The Mixed Waste Management Facility

Monthly Report
August 1995

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Lawrence Livermore National Laboratory
Environmental Programs

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The Mixed Waste Management Facility

Monthly Report
August 1995

Ronald D. Streit

September 1995

Lawrence Livermore National Laboratory
University of California • Livermore, California • 94550

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Contents

Project Summary.....	iii
Project Financial Summary.....	v
1.1.1 Quality Assurance.....	1
1.1.2 PSAR.....	2
1.1.3 Environmental Documentation.....	4
1.1.4 ES&H.....	6
1.1.5 Program Support.....	7
1.1.6 Public Participation.....	10
1.2.1 Conceptual Design.....	11
1.2.2 Plant Start-Up Management.....	12
1.2.3 Activation.....	13
1.3.1 Project Management.....	14
1.3.2 Project Control.....	16
1.3.3 Technical Systems Integration.....	18
1.4.1 Receiving and Shipping.....	20
1.4.2 Solids Feed Preparation.....	22
1.4.3 Liquids Feed Preparation.....	24
1.5.1 Mediated Electrochemical Oxidation.....	26
1.5.2 Molten Salt Oxidation.....	28
1.5.3 Wet Oxidation.....	32
1.5.4 UV Photolysis.....	33
1.5.5 Experimental Off-Gas.....	34
1.6.1 Process Transport and Storage.....	36
1.6.2 Analytical Services.....	38
1.6.3 Water Treatment.....	40
1.6.4 Final Forms.....	41
1.6.5 Supervisory Instrumentation and Control.....	43
Appendix A. Milestone/Marker Log.....	45

Project Summary

Overview

The Project continues to make progress toward the Project Preliminary Design Review (PDR), scheduled for November 15-16, 1995. We are completing peer reviews and system level preliminary design reviews consistent with the project schedule. A key activity during August was to complete the initial project cost estimates based on the preliminary design information. This bottom-up estimate will form the basis for the revised Project Baseline to be issued subsequent to the Project PDR. There is some concern that, because of project budget modifications, there will be corresponding modifications to schedule, scope, and/or TPC. The Environmental Assessment has been distributed by DOE for public comment, and a meeting was held with the MWMF National Review Panel to discuss any concerns.

Technically, the MSO Engineering Development Unit (EDU) continues to provide valuable design information that is directly applicable to the plant system, specifically in the injector design and controls. Based on an evaluation of the options for polymer salt encapsulation, a decision was made to design for a polymer extruded thermoplastic and to delete the thermo-set polymer option. At a relatively small difference in cost, the thermoplastic option provides for a significantly better final forms product and less development risk.

Overall, the Project continues to run below budget for FY95 as a result of slow start-up during the early part of the fiscal year. Based on the revised FY96 plan, which adjusts for this effect, we are also somewhat below budget. However, the majority of this difference is a result of uncoded liens. The key upcoming activity, the Project PDR, is on schedule. This will be followed by the DOE KD-2 required to proceed with final design.

Cost Status. Expenditures in August are below plan because procurements for salt separation are still pending and are awaiting final resolution of preliminary design. The delayed work for certain WBS elements following the April '95 rebaseline continues to impact spending levels. We are projecting an "Approved Work Scope" carryover of approximately \$985K. \$340K is related to manpower costs that were delayed because of slow ramp-up. The remaining approximately \$645K is due to large procurements that are presently being processed or are scheduled for early FY96 processing (specifically the salt separation system). Obligated liens are estimated to be \$460K at the end of FY95.

Schedule Status. The project PDR will be held November 15-16, 1995 (on schedule) per the Rev 1.2 Rebaseline schedule.

As stated last month, the approximately flat spending profile over the next three fiscal years, per DOE guidance, will result in stretch-out of the project into FY99 (with increased carrying costs).

Significant Issues and Planned Corrective Actions

As stated previously, the funding uncertainty and continued reassessment of the decision to proceed with MWMF makes it difficult to plan for and implement the project plans. Due to the reduction of funds this year, and DOE guidance for the

outyear funding, the MWMF budget plan does not track with the approved Project Baseline or validated budgets. We have written a Preliminary Design Project Baseline guidance that assumes specific budget profiles for the remainder of the project. Per DOE guidance, we have focused on keeping the spending profile relatively flat, and at approximately \$10M/yr. This will result in stretch-out of the project to FY99. However, we are developing a plan to mitigate the impact of this on overall project cost. Uncertainty in the budget profile and budget "stability," however, require DOE attention. This will continue to have a negative impact on meeting project goals and milestones as well as in retaining the best personnel.

NEPA for MWMF poses a continued, but lessened, schedule risk for MWMF and DWTF. The key concern remains a NEPA determination by September to allow the start of Phase I construction (and expenditure of FY95 funds), as well as to initiate Title II of Phase II in November; the former is on critical path. The MWMF EA has been submitted for public comment during the month of August with final input due by September 5, 1995. As of this writing, no significant comments on the EA have been submitted. DOE/OAK is addressing the comments received and we anticipate having the NEPA documentation complete by mid-September as required for the Project schedule.

A number of key personnel openings in the MWMF Project management have forced the delay of certain markers and project documentation. We have evaluated the project needs and organizational structures in light of reduced budgets. An interim project organization has been developed focusing the project in two areas: facility and infrastructure, and demonstration technologies. In this structure, the Systems Integration Manager and Project Control Manager will be replaced by a single position, Deputy Project Manager. The Project Engineers have been consolidated from four to two; a new position, "Facility and Infrastructure Project Engineer" has been created, and a position "Integration and Operations Project Engineer" has emerged from consolidating other efforts. The position of Deputy Project Manager is posted. The other openings have been filled with Project personnel on either a permanent or acting basis. Critical milestones and markers will be addressed with priority, whereas "support" documentation will be addressed as time permits.

Because of delays to Project completion, as identified in the revised baseline guidance, increased TPC or reduced scope may be required. The Project Baseline guidance attempts to mitigate the impact of stretch-out by staging major project elements. However, project management, controls, systems integration, QA, and other level-of-effort functions required for the duration of the project will be unavoidably increased. These will be maintained at the lowest level that is prudent with sound project management practices.

Summary of Accomplishments

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

- **Public Participation:** The second NRP meeting was held August 23 to receive comments on the MWMF EA. No significant issues were raised. The first

MWMF newsletter and the public information Fact Sheet were completed and will be distributed in September.

- **Technical Systems Integration:** Continued to answer questions and give clarification to Parsons to assist in their design effort. Initiated a trade-off study comparing the use of hot liquid (600°F) over conventional steam heating. The main advantage of the hot liquid is that the higher temperature can be attained without an increase in operating pressure.
- **Feed Preparation:** The evaluation of Control Shell for telerobot low-level control continues to proceed much more rapidly than expected. A prototype teleoperational control system for the PUMA arm and Cybernet hand control has been designed. All prototype control modules have been implemented on the workstation level development system. Testing of the control modules on the real-time platform is proceeding well.
- **MEO:** The Asoma X-Ray fluorescence unit has been activated. The purpose of this instrument is to measure the total concentration of Ag in the anolyte solution. A Guided Wave spectrophotometer probe designed to measure concentrations of highly absorbing fluids was checked and tested with dye solutions.
- **MSO:** Good progress continued in materials development and evaluation. Corrosion tests have begun on 36 aluminized samples of Inconel 600 nickel alloy. HiTempco and Sermatech slurry processes for aluminizing aerospace components will be evaluated as a method to repair pack diffusion aluminized coatings intended for the MSO vessels. Tests were run in EDU with 55 kg of sodium carbonate. The unit adequately heated the salt to 950°C, and temperature maintenance was easily achieved by adjusting the heater output and by using the blower. Preliminary layouts of the three-vessel MSO system were completed. The P&ID for the primary unit was revised to indicate the current configuration.
- **Process Transport and Storage:** A peer review of the PTS blending, sampling, and transport designs was done. Action items from the meeting have been considered and changes have been incorporated into the Title I design.
- **Final Forms:** The Preliminary Design Review for Final Forms, including Local Instrumentation and Control, was held on August 7. Several action items and design issues were identified, but no serious problems emerged. FFM's Process Off-gas system design is proceeding. It appears that it will be simple and small in size since the quantities of noxious off-gas and volatilized inorganic solids produced are expected to be minimal.

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 August. For reference, the monthly profiles are shown for both the original (11/94 Plan) and the revised (4/95 Plan) FY95 spending plan. There are no significant financial items to report beyond those discussed in the Cost Status paragraph of the Overview section above.

TABLE 1

MWMF Project - Monthly Financial Summary for FY95
September 1995

OPEX (\$K, monthly expenditures)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Subtotal*	Undisb#	4/95 Budget*	11/94 Plan*
DOE Funds*	279	235	235	0	0	301	-120	0	0	0	0	0		930	NA, for information only		
FY95 Plan 11/94		59	58	56	58	53	63	66	66	66	66	71	66	746			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	-13	67	19	42		576			
Variance		0	0	0	0	0	0	40	-63	17	-28	-12		-46			
Actual Liens**		246	242	285	305	275	247	215	152	140	140	140		NA			
1. Mgmt Reserve		0	0	0	0	0	0	0	0	0	0	0		0	60	60	84
2. 95/96 Liens holdback***														124	-44	80	100
FY95 OPEX budget =																815	930

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	930	930	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	450	516	535	576	
Variance		0	0	0	0	0	0	40	-23	-6	-34	-46	

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*	Undisb#	4/95 Budget*	11/94 Plan*
DOE Funds*	2649	0	0	0	2000	0	2856	-850	1000	0	0	0		7655	NA, for information only		
FY95 Plan 11/94		657	725	715	748	692	724	700	749	671	606	737	632	8358			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	541	579	435	468		5811			
Variance		0	0	0	0	0	1	-88	-88	-10	-208	-144		-639			
Actual Liens**		86	81	85	125	961	547	470	557	457	618	585		NA			
1. Mgmt Reserve		0	0	0	0	0	0	0	0	15	20	227		262	66	328	605
2. 95/96 Liens holdback***														10	240	250	400
LDRD-CAP#		0	0	0	0	0	0	0	0	0	0	0		0	0	0	291
FY95 CENRTC budget =																7768	9654

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	7655	7655	7655	7655	
FY95 Plan 4/95*		730	917	1289	1890	2530	3192	3886	4515	5104	5837	6450	7190
Actual		730	918	1289	1891	2530	3193	3789	4330	4909	5343	5811	
Variance		0	0	0	0	0	1	-98	-185	-195	-494	-638	

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*	Undisb#	4/95 Budget*	11/94 Plan*
DOE Funds*	2928	235	235	0	2000	301	2736	-850	1000	0	0	0		8585	NA, for information only		
FY95 Plan 11/94		717	783	772	806	744	787	767	815	737	672	807	698	9104			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	528	645	453	510		6388			
Variance		0	0	0	0	0	1	-59	-150	7	-326	-156		-684			
Actual Liens**		331	323	370	430	1236	794	685	709	597	758	725		NA			
Actual Preliens**								373	192	201	107	181		NA			
1. Mgmt Reserve		0	0	0	0	0	0	0	0	15	20	227		262	126	388	689
2. 95/96 Liens holdback***														134	196	330	500
LDRD-CAP#		0	0	0	0	0	0	0	0	0	0	0		0	0	0	291
FY95 TOTAL budget*** =																8583	10584

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	8585	8585	8585	8585	
FY95 Plan 4/95*		833	1124	1719	2234	2951	3564	4310	4988	5626	6405	7071	7865
Actual		833	1124	1719	2234	2952	3565	4252	4780	5425	5878	6388	
Variance		0	0	0	0	0	1	-58	-208	-201	-527	-684	

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	48.4	46.9	41.3	40.4	
Labor (\$K)@		409	349	322	390	415	450	436	440	424	365	338	

* 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

1. FFM,6=15K; XOG,7=20K; TFM, =120K; SFP, =107K

2. (7/13/95) OE: Aspen=32, Weston=64, PP/Kaiser=28; CE: S&W = 10

@ 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

*** Updated periodically (see note); only Subtotal Relevant

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

- We completed a QA surveillance/verification on the project document and records system, fulfilling milestone 1.3.2-9.
- We continued updating the action item tracking system/list and attended various peer and preliminary design review meetings.
- We worked with project personnel on QA issues and the QA filing system.

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	Used actual costs through March						3	3	3	3	3	3
Monthly actual	2	3	12	-4	3	5	0	0	3	-1	0	
11/94 Plan cumulative	3	6	8	11	13	17	19	22	25	28	31	34
4/95 Plan cumulative	Used actual costs						23	26	29	32	35	38
Actual cumulative	2	5	17	13	16	21	21	21	24	23	22	
Current lien	0	0	0	0	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 August 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	Used actual costs through March						0	0	0	0	0	0
Monthly actual	14	2	0	-16	0	0	0	0	10	0	0	
11/94 Plan cumulative	0	0	0	0	0	0	0	0	0	0	0	0
4/95 Plan cumulative	Used actual costs						0	0	0	0	0	0
Actual cumulative	14	16	16	0	0	0	0	0	10	10	10	
Current lien	74	73	73	73	73	73	73	73	64	64	64	

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	Used actual costs through March						0	0	0	0	0	0
Monthly actual	0	0	2	15	0	0	0	-1	0	0	0	
11/95 Plan cumulative	5	10	13	15	17	19	20	20	20	20	20	20
4/95 Plan cumulative	Used actual costs							16	16	16	16	16
Actual cumulative	0	0	2	16	16	16	16	15	15	15	15	
Current lien	0	0	0	0	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	Status
		Date*	
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

- The notice announcing availability of the MWMF draft EA for public review and comment was published in local newspapers in early August. Comments were to be submitted to DOE by September 5.
- There was minimal permitting activity during August. DTSC continue to review and consider information supporting why molten salt oxidation should be categorized as treatment other than incineration.

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	Used actual costs through March						3	0	0	0	0	0
Monthly actual	14	12	26	-32	7	3	17	10	3	2	0	
11/94 Plan cumulative	5	10	15	20	21	26	31	31	31	31	31	31
4/95 Plan cumulative	Used actual costs						33	33	33	33	33	33
Actual cumulative	14	26	52	20	27	30	47	56	60	62	62	
Current lien	0	0	0	0	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	Used actual costs through March						15	8	8	6	5	5
Monthly actual	0	0	11	109	34	15	7	-56	5	1	2	
11/94 Plan cumulative	40	80	120	160	170	178	185	193	200	206	211	216
4/95 Plan cumulative	Used actual costs						185	192	200	206	211	216
Actual cumulative	0	0	11	121	155	170	177	120	125	126	128	
Current lien	0	0	0	0	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	Sep 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

We provided on-going ES&H support to the MWMF Project as 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							14	14	14	14	14	14
Monthly actual	11	8	14	6	12	12	9	8	19	9	21	
11/94 Plan cumulative	14	27	41	54	68	81	95	108	122	135	149	162
4/95 Plan cumulative	<i>Used actual costs</i>						76	89	103	116	130	143
Actual cumulative	11	19	32	38	51	62	72	80	99	108	128	
Current lien	0	0	0	0	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

In response to continued budget concerns, OPEX-funded program support activities have been reduced to the extent possible. We are continuing to address the following activities:

- We met with SEG/Synthetica to further the discussion as to potential partnership for demonstration in MWMF. While they are interested in working together to integrate MWMF as a demonstration technology for MWMF, their initial interest is in a very short turn-around demonstration. We will continue to pursue this connection.
- We continue to monitor the progress of DTSC activities in two areas: (1) preparations for making a ruling on the status of MSO relative to incineration and (2) supporting CEQA input requests relative to the LLNL *Site Treatment Plan*. The DTSC position on MSO as a non-incineration thermal process was documented and reviewed. DTSC is now in the process of forwarding this position to the Federal EPA Regional Office to obtain a formal ruling as to the process classification. DTSC would like to have Federal EPA make the ultimate determination.
- We are in the process of developing a test plan proposal for the certification of technologies in MWMF. This will form the basis for the technology-specific test plans and run plans to be completed on each primary process submitted for demonstration.

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	Used actual costs through March						27	25	25	25	25	25
Monthly actual	54	76	169	-48	44	-76	60	-36	18	0	15	
11/94 Plan cumulative	30	59	86	114	141	174	201	233	264	293	326	354
4/95 Plan cumulative	Used actual costs						247	272	297	322	347	372
Actual cumulative	54	131	300	251	296	220	280	243	261	261	276	
Current lien	140	136	179	198	169	143	111	48	46	46	46	

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	Completed
D115-1	DOE issues Project Plan	Jan 95	Open
L115-8	Technology Selection and Implementation Plan, Part II	Apr 95	Completed
L115-9	FY97 Project Validation	Apr 95	Completed
L115-1	Submit Project Management Plan (Final)	May 95	Completed
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 the National Review Panel (NRP), the MWMF Letter (a community bulletin), and preparation and coordination of press releases and community tours. The first MWMF Letter is being prepared for September release.

Summary of Monthly Activities

The second NRP meeting was held August 23 to receive comments on the MWMF EA. The first MWMF newsletter and the public information Fact Sheet were completed and will be distributed in September.

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	Used actual costs through March						5	8	8	5	5	5
Monthly actual	10	3	3	8	11	5	7	5	14	9	6	
11/94 Plan cumulative	8	16	24	32	40	48	56	64	72	80	88	96
4/95 Plan cumulative	Used actual costs						44	51	59	64	69	74
Actual cumulative	10	12	15	23	34	38	46	51	65	74	80	
Current lien	28	28	28	29	28	28	28	28	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	Completed
L116-1	First meeting of NRP	Jun 95	Completed
L116-2.1	Issue first public newsletter	Sept 95	Completed
L116-2.2	Receive comments from NRP	Apr 95	Deleted
L116-2	Second meeting of NRP	Aug 95	Completed
L116-3.1	Issue second newsletter	Jan 96	

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	Used actual costs through March						0	0	0	0	0	0
Monthly actual	-1	-1	0	0	0	2	-2	-2	-2	0	0	
11/94 Plan cumulative	0	0	0	0	0	0	0	0	0	0	0	0
4/95 Plan cumulative	Used actual costs						0	0	0	0	0	0
Actual cumulative	-1	-2	-2	-2	-2	0	-2	-2	-2	-2	-2	
Current lien	4	4	4	4	4	3	3	3	3	2	2	

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

All work for this WBS element has been effectively deferred to FY96.

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	Used actual costs through March						0	0	0	0	7	7
Monthly actual	0	0	0	0	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	Used actual costs						0	0	0	0	7	14
Actual cumulative	0	0	0	0	0	0	0	0	0	0	0	
Current lien	0	0	0	0	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.

¹ Estimated date only

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

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 finalizing 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 MWMF.

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	Used actual costs through March						0	0	0	0	0	0
Monthly actual	0	0	0	0	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	Used actual costs						0	0	0	0	0	0
Actual cumulative	0	0	0	0	0	0	0	0	0	0	0	
Current lien	0	0	0	0	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. The Project continues to make progress toward the Project Preliminary Design Review (PDR), scheduled for November 15-16, 1995. In August we completed the peer review of the Process Transport and Storage element and the system PDR for Final Forms. Additionally, the draft SDD for MEO, completed in July, has been reviewed and submitted to TID for final processing and close out of this element.

A key activity during August was to complete the initial project cost estimates based on the preliminary design information. This bottom-up estimate will form the basis for the revised Project Baseline to be issued subsequent to the Project PDR. There is some concern that due to project budget modifications, there will be corresponding modification to schedule, scope, and/or TPC. The Environmental Assessment has been distributed by DOE for public comment, and a meeting was held August 23 with the MWMF National Review Panel to discuss any concerns.

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	Used actual costs through March						55	65	55	55	80	80
Monthly actual	71	12	36	37	44	44	41	66	45	37	55	
11/94 Plan cumulative	59	116	169	226	279	344	398	499	599	691	796	856
4/95 Plan cumulative	Used actual costs						299	364	419	474	554	634
Actual cumulative	71	83	119	156	200	244	285	351	396	433	488	
Current lien	0	0	0	0	111	37	37	35	33	30	28	

Significant Procurement Actions this Month

None

Milestones and Markers

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

<u>ID No.</u>	<u>Milestone/Marker</u>	<u>Scheduled Date*</u>	<u>Status</u>
L131-2	Input to <i>FY95 Plan</i> (see 115-7)	Dec 94	Complete
L131-4	Submit MWMF Rebaseline (Revision 1.2, MWMF/DWTF Merge)	May 95	Completed
L131-1	Preliminary Design Review completed	Nov 95	
D131-2	DOE Issues KD-2	Nov 95	
L131-5	Submit PDR Project Baseline, Rev. 2.0	Jan 96	

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 all major management planning to issue guidance for preparing bottom-up estimates at the conclusion of preliminary design and for the *FY96 Plan*. The results of this work will be two documents: (1) a revised Project Baseline (*Revision 2.0* issued as baseline change) that reflects current DOE scope and funding guidance and (2) the *FY96 Plan*. In August, we continued to:
 - Set tasks and schedule for completing this work.
 - Define a project staging (and related funding) strategy.
 - Define major cost elements to manage to flatten FY funding profiles.
 - Prepare and issue guidance memos that include scope, schedule, cost guidance, and responsibility matrix for lead engineers.
- We continued testing and final work of the integrated cost/schedule estimating system, using Excel as user interface (input and output) sheets and Primavera as a roll-up, database, and reporting element. Transfer between Excel input sheets and Primavera is electronic to minimize human errors.
- Other significant activities and accomplishments include the following:
 - Issued the DOE PTS monthly report.
 - Issued the *July Monthly Report*.
 - Continued investigating several liens for possible removal from project accounts.
 - Management Reserve (MR) actions: \$120K for FFM and \$107K for SFP (total of \$227K).
 - Tracked and supported work to issue a continued contract for outside engineering services to support project scheduling and control.
- Key issues:
 - Developing plan to respond to DOE FY96 and outyear funding guidance.
 - DOE-OAK made changes in the September Program Letter. It now reflects the actual LLNL/DOE Contract Modification balances.

FY95 Budget**Spending profiles (\$471K, 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	Used actual costs through March						37	43	43	39	45	39
Monthly actual	44	9	22	45	66	38	41	42	46	27	29	
11/94 Plan cumulative	42	82	119	158	195	240	277	320	363	402	447	486
4/95 Plan cumulative	Used actual costs						262	305	348	387	432	471
Actual cumulative	44	53	76	121	187	225	266	308	354	382	411	
Current lien	0	0	0	42	42	38	26	26	11	11	11	

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	Completed
L132-1	Implement cost planning/tracking systems (document)	Dec 94	Completed
L132-5	Issue Configuration Control System Document	Mar 95	Completed
L132-6.1	Input to <i>MW MF Project Management Plan</i> (see L115-1)	Apr 95	Completed
L132-7	Performance Management System documented	Aug 95	Completed
L132-9.1	Records Control Procedure	Apr 95	Completed
L132-8.1	Complete support of Project PDR (see L131-1)	Nov 95	
L132-9.2	Assessment/Surveillance Procedure	Jul 95	Completed
L132-9	Complete QA Self Assessment	Aug 95	Completed
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 integrated design addresses systems interfaces, 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

- Lead engineers were requested to review and comment on the interim review of the Title 1 package of drawings, specifications, and studies provided by Parsons. Comments are due back to Parsons by September 8, 1995.
- We initiated a trade-off study for the evaporator in the MSO salt recycle system comparing the use of hot liquid (~600° F) over conventional steam heating. The main advantage of the hot liquid is that the higher temperature can be attained without an increase in operating pressure.
- We initiated an evaluation of equipment arrangements for the MWMF floor plan including MSO, Final Forms, Computer Room, and the Water Treatment areas. This evaluation is expected to provide a more useful placement of these areas of common material transport, freeing up area in the MWMF previously required for forklift access.
- A memo is in signature providing direction and decisions as a result of the series of meetings with Hazards Control. This memo will complete the marker providing personnel egress guidance.
- We continued to answer questions and provide clarification to Parsons to assist in their design effort.

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	Used actual costs through March						27	27	27	27	27	27
Monthly actual	51	-1	10	18	30	18	19	20	17	22	18	

	28	54	80	106	132	162	188	217	246	272	302	328
11/94 Plan	Used actual costs						154	181	208	235	262	289
4/95 Plan	51	50	60	78	108	127	146	166	183	205	222	
Current lien	2	0	2	0	1	3	2	1	1	1	4	

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
L133-1.4	Input to <i>FY95 Plan</i> (see 115-7)	Nov 94	Completed
L133-2	Issue Integrated Operations Plan	Jan 95	Completed
L133-4	Issue Metrication Plan	Feb 95	Completed
L133-3	Issue Title I System Design Requirements	Aug 95	Completed
L133-5	Input to <i>FY96 Plan</i> (see 115-10)	Oct 95	
L133-10.1	Identify emissions for air permit	Jun 95	Completed
L133-10.2	Review floorplan layout and personnel egress	Jul 95	Completed
L133-10.3	Review facility Process Flow Diagrams	Sep 95	In Progress
L133-10.4	Facility preliminary design (20%)	Sep 95	In Progress
L133-10.5	Title 1 Design Review (80%)	Sep 95	
L133-10.6	LLNL Review Title 1 Design	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. RAS 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). RAS includes both receiving and shipping equipment and systems integration.

Summary of Monthly Activities

- We continued coordinating design efforts for the MWMF and DWTF RAS areas.
- An agreement was reached between MWMF and HWM stating HWM will provide delivery and pick-up of drums on an as-needed basis for MWMF. Prior agreement was based upon HWM providing one delivery in the morning and one pick up in the afternoon.
- We continued design activities in preparation for the upcoming System 90% PDR.

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	Used actual costs through March						11	7	7	7	5	5
Monthly actual	21	2	4	12	4	11	5	9	4	4	2	
11/94 Plan cumulative	18	35	51	68	84	103	117	132	147	156	166	175
4/95 Plan cumulative	Used actual costs						65	72	79	86	91	96
Actual cumulative	21	23	27	40	44	54	59	68	72	77	79	
Current lien	0	0	0	0	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	Sep 95	
L141-1.4	RAS LI&C System PDR complete	Sep 95	

L141-1 RAS System Preliminary Design Review

Sep 95

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 a bottom-up cost estimate. Cost estimates have been obtained from potential vendors as well as engineering estimates for fabricated items. The first draft of the Title I bottom-up cost estimate has been completed and submitted for conversion into Primavera. Drawings (BFD, PFD, and P&ID) have been updated in preparation of the upcoming System 90% PDR.
- The evaluation of Control Shell for telerobot low-level control has proceeded much more rapidly than expected. Over the last two months, the team has acquired the product on loan and designed a prototype teleoperation control system for the PUMA arm and Cybernet hand control that is similar in complexity to the SMART controlled system. The prototype will allow the PUMA to be teleoperated in a force/rate control mode with automatic override of operator commands that send the arm into joint limits and singularities. All the prototype control modules have been implemented on the workstation level development system. All control modules except for PUMA interface have been tested on the real-time platform, leaving only the interface to be debugged and tested before the actual hardware can be operated. This is expected to take a few days effort. If the completed system achieves comparable real-time performance to SMART, the switch to Control Shell will be official. The prototype system will then be restructured to control the Titan III arm.
- In parallel with our evaluation of Control Shell, Oak Ridge National Lab (ORNL) has completed development of a Control Shell implementation of a Schilling Titan II control system. They have expressed a willingness to collaborate on the development of our control system, to the point of sharing the code they have already developed.
- Schilling Robotic Systems has expressed some interest in a Cooperative Research and Development Agreement (CRADA) covering control development for the Titan III arm and the particulars are being worked out. ORNL and Schilling have been contacted regarding possible inclusion of ORNL in the CRADA.
- More detailed documentation on functional requirements of the telerobotic system have been completed to support detailed Title I cost estimates and revisions to the System Design Requirements.

- Preparations for receipt and installation of the engineering development workcell are underway.
- We have continued activities to complete the *Functional Requirements Document for the SFP System*.

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	Used actual costs through March						52	57	105	232	42	167
Monthly actual	83	31	31	76	92	85	44	38	125	32	28	
11/94 Plan cumulative	95	186	272	363	450	554	641	741	841	877	918	954
4/95 Plan cumulative	Used actual costs						449	506	611	843	885	1,052
Actual cumulative	83	114	144	220	312	397	441	479	604	636	663	
Current lien	21	0	0	0	639	275	275	307	228	408	395	

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
L142-1.2	Identify initial suite of characterization equipment	Jan 95	Completed
L142-1.5	Process Vision/Robline bilateral communication link demonstrated	Feb 95	Completed
L142-1.6	Process Vision/Robline bilateral message handling demonstrated	Mar 95	Completed
L142-1.3	Complete validation of characterization, isolation and segregation methods	Apr 95	Completed
L142-1.4	Complete preliminary operator control station design	Apr 95	Completed
L142-1.7	SFP workcell control architecture designed	May 95	Completed
L142-1.8	SFP LI&C System Functional Requirements Document complete	Sep 95	
L142-1.9	SFP LI&C System Preliminary Design review complete	Sep 95	
L142-1.10	Locate user interface stations and required functionality	Sep 95	In Progress
L142-1.11	Draft FP control console layout	Sep 95	In Progress
L142-1	SFP System Preliminary Design Review	Sep 95	
L142-2	Telerobotics Preliminary Design Review	Sep 95	

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

- We completed the Block Flow, Process Flow Diagrams, and Equipment Lists for LFP. The P&ID is also completed and continues to be revised as the LFP design undergoes slight adjustments.
- We completed the LFP trade-off study matrix. It is undergoing review for completeness.
- We completed the Liquids Characterization Report.
- We continued efforts on generating the *System Design Description*.
- We completed the first cut of the bottom-up roll-up for the LFP for the balance of the project.

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	Used actual costs through March						22	20	20	14	14	14
Monthly actual	37	6	14	22	28	22	22	20	20	14	14	
11/94 Plan cumulative	38	74	108	144	178	219	253	293	333	351	372	390
4/95 Plan cumulative	Used actual costs						152	172	192	206	220	234
Actual cumulative	37	43	57	79	108	130	152	172	192	206	220	
Current lien	0	0	0	0	0	0	0	0	0	0	0	

Significant Procurement Actions this Month

None

Milestones and Markers

ID No.	Milestone/Marker	Scheduled Date	Status
L143-1.1	Define surrogate feeds	Nov 94	Completed
L143-1.3	Complete validation of characterization and segregation methods	Apr 95	Completed
L143-1.4	LFP LI&C System Functional Requirements document	Sep 95	
L143-1.5	LFP LI&C System Preliminary Design Review	Sep 95	
L143-1	90% Preliminary Design Review	Sep 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

The activities are focused on completing the remaining tests and documenting the results prior to close-out of this task at the end of September.

- We have activated an Asoma X-ray fluorescence unit that had been sent to the manufacturer to be checked out and equipped with an Am-241 source. The purpose of this instrument is to measure the total concentration of silver in the anolyte solution. The unit was calibrated with known silver nitrate solutions. Solutions of anolyte with other salts will be tested for possible interference.
- A Guided Wave spectrophotometer probe designed to measure concentrations of highly absorbing fluids was checked out and tested with dye solutions. The function of the probe is to measure the concentration of silver(II) in the anolyte. Since silver(II) has a very high absorption coefficient in the visible range, a special probe is necessary for absorption/transmission measurements. From the tests on concentrated dye solutions, it was determined that the probe will readily measure the maximum silver(II) concentration (~0.5 M) attainable in our system.
- The samples collected during the simulated steady-state runs on the bench-scale system have been analyzed for nitric acid and silver concentrations. The results are currently being evaluated to determine the movement of water and silver through the membrane during cell operation.

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	Used actual costs through March						81	73	73	53	25	25
Monthly actual	103	32	68	76	82	91	75	71	48	30	18	
11/94 Plan cumulative	79	177	271	384	486	577	658	731	804	877	950	1023
4/95 Plan cumulative	Used actual costs						534	607	680	733	758	783
Actual cumulative	103	136	203	279	361	453	527	598	647	677	695	
Current lien	22	21	14	9	6	7	13	3	3	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 Date*	Status
L151-1.1	Complete tests on turbo-aerator for nitrous-acid conversion (document)	Jan 95	Completed
L151-1.4	Summarize silver recovery chemistry results to date (document)	Apr 95	Completed
L151-1.6	Report on NaOH-AgCl recovery (document)	Apr 95	Completed
L151-1.7	Computer simulation of the combined MEO and Acid Recovery control systems (document)	Mar 95	Completed
L151-1.8	Final Report on steady-state flow and chemistry balance tests (document)	Sep 95	In Progress
L151-1.9	Demonstrate prototype cellulose feeder (document)	Jun 95	deleted
L151-1.12	LI&C Functional Requirements Document complete	Sep 95	
L151-1.10	P&ID drawings (document)	Sep 95	Completed
L151-1.11	Layout drawings of major equipment items (document)	Sep 95	Completed
L151-1.13	LI&C System Preliminary Design review	Sep 95	deleted
L-151-2	MEO System Preliminary Design review	Sep 95	deleted
L-151-3	MEO System Design Description document	Jul 95	Completed

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:**
 - *Aluminized coatings of Inconel 600 nickel alloy*
A total of thirty-six samples was aluminized using the pack diffusion process by Alon Co. (Tarentum, PA) and HiTempco (Old Bethpage, NY). Corrosion tests at LLNL have begun on these in their as-coated and pre-oxidized conditions.
 - *Repairing aluminized coatings of Inconel 600 nickel alloy*
Both HiTempco and Sermatech (Limerick, PA) have slurry processes for aluminizing aerospace components. We will evaluate this as a method to repair pack diffusion coatings intended for our vessel. To simulate severe coating damage, gouges have been machined into the surfaces of aluminized strips from Alon. Next, HiTempco and Sermatech will attempt to repair the gouges by overcoating with slurry aluminizing.
 - *Corrosion testing at LLNL*
Corrosion testing began on ten samples of bare or coated Inconel 600, including a weldment. Sample particulars will be reported subsequently with their corrosion results.
- **Engineering Demonstration Unit (EDU)**
 - Tests were run in EDU with 55 kg of sodium carbonate. The unit adequately heated the salt to 950°C, and temperature maintenance was easily achieved by adjusting the heater output and by using the blower. Salt was frozen in the reactor and re-melted with no problems.
 - The side injector has been tested with a variety of materials. Tip temperatures are on the order of 32°C, which indicate that flashing of feed materials will not occur with cooling jacket air flows between 5-10 SCFM. The optimum air feed ratio for this injector has been established at 10% through the feed tube, with the remaining 90% through the surrounding annulus. Work is continuing to determine the optimum amount of excess air, as a function of off-gas quality.
 - Injection rates of up to 4.9 kg/hr were obtained, which translate to superficial velocities on the order of 4.0 ft/s and 1.1 ft/s based on the lower and upper diameters, respectively.

- The salt sucker was used to remove both the 27 kg charge of sodium/potassium carbonate eutectic and 55 kg charge of sodium carbonate. Time for removal was approximately 23 and 50 seconds, respectively. Minor modifications were made to the OSP based on the information gained from the first operations of the salt sucker. These changes do not impact the safety of the operation; concurrence has been obtained from Hazards Control.
- The computer control system is now being used for EDU operations. We have discovered some inadequacies with the data archive and retrieval capabilities of ProcessVision. We are working to resolve these. Several new I/O points were added to the system last month which have overflowed the spare channels in the control system. Plans are being made to expand the control system to accommodate these and other I/O points that will be added in the near future.
- Injector Development
 - The side liquid injector system is operational on EDU. The injector in its original configuration worked well until a weld at the tip failed. We removed the injector and modified to make it more robust. It is now back in service and functioning well.
 - Bench testing of the solid dry feed injector continued.
 - ETEC expects to deliver the top liquid injector about the 18th of September.
- Primary Unit Design
 - We completed preliminary layouts of the three-vessel MSO system. The preliminary sub-system layouts were sent to various outside contractors for cost estimates to be used in the revised project cost estimate.
 - We revised the primary unit's P&ID to indicate the current configuration. The revised drawings will assist us in estimating the work force and hardware required for the control system.
- Salt Recycle
 - Three qualified vendors were asked to do a preliminary design effort to be completed in mid September. The goal of this effort is for each vendor to provide a preliminary PFD and process description, a project plan that they suggest to tackle the complete system (including identification of additional design information needed and a preliminary plan for getting it), an equipment arrangement sketch, and a cost estimate. All three expended some effort on this task in August.
 - We continued extensive work to define the performance requirements for the salt separation system. The identification and amounts of the contaminants in the spent salt can cover a very wide range. Four example salt compositions were developed to guide the preliminary design effort by the vendors. These compositions will challenge the process design and force several difficult separation issues to be faced.
 - The specification for design and procurement of the salt separation system was finalized and reviewed by project management in August. This procurement will be handled under a new procedure "Commercial Best Value Source Selection" which is designed to streamline the proposal, proposal evaluation, and negotiation activities.

- First draft estimates were completed to support the Preliminary Design Rebaseline, Rev. 2.
- Salt recycle laboratory work in August was to determine separation and partition of example salt A, a low-ash, halide-rich salt mixture. The results indicated that fairly pure sodium carbonate (>90% wt.% Na₂CO₃) can be recovered and most of salt species, other than sodium carbonate, going to brine solution. Efforts are also underway to demonstrate separation efficiencies with example salt B, a high-ash, sulfate and phosphate-rich salt mixture.
- A small scale salt melting apparatus was designed and assembled this month. All the equipment are existing.
- Process modeling
 - We are continuing to test the new blended database with the EQ3/6 code. Results obtained are not consistent with those using the original database. We are concurrently running the code with the original databases, checking the results against published solubility data.

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	Used actual costs through March						285	221	153	202	279	242
Monthly actual	139	27	83	101	124	222	221	245	190	200	214	
11/94 Plan cumulative	140	287	481	691	900	1,096	1,331	1,552	1,705	1,907	2,186	2,428
4/95 Plan cumulative	Used actual costs						981	1,202	1,355	1,557	1,836	2,078
Actual cumulative	139	166	249	350	474	696	917	1,163	1,352	1,552	1,766	
Current lien	3	36	47	52	154	154	110	181	181	165	131	

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	Completed
L152-2.2	Complete Design Specification	Jan 95	Completed
L152-2.3	Conduct Industrial Partner meeting	Jan 95	Completed
L152-3.5	LI&C Functional Requirements Document complete	Oct 95	
L152-3.6	LI&C System Preliminary Design complete	Oct 95	
L152-2	Select Industrial Participation method for Primary Unit	Jun 95	Completed
L152-3.4	Install development unit	Jun 95	Completed

L152-3	MSO System MWMF PDR	Oct 95
L152-5	Start Title II design	Nov 95
L152-6	Select Industrial Participation method for Salt Recycle	Nov 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	Used actual costs through March						0	0	0	0	0	0
Monthly actual	0	0	0	0	0	1	1	1	1	0	0	
11/94 Plan cumulative	0	0	0	0	0	0	0	0	0	0	0	0
4/95 Plan cumulative	Used actual costs						0	0	0	0	0	0
Actual cumulative	0	0	0	0	0	1	0	0	0	1	1	
Current lien	0	0	0	0	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	Used actual costs through March						0	0	0	0	0	0
Monthly actual	0	0	0	0	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	Used actual costs						0	0	0	0	0	0
Actual cumulative	0	0	0	0	0	0	0	0	0	0	0	
Current lien	0	0	0	0	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 preliminary report (Milestone L155-1) on testing and debugging of the gas-liquid contactor (hardware and I&C) for destruction of NO_x with acidic urea was issued.
- The parametric study of NO_x-urea chemistry is in progress.

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	Used actual costs through March						6	6	6	6	0	0
Monthly actual	18	12	19	9	6	2	21	6	3	3	7	
11/94 Plan cumulative	13	26	38	51	63	78	90	104	118	131	145	158
4/95 Plan cumulative	Used actual costs						72	78	84	90	90	90
Actual cumulative	18	29	49	58	63	66	86	93	95	98	105	
Current lien	0	1	0	4	0	17	2	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
L155-1.1	Fabricate prototype gas-liquid contactor for acidic urea DeNO _x scrubbing	Jun 95	Completed
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)	Aug 95	Completed
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)	Sep 95	In progress

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

The principal objective of the Process Transport and Storage (PTS) system is to collect, transfer, deposit, store, and handle containers, discrete items, dry and wet bulk materials, slurries, and liquids. PTS 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). PTS includes both process transport and storage equipment and systems integration.

Summary of Monthly Activities

- A Peer Review of the PTS blending, sampling, and transport designs was conducted. Action items from the meeting have been considered and a number of changes have been incorporated into the Title I design. A few items remain to be resolved.
- The first draft Title I bottom-up cost estimates have been completed and submitted for conversion into Primavera. Costs are somewhat higher than in Revision 1.2, but include costs related to the transfer of the blending work scope from Feed Prep. Once the cost information is processed, it will be compared to previous estimates to determine any significant changes that need to be addressed.
- Final preparations are underway for the PTS preliminary design review scheduled for September 11.

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	Used actual costs through March						9	6	6	6	6	6
Monthly actual	15	6	3	4	4	-1	9	4	7	3	9	
11/94 Plan cumulative	6	12	17	23	31	41	50	60	70	76	83	89
4/95 Plan cumulative	Used actual costs						40	45	51	57	63	69
Actual cumulative	15	21	24	27	31	30	39	43	50	54	63	
Current lien	0	0	0	0	0	5	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
L161-1.1	Select standard transport container designs	Jul 95	Completed
L161-1.2	Floor plan layout complete	Aug 95	Completed
L161-1.3	LI&C Functional Requirements Doc. complete	Sep 95	
L161-1.4	PTS LI&C System Preliminary Design review	Sep 95	
L161-1	PTS System Preliminary Design Review	Sep 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

- The principle activity this month was preparation of the rebaselined budget for FY96-99. Issues surrounding the costing of various analytical equipment within other WBS elements were somewhat resolved late in the month; certain equipment formerly costed in Process Transport and Storage will instead be purchased by Analytical Services, while equipment for off-gas monitoring at the facility stack will become DWTF -purchased equipment. The WBS unit responsible for purchase of additional equipment (XRF, GC/MS, LSC, TOC/TOX) required for analytical characterization has not yet been resolved.
- Provided input to a draft report describing the results of chemical characterization analysis on five barrels of mixed waste sampled to help evaluate materials handling issues and chemical characterization data issues in support of Liquid Feed Prep.

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	Used actual costs through March						9	10	10	9	10	10
Monthly actual	19	-2	8	8	9	9	9	10	5	8	9	
11/94 Plan cumulative	10	19	28	37	46	57	66	76	86	95	122	140
4/95 Plan cumulative	Used actual costs						60	70	80	89	99	109
Actual cumulative	19	16	24	32	41	51	60	71	76	83	92	
Current lien	0	0	0	0	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	Status
		Date*	
L162-4	Define MEO on-line analysis requirements	Feb 95	Completed
L162-3	Define facility off-gas monitoring requirements	Feb 95	Completed
L162-6	Define DWTF analysis requirements	Mar 95	Completed
L162-2	Define analysis tests based on process acceptance criteria	Oct 95	Partial
L162-5	Define MSO on-line analysis requirements	Mar 95	Completed
L162-7.1	LI&C Functional Requirements Document complete	Aug 95	Completed
L162-7.2	LI&C System Preliminary Design review	Sep 95	
L162-7	Analytical Lab System Preliminary Design review	Sep 95	

WBS Element 1.6.3 Water Treatment**Task Description**

Water Treatment (WTR) 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. WTR 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

The HWM design team continued Title I design work on the MWMF WTR process equipment specification and cost, and schedule estimating in support of the Preliminary Design Rebaseline, Rev. 2.

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	Used actual costs through March						13	15	5	5	5	5
Monthly actual	0	0	2	3	3	2	3	2	3	1	4	
11/94 Plan cumulative	0	14	27	41	54	70	83	98	103	108	117	126
4/95 Plan cumulative	Used actual costs						22	37	42	47	52	56
Actual cumulative	0	0	2	5	7	9	12	14	16	17	21	
Current lien	0	0	0	0	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	Oct 95	
L163-3.2	LI&C System Preliminary Design review	Oct 95	
L163-3	WT System Preliminary Design Review	Oct 95	
L163-4	Begin Final (Title II) Design	Nov 95	

WBS Element 1.6.4 Final Forms**Task Description**

The Final Forms (FF) 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 FF 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

- Preliminary Design (PD) of Final Forms (FFM) at about the 80% level and including the LI&C portion, was formally reviewed on August 7. Several additional action items (some necessary to complete the PD) and design issues were identified; but no serious problems emerged. Some of these have already been resolved. Some global MWMF issues also arose, in most cases not for the first time. Incomplete FFM action items may be grouped as follows:
 - Clarify certain regulatory issues associated with the final disposal of the solid waste forms produced by FFM during MWMF operations.
 - Complete written documentation supporting the PD.
 - Complete minor design matters involving the FFM Process Off-gas system, FFM's LI&C design, and constraints imposed by FFM on the methods used by MSO's Salt Recycle system to dry brines.
- This completes Marker 164-2.3 and Milestone 164-2.
- Considerable effort was expended on Revision 2.0, especially cost estimation.
- California regulations defining "hazardous" waste include the Total Threshold Limit Concentration (TTLC). This regulation preceded Federal and California regulations based on leach resistance. Many regard the TTLC as somewhat outmoded, but there has been little incentive for regulatory relief because of a paucity of tangible examples where the TTLC is clearly inappropriate. We expect that our ceramic waste form will pass all Federal and California leach tests, but that the waste loading will be so high (this being a major design desideratum) that the material will be ruled hazardous (and therefore *mixed* if also radioactive) solely on the basis of the TTLC. Our specimen no. 190 nearly provides the needed example, its only significant failure being the cadmium leaching. We are preparing additional experimental ceramics specifically formulated to demonstrate the problem as it pertains to MWMF. If these are successful, we (through LLNL's legal department) intend to recommend regulatory changes.
- FFM's Process Off-gas system design is taking shape. It will be fairly simple and quite small, as the quantities of noxious off-gas and volatilized inorganic solids produced are expected to be minimal, particularly in the absence of MEO.
- We fabricated additional ceramic formulations and are awaiting analytical results.
- The polymer microencapsulation subcontract has still not been placed.

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	Used actual costs through March						33	33	33	33	33	34
Monthly actual	59	13	23	26	38	35	32	33	30	27	37	
11/94 Plan cumulative	34	67	100	133	166	200	233	266	299	332	365	399
4/95 Plan cumulative	Used actual costs						226	259	292	325	358	392
Actual cumulative	59	72	95	120	158	193	224	257	286	314	351	
Current lien	1	1	2	1	1	1	1	1	1	1	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
L164-1.3	Report status of immobilization evaluations	May 95	Completed
L164-2.1	Final Forms subsystem design status peer review	May 95	Completed
L164-1	Evaluations of immobilization technologies done	Jun 95	Completed
L164-2.2	LI&C Functional Requirements Document done	Sep 95	In progress
L164-2.3	LI&C System Preliminary Design review	Aug 95	Completed
L164-2	Final Forms System Preliminary Design review	Aug 95	Completed
L164-3	Report: Design of polymer microencapsulation system	Oct 95	
L164-4.1	Report: Volatile residue components and the design of ceramic waste form system	Sep 95	
L164-4.2	Report: Interim status of ceramic waste form compositions and process parameters	Sep 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

- Bottom-up cost-to-completion estimates were made for all I&C elements to support preparation of the Project Revised Baseline Plan - Rev. 2.0.
- We met with Peak Technologies / HazTrack representatives for technical discussion regarding their container tracking products.
- We ordered a communications interface which will allow data to be downloaded from the Facility DBMS tables to the process workcell controllers.
- We continued an evaluation of Allen-Bradley DeviceNet products.
- We resumed activities to complete marker L165-1.12 — *SI&C Functional Requirements Document complete*. This marker is late due to manpower dilution caused by competing, more immediate, LI&C needs.

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	Used actual costs through March						40	38	38	40	37	44
Monthly actual	70	41	35	43	75	68	50	30	32	25	23	
11/94 Plan cumulative	50	144	204	247	287	325	373	411	449	489	526	571
4/95 Plan cumulative	Used actual costs						372	410	448	488	525	569
Actual cumulative	70	112	146	189	264	332	381	411	443	468	491	
Current lien	37	23	19	18	8	11	5	3	0	0	13	

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	Completed
L165-1.10	Rapid prototype Engineering Development testing complete, report written	Feb 95	Completed
L165-1.11	Integrated control system design peer review	Mar 95	Completed
L165-2.1	Instrumentation and Equipment Database operational	Apr 95	Completed
L165-1.12	SI&C Functional Requirements Document complete	Sep 95	
L165-1	SI&C System 90% Preliminary Design Review	Jun 95	Completed
L165-1.13	Engineering Development tasks complete, documented	Sep 95	
L165-1.14	Preliminary Design activities complete, documented	Sep 95	
L165-2.2	Process I&C Standards established	Sep 95	

Appendix A
Milestone/Marker Log

MWMF Milestone/Marker Log

For Aug 95 Monthly Report - Sorted by Number

	Number	Item	PTS	Orig. Date	Date	Status	Comments
		Rev. Date: 9/20/95; Doc. Resp. Person: M. Hussey					
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
X	D113-1	EA determination by DOE	X	Aug-94	Sep-95		EA draft submitted for comments. Final determination and issue of FONSI by DOE Compliance Office now expected in September.
	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	recieved KD-1 only
	D131-2	DOE issues KD-2	X	Jun-94	Nov-95		Delayed due to reduced DOE funding.
	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	complete	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	complete	Document in TID for publication. Release expected in Apr-95.
	L115-9	FY97 Project Validation			Apr-95	complete	
	L116-1	First meeting of NRP	X	Feb-95	Jun-95	complete	Delayed while key regulatory issues were resolved and the detail strategy for NEPA and CEQA finalized. Now scheduled for 6/20/95.

MWMF Milestone/Marker Log

For Aug 95 Monthly Report - Sorted by Number

	Number	Item	PTS	Orig. Date	Date	Status	Comments
	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.
X	L116-2	Second meeting of NRP		Aug-95	Aug-95	Complete	Date affected by review of EA by DOE and State(Ca.).
	L116-2.1	Issue first public newsletter		Mar-95	Sep-95		Date affected by review of EA by DOE and State(Ca.).
	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	Jan-96		Date changed to allow time to prepare and publish newsletter following NRP meeting.
	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	
	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	Nov-95		Delayed due to reduced DOE funding.
	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	
	L131-4	Submit MWMF Rebaseline (MWMF/DWTF Merge)	X	Mar-95	May-95	complete	Delayed due to FY97 field submittals and other higher priority work.
	L131-5	Submit Post-PDR Project Baseline	X	Sep-95	Jan-96		Delayed due to reduced DOE funding.
	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.
	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	Aug-95	complete	Delayed due to requests for unplanned work from DOE.
	L132-8.1	Complete support of Project PDR (see L131-1)		Jun-95	Nov-95		Delayed due to reduced DOE funding.
X	L132-9	Complete QA Self Assessment			Aug-95	Complete	
	L132-9.1	Records Control Procedure issued			Apr-95	complete	
	L132-9.2	Assessment/Surveillance Procedure issued			Jul-95	complete	
	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	
X	L133-3	Issue Title I System Design Requirements		Feb-95	Aug-95	complete	Delayed due to reduced DOE funding.
	L133-4	Issue Metrication Plan			Feb-95	complete	
	L133-5	Input to FY96 Plan (see 115-10)			Oct-95		
	L133-10.1	Identify emissions for air permit			Jun-95	complete	New marker

MWMF Milestone/Marker Log

For Aug 95 Monthly Report - Sorted by Number

Number	Item	PTS	Orig. Date	Date	Status	Comments
L133-10.2	Review floorplan layout and personnel egress			Jul-95	complete	New marker
X L133-10.3	Review facility Process Flow Diagrams			Sep-95		Delayed due to higher priority activities.
X L133-10.4	Facility preliminary design (20%)			Sep-95		Delayed due to higher priority activities.
L133-10.5	Title I Design Review (80%)			Sep-95		New marker
L133-10.6	LLNL Review Title I Design			Oct-95		New marker
L141-1	HAS System Preliminary Design Review			Sep-94		Delayed due to reduced DOE funding.
L141-1.1	Complete pilot characterization studies			Jun-94	complete	activity stretched-out due to reduced funding guidance
L141-1.2	Identify equipment and define floor plan			Sep-94	complete	activity stretched-out due to reduced funding guidance
L141-1.3	HAS L&C System Functional Requirements Document complete			Jun-95		Delayed due to reduced DOE funding.
L141-1.4	HAS L&C Preliminary Design Review			Jul-95		Delayed due to reduced DOE funding.
L142-1	SFP System Preliminary Design Review			Jul-95		Delayed due to reduced DOE funding.
L142-1.1	SFP surrogate feeds defined			May-94	complete	
L142-1.2	Identify initial suite of characterization equipment			Jun-94		Delayed due to later than scheduled completion of pilot characterization studies and reduced manpower and funding guidance received after original schedule was established.
L142-1.3	Complete validation of characterization, isolation, and segregation methods			Sep-94	complete	Delayed by late completion of pilot characterization studies, reduced manpower/funding guidance, rebaselining activities, and project delay of procurements of engineering development equipment.
L142-1.4	Complete preliminary operator control station design			Mar-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	complete	
L142-1.8	L&C Functional Requirements Document complete			Jun-95		
L142-1.9	L&C Preliminary Design Review			Sep-95		Delayed due to reduced DOE funding.
X L142-1.10	Locate user interface stations and required functionality			Aug-95		Delayed due to higher priority activities.
X L142-1.11	Draft FP control console layout			Aug-95		Delayed due to higher priority activities.
L142-2	Telerobotics Preliminary Design Review			Sep-95		New milestone.
L143-1	LFP System Preliminary Design Review			Jul-95		Delayed due to reduced DOE funding.
L143-1.1	Define surrogate feeds			May-94	complete	date changed to agree with extended project schedule
L143-1.2	LFP general arrangement plan finalized			Jul-94	deleted	
L143-1.3	Complete validation of characterization and segregation methods			Sep-94	complete	Delayed by technical difficulties which have since been resolved.
L143-1.4	L&C Functional Requirements Document complete			Jun-95		
L143-1.5	L&C Preliminary Design Review			Jul-95		Delayed due to reduced DOE funding.
L151-1.1	Complete tests on turbo-aerator for nitrous acid conversion (document issued)			Mar-94	complete	Release of report delayed due to slower than expected review cycle.
L151-1.10	P&ID drawings (document)			Sep-95	complete	Incorporated into L151-3.
L151-1.11	Layout drawings of major equipment items (document)			Sep-95	complete	Incorporated into L151-3.
X L151-1.12	L&C Functional Requirements Document complete			Aug-95		Delayed due to higher priority activities.
L151-1.13	L&C Preliminary Design Review			Sep-95	deleted	Replaced by L151-3.
L151-1.2	Initiate steady-state flow and chemistry balance tests			Apr-94	complete	

MWMF Milestone/Marker Log

For Aug 95 Monthly Report - Sorted by Number

Number	Item	PTS	Orig. Date	Date	Status	Comments
L151-1.3	Initiate instrumentation and control system tests for MEO			Aug-94	complete	
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
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	Sep-95		Document delayed while waiting for chemical analysis results.
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	deleted	Replaced by L151-3.
L151-2.1	Preliminary Process Flow Diagram for MEO			Jun-94	complete	
L151-2.2	Preliminary equipment layout for MEO			Sep-94	complete	
L151-3	MEO System Design Description (document)			Jul-95	complete	New milestone. Replaces L151-1.13 and L151-2.
L152-1	Complete MEO bench scale rubber destruction tests			Dec-93	complete	
L152-2	Select Industrial Participation method for Primary Unit			Jun-95	complete	
L152-2.1	MEO 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	MEO System MWMF PDR		Jun-95	Oct-95		Delayed due to reduced DOE funding.
L152-3.1	Preliminary Process Flow Diagram complete for MEO		Jun-94	Sep-94	complete	
L152-3.2	Initiate MEO Preliminary Design			Jul-94	complete	
L152-3.3	Initiate vessel material study			Oct-94	Complete	
L152-3.4	Install development unit			Jun-95	Complete	
L152-3.5	L&C Functional Requirements Document complete		May-95	Oct-95		Delayed due to reduced DOE funding.
L152-3.6	L&C Preliminary Design Review		Jun-95	Oct-95		Delayed due to reduced DOE funding.
L152-4	Start Development Activities			Aug-94	complete	
L152-5	Start Title II design		Jul-95	Nov-95		Delayed due to reduced DOE funding.
L152-6	Select Industrial Participation method for Salt Recycle			Nov-95		New Milestone
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 RFC 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 WOXSupport System complete			Jul-94	deleted	WBS element deleted per DOE guidance
L154-1	Complete and document UVP work to date			Jul-94	complete	

MWMF Milestone/Marker Log

For Aug 95 Monthly Report - Sorted by Number

	Number	Item	PTS	Orig. Date	Date	Status	Comments
	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
X	L155-1	Summarize Gas Liquid Contactor Tests (document)		Jun-95	Aug-95	Complete	Delayed due to testing difficulties. Corrections have been made.
	L155-1.1	Fab prototype gas-liquid contactor for acidic urea NOx destruction		Jun-94	Jun-95	complete	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	deleted	Deleted from scope due to budget reductions. (1/95)
	L155-3.1	Summarize NOx-urea chemistry to date (document)		Sep-95	Sep-95		Delayed awaiting completion of Milestone L155-1. Date was Aug-95.
	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)
	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	Sep-95		Delayed due to reduced DOE funding.
	L161-1.1	Select standard transport container designs		Jun-94	Jul-95		Delayed due to reduced DOE funding.
X	L161-1.2	Floor plan layout complete		Jul-94	Aug-95	Complete	Delayed due to reduced DOE funding.
	L161-1.3	LI&C Functional Requirements Document complete		Jun-95	Sep-95		Delayed due to reduced DOE funding.
	L161-1.4	PTS LI&C System Preliminary Design review		Jul-95	Sep-95		Delayed due to reduced DOE funding.
	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"
X	L162-2	Define analysis tests based on process acceptance criteria		Sep-94	Oct-95	partial	Delayed due to reduced DOE funding. First issue expected in October.
	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.
	L162-7	Analytical Lab System Preliminary Design review		Aug-95	Sep-95		Delayed due to reduced DOE funding.
X	L162-7.1	LI&C Functional Requirements Document complete		Jul-95	Aug-95	Complete	Delayed while document is in review cycle.
X	L162-7.2	LI&C Preliminary Design Review		Aug-95	Sep-95		Rescheduled to be held in conjunction with system PDR (L162-7).
	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	Oct-95		Delayed due to reduced DOE funding.
	L163-3.1	LI&C Functional Requirements Document complete		Jun-95	Oct-95		Delayed due to reduced DOE funding.

MWMF Milestone/Marker Log

For Aug 95 Monthly Report - Sorted by Number

	Number	Item	PTS	Orig. Date	Date	Status	Comments
	L163-3.2	LI&C Preliminary Design Review		Jul-95	Oct-95		Delayed due to reduced DOE funding.
	L163-4	Begin Final Design		Jul-95	Oct-95		Delayed due to reduced DOE funding.
	L164-1	Evaluations of immobilization technologies complete		May-95	Jun-95	complete	Delayed pending decision on most cost effective technology for the project.
	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	
	L164-1.3	Report status of immobilization evaluations		Sep-94	May-95	complete	Delayed until after peer review of polymer microencapsulation. Peer Review activities finalized on 4/24/95. Report expected in May 95.
X	L164-2	Final Forms System Preliminary Design Review		Jun-95	Aug-95	Complete	Delayed due to reduced DOE funding.
	L164-2.1	Final Forms subsystem design status peer review		Feb-95	May-95	complete	Peer Review activities finalized on 4/24/95. Report to be completed in May 95.
X	L164-2.2	LI&C Functional Requirements Document complete		May-95	Sep-95		Document in review cycle.
X	L164-2.3	LI&C Preliminary Design Review		Jun-95	Aug-95	Complete	Delayed due to reduced DOE funding.
	L164-3	Report: Design of polymer microencapsulation system		Jun-95	Oct-95		Delayed due to reduced DOE funding.
	L164-4.1	Report issued: Volatile residue components and the design of ceramic waste form system		Jul-95	Sep-95		Delayed due to reduced DOE funding.
	L164-4.2	Report issued: Interim status of ceramic waste form compositions and process parameters		Aug-95	Sep-95		Delayed due to reduced DOE funding.
	L165-1	SI&C System Preliminary Design Review		May-95	Jun-95	complete	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	complete	Completion expected in early Mar 95. Key participants are unavailable in February.
	L165-1.12	SI&C Functional Requirements Document complete		Apr-95	Sep-95	In progress	Delayed due to reduced DOE funding.
	L165-1.13	Engineering Development tasks complete, documented		Jun-95	Sep-95		Delayed due to reduced DOE funding.
	L165-1.14	Preliminary Design activities complete, documented		Jun-95	Sep-95		Delayed due to reduced DOE funding.
	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.
	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						