy reports DOE/EM-0121P through DOE/EM-149P.

5. Environmental Protection Agency, "Universal Treatment Standards," EPA report 59-FR, 47982 (September 19, 1994).

6. US Department of Energy/EM, "Programmatic Environmental Impact Statement," report in preparation

7. Options Analysis Team, "Proposed Changes to the Draft Site Treatment Plan Mixed Waste Treatment Configuration," draft report (November 15, 1994).

8. FFCAct Task Force, "Treatment Selection Guides," Rev.0, March 1, 1994

APPENDIX A

OAT CONFIGURATION, FACILITY CODES, NAMES, AND STATUS (December 7, 1994 configuration)

Facility ID	Facility Name	Status
	Undefined Facility	
AE-S001	Alkali Metal Passivation Booth (AMPB)	Existing
AE-S801	Bldg. 306, Precipitation/Filtration Unit	Existing
AE-S802	Wet Oxidation System	New
AE-S803	Vitrification	New
AE-S804	Macroencapsulation	New
AE-S805	Portable Surface Decon Unit	New
AP-S901	Aptus Environmental Commercial Facility	Existing
AW-S007	Remote Mixed Waste Treatment Facility (RMWTF)	New large site
AW-S037	Sodium Processing Facility	Existing
BN-S701	Characterize to Determine Hazardous Constituents	
BN-S801	Elementary Neutralization	New
BN-S802	Cyanide Destruction Treatability Study	New readily impl
CM-S801	Oak Ridge Commercial Option	Existing
DP-S001	Central Neutralization Facility	Existing
DP-S002	TSCA Incinerator—Liquids & Combustible Solids	Existing
DP-S701	12/9 Newly Defined Facility	
DP-S804	Bench-Scale Treatments	Existing
DP-S805	12/9 Newly Defined Facility	
DP-S806	12/9 Newly Defined Facility	
DP-S807	12/9 Newly Defined Facility	
DP-S808	12/9 Newly Defined Facility	
DP-S809	12/9 Newly Defined Facility	
DS-S001	DSSI Commercial Facility	Existing
EH-S701	Additional Characterization Needed to Determine Treatment	
ET-S001	RMDF—Neutralization Process	New large site
ET-S701	Additional Characterization Needed to Determine Treatment	
EV-S003	Envirocare CommercialFfacility	Existing
FM-S001	UNH Treatment Facility	Existing
FM-S801	Chemical Treatment Project	New readily impl
FM-S802	FEMP Wastewater Treatment System (Incineration Project)	Existing
FM-S803	HF Neutralization System	Existing
FM-S804	Stabilization Project	New
GA-S701	Additional Characterization Needed to Determine/Confirm Alpha	
GA-S801	On-Site Neutralization	Existing
GJ-S701	Characterize to Determine Radioactivity	
GJ-S801B	Mobile Thermal Desorption Process	New readily impl
GJ-S803	Mobile Treated Water Evaporation	New readily impl
GJ-S804	Sort/Survey/Decontamination	New

Facility ID	Facility Name	Status
OR-S001	Melton Valley Low-Level Waste Immobilization Facility	Existing
OR-S004	Non-Radiological Wastewater Treatment Plant	Existing
OR-S802	CERCLA ROD	
PA-S902	Commercial Treatment and Disposal—Unassigned Vendor	Existing
PA-S903	Show No Added Radiation, Then Recycle	New
PI-S801	Amalgamation Bench Scale	New readily impl
PO-S003	X-622 Groundwater Treatment Facility	Existing
PO-S008	Waste Treatment Facility	New non-large site
PO-S901	Commercial Off-Site Recycling Facility	
PP-S801	Solidification/Stabilization	New readily impl
PP-S802	Store Material for Reuse	
PX-S004	Burning Ground: One Cage, One Tray, and One Pan	Existing
PX-S801	Stabilization Skid and Bench Scale	New readily impl
PX-S802	Sulfate Precipitation of Barium	New readily impl
PX-S803	Mobile Macroencapsulation Process	New readily impl
QX-S004	QUADREX Commercial Facility	Existing
RF-S004	Process Waste Treatment Facility: Building 374	Existing
RF-S016	CTMP System #3: Immobilization of Miscellaneous Waste Forms	New non-large site
RF-S017	CTMP System 2/4b: Bldg. 374/774: Solidified Bypass Sludge	New non-large site
RF-S019	CTMP System 5—Organic Contaminant Removal	New non-large site
RF-S028	CTMP Systems 6/2/4b	New non-large site
RL-S005	200 Area Effluent Treatment Facility (ETF)	Existing
RL-S007	Waste Receiving and Processing Facility (WRAP IIA)	New large site
SA-S804	Treatability Study: Chemical Destruction/Explosives	New readily impl
SA-S806	TS: Chemically Deactivate Reactive Pyrophoric Metals	New readily impl
SA-S807	Treatability Study: Solidification/Neutralization	New readily impl
SE-S005	Scientific Ecology Group (SEG) Commercial Facility	Existing
SR-S002	F/H Area Effluent Treatment Facility (ETF)	Existing
SR-S003	SRL (SRTC) Ion Exchange Treatment Probe—High Activity	Existing
SR-S004	SRL (SRTC) Ion Exchange Treatment Probe—Low Activity	Existing
SR-S007	Consolidated Incineration Facility (CIF)—Solid Feed	Existing
SR-S008	Consolidated Incineration Facility (CIF)—Ashcrete	Existing
SR-S015	M-Area Vendor Treatment Process	New large site
SR-S018	Consolidated Incineration Facility—Liquid Feed System	Existing
SR-S019	M-Area LETF: 313-M/321-M	Existing
SR-S801	Waste Already Meets Treatment Standard	
SR-S802	Treatment Variance Required/Obtained to Treat the Waste	
SR-S804	Onsite/Offsite Vendor Treatment	Existing
SR-S806	Ion Exchange/D-Area Heavy Water Reclamation Process	Existing
SR-S808	Tritium Facility 234-H: Macroencapsulation as 90-Day Generator	Existing
SR-S809	Remote-Handling Macroencapsulation—Containment	New

Facility ID	Facility Name	Status
	Building	
SR-S810	Wet Oxidation and LLW Lead Macroencapsulation—Containment Building	New
SR-S811	Further Characterization/Studies Required	
SR-S812	Storage of Tritiated Oil for Decay	Existing
WS-S001	Site Water Treatment Plant Train 1	Existing
WS-S004	Chemical Stabilization/Solidification Facility	New non-large site
WS-S803	Deactivation Followed by Stabilization	New non-large site
WS-S804	Amalgamation	New non-large site
WS-S807	Decontamination/Stabilization	New non-large site
WS-S808	Microencapsulation	New non-large site
WV-S001	IRTS: SMWS; LWTS; STS; CSS; Drum	Existing
WV-S701	Needs Further Characterization	
WV-S802	Contact Size Reduction Facility (CSRF)	Existing
WV-S803	Int. Waste Storage Facility	Existing
YP-S001	Biodenitrification Unit, Building 9818	Existing
YP-S002	Central Pollution Control Facility (CPCF)	Existing
YP-S003	Cyanide Treatment Facility, Building 9201-5N	Existing
YP-S801	CERCLA ROD	

APPENDIX B. AGENDA

Mixed Waste Focus Area
Alternative Technology Workshop
Salt Lake City, Utah
January 24-26, 1995

Date and Time	Topic	Presenter
Tues., Jan 24		
0830	Welcome and Introductions	Steve Domotor, DOE/EM-332 Pete Castle, LITCO/EM-332 Chris Bonzon, DOE/ID MW Lead
0915	Workshop Overview -Objectives -Workshop Materials -Proposed Approach	Lee Borduin, Los Alamos
1000	Break	
1015	PEIS Flowsheet Description	Don Musgrave, BCM, Inc.
1030	EPA Universal Standards	John Mayberry, SAIC
1045	Workshop Materials Explanation	Byron Palmer, Los Alamos
1100	Treatment Selection Guide	Pete Castle
1130	Formation of Breakout Groups. Proposed Approach to Review and Decision Making	Lee Borduin
1215	Lunch	
	Breakout Groups	
1315	Breakout Groups Go Forth	
1600	Reconvene to Review Progress and Issues	Domotor, Borduin, Castle
1700	Adjourn	
Wed., Jan 25		
0800	Continue Breakout Groups	
1130	Convene to Assess Progress	Team Leaders
1200	Lunch	
1300	Continue Breakout Groups, Begin Drafting Conclusions and Issues	
1600	Convene to Assess Progress	Team Leaders
1700	Adjourn	
Thurs., Jan 26		
0800	Continue Breakout Groups Assessments and Report Preparation	
1100	Convene to Assess Progress	Team Leaders
1200	Lunch	
1300	Continue Breakout Groups	
1500	Team Leaders provide summary reports. Determine needed follow-up assignments, continue report preparation.	Team Leaders Borduin and Castle

APPENDIX C. WORKSHOP PARTICIPANTS

Name & Affiliation	Affiliation & Fed Ex Address	Telephone/FAX/e-mail
Stephen Domotor	Department of Energy/EM-332 MWFA Co-Chair	TEL# 301/903-5053 FAX# 301/903-1643
Chris Bonzon	DOE/ID MWFA Lead Org. Mgr.	TEL# 208/526-3752 FAX# 208/526-6249
Jan Berry	ORNL/MWIP	TEL# 615/574-4953 FAX# 615/576-7865 e-mail: amy@ornl.gov
Lee Borduin	LANL/EM-332 Technology Analysis Group	TEL# 505/667-3150 FAX# 505/665-2897 e-mail: lborduin@lanl.gov
Pete Castle	LITCO/EM-332	TEL# 301/903-1293 FAX # 301/903-1308 e-mail: Peter.Castle@em.doe.gov or Castle@CST4.lanl.gov
Tom Conley	ORNL	TEL# 615/574-6792 FAX# 615/576-7865 e-mail: conleyt@ornl.gov
Les Dole	ORNL/MWIP	TEL# 615/576-4319 FAX# 615/576-7865 or -4195 e-mail: dolelr@ornl.gov
Dave Eaton	INEL/ LITCO	TEL# 208/526-7002 FAX# 208/526-7700 e-mail: dle@inel.gov
Dirk Gombert	INEL/LITCO MWFA Core Team Leader	TEL# 208/526-4624 FAX# 208/526-9805 e-mail: dg3@inel.gov
Donnie Helton	WSRC	TEL# 301/903-4992 FAX# 301/903-1308
John Mayberry	SAIC	TEL# 208/528-2116 FAX# 208/528-2197
John McFee	IT Corporation	TEL# 505/262-8800 FAX# 505/262-8855
Don Musgrave	B.C.Musgrave, Inc.	TEL# 510/443-9929 FAX # 510/449-1343 e-mail: burdonm@netcom.com
Byron Palmer	LANL Technology Analysis Group	TEL#505/667-3528 FAX# 505/665-0621 e-mail: palmer@lanl.gov
John Pendergrass	TK Thompson, Inc. LANL Technology Analysis Group	TEL# 505/852-2710 FAX#505/852-2710 e-mail: jpender@cst4.lanl.gov or japender@aol.com
Bill Schwinkendorf	BDM Federal	TEL# 505/848-5606 FAX# 505/848-5372

APPENDIX D
SELECTED VIEWGRAPHS AND DATA FORMS

D.1. Workshop Overview and Approach

MIXED WASTE FOCUS AREA

ALTERNATIVE TECHNOLOGIES WORKSHOP

DOE Headquarters:
S. Domotor, DOE/EM-332
P. Castle, LITCO/EM-332

Los Alamos Technical Analysis Team:
L. Borduin, LANL
B. Palmer, LANL
J. Pendergrass, TKT, Inc.

January 24-26, 1995

MIXED WASTE FOCUS AREA
ALTERNATIVE TECHNOLOGIES WORKSHOP

WORKSHOP OBJECTIVES:

(1) determine opportunities for application of emerging technologies within the OAT "wise" configuration,

(2) establish technology development priorities,

(3) identify technology development gaps,

(4) develop recommendations for needed re-direction of development efforts,

(5) validate OAT waste stream assignments, and

(6) determine impact of EPA Universal Standards Rule.

WKSPOBJV.DOC

MIXED WASTE FOCUS AREA
ALTERNATIVE TECHNOLOGIES WORKSHOP

BACKGROUND: OAT CONFIGURATION

- Started with Original DSTP Configuration/Data Base (Table I-A)
- Addressed only MLLW Issues
- OAT Analysis developed to
  -maximize use of existing facilities,
  -minimize shipping distance for untreated wastes,
  -minimize need to build new facilities, and
  -reduce cost and risks associated with mixed waste treatment.
- 11/15 OAT Configuration - 120 facilities
- 12/9 Revised Configuration - 138 facilities
- OAT increased use of Mobile Treatment/ reduced New Facilities
- Shipped waste is 6.3% in OAT vs. 4.9% DSTP Configurations
- Configuration identified Facilities, not specific Technologies (DSTP database)
- Potential for application of Emerging Technologies not addressed.
- 12/9 Configuration as included in Tables I-B and III-C.

WKSOATCF.DOC

MIXED WASTE FOCUS AREA
ALTERNATIVE TECHNOLOGIES WORKSHOP

DATA ANALYSIS APPROACH:

- MWIR / DSTP Data Base Linkup
- Used 12/9 OAT Facility Configuration (Table III-C and OAT references)
- Sorted Waste Stream Data by Site/Facility/Radiological/PCB/Handling Criteria
- Used Existing PEIS Flowsheet Calculational Models to Estimate Treatment Technology Needs (Table II-A and B)
  - Base Case
  - Thermal
  - Non-Thermal
- Result is Table I-B. OAT Treatment Facility/Waste Stream Analysis

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MIXED WASTE FOCUS AREA
ALTERNATIVE TECHNOLOGIES WORKSHOP

Supporting Analyses and Searches:

- OAT Facility Capacity Analysis(Table III-C)
- DOE Emerging Technologies (Table III-D/Dole and Castle)
- PSTP Site-Selected Technologies (Table III-E)
- Potential Mismatches in OAT Waste Stream Assignment (Table III-F)
- Potential Mismatches in MWIR/DSTP Waste Streams(Table III-G)

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MIXED WASTE FOCUS AREA
ALTERNATIVE TECHNOLOGIES WORKSHOP

WORKSHOP APPROACH:

Organization
- OAT Facilities Divided into Three Approximately Equitable Sets
- Establish Three Teams to Conduct Review
- Team Chairperson to Guide Review and Report Results

Alternative Technology Review Process
- Using Table I-B, Review Facilities in New / Unknown Status / Existing Sequence
- Review Each Facility in the 3 PEIS Modes:
  - Base Case (Incinerators Operational)
  -Thermal Case (High Temperature Processes Operational)
  - Non-Thermal (No High Temperature Processes Permitted)

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MIXED WASTE FOCUS AREA
ALTERNATIVE TECHNOLOGIES WORKSHOP

WORKSHOP APPROACH:

Alternative Technology Review Process (cont'd)

- As Needed, query MWIR data base for additional waste stream information
- Use Treatment Selection Criteria Principles
- As Required, Propose Alternative and/or Supplemental Technologies for Each Waste Stream/Facility
- Record Technology Needs (per 3 PEIS cases)

OAT Configuration Review

- Examine Facility/Waste Stream Compatibility
- Record any Issues

EPA Universal Treatment Standard Issues

- Review "Tagged" Streams in Table I-B
- Record any Issues

WKSAPPR.DOC

MIXED WASTE FOCUS AREA
ALTERNATIVE TECHNOLOGIES WORKSHOP

WORKSHOP PRODUCTS:

- Complete Set of Alternative and/or Supplemental Technology Needs for OAT Facility Configuration
- Complex-wide Summary of Technology Needs
- List of OAT Configuration Waste Stream Assignment Issues
- Potential Universal Treatment Standard Issues Listed by Facility/Waste Stream

POST WORKSHOP PRODUCTS:

- Schedule Analysis Relative to Identified Alternative Technologies
- Technology Development Priorities, Gaps, and Needed Re-direction

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D.2. Analyses and Workshop Materials Explanation

MWFA Alternative Technology Workshop Analyses

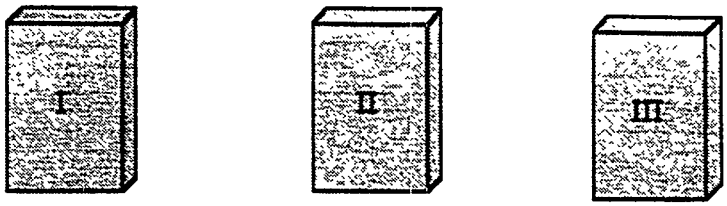
Byron Palmer

Los Alamos

Introduction

- Methods Used to Prepare Documents
  - Volume 1-OAT Facility Waste Analysis
  - Volume 2-PEIS Facility and Site Analysis of Oat DSTP Configuration
  - Volume 3-General Reference
- Proposed Use of Documents and Forms
  - Emerging Technology Form
  - Facility/Waste Stream Issues

Documentation Organization



Facility	PEIS Analysis	Reference
Waste List	Facility	Technology
PEIS Units	Site	

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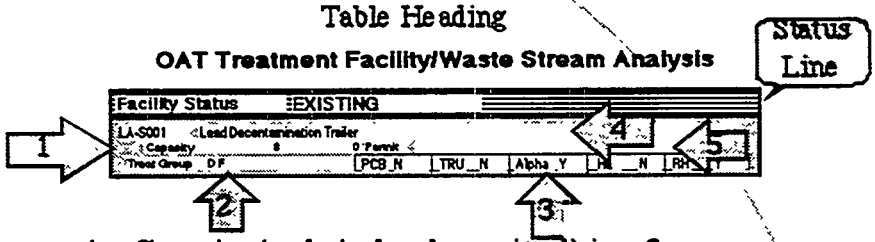
Volume 1
OAT Facility Waste Analysis

Table Heading

OAT Treatment Facility/Waste Stream Analysis



1. Capacity (technical and permitted) in m3
2. Treatability Group
3. Treatment Capabilities
4. Facility ID and Name
5. Permit Status

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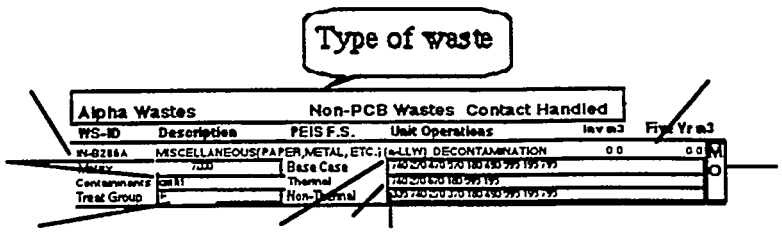
Volume 1 (Waste)



1 Waste ID and Name

2 Volume in m^3

3 Matrix and Contaminants

4 Treatability Group

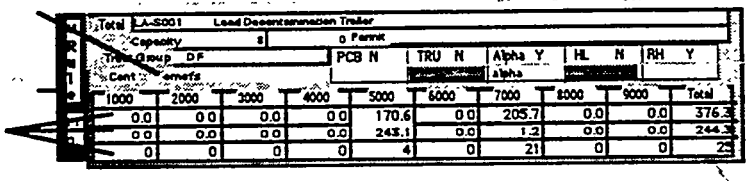
5 Base Case Units

6 Thermal Case Units

7 Non-Thermal Case Units

8 Universal Rule Indicators

Volume 1 (Summary)



1 All contaminant codes sent to the facility

2 Universal Rule Indicator M-Metal, O-Organic

3 Matrix groups by inventory, projected, and number

4 Waste categories sent to facility

Volume II
PEIS Facility and Site Analysis

Total TA-0001 -- Lead Contamination Trailer -- XXXXXXXX			
Unit	Name	Volume(m^3/yr)	Mass(kg/yr)
[illegible]	Debris	[illegible]	[illegible]
[illegible]	Inherently Hazardous Wastes	[illegible]	[illegible]
[illegible]	Solid Process Residue Aqueous & Soil	[illegible]	[illegible]
510	Debris Aqueous and Soil	15.0282	49548.6
[illegible]	Inherently Hazardous Aqueous and Soil	1.1545	15649.8
150	Aqueous Liquids Solids Separation	92.2972	188555.8
550	Process Residues Solids Separation	0.7779	1811.2
551	Process Residues Sludges Separation	0.0076	28.2
550	Debris Solids Separation	15.0282	49548.6
[illegible]	Inherently Hazardous Solids Separation	1.1545	15649.8

Volume II (cont.)

Unit	Name	Volume(m^3/yr)	Mass(kg/yr)
140	Aqueous Liquids Neutralization	1.1826	3267.2
540	Process Residues Neutralization	0.0095	32.5
540	Debris Shredding	15.0521	49246.7
740	Chemical/Physical Separation	1.2511	16751.8
741	Inherently Hazardous Neutralization	0.0965	1855.8
270	Aqueous Phase Organic Contraction	16.1285	59352.2
470	Organic Phased Contraction	0.9658	958.4
570	Phased Separation	2.9585	35677.8
150	Evaporation	92.1468	99565.5
450	Secondary Waste	0.5994	7852.8
190	Condensate	91.9752	89558.5
490	Offgas Treatment	0.4816	5651.5
190	Polymer Solidification	2.1825	44218.2
690	Palletizing	15.0521	49246.7
190	Sludge Sorting	0.1895	6199.5
190	Debris Sorting	1.0281	49246.7

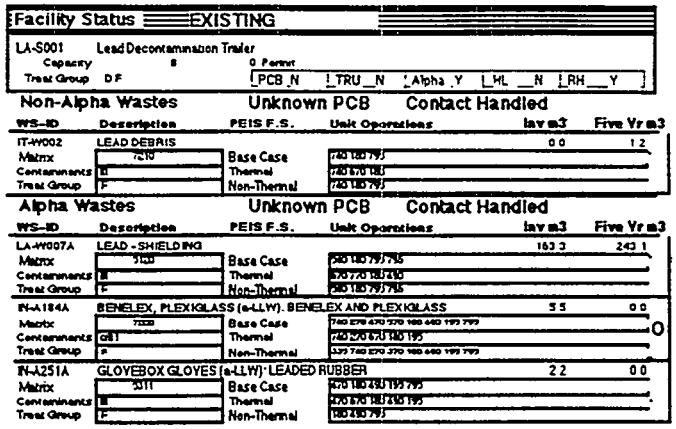
Volume II (cont.)

Unit	Item	Volume(m^3/yr)	Mass(kg/yr)
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]

Volume III

- MWIR/DSTP Waste Matrix Codes
- Contaminant Codes
- OAT Facility Capacity Analysis
- DOE Emerging Technologies
- PSTP Site Selected Technologies
- Potential Mismatches in OAT Waste
- Potential Mismatches in MWIR Matrices

LA-S001 (page 108)



Facility Status EXISTING

LA-S001 Lead Decontamination Trailer

Capacity 8 0 Permit

Treat Group D F | PCB N | TRU N | Alpha Y | HL N | RH Y

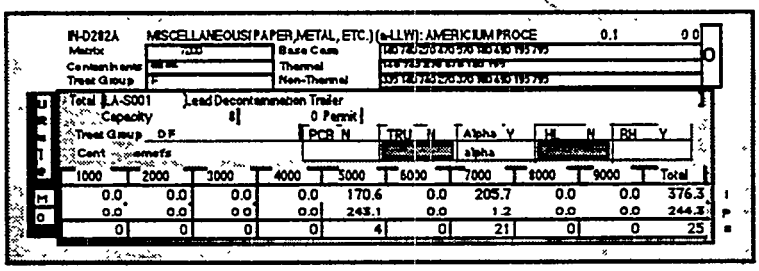
Non-Alpha Wastes — Unknown PCB — Contact Handled

WS-ID	Description	PEIS F.S.	Unit Operations	Inv m3	Five Yr m3
IT-W002	LEAD DEBRIS			0 0	1 2
Matrix 7570		Base Case			
Contaminants B		Thermal			
Treat Group F		Non-Thermal			

Alpha Wastes — Unknown PCB — Contact Handled

WS-ID	Description	PEIS F.S.	Unit Operations	Inv m3	Five Yr m3
LA-W007A	LEAD - SHIELDING			163 3	243 1
Matrix 7570		Base Case			
Contaminants B		Thermal			
Treat Group F		Non-Thermal			
IN-A184A	BENELEX, PLEXIGLASS (a-LLW). BENELEX AND PLEXIGLASS			5 5	0 0
Matrix 7220		Base Case			
Contaminants oil		Thermal			
Treat Group F		Non-Thermal			
IN-A251A	GLOVEBOX GLOVES (a-LLW) LEADED RUBBER			2 2	0 0
Matrix 5111		Base Case			
Contaminants B		Thermal			
Treat Group F		Non-Thermal			

LA-S001 (cont.)



IN-D282A MISCELLANEOUS PAPER, METAL, ETC.) (a-LLW): AMERICIUM PROCE 0.1 0 0

Matrix 7220 Base Case

Contaminants Thermal

Treat Group F Non-Thermal

Total LA-S001 Lead Decontamination Trailer

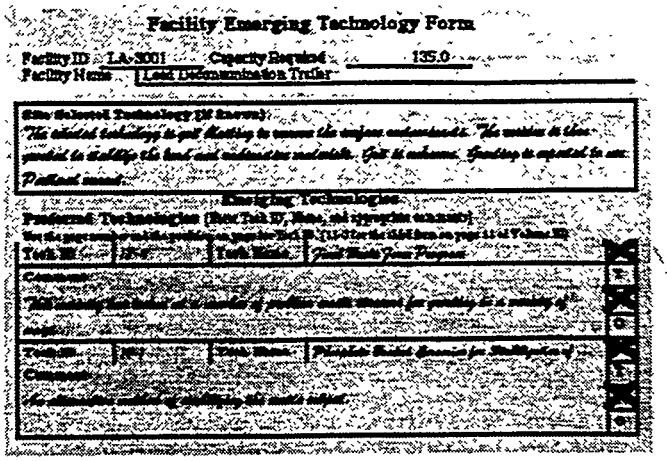
Capacity 8 0 Permit

Treat Group D F | PCB N | TRU N | Alpha Y | HL N | RH Y

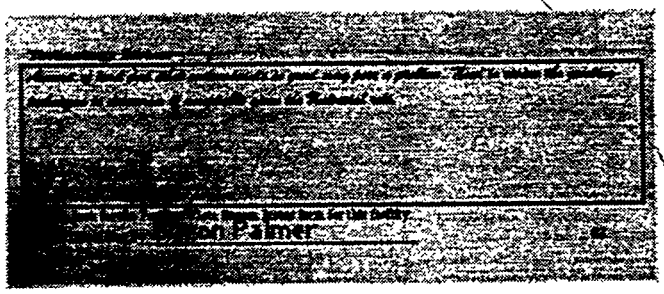
Cont ...mets alpha

	1000	2000	3000	4000	5000	6000	7000	8000	9000	Total
M	0.0	0.0	0.0	0.0	170.6	0.0	205.7	0.0	0.0	376.3
O	0.0	0.0	0.0	0.0	243.1	0.0	1.2	0.0	0.0	244.3
	0	0	0	0	4	0	21	0	0	25

Emerging Technology Form



Emerging Technology Form (Issues)



D.3. Workshop Data Sheets

Facility Emerging Technology Form

Facility ID _____ Capacity Required _____
Facility Name _____

Site Selected Technology (if known)

Emerging Technologies

Preferred Technologies (Enter Tech ID, Name, and appropriate comments)
Use the page number and the position on page for Tech ID. (11-3 for the third item on page 11 of Volume III)

Tech ID		Tech Name		B
Comment				T
				N
				O
Tech ID		Tech Name		B
Comment				T
				N
				O
Tech ID		Tech Name		B
Comment				T
				N
				O

Other

Tech ID		Tech Name		B
Comment				T
				N
				O
Tech ID		Tech Name		B
Comment				T
				N
				O

Technology Issues

See the back for the Facility/Waste Stream Issues form for this facility.

Treatment Facility/Waste Stream Issues

Use this form to note issues connected with this facility and waste streams assigned to it.

WS ID		WS Name	
Comment			

WS ID		WS Name	
Comment			

WS ID		WS Name	
Comment			

WS ID		WS Name	
Comment			

WS ID		WS Name	
Comment			

WS ID		WS Name	
Comment			

WS ID		WS Name	
Comment			

WS ID		WS Name	
Comment			

NEW UNIVERSAL TREATMENT STANDARDS FOR TOXIC METALS

MWFA Alternative Technologies Workshop

John L. Mayberry

SAIC

January 24, 1995

EPA's NEW UNIVERSAL TREATMENT STANDARDS

- BACKGROUND:
  - EPA issued new Universal Treatment Standards on September 19, 1994
  - UTS effect the leachability requirement for toxic metals that are included in listed wastes
  - UTS does not apply to D004 to D011 heavy metals

APPLICABILITY OF UTS TO DOE WASTE STREAMS

- DOE MLLW streams: 91
- Total amount of waste: 13,148 meters^3

IMPACT OF UTS ON DOE WASTE STREAMS

- UTS has low leachability requirements for non-waste water listed wastes:

- Beryllium	0.014	ppm TCLP
- Cadmium	0.19	ppm TCLP
- Mercury	0.2	ppm TCLP if from retort
	0.025	ppm TCLP from all others
- Selenium	0.16	ppm TCLP
- Silver	0.2	ppm TCLP
- Thallium	0.078	ppm TCLP

CONCLUSIONS

- The technologies selected by the PSTP may not pass the UTS TCLP requirements for listed waste streams with toxic metals.
- The emerging technologies currently in development that may be used on these waste streams need to be tested against the UTS leachability limits.

APPENDIX E

PEIS TREATMENT SYSTEM ANALYSIS

The PEIS flowsheet analysis model was used to develop a preliminary set of unit operations needed to treat waste streams to RCRA-approved final forms. Mixed low-level waste streams were identified in the December 9, 1994, OAT configuration. The model provided qualitative estimates of required treatment operations and quantitative estimates of required treatment capacity and final waste form volumes. It provided needed treatment of contaminants and accounted for treatment of secondary waste and recycle streams. Therefore, the PEIS model was able to estimate total demand on waste treatment facilities. Three different waste treatment flowsheets were modeled: Base Case, Thermal, and Non-Flame.

E.1. MODEL METHODOLOGY

The flowsheet analysis model was developed to predict waste treatment needs for the PEIS project. It was adapted for the Alternative Technology Workshop by adding recycle stream calculations, container washing and disposal streams, and more explicit provision for certain separations and treatments. Calculations were conducted on both mass and volume bases. There are three versions of the PEIS model, each based on a different waste treatment flowsheet. The Base Case flowsheet (Figs. E-1 and E-2) uses thermal technologies for organic destruction and grouting for stabilization of most solid wastes. The Thermal flowsheet (Figs. E-3 and E-4) retains thermal technologies for organic destruction but uses vitrification and metals melting for stabilization of most solid wastes. The Non-Flame flowsheet (Figs. E-5 and E-6) uses nonthermal aqueous-based technologies for separation and destruction of organic waste components, along with grouting for stabilization of most solid wastes. The three flowsheets are intended to represent a broad spectrum of approaches to mixed waste treatment. The section "Unit Operations Codes for PEIS Flowsheets" describes treatment operations corresponding to codes used in the flowsheets and models.

The program models individual treatment operations that are connected to treatment trains. The path that a waste stream follows through the flowsheet is dictated by waste matrix and contaminants within that stream. Each treatment unit operates on the waste stream to perform at least one of the following: change the waste matrix, split the waste stream, remove contaminants from the waste stream, or change the waste stream mass and/or volume. The next waste treatment step is also specified. Rigorous engineering calculations are not performed within waste treatment operations; waste streams are split in "black-box" operations based on engineering judgment. Contaminant concentrations are not specified; a contaminant either is or is not present. Radionuclides are not considered at this stage.

Some waste treatment operations in the PEIS flowsheets represent specific unit operations (i.e., evaporation, grouting, debris shredding). Others represent generic types of waste treatment, in which the function may be filled by a variety of operations (i.e. separation, thermal organic destruction, destruction of explosives, offgas treatment). In either case, the described waste treatment operation can be performed by standard or innovative technologies; no distinction is made in the model.

Assumptions made in modeling flowsheet treatment operations must be understood. Because many treatment operations are not based on specific technologies, the technology needed to perform the operation may not be fully developed. For example, it is assumed in the Non-Flame flowsheet that the washing operations (335, 435, 535) accomplish complete removal of organic

contaminants from the solid waste matrix. If the currently available technology is not actually capable of a high degree of separation, a technology development need exists.

E.2. MODEL RESULTS

Table E.1 contains treatment operation requirements for all facilities contained in the OAT configuration for the base case, thermal case, and non-thermal case. Listed treatment operations are useful as a cross-check and confirmation of workshop-cited technologies and potential OAT waste stream assignment mismatches.

PEIS Flowsheets

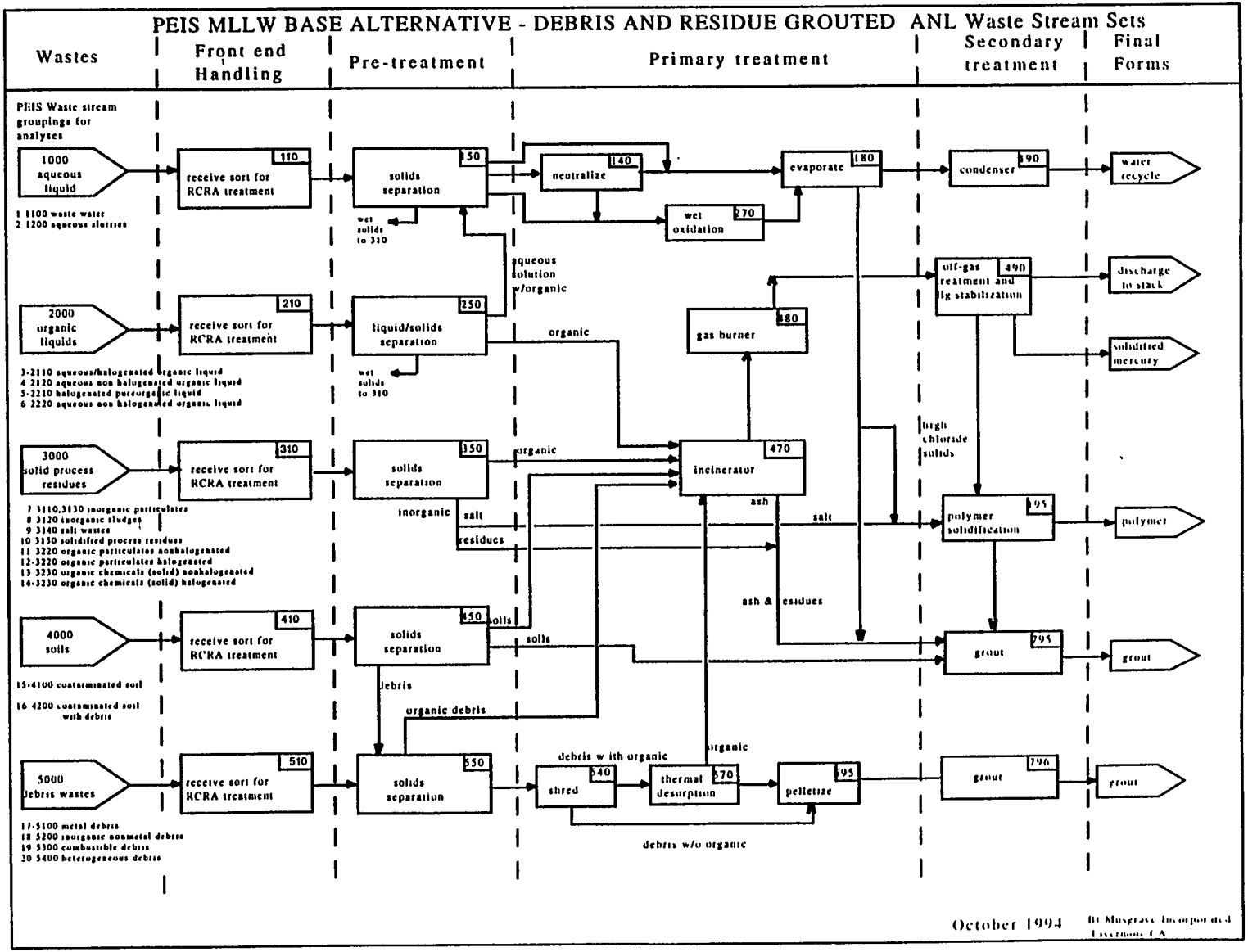


Fig. E-1. Base Case Matrices 1000-5000.

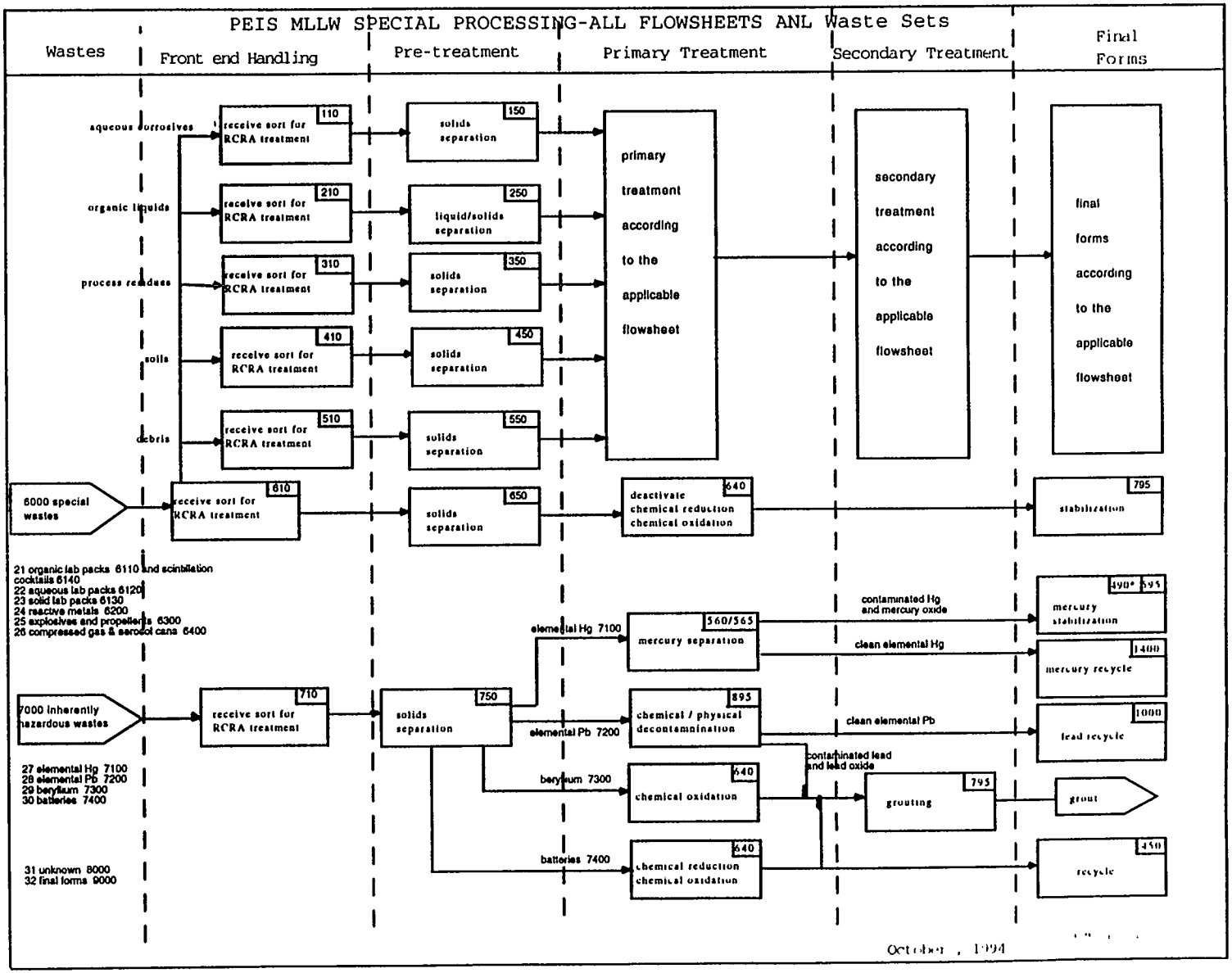


Fig. E-2. Base Case Matrices 6000-8000.

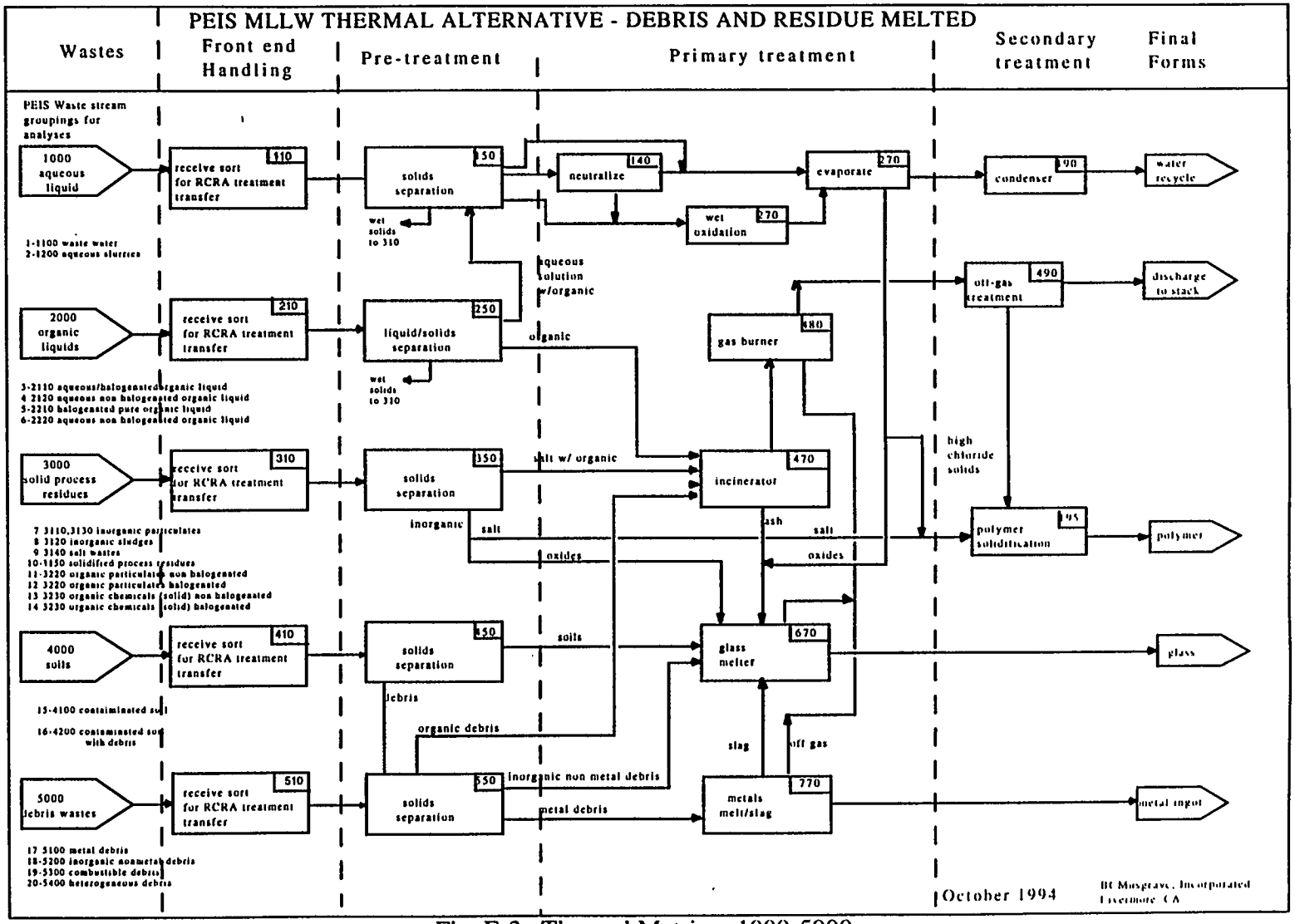


Fig. E-3. Thermal Matrices 1000-5000.

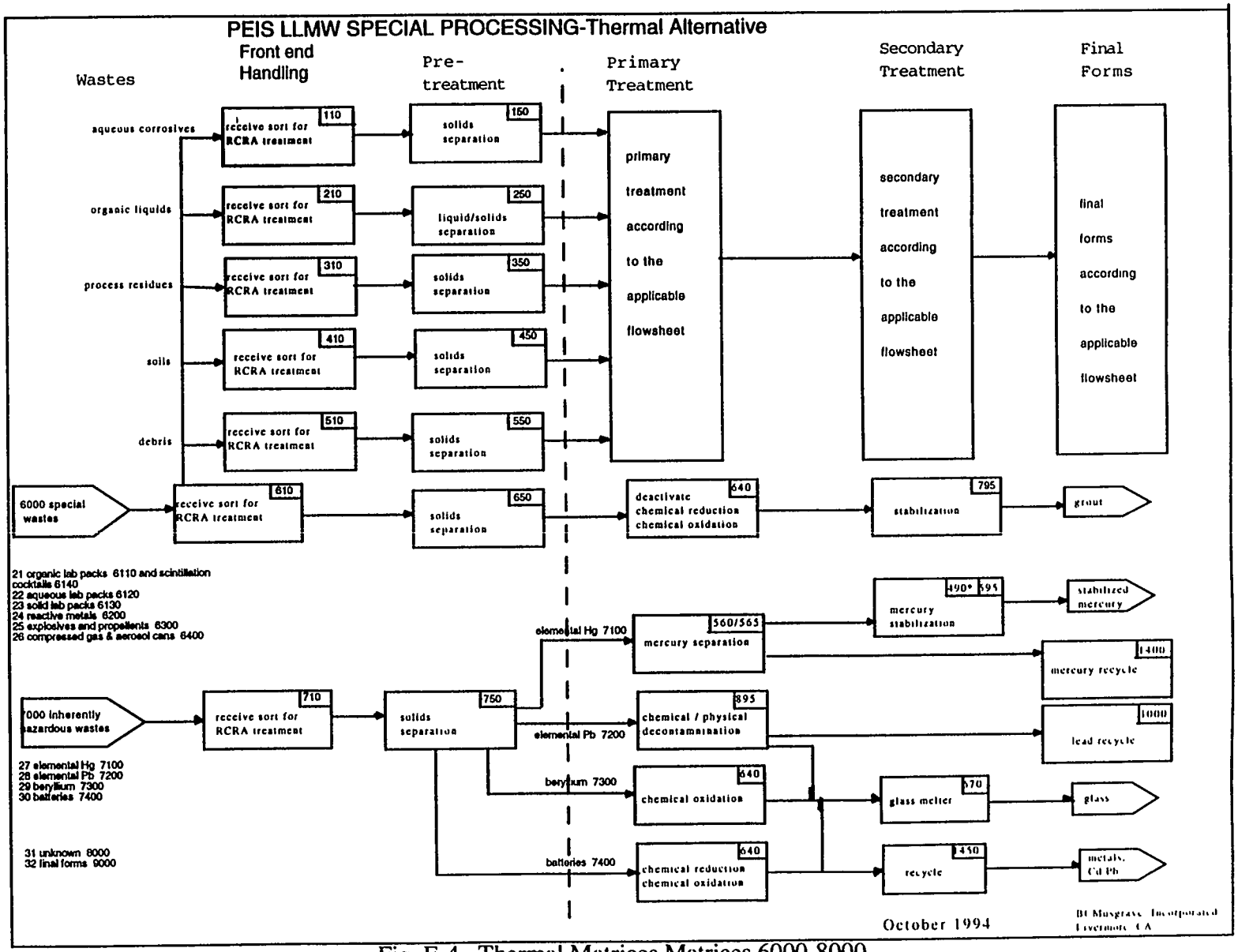


Fig. E-4. Thermal Matrices Matrices 6000-8000.

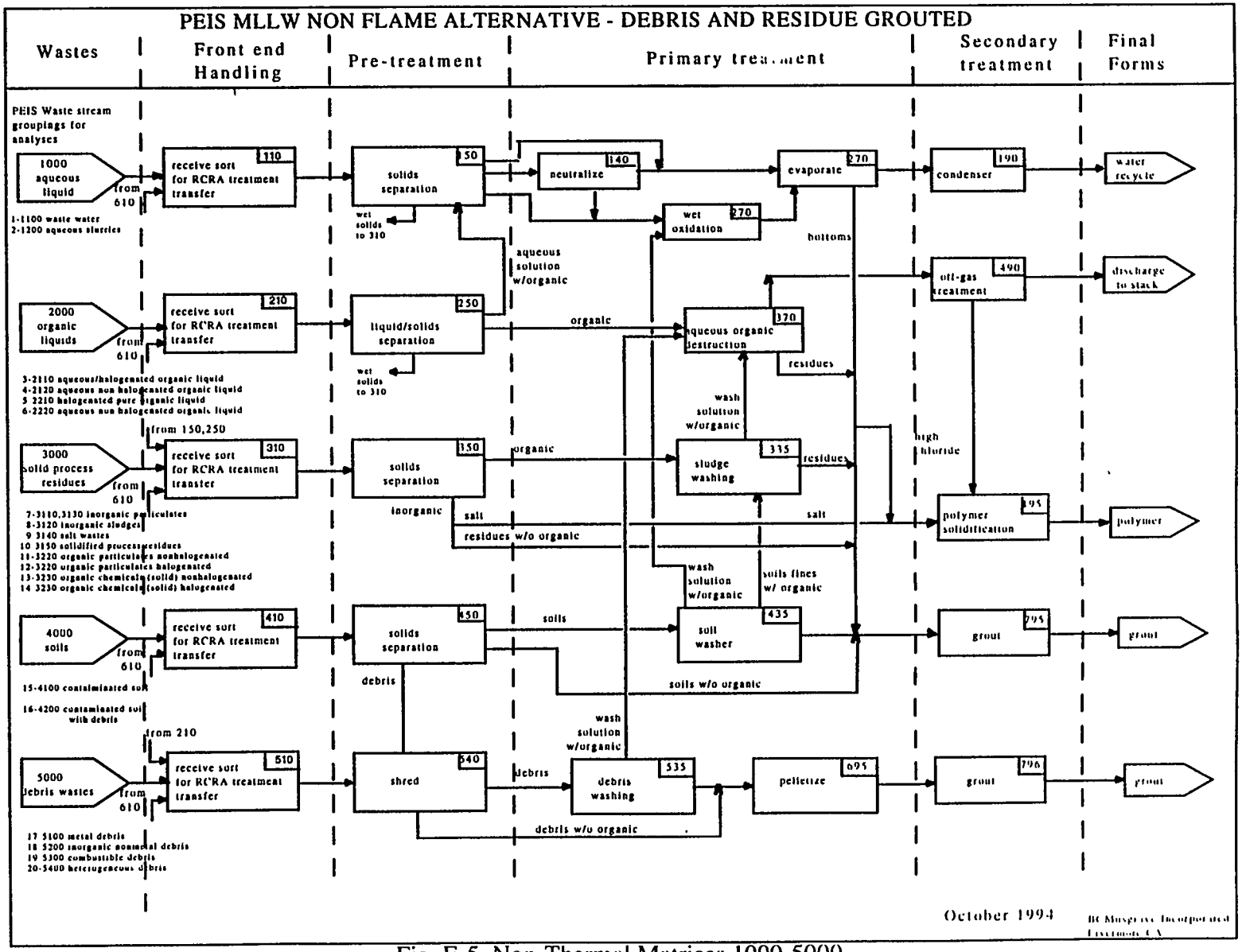


Fig. E-5. Non-Thermal Matrices 1000-5000.

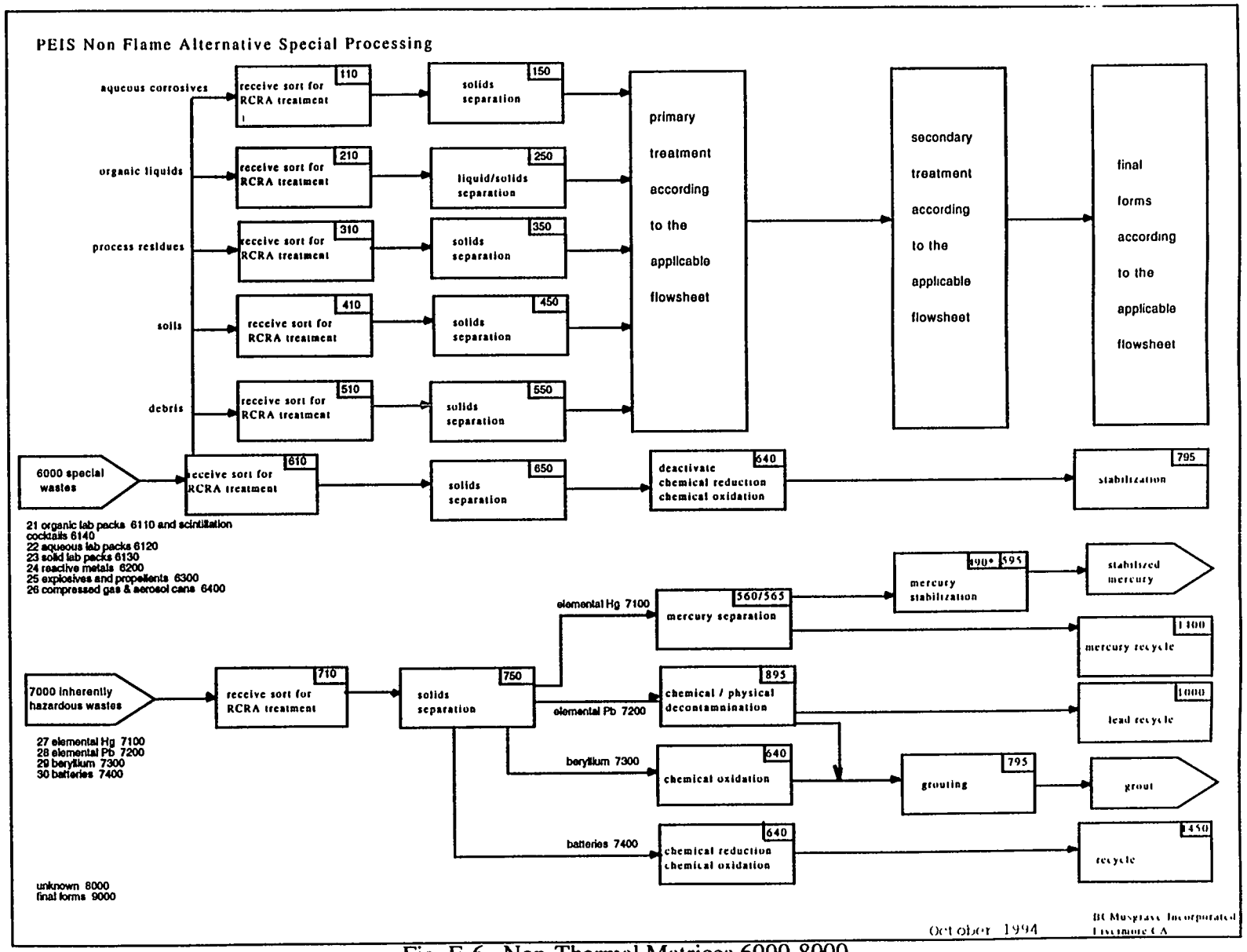


Fig. E-6. Non-Thermal Matrices 6000-8000.

E.3. TREATMENT OPERATIONS DESCRIPTIONS

Treatment units predicted by the PEIS model for the three flowsheets are described below. The receive and sort modules, pretreatment operations, and final forms are not included in the listing; only treatment and post-treatment operations are listed to simplify presentation.

Treatment Operation Definitions For PEIS Flowsheets

Units with a * are not listed in Table E.1 to conserve space. Most of them are used in any given treatment facility.

Units* 110, 210, 310, 410, 510, 610, 710, 810, 910—Receive and Sort

These units receive waste streams of the corresponding 1000-level matrix (i.e., unit 110 receives all aqueous 1000 streams) and route the streams to the appropriate initial treatment unit.

Units* 140, 240, 340, 440—Neutralization

Units neutralize corrosive contaminants present in waste matrices 1000–4000, respectively.

Units* 150, 250—Solids Separation

These are solid-liquid separation units for aqueous and organic waste streams, respectively.

Unit 180—Evaporator

This unit is designed to remove the salts and toxic metals from an aqueous waste stream through evaporation. The condensate goes on to a condenser unit (Unit 190), and the bottoms are sent to a stabilization process.

Unit 190—Condenser

Condenses the aqueous stream from the evaporator (180) for recycling or release. Mercury also is separated.

Unit 195—Polymer Encapsulation

Encapsulates the solids with high salt content that cannot be grouted.

Unit 270—Organic Destruction

This is an organic destruction unit for aqueous streams.

Unit 335—Sludge Washing

Accepts solid wastes and performs non-thermal separation of organics.

Units* 350, 450, 550, 650, 750—Solid Separation

These units perform large-scale separation (i.e., debris removal from soils) and route solid waste streams for further processing.

Unit 351*—Halogen Separation

Represents separation of solid waste high in halides from other solid waste components. The actual technology depends on the waste form.

Unit 352*—Mercury Separation

Represents separation of solid waste high in mercury from other solid waste components. The actual technology depends on the waste form.

Unit 370—Aqueous Organic Destruction

Accepts concentrated organic liquids and high-solid-bearing aqueous streams for organic destruction/oxidation.

Unit 435—Soil Washer

Similar to Unit 335 for soils.

Unit 470—Thermal Destruction
Unit represents an incinerator or thermal destruction unit capable of handling solid and liquid feed.

Unit 480—Secondary Burner
Receives the offgas from the thermal destruction unit (470) and subjects it to a second thermal oxidation for increased destruction of organics.

Unit 490—Offgas Treatment
Represents the scrubbing and filtration operations of offgas treatment. Outputs are stack gas, particulates, and caustic aqueous blowdown and stabilized mercury (in PEIS model).

Unit 535—Debris Washing
Removes organics from debris feed stream.

Unit 540—Shred
Shreds debris waste streams in preparation for pelletizing and grouting.

Unit 560—Mercury Distillation
Operation distills waste to generate a mercury recycle stream.

Unit 565—Mercury Condensation
Separates mercury from gas streams for recycle or stabilization.

Unit 570—Thermal Desorption
Operation removes the volatile organics from debris wastes through heating.

Unit 595—Mercury Solidification
Accepts elemental mercury and produces a solid mercury compound (i.e., HgS).

Unit 640—Chemical Oxidation/Reduction
This unit oxidizes or reduces special wastes, inherently hazardous wastes, and any other form requiring special treatment for reactive matrices or contaminants.

Unit 670—Glass Melter
Accepts inorganic solids to produce a vitrified final form.

Unit 695—Pelletize
This operation pelletizes debris waste preparatory to grouting. It is expected that this unit will halve the volume of the debris waste stream.

Unit 740—Chemical/Physical Separation
Chemical or physical separation techniques to remove designated inherently hazardous materials (i.e., mercury) from the waste matrix.

Unit 770—Metals Melt/Slag
Melts metal debris to produce final form.

Unit 795—Grout
Grouts solid wastes of the 3000 and 4000 series (solid process residues and soils). Unit 796 grouts debris wastes.

Unit 796—Grout
Grouts debris wastes. This unit is distinct from Unit 795 based on the assumption of different equipment design for debris handling.

Unit 895—Recycle/Stabilization
This unit operation is designed to remove lead and cadmium contaminants from inherently hazardous materials and recycle the remainder.

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
AE-S001—ALKALI METAL PASSIVATION BOOTH (AMPB)—EXISTING		
640—Chemical Oxidation/Reduction 795—Grout	640—Chemical Oxidation/Reduction 670—Glass Melter	640—Chemical Oxidation/Reduction 795—Residue Grouting 1002—Water Reactives Processing
AE-S801—BLDG. 306, PRECIPITATION/FILTRATION UNIT—EXISTING		
140—Neutralize 340—Neutralize 540—Shred 180—Evaporate 190—Condenser 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	140—Neutralize 340—Neutralize 670—Glass Melter 180—Evaporate 190—Condenser 195—Polymer Solidification	140—Aqueous Liquids Neutralization 540—Debris Shredding 541—Debris Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
AE-S803—VITRIFICATION—NEW		
490—Hg Solidification 795—Grout	670—Glass Melter	335—Sludge Washing 435—Soil Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		490—Offgas Treatment 595—Mercury Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
AE-S804—MACROENCAPSULATION—NEW		
540—Shred 695—Pelletize 796—Grout	670—Glass Melter	540—Debris Shredding 180—Evaporation 190—Condenser 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
AE-S805—PORTABLE SURFACE DECONTAMINATION UNIT—NEW		
540—Shred 740—Chemical/Physical Separation 695—Pelletize 795—Grout 796—Grout	740—Chemical/Physical Separation 670—Glass Melter 770—Metal Melter	540—Debris Shredding 740—Chemical/Physical Separation 180—Evaporation 190—Condenser 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
AW-S007—REMOTE MIXED WASTE TREATMENT FACILITY (RMWTF)—NEW LARGE SITE		
640—Chemical Oxidation/Reduction 795—Grout	640—Chemical Oxidation/Reduction 670—Glass Melter	640—Chemical Oxidation/Reduction 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		490—Offgas Treatment 795—Residue Grouting 1002—Water Reactives Processing
AW-S037—SODIUM PROCESSING FACILITY—EXISTING		
640—Chemical Oxidation/Reduction 795—Grout	640—Chemical Oxidation/Reduction 670—Glass Melter	640—Chemical Oxidation/Reduction 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 795—Residue Grouting
BN-S701—CHARACTERIZE TO DETERMINE HAZARDOUS CONSTITUENTS		
270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 795—Grout	270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification	335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 795—Residue Grouting
BN-S801—ELEMENTARY NEUTRALIZATION—NEW		
140—Neutralize 240—Neutralize 340—Neutralize	240—Neutralize 340—Neutralize 270—Organic Destruction	140—Aqueous Liquids Neutralization 240—Organic Liquids Neutralization 335—Sludge Washing

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 795—Grout	470—Thermal Destruction 670—Glass Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 795—Residue Grouting
BN-S802—CYANIDE DESTRUCTION TREATABILITY STUDY—NEW READILY IMPL		
470—Thermal Destruction 480—Secondary Burner 795—Grout	670—Glass Melter	335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 795—Residue Grouting
CM-S801—OAK RIDGE COMMERCIAL OPTION—EXISTING		
140—Neutralize 340—Neutralize 540—Shred 560—Mercury Distillation 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner	140—Neutralize 340—Neutralize 560—Mercury Distillation 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 180—Evaporate 480—Secondary Burner	140—Aqueous Liquids Neutralization 540—Debris Shredding 541—Debris Neutralization 335—Sludge Washing 435—Soil Washing 535—Debris Washing 560—Mercury Distillation 270—Aqueous Phase Organic Destruction

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	190—Condenser 490—Hg Solidification 195—Polymer Solidification	370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
DP-S001—CENTRAL NEUTRALIZATION FACILITY—EXISTING		
140—Neutralize 340—Neutralize 640—Chemical Oxidation/Reduction 270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 795—Grout 895—Recycle/Stabilization	140—Neutralize 340—Neutralize 640—Chemical Oxidation/Reduction 270—Organic Destruction 670—Glass Melter 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification 895—Recycle/Stabilization	140—Aqueous Liquids Neutralization 640—Chemical Oxidation/Reduction 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 795—Residue Grouting 895—Battery Recycle/Stabilization
DP-S002—TSCA INCINERATOR— LIQUIDS AND COMBUSTIBLE SOLIDS—EXISTING		
140—Neutralize 240—Neutralize 340—Neutralize 540—Shred	240—Neutralize 340—Neutralize 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 240—Organic Liquids Neutralization 540—Debris Shredding

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 560—Mercury Distillation 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout 895—Recycle/Stabilization	560—Mercury Distillation 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 895—Recycle/Stabilization	541—Debris Neutralization 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 741—Inherently Hazardous Neutralization 335—Sludge Washing 535—Debris Washing 560—Mercury Distillation 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting 895—Battery Recycle/Stabilization
DP-S701—12/9 NEWLY DEFINED FACILITY—		
140—Neutralize 340—Neutralize 540—Shred 640—Chemical Oxidation/Reduction 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption	140—Neutralize 340—Neutralize 640—Chemical Oxidation/Reduction 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter	140—Aqueous Liquids Neutralization 540—Debris Shredding 541—Debris Neutralization 640—Chemical Oxidation/Reduction 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout 895—Recycle/Stabilization	180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 895—Recycle/Stabilization	Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting 895—Battery Recycle/Stabilization
DP-S804—BENCH SCALE TREATMENTS—EXISTING		
DP-S805—12/9 NEWLY DEFINED FACILITY		
540—Shred 470—Thermal Destruction 490—Hg Solidification 695—Pelletize 796—Grout	470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 490—Hg Solidification	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 540—Debris Shredding 541—Debris Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 695—Pelletizing

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		795—Residue Grouting 796—Debris Grouting
DP-S806—12/9 NEWLY DEFINED FACILITY		
540—Shred 470—Thermal Destruction 570—Thermal Desorption 480—Secondary Burner 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	670—Glass Melter 770—Metal Melter	540—Debris Shredding 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
DP-S807—12/9 NEWLY DEFINED FACILITY—		
340—Neutralize 540—Shred 470—Thermal Destruction 570—Thermal Desorption 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	340—Neutralize 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification	140—Aqueous Liquids Neutralization 540—Debris Shredding 335—Sludge Washing 435—Soil Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
DP-S808—12/9 NEWLY DEFINED FACILITY—		
340—Neutralize 740—Chemical/Physical Separation 470—Thermal Destruction 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification 795—Grout	340—Neutralize 740—Chemical/Physical Separation 670—Glass Melter	140—Aqueous Liquids Neutralization 740—Chemical/Physical Separation 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 795—Residue Grouting
DP-S809—12/9 NEWLY DEFINED FACILITY		
340—Neutralize 540—Shred 470—Thermal Destruction 570—Thermal Desorption 480—Secondary Burner 195—Polymer Solidification 695—Pelletize 795—Grout	340—Neutralize 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 195—Polymer Solidification	140—Aqueous Liquids Neutralization 335—Sludge Washing 435—Soil Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
796—Grout		180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
DS-S001—DSSI COMMERCIAL FACILITY—EXISTING		
140—Neutralize 240—Neutralize 340—Neutralize 540—Shred 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	40—Neutralize 240—Neutralize 340—Neutralize 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	140—Aqueous Liquids Neutralization 240—Organic Liquids Neutralization 540—Debris Shredding 541—Debris Neutralization 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting 1001—Explosives Processing
EH-S701—ADDITIONAL CHARACTERIZATION NEEDED TO DETERMINE TREATMENT—		
140—Neutralize	240—Neutralize	140—Aqueous Liquids Neutralization

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
240—Neutralize 340—Neutralize 270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 795—Grout	340—Neutralize 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification	240—Organic Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 795—Residue Grouting
ET-S001—RMDF—NEUTRALIZATION PROCESS—NEW LARGE SITE		
140—Neutralize 340—Neutralize 180—Evaporate 190—Condenser 195—Polymer Solidification 795—Grout	140—Neutralize 340—Neutralize 670—Glass Melter 180—Evaporate 190—Condenser 195—Polymer Solidification	140—Aqueous Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 795—Residue Grouting
ET-S701—ADDITIONAL CHARACTERIZATION NEEDED TO DETERMINE TREATMENT		
EV-S003—ENVIROCARE COMMERCIAL FACILITY—EXISTING		
340—Neutralize 540—Shred 470—Thermal Destruction 570—Thermal Desorption	340—Neutralize 470—Thermal Destruction 670—Glass Melter 770—Metal Melter	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 540—Debris Shredding 335—Sludge Washing

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	480—Secondary Burner 195—Polymer Solidification	535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
FM-S001—UNH TREATMENT FACILITY—EXISTING		
140—Neutralize 340—Neutralize 640—Chemical Oxidation/Reduction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 795—Grout	140—Neutralize 340—Neutralize 670—Glass Melter 180—Evaporate 190—Condenser 195—Polymer Solidification	140—Aqueous Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 795—Residue Grouting
FM-S801—CHEMICAL TREATMENT PROJECT—NEW READILY IMPLEMENTED		
140—Neutralize 340—Neutralize 540—Shred 640—Chemical Oxidation/Reduction	140—Neutralize 340—Neutralize 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 540—Debris Shredding 640—Chemical Oxidation/Reduction

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
740—Chemical/Physical Separation 560—Mercury Distillation 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout 895—Recycle/Stabilization	560—Mercury Distillation 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 895—Recycle/Stabilization	740—Chemical/Physical Separation 335—Sludge Washing 435—Soil Washing 535—Debris Washing 560—Mercury Distillation 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting 895—Battery Recycle/Stabilization 1002—Water Reactives Processing
FM-S802—FEMP WASTE WATER TREATMENT SYSTEM (INCINERATION PROJ)—EXISTING		
140—Neutralize 340—Neutralize 270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 795—Grout	140—Neutralize 340—Neutralize 270—Organic Destruction 670—Glass Melter 180—Evaporate 190—Condenser 195—Polymer Solidification	140—Aqueous Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		195—Polymer Solidification 795—Residue Grouting
FM-S803—HF NEUTRALIZATION SYSTEM—EXISTING		
140—Neutralize 340—Neutralize 180—Evaporate 190—Condenser 195—Polymer Solidification 795—Grout	140—Neutralize 340—Neutralize 670—Glass Melter 180—Evaporate 190—Condenser 195—Polymer Solidification	140—Aqueous Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 795—Residue Grouting
FM-S804—STABILIZATION PROJECT—NEW		
140—Neutralize 240—Neutralize 340—Neutralize 540—Shred 270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	240—Neutralize 340—Neutralize 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 240—Organic Liquids Neutralization 540—Debris Shredding 335—Sludge Washing 435—Soil Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
GA-S701—ADDITIONAL CHARACTERIZATION NEEDED TO DETERMINE/CONFIRM ALPHA --		
140—Neutralize 340—Neutralize 540—Shred 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	140—Neutralize 340—Neutralize 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 540—Debris Shredding 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
GA-S801—ON-SITE NEUTRALIZATION—EXISTING		
140—Neutralize 340—Neutralize 180—Evaporate 190—Condenser 195—Polymer Solidification	140—Neutralize 340—Neutralize 670—Glass Melter 180—Evaporate 190—Condenser	140—Aqueous Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
795—Grout	195—Polymer Solidification	Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 795—Residue Grouting
GJ-S701—CHARACTERIZE TO DETERMINE RADIOACTIVITY—		
270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 795—Grout	270—Organic Destruction 670—Glass Melter 180—Evaporate 190—Condenser 195—Polymer Solidification	335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 795—Residue Grouting
GJ-S801B—MOBILE THERMAL DESORPTION PROCESS—NEW READILY IMPLEMENTATION		
540—Shred 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification	460—Solid Organic Destruction 540—Debris Shredding 335—Sludge Washing 435—Soil Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		695—Pelletizing 795—Residue Grouting 796—Debris Grouting
GJ-S803—MOBILE TREATED WATER EVAPORATION—NEW READILY IMPLEMENTED		
GJ-S804—SORT/SURVEY/DECON—NEW		
140—Neutralize 340—Neutralize 540—Shred 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout 895—Recycle/Stabilization	140—Neutralize 340—Neutralize 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 895—Recycle/Stabilization	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 540—Debris Shredding 541—Debris Neutralization 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting 895—Battery Recycle/Stabilization 1001—Explosives Processing 1002—Water Reactives Processing

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
GJ-S805—GENERATOR TREATMENT PLAN—NEW		
IN-S004—WERF: STABILIZATION—PORTLAND CEMENT—EXISTING		
795—Grout	670—Glass Melter	180—Evaporation 190—Condenser 795—Residue Grouting
IN-S005—WERF: INCINERATION—CONTROLLED AIR INCINERATOR—EXISTING		
140—Neutralize 240—Neutralize 340—Neutralize 540—Shred 740—Chemical/Physical Separation 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	140—Neutralize 240—Neutralize 340—Neutralize 740—Chemical/Physical Separation 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 240—Organic Liquids Neutralization 540—Debris Shredding 541—Debris Neutralization 740—Chemical/Physical Separation 335—Sludge Washing 435—Soil Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
IN-S006—PWTU: SEPARATION—NEUT/ION EXCHANGE/CARBON ABSORPTION—EXISTING		

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
140—Neutralize 340—Neutralize 540—Shred 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	140—Neutralize 340—Neutralize 270—Organic Destruction 670—Glass Melter 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification	140—Aqueous Liquids Neutralization 540—Debris Shredding 541—Debris Neutralization 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
IN-S008—TAN 726A: SEPARATION ION EXCHANGE—EXISTING		
180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification 795—Grout	670—Glass Melter 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification	180—Evaporation 190—Condenser 595—Mercury Solidification 795—Residue Grouting
IN-S010—WEDF: AMALGAMATION—NEW READILY IMPLEMENTED		
560—Mercury Distillation 490—Hg Solidification	560—Mercury Distillation 490—Hg Solidification	560—Mercury Distillation 180—Evaporation 190—Condenser 595—Mercury Solidification 795—Residue Grouting

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
IN-S011—WEDF: STABILIZATION—EXISTING		
340—Neutralize 540—Shred 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	340—Neutralize 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 540—Debris Shredding 541—Debris Neutralization 335—Sludge Washing 435—Soil Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
IN-S014—IWPF: AMALGAMATION SYSTEM—NEW LARGE SITE		
540—Shred 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification	270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	540—Debris Shredding 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout		190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
IN-S015—IWPF: THERMAL DESTRUCTION—NEW LARGE SITE		
140—Neutralize 240—Neutralize 340—Neutralize 440—Neutralization 540—Shred 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	140—Neutralize 240—Neutralize 340—Neutralize 440—Neutralization 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 240—Organic Liquids Neutralization 540—Debris Shredding 541—Debris Neutralization 335—Sludge Washing 435—Soil Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
IN-S030—HEPA FILTER LEACHING SYSTEM (HFLS) (CPP-659)—EXISTING		

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
540—Shred 470—Thermal Destruction 570—Thermal Desorption 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification	460—Solid Organic Destruction 540—Debris Shredding 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
IN-S033—ICPP DEBRIS TREATMENT AND CONTAINMENT FACILITY: WATER WASHING—EXISTING		
540—Shred 470—Thermal Destruction 570—Thermal Desorption 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification	460—Solid Organic Destruction 540—Debris Shredding 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
IN-S034—ICPP DEBRIS TREATMENT AND CONTAINMENT FACILITY: CO2 Decon (Unit 2)—EXISTING		
740—Chemical/Physical Separation 795—Grout	740—Chemical/Physical Separation 670—Glass Melter	140—Aqueous Liquids Neutralization 740—Chemical/Physical Separation 741—Inherently Hazardous Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 795—Residue Grouting
IN-S036—TAN 607 CASK DISMANTLE—EXISTING		
540—Shred 740—Chemical/Physical Separation 695—Pelletize 795—Grout 796—Grout	740—Chemical/Physical Separation 670—Glass Melter 770—Metal Melter	540—Debris Shredding 740—Chemical/Physical Separation 180—Evaporation 190—Condenser 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
IN-S043—IWPF: REMOTE-HANDLED WASTE TREATMENT CELL—NEW LARGE SITE		
340—Neutralize	340—Neutralize	460—Solid Organic Destruction

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
540—Shred 470—Thermal Destruction 570—Thermal Desorption 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 195—Polymer Solidification	140—Aqueous Liquids Neutralization 540—Debris Shredding 541—Debris Neutralization 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
IN-S044—MWSF: BLEND/REPACKAGE LIQ WASTE FOR INCIN AT WERF—NEW READILY IMPL		
140—Neutralize 340—Neutralize 540—Shred 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	140—Neutralize 340—Neutralize 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	140—Aqueous Liquids Neutralization 540—Debris Shredding 541—Debris Neutralization 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
695—Pelletize 795—Grout 796—Grout		490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
IN-S128—WEDF: MERCURY RETORT FOR HIGH MERCURY SUBCAT WASTES—NEW READILY IMPL		
340—Neutralize 540—Shred 470—Thermal Destruction 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	340—Neutralize 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 540—Debris Shredding 335—Sludge Washing 435—Soil Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
IN-S130—TREATMENT OF WASTE UNDER 40CFR263-GTPS AT TRA/MACROENCA—EXISTING		
540—Shred 470—Thermal Destruction 490—Hg Solidification	470—Thermal Destruction 670—Glass Melter 770—Metal Melter	460—Solid Organic Destruction 540—Debris Shredding 335—Sludge Washing

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
695—Pelletize 796—Grout	480—Secondary Burner 490—Hg Solidification	270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
IN-S132—GENERATOR TREATMENT PLANS AT SMC/STABILIZATION—EXISTING		
795—Grout	670—Glass Melter	180—Evaporation 190—Condenser 795—Residue Grouting
IN-S133—GENERATOR TREATMENT PLANS AT ICPP/STABILIZATION—EXISTING		
470—Thermal Destruction 480—Secondary Burner 795—Grout	670—Glass Melter	335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 795—Residue Grouting
IN-S139—GTP AT NRF/SEPARATION—EXISTING		
180—Evaporate 190—Condenser 195—Polymer Solidification	670—Glass Melter 180—Evaporate 190—Condenser	180—Evaporation 190—Condenser 795—Residue Grouting

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
795—Grout	195—Polymer Solidification	
IN-S140—GTP AT NRF/STABILIZATION—EXISTING		
640—Chemical Oxidation/Reduction 795—Grout	640—Chemical Oxidation/Reduction 670—Glass Melter	640—Chemical Oxidation/Reduction 180—Evaporation 190—Condenser 795—Residue Grouting
LA-S001—LEAD DECONTAMINATION TRAILER—EXISTING		
540—Shred 740—Chemical/Physical Separation 470—Thermal Destruction 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	740—Chemical/Physical Separation 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 195—Polymer Solidification	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 540—Debris Shredding 740—Chemical/Physical Separation 741—Inherently Hazardous Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
LA-S003—HAZ WASTE TREAT FAC (HWTF): REACTIVE METALS SKID—NEW READILY IMPL		
640—Chemical Oxidation/Reduction 470—Thermal Destruction 480—Secondary Burner	640—Chemical Oxidation/Reduction 470—Thermal Destruction 670—Glass Melter	640—Chemical Oxidation/Reduction 335—Sludge Washing 270—Aqueous Phase Organic

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
195—Polymer Solidification 795—Grout	480—Secondary Burner 195—Polymer Solidification	Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 795—Residue Grouting 1002—Water Reactives Processing
LA-S004—HWTF: PLATING WASTES ACIDS/BASES SKID—NEW READILY IMPL		
140—Neutralize 340—Neutralize 540—Shred 270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	140—Neutralize 340—Neutralize 270—Organic Destruction 670—Glass Melter 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification	140—Aqueous Liquids Neutralization 540—Debris Shredding 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
LA-S005—HWTF: DETOXIFICATION SKID—NEW READILY IMPL		
540—Shred 470—Thermal Destruction 570—Thermal Desorption 480—Secondary Burner	470—Thermal Destruction 670—Glass Melter 480—Secondary Burner 195—Polymer Solidification	540—Debris Shredding 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout		Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
LA-S006—CONTROLLED AIR INCINERATOR—SOLID FEED SYSTEM—EXISTING		
540—Shred 470—Thermal Destruction 570—Thermal Desorption 480—Secondary Burner 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 195—Polymer Solidification	460—Solid Organic Destruction 540—Debris Shredding 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
LA-S007—CONTROLLED AIR INCINERATOR—LIQUID FEED SYSTEM—EXISTING		
270—Organic Destruction 470—Thermal Destruction	270—Organic Destruction 470—Thermal Destruction	335—Sludge Washing 270—Aqueous Phase Organic

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 795—Grout	670—Glass Melter 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification	Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 795—Residue Grouting
LA-S801—GAS CYLINDER SKID—NEW READILY IMPL		
640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 560—Mercury Distillation 490—Hg Solidification 795—Grout 895—Recycle/Stabilization	640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 560—Mercury Distillation 670—Glass Melter 490—Hg Solidification 895—Recycle/Stabilization	640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 335—Sludge Washing 560—Mercury Distillation 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 795—Residue Grouting 895—Battery Recycle/Stabilization
LA-S804—MOBILE HYDROTHERMAL PROCESSING—NEW READILY IMPL		
140—Neutralize 340—Neutralize 540—Shred 270—Organic Destruction	140—Neutralize 340—Neutralize 270—Organic Destruction 470—Thermal Destruction	140—Aqueous Liquids Neutralization 540—Debris Shredding 335—Sludge Washing 270—Aqueous Phase Organic

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	670—Glass Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
LB-S004—BUILDING 75: UNIT 131 AFH—EXISTING		
140—Neutralize 240—Neutralize 340—Neutralize 270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 795—Grout	240—Neutralize 340—Neutralize 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification	140—Aqueous Liquids Neutralization 240—Organic Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 795—Residue Grouting
LL-S002—BUILDING 513 SOLIDIFICATION UNIT—EXISTING		
470—Thermal Destruction 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification	470—Thermal Destruction 670—Glass Melter 480—Secondary Burner 490—Hg Solidification	460—Solid Organic Destruction 335—Sludge Washing 435—Soil Washing 535—Debris Washing

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
795—Grout	195—Polymer Solidification	270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
LL-S004—AREA 514 WASTE WATER TREATMENT TANK FARM—EXISTING		
140—Neutralize 340—Neutralize 270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 795—Grout	140—Neutralize 340—Neutralize 270—Organic Destruction 670—Glass Melter 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification	140—Aqueous Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 795—Residue Grouting
LL-S801—TREATABILITY STUDY NO.1—LITHIUM METAL—NEW READILY IMPL		
540—Shred 640—Chemical Oxidation/Reduction 470—Thermal Destruction	640—Chemical Oxidation/Reduction 470—Thermal Destruction 670—Glass Melter	540—Debris Shredding 640—Chemical Oxidation/Reduction 335—Sludge Washing

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 695—Pelletize 795—Grout 796—Grout	770—Metal Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting 1002—Water Reactives Processing
LL-S803—MIXED WASTE MANAGEMENT FACILITY—NEW		
270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 795—Grout	270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 795—Residue Grouting
MD-S001—MOUND GLASS MELTER THERMAL TREATMENT UNIT—EXISTING		
540—Shred 470—Thermal Destruction 570—Thermal Desorption 480—Secondary Burner	470—Thermal Destruction 670—Glass Melter 480—Secondary Burner 195—Polymer Solidification	540—Debris Shredding 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout		Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
MD-S801—MOBILE PACKED BED REACTOR/SILENT DISCHARGE PLASMA TREAT—NEW READILY IMPL		
470—Thermal Destruction 480—Secondary Burner 195—Polymer Solidification 795—Grout	470—Thermal Destruction 670—Glass Melter 480—Secondary Burner	335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 795—Residue Grouting
MS-S801—ASSESSMENT OF TECHNOLOGIES—		
795—Grout	670—Glass Melter	335—Sludge Washing 435—Soil Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		180—Evaporation 190—Condenser 490—Offgas Treatment 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
NS-S003—NSSI COMMERCIAL FACILITY—INCINERATION—EXISTING		
490—Hg Solidification 795—Grout	670—Glass Melter	180—Evaporation 190—Condenser 595—Mercury Solidification 795—Residue Grouting
NT-S001—LIQUID WASTE TREATMENT FACILITY—NEW WW FACILITY		
270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 795—Grout	270—Organic Destruction 670—Glass Melter 180—Evaporate 190—Condenser 195—Polymer Solidification	335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 795—Residue Grouting
OH-S001—OHIO OPTION (AT AN UNSPECIFIED DOE FACILITY IN OHIO)—NEW		
340—Neutralize 540—Shred 640—Chemical Oxidation/Reduction 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption	340—Neutralize 640—Chemical Oxidation/Reduction 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 540—Debris Shredding 640—Chemical Oxidation/Reduction 335—Sludge Washing 435—Soil Washing

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
OR-S001—MELTON VALLEY LOW-LEVEL WASTE IMMOBILIZATION FACILITY—EXISTING		
140—Neutralize 340—Neutralize 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification 795—Grout	140—Neutralize 340—Neutralize 670—Glass Melter 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification	140—Aqueous Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 795—Residue Grouting
OR-S004—NON-RADIOLOGICAL WASTE WATER TREATMENT PLANT—EXISTING		
140—Neutralize 340—Neutralize 270—Organic Destruction	140—Neutralize 340—Neutralize 270—Organic Destruction	140—Aqueous Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 795—Grout	670—Glass Melter 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification	Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 795—Residue Grouting
OR-S802—CERCLA ROD—		
140—Neutralize 340—Neutralize 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification 795—Grout	140—Neutralize 340—Neutralize 670—Glass Melter 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification	140—Aqueous Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 795—Residue Grouting
PA-S902—COMMERCIAL TREATMENT AND DISPOSAL—UNASSIGNED VENDOR—EXISTING		
340—Neutralize 540—Shred 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification	340—Neutralize 470—Thermal Destruction 670—Glass Melter 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification	140—Aqueous Liquids Neutralization 540—Debris Shredding 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
695—Pelletize 795—Grout 796—Grout		180—Evaporation 190—Condenser 490—Offgas Treatment 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
PA-S903—SHOW NO ADDED RADIATION, THEN RECYCLE—NEW		
540—Shred 640—Chemical Oxidation/Reduction 470—Thermal Destruction 570—Thermal Desorption 480—Secondary Burner 695—Pelletize 795—Grout 796—Grout 895—Recycle/Stabilization	640—Chemical Oxidation/Reduction 670—Glass Melter 770—Metal Melter 895—Recycle/Stabilization	140—Aqueous Liquids Neutralization 540—Debris Shredding 640—Chemical Oxidation/Reduction 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting 895—Battery Recycle/Stabilization 1001—Explosives Processing
PI-S801—AMALGAMATION BENCH SCALE—NEW READILY IMPL		
560—Mercury Distillation 490—Hg Solidification	560—Mercury Distillation 490—Hg Solidification	560—Mercury Distillation 180—Evaporation 190—Condenser

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		595—Mercury Solidification 795—Residue Grouting
PO-S003—X-622 GROUNDWATER TREATMENT FACILITY—EXISTING		
270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 795—Grout	270—Organic Destruction 670—Glass Melter 180—Evaporate 190—Condenser 195—Polymer Solidification	335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 795—Residue Grouting
PO-S008—WASTE TREATMENT FACILITY—NEW NON-LARGE SITE		
140—Neutralize 340—Neutralize 540—Shred 640—Chemical Oxidation/Reduction 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	140—Neutralize 340—Neutralize 640—Chemical Oxidation/Reduction 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 540—Debris Shredding 640—Chemical Oxidation/Reduction 335—Sludge Washing 435—Soil Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
PO-S901—COMMERCIAL OFF-SITE RECYCLING FACILITY—		
540—Shred 640—Chemical Oxidation/Reduction 470—Thermal Destruction 490—Hg Solidification 695—Pelletize 796—Grout 895—Recycle/Stabilization	640—Chemical Oxidation/Reduction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 490—Hg Solidification 895—Recycle/Stabilization	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 540—Debris Shredding 640—Chemical Oxidation/Reduction 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting 895—Battery Recycle/Stabilization
PP-S801—SOLIDIFICATION/STABILIZATION—NEW READILY IMPLEMENTED		
540—Shred 470—Thermal Destruction 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidificati[illegible]	470—Thermal Destruction 670—Glass Melter 770—Metal Melter 180—Evaporate 480—Secondary Burner 190—Condenser	460—Solid Organic Destruction 540—Debris Shredding 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
695—Pelletize 795—Grout 796—Grout	490—Hg Solidification 195—Polymer Solidification	Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
PP-S802—STORE MATERIAL FOR RE-USE—		
540—Shred 740—Chemical/Physical Separation 470—Thermal Destruction 695—Pelletize 795—Grout 796—Grout	740—Chemical/Physical Separation 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner	460—Solid Organic Destruction 540—Debris Shredding 740—Chemical/Physical Separation 180—Evaporation 190—Condenser 490—Offgas Treatment 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
PX-S004—BURNING GROUND: ONE CAGE, ONE TRAY, AND ONE PAN—EXISTING		
470—Thermal Destruction 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification 795—Grout	470—Thermal Destruction 670—Glass Melter 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification	460—Solid Organic Destruction 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		195—Polymer Solidification 795—Residue Grouting 1001—Explosives Processing
PX-S801—STABILIZATION SKID AND BENCH SCALE—NEW READILY IMPLEMENTED		
PX-S802—SULFATE PRECIPITATION OF BARIUM—NEW READILY IMPLEMENTED		
540—Shred 695—Pelletize 796—Grout	770—Metal Melter	540—Debris Shredding 180—Evaporation 190—Condenser 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
PX-S803—MOBILE MACROENCAPSULATION PROCESS—NEW READILY IMPLEMENTED		
540—Shred 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 470—Thermal Destruction 570—Thermal Desorption 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout 895—Recycle/Stabilization	640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 490—Hg Solidification 895—Recycle/Stabilization	460—Solid Organic Destruction 540—Debris Shredding 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		795—Residue Grouting 796—Debris Grouting 895—Battery Recycle/Stabilization
QX-S004—QUADREX COMMERCIAL FACILITY—EXISTING		
540—Shred 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification	540—Debris Shredding 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
RF-S004—PROCESS WASTE TREATMENT FACILITY: BUILDING 374—EXISTING		
140—Neutralize 340—Neutralize 270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 795—Grout	140—Neutralize 340—Neutralize 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification	140—Aqueous Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		795—Residue Grouting
RF-S016—CTMP SYSTEM #3: IMMOBILIZATION OF MISC WASTE FORMS—NEW NON-LARGE SITE		
140—Neutralize 340—Neutralize 540—Shred 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	140—Neutralize 340—Neutralize 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 540—Debris Shredding 541—Debris Neutralization 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting 1002—Water Reactives Processing
RF-S017—CTMP SYSTEM 2/4B:BLDG. 374/774: SOLIDIFIED BYPASS SLUDGE—NEW NON-LARGE SITE		
140—Neutralize 340—Neutralize 540—Shred 270—Organic Destruction 470—Thermal Destruction	140—Neutralize 340—Neutralize 270—Organic Destruction 670—Glass Melter 180—Evaporate	140—Aqueous Liquids Neutralization 540—Debris Shredding 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	190—Condenser 195—Polymer Solidification	Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
RF-S019—CTMP SYSTEM 5—SURFACE ORGANIC CONTAMINANT REMOVAL—NEW NON-LARGE SITE		
540—Shred 470—Thermal Destruction 570—Thermal Desorption 480—Secondary Burner 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 195—Polymer Solidification	460—Solid Organic Destruction 540—Debris Shredding 335—Sludge Washing 435—Soil Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
RF-S028—CTMP SYSTEMS 6/2/4b—NEW NON-LARGE SITE		
470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 795—Grout	670—Glass Melter 180—Evaporate 190—Condenser 195—Polymer Solidification	335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 795—Residue Grouting
RL-S005—200 AREA EFFLUENT TREATMENT FACILITY (ETF)—EXISTING		
270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 795—Grout	270—Organic Destruction 670—Glass Melter 180—Evaporate 190—Condenser 195—Polymer Solidification	335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 795—Residue Grouting
RL-S007—WASTE RECEIVING AND PROCESSING FACILITY (WRAP IIA)—NEW LARGE SITE		
340—Neutralize 540—Shred 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 560—Mercury Distillation	340—Neutralize 440—Neutralization 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 560—Mercury Distillation	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 540—Debris Shredding 541—Debris Neutralization 640—Chemical Oxidation/Reduction

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout 895—Recycle/Stabilization	270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 895—Recycle/Stabilization	740—Chemical/Physical Separation 741—Inherently Hazardous Neutralization 335—Sludge Washing 435—Soil Washing 535—Debris Washing 560—Mercury Distillation 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting 895—Battery Recycle/Stabilization 1002—Water Reactives Processing
SA-S804—TREATABILITY STUDY: CHEMICAL DESTRUCTION/EXPLOSIVES—NEW READILY IMPL		
540—Shred 640—Chemical Oxidation/Reduction 470—Thermal Destruction 695—Pelletize 795—Grout 796—Grout	640—Chemical Oxidation/Reduction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner	460—Solid Organic Destruction 540—Debris Shredding 640—Chemical Oxidation/Reduction 180—Evaporation 190—Condenser 490—Offgas Treatment 695—Pelletizing

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		795—Residue Grouting 796—Debris Grouting 1001—Explosives Processing
SA-S806—TS: CHEMICALLY DEACTIVATE REACTIVE PYROPHORIC METALS—NEW READILY IMPL		
SA-S807—TREATABILITY STUDY: SOLIDIFICATION/NEUTRALIZATION—NEW READILY IMPL		
SE-S005—SCIENTIFIC ECOLOGY GROUP (SEG) COMMERCIAL FACILITY—EXISTING		
540—Shred 740—Chemical/Physical Separation 470—Thermal Destruction 570—Thermal Desorption 480—Secondary Burner 490—Hg Solidification 695—Pelletize 795—Grout 796—Grout	740—Chemical/Physical Separation 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 490—Hg Solidification	460—Solid Organic Destruction 540—Debris Shredding 740—Chemical/Physical Separation 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
SR-S002—F/H AREA EFFLUENT TREATMENT FACILITY (ETF)—EXISTING		
SR-S003—SRL (SRTC) ION EXCHANGE TREATMENT PROBE—HIGH ACTIVITY—EXISTING		
140—Neutralize	140—Neutralize	140—Aqueous Liquids Neutralization

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
340—Neutralize 270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 795—Grout	340—Neutralize 270—Organic Destruction 670—Glass Melter 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification	335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 795—Residue Grouting
SR-S004—SRL (SRTC) ION EXCHANGE TREATMENT PROBE—Low Activity—EXISTING		
140—Neutralize 340—Neutralize 270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 795—Grout	140—Neutralize 340—Neutralize 270—Organic Destruction 670—Glass Melter 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification	140—Aqueous Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 795—Residue Grouting
SR-S007—CONSOLIDATED INCINERATION FACILITY (CIF)—Solid Feed—EXISTING		
540—Shred 470—Thermal Destruction 570—Thermal Desorption 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification	470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification	460—Solid Organic Destruction 540—Debris Shredding 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
695—Pelletize 795—Grout 796—Grout		370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
SR-S008—CONSOLIDATED INCINERATION FACILITY (CIF)—ASHCRETE—EXISTING		
270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 795—Grout	270—Organic Destruction 670—Glass Melter 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification	335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 795—Residue Grouting
SR-S015—M-AREA VENDOR TREATMENT PROCESS—NEW LARGE SITE		
140—Neutralize 340—Neutralize 540—Shred 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate	140—Neutralize 340—Neutralize 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 180—Evaporate	140—Aqueous Liquids Neutralization 335—Sludge Washing 435—Soil Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
SR-S018—CONSOLIDATED INCINERATION FACILITY—LIQUID FEED SYSTEM—EXISTING		
270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 795—Grout	270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 795—Residue Grouting
SR-S019—M-AREA LETF: 313-M/321-M—EXISTING		
540—Shred 695—Pelletize 796—Grout	770—Metal Melter	540—Debris Shredding 180—Evaporation 190—Condenser 695—Pelletizing 795—Residue Grouting 796—Debris Grouting

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
SR-S801—WASTE ALREADY MEETS TREATMENT STANDARD—		
540—Shred 740—Chemical/Physical Separation 560—Mercury Distillation 490—Hg Solidification 695—Pelletize 795—Grout 796—Grout	740—Chemical/Physical Separation 560—Mercury Distillation 670—Glass Melter 770—Metal Melter 490—Hg Solidification	540—Debris Shredding 740—Chemical/Physical Separation 560—Mercury Distillation 180—Evaporation 190—Condenser 595—Mercury Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
SR-S802—TREAT. VARIANCE REQUIRED/OBTAINED TO TREAT THE WASTE --		
540—Shred 470—Thermal Destruction 570—Thermal Desorption 480—Secondary Burner 490—Hg Solidification 695—Pelletize 795—Grout 796—Grout	470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 490—Hg Solidification	460—Solid Organic Destruction 540—Debris Shredding 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
SR-S804—ONSITE/OFFSITE VENDOR TMT—EXISTING		
740—Chemical/Physical Separation 795—Grout	740—Chemical/Physical Separation 670—Glass Melter	740—Chemical/Physical Separation 795—Residue Grouting

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
SR-S806—ION EXCHANGE/D-AREA HEAVY WATER RECLAMATION PROCESS—EXISTING		
180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification 795—Grout	670—Glass Melter 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification	180—Evaporation 190—Condenser 595—Mercury Solidification 795—Residue Grouting
SR-S808—TRITIUM FACILITY 234-H: MACROENCAPS AS 90-DAY GENERATOR—EXISTING		
540—Shred 695—Pelletize 796—Grout	770—Metal Melter	540—Debris Shredding 180—Evaporation 190—Condenser 595—Mercury Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
SR-S809—REMOTE HANDLING MACROENCAPSULATION-CONTAINMENT BLDG.—NEW		
195—Polymer Solidification 795—Grout	670—Glass Melter 195—Polymer Solidification	180—Evaporation 190—Condenser 195—Polymer Solidification 795—Residue Grouting
SR-S810—WET OXIDATION AND LLW LEAD MACROENCAPS-CONTAINMENT BLDG—NEW		
740—Chemical/Physical Separation 795—Grout	740—Chemical/Physical Separation 670—Glass Melter	740—Chemical/Physical Separation 180—Evaporation 190—Condenser 795—Residue Grouting
SR-S811—FURTHER CHARACTERIZATION/STUDIES REQUIRED—		
540—Shred 470—Thermal Destruction 570—Thermal Desorption	470—Thermal Destruction 670—Glass Melter 770—Metal Melter	460—Solid Organic Destruction 540—Debris Shredding 335—Sludge Washing

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	180—Evaporate 480—Secondary Burner 190—Condenser 490—Hg Solidification 195—Polymer Solidification	535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting 1002—Water Reactives Processing
SR-S812—STORAGE OF TRITIATED OIL FOR DECAY—EXISTING		
470—Thermal Destruction 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification 795—Grout	470—Thermal Destruction 670—Glass Melter 480—Secondary Burner 490—Hg Solidification	335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 795—Residue Grouting
WS-S001—SITE WATER TREATMENT PLANT TRAIN 1—EXISTING		
140—Neutralize 340—Neutralize 180—Evaporate	140—Neutralize 340—Neutralize 670—Glass Melter	140—Aqueous Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
190—Condenser 490—Hg Solidification 195—Polymer Solidification 795—Grout	180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification	Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 795—Residue Grouting
WS-S004—CHEMICAL STABILIZATION/SOLIDIFICATION FACILITY—NEW NON-LARGE SITE		
540—Shred 470—Thermal Destruction 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 195—Polymer Solidification	460—Solid Organic Destruction 540—Debris Shredding 335—Sludge Washing 435—Soil Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
WS-S803—DEACTIVATION FOLLOWED BY STABILIZATION—NEW NON-LARGE SITE		
540—Shred 640—Chemical Oxidation/Reduction 270—Organic Destruction	640—Chemical Oxidation/Reduction 270—Organic Destruction 470—Thermal Destruction	540—Debris Shredding 640—Chemical Oxidation/Reduction 335—Sludge Washing

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	670—Glass Melter 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification	270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting 1002—Water Reactives Processing
WS-S804—AMALGAMATION—NEW NON-LARGE SITE		
560—Mercury Distillation 490—Hg Solidification	560—Mercury Distillation 490—Hg Solidification	560—Mercury Distillation 180—Evaporation 190—Condenser 595—Mercury Solidification 795—Residue Grouting
WS-S807—DECONTAMINATION/STABILIZATION—NEW NON-LARGE SITE		
540—Shred 470—Thermal Destruction 490—Hg Solidification 195—Polymer Solidification 695—Pelletize 796—Grout	470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 490—Hg Solidification 195—Polymer Solidification	460—Solid Organic Destruction 540—Debris Shredding 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		595—Mercury Solidification 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
WS-S808—MICROENCAPSULATION—NEW NON-LARGE SITE		
540—Shred 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 470—Thermal Destruction 695—Pelletize 795—Grout 796—Grout 895—Recycle/Stabilization	640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 895—Recycle/Stabilization	460—Solid Organic Destruction 540—Debris Shredding 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 180—Evaporation 190—Condenser 490—Offgas Treatment 695—Pelletizing 795—Residue Grouting 796—Debris Grouting 895—Battery Recycle/Stabilization
WV-S001—IRTS: SMWS; LWTS; STS; CSS; Drum—EXISTING		
540—Shred 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	670—Glass Melter 180—Evaporate 190—Condenser 195—Polymer Solidification	540—Debris Shredding 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 695—Pelletizing 795—Residue Grouting

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		796—Debris Grouting
WV-S701—NEEDS FURTHER CHARACTERIZATION --		
140—Neutralize 340—Neutralize 540—Shred 270—Organic Destruction 470—Thermal Destruction 570—Thermal Desorption 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	140—Neutralize 340—Neutralize 270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 540—Debris Shredding 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting
WV-S802—CONTACT SIZE REDUCTION FACILITY (CSRF)—EXISTING		
540—Shred 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 470—Thermal Destruction 570—Thermal Desorption 480—Secondary Burner 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 470—Thermal Destruction 670—Glass Melter 770—Metal Melter 480—Secondary Burner 195—Polymer Solidification 895—Recycle/Stabilization	460—Solid Organic Destruction 140—Aqueous Liquids Neutralization 540—Debris Shredding 640—Chemical Oxidation/Reduction 740—Chemical/Physical Separation 335—Sludge Washing 535—Debris Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
895—Recycle/Stabilization		Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 195—Polymer Solidification 695—Pelletizing 795—Residue Grouting 796—Debris Grouting 895—Battery Recycle/Stabilization
WV-S803—INT. WASTE STORAGE FACILITY—EXISTING		
140—Neutralize 340—Neutralize 180—Evaporate 190—Condenser 195—Polymer Solidification 795—Grout	140—Neutralize 340—Neutralize 670—Glass Melter 180—Evaporate 190—Condenser 195—Polymer Solidification	140—Aqueous Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 795—Residue Grouting
YP-S001—BIODENITRIFICATION UNIT, BUILDING 9818—EXISTING		
140—Neutralize 340—Neutralize 180—Evaporate 190—Condenser 195—Polymer Solidification 795—Grout	140—Neutralize 340—Neutralize 670—Glass Melter 180—Evaporate 190—Condenser 195—Polymer Solidification	140—Aqueous Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
		490—Offgas Treatment 795—Residue Grouting
YP-S002—CENTRAL POLLUTION CONTROL FACILITY (CPCF)—EXISTING		
140—Neutralize 340—Neutralize 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification 795—Grout	140—Neutralize 340—Neutralize 670—Glass Melter 180—Evaporate 190—Condenser 490—Hg Solidification 195—Polymer Solidification	140—Aqueous Liquids Neutralization 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 595—Mercury Solidification 795—Residue Grouting
YP-S003—CYANIDE TREATMENT FACILITY, BUILDING 9201-5N—EXISTING		
540—Shred 270—Organic Destruction 470—Thermal Destruction 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification 695—Pelletize 795—Grout 796—Grout	270—Organic Destruction 470—Thermal Destruction 670—Glass Melter 180—Evaporate 480—Secondary Burner 190—Condenser 195—Polymer Solidification	540—Debris Shredding 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 695—Pelletizing 795—Residue Grouting 796—Debris Grouting 1001—Explosives Processing 1002—Water Reactives Processing

Table E.1- PEIS Predictions of Required Treatment Units

Base Case	Thermal Case	Non-Thermal Case
YP-S801—CERCLA ROD --		
640—Chemical Oxidation/Reduction 795—Grout	640—Chemical Oxidation/Reduction 670—Glass Melter	640—Chemical Oxidation/Reduction 335—Sludge Washing 270—Aqueous Phase Organic Destruction 370—Aqueous Phase Organic Treatment 180—Evaporation 190—Condenser 490—Offgas Treatment 795—Residue Grouting

APPENDIX F

SITE ID, NAME, AND LOCATION

Site ID	Site Name	State
AE	Argonne National Laboratory—East	Illinois
AL	Ames Laboratory	Iowa
AP	Aptus Environmental Commercial Facility	Kansas
AW	Argonne National Laboratory—West	Idaho
BC	Battelle Columbus Laboratories	Ohio
BN	Brookhaven National Laboratory	New York
BT	Bettis Atomic Power Laboratory	Pennsylvania
CI	Colonie Interim Storage Site	New York
CM	Commercial Facility	[Commercial]
CN	Charleston Naval Shipyard	South Carolina
DP	Oak Ridge K-25 Site	Tennessee
DS	DSSI Commercial Facility	Tennessee
EH	Lab. For Energy-Related Health Research	California
ET	Energy Technology Engineering Center	California
EV	Envirocare Commercial Facility	Utah
FM	Fernald Environmental Management Project	Ohio
GA	General Atomics	California
GE	GE Vallecitos	California
GJ	Grand Junction Project Office	Colorado
HA	Hake Associates Commercial Facility	Tennessee
IC	IT Corp Commercial Facility	Tennessee
IN	Idaho National Engineering Laboratory	Idaho
IT	Inhalation Toxicology Research Institute	New Mexico
KA	Knolls Atomic Power Laboratory—Schenect.	New York
KC	Kansas City Plant	Missouri
KK	Knolls Atomic Power Laboratory—Kesselring	New York
KW	Knolls Atomic Power Laboratory—Windsor	Connecticut
LA	Los Alamos National Laboratory	New Mexico
LB	Lawrence Berkeley Laboratory	California
LL	Lawrence Livermore National Laboratory	California
MD	Mound Plant	Ohio
MI	Mare Island Naval Shipyard	California
MS	Middlesex Sampling Plant	New Jersey
MU	University of Missouri	Missouri
NN	Norfolk Naval Shipyard	Virginia
NS	NSSI Commercial Facility	Texas
NT	Nevada Test Site	Nevada
OH	Ohio Option	Ohio
OR	Oak Ridge National Laboratory	Tennessee
PA	Paducah Gaseous Diffusion Plant	Kentucky
PH	Pearl Harbor Naval Shipyard	Hawaii
PI	Pinellas Plant	Florida
PN	Portsmouth Naval Shipyard	Maine

Site ID	Site Name	State
PO	Portsmouth Gaseous Diffusion Plant	Ohio
PP	Princeton Plasma Physics Laboratory	New Jersey
PS	Puget Sound Naval Shipyard	Washington
PX	Pantex Plant	Texas
QX	Quadrex Commercial Facility	Florida
RA	Ramp Industries Commercial Facility	Colorado
RF	Rocky Flats Plant	Colorado
RL	Hanford Site	Washington
RM	RMI Titanium Company	Ohio
SA	Sandia National Laboratory—New Mexico	New Mexico
SE	Scientific Ecology Group (SEG)Commercial	Tennessee
SL	Sandia National Laboratory—California	California
SM	Site A/Plot M	Illinois
SR	Savannah River Site	South Carolina
WP	Waste Isolation Pilot Project	New Mexico
WS	Weldon Spring Site	Missouri
WV	West Valley Demonstration Project	New York
YP	Oak Ridge Y-12 Plant	Tennessee