The Mixed Waste Management Facility

Monthly Report
April 1995

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Contents

Project Summary.....	iii
Project Financial Summary	vi
1.1.1 Quality Assurance	1
1.1.2 PSAR.....	2
1.1.3 Environmental Documentation.....	3
1.1.4 ES&H	5
1.1.5 Program Support	6
1.1.6 Public Participation	8
1.2.1 Conceptual Design	9
1.2.2 Plant Start-Up Management	10
1.2.3 Activation	11
1.3.1 Project Management.....	12
1.3.2 Project Control	14
1.3.3 Technical Systems Integration.....	16
1.4.1 Receiving and Shipping	18
1.4.2 Solids Feed Preparation.....	19
1.4.3. Liquids Feed Preparation	21
1.5.1. Mediated Electrochemical Oxidation	23
1.5.2. Molten Salt Oxidation.....	25
1.5.3 Wet Oxidation.....	29
1.5.4 UV Photolysis.....	30
1.5.5 Experimental Off-Gas	31
1.6.1. Process Transport and Storage	33
1.6.2. Analytical Laboratory	34
1.6.3. Water Treatment.....	36
1.6.4 Final Forms	37
1.6.5 Supervisory Instrumentation and Control	39
Appendix A. Milestone/Marker Log	41

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Project Summary

Overview

During late April, we modified the budget and work plan for FY95 to reflect a \$2000K funding reduction for this fiscal year. These changes incorporate both the delayed start and slow ramp-up due to DOE funding uncertainties, as well as new and real reductions in Project activities. Due to the significant budgeting impact, this report reflects the resulting budget changes (for April). Scope and schedule impact, however, will be documented in the May report due to the additional effort involved in assessing schedule impact. We will combine the *May Monthly Report* and the *Revised FY95 Plan* for cost efficiency; we will submit the *FY95 Plan Rebaseline* for approval by DOE in May.

Technical progress continued during April, but was redirected toward the new *FY95 Plan*. Key changes in the revised plan are to delete MEO from Project scope and wrap up work to date, defer further major procurements for the Project from FY95, delete MSO staff additions (with milestones), and defer work and milestones in other WBS elements. Engineering development, preliminary design, and peer reviews continued in preparation for the Project Preliminary Design Review. The budget reduction is expected to delay the Project Preliminary Design Review until Q1 of FY96.

Management focus during April centered upon issuing the permitting strategy and Revision 1.2 of the Project Baseline. We spent significant effort in response to DOE requests for impact studies, to directed changes in project funding, and in support of DOE/OAK FY97 field submittals. Most of this was unplanned and out-of-scope work for the Project. The Project continued to work closely with DOE and other stakeholders to support NEPA determination activities (the revised EA was submitted to DOE in February), a critical-path item. Good progress continued toward preparing the *Project Management Plan*. Good progress also continued toward completing peer reviews and in implementing the project *QA Plan*. Work continued on public participation and MWMF involvement in national mixed waste planning groups.

Cost Status. The key cost issue is the response to, and impact of, the FY95 and FY96 reduced funding guidance. About \$1100K of the \$2000K budget cut for FY95 came from a spending underrun due to changing DOE guidance and the resulting slow ramp-up of design staff, as discussed last month. However, about \$350K of the underrun was planned to be spent in the remainder of FY95 to bring the Project back to schedule. Thus, the revised guidance reflects a 23% cut in remaining planned Project spending. The rebaseline *FY95 Plan* meets the rebaseline funding guidance, and affects planned accomplishments in FY95 and outyears. In addition to the scope reductions, the rebaseline *FY95 Plan* assumes that the LDRD tax will not be applied to the Project (this is consistent with the full *Project Baseline Plan (Revision 1.2)* for the recent successful FY97 Validation) and has reduced both management reserve and liened carryover for the remainder of the year (with an acceptable level of financial risk).

Funding reductions in FY96 and beyond offer a significant challenge, but also perhaps certain opportunities from a revised Project strategy. DOE funding guidance is for essentially flat funding by fiscal year, and this offers a challenge for a conventional project that typically requires peak funding year(s) to accommodate large capital procurements. We are analyzing revised strategies that might allow, by significant

rescoping and phasing of the Project, for earlier delivery and demonstration of key treatment technologies, with other elements implemented at a later date.

Due to the significant changes in DOE funding guidance for the Project and the level-of-effort nature of directed changes and out-of-scope work requested of the Project to date, the earned value parameters of Process Transport and Storage have been modified to reflect the rebaseline, and cost variance has been zeroed. This has been done in discussion with DOE/OAK project management.

Schedule Status. While both actual costs and less important milestones were both running behind planned values, due to ongoing changes in formal and verbal DOE guidance, key milestones are proceeding in accordance with the current long-range Project plan. Recent developments in both permitting (the "no RCRA RD&D permit option") and NEPA areas (Title II approval for DWTF Phase I) appear consistent with overall project plans. With the reduced FY95 funding, we anticipate only a minor delay for the Project Preliminary Design Review. However, significant replanning for the overall Project is required and will likely affect longer-range milestones. The earned value parameters of PTS have been modified to reflect the rebaseline, and schedule variance has been zeroed.

Significant Issues and Planned Corrective Actions

Significant reductions in funding received for FY95 and FY96 have caused a cutback in planned work for FY95 and will require substantive changes in overall Project implementation strategy. LLNL submitted the FY97 Validation, Rev. 1.2, and Activity Data Sheet (ADS) in March with a funding profile of \$7.6M, \$15.3M, \$13.0M, \$12.6M, \$0.0M for FY95 through FY99, respectively. In early April, DOE/OAK modified the submitted ADS to profiles of 7.6, 15.3, 9.0, 9.0, 9.0 respectively. On 18 April, we received guidance profiles of \$5.6M and \$10.0M for FY95 and FY96, with out-years at about \$9.0M/year. We developed and implemented a rebaseline plan to reduce scope, defer work, and reduce spending to accommodate the revised FY95 20% funding shortfall. However, we will develop a detailed plan for implementing the overall project under these constraints as part of the Preliminary Design Review.

The National Environmental Policy Act (NEPA) compliance for the MWMF poses a continued schedule risk for the MWMF and DWTF (see *February Monthly Report*). The key concern remains a NEPA determination by September to allow Title II of Phase II and award of Phase I to proceed; the former is on critical path. The MWMF EA, revised to reflect the DWTF/MWMF collocation, was submitted to DOE/OAK in February, and the current estimated decision date is August. The DWTF and MWMF are working closely with DOE to expedite this process.

Uncertainty in permitting strategy and requirements poses potential, albeit lessening, schedule risk. We initiated review of the "no-RCRA RD&D permit" strategy by DTSC. If concurred upon, this will significantly reduce Project schedule risk.

Summary of Accomplishments

Detailed accomplishments and milestone status are reported in the Task Summaries that follow the Project Financial Summary. Directly below we highlight the major accomplishments during this reporting period:

- Preliminary design continued, including peer reviews for Solids Feed Prep (conventional), Liquids Feed Prep, and Final Forms (ceramic).
- We completed evaluation and replanning for the FY95 budget reduction for WBS Level 3 elements.
- Technical Integration: We issued signature protocol for drawings. We began work to define surrogate feeds for waste treatment systems. We developed information for facility utility requirements and for off-gas emissions.
- NEPA/CEQA: DOE/OAK addressed requested changes in the EA. We discussed revised permitting strategy with DOE and California DTSC, and are continuing. MWMF staff received a half-day class on hazardous waste land disposal restrictions.
- We held a briefing for the Mixed Waste Focus Area (MWFA) implementation group on MWMF plans. A good match with MWFA needs and MWMF plans appears to exist; an MWFA representative will be involved with the MWMF National Review Panel (NRP).
- QA: We issued the Records Control Procedure. DOE/OAK approved Revision 1 to the WBS Dictionary as part of preparing Revision 1.3 of the Project Baseline.
- Feed Preparation: We finished peer reviews for solid (conventional hardware) and liquid feed areas. The detailing of equipment continues. Tests of density separation equipment at manufacturer sites were successful.
- MEO: We began planning and activities to wrap up and document MEO work to date, as a result of budget reductions. Testing already in progress will be completed and drawings and documentation will be updated to reflect the current status. Tests on the 1/15-scale silver recovery system continued, along with steady-state testing on the FM-21. We began consolidation of P&ID drawings.
- MSO: Materials evaluation for vessel coatings continued, primarily with ETEC and ORNL. The EDU vessel is on schedule for delivery in May; design of controls is complete; engineering and operational safety notes are complete. Injector testing began using the visual model test bench, with design changes resulting from initial tests. Preliminary design of the primary MSO vessel and ancillary systems continued. Modeling and design of the salt recycle system continued. We placed a CBD announcement to solicit industrial partners for the salt recycle system.
- Analytical Services: We issued a document describing DWTF analytical requirements. We analyzed model waste streams to determine maximum emission levels of certain constituents, to define instrumentation requirements.
- Final Forms: We completed a peer review on ceramic waste forms, with minor action items. Evaluation of ceramic waste forms continued, studying higher loading levels and the presence of small levels of fluoride. Planned studies of polyethylene micro-encapsulation with Rocky Flats were canceled due to budget cuts.
- Instrumentation and Control: We continued responses to the March peer review; continued evaluation of database management software; completed design of prototype integrated system, with three local workcells; and completed the instrumentation database.

Project Financial Summary

Figures 1 and 2 present graphical plots of planned-versus-actual spending for OPEX and CENRTC. Table 1 presents a more detailed financial summary of the MWMF Project for April. The figures and the table have been modified to reflect the revised financial plan for FY95 that was required in response to the DOE directive during April to reduce the FY95 budget (see discussion above). For reference, the monthly profiles are shown for both the original (11/94 Plan) and the revised (4/95 Plan) FY95 spending plan. The cumulative profiles are shown for only the revised FY95 spending plan.

As part of the FY95 rebaseline, the revised spending plan has used the actual spending profile through March and contains revised spending estimates for the remainder of FY95. This has accomplished the DOE objective of a \$2000K budget reduction for FY95.

As shown in Table 1, the Budget Obligation Authority (BA) from DOE for CENRTC funds was reduced during April. This fund reduction was contained in the DOE Contract Modification Letter to LLNL and is assumed to be part of the FY95 funding reduction action. With the current levels of BA funds, sufficient OPEX funds exist to meet the estimated commitments. However, for CENRTC funds, the current BA levels are about \$1000K below that estimated for FY95. The current CENRTC BA level is estimated to be adequate through approximately August, although earlier obligations (e.g., contracts, procurement orders) could require an early commitment of funds. This needs to be resolved by DOE/OAK.

Significant differences continue to exist between the authorized funds, as contained in the Program Letter and the DOE Contract Modification Letter. Management of the MWMF Project must be in accordance with the DOE Contract Modification Letter. The task summaries identify major procurements initiated during April.

MWMF Project - Monthly Financial Summary for FY95

APRIL, 1995

OPEX (\$K, monthly expenditures)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Subtotal*	Undlstd#	4/95 Budget^	11/94 Plan^
DOE Funds*	279	235	235	0	0	301	-120	0						930			
FY95 Plan 11/94		59	58	56	58	53	63	66	66	66	66	71	66	745	NA, for information only		746
FY95 Plan 4/95		103	103	224	-87	78	-49	51	50	50	46	54	53	675		675	
Actual		103	103	224	-87	78	-49	91						463			
Variance		0	0	0	0	0	0	40						40			
Actual Liens**		246	242	285	305	275	247	215						NA			
Mgmt Reserve		0	0	0	0	0	0	0						0	60	60	84
95/96 Liens		0	0	0	0	0	0	0						0	80	80	100
														FY95 OPEX budget =			

OPEX (\$K, cumulative to date)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
DOE Funds*	279	514	749	749	749	1050	930	930					
FY95 Plan 4/95		103	206	430	343	421	372	423	473	522	568	622	675
Actual		103	206	430	343	421	372	463					
Variance		0	0	0	0	0	0	40					

DOE FY95 new-BA, OPEX		
budget	guidance^^	delta
536	2800	-2264

CENRTC (\$K, monthly expenditures)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Subtotal*	Undlstd#	4/95 Budget^	11/94 Plan^
DOE Funds*	2649	0	0	0	2000	0	2856	-850						6655			
FY95 Plan 11/94		657	725	715	748	692	724	700	749	671	606	737	632	8358	NA, for information only		8358
FY95 Plan 4/95		730	188	371	602	640	662	695	629	589	733	613	741	7190		7190	
Actual		730	188	371	602	640	662	596						3789			
Variance		0	0	0	0	0	1	-98						-98			
Actual Liens**		86	81	85	125	961	547	470						NA			
Mgmt Reserve		0	0	0	0	0	0	0						0	328	328	605
95/96 Liens		0	0	0	0	0	0	0						0	250	250	400
LDRD-CAP#		0	0	0	0	0	0	0						0	0	0	291
														FY95 CENRTC budget =			

CENRTC (\$K, cumulative to date)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
DOE Funds*	2649	2649	2649	2649	4649	4649	7505	6655					
FY95 Plan 4/95		730	917	1289	1890	2530	3192	3886	4515	5104	5837	6450	7190
Actual		730	918	1289	1891	2530	3193	3789					
Variance		0	0	0	0	0	1	-98					

DOE FY95 new-BA, CENRTC		
budget	guidance^^	delta
5119	4856	263

PROJECT TOTAL (\$K, monthly expenditures)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Subtotal*	Undlstd#	4/95 Budget^	11/94 Plan^
DOE Funds*	2928	235	235	0	2000	301	2736	-850						7585			
FY95 Plan 11/94		717	783	772	806	744	787	767	815	737	672	807	698	9104	NA, for information only		9104
FY95 Plan 4/95		833	291	595	515	718	613	746	678	638	780	666	794	7865		7865	
Actual		833	291	595	515	718	613	687						4252			
Variance		0	0	0	0	0	1	-59						-58			
Actual Liens**		331	323	370	430	1236	794	685						NA			
Mgmt Reserve		0	0	0	0	0	0	0						0	388	388	689
95/96 Liens		0	0	0	0	0	0	0						0	330	330	500
LDRD-CAP#		0	0	0	0	0	0	0						0	0	0	291
														FY95 TOTAL budget*** =			
														Est. FY95 var. =			

TOTAL PROJECT EXPENDITURES (\$K, cumulative to date)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
DOE Funds*	2928	3163	3398	3398	5398	5699	8435	7585					
FY95 Plan 4/95		833	1124	1719	2234	2951	3564	4310	4988	5626	6405	7071	7865
Actual		833	1124	1719	2234	2952	3565	4252					
Variance		0	0	0	0	0	1	-58					

DOE FY95 new-BA, TOTAL		
budget	guidance^^	delta
5655	7656	-2001

MANPOWER SUMMARY (total project, by month)

	CO*	Oct	Nov	Dec@	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Labor (FTE)		49.1	46.9	49.1	47.2	46.0	49.3	48.6					
Labor (\$K)@		409	349	322	390	415	450	436					

Current End-of-Year Projection	
Actual + current liens =	4936
FY95 Plan + current liens =	8550
FY95 TOTAL budget plan =	8583

* DOE funds include FY94/95 carryover (source: LLNL Contract Modification)

** Relevant for current month only; sum not meaningful

*** Includes budgeted amounts for management reserve, liens holdback, LDRD

Undistributed remaining budget; CE/LDRD values assume 6% of new-BA budget

@ Labor \$K value includes non-FTE labor costs (small cost amount); Dec has mischarge corrected.

^ 4/95 Budget* is current FY95 Plan; 11/94 Plan* is prior FY95 baseline plan

^^ As identified in the most recent program letter

TABLE 1

WBS Element 1.1.1 Quality Assurance**Task Description**

Quality Assurance (QA) provides quality assurance support to the MWMF Project. This effort includes development and implementation of the Project's QA program and oversight for conformance to the approved plan and other quality and ES&H requirements. This WBS element covers only a fraction of the OPEX QA effort, with the CENRTC portion contained under WBS 1.3.2, Project Control.

Summary of Monthly Activities

- Completed the quality assurance procedure, *Records Control* (marker L132-9.1). This document was approved by Project Management.
- Continued working with Project personnel on QA issues and the QA filing system.
- Supported QA aspects of peer reviews.

FY95 Budget Spending profiles (OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	3	3	3	3	3	3	3	3	3	3	3	3
4/95 Plan	2	3	12	-5	3	5	3	3	3	3	3	3
Monthly actual	2	3	12	-4	3	5	0					
11/94 Plan cumulative	3	6	8	11	13	17	19	22	25	28	31	34
4/95 Plan cumulative	2	5	17	13	16	21	23	26	29	32	35	38
Actual cumulative	2	5	17	13	16	21	21					
Current lien	0	0	0	0	0	0	0					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation.

ID no.	Milestone/Marker	Scheduled Date*	Status
None	Level of effort activity		

WBS Element 1.1.2 PSAR**Task Description**

The *Preliminary Safety Analysis Report* (PSAR) provides the integration of safety input, design reviews, and safety analysis for Phases I and II of the integrated MWMF/DWTF Project. Safety analysis includes analysis, generation of documentation, and documentation review and approval. The element includes the generation of the PSAR, which must be completed prior to major procurements and follow-on analysis required for the generation of the *Final Safety Analysis Report* (FSAR). The FSAR is required after construction and prior to operation.

Summary of Monthly Activities

There were no significant activities during April on the PSAR as the document was completed and distributed in 1994.

FY95 Budget Spending profiles (OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	0	0	0	0	0	0	0	0	0	0	0	0
4/95 Plan	14	2	0	-16	0	0	0	0	0	0	0	0
Monthly actual	14	2	0	-16	0	0	0					
11/94 Plan cumulative	0	0	0	0	0	0	0	0	0	0	0	0
4/95 Plan cumulative	14	16	16	0	0	0	0	0	0	0	0	0
Actual cumulative	14	16	16	0	0	0	0					
Current lien	74	73	73	73	73	73	73					

Spending profiles (CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/95 Plan	5	5	3	2	2	2	1	0	0	0	0	0
4/95 Plan	0	0	2	15	0	0	0	0	0	0	0	0
Monthly actual	0	0	2	15	0	0	0					
11/95 Plan cumulative	5	10	13	15	17	19	20	20	20	20	20	20
4/95 Plan cumulative	0	0	2	16	16	16	16	16	16	16	16	16
Actual cumulative	0	0	2	16	16	16	16					
Current lien	0	0	0	0	0	0	0					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
L112-1	PSAR to DOE for review	Dec 94	Completed

WBS Element 1.1.3 Environmental Documentation

Task Description

The National Environmental Policy Act (NEPA) portion of this WBS provides for the preparation of the *Environmental Assessment* (EA) and all required follow-up documentation required by DOE to make a determination about impacts. The effort includes preliminary evaluations, preparation of technical information, EA preparation, and comment resolution.

The California Environmental Quality Act (CEQA) and permitting portion of this WBS provide for the preparation of permit applications and associated environmental analysis to support the regulatory agency permitting and CEQA review process. The effort includes preliminary evaluations, preparation of technical information to support the agency CEQA document and permit evaluation, and comment resolution. This element prepares and coordinates approval of State and local permits and supports public participation activities associated with the permit approvals.

Summary of Monthly Activities

- LLNL continued to address comments from DOE/OAK on the revised EA and to consult with the DOE/OAK NEPA Compliance Officer on appropriate language to be used in the document. The revised document is to be resubmitted to DOE-OAK in May.
- Submittal of the RD&D permit application remained on hold in April. MWMF Project members met with LLNL management and DOE staff to discuss proposed changes to the permit strategy and received their concurrence with the revised strategy. After discussing these changes with the DTSC, we scheduled a meeting for May to discuss continued agency consultation in more detail.
- A half-day class was scheduled for MWMF staff on hazardous waste land disposal restrictions.

FY95 Budget Spending profiles (OPEX): NEPA

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	5	5	5	5	1	5	5	0	0	0	0	0
4/95 Plan	14	12	26	-32	7	3	3	0	0	0	0	0
Monthly actual	14	12	26	-32	7	3	17					
11/94 Plan cumulative	5	10	15	20	21	26	31	31	31	31	31	31
4/95 Plan cumulative	14	26	52	20	27	30	33	33	33	33	33	33
Actual cumulative	14	26	52	20	27	30	47					
Current lien	0	0	0	0	0	0	0					

Spending profiles (CENRTC): CEQA, Permitting

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	40	40	40	40	10	8	8	8	8	6	5	5
4/95 Plan	0	0	11	109	34	15	15	8	8	6	5	5
Monthly actual	0	0	11	109	34	15	7					
11/94 Plan cumulative	40	80	120	160	170	178	185	193	200	206	211	216
4/95 Plan cumulative	0	0	11	121	155	170	185	192	200	206	211	216
Actual cumulative	0	0	11	121	155	170	177					
Current lien	0	0	0	0	0	0	0					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
L113-4	Submit revised EA to DOE	Feb 95	Completed
L113-3	Submit RD&D permit application to DTSC	Feb 95	On hold
D113-1	EA determination by DOE	Aug 95	
L113-2	Submit air permit to BAAQMD	Apr 96	
C113-1	RD&D permit issued by DTSC	Apr 96	
C113-2	Authorization to construct issued by BAAQMD	Jul 96	

WBS Element 1.1.4 ES&H**Task Description**

ES&H provides for on-going Environment, Safety, and Health (ES&H) representation to the MWMF Project by ES&H specialists to ensure that all activities are conducted in a safe and environmentally sound manner and to ensure that ES&H standards have been properly applied.

Summary of Monthly Activities

Ongoing ES&H support was provided to the MWMF Project per the activities described above.

FY95 Budget Spending profiles (OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	14	14	14	14	14	14	14	14	14	14	14	14
4/95 Plan	11	8	14	6	12	12	14	14	14	14	14	14
Monthly actual	11	8	14	6	12	12	9					
11/94 Plan cumulative	14	27	41	54	68	81	95	108	122	135	149	162
4/95 Plan cumulative	11	19	32	38	51	62	76	89	103	116	130	143
Actual cumulative	11	19	32	38	51	62	72					
Current lien	0	0	0	0	0	0	0					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
None	Level of effort activity		

WBS Element 1.1.5 Program Support**Task Description**

Program Support provides top-level planning, control, and support of MWMF Project OPEX-funded activities. Specific activities include management of project assurances and interface with development activities. This element encompasses support for the Project Office including organization, schedule and budgeting activities, Project plans and reporting, personnel hiring and housing, Project operations control, facility technical support, and OPEX-funded technical support.

Summary of Monthly Activities

To better integrate the MWMF with other EM30-40-50 activities, we met with the Mixed Waste Focus Area (MWFA) Implementation members at INEL on April 25. This meeting was a follow-on of discussions with Steve Domotor at the WM95 Conference. The meeting included key members of the Implementation team: the DOE lead, Chris Bonzon, the LITCO lead, Alan Rogers, and a number of members of their technical staff. Richard Scott, DOE/OAK, attended, along with R. Streit, M. Adamson, and, Richard Ragaini from LLNL. The meeting was very positive, with good interaction and exchange of ideas. Chris Bonzon (DOE) started with a discussion of the MWFA plans and goals, followed by overviews from LLNL of the MWMF Project and the technologies to be implemented. The technology selection and waste stream selection process was also discussed at some length. A trip report was distributed. As follow-up to this meeting, we have asked the MWFA to be represented on the MWMF NRP and to participate in our key design reviews. The MWFA has agreed.

We held a meeting with key LLNL management to review the proposed permitting strategy based on the use of "Treatability Exemptions" rather than on the RD&D permit. LLNL management has concurred in this approach, and we sent a letter with supporting attachments to DOE/OAK for review (Richard Scott). We also continued our discussion with DTSC, who continued to agree that this approach appears right. DTSC continues to request that they support the MWMF activities, via a DOE grant, to provide input on permitting, equipment classification (e.g., non-incinerator Cat-X vs. incinerator), interaction with the STP, and public involvement. A meeting is planned for May to discuss the permitting strategy with DOE and DTSC.

FY95 Budget Spending profiles (OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	30	29	27	29	27	33	27	31	31	29	33	29
4/95 Plan	54	76	169	-48	44	-76	27	25	25	25	25	25
Monthly actual	54	76	169	-48	44	-76	60					
11/94 Plan cumulative	30	59	86	114	141	174	201	233	264	293	326	354
4/95 Plan cumulative	54	131	300	251	296	220	247	272	297	322	347	372
Actual cumulative	54	131	300	251	296	220	280					
Current lien	140	136	179	198	169	143	111					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
L115-7	Submit FY95 Plan	Dec 94	Complete
D115-1	DOE issues Project Plan	Jan 95	Open
L115-8	Technology Selection and Implementation Plan, Part II	Apr 95	Complete
L115-9	FY97 Project Validation	Apr 95	Complete
L115-1	Submit Project Management Plan (Final)	May 95	In Progress
L115-10	Submit FY96 Plan	Oct 95	

WBS Element 1.1.6 Public Participation**Task Description**

Public Participation provides for public input to the planning and execution phases of the MWMF Project. Included are a National Review Panel (NRP), a Community Newsletter, and preparation and coordination of press releases and community tours.

Summary of Monthly Activities

As discussed in the last monthly, the first NRP meeting is now scheduled for June 20. We are sending letters to all participants and developing an agenda. As discussed elsewhere (WBS 1.1.5), interactions with the Mixed Waste Focus Area (MWFA) Implementation group have resulted in the addition of a representative of the MWFA on the NRP.

To support "generic" briefings and public outreach, a poster briefing is being completed in conjunction with the Environmental Programs Directorate. This package will be available for conferences, public meetings, and visitor center display as required.

FY95 Budget Spending profiles (OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	8	8	8	8	8	8	8	8	8	8	8	8
4/95 Plan	10	3	3	8	11	5	5	8	8	5	5	5
Monthly actual	10	3	3	8	11	5	7					
11/94 Plan cumulative	8	16	24	32	40	48	56	64	72	80	88	96
4/95 Plan cumulative	10	12	15	23	34	38	44	51	59	64	69	74
Actual cumulative	10	12	15	23	34	38	46					
Current lien	28	28	28	29	28	28	28					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
L116-1.1	National Review Panel (NRP) formed	Apr 95	Complete
L116-1	First meeting of NRP	Jun 95	In Progress
L116-2.1	Issue first public newsletter	Jun 95	
L116-2.2	Receive comments from NRP	Apr 95	Deleted
L116-2	Second meeting of NRP	Nov 95	
L116-3.1	Issue second newsletter	Dec 95	

WBS Element 1.2.1 Conceptual Design**Task Description**

Conceptual Design provides the Project's technical, cost, and schedule baselines that form the basis for KD-1.

Summary of Monthly Activities

Conceptual design activity is complete. No further activities remain in this WBS element.

FY95 Budget Spending profiles (\$0K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	0	0	0	0	0	0	0	0	0	0	0	0
4/95 Plan	-1	-1	0	0	0	2	0	0	0	0	0	0
Monthly actual	-1	-1	0	0	0	2	-2					
11/94 Plan cumulative	0	0	0	0	0	0	0	0	0	0	0	0
4/95 Plan cumulative	-1	-2	-2	-2	-2	0	0	0	0	0	0	0
Actual cumulative	-1	-2	-2	-2	-2	0	-2					
Current lien	4	4	4	4	4	3	3					

Charges were transfers from FY94.

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element 1.2.2 Plant Start-Up Management**Task Description**

Plant Start-Up Management provides (1) operations and maintenance review of system designs; (2) the development of top-level plans for staffing, training, testing, and readiness review; (3) task analysis and preparation, review, and revision of site operating plan, maintenance, instrument calibration, and emergency response procedures; (4) recruiting, hiring, clearing, and providing general employee training for the plant staff; and (5) the development of training materials, training the trainers, and special technical and on-the-job training for the plant staff.

Summary of Monthly Activities

Activity in this WBS element was originally planned for April 1995. We prepared and reviewed a job description for an Acting Operations Manager, to begin planning for activation and initial operations in February 1995. Due to the FY95 budget reduction of 4/18/95, however, work on operational planning has been effectively deferred from the FY95 scope.

FY95 Budget Spending profiles (OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	0	0	0	0	0	0	10	10	10	13	13	13
4/95 Plan	0	0	0	0	0	0	0	0	0	0	7	7
Monthly actual	0	0	0	0	0	0	0					
11/94 Plan cumulative	0	0	0	0	0	0	10	20	30	43	56	69
4/95 Plan cumulative	0	0	0	0	0	0	0	0	0	0	7	14
Actual cumulative	0	0	0	0	0	0	0					
Current lien	0	0	0	0	0	0	0					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
L122-1	Issue MWMF Start-Up and Activation Plan	Feb 96	

WBS Element 1.2.3 Activation**Task Description**

Activation provides: (1) the preparation, review, revision, and release of all Operational Test Procedures (OTPs); (2) plant systems activation, integration, and performance of OTPs in each of the technology areas including Operational Readiness Reviews (ORRs); (3) technical support for the preparation of Operational Safety Requirements (OSRs) and Facility Safety Requirements (FSRs), as well as the identification and resolution of problems during plant operational testing, start-up, and activation, including finalization of design documentation for equipment and process modifications; (4) maintenance support to perform equipment or process modifications during start-up, testing, and activation; (5) all operational spares and the initial stores inventory; and (6) all manpower and materials required to deliver support services (utilities, power, etc.) during construction, testing, and activation of the MWMMF.

Summary of Monthly Activities

There are no activities under this WBS element during FY95.

FY95 Budget Spending profiles (OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	0	0	0	0	0	0	0	0	0	0	0	0
4/95 Plan	0	0	0	0	0	0	0	0	0	0	0	0
Monthly actual	0	0	0	0	0	0	0					
11/94 Plan cumulative	0	0	0	0	0	0	0	0	0	0	0	0
4/95 Plan cumulative	0	0	0	0	0	0	0	0	0	0	0	0
Actual cumulative	0	0	0	0	0	0	0					
Current lien	0	0	0	0	0	0	0					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element 1.3.1 Project Management**Task Description**

Project Management provides top-level project planning, direction, and control of the MWMF Project CENRTC-funded systems. Specific activities include project management and support of the Project Office, project assurance (including quality assurance, safeguards, environment, and safety oversight), management overview of information management and technical activities, and interface with DOE.

Summary of Monthly Activities

Project management for all elements of the Title I design of CENRTC-funded activities continued.

Technical progress continued in general accordance with the MWMF FY95 Plan. Engineering development and design continued in support of preliminary design (PD) of MWMF major subsystems. Peer reviews continue in preparation for system PD reviews. Procurements in support of engineering design/development continue to increase.

During April the Project received additional guidance on budget reductions for FY95 and FY96. These reductions of \$2,000K for FY95 and up to \$5,000K for FY96 will seriously impact our ability to meet the technical and schedule baseline as defined in the FY97 Validation (and *Project Baseline Rev. 1.2*). Significant effort was expended during April reevaluating budgets and scope to determine how to meet this latest request. A new budget profile for FY95 has been developed, as shown in this monthly, and we are continuing to lay out a more global budget/schedule/scope evaluation for the out-year cuts in conjunction with the FY95 budget cut.

FY95 Budget Spending profiles (CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	59	56	54	56	54	65	54	101	101	92	105	60
4/95 Plan	71	12	36	37	44	44	55	65	55	55	80	80
Monthly actual	71	12	36	37	44	44	41					
11/94 Plan cumulative	59	116	169	226	279	344	398	499	599	691	796	856
4/95 Plan cumulative	71	83	119	156	200	244	299	364	419	474	554	634
Actual cumulative	71	83	119	156	200	244	285					
Current lien	0	0	0	0	111	37	37					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
L131-2	Input to FY95 Plan (see 115-7)	Dec 94	Complete
L131-4	Submit MWMF Rebaseline (MWMF/DWTF Merge)	May 95	In Progress
L131-1	Preliminary Design Review completed	Aug 95	
D131-2	DOE Issues KD-2	Aug 95	
L131-5	Submit Post-PDR Project Baseline	Sep 95	

WBS Element 1.3.2 Project Control**Task Description**

Project Control provides for the Project integration, configuration management, cost and schedule control, quality assurance (see WBS 1.1.1), and administration of the CENRTC-funded systems. It develops and maintains the management systems used to monitor progress against the established baselines and to ensure configuration control (drawings, documents, etc.).

Summary of Monthly Activities

- We completed the *Project Baseline Revision 1.2* (PB Rev. 1.2) document in a format consistent with DOE 4700.1 and delivered it to TID for editing. We completed final summary cost tables, Primavera reports, change logs, and the responsibility matrix. This will provide the backup documentation and will be the formal change request for the FY97 Validation. This change was for a \$15.3M/\$13.0M/\$12.6M funding profile for FY96/97/98, respectively, and assumed \$7.6M new BA in FY95.
- We submitted an Activity Data Sheet (ADS) and a Project Data Sheet (PDS) for the above funding profile in March. In April, we provided information to DOE/OAK to submit a revised funding request profile of 15.3/9/9 M\$.
- DOE requested options for further funding cuts during April. We received verbal direction on April 18 to prepare plans for a \$2M cut in FY95 funding and a \$5M cut in FY96; we placed all new cost actions for FY95 on hold and initiated planning. We also received verbal direction to delete MEO from the Project scope.
- We prepared and completed input to the *Project Management Plan* for Project controls (Marker L132-6.1).
- We provided information to DOE/OAK/Finance on spending projections for FY95. This will be revised with the latest funding guidance.
- We continued low-priority work on developing Project management controls. We demonstrated electronic transfer of data from Excel sheets to Primavera as a key step in using Primavera as a database to provide an integrated scheduling/cost estimating process.
- In the QA area, the *Records Control Procedure* was approved and issued (Marker L132-9.1). We issued QA Note #1 to highlight key QA current actions. We supported peer reviews by maintaining an action item log. DOE/OAK approved Revision 1 to the WBS dictionary as part of preparing PB Rev. 1.2.
- Other significant activities and accomplishments during April:
 - Issued the DOE PTS monthly report.
 - Issued the *March Monthly Report*.
 - Held meeting to define facility peer review schedule.
 - Held meeting to resolve Hazard Control interfaces.
- Key issues:
 - Minimizing impact to project by 20% and 30% budget cut in FY95 and FY96, respectively.

FY95 Budget**Spending profiles (CENRTC)**

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	42	40	37	39	37	45	37	43	43	39	45	39
4/95 Plan	44	9	22	45	66	38	37	43	43	39	45	77
Monthly Actual	44	9	22	45	66	38	41					
11/94 Plan cumulative	42	82	119	158	195	240	277	320	363	402	447	486
4/95 Plan cumulative	44	53	76	121	187	225	262	305	348	387	432	509
Actual cumulative	44	53	76	121	187	225	266					
Current lien	0	0	0	42	42	38	26					

The lien is for manpower support services (project scheduling).

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
L132-4	Input to <i>FY95 Plan</i> (see 155-7)	Dec 94	Complete
L132-1	Implement cost planning/tracking systems (document)	Dec 94	Complete
L132-5	Issue Configuration Control System Document	Mar 95	Complete
L132-6.1	Input to <i>MWMF Project Management Plan</i> (see L115-1)	Apr 95	Complete
L132-7	Performance Management System documented	July 95	
L132-9.1	Records Control Procedure	Apr 95	Complete
L132-8.1	Complete support of Project PDR (see L131-1)	Jul 95	
L132-9.2	Assessment/Surveillance Procedure	Jul 95	
L132-9	Complete QA Self Assessment	Aug 95	
L132-10.1	Input to <i>FY96 Plan</i> (see L115-10)	Oct 95	

WBS Element 1.3.3 Technical Systems Integration**Task Description**

Technical Systems Integration provides the oversight and performance studies intended to verify or document system integration performance, system analysis, special process diagnostics, and planning and analysis of the process aspects of integrated tests. It covers technical issues that affect all primary and support processes. It also includes the responsibility for assuring that the systems interfaces are addressed in the integrated design, including interfaces with LLNL Hazardous Waste Management and facility engineering. The element coordinates the System Design Requirements (SDRs), the MWMF floor plan, and the Integrated Operating Plan.

Summary of Monthly Activities

- We issued a policy to provide a numbering and signature protocol for MWMF documents and revisions. This policy establishes strict guidelines for signatures on drawings, project level documents, and procedure, and specification. It establishes archival requirements and numbering conventions.
- We launched a concerted effort to establish surrogate waste feed definitions for waste processing subsystems other than Feed Preparation. These definitions will provide valuable input to Title I design of Solids and Liquids Feed Preparation.
- All lead engineers provided input for facility utility requirements.
- We scheduled meetings with the individual process engineers and the Hazards Control personnel (Team 2) to discuss perceived hazards and come to initial closure on the PPE requirements.
- We set up a peer review for May 11, 1995, to discuss the building floor plan.
- Lead Engineers have responded to a request for off-gas emissions from each process to support the air permitting function. Joe McIntyre is evaluating the data.
- We provided emission data for the EA.

FY95 Budget Spending profiles (CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	28	26	26	26	26	30	26	29	29	26	30	26
4/95 Plan	51	-1	10	18	30	18	27	27	27	27	27	27
Monthly actual	51	-1	10	18	30	18	19					
11/94 Plan cumulative	28	54	80	106	132	162	188	217	246	272	302	328
4/95 Plan cumulative	51	50	60	78	108	127	154	181	208	235	262	289
Actual cumulative	51	50	60	78	108	127	146					
Current lien	2	0	2	0	1	3	2					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled	Status
		Date*	
L133-1.4	Input to FY95 Plan (see 115-7)	Nov 94	Complete
L133-2	Issue Integrated Operations Plan	Jan 95	Complete
L133-4	Issue Metrication Plan	Feb 95	Complete
L133-3	Issue Title I System Design Requirements	May 95	In Progress
L133-5	Input to FY96 Plan (see 115-10)	Oct 95	

WBS Element 1.4.1 Receiving and Shipping**Task Description**

The principal objective of the Receiving and Shipping (RAS) system is to provide for the receiving, logging, identification, and characterization of all incoming waste containers and to determine the acceptability for processing the waste. Receiving and Shipping provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, installation of Receiving and Shipping equipment, Title III inspection, and acceptance test procedures (ATP). Receiving and Shipping includes both receiving and shipping equipment and systems integration.

Summary of Monthly Activities

- Activities this month continued with the coordination of the design efforts for the RAS areas of the MWMF and DWTF. We are drafting a letter describing the proposed recommendations. We have been developing layouts showing the revised RAS areas and how they would fit into the facility.

FY95 Budget Spending profile (CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	18	17	16	17	16	19	14	15	15	9	10	9
4/95 Plan	21	2	4	12	4	11	11	7	7	7	5	5
Monthly actual	21	2	4	12	4	11	5					
11/94 Plan cumulative	18	35	51	68	84	103	117	132	147	156	166	175
4/95 Plan cumulative	21	23	27	40	44	54	65	72	79	86	91	96
Actual cumulative	21	23	27	40	44	54	59					
Current lien	0	0	0	0	0	0	0					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
L141-1.1	Complete pilot characterization studies	Dec 94	Complete
L141-1.2	Identify equipment and define floor plan	Mar 95	Complete
L141-1.3	RAS LI&C System Functional Requirements Document complete	Jun 95	Open
L141-1.4	RAS LI&C System Preliminary Design review complete	Jul 95	Open
L141-1	RAS System Preliminary Design Review	Jul 95	Open

WBS Element 1.4.2 Solids Feed Preparation**Task Description**

The principal objective of the Solids Feed Preparation (SFP) system is to provide for the receipt, characterization, preparation for processing, and handling of homogeneous and heterogeneous solids received from storage and other processes in the facility. This includes segregating the incoming waste stream into combustible solids, heterogeneous solids, homogeneous inorganic solids and metals, and liquids not previously identified. SFP provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, installation of SFP equipment, Title III inspection, and acceptance test procedures (ATP). SFP includes both solids feed preparation equipment and systems integration.

Summary of Monthly Activities

- Activities this month focused on the in-house peer review of the SFP hardware presented April 6, 1995, and the SFP System Preliminary Design Review (PDR) on June 29, 1995. There were seven "action items" created as a result of the peer review. In answering these action items, we have generated a new feed preparation layout. The new layout has a single entry point for all materials into the feed preparation area (via decontamination) and provides separation of the solids and liquids drum sampling and opening functions. This layout also provides for the emptying of liquids drums without lifting the drums while in the feed preparation area. The layout also addresses some of the concerns on decontamination of the strongback, which holds the incoming and outgoing drums by keeping the transfer cart within the feed preparation area. The telerobotics peer review is scheduled for May 22, 1995, with the same System PDR date. Samples of various shredded materials (organic and inorganic) were sent to a density separation vendor to validate that inorganic materials can be separated, which completes milestone/marker L142-1.3. The results from this testing were very encouraging in that the light vermiculite material was separated from all samples in a very efficient manner. It appears that the density separation equipment will be the only equipment required to separate the lighter inorganic materials from the 1-mm organic feed. The detailing of the equipment and vendor inquiries to firm up cost estimates is in progress.
- We obtained LLNL Patent Office acceptance of the software licensing agreement covering the SMART package so that the latest version of the software could be loaded on the workstation. This installation is in progress. The preliminary operator console station design was completed this month, which completes milestone /marker L142-1.4. The JR3 force/torque sensor was interfaced with SMART to produce active force compliance. We upgraded the Graphics simulation software, the Silicon Graphics workstation operating system, and the applications software for ROBLINE.

FY95 Budget

Spending profiles (CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	95	91	86	91	87	104	87	100	100	36	41	36
4/95 Plan	83	31	31	76	62	85	52	87	105	232	42	167
Monthly actual	83	31	31	76	92	85	44					
11/94 Plan cumulative	95	186	272	363	450	554	641	741	841	877	918	954
4/95 Plan cumulative	83	114	144	220	282	367	449	506	611	843	885	1,052
Actual cumulative	83	114	144	220	312	397	441					
Current lien	21	0	0	0	639	275	275					

Significant procurement actions this month

The ICO for SNLA SMART support for the perForce hand controller was placed.

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
L142-1.2	Identify initial suite of characterization equipment	Jan 95	Complete
L142-1.5	Process Vision/Robline bilateral communication link demonstrated	Feb 95	Complete
L142-1.6	Process Vision/Robline bilateral message handling demonstrated	Mar 95	Complete
L142-1.3	Complete validation of characterization, isolation and segregation methods	Apr 95	Complete
L142-1.4	Complete preliminary operator control station design	Apr 95	Complete
L142-1.7	SFP workcell control architecture designed	May 95	Open
L142-1.8	SFP LI&C System Functional Requirements Document complete	Jun 95	Open
L142-1.9	SFP LI&C System Preliminary Design review complete	Jul 95	Open
L142-1	SFP System Preliminary Design Review	Jul 95	Open

WBS Element 1.4.3. Liquids Feed Preparation**Task Description**

The principal objective of the Liquids Feed Preparation (LFP) system is to provide for the receipt, characterization, preparation for processing, and handling of homogeneous and heterogeneous liquids and solids/liquids mixtures received from storage and other processes in the facility. This includes segregating the incoming waste stream into aqueous with Trimsol, chlorinated organic liquids, oils, solvents, and scintillation cocktails. LFP provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, and installation of LFP equipment, Title III inspection, and acceptance test procedures (ATP). LFP includes both liquids feed preparation equipment and systems integration.

Summary of Monthly Activities

- Design, cost, and technical trade-off studies for LFP continue. Design and equipment layout drawings, process flow diagrams, P&IDs and other necessary drawings for Title I continue to evolve. The floor plan has been revised, consolidating the sampling and container-emptying functions and removing the requirement to lift incoming, full liquids containers in the feed prep area. This addresses concerns raised during the peer review that drum integrity might make lifting operations undesirable. This design concept further consolidates the LFP area while maintaining technical scope.
- We completed a peer review for LFP. There were five action items, none of which were of major consequence on the present design.
- Milestone L143-1.3, *Validation of characterization and segregation methods*, is complete.

FY95 Budget**Spending profiles (CENRTC)**

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	38	36	34	36	34	41	34	40	40	18	21	18
4/95 Plan	37	6	14	22	28	22	22	20	20	14	14	14
Monthly actual	37	6	14	22	28	22	22					
11/94 Plan cumulative	38	74	108	144	178	219	253	293	333	351	372	390
4/95 Plan cumulative	37	43	57	79	208	130	152	172	192	206	220	234
Actual cumulative	37	43	57	79	108	130	152					
Current lien	0	0	0	0	0	0	0					

Significant procurement actions this month

None

Milestones and Markers

	Item	Scheduled Date	Status
L143-1.1	Define surrogate feeds	Nov 94	Complete
L143-1.3	Complete validation of characterization and segregation methods	Apr 95	Complete
L143-1.4	LFP LI&C System Functional Requirements document	Jun 95	Complete
L143-1.5	LFP LI&C System Preliminary Design Review	Jul 95	
L143-1	90% Preliminary Design Review	Jul 95	

WBS Element 1.5.1. Mediated Electrochemical Oxidation**Task Description**

The principal objective of Mediated Electrochemical Oxidation (MEO) is to receive appropriately characterized mixed waste streams and completely convert the organic portions to CO₂ and water, to recycle acid and silver, and to remove ash containing the radioactive constituents. The MEO element provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, and installation of the MEO equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities.

Summary of Monthly Activities

- We assembled and began debugging the electrolyte concentration monitor. We identified the sampling pump to be malfunctioning and had it replaced by the manufacturer. Start-up testing continues.
- We simulated Ag recovery using the 1/15-scale silver recovery system began in B161. Initial yields were 86% as opposed to the 98% yield obtained in the lab-scale tests. The reduced yield appears to result from reduced reactant cooling rates due to the greater mass of material and possibly from clumping of the larger quantities of AgCl. We are preparing to control these problems and to attempt a run to achieve better yield.
- We began preparation for steady-state simulation runs of the FM-21 in B.161. These runs will be used to verify the MEO secondary design capacities.
- We placed an order for a unique Ag⁺⁺ probe, developed in conjunction with UOP Guided Wave Inc.
- We documented and published the results of the lab-scale silver recovery process development work. Process yields are over 98%, reactions times are short and well within the requirements for Ag recycle in the MWMF. This completes milestones L151-1.4 and L151-1.6, which were combined into one report for simplicity.
- Design effort included the following:
 - Developed conceptual method to wash large solids in MEO for decontamination purposes. Such items as broken glass vials or contaminated tools could be decontaminated using this method. Produced a new MEO Primary System box layout and PFD that allows the future installation of a decontamination unit. This new PFD and layout will also allow all MEO electrolytes to drain to a reservoir in the event of unexpected shut-down, decreasing the probability of spilling acid within the enclosure.
 - Began review, mark-up, and modification preliminary of P&IDs.

FY95 Budget Spending profiles (CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	79	98	94	113	102	91	81	73	73	73	73	73
4/95 Plan	103	33	68	76	82	91	81	73	73	53	25	25
Monthly actual	103	32	68	76	82	91	75					
11/94 Plan cumulative	79	177	271	384	486	577	658	731	804	877	950	1023
4/95 Plan cumulative	103	136	203	279	361	453	534	607	680	733	758	783
Actual cumulative	103	136	203	279	361	453	527					
Current lien	22	21	14	9	6	7	13					

Significant procurement actions this month

Placed order for unique Ag++ probe—\$8500

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
L151-1.1	Complete tests on turbo-aerator for nitrous-acid conversion (document)	Jan 95	Complete
L151-1.4	Summarize silver recovery chemistry results to date (document)	Apr 95	Complete
L151-1.6	Report on NaOH-AgCl recovery (document)	Apr 95	Complete
L151-1.7	Computer simulation of the combined MEO and Acid Recovery control systems (document)	Mar 95	Complete
L151-1.8	Final Report on steady-state flow and chemistry balance tests (document)	Aug 95	In Progress
L151-1.9	Demonstrate prototype cellulose feeder (document)	Jun 95	deleted
L151-1.12	LI&C Functional Requirements Document complete	Aug 95	
L151-1.10	P&ID drawings (document)	Sep 95	In Progress
L151-1.11	Layout drawings of major equipment items (document)	Sep 95	In Progress
L151-1.13	LI&C System Preliminary Design review	Sep 95	
L-151-2	MEO System Preliminary Design review	Sep 95	

WBS Element**1.5.2. Molten Salt Oxidation****Task Description**

The principal objectives of Molten Salt Oxidation (MSO) are to receive appropriately characterized mixed waste streams and completely convert the organic portions to CO₂ and water, to remove ash containing the radioactive constituents, and to recycle/process the spent salt. The MSO element provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, and installation of the MSO equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities.

Summary of Monthly Activities

- **Materials Development and Evaluation:**

Overlay coatings

- Thermal spray (outside LLNL): We designed initial coatings for BIRL Industrial Research Laboratory to deposit on Inconel 600. These feature alumina topcoats with and without high-Al bond coats (MCRALY, Ni-Al, or FeAl₃) which might form self-healing barriers of oxidized Al should salt leak through the topcoat.
- Physical vapor deposition (PVD) by unbalanced magnetron sputtering (at LLNL): Initial coatings of alumina ~0.5 µm thick were applied to two rods and one plate of Inconel 600. The coatings appear sound and have not spalled from the plate after two thermal cycles to operating temperature (950°C) and back.

Salt contamination from vessel corrosion

A worst-case calculation predicts that corrosion of a bare Inconel 600 vessel operated continuously for a year would add 30 kg (66 lb) of heavy metal, primarily Ni and Cr, to the salt. Protective coatings would practically eliminate such contamination, even if they suffered point failures that shorten the vessel's life.

Temperature effect on corrosion rate (in collaboration with ETEC)

Metallographic analysis is underway on Inconel 600 corrosion tested at 850°C and 900°C, and Inconel 601 at 900°C.

Iron aluminide coatings (in collaboration with ETEC and ORNL)

Iron was electroplated onto Inconel 600, aluminized to form iron aluminide, then corrosion tested at 900°C/500 hours. Extensive hot corrosion resulted in swelling and delamination. Detailed failure analysis is not planned; rather, this process will be abandoned.

Aluminized coatings (in collaboration with ETEC)

Metallographic analysis is underway on aluminized coatings produced on Inconel alloys 600 and 601 and corrosion tested by ETEC at 900°C/500 hours.

Corrosion test furnace

Improvements are underway to:

- reduce the temperature drop of outer tubes in our multitube furnace by adding outboard baffle plates.
- protect against salt damage by adding liner tubes of Inconel 600 to contain the salt-loaded ceramic tubes, and adding a catch tray in the base of the furnace.

- **Engineering Demonstration Unit (EDU):**

Fabrication of the EDU vessel is nearly complete. Delivery of the vessel is scheduled to be the second week in May. Fins have been added to the exterior of the vessel to increase heat transfer. A concern with regard to the temperature gradient (from fin base to tip) and the associated thermal stress was raised. The magnitude of the thermal stresses was modeled with assistance from the Nuclear Test Engineering Division personnel and computer analysis (FEA). Even though the thermal stresses were high, the creep properties of the material at elevated temperatures allow the material to deform and distribute the stresses. The deformations will not compromise the integrity of the vessel.

The controls hardware design is 98% complete and formal drawings are being checked. All major control hardware (minus the computer) has been mounted and wiring is 70% complete. All AC power wiring is complete. The cooling blower was operated manually from the speed controller front panel. Heater and TC wiring will be completed after the parts are received.

The Horiba gas analyzer system minus the THC unit has been received. The THC analyzer was not ready for shipment from the factory due to a problem with the burner. The electrical interface design is complete and installation is in progress.

The "salt sucker" design (a device for removing expended salt from the vessel) has been informally evaluated and is progressing into a fabrication phase. Several parts of the salt sucker system (e.g., vacuum ballast tank, salt containment vessel) have been acquired from LLNL excess, thereby reducing fabrication time and material costs.

The current Operational Safety Procedure for MSO was modified and submitted to Hazards Control to include operation of EDU, visualization models, "salt sucker," and gas analysis system. The Engineering Safety Notes for the seismic restraints of EDU and the visualization models are in progress. The extension of the NEPA categorical exclusion has been received.

- **Injector Development:**

The test bench has been modified to permit higher oxidation air flow rates. The cold injector was tested in the visual model. The flow was judged to be too concentrated on the opposing vessel wall. In order to diffuse the flow, we added a deflector to the end of the injector. Flow was directed up and down and a good mixing pattern was evident. A similar deflector is being designed for the EDU Injector. Fabrication of the injector plumbing panels has begun.

- **Primary Unit Design:**

We started design on the vessel head area. Provisions for a top injector and salt level probe withdrawal mechanism, baffles, and a salt reload hopper are incorporated. The increased vessel spacing (last month) appears to provide better accessibility to the vessels while not adversely affecting the off-gas piping or the salt removal equipment.

- **Process Off-Gas:**

Pipe sizes have been selected to maintain a minimum flow velocity of 15 m/s (50 ft/s) to ensure that any salt dust generated will stay entrained in the gas until it reaches the Gas Solid Separation filter. Preliminary sizing of the Gas Solid Separation filter has been completed and cost estimates obtained. Vendors have

been contacted to provide a cost estimate for the heat exchanger. A location for a catalytic converter has been selected in the event one is needed to remove carbon monoxide and/or nitrogen oxide.

- **Salt Recycle:**

Laboratory work continued in April to characterize the processes proposed for use in Salt Recycle. Model salts were mixed from known amounts of NaCl and Na₂CO₃, and laboratory techniques were developed to make separations by crystallization at cold temperatures (in the range of 10°C). Initial work began to test multiple stages of crystallization.

Literature data on salt solubilities for multiple component systems (NaCl, Na₂CO₃, and water) over a wide temperature range was brought to bear on the work in salt recycle. This data is being used to develop and refine a process design, to guide the laboratory work, and to evaluate computer models for potential use.

We identified potential computer models for calculating solution/solid phase equilibria and for modeling the salt recycle process. The spent salt system has a large number of possible salt constituents plus regulated metals and radionuclides, and a wide range of process parameters, making a calculational approach less costly than full experimental exploration of the parameters. A process flow sheet model coupled to a phase equilibrium model is expected to predict the process performance for various combinations of salt and process parameters. This will assist the process design effort and more precisely define the scope of necessary laboratory work. Test problems were developed to compare the computer model predictions to literature data to help determine the accuracy and utility of the models.

- **Industrial Participation:**

We placed Commerce Business Daily announcement to solicit industrial participation in crystallization or the entire salt recycle process. We received six responses. We are evaluating these as to how they might best serve the Project.

FY95 Budget Spending profiles (CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	140	147	194	210	209	196	235	221	153	202	279	242
4/95 Plan	139	27	83	101	124	222	285	221	153	202	279	242
Monthly actual	139	27	83	101	124	222	221					
11/94 Plan cumulative	140	287	481	691	900	1096	1331	1552	1705	1907	2186	2428
4/95 Plan cumulative	139	166	249	350	474	696	981	1,202	1,355	1,557	1,836	2,078
Actual cumulative	139	166	249	350	474	696	917					
Current lien	3	36	47	52	154	154	110					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate

ID no.	Milestone/Marker	Scheduled Date*	Status
L152-3.3	Initiate vessel material study	Oct 94	Complete
L152-2.2	Complete Design Specification	Jan 95	Complete
L152-2.3	Conduct Industrial Partner meeting	Jan 95	Complete
L152-3.5	LI&C Functional Requirements Document complete	Jun 95	
L152-3.6	LI&C System Preliminary Design complete	Jul 95	
L152-2	Select Industrial Participation method	Jun 95	
L152-3.4	Install development unit	Jun 95	
L152-3	MSO System MWMF PDR	Jun 95	
L152-5	Start Title II design	Jul 95	

WBS Element 1.5.3 Wet Oxidation**Task Description**

The principal objective of Wet Oxidation (WOX) is to demonstrate treatment of organic mixed wastes using a wet oxidation process to convert the organic portions to CO₂, water, and inorganic ions, leaving ash, salts, metals, and radionuclides in a residual solution/slurry. The WOX element provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, and installation of the WOX equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities.

Summary of Monthly Activities

This activity has been closed out. No FY95 activities.

FY95 Budget Spending profiles (CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	0	0	0	0	0	0	0	0	0	0	0	0
4/95 Plan	0	0	0	0	0	0	0	0	0	0	0	0
Monthly actual	0	0	0	0	0	1	-1	0	0	0	0	0
11/94 Plan cumulative	0	0	0	0	0	0	0	0	0	0	0	0
4/95 Plan cumulative	0	0	0	0	0	0	0	0	0	0	0	0
Actual cumulative	0	0	0	0	0	1	0					
Current lien	0	0	0	0	0	0	0					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element 1.5.4 UV Photolysis**Task Description**

The principal objective of UV Photolysis (UVP) is to demonstrate ultraviolet-driven treatment of the hazardous and toxic organic constituents in the condensate from the Wet Oxidation process (WBS 1.5.3) to produce a sewerable water stream. The UVP element provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, and installation of the UVP equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities.

Summary of Monthly Activities

This activity has been closed out. No FY95 activities.

FY95 Budget Spending profiles (CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	0	0	0	0	0	0	0	0	0	0	0	0
4/95 Plan	0	0	0	0	0	0	0	0	0	0	0	0
Monthly actual	0	0	0	0	0	0	0					
11/94 Plan cumulative	0	0	0	0	0	0	0	0	0	0	0	0
4/95 Plan cumulative	0	0	0	0	0	0	0	0	0	0	0	0
Actual cumulative	0	0	0	0	0	0	0					
Current lien	0	0	0	0	0	0	0					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
None	No activity		

WBS Element 1.5.5 Experimental Off-Gas**Task Description**

The principal objective of Experimental Off-Gas Treatment (XOGT) is to demonstrate advanced, more effective off-gas treatment technologies that minimize secondary waste. These are improved selective catalytic reduction (SCR) of NO_x to nitrogen in gaseous phase, acidic urea DeNO_x scrubbing, and advanced metal filters. The second objective is to demonstrate feasibility and effectiveness of off-gas treatment at or near to the source of the gas where the treatment can be tailored to that specific source. The XOGT element provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, and installation of XOGT equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities. XOGT will be backed by the facility off-gas system.

In January 1995, FY95 activities for this element were downscoped to reflect future year budget reductions. Activities are to be leveled out in June 1995 and restarted late in the Project. The milestones have been updated to reflect this.

Summary of Monthly Activities

- The MWMF-scale advanced gas-liquid contactor for destruction of NO_x with acidic urea was delivered this month.
- The separate enclosure in B161 for the Urea DeNO_x system is ready.
- The gas-liquid contactor for destruction of NO_x with acidic urea is being assembled and tested.

FY95 Budget Spending profiles (CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	13	13	12	13	12	15	12	14	14	13	14	13
4/95 Plan	18	12	19	9	6	2	6	6	6	6	0	0
Monthly actual	18	12	19	9	6	2	21					
11/94 Plan cumulative	13	26	38	51	63	78	90	104	118	131	145	158
4/95 Plan cumulative	18	29	49	58	63	66	72	78	84	90	90	90
Actual cumulative	18	29	49	58	63	66	86					
Current lien	0	1	0	4	0	17	2					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
L155-1.1	Fabricate prototype gas-liquid contactor for acidic urea DeNO _x scrubbing	Jun 95	In Process
L155-3.2	Initiate systematic catalysts testing	Jan 95	Deleted
L155-2.1	Initiate instrumentation and control system test	Feb 95	Deleted
L155-3.3	I&C Functional Requirements Document complete	May 95	Deleted
L155-1	Summarize Gas Liquid Contactor Tests (document)	Jul 95	
L155-3.4	LI&C System Preliminary Design review	Jun 95	Deleted
L155-3	XOG System Preliminary Design review	Jun 95	Deleted
L155-3.1	Summarize NO _x -urea chemistry to date (document)	Aug 95	

WBS Element 1.6.1. Process Transport and Storage**Task Description**

The principal objective of the Process Transport and Storage system is to collect, transfer, deposit, store, and handle containers, discrete items, dry and wet bulk materials, slurries, and liquids. Process Transport and Storage provides management, system analysis and support, design (Title I, II, and III) engineering, procurement, installation of process support systems equipment, Title III inspection, and acceptance test procedures (ATP). Process Transport and Storage includes both process transport and storage equipment and systems integration.

Summary of Monthly Activities

- For each treatment process, we have collected and summarized batch sizes and material properties to determine container and interface sizes and materials. The number of containers needed will be determined from the facility flow model and depends upon analytical lab turnaround time and the demonstration schedule for the facility. The number of containers in each material compatibility category will determine the amount of storage space required.
- Work has begun on the process flow diagram and P&ID for PTS.

FY95 Budget Spending profiles (CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	6	6	5	6	8	10	9	10	10	6	7	6
4/95 Plan	15	6	3	4	4	-1	9	6	6	6	6	6
Monthly actual	15	6	3	4	4	-1	9					
11/94 Plan cumulative	6	12	17	23	31	41	50	60	70	76	83	89
4/95 Plan cumulative	15	21	24	27	31	30	40	45	51	57	63	69
Actual cumulative	15	21	24	27	31	30	39					
Current lien	0	0	0	0	0	5	0					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
L161-1.1	Select standard transport container designs	May 95	In process
L161-1.2	Floor plan layout complete	Jun 95	In process
L161-1.3	LI&C Functional Requirements Doc. complete	Jun 95	
L161-1.4	PTS LI&C System Preliminary Design review	Jul 95	
L161-1	PTS System Preliminary Design Review	Jul 95	

WBS Element 1.6.2. Analytical Services**Task Description**

The principal objective of Analytical Services is to provide chemical analysis support for process control and characterization, material control, and regulatory requirements. Analytical Services provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, installation of analytical laboratory equipment, Title III inspection, and acceptance test procedures (ATP). Analytical Services includes Analytical Laboratory Equipment, Local Process I&C, and Process Off-Gas.

Summary of Monthly Activities

- We completed a document that describes the DWTF process and required analytical measurements.
- We completed compilation of model waste streams data (1/91-6/92), which was used for the report *MWMF Analysis of Initially Selected Mixed Waste Streams*, in order to determine maximum emission levels of FHAP (Federal Hazardous Air Pollutants) and TAC (Toxic Air Contaminants).
- We participated in the LFP peer review.

FY95 Budget**Spending profiles (CENRTC)**

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	10	9	9	9	9	11	9	10	10	9	27	18
4/95 Plan	19	-2	8	8	9	9	9	10	10	9	10	10
Monthly actual	19	-2	8	8	9	9	9					
11/94 Plan cumulative	10	19	28	37	46	57	66	76	86	95	122	140
4/95 Plan cumulative	19	16	24	32	41	51	60	70	80	89	99	109
Actual cumulative	19	16	24	32	41	51	60					
Current lien	0	0	0	0	0	0	0					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
L162-4	Define MEO on-line analysis requirements	Feb 95	Complete
L162-3	Define facility off-gas monitoring requirements	Feb 95	Complete
L162-6	Define DWTF analysis requirements	Mar 95	Complete
L162-2	Define analysis tests based on process acceptance criteria	May 95	Partial
L162-5	Define MSO on-line analysis requirements	Mar 95	Complete
L162-7.1	LI&C Functional Requirements Document complete	Jul 95	
L162-7.2	LI&C System Preliminary Design review	Aug 95	
L162-7	Analytical Lab System Preliminary Design review	Aug 95	

WBS Element 1.6.3. Water Treatment**Task Description**

Water Treatment (WT) is an integral part of treatment train demonstrations, continuing treatment of aqueous byproducts as part of demonstration tests to produce solid residuals suitable for Final Forms and fully treated water that meets treatment standards and sewer limits. WT provides the management, system analysis and support, design and engineering (Title I, II, III), procurement, and installation of the WT equipment necessary to demonstrate treatment trains, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities.

Summary of Monthly Activities

- We received DOE authorization in early April to proceed with Title I WT design.
- The HWM water treatment design team began Title I design work on the MWMF WT process equipment selection and specification. Preferred unit operations were defined and sized. Discussions began with vendors regarding equipment capabilities, cost, and availability.

FY95 Budget Spending profiles (CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	0	14	13	14	13	16	13	15	5	5	10	8
4/95 Plan	0	0	2	3	3	2	13	15	5	5	5	5
Monthly actual	0	0	2	3	3	2	3					
11/94 Plan cumulative	0	14	27	41	54	70	83	98	103	108	117	126
4/95 Plan cumulative	0	0	2	5	7	9	22	37	42	47	52	56
Actual cumulative	0	0	2	5	7	9	12					
Current lien	0	0	0	0	0	0	0					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
L163-1.1	Water Treatment Trade-off Study Revision	Feb 95	Complete
L163-2	Memorandum of Understanding with HWM	Jan 95	Complete
163-3.1	LI&C Functional Requirements Document complete	Jun 95	
L163-3.2	LI&C System Preliminary Design review	Jul 95	
L163-3	WT System Preliminary Design Review	Jul 95	
L163-4	Begin Final Design	Jul 95	

WBS Element

1.6.4 Final Forms

Task Description

The Final Forms task is to immobilize the residues from the treatment of the mixed waste input streams by the primary processes, and residue resulting from secondary support processes that are integral to the primary treatment processes. The final form types are (1) ceramics for mineral residues, (2) polymer microencapsulation for salt, and (3) sulfur-polymer microencapsulation for volatile inorganic solids.

Summary of Monthly Activities

- We held a peer review on April 24. This dealt with general aspects of the Final Forms system and with details of the ceramic waste form material and process design (polymer microencapsulation was peer-reviewed on March 24). The only new action item resulting from the review was that the mineral residues Process Acceptance Criteria in the Final Forms System Design Requirement should include maximum sodium and carbonate levels.
- The ceramic waste form is being optimized for maximum loading of radionuclide and RCRA metal loadings, consistent with excellent leach resistance. At the expected loading levels, the waste form will exceed the California Total Threshold Limit Concentration (TTLC) value for one or more regulated metals (e.g., Be, Zn) and so will exhibit the "characteristic of toxicity" according to California regulations.
- As mentioned in the March report, we are examining the ceramic waste form design at increase loading levels. We prepared specimens of a formulation containing substantial levels of U, Ag, Be, and Tl (0.84, 1.9, 0.36, and 1.8 wt%) together with 2.6 wt% Zn and low levels of a wide variety of other elements. For analysis purposes, three sintering times were used (1 hour, 1 day, and 1 week). SEM analysis showed the following: U partitions into the zirconolite phase, as expected. The concentration of U in the zirconolite seems uneven, however, suggesting that considerably higher levels are feasible. Accordingly, specimens with tripled U concentration are in preparation. Most of the Tl vaporized, as expected. The fate of Ag in this ceramic design is uncertain. On thermodynamic considerations, it seems likely to remain as very fine metallic particles located at the ceramic grain boundaries. In these experiments, SEM showed the Ag remains in the ceramic. Other analyses, intended to determine its state, are in progress. The fate of the Be is also uncertain. Its analysis by electron microprobe is in progress.
- Small quantities of fluorides (NaF, CaF₂) from the destruction of fluorinated hydrocarbons may be present in the mineral residues. These fluorides have the potential to affect the phase relationships, volatilization phenomena, and processing of the ceramics. Exploratory experiments (using the same formulation as above but with rather high additions of NaF or of CaF₂) showed a distinct shift of the phase quantities and required a reduction in sintering temperatures. Experiments with more realistic levels of these additives are in progress.
- Concern has been expressed that any Na₂CO₃ (from the MSO process) present in the mineral residues would decompose with the evolution of CO₂ during sintering, with detrimental effects. As noted previously (*cf.* March report), the slurry is now acidified prior to calcining. This step decomposes the carbonate, evolving CO₂ and

leaving NaOH. The latter is a component of the ceramic anyway, and experiments at 5 wt% Na₂CO₃ produced an excellent material. Acidification in the presence of fluorides may be undesirable, however, as it produces HF. Accordingly, experiments without acidification are in progress.

- Planned work on the polyethylene microencapsulation of salt, to be performed at EG&G Rocky Flats under an MWMF ICO, has been delayed. The scope is being curtailed to save costs. (This will supplement previous work funded by EM-50. See 12/94 and 1/95 reports.)
- Marker L164-1.3, repeatedly postponed, is incomplete but will be finished in May.

FY95 Budget**Spending profiles (CENRTC)**

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	34	33	33	33	33	34	33	33	33	33	33	34
4/95 Plan	59	13	23	26	38	35	33	33	33	33	33	34
Monthly actual	59	13	23	26	38	35	32					
11/94 Plan cumulative	34	67	100	133	166	200	233	266	299	332	365	399
4/95 Plan cumulative	59	72	95	120	158	193	226	259	292	325	358	392
Actual cumulative	59	72	95	120	158	193	224					
Current lien	1	1	2	1	1	1	1					

Significant procurement actions this month

None

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
L164-1.3	Report status of immobilization evaluations	May 95	In Progress
L164-2.1	Final Forms subsystem design status peer review	May 95	In Progress
L164-1	Evaluations of immobilization technologies complete	May 95	
L164-2.2	LI&C Functional Requirements Document complete	May 95	
L164-2.3	LI&C System Preliminary Design review	Jun 95	
L164-2	Final Forms System Preliminary Design review	Jun 95	
L164-3	Report: Design of polymer microencapsulation system	Jun 95	
L164-4.1	Report: Volatile residue components and the design of ceramic waste form system	Jul 95	
L164-4.2	Report: Interim status of ceramic waste form compositions and process parameters	Aug 95	

WBS Element 1.6.5 Supervisory Instrumentation and Control (SI&C)

Task Description

Supervisory Instrumentation and Control (I&C) systems will be provided and integrated to demonstrate, test, and evaluate mixed-waste destruction technologies in a safe, environmentally acceptable, reliable, and cost-effective manner. I&C systems provide the management, system analysis and support, design (Title I, II, III) engineering, procurement, equipment installation, Title III inspection, and acceptance test procedures (ATP) covering equipment and system integration activities for: Facility database management, safety control, process I&C standards, supervisory control, and ancillary systems and equipment including the instrumentation and equipment database, intercom communication, process and surveillance CCTV, cable and power distribution and grounding, and control room facilities.

Summary of Monthly Activities

- We reviewed the Project Plan to accommodate the FY95 budget reduction of 2M\$.
- We drafted or completed responses to five of the twelve action items identified during the ICS Peer Review of March 9th.
- We continued evaluation testing of the ProcessVision-to-DBMS software (Engr. Dev. Phase 2B). MinnovEX Technologies, Inc. is resolving driver errors that we have identified during our testing.
- We continued ICS testing activities. We successfully demonstrated automatic process startup and operator login.
- We completed design of the engineering prototype/strawman integrated system. We also completed implementation of the three local workcells. Integration of the three workcells with the supervisory layer is in progress.
- We scheduled a two-day on-site workshop on Human Factors Engineering (HFE) for June 1-2.
- We set up an 8-channel conceptual mockup with 2 live digital video channels as a general surveillance CCTV model and a 6-channel video/1-channel 3D graphics conceptual mockup as a telerobotics model.
- We continued the *Functional Requirements Document for the MWME Grounding System*.
- We completed Marker L165-2.1—*Instrumentation and Equipment Database operational*.

FY95 Budget Spending profiles (CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/94 Plan	50	94	60	43	40	38	48	38	38	40	37	45
4/95 Plan	70	41	35	43	75	68	40	38	38	40	37	44
Monthly actual	70	41	35	43	75	68	50					
11/94 Plan cumulative	50	144	204	247	287	325	373	411	449	489	526	571
4/95 Plan cumulative	70	112	146	189	264	332	372	410	448	488	525	569
Actual cumulative	70	112	146	189	264	332	381					
Current lien	37	23	19	18	8	11	5					

Significant procurement actions this month

None.

Milestones and Markers

*See "Milestone/Marker Log" for original dates and reconciliation, if appropriate.

ID no.	Milestone/Marker	Scheduled Date*	Status
L165-1.9	Engineering Development System operational	Jan 95	Complete
L165-1.10	Rapid prototype Engineering Development testing complete, report written	Feb 95	Complete
L165-1.11	Integrated control system design peer review	Apr 95	Complete
L165-2.1	Instrumentation and Equipment Database operational	Apr 95	Complete
L165-1.12	SI&C Functional Requirements Document complete	May 95	In Progress
L165-1	SI&C System Preliminary Design Review	Jun 95	
L165-1.13	Engineering Development tasks complete, documented	Jun 95	
L165-1.14	Preliminary Design activities complete, documented	Jun 95	
L165-2.2	Process I&C Standards established	Sep 95	

Appendix A

Milesone/Marker Log

MWMF Milestone / Marker Log			Sorted by number			For Apr. 95 Report
Number	Item	PTS	Orig. Date	Date	Status	Comments
Doc. Resp. Person: M. De Micco, A. Throop (alt.); Rev. date: 5/25/95						
X = changes in this revision						
C113-1	RD&D permit issued by DTSC	X		Apr-96		date required by DWTF schedule. Better est. after DTSC review applic.
C113-2	Authorization to construct issued by BAAQMD	X	Oct-94	Jul-96		Schedule change as a result of permitting strategy change.
D112-1	PSAR Approved by DOE	X	Jun-94	Nov-94	deleted	facility categorized Low Hazard; DOE approval not req'd
D113-1	EA determination by DOE	X	Aug-94	Aug-95		EA draft submitted. Rev. due to MWMF/DWTF merge. Rev. EA 2/95. Aug-95 is earliest date for EA review and FONSI issue per DOE Compliance Office.
D115-1	DOE issue Project Plan	X		Jan-95	Open	No revised date available from DOE. LLNL preparing PMP w/o PP.
D121-1	Preliminary approval and funding for Preliminary Design	X	Apr-94	Jun-94	complete	delayed decision by DOE
D121-2	KD 1/2 Approval by DOE	X		Jun-94	complete	received KD-1 only
D131-2	DOE issues KD-2	X	Jun-94	Aug-95		Delayed due to reduced funding guidance by DOE
L111-1	Develop and issue Quality Assurance Plan			Oct-93	complete	
L111-2	Develop and issue Document Control Plan			Jan-94	complete	
L111-3	Issue Design Review Procedure			Sep-94	complete	
L112-1	PSAR to DOE for Review	X	Mar-94	Dec-94	complete	delayed to include CDR information and due to DOE decision to merge MWMF & DWTF
L112-1.1	Issue PSAR Contract			Oct-93	complete	
L112-1.2	Preliminary PSAR Review			Feb-94	complete	
L113-1	Environmental Assessment (EA) submitted to DOE	X	Mar-94	Jun-94	complete	delayed to include CDR information, draft submitted
L113-2	Submit air permit to BAAQMD	X	May-94	Apr-96		Schedule change as a result of permitting strategy change.
L113-3	Submit RD&D permit application to DTSC	X	Jul-94	Feb-95	on hold	Draft application complete. Permit application may not be submitted if revised strategy is approved.
L113-4	Submit revised EA to DOE (for MWMF/DWTF merge)	X	Dec-94	Feb-95	complete	Delayed to allow coordination with permitting efforts (L113-3).
L114-1.1	ES&H review of 30% CDR			Dec-93	complete	
L114-1.2	ES&H review of 90% CDR			Mar-94	complete	
L114-1.3	ES&H review of 90% PDR		Sep-94	Jan-95	deleted	changed to reflect level of effort work
L114-2	Complete review of PSAR			Aug-94	complete	
L115-1	Submit Project Management Plan (Final)	X	Jan-95	May-95	In Progress	Delayed due to unavailability of DOE Project Plan.
L115-1.1	Project Management Plan (Draft)			Oct-93	complete	
L115-10	Submit FY96 Plan	X		Oct-95		
L115-2	Select Project Engineers and Project Control Manager			Dec-93	complete	
L115-3	Submit FY94 Plan	X		Jan-94	complete	
L115-4	Initiate PTS and Monthly reporting			Jan-94	complete	
L115-5	Technology Selection and Implementation Plan	X		Feb-94	complete	
L115-6	Develop Design Basis Operations Plan			Mar-94	complete	
L115-7	Submit FY95 Plan	X	Sep-94	Dec-94	complete	delayed due to LLNL accounting changes and higher DOE priorities
L115-8	Technology Selection and Implementation Plan, Part II		Mar-95	Apr-95		Document in TID for publication. Release expected in Apr-95.
L115-9	FY97 Project Validation			Apr-95		
X L116-1	First meeting of NRP	X	Feb-95	Jun-95		Delayed while key regulatory issues were resolved and the detail strategy for NEPA and CEQA finalized. Now scheduled for 6/20/95.
X L116-1.1	National Review Panel (NRP) formed		Dec-94	Apr-95	Complete	Activity delayed while key regulatory issues relative to MSO are resolved and the detail strategy for NEPA and CEQA finalized.
L116-2	Second meeting of NRP		Aug-95	Nov-95		Activity delayed while key regulatory issues relative to MSO are resolved and the detail strategy for NEPA and CEQA finalized.
L116-2.1	Issue first public newsletter		Mar-95	Jun-95		Activity delayed while key regulatory issues relative to MSO are resolved and the detail strategy for NEPA and CEQA finalized.

MWMF Milestone / Marker Log			Sorted by number			For Apr. 95 Report
Number	Item	PTS	Orig. Date	Date	Status	Comments
L116-2.2	Receive comments from NRP			Apr-95	Deleted	Comments and action items will be received as part of NRP meeting minutes.
L116-3.1	Issue second newsletter		Sep-95	Dec-95		Activity delayed while key regulatory issues relative to MSO are resolved and the detail strategy for NEPA and CEQA finalized.
L121-1	30% CDR Review			Dec-93	complete	
L121-1.1	Initiate Point Design Reviews			Oct-93	complete	
L121-1.2	Complete Point Design Reviews			Nov-93	complete	
L121-2	90% CDR Review			Mar-94	complete	
L121-3	CD Report issued	X		Apr-94	complete	
X L122-1	Issue MWMF Start-Up and Activation Plan		Sep-95	Feb-96		Delayed due to 4/95 budget cut.
L131-1	Preliminary Design Review (Overall Project) completed	X	Sep-94	Aug-95		Delayed due to funding limitations per DOE guidance.
L131-2	Input to FY95 Plan (see 115-7)	X	Sep-94	Dec-94	complete	delayed due to LLNL accounting changes and higher DOE priorities
L131-3	Submit MWMF Rebaseline (KD-1)	X		Sep-94	complete	
X L131-4	Submit MWMF Rebaseline (MWMF/DWTF Merge)	X	Mar-95	May-95	in progress	Delayed due to FY97 field submittals and other higher priority work.
L131-5	Submit Post-PDR Project Baseline	X		Sep-95		
L132-1	Implement Cost planning/tracking systems (document)		Sep-94	Dec-94	complete	activity stretched-out due to reduced funding guidance
L132-10.1	Input to FY96 Plan (see L115-10)			Oct-95		
L132-2	Implement Technical baseline control system		May-94	Nov-94		see 132-7
L132-3	Implement Schedule control/tracking system			Aug-94		see 132-7
L132-4	Input to FY95 Plan (see L115-7)		Nov-94	Dec-94	complete	delayed due to LLNL accounting changes and higher DOE priorities
L132-5	Issue Configuration Control System Document		Jan-95	Mar-95	complete	Delayed to allow discussion and review and due to higher priorities.
X L132-6.1	Input to MWMF Project Management Plan (see L115-1)		Feb-95	Apr-95	complete	Delayed due to higher priority work.
X L132-7	Performance Management System documented		Apr-95	Jul-95		Delayed by requests for unplanned work from DOE.
X L132-8.1	Complete support of Project PDR (see L131-1)		Jun-95	Jul-95		Delayed due to DOE funding reductions.
L132-9	Complete QA Self Assessment			Aug-95		
X L132-9.1	Records Control Procedure issued			Apr-95	complete	
L132-9.2	Assessment/Surveillance Procedure issued			Jul-95		
L133-1.1	Draft System Engineering Management Plan			Sep-94	deleted	information in other documents
L133-1.2	Issue MWMF development plan			Jul-94	complete	
L133-1.3	Complete MWMF floor plan			Jul-94	complete	
L133-1.4	Input to FY95 Plan (see 115-7)			Nov-94	complete	
L133-2	Issue Integrated Operations Plan			Jan-95	complete	
L133-3	Issue Title I System Design Requirements		Feb-95	May-95	In Progress	Rebaselining activities require more extensive changes to SDRs than originally anticipated.
L133-4	Issue Metrication Plan			Feb-95	Complete	
L133-5	Input to FY96 Plan (see 115-10)			Oct-95		
L141-1	RAS System Preliminary Design Review		Sep-94	Jul-95		PDR delayed due to funding limitations per DOE guidance
L141-1.1	Complete pilot characterization studies		Jun-94	Dec-94	complete	activity stretched-out due to reduced funding guidance
L141-1.2	Identify equipment and define floor plan		Sep-94	Mar-95	complete	activity stretched-out due to reduced funding guidance
L141-1.3	RAS Li&C System Functional Requirements Document complete			Jun-95		
L141-1.4	RAS Li&C Preliminary Design Review			Jul-95		
L142-1	SFP System Preliminary Design Review			Jul-95		
L142-1.1	SFP surrogate feeds defined			May-94	complete	
L142-1.2	Identify initial suite of characterization equipment		Jun-94	Jan-95	complete	Delayed due to later than scheduled completion of pilot characterization studies and reduced manpower and funding guidance received after original schedule was established.

MWMF Milestone / Marker Log				Sorted by number			For Apr. 95 Report
	Number	Item	PTS	Orig. Date	Date	Status	Comments
X	L142-1.3	Complete validation of characterization, isolation, and segregation methods		Sep-94	Apr-95	complete	Delayed by late completion of pilot characterization studies, reduced manpower/funding guidance, rebaselining activities, and project delay of procurements of engineering development equipment.
X	L142-1.4	Complete preliminary operator control station design		Mar-95	Apr-95	complete	Delayed due to project rebaseline activities.
	L142-1.5	Process Vision/Robline bilateral communication link demonstrated			Feb-95	complete	
	L142-1.6	Process Vision/Robline bilateral message handling demonstrated			Mar-95	complete	
	L142-1.7	SFP workcell control architecture designed			May-95		
	L142-1.8	LI&C Functional Requirements Document complete			Jun-95		
X	L142-1.9	LI&C Preliminary Design Review			Jul-95		Title correction.
	L143-1	LFP System Preliminary Design Review			Jul-95		
	L143-1.1	Define surrogate feeds		May-94	Nov-94	complete	date changed to agree with extended project schedule
	L143-1.2	LFP general arrangement plan finalized		Jul-94	Dec-94	deleted	
X	L143-1.3	Complete validation of characterization and segregation methods		Sep-94	Apr-95	complete	Delayed by technical difficulties which have since been resolved.
	L143-1.4	LI&C Functional Requirements Document complete			Jun-95		
X	L143-1.5	LI&C Preliminary Design Review			Jul-95		Title correction.
	L151-1.1	Complete tests on turbo-aerator for nitrous acid conversion (document issued)		Mar-94	Jan-95	complete	Release of report delayed due to slower than expected review cycle.
	L151-1.10	P&ID drawings (document)			Sep-95		
	L151-1.11	Layout drawings of major equipment items (document)			Sep-95		
	L151-1.12	LI&C Functional Requirements Document complete			Aug-95		
	L151-1.13	LI&C Preliminary Design Review			Sep-95		
	L151-1.2	Initiate steady-state flow and chemistry balance tests			Apr-94	complete	
	L151-1.3	Initiate instrumentation and control system tests for MEO			Aug-94	complete	
X	L151-1.4	Summarize silver recovery chemistry results to date (document)		Sep-94	Apr-95	complete	Release of report delayed because PI was involved with higher priority tasks. Task has been assigned to another engineer.
	L151-1.5	Fabricate and set-up cellulose Feeder		Sep-94	Dec-94	complete	activity stretched-out due to reduced funding guidance
X	L151-1.6	Report on NaOH-AgCl recovery (document)		Feb-95	Apr-95	complete	Delayed to allow patent disclosure to be filed. Document is in review cycle with release expected in Apr-95.
	L151-1.7	Computer simulation of the combined MEO and Acid Recovery control systems (document)		Feb-95	Mar-95	complete	Delayed due to higher priority tasks.
X	L151-1.8	Final Report on steady-state flow and chemistry balance tests (document issued)		Apr-95	Aug-95		Delayed due to budget uncertainty.
X	L151-1.9	Demonstrate prototype cellulose feeder (document)			Jun-95	deleted	Deleted per Rebaseline 1.2 as cost savings measure.
	L151-2	MEO System Preliminary Design Review			Sep-95		
	L151-2.1	Preliminary Process Flow Diagram for MEO			Jun-94	complete	
	L151-2.2	Preliminary equipment layout for MEO			Sep-94	complete	
	L152-1	Complete MSO bench scale rubber destruction tests			Dec-93	complete	
	L152-2	Select Industrial Participation method			Jun-95		
	L152-2.1	MSO advertise in the CBD		Apr-94	Jun-94	complete	delayed due to funding limitations per DOE guidance
	L152-2.2	Complete Design Specification		May-94	Jan-95	complete	delayed for incorporation of reviewer's comments
	L152-2.3	Conduct Industrial Partner meeting		Jul-94	Jan-95	complete	Delayed due to funding limitations per DOE guidance and unavailability of participants due to holidays. Scheduled for January 5th.
	L152-3	MSO System MWMF PDR			Jun-95		
	L152-3.1	Preliminary Process Flow Diagram complete for MSO		Jun-94	Sep-94	complete	
	L152-3.2	Initiate MSO Preliminary Design			Jul-94	complete	
	L152-3.3	Initiate vessel material study			Oct-94	Complete	
	L152-3.4	Install development unit			Jun-95		

MWMF Milestone / Marker Log			Sorted by number			For Apr. 95 Report
Number	Item	PTS	Orig. Date	Date	Status	Comments
X L152-3.5	LI&C Functional Requirements Document complete		May-95	Jun-95		Delayed due to higher priority work.
L152-3.6	LI&C Preliminary Design Review			Jun-95		
L152-4	Start Development Activities			Aug-94	complete	
L152-5	Start Title II design			Jul-95		
L153-1	Award WOX contract.			Sep-94	deleted	WBS element deleted per DOE guidance
L153-1.1	Complete and document work to date			Jul-94	complete	
L153-1.2	Issue RFQ for WOX treatment unit w/ completed specification			Jun-94	deleted	WBS element deleted per DOE guidance
L153-2	30% Preliminary Design Review for WOX			Sep-94	deleted	WBS element deleted per DOE guidance
L153-2.1	WOX dispersion system test and design recommendation complete			May-94	deleted	WBS element deleted per DOE guidance
L153-2.2	Preliminary WOX treatability tests complete			Jun-94	deleted	WBS element deleted per DOE guidance
L153-2.3	Preliminary WOX Process Flow Diagram complete			Jun-94	deleted	WBS element deleted per DOE guidance
L153-2.4	Preliminary P&ID for WOX Support System complete			Jul-94	deleted	WBS element deleted per DOE guidance
L154-1	Complete and document UVP work to date			Jul-94	complete	
L154-2	UVP System Preliminary Design Review			Sep-94	deleted	WBS element deleted per DOE guidance
L154-2.1	UVP Process Flow Diagram			Jul-94	deleted	WBS element deleted per DOE guidance
L154-2.2	P&ID for UVP Support System			Jul-94	deleted	WBS element deleted per DOE guidance
L154-2.2	EOG preliminary Equipment Layout			Sep-94	deleted	WBS element deleted per DOE guidance
L154-2.3	UVP Equipment Layout			Aug-94	deleted	WBS element deleted per DOE guidance
L155-1	Summarize Gas Liquid Contactor Tests (document)		Jun-95	Jul-95	In progress	Delayed due to vacation schedule.
L155-1.1	Fab prototype gas-liquid contactor for acidic urea NOx destruction		Jun-94	Jun-95	in progress	Delayed due to DOE stretchout & peer review action item(s). Design/fabrication package currently out for bid.
L155-1.2	Complete XOG tests on urea and SCR DeNOx			Jul-94	deleted	break up into other markers
L155-2	Urea DeNOx: peer review			Aug-94	complete	
L155-2.1	Initiate instrumentation and control system test		Aug-94	Feb-95	deleted	Deleted from scope due to budget reductions. (1/95)
L155-3	XOG System Preliminary Design Review		Sep-94	Jun-95		PDR delayed due to funding limitations per DOE guidance
X L155-3.1	Summarize NOx-urea chemistry to date (document)		Sep-95	Aug-95		Was to be included in L155-1. Delayed from 7/95 to 8/95 due to later than anticipated start in testing.
L155-3.2	Initiate systematic catalysts testing			Jan-95	deleted	Deleted from scope due to budget reductions. (1/95)
L155-3.3	LI&C Functional Requirements Document complete			May-95	deleted	Deleted from scope due to budget reductions. (1/95)
X L155-3.4	LI&C Preliminary Design Review			Jun-95	deleted	Deleted from scope due to budget reductions. (1/95) Title correction.
L161-1	Process Transport & Storage System Preliminary Design Review		Sep-94	Jul-95		PDR delayed due to funding limitations per DOE guidance
L161-1.1	Select standard transport container designs		Jun-94	May-95		activity stretched-out due to reduced funding guidance
L161-1.2	Floor plan layout complete		Jul-94	Jun-95		activity stretched-out due to reduced funding guidance
L161-1.3	LI&C Functional Requirements Document complete			Jun-95		
L161-1.4	PTS LI&C System Preliminary Design review			Jul-95		
L162-1	Complete preliminary floor plan layout			Jun-94	complete	
L162-1.1	Select ATS standard transport container designs			Jun-94	deleted	WBS content revised to "Analytical Lab"
L162-1.2	Finalize ATS transport handling capacity			Jun-94	deleted	WBS content revised to "Analytical Lab"
L162-1.3	Finalize ATS transport equipment selection			Aug-94	deleted	WBS content revised to "Analytical Lab"
L162-2	Define analysis tests based on process acceptance criteria		Sep-94	May-95	partial	Waiting for process acceptance criteria to be finalized. Also delayed due to project rebaseline activities. Completion expected in May-95.
L162-3	Define facility off-gas monitoring requirements		Sep-94	Feb-95	complete	Completed for preliminary design.
L162-4	Define MEO on-line analysis requirements		Dec-94	Feb-95	complete	Completed for preliminary design.
L162-5	Define MSO on-line analysis requirements		Jan-95	Mar-95	complete	Waiting for salt analysis to be defined. Completion expected in Mar-95.
L162-6	Define DWTF analysis requirements			Feb-95	complete	Completed for preliminary design.

MWMF Milestone / Marker Log			Sorted by number			For Apr. 95 Report
Number	Item	PTS	Orig. Date	Date	Status	Comments
L162-7	Analytical Lab System Preliminary Design review			Aug-95		
L162-7.1	LI&C Functional Requirements Document complete			Jul-95		
L162-7.2	LI&C Preliminary Design Review			Aug-95		
L163-1	Water Treatment trade-off study		Jun-94	Sep-94	complete	
L163-1.1	Water Treatment trade-off study revision		Dec-94	Feb-95	complete	Delayed due to previously unplanned decision to have TID edit document. Presently out for signatures. Release expected in Feb 95.
L163-2	Memorandum of Understanding with HWM			Jan-95	complete	
L163-3	WTR System Preliminary Design Review			Jul-95		was L163-2.1
L163-3.1	LI&C Functional Requirements Document complete			Jun-95		was L163-2
L163-3.2	LI&C Preliminary Design Review			Jul-95		was L163-2.2
L163-4	Begin Final Design			Jul-95		was L163-2.3
L164-1	Evaluations of immobilization technologies complete			May-95		
L164-1.1	Preliminary process flow diagram complete for FF			Jul-94	complete	
L164-1.2	Preliminary equipment layout complete for FF			Aug-94	complete	
X L164-1.3	Report status of immobilization evaluations		Sep-94	May-95	In progress	Delayed until after peer review of polymer microencapsulation. Peer Review activities finalized on 4/24/95. Report expected in May 95.
L164-2	Final Forms System Preliminary Design Review			Jun-95		
X L164-2.1	Final Forms subsystem design status peer review		Feb-95	May-95	In progress	Peer Review activities finalized on 4/24/95. Report to be completed in May 95.
L164-2.2	LI&C Functional Requirements Document complete			May-95		
X L164-2.3	LI&C Preliminary Design Review			Jun-95		Title correction.
L164-3	Report: Design of polymer microencapsulation system			Jun-95		
L164-4.1	Report issued: Volatile residue components and the design of ceramic waste form system			Jul-95		
L164-4.2	Report issued: Interim status of ceramic waste form compositions and process parameters			Aug-95		
L165-1	SI&C System Preliminary Design Review		May-95	Jun-95		Delayed due to scheduling conflicts.
L165-1.1	I/C general arrangement plan complete			Mar-94	complete	
L165-1.10	Rapid prototype Engineering Development testing complete and report written		Jan-95	Feb-95	complete	Delayed because of late delivery of MinnovEX DBMS software driver. See Jan 95 WMMF Monthly Report.
L165-1.11	Integrated control system design peer review		Feb-95	Mar-95	In progress	Completion expected in early Mar 95. Key participants are unavailable in February.
X L165-1.12	SI&C Functional Requirements Document complete		Apr-95	May-95	In progress	Delayed due to resource conflicts.
L165-1.13	Engineering Development tasks complete, documented			Jun-95		
L165-1.14	Preliminary Design activities complete, documented			Jun-95		
L165-1.2	Process Control System FEP hardware/software selected			Apr-94	complete	
L165-1.3	Supervisory Control System hardware/software selected			Apr-94	complete	
L165-1.4	Handling Systems open architecture controller selected			Jul-94	deleted	to WBS 1.4.2
L165-1.5	Analytical laboratory LIMS selected			Jul-94	deleted	LIMS may not be used in system design
L165-1.6	Telerobotics platform selected			Aug-94	deleted	to WBS 1.4.2
L165-1.7	Teleoperator controller selected			Sep-94	deleted	to WBS 1.4.2
L165-1.8	Database Management System hardware/software selected			Jul-94	complete	
L165-1.9	Engineering Development System operational		Dec-94	Jan-95	complete	Delayed because of late delivery of MinnovEX DBMS software driver.
X L165-2.1	Instrumentation and Equipment Database operational		Mar-95	Apr-95	complete	Delayed pending I&C design team review scheduled for 4/7/95.
L165-2.2	Process I&C Standards established			Sep-95		
end						