The Mixed Waste Management Facility

Monthly Report
March 1995

April 1995

Lawrence Livermore National Laboratory
Environmental Programs

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The Mixed Waste Management Facility

Monthly Report
March 1995

Ronald D. Streit

April 1995

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

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Project Summary

Overview

Technical progress in March continued (see "Accomplishments" below) in general accordance with the *MWMF FY95 Plan*. Engineering development and design continued in support of preliminary design of MWMF major subsystems. Peer reviews continued in preparation for system preliminary design (PD) reviews.

Management focus during March centered upon completing the FY97 Validation review and upon reviewing the permitting strategy with stakeholders. The FY97 Validation was successfully completed, with no major action items following the two-day review. With no directed changes from validation, the FY97 Field Budget Submittal information was prepared. Activity Data Sheets (ADS) (revised for the MWMF and a new ADS for operations beginning FY98), Field Work Proposals, and Project Data Sheets were prepared, and a revised project baseline change proposal is being prepared. The ADSs will likely be revised by DOE/OAK to reflect new funding guidance. A new baseline change proposal will similarly be developed to reflect these changes as part of completing Title I; funding guidance for this will need to be firmed up around June.

The permitting strategy that involves no Resource Conservation and Recovery Act (RCRA) RD&D permit and surrogate/limited-treatability studies for initial MWMF operations was reviewed and approved by senior LLNL management. Preliminary discussions have been held with other stakeholders—DOE, Department of Toxic Substances Control (DTSC)—with favorable comments; final review with these groups can now proceed to finalize this strategy.

The General Accounting Office (GAO) concern was an initial projection of \$900K uncosted carryover from FY96 to FY97. This figure was due to improper inclusion of liens (different DOE and LLNL groups use differing definitions) and the large number of possible funding scenarios that have been requested. The final report recognized the uncertainty factor, the cooperation of DOE/OAK and LLNL to minimize the value, and recommended that uncommitted carryover be kept to less than \$100K in future years.

Cost Status. In summary, corrective cost transfers have brought OPEX costs close to the FY95 plan. In CENRTC, spending continues to run about \$1000K below plan, due to the late start in ramping up design manpower as a result of DOE funding uncertainties. While some of this work and associated costs will be made up over the next six months, overall FY95 spending is currently projected to be about \$1100K below plan since management reserve and some indirect costs will not be realized. Discussions with DOE/OAK are underway to update funding and spending plans for the rest of FY95.

Schedule Status. In summary, critical path items are DWTF construction, National Environmental Policy Act (NEPA), and permitting (for both the MWMF and DWTF). Progress on PD for the MWMF is close to schedule.

Significant Issues and Planned Corrective Actions

NEPA for the MWMF poses a continued schedule risk for the MWMF and DWTF (see *February Monthly Report*). The key concern is a NEPA decision to allow Title II work for DWTF Phase 1 and 2, which is on the MWMF critical path. The MWMF *Environmental Assessment* (EA), revised to reflect the DWTF/MWMF co-location, was

submitted to DOE/OAK in February 1995, with a current estimated decision date of August. Both projects are working closely with DOE to expedite this process.

Uncertainty in permitting strategy and requirements poses potential, albeit lessening, schedule risk. While informally reviewed with all stakeholders, the proposed permitting strategy was approved by LLNL senior management; review by outside groups can now proceed.

Funding uncertainties continue to affect planning and current work. The FY97 Validation and Field Budget Submittals were completed during March, based on a guidance funding profile of \$15M, \$13M, and \$12M in FY96, FY97, and FY98 respectively. Subsequent funding guidance profiles are currently \$15M, \$9M, and \$9M, with possible reductions of up to \$2M in FY95 and FY96; MEO will also be dropped from the Project scope. We are working closely with DOE/OAK to try to minimize the impact of these funding uncertainties.

The issue raised during the GAO audit of carryover funding at LLNL was essentially resolved. The final GAO report recommended keeping unobligated carryover in the MWMF to below \$100K in future years.

The issue regarding the report by the DOE Office of Inspector General (OIG) remains unresolved to date (see *October Monthly Report*). DOE/OAK is awaiting a response from the OIG from information submitted to them.

Summary of Accomplishments

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

- Preliminary design continued, including peer reviews for four WBS elements. Work was revived to update the System Design Requirements for Title I, to reflect changes imposed by the revised project baseline (PB).
- Utility and other key requirements from the MWMF for DWTF Title I were updated. A method to update and control changes to DWTF that are requested by the MWMF was implemented.
- NEPA/CEQA: Comments on the revised EA were received from DOE/OAK ahead of schedule; changes are being made at LLNL to reflect these comments. DOE/OAK will then proceed to review by other stakeholders (state, etc.), with an objective to issue a determination by August.
- Quality assurance (QA): The Project Configuration Management Plan was issued. Changes to the WBS dictionary were reviewed and approved by DOE/OAK as part of the Validation review.
- The Water Treatment Trade Study was approved by DOE/OAK.
- Feed Preparation: Evaluation of feed shredding and separation equipment continued in conjunction with outside vendors. A peer review was held for MWMF solid feed equipment. Work is underway to obtain and evaluate existing telerobotic software. The final draft of a plan to detect and control the presence of tritium in the facility was circulated for comments.
- MEO: A 1/15 scale system was activated to evaluate, at larger scale, the successful silver recovery process that was developed at glassware scale. Several patent

disclosures were prepared for new developments made during MWMF design work. A peer review was completed.

- MSO: As part of Revision 1.2 to the project baseline (PB1.2) and after several reviews, the baseline for MSO will be formally modified to reflect multiple smaller units, which represents a less expensive, more flexible design. A letter of interest was received from a second potential Cooperative Research and Development Agreement (CRADA) partner. Fabrication of the Engineering Demonstration Unit (EDU) vessel is in progress. Design of EDU controls is essentially complete, and installation of support equipment began in B241. Material testing continued, using outside vendors and by assembly of a test furnace at LLNL. The injector test bench was moved to B241. Bench-scale work began to characterize the proposed salt recycle process.
- Final Forms: A peer review on the polymer micro-encapsulation of salt was completed, with no new issues identified. A cast thermosetting process is the present baseline, with extruded thermoplastic as a backup.

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 Project for March, and has been modified in format this month to view variances and Project estimates at the end of FY95.

During March, some corrective cost transfers continued, as discussed in prior monthly reports. OPEX actual spending is close to that planned. Not all OPEX liens shown will be charged to MWMF accounts, since they represent manpower support labor. In CENRTC, spending continues to run about \$1000K below plan, due to the late start in ramping up design manpower, as a result of DOE funding uncertainties. Preliminary discussions with Cost Account Managers indicate that some of the delayed effort and costs (~\$390K) will be made up during the remainder of FY95. However, since we would anticipate not costing Laboratory Directed Research and Development (LDRD), current estimates indicate that the Project would underrun from its obligation plan by about \$1100K at the end of FY95 (see Table 1). Discussions with DOE/OAK are underway to update funding and spending plans for the remainder of FY95.

DOE/OAK was able to swap OPEX and CENRTC funds within the DOE Complex to resolve the pending imbalance for FY95. Additional CENRTC funding was added to MWMF authorized funding (Laboratory Contract Modification), as shown in Table 1, to solve the near-term issue.

Major procurements initiated during February are identified in the task summaries. No distribution of Management Reserve or FY95/96 carryover was made during March.

MWMF Project - Monthly Financial Summary for FY95
MARCH, 1995

OPEX (\$K, monthly expenditures)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Subtotal*	Undistrib	Total Budget	Estimate*
DOE Funds*	279	235	235	0	0	301	-120							930			
FY95 Plan		59	58	56	58	53	63	66	66	66	66	71	66	746		746	746
Actual		103	103	224	-87	78	-49							372			
Variance		44	46	168	-145	25	-112							26			
Actual Liens**		246	242	285	305	275	247							NA			
Mgmt Reserve		0	0	0	0	0	0							0	84	84	84
95/96 Liens		0	0	0	0	0	0							0	100	100	100
FY95 OPEX budget =																930	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						
FY95 Plan		59	117	173	231	284	346	412	478	544	610	681	746
Actual		103	206	430	343	421	372						
Variance		44	89	257	112	136	26						

DOE FY95 new-BA, OPEX		
budget	guidance**	delta
651	2800	-2149

CENRTC (\$K, monthly expenditures)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Subtotal*	Undistrib	Total Budget	Estimate*
DOE Funds*	2649	0	0	0	2000	0	2856							7505			
FY95 Plan		657	725	715	748	692	724	700	749	671	606	737	632	8358		8358	7679
Actual		730	188	371	602	640	662							3193			
Variance		72	-537	-344	-146	-52	-62							-1069			
Actual Liens**		86	81	85	125	961	547							NA			
Mgmt Reserve		0	0	0	0	0	0							0	605	605	200
95/96 Liens		0	0	0	0	0	0							0	400	400	675
LDRD-CAP#		0	0	0	0	0	0							0	291	291	0
FY95 CENRTC budget =																9654	8554

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						
FY95 Plan		657	1382	2098	2846	3538	4262	4962	5712	6383	6989	7725	8358
Actual		730	918	1289	1891	2531	3193						
Variance		72	-465	-809	-955	-1007	-1069						

DOE FY95 new-BA, CENRTC		
budget	guidance**	delta
7005	4856	2149

PROJECT TOTAL (\$K, monthly expenditures)

	CO*	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Subtotal*	Undistrib	Total Budget	Estimate*
DOE Funds*	2928	235	235	0	2000	301	2736							8435			
FY95 Plan		717	783	772	806	744	787	767	815	737	672	807	698	9104		9104	8425
Actual		833	291	595	515	718	613							3565			
Variance		116	-492	-176	-291	-26	-174							-1043			
Actual Liens**		331	323	370	430	1236	794							NA			
FY95 TOTAL budget*** =																10584	9484
Est. FY95 var. =																	-1100

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						
FY95 Plan		717	1499	2271	3077	3821	4608	5375	6190	6827	7599	8406	9104
Actual		833	1124	1719	2234	2952	3565						
Variance		116	-375	-552	-843	-869	-1043						

DOE FY95 new-BA, TOTAL		
budget	guidance**	delta
7656	7656	0

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	49.5						
Labor (\$K)@		409	349	322	390	415	450						

* DOE funds include FY94/95 carryover; Ref. LLNL Contract Mod.

** Relevant for current month only; sum not meaningful

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

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

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

^ Values represent current "best estimate" at and FY95, as of 4/13/95

^^ As identified in the most recent program letter

TABLE 1

WBS Element 1.1.1 Quality Assurance**Task Description**

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

Summary of Monthly Activities

- Completed the *Project Configuration Management Plan*. This document was approved by Project Management.
- Completed a Project Key Documents Tree.
- Created a draft of a Records Control QA procedure.
- Continued working with Project personnel on QA issues and the QA filing system.
- Issued revised WBS Dictionary (Revision 1). It was approved by DOE/OAK.
- Issued revised WBS (Revision 5).
- Supported QA aspects of peer reviews.

FY95 Budget Spending profiles (\$34K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/95 Plan	3	3	3	3	3	3	3	3	3	3	3	3
Monthly actual	2	3	12	-4	3	5						
Plan cumulative	3	6	8	11	13	17	19	22	25	28	31	34
Actual cumulative	2	5	17	13	16	21						
Current lien	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 March on the PSAR as the document was completed and distributed in 1994.

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

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

Spending profiles (\$20K, 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
Monthly actual	0	0	2	15	0	0						
Plan cumulative	5	10	13	15	17	19	20	20	20	20	20	20
Actual cumulative	0	0	2	16	16	16						
Current lien	0	0	0	0	0	0						

Significant procurement actions this month

None

Milestones and Markers

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

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

WBS Element 1.1.3 Environmental Documentation**Task Description**

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

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

Summary of Monthly Activities

- We received comments from DOE/OAK on the revised EA. DOE/OAK has been expediting the review process where possible. Comments were largely editorial and related to format (e.g., make document less technical and shorter). LLNL is currently addressing these comments.
- Submittal of the RD&D permit application remained on hold in March pending completion of the final review of the overall permitting strategy. MWMF Project members assembled additional information to address comments from LLNL management and the DOE project manager on proposed changes to the permit strategy.
- A half-day class was conducted for MWMF staff on hazardous waste management requirements under RCRA and state law.

FY95 Budget**Spending profiles (\$31K, OPEX): NEPA**

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

Spending profiles (\$216K, CENRTC): CEQA, Permitting

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

Large variances from monthly plan reflect corrective cost transfers as discussed in prior reports.

Significant procurement actions this month

None

Milestones and Markers

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

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

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

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

Summary of Monthly Activities

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

FY95 Budget Spending profiles (\$162K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/95 Plan	14	14	14	14	14	14	14	14	14	14	14	14
Monthly actual	11	8	14	6	12	12						
Plan cumulative	14	27	41	54	68	81	95	108	122	135	149	162
Actual cumulative	11	19	32	38	51	62						
Current lien	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

During March, we continued to focus on addressing the rebaseline for the MWMF for Project Validation, and on finalizing the permitting strategy.

The FY97 Validation was completed on March 21-22, 1995. During this two-day meeting, the project scope, cost, and schedules were reviewed. We were able to accommodate all of the reviewers' concerns and questions prior to the close of the meeting. No outstanding action items were identified. As of the close of the meeting we had every indication that the Project would be validated as presented.

We continued to meet with key players in approving the revised MWMF permitting strategy to not pursue the RD&D permit at this time. A permitting logic diagram was developed identifying key elements to be completed (1) to reach the goal for transitioning the processes to treatment, and (2) to meet the goal as a national testbed. A meeting is scheduled for early April with LLNL management (H. Galles and D. Fisher) for closure on this item. We have had some preliminary discussions with DTSC and have received their endorsement.

During the end of February and beginning of March, we attended the WM95 Conference in Tucson, Arizona. This conference provided us the opportunity to initiate discussions with the Mixed Waste Focus Area members, in particular Steve Domotor. From this introduction we decided to pursue meeting with the Mixed Waste Focus Area implementation team at Idaho National Engineering Laboratory (INEL), and to brief the key management team either at DOE/HQ or in connection with the Validation. Due to schedule constraints, this meeting could not be coordinated with the Validation, but a meeting at INEL is scheduled for April.

FY95 Budget Spending profiles (\$354K, OPEX)

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

Significant procurement actions this month

None

Milestones and Markers

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

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

WBS Element 1.1.6 Public Participation**Task Description**

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

Summary of Monthly Activities

Activity was limited during March. Planning for the first NRP meeting continued; the meeting is now scheduled for the middle of June. Additionally, interactions with the Mixed Waste Focus Area were initiated leading to a planned meeting with the implementation team at INEL in April.

FY95 Budget Spending profiles (\$96K, OPEX)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/95 Plan	8	8	8	8	8	8	8	8	8	8	8	8
Monthly actual	10	3	3	8	11	5						
Plan cumulative	8	16	24	32	40	48	56	64	72	80	88	96
Actual cumulative	10	12	15	23	34	38						
Current lien	28	28	28	29	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	In Progress
L116-1	First meeting of NRP	May 95	In Progress
L116-2.1	Issue first public newsletter	Jun 95	
L116-2.2	Receive comments from NRP	Apr 95	Deleted
L116-2	Second meeting of NRP	Nov 95	
L116-3.1	Issue second newsletter	Dec 95	

WBS Element 1.2.1 Conceptual Design**Task Description**

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

Summary of Monthly Activities

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

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

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

No activity on this WBS element is planned until April 1995. A job posting for an acting Operations Manager, to support operations planning during preliminary and final design, was written and distributed to the MWMF Project and HWM for comment.

FY95 Budget Spending profiles (\$69K, OPEX)

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

Significant procurement actions this month

None

Milestones and Markers

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

ID no.	Milestone/Marker	Scheduled Date*	Status
L122-1	Issue MWMF Start-Up and Activation Plan	Sep 95	

WBS Element 1.2.3 Activation**Task Description**

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

Summary of Monthly Activities

There are no activities under this WBS element during FY95.

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

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

Significant procurement actions this month

None

Milestones and Markers

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

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

WBS Element 1.3.1 Project Management**Task Description**

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

Summary of Monthly Activities

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

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

As stated elsewhere, the Project Validation was completed on March 21-22, 1995 without any unresolved action items. Based on the Validation, we are now in the process of completing the Revised Baseline 1.2 (PB1.2) detailing (1) the scope, schedule, and cost implications of recent DOE guidance on co-locating the DWTF and MWMF, and (2) budget limitations.

FY95 Budget Spending profiles (\$856K, CENRTC)

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

Significant procurement actions this month

None

Milestones and Markers

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

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

WBS Element 1.3.2 Project Control**Task Description**

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

Summary of Monthly Activities

- Supported the FY97 Validation by DOE. Scope, cost, and schedule information was developed and presented consistent with DOE/OAK guidance. Information was based on plans and estimates developed as part of the proposed Project Baseline Revision 1.2 (PB1.2). No major action items remained following the two-day briefing and clarification meetings.
- FY97 Budget Submittal information was prepared based on information developed. The Project was notified late regarding the due date for Submittal information; however, we worked closely with DOE/OAK to avoid any impact on the submittal schedule.
 - An Activity Data Sheet (ADS) for the MWMF was prepared for DOE/OAK/EM, based on PB1.2. A new ADS was prepared for an operations budget for the MWMF beginning in FY98. Both ADSs were revised and resubmitted, due to the significant change required in the ADS format this year. The ADS will be modified by DOE/OAK to reflect the revised funding guidance (see "issues" below)
 - A Field Work Proposal (FWP) was also prepared for Laboratory submittal, but was later resubmitted in the form of a Project Data Sheet (PDS) submittal, which is required for "projects" such as the MWMF.
- Work was completed on the PB1.2 to support the Validation Review, but formal preparation of the PB1.2 document was delayed until April because of the FY97 Budget Submittals that had a more immediate need.
- Low-priority work continued on developing Project management controls. Preparations were completed to transfer information electronically between Primavera and cost estimation/cost rollup spreadsheets.
- In the QA area, the peer review schedule was monitored and supported, with four major peer reviews held. The Configuration Control Plan was approved and issued by the Project (Milestone L132-5).
- Other significant activities and accomplishments during February:
 - A job description was prepared for an Acting Operations Manager for the MWMF, and was issued for review by the MWMF Project and HWM.
 - Facilities: Coordinated building maintenance and repairs as necessary. Set up Resource Manager computer. Continued to resolve the return of Graham Court storage facility to LLNL and continued to issue the Findings and Determination memorandum from Site Planning on the DWTF/MWMF proposed site location. Reviewed office space move plans for the NIF and MWMF projects.

- MWMF Property Center (PC): Tagged new class of equipment with property numbers.
- Most of the MWMF engineering team attended an RCRA-laws training class.
- Issued the DOE PTS monthly report.
- Issued the *February Monthly Report*.
- Key issues:
 - DOE/OAK was able to sway funds to correct the immediate issue regarding OPEX/CENRTC imbalance for FY95.
 - The Project received a range for funding guidance for FY97 and FY98 from DOE that is significantly below that used in PB1.2. Guidance will need to be firmed up by around June, when the next formal plan and bottom-up cost estimate will begin as part of Title II design.
 - The final report of a General Accounting Office (GAO) review of carryover funding at LLNL recommended that unobligated carryover be kept to less than \$100K in future years. The report recognized the issue of large swings in funding guidance and the cooperation of the MWMF and DOE to minimize carryover.
 - Differing use of definitions and calculations for such terms as *obligations*, *outlays*, etc., has been a point of confusion, both between the Project/LLNL and DOE, and within DOE. We are trying to clarify the proper use of such terms.

FY95 Budget**Spending profiles (\$486K, CENRTC)**

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

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

Significant procurement actions this month

None

Milestones and Markers

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

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

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

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

Summary of Monthly Activities

- We initiated a spreadsheet-based flow model to identify material accumulation issues associated with movement of containers through the MWMF.
- We established a schedule to revise SDRs to reflect the changes imposed by PB1.2.
- We continued updating facility utility requirements to support the first phase of the DWTF Project.
- We began establishing Title I requirements for the facility off-gas system and identifying the regulatory issues that drive off-gas system design.
- We implemented a working arrangement with the DWTF Project staff to provide an active list of comments and changes to the facility requested by the MWMF.

FY95 Budget Spending profiles (\$328K, CENRTC)

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

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 FY95 Plan (see 115-7)	Nov 94	Complete
L133-2	Issue Integrated Operations Plan	Jan 95	Complete
L133-4	Issue Metrication Plan	Feb 95	Complete
L133-3	Issue Title I System Design Requirements	May 95	In Progress
L133-5	Input to FY96 Plan (see 115-10)	Oct 95	

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

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

Summary of Monthly Activities

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

FY95 Budget Spending profile (\$175K, CENRTC)

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

Significant procurement actions this month

None

Milestones and Markers

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

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

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

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

Summary of Monthly Activities

- Activities this month focused on supporting the FY97 validation effort. The in-house peer review of the SFP hardware is scheduled for April 6, 1995, and the SFP System Preliminary Design Review (PDR) on June 29, 1995. The telerobotics peer review is scheduled for April 20, 1995, with the same System PDR date. Samples of various shredded materials (organic and inorganic) were sent to a density separation vendor to validate that inorganic materials can be separated. In progress is the detailing of the equipment and vendor inquiries to firm up cost estimates.
- LLNL personnel attended a two-day, hands-on class on SMART. SMART is an SNLA-developed low-level control system for telerobotics that will be used in the MWMF to avoid redeveloping software. We completed the requisition package for SNL support and integration of the SMART module for the Cybernet perFORCE hand control. The RSI unilateral hand control module is completed and in checkout. The RSI module is communicating with the VME chassis. The next step is to check out the RST SMART interface for PUMA control. The JR3 force/torque sensor is communicating with the VME chassis and will be interfaced with SMART to produce active force compliance.
- We completed the engineering development robot requisition package and obtained approval to initiate the procurement cycle. It is anticipated that sending out the RFQ and evaluating the bids will take 6 to 9 weeks.
- The final draft of the tritium strategy was generated and circulated for comments. The final version is currently being generated for issue.

FY95 Budget Spending profiles (\$954K, CENRTC)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/95 Plan	95	91	86	91	87	104	87	100	100	36	41	36
Monthly actual	83	31	31	76	92	85						
Plan cumulative	95	186	272	363	450	554	641	741	841	877	918	954
Actual cumulative	83	114	144	220	312	397						
Current lien	21	0	0	0	639	275						

Significant procurement actions this month

The ICO for SNLA SMART support for the perForce hand controller was initiated but has not been placed, awaiting additional information from SNLA.

Milestones and Markers

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

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

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

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

Summary of Monthly Activities

Design, cost, and technical trade-off studies for LFP continue. Design drawings, process flow diagrams, P&IDs and other necessary drawings for Title I are in the process of being drawn. Liquid/liquid separation experimental work is complete and the data is being analyzed. This data reduction effort is 75% complete. The liquid/solid separation data analysis is complete.

The marker L143-1.3 will be completed in April rather than March as originally scheduled. This is due to technical difficulties, since resolved, in explaining data for both of the aforementioned experimental efforts.

FY95 Budget Spending profiles (\$390K, CENRTC)

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

Significant procurement actions this month

None

Milestones and Markers

	Item	Scheduled Date	Status
L143-1.1	Define surrogate feeds	Nov 94	Complete
L143-1.3	Complete validation of characterization and segregation methods	Apr 95	Open
L143-1	90% Preliminary Design Review	Jul 95	Open

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

- Completed simulation of the control of the MEO primary system operating in tandem with the distillation system. The results were published in report form.
- Operated the 1/15-scale silver recovery system using water, fly ash, and clay as surrogates for debugging purposes. The system will be used to simulate the Ag recovery process in the next 2 to 3 weeks.
- Prepared patent disclosures for unique features of the MWMF MEO process to protect LLNL's future commercialization rights.
- Completed Peer Review of the MEO system design for the MWMF on March 22, 1995.

Design effort included the following:

- Began scoping a method to wash large solids in MEO for decontamination purposes. Such items as broken glass vials or contaminated tools could be decontaminated using this method.
- Updated PFDs to incorporate minor changes in the Ag recovery process.
- Updated MEO Utilities requirements.

FY95 Budget**Spending profiles (\$1,023K, CENRTC)**

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

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	Complete
L151-1.7	Computer simulation of the combined MEO and Acid Recovery control systems (document)	Mar 95	Complete
L151-1.4	Summarize silver recovery chemistry results to date (document)	Apr 95	In Progress
L151-1.6	Report on NaOH-AgCl recovery (document)	Apr 95	In Progress
L151-1.8	Final Report on steady-state flow and chemistry balance tests (document)	Apr 95	
L151-1.9	Demonstrate prototype cellulose feeder (document)	Jun 95	Deleted
L151-1.12	LI&C Functional Requirements Document complete	Aug 95	
L151-1.10	P&ID drawings (document)	Sep 95	In Progress
L151-1.11	Layout drawings of major equipment items (document)	Sep 95	In Progress
L151-1.13	LI&C System Preliminary Design review	Sep 95	
L-151-2	MEO System Preliminary Design review	Sep 95	

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

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

Summary of Monthly Activities

- **Materials Development and Evaluation:**

Overlay coatings. Preliminary agreements were made to produce overlay coatings of oxides (such as alumina, stabilized zirconia) for assessment. The coating methods include thermal spray as well as vapor deposition by physical (PVD) and chemical (CVD) processes. Both in-house and commercial coaters are involved.

Temperature effect on corrosion rate (*in collaboration with ETEC*). Based on corrosion test results, Inconel 600 was selected last month as our baseline vessel material for service at 950°C. Because corrosion rate decreases dramatically with temperature, we intend to provide data on the critical trade-off between MSO destruction and removal efficiency (DRE) and corrosion rate. To this end, corrosion tests of Inconel 600 were extended to 850 and 900°C to yield an Arrhenius relationship for corrosion rate. Metallographic determinations of corrosion rates are underway.

Iron aluminide coatings (*in collaboration with ETEC and ORNL*). Very little corrosion was found (metallographically) for ORNL's iron aluminide after testing at 900°C/1000 h. Next: attempt to produce an analogous coating on Inconel 600.

Aluminized coatings (*in collaboration with ETEC*). We are metallographically assessing aluminized coatings produced on Inconel alloys and then corrosion tested by ETEC at 900°C/500 h.

Corrosion test furnace. A multitube furnace with atmosphere control is being established to corrosion test candidate materials for the vessel. Major components were received and assembled. A 10-channel TC data logger has been ordered to replace the rented 5-channel TC logger. The furnace control chassis drawings have been completed and submitted to the engineering records center. Early shakedown runs showed excellent temperature control. The atmosphere system to simulate MSO operation (excess, moist air with CO₂) will be added next. Sample testing is planned for early May.

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

The EDU will serve as an engineering test bed for (1) development and validation of liquid and solid feed injector designs, (2) evaluation of baffles in the minimization of salt carryover, and (3) investigation of scale-up effects of physical characteristics of the molten salt (destruction efficiency, froth height, etc.). Information acquired from operation of the EDU will be important to the MWMF system design.

The EDU control hardware design is 90% complete, and formal drawings are in progress. Installation is in progress starting with the racks and main AC power. Approximately 80% of the PLC hardware has now been received. Delivery of the Horiba gas analyzers is expected by April 14. The EDU control requirements have been generated, and PLC and operator interface programming has begun.

The EDU support frame has been installed in B241 and anchored to the floor. Initial assembly of the vessel support frame and fit-up of the heaters are complete. Final heater wiring will start after installation of the vessel. ES&H issues associated with the design, assembly, and operation of the off-gas analyzer calibration gas system have been resolved. Preliminary design of the salt withdrawal system has been evaluated and refined. The vessel fabricator has received the Inconel material.

- **Injector Development:**

The test bench has been moved from B490 to B241. Both (8" diam. and 24" diam.) Visualization Models have been moved to B241 and bolted to the floor. Modification of the "cold" injector for testing in the test bench and the 8" Visualization Model has been completed. Construction of the EDU liquid injector has begun. Components for the EDU injector plumbing system have been ordered and received.

- **Primary Unit Design:**

Effort continued on the primary arrangement. The frame is being modified to accommodate the multicontainment zones to minimize cross contamination in the event of a spill and to provide for a salt drain and solidification units. The mounting supports were adjusted to allow the off-gas tube to exit in a straight line, and ports were added for the rupture disc and a clean-out port for the soot blower. Cooling has been added to the off-gas tube between the vessel and the soot blower to enhance the cooling of salt vapor before it reaches the bag filter.

We spent time on the "Baseline Vessel Design." There were many changes in the complete system, some of them being in the Off-Gas System, where the line size and length were changed and cooling added. Another change was the spacing between the vessels, an extra 48" were added. There are many ongoing changes.

- **Salt recycle:**

Laboratory work continued in March to characterize the processes proposed for use in Salt Recycle. Dissolution time of used MSO salt was confirmed to be rapid and relatively insensitive to particle size. The presence of water-soluble metals in used salt from the 6" MSO vessel was confirmed. These metals are corrosion products from corrosion of the vessel by the melt. We began to develop bench-scale techniques to perform NaCl and Na₂CO₃ salt separation by crystallization, and to perform the associated analyses that inexpensively and quickly monitor results of the experimental work. Separation by crystallization on surrogate salt mixtures was performed.

Design effort concentrated on a bottom penetration valve to remove the salt from the vessel and on methods of freezing the molten salt after removal. Material balance calculations were done to examine the effects of differing salt recycle performance efficiencies and differing MSO feed rates on salt process flow requirements and utility requirements.

- Industrial Participation:**

A meeting was held with our potential CRADA partner. A draft scope for the Joint Work Statement was completed. A letter of interest was received by a second potential partner.

FY95 Budget Spending profiles (\$2428K, CENRTC)

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

Significant procurement actions this month

None

Milestones and Markers

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

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

WBS Element 1.5.3 Wet Oxidation**Task Description**

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

Summary of Monthly Activities

This activity has been closed out. No FY95 activities.

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

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

*Charge is an error. This will be corrected during April.

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 (\$0K, CENRTC)

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

Significant procurement actions this month

None

Milestones and Markers

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

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

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

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

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

Summary of Monthly Activities

- The MWMF-scale advanced gas-liquid contactor for destruction of NO_x with acidic urea is scheduled to be delivered in April 1995.
- The separate enclosure in B161 for the Urea DeNO_x system is being readied.
- The experimental plan and the instrumentation and the utility requirements have been approved by LLNL Hazards Control.

FY95 Budget**Spending profiles (\$158K, CENRTC)**

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

Significant procurement actions this month

None

Milestones and Markers

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

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

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

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

Summary of Monthly Activities

- Title I design is being initiated this month, a month later than planned. The delayed start was planned to allow treatment processes to proceed far enough into Title I design to determine feed and process effluent characteristics needed for PT&S interface requirements.
- Initial interface requirements are being consolidated to update the SDR for Title I design.

FY95 Budget**Spending profiles (\$89K, CENRTC)**

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

Cost corrections in March offset expenditures, resulting in a negative cumulative cost impact.

Significant procurement actions this month

None

Milestones and Markers

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

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

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

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

Summary of Monthly Activities

- Attended the Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy "Pittcon 95." Met with vendors of a wide variety of process monitoring, off-gas monitoring, and chemical analysis instrumentation to discuss MWMF/DWTF analysis needs and potential monitoring strategies. Materials requested at the conference have begun arriving, and are being reviewed and filed.
- Received information regarding chemical measurement instrumentation currently owned by the DWTF Project, as well as apparatus proposed for future purchases. This information is being integrated with instrumentation scheduled for procurement by the MWMF for use in the MWMF/DWTF Analytical Laboratory. We are currently completing a document, to be distributed in April, which describes the DWTF process and required analytical measurements.
- Participated in FFM peer review for polymer encapsulation of salt.
- Have been requested by MSO to develop an x-ray fluorescence-based screening analysis method for measurement of Al_2O_3 , SiO_2 , and Cl^- in Na_2CO_3 salt.

FY95 Budget**Spending profiles (\$140K, CENRTC)**

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
11/95 Plan	10	9	9	9	9	11	9	10	10	9	27	18
Monthly actual	19	-2	8	8	9	9						
Plan cumulative	10	19	28	37	46	57	66	76	86	95	122	140
Actual cumulative	19	16	24	32	41	51						
Current lien	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	Complete
L162-3	Define facility off-gas monitoring requirements	Feb 95	Complete
L162-6	Define DWTF analysis requirements	Mar 95	Complete
L162-2	Define analysis tests based on process acceptance criteria	May 95	Partial
L162-5	Define MSO on-line analysis requirements	Mar 95	Complete
L162-7.1	LI&C Functional Requirements Document complete	Jul 95	
L162-7.2	LI&C System Preliminary Design review	Aug 95	
L162-7	Analytical Lab System Preliminary Design review	Aug 95	

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

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

Summary of Monthly Activities

A series of briefing sessions with the HWM water treatment design team concluded. The purposes of these sessions were (1) to implement the Memorandum of Understanding with HWM, (2) to inform the HWM design team of the MWMF's requirements, and (3) to establish a schedule for the HWM team to support Title I design. The HWM team began design work on the MWMF Water Treatment process equipment selection and specification.

FY95 Budget Spending profiles (\$126K, CENRTC)

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

Significant procurement actions this month

None

Milestones and Markers

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

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

WBS Element 1.6.4 Final Forms**Task Description**

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

Summary of Monthly Activities

- Vaporization of inorganic constituents during ceramic waste form processing: Rare-earth sulfates tend to be water soluble, and because of the temperatures at which some of them vaporize, they may have a deleterious impact on the sintering step. Inclusion of Na_3PO_4 in our formulations should alleviate both of these potential problems by precipitating the rare-earth sulfates as phosphates.
- Effect of slurry pH on the zirconolite phase distribution: Interesting microstructural changes occur over the pH = 3–5 range. We regard the observed microstructures as satisfactory but less than optimal. It seems likely that further improvements will require processing additives, not just a pH adjustment. Further work on microstructure control will be undertaken at a later time. For now, we have settled on an adjustment to pH = 3.
- Our main efforts are now aimed at determining the effect of high levels of various elements on the phase relationships, processing, and performance of the ceramic waste form. A formulation containing substantial concentrations of U, Ag, Be, Zn, and Tl together with low levels of a wide variety of other elements was developed. Specimens were fabricated without difficulty and are now being evaluated.
- The peer review of the polymer microencapsulation immobilization of salt was held on March 24. (Other aspects of Final Forms are scheduled for late April.) Issues associated with the choice of polymer type (cast thermoset vs. extruded thermoplastic) were presented. Included was an extensive discussion of design implications arising from Federal and State leach resistance including the new Universal Treatment Standards (UTS). No new issues were identified. Accordingly, the use of a cast thermosetting polymer is now regarded as definitely chosen as the baseline design for salt immobilization. Because this choice entails significant technical risk, extruded thermoplastic (polyethylene) is still maintained as a backup. A part of the backup design work will include assessment of alternate extrusion technologies. These would be technically less satisfactory than co-rotating twin-screw extrusion, but would be cheaper. Marker L164-1.3, postponed until after this review, is still incomplete but will appear in mid-April.

FY95 Budget**Spending profiles (\$399K, CENRTC)**

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

Significant procurement actions this month

None

Milestones and Markers

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

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

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

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

Summary of Monthly Activities

- The *Integrated Control System (ICS) Peer Review* was conducted on March 9, 1995. Twelve noteworthy action items were generated.
- Electrical power requirements for each of the Local I&C (LI&C) systems and the Supervisory I&C (SI&C) System have been determined and submitted to facility planners.
- Evaluation testing of the ProcessVision-to-DBMS software (Engr. Dev. Phase 2B) was continued.
- Continued testing activities for the integrated control system.
- Continued design of the engineering prototype/strawman integrated system; implementation is near complete. A much improved understanding of PLC-ProcessVision interaction has already been attained. A ProcessVision 5/40E driver bug has been uncovered—Comdale corrected it and sent us updated code.
- Initiated review activities preparatory to drafting an Inventory Tracking System functional requirements document. Another round of discussion was held with TWMS/HWM personnel.
- Continued organization of a two-day on-site workshop on Human Factors Engineering (HFE). This workshop will provide participants the fundamental concepts of HFE and Ergonomics as applied to total systems quality and performance in equipment operability, training, procedures, maintenance, and design. Special emphasis will be given to the application of HFE principles on graphical user interface (GUI) design.
- A document summarizing the results of all trade-off studies supporting I&C subsystem component selection was completed.
- Prepared a second draft of the *Functional Requirements Document for the MWMF CCTV System*.
- Continued activities to revise ME specification MEL-709-D. This specification is referenced in mechanical system specifications such as for the MSO Salt Crystallizer and SFP robot arm.
- Started the *Functional Requirements Document for the MWMF Grounding System*.

- Conducted a meeting to review/establish *Remote Operations and Control Room Vision* and requirements. Updated the control room floor plan and equipment plan to reflect the needs.
- Presented a tutorial of the Engineering Document Viewing and Distribution System to all MWMF design personnel—the system is now available for general use by system designers.
- Marker L165-2.1—*Instrumentation and Equipment Database operational*—is near completion, pending final review of the I&C Design Team scheduled for April 7.
- Completed Marker L142-1.6—*ProcessVision/Robline bilateral message handling demonstrated*.

FY95 Budget Spending profiles (\$571K, CENRTC)

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

Significant procurement actions this month
None.

Milestones and Markers

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

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

Appendix A

Milestone/Marker Log

MWMF Milestone / Marker Log			Sorted by number			For Mar. 95 Report
Number	Item	PTS	Orig. Date	Date	Status	Comments
Doc. Resp. Person: M. De Micco, A. Throop (alt.); Rev. date: 4/14/95						
X = changes in this revision						
C113-1	RD&D permit issued by DTSC	X		Apr-96		date required by DWTF schedule. Better est. after DTSC review applic.
X C113-2	Authorization to construct issued by BAAQMD	X	Oct-94	Jul-98		Schedule change as a result of permitting strategy change.
D112-1	PSAR Approved by DOE	X	Jun-94	Nov-94	deleted	facility categorized Low Hazard; DOE approval not req'd
D113-1	EA determination by DOE	X	Aug-94	Aug-95		EA draft submitted. Rev. due to MWMF/DWTF merge. Rev. EA 2/95. Aug-95 is earliest date for EA review and FONSI issue per DOE Compliance Office.
D115-1	DOE issue Project Plan	X		Jan-95	Open	No revised date available from DOE. LLNL preparing PMP w/o PP.
D121-1	Preliminary approval and funding for Preliminary Design	X	Apr-94	Jun-94	complete	delayed decision by DOE
D121-2	KD 1/2 Approval by DOE	X		Jun-94	complete	received KD-1 only
X D131-2	DOE issues KD-2	X	Jun-94	Aug-95		Delayed due to reduced funding guidance by DOE
L111-1	Develop and issue Quality Assurance Plan			Oct-93	complete	
L111-2	Develop and issue Document Control Plan			Jan-94	complete	
L111-3	Issue Design Review Procedure			Sep-94	complete	
L112-1	PSAR to DOE for Review	X	Mar-94	Dec-94	complete	delayed to include CDR information and due to DOE decision to merge MWMF & DWTF
L112-1.1	Issue PSAR Contract			Oct-93	complete	
L112-1.2	Preliminary PSAR Review			Feb-94	complete	
L113-1	Environmental Assessment (EA) submitted to DOE	X	Mar-94	Jun-94	complete	delayed to include CDR information, draft submitted
X L113-2	Submit air permit to BAAQMD	X	May-94	Apr-96		Schedule change as a result of permitting strategy change.
X 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	
X L115-1	Submit Project Management Plan (Final)	X	Jan-95	May-95	In Progress	Delayed due to unavailability of DOE Project Plan.
L115-1.1	Project Management Plan (Draft)			Oct-93	complete	
L115-10	Submit FY96 Plan	X		Oct-95		
L115-2	Select Project Engineers and Project Control Manager			Dec-93	complete	
L115-3	Submit FY94 Plan	X		Jan-94	complete	
L115-4	Initiate PTS and Monthly reporting			Jan-94	complete	
L115-5	Technology Selection and Implementation Plan	X		Feb-94	complete	
L115-6	Develop Design Basis Operations Plan			Mar-94	complete	
L115-7	Submit FY95 Plan	X	Sep-94	Dec-94	complete	delayed due to LLNL accounting changes and higher DOE priorities
X L115-8	Technology Selection and Implementation Plan, Part II		Mar-95	Apr-95		Document in TID for publication. Release expected in Apr-95.
L115-9	FY97 Project Validation			Apr-95		
L116-1	First meeting of NRP	X	Feb-95	May-95		Activity delayed while key regulatory issues relative to MSO are resolved and the detail strategy for NEPA and CEQA finalized.
L116-1.1	National Review Panel (NRP) formed		Dec-94	Apr-95	In Progress	Activity delayed while key regulatory issues relative to MSO are resolved and the detail strategy for NEPA and CEQA finalized.
L116-2	Second meeting of NRP		Aug-95	Nov-95		Activity delayed while key regulatory issues relative to MSO are resolved and the detail strategy for NEPA and CEQA finalized.
L116-2.1	Issue first public newsletter		Mar-95	Jun-95		Activity delayed while key regulatory issues relative to MSO are resolved and the detail strategy for NEPA and CEQA finalized.

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

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

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

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