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Mixed Waste Management Facility

Monthly Report
May 1994

Ron Streit

June 1994

LAWRENCE LIVERMORE NATIONAL LABORATORY
University of California • Livermore, California • 94550

MASTER

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Summary

During May, after delivering the Conceptual Design (CD) Report in April, the MWMF Project continued to support the DOE decision and planning process for the MWMF. A full-day briefing was provided for the DOE Independent Cost Verification (ICV) committee, which was chartered to review the CD Report (CDR), along with many subsequent individual meetings to review detailed cost estimates. Project options and impact information for a number of scope and funding scenarios was provided in support of the FY96 budget validation process.

The Project continues to operate under the guidance provided in February to maintain, essentially, the January spending rate. Work on high-priority and critical-path items continued to the extent possible. Key activities included the Environmental Assessment (EA), Preliminary Safety Analysis Report (PSAR), and Permitting Actions. An in-depth programmatic review of the EA was completed, and the Laboratory review and approval process was initiated. A meeting was held with State permitting officials to clarify required actions and schedule planning. Although preliminary discussions have been held previously, sufficient technical information and manpower were not available to productively move out in this area until the CDR was complete. The meeting helped firm up the structure of permit applications and identify specific actions for State, Project, and DOE representatives.

Post-CD effort continued in both the process and process-support systems for early high-leverage activities. This included the iteration of the Building 494 floor plan in preparation for beginning Title I on the Building 494 Upgrade. Although currently on hold, pending release of funds by DOE, this upgrade effort is on the critical path for the Project. Other engineering development proceeded on a slow track to accommodate reduced-funding guidance. Plans were prepared for engineering development tasks during Preliminary Design and key laboratory work was also maintained, as reported herein.

Funding for preliminary design and direction by DOE to proceed with preliminary design has not yet been received. As the following reports show, significant levels of work, milestones, and markers are being deferred. The FY94 Plan will be formally revised after a DOE decision to proceed with preliminary design. The markers and milestones in this report have therefore not been modified to reflect DOE revised-funding guidance. Revised dates are reported only where the impact can be well determined.

The following list summarizes other significant accomplishments during May.

- The Waste Analysis Plan (WAP) from the Laboratory's Hazardous Waste Management division (HWM) was reviewed, as a basis for preparing a WAP for the MWMF.
- An experimental plan for liquids separation was written.
- Silver recovery experiments continued in Mediated Electrochemical Oxidation to measure yield dependency on particle size.
- A work plan for in-house Wet Oxidation treatability tests was written. The CBD was written and reviewed by the Project.

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- Studies of ceramic waste forms using simulated residues from primary treatments continued. Preparation of mineral phase analytical standards was begun
- Extensive vendor visits to evaluate supervisory and front-end control systems were restarted. Evaluation and selection criteria were established in preparation for the purchase of system hardware and software for prototype testing. A guideline for I&C System Design Documents was also issued.
- A cost-account structure for the Project was developed.
- Requirements and options continued to be assessed for providing an integrated system to estimate, track, and report the cost, schedule, and technical elements of the Project upon KD-1 approval.
- Preliminary meetings with Laboratory procurement management were held to plan CBD and future procurement actions.

Project Financial Summary

During May, the Project continued to operate under DOE reduced-funding guidance (see February '94 Report). The imbalance in the authorized levels of OPEX and CENRTC funding is being addressed by DOE, but additional CENRTC funding has not yet been received by the Project. Thus, corrective adjustments in charges have not yet been possible. Holding accounts under WBS 1.1.5, *Program Support*, continue to be used to collect charges for future adjustment. Thus, both cost and accomplishments for affected activities are reported under WBS 1.1.5.

Direct manpower charges were well below the January rate as planned, and overall charges were down following the CD effort. However, May charges included several prior liens that were costed, documentation charges for work in support of DOE validation, and a negative corrective cost adjustment, so that trends are difficult to estimate. Nevertheless, efforts to meet DOE funding guidance while maintaining critical technical work appear to be effective.

OPEX (\$K), cumulative:

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	425	820	1231	1628	2039	2423	2539	2655	2766	2905	3044	3160
Rev. Plan**	425	820	1231	1628	2068	2508	2948	3388				
Actual	491	847	1299	1739	2232	2853	3621	4034				
Funding	680*	680	1630	1630	3103	3105	4105	4205				

CENRTC (\$K), cumulative:

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	148	273	416	593	846	1417	2154	3147	4087	5000	6332	7620
Rev. Plan**	148	273	416	593	753	913	1073	1233				
Actual	156	275	407	538	676	798	876	1073				
Funding	370*	370	470	470	870	1070	1170	1370				

* FY93 carry-over

** Revised Plan represents funding guidance through April from DOE/OAK (letter, K. King to R. Streit, received Feb. 25, 1994). OPEX rate = \$439K, CENRTC rate = \$(600-440)K = \$160K after February. Actuals are from LLNL Cost Account Reports.

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WBS Element: 1.1.1. Quality Assurance

Task Description:

Quality Assurance provides quality assurance and safeguards support for and evaluations of the MWMF Project to ensure compliance with applicable DOE regulations, and environment, safety, health, and NEPA/CEQA requirements. This effort includes development of the Project's quality assurance documentation and oversight for conformance to the approved plan.

Summary of Activities:

The QA Manager continued to manage the QA file and attend meetings in review capacity. Binders to consolidate back-up CDR cost data were prepared to support the conceptual design DOE cost verification effort.

Cost Summary: FY94 Budget: \$180K OPEX

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	9	11	11	13	15	16	17	17	17	18	18	18
Actual	11	11	8	6	3	13	10	13				

FY94 Major Procurements:

None

Key Milestones and Markers:

Item		Scheduled Date	Status
L111-1	Develop and issue Quality Assurance Plan	Oct '93	Complete
L111-2	Develop and issue Document Control Plan	Jan '94	Complete

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WBS Element: 1.1.2. PSAR

Task Description:

The PSAR provides the integration of safety input, design reviews, and safety analysis for the MWMF Preliminary Safety Analysis Report (PSAR). Safety analysis includes the analysis, generation of documentation, and documentation review and approval. The element includes the generation of the Preliminary Safety Analysis Report and follow-on analysis required prior to the generation of the Final Safety Analysis Report (FSAR). This element provides additional criticality support to resolve safety issues.

Summary of Activities:

Comments collected from review of the second draft of the PSAR were consolidated. These comments were returned to the contractor for final resolution.

Cost Summary: FY94 Budget: \$230K OPEX

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	59	57	50	31	22	11	0	0	0	0	0	0
Actual	30	9	10	2	24	58	7	164				

The May cost reflects a contract lien payment of \$125K. PSAR costs for FY94 are expected to total about \$350K instead of the \$230K originally expected. This occurs for two reasons: (1) the PSAR was started early, when the MWMF was on fast track and then subsequently delayed, so that sufficient information was not available until after the CDR (and significant rewriting was required). (2) DOE guidance concerning the level of PSAR required was uncertain. Initial DOE guidance (Duffy letter) was that all EM facilities would require a PSAR in accordance with DOE 5480.23 format. Recent guidance (early June) negates this requirement, but the PSAR has been prepared consistent with the more detailed format.

FY94 Major Procurements:

Contract for services to prepare Safety Analysis Report: \$205K

Key Milestones and Markers:

Item	Scheduled Date	Status
L112-1.1 Issue contract	Oct '93	Complete
L112-1.2 Preliminary PSAR review	Feb '94	Complete
L112-1 PSAR to DOE for review	Jul '94 ⁽¹⁾	Open
D112-1 PSAR approved by DOE	Oct '94 ⁽²⁾	Open

(1) Revised originally from March '94.

(2) Revised originally from June '94.

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WBS Element: 1.1.3. NEPA/CEQA

Task Description:

NEPA/CEQA provides for the preparation of input to the Environmental Assessment (EA) and all required follow-up documentation required for the NEPA/CEQA and necessary permitting. The effort includes preliminary evaluations, preparation of an implementation plan, preparation of technical information to support EA preparation, and comment resolution. This element prepares and coordinates approval of State, EPA, and local permits and supports public participation activities associated with the permits approvals.

Summary of Activities:

The draft EA went through final revisions and was routed for final approval prior to submittal to DOE-OAK. California Department of Toxic Substances Control representatives met with LLNL and DOE staff on May 31 to continue discussing the RD&D permitting process and permit application structure.

Cost Summary: FY94 Budget: \$290K OPEX

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	9	12	36	36	37	21	18	18	13	39	39	12
Actual	8	10	29	11	13	25	26	17				

FY94 Major Procurements:

None

Key Milestones and Markers:

Item	Scheduled Date	Status
L113-1 Submit EA to DOE	Jun '94 ⁽¹⁾	Draft Submitted
L113-2 Submit air permit application to BAAQMD	Jul '94 ⁽²⁾	Open
L113-3 Submit Research, Development & Demonstration (RD&D) permit application to DTSC	Jul '94	Open
D113-1 EA approved by DOE	Nov '94 ⁽³⁾	Open
C113-2 Authority to Construct issued by BAAQMD	Oct '94	Open

(1) Revised from March '94 to match CDR progress.

(2) Revised from May '94 to match CDR progress.

(3) Revised from August '94 to match CDR progress.

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WBS Element: 1.1.4. ES&H

Task Description:

ES&H provides for Environment, Safety, and Health representation to the MWMF Project 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. This element provides for conducting and/or monitoring safety-related analyses and the resultant documentation. Specific activities include preparing and implementing various assurance plans; performing hazard evaluations and safety assessments; participating in design reviews to ensure compliance with safety and environmental standards and regulations; preparing safety and environmental procedures; and preparing input for permit applications and other documentation required for compliance with Federal and/or State requirements.

Summary of Activities:

Members of the ES&H team have continued to attend technical meetings to consult with principal investigators and engineers on ES&H issues.

Cost Summary: FY94 Budget: \$120K OPEX

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	8	8	8	8	9	9	9	12	12	12	12	13
Actual	2	10	12	13	16	16	7	13				

Actual costs are running somewhat over the planned costs. This is due to the increased time spent reviewing the PSAR and design meetings, as well as the use of supplementary labor on the safety team. The cost for both items is expected to drop, so that costs should begin to track at or below plan values.

FY94 Major Procurements:

None

Key Milestones and Markers:

	Item	Scheduled Date	Status
L-114-1.1	Review 30% Conceptual Design	Dec '93	Complete
L-114-1.2	Review 90% Conceptual Design	Mar '94	Complete
L-114-1.3	Review 90% Preliminary Design	Sep '94	Open

WBS Element: 1.1.5. Program Support

Task Description:

Program Support provides top-level planning, control, and support of the MWMF Project's 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, Building 494 occupant relocation, and OPEX-funded technical support.

Summary of Activities:

During May, after delivering the CDR in April, the major focus of the Project was to support the DOE decision process to proceed with the MWMF Project. Project options and impact information were provided in support of the FY96 budget validation. Full-day briefings were provided for both the Project, FY96 Validation, and the DOE Independent Cost Verification (ICV) Committee, along with subsequent individual meetings to review detailed cost estimates. Essential engineering development and advanced CD work continued on a slow track; such significant common work included more-detailed equipment layouts to determine building interfaces and the preparation of engineering development plans. Other significant accomplishments by WBS include:

1.3.1 Project Management

- Completed final review of EA and PSAR.
- Met with State RD&D Permitting officials.

1.3.2 Project Control

- Developed future cost-account structure for Project.
- Continued study of requirements and options to provide an integrated system to estimate, track, and report the cost, schedule, and technical elements of the Project upon KD-1 approval.
- Held preliminary meeting with Laboratory procurement management to plan CBD and future procurement actions.

1.3.3 Technical Systems Integration

- Integrated revised floor-plan layouts and building interfaces.

1.4.1 Receiving & Shipping

- Reviewed HWM Waste Analysis Plan (WAP) as basis for MWMF WAP.

1.4.2 Solids Feed Preparation

- Developed design work packages and schedule.

1.4.3 Liquids Feed Preparation

- Prepared experimental plan for liquid/liquid separation, for work in June.

1.6.1 Process Transport & Storage

- Developed design work packages and schedule.

1.6.2 Analytical Lab

- Held discussions to define analytical test requirements (test type, number of samples, sampling frequency, etc., for each process).

1.6.3 Water Treatment

- Continued water treatment unit sizing and specification.

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Cost Summary: FY94 Budget: \$1250K OPEX

(NOTE: revised actual costs reflect revised cost data.)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	230	157	151	145	122	121	56	53	53	53	53	56
Actual	331	161	192	135	191	207	405	49				

The Project continues to operate under the February reduced-funding DOE letter guidance and with an imbalance in OPEX/CENRTC funding. Accounts under 1.1.5 are used as holding accounts for CENRTC-related work. Charges will be transferred to appropriate accounts when corrective CENRTC funds are provided by DOE. The small expense this month is due to a -\$151K cost adjustment from previous months.

Key Milestones and Markers:

Item	Scheduled Date	Status
L115-1.1 Project Management Plan (Draft)	Oct '93	Complete
L115-2 Select Project Engineers, Project Control Manager	Dec '93	Complete
L115-3 Submit FY94 Project Plan	Jan '94	Complete
L115-4 Initiate PTS and Monthly reporting	Jan '94	Complete
L115-5 Technology Selection and Implementation Plan, Part I: Primary Processes	Feb '94	Complete
L115-6 Develop Design Basis Operations Plan	Mar '94	Complete
L115-1 Project Management Plan (Final)	Apr '94 ⁽¹⁾	On Hold
L115-7 Submit FY95 Project Plan (OPEX)	Sep '94	Open

⁽¹⁾ Milestone to be delayed pending DOE decision on the MWMF project.

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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 Advisory Committee, a Community Newsletter and preparation and coordination of press releases and community tours.

Summary of Activities:

This activity is on hold by the Project due to DOE uncertainties.

Cost Summary: FY94 Budget: \$150K OPEX

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	0	0	5	14	16	16	16	16	16	17	17	17
Actual	0	1	0	4	0	1	1	0				

FY94 Major Procurements:

Contracted support for Public Participation activities

Key Milestones and Markers:

Item	Scheduled Date ⁽¹⁾	Status
L116-1.1 Form National Advisory Committee (NAC)	Feb '94	On Hold
L116-2.1 Issue first public newsletter	Mar '94	On Hold
L116-1.2 First meeting of NAC	Mar '94	On Hold
L116-1.3 Receive comments on CDR Draft from NAC	Apr '94	On Hold
L116-2.2 Issue second newsletter	Jun '94	On Hold
L116-1.4 Second meeting of NAC	Jul '94	On Hold
L116-2.3 Issue third newsletter	Sep '94	On Hold

⁽¹⁾ All activities on hold to accommodate reduced DOE funding guidance. Dates will be revised upon longer-term DOE funding guidance.

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 Activities:

Following issuing the CDR in April, this activity supported the DOE Independent Cost Verification (ICV) effort by providing a detailed, full-day briefing to the ICV committee and subsequently reviewing detailed estimates on an individual basis. DOE Milestone D121-1, to issue preliminary funding for preliminary design based on the 90% briefing, remains outstanding.

Cost Summary: FY94 Budget: \$940K OPEX

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	110	150	150	150	190	190	0	0	0	0	0	0
Actual	111	154	198	268	250	303	313	157				

Continued charges in April and May reflect, in part, continued work to issue the CDR and to support the ICV. Significant portions reflect mischarges due to lack of CENRTC accounts, which will be adjusted when necessary CENRTC funds are received. This account will subsequently be closed to further charges.

FY94 Major Procurements:

Contracted services for CDR support: \$7K

Key Milestones and Markers:

Item	Scheduled Date	Status
L121-1.1 Initiate Point Design Reviews	Oct '93	Complete
L121-1.2 Complete Point Design Reviews	Nov '93	Complete
L121-1 30% Conceptual Design Review	Dec '93	Complete
L121-2 90% Conceptual Design Review	Mar '94	Complete
L121-3 Issue Conceptual Design Report	Apr '94	Complete
D121-1 Preliminary Approval and Funding to proceed into Preliminary Design	Apr '94	Preliminary Approval Received (No funding)
D121-2 KD-1/2 approved by DOE	Jun '94	Open

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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 Activities:

No activities are scheduled for this WBS element for FY94.

Cost Summary: FY94 Budget: \$0K OPEX

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	0	0	0	0	0	0	0	0	0	0	0	0
Actual	0	0	0	0	0	0	0	0				

FY94 Major Procurements:

None

Key Milestones and Markers:

Item	Scheduled Date	Status
None		

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 Operational Test Procedures in each of the technology areas including Operational Readiness Reviews; (3) technical support for the preparation of Operational Safety Requirements (OSR) and Facility Safety Requirements (FSR), 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 (e.g., utilities, power) during construction, testing, and activation of the MWMF.

Summary of Activities:

No activities are scheduled for this WBS element for FY94.

Cost Summary: FY94 Budget: \$0K OPEX

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	0	0	0	0	0	0	0	0	0	0	0	0
Actual	0	0	0	0	0	0	0	0				

FY94 Major Procurements:

None

Key Milestones and Markers:

Item	Scheduled Date	Status
None		

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WBS Element: 1.3.1. Project Management

Task Description:

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

Summary of Activities:

Due to the reduced-funding guidance and imbalance of OPEX/CENRTC funds, only essential activities are being completed. Activities are reported under WBS 1.1.5, *Program Support*.

Cost Summary: FY94 Budget: \$300K CENRTC

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	0	0	0	0	0	0	50	50	50	50	50	50
Actual	0	0	0	0	0	0	0	0				

Charges are shown under 1.1.5, and will be adjusted when requested CENRTC funding is received from DOE.

FY94 Major Procurements:

Service contract to SAIC for Project support and independent technical and administrative reviews.

Key Milestones and Markers:

Item	Scheduled Date ⁽¹⁾	Status
L131-1.1 In-house Point Design Review	Jun '94	Open
L131-1 90% Preliminary Design Review ⁽²⁾	Sep '94	Open
L131-2 Submit FY95 Project Plan (CENRTC)	Sep '94	Open

⁽¹⁾ Milestones on hold pending funding resolution by DOE.

⁽²⁾ Tied to April 1st KD-1/2 decision approval from DOE.

WBS Element: 1.3.2. Project Control

Task Description:

Project Control provides for the Project integration, configuration management, cost and schedule control, 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 Activities:

Due to the reduced-funding guidance and imbalance of OPEX/CENRTC funds, only essential activities are being completed. Project Control activities are reported under WBS 1.1.5, *Program Support*.

Cost Summary: FY94 Budget: \$300K CENRTC

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	0	0	0	0	28	34	39	39	44	38	39	39
Actual	0	0	0	0	0	0	0	0				

Charges are shown under 1.1.5, and will be adjusted when requested CENRTC funding is received from DOE.

FY94 Major Procurements:

None

Key Milestones and Markers:

	Item	Scheduled Date ⁽¹⁾	Status ⁽¹⁾
L132-2.1	Prepare Configuration Control Plan	May '94 ⁽²⁾	In Progress
L132-2.2	Prepare Design Review Procedure	Mar '94	On Hold
L132-1	Implement cost planning/tracking systems	June '94	Open
L132-2	Implement technical baseline control system	May '94	Open
L132-3	Implement schedule control/tracking system	Aug '94	Open

(1) All except essential activities deferred to accommodate reduced DOE funding guidance. Dates will be revised upon longer-term DOE funding guidance.

(2) Revised from February '94.

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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 also includes the responsibility for assuring that the systems aspects of the overall processes are adequately addressed in the integrated design. Includes System Engineering Management Plan and System Design Requirements coordination. Specific topics include the integration of waste-treatment processes and facility, risk assessment, accountability, safety, radiation exposure, and availability.

Summary of Activities:

Due to the reduced-funding guidance and imbalance of OPEX/CENRTC funds, only essential activities are being completed. Systems integration activities are reported under 1.1.5, *Program Support*.

Cost Summary: FY94 Budget: \$300K CENRTC

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	0	0	0	0	0	0	50	50	50	50	50	50
Actual	0	0	0	0	0	0	0	0				

Charges are shown under 1.1.5, and will be adjusted when requested CENRTC funding is received from DOE.

FY94 Major Procurements:

None

Key Milestones and Markers:

Item		Scheduled Date	Status
L133-1.1	Draft System Engineering Management Plan	Sep '94	Open

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

The principal objective of the Receiving and Shipping 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 Activities:

Due to the reduced-funding guidance and imbalance of OPEX/CENRTC funds, only essential activities are being completed. Activities are reported under WBS 1.1.5, *Program Support*.

Cost Summary: FY94 Budget: \$200K CENRTC

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	0	0	0	0	0	20	30	30	30	30	30	30
Actual	0	0	0	0	0	0	0	0				

Charges are shown under 1.1.5, and will be adjusted when requested CENRTC funding is received from DOE.

FY94 Major Procurements:

None

Key Milestones and Markers:

	Item	Scheduled Date ⁽¹⁾	Status
L141-1.1	Complete pilot characterization studies	Jun '94	Open
L141-1.2	Identify equipment and define floor plan	Sep '94	Open
L141-1	90% Preliminary Design Review	Sep '94	Open

(1) All except essential activities deferred to accommodate reduced DOE funding guidance. Dates will be revised upon DOE budget decision and longer-term DOE funding guidance.

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WBS Element: 1.4.2. Solids Feed Preparation

Task Description:

The principal objective of the Solids Feed Preparation 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. Solids Feed Preparation provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, installation of Solids Feed Preparation equipment, Title III inspection, and acceptance test procedures (ATP). Solids Feed Preparation includes both solids feed preparation equipment and systems integration.

Summary of Activities:

Due to reduced-funding guidance and imbalance of OPEX/CENRTC funds, only essential activities are being completed. Activities are reported under WBS 1.1.5, *Program Support*.

Cost Summary: FY94 Budget: \$600K CENRTC

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	0	0	0	0	0	130	70	90	90	70	70	80
Actual	0	0	0	0	0	0	0	0				

Charges are shown under 1.1.5, and will be adjusted when requested CENRTC funding is received from DOE.

FY94 Major Procurements:

Support contracts to NWC sites: \$100K

Mechanical segregation test equipment: \$100K

Prototype equipment for waste handling evaluations: \$100K

Key Milestones and Markers:

	Item	Scheduled Date ⁽¹⁾	Status
L142-1.1	Define surrogate feeds	May '94	Open
L142-1.2	Identify initial suite of characterization equipment	Jun '94	Open
L142-1.3	Complete validation of characterization, isolation and segregation methods	Sep '94	Open
L142-1.4	Complete preliminary operator control station design	Sep '94	Open
L142-1	90% Preliminary Design Review	Sep '94	Open

⁽¹⁾ All except essential activities deferred to accommodate reduced DOE funding guidance. Dates will be revised upon DOE budget decision and longer-term DOE funding guidance.

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

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

Summary of Activities:

We proceeded with the overall-Project effort to finalize the B494 floor-plan layout. An experimental plan was drafted for liquids/liquids separation work to be initiated during June. Other activities have been delayed awaiting DOE funding to proceed.

Cost Summary: FY94 Budget: \$400K CENRTC

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	0	0	0	0	0	75	75	50	50	50	50	50
Actual	12	5	1	0	1	8	11	18				

FY94 Major Procurements:

Support contracts to NWC sites: \$50K

Liquid/liquid and liquid/solid separation test equipment: \$80K

Key Milestones and Markers:

	Item	Scheduled Date ⁽¹⁾	Status
L143-1.1	Define surrogate feeds	May '94	Open
L143-1.2	Finalize Liquids Feed Prep general arrangement plan	Jul '94	Open
L143-1.3	Complete validation of liquid/liquid and liquid/solid separation methods	Sep '94	Open
L143-1	90% Preliminary Design Review	Sep '94	Open

⁽¹⁾ All except essential activities deferred to accommodate reduced DOE funding guidance. Dates will be revised upon longer-term DOE funding guidance.

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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 Project 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 Activities:

Experiments continued on the hydroxide-peroxide process to recover silver from silver chloride. Test results indicate that Ag/AgO may coat the AgCl particles, thus interrupting the reaction and resulting in lower yields of 60 to 80%; this explains earlier observations. Preliminary experiments also indicate that smaller particles—typical of those produced during destruction of halogenated organics in MEO—may be less affected, which will result in higher yields. Experiments are planned to continue.

During set-up for steady-state flow and chemistry balance tests, unusual liquid level fluctuations in the turbo-aerator and catholyte reservoir were observed. Tests are currently being conducted to determine the nature and cause of these fluctuations.

A layout of the MEO equipment as intended to be installed in B494 was produced. A review by the MWMF Project engineering team determined the layout was efficient and that the current MEO space allocation should be maintained.

Instrumentation and control planning for the MEO installation in the MWMF was initiated. The object is to produce Process and Instrumentation diagrams (P&IDs) for the preliminary design.

Cost Summary: FY94 Budget: \$950K CENRTC

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	67	67	67	69	70	70	90	90	90	90	90	90
Actual	57	56	70	54	47	45	24	73				

FY94 Major Procurements:

None

Key Milestones and Markers:

Item		Scheduled Date ⁽¹⁾	Status
L151-1.1	Complete tests on turbo-aerator for nitrous-acid conversion	Aug '94 ⁽²⁾	In Progress
L151-1.2	Initiate steady-state flow, chemistry balance tests	Jun '94	Open
L151-2.1	Preliminary Process Flow Diagram	Jun '94	Open
L151-1.3	Initiate instrumentation, control system tests	Jul '94	Open
L151-2.2	Preliminary Equipment Layout	Sep '94	Open
L151-1.4	Complete tests for silver recovery	Sep '94	In Progress
L151-1	Complete engineering characterization tests	Sep '94	Open
L151-2	90% Preliminary Design Review	Sep '94	Open

⁽¹⁾ Milestones have been delayed due to reduced DOE funding guidance.

⁽²⁾ Delayed from May '94 due to unexpected test results requiring further study.

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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 Project 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 Activities:

MSO spatial and floor plan arrangements were reevaluated and revised. Injector seal evaluation was initiated. As noted below, there have been delays due to reduced resources. The Commerce Business Daily (CBD) advertisement experienced some delays in procurement, but is expected to be released during June.

Cost Summary: FY94 Budget: \$1260K CENRTC

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	29	15	17	22	25	24	34	34	56	83	431	490
Actual	16	12	6	18	22	27	15	22				

FY94 Major Procurements:

Contract for MSO system definitive design: \$750K

Key Milestones and Markers:

Item		Scheduled Date ⁽¹⁾	Status
L152-1	Complete bench-scale rubber destruction tests	Dec '93	Complete
L152-2.1	Advertise in the CBD	Jun '94 ⁽²⁾	In Progress
L152-2.2	Complete specification	May '94	In Progress
L152-3.1	Complete Preliminary Process Flow Diagram	Jun '94	Open
L152-2.3	Select industrial partner	Jul '94	Open
L152-2	Award contract	Aug '94	Open
L152-3.2	Initiate Preliminary Design	Aug '94	Open
L152-3	30% Preliminary Design Review	Sep '94	Open

⁽¹⁾ Milestones have been delayed due to reduced DOE funding guidance.

⁽²⁾ Revised from April '94.

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 Project 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 Activities:

The overall work remains on a slow track due to reduced-funding guidance; key work is done on a priority basis. Principal activities included facility space allocation evaluation and equipment location planning.

In-house treatability tests to support engineering development will proceed in synergy with a related technology development Project. During the report period, a work plan for the first series of in-house treatability tests was written and in-house resources were identified to begin this work. However, initiation of this work has been postponed.

Also, steps to begin the procurement of treatability tests were taken. Text for a CBD advertisement was finalized for program review. The purpose of the CBD is to identify firms that have the needed capabilities and are interested in conducting laboratory-scale treatability tests. Upon receipt of responses to the CBD, the exact approach to contracting for such tests will be determined, taking into account the number and qualifications of the responding companies and the long-term procurement strategy; that strategy's goal is to procure the major Wet Oxidation system equipment from a vendor with demonstrated wet oxidation pilot-plant design, construction, and commissioning experience.

Cost Summary: FY94 Budget: \$560K CENRTC

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	7	7	7	7	16	32	76	56	60	67	165	60
Actual	21	8	5	10	6	7	1	7				

FY94 Major Procurements:

Treatability Tests, if commissioned from vendor (incl. analytical costs): \$90K

Dispersion test equipment: \$30K

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Key Milestones and Markers:

Item	Scheduled Date ⁽¹⁾	Status
L153-1.1 Advertise in the CBD	Apr '94 ⁽²⁾	In Progress
L153-2.1 Complete dispersion system test and design	May '94	In Progress
L153-2.2 Complete preliminary treatability tests	Jun '94	Open
L153-1.2 Issue RFQ for treatment unit w/completed specification	Jun '94	Open
L153-2.3 Complete preliminary Process Flow Diagram	Jun '94	Open
L153-2.4 Complete preliminary P&ID for Support System	Jul '94	Open
L153-1 Award contract	Sep '94	Open
L153-2 30% Preliminary Design Review	Sep '94	Open

(1) All except essential activities deferred to accommodate reduced DOE funding guidance. Dates will be revised upon longer-term DOE funding guidance.

(2) To be revised pending DOE budget decision.

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 Project 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 Activities:

The overall work remains on a slow track due to reduced-funding guidance; key work is done on a priority basis. Principal activities included facility space-allocation evaluation and equipment-location planning.

Cost Summary: FY94 Budget: \$300K CENRTC

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	2	2	2	5	6	12	26	33	99	42	36	35
Actual	3	3	2	-2	0	0	0	5				

FY94 Major Procurements:

Treatability Tests, commissioned from vendor (including analytical costs): \$55K

Key Milestones and Markers:

Item	Scheduled Date ⁽¹⁾	Status
L154-1 Complete preliminary treatability tests	Jul '94	Open
L154-2.1 UVP Process Flow Diagram	Jul '94	Open
L154-2.2 Complete piping and instrumentation drawings for UVP support system	Jul '94	Open
L154-2.3 UVP equipment layout	Aug '94	Open
L154-2 UVP 90% Preliminary Design Review	Sep '94	Open

(1) All except essential activities deferred to accommodate reduced DOE funding guidance. Dates will be revised upon longer-term DOE funding guidance.

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WBS Element: 1.5.5. Experimental Off-Gas

Task Description:

The objective of the Experimental Off-Gas (XOG) treatment 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, conversion of NO_x to nitrogen in aqueous urea, and use of cleanable metal HEPA filters. The XOG Project element provides the management, system analysis and support, design (Title I, II, III) engineering, procurement, and installation of XOG equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities. The XOG will be backed by the Process off-gas system representing best available control technology (BACT).

Summary of Activities:

This work remains on a slow track due to reduced-funding guidance. Turbo-aerator gas capacity is fully predictable in the absence of wall effects, i.e., in large enough tanks. It was determined that the internal gas circulation capacity can be reduced by a factor of 2 due to wall effects in the small tanks. The minimum ratio of the internal gas circulation rate to the overall gas throughput rate (gas recirculation factor) necessary to maintain a specified gas-liquid contactor efficiency is, therefore, a key scale-up parameter. This factor needs to be determined experimentally for an individual gas-liquid system. The appropriate series of experiments for acidic urea DeNO_x using the existing bench-scale MEO gas-liquid contactor was planned and initiated in May and will continue into June.

Cost Summary: FY94 Budget: \$250K CENRTC

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	5	5	5	12	22	32	28	29	30	29	27	26
Actual	9	7	4	2	4	-1	0	8				

FY94 Major Procurements:

Catalyst blocks: \$6K

Gas/liquid contactor: \$13K

Gas analyzer lease: \$25K

Key Milestones and Markers:

Item		Scheduled Date ⁽¹⁾	Status
L155-1.1	Fabricate prototype gas-liquid contactor for acidic urea NO _x destruction	Jun '94	Open
L155-1.2	Complete tests on urea and SCR DeNO _x	Jul '94	Open
L155-1	Complete engineering characterization tests	Jul '94	Open
L155-2.1	Initiate instrumentation and control system test	Aug '94	Open
L154-2.2	Preliminary Equipment Layout	Sep '94	Open
L155-2	90% Preliminary Design Review	Sep '94	Open

⁽¹⁾ All except essential activities deferred to accommodate reduced DOE funding guidance. Dates will be revised upon DOE budget decision and longer-term DOE funding guidance.

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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 Activities:

Due to the reduced-funding guidance and imbalance of OPEX/CENRTC funds, only essential activities are being completed. Activities are reported under WBS 1.1.5, *Program Support*.

Cost Summary: FY94 Budget: \$250K CENRTC

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	0	0	0	0	0	25	30	55	55	35	25	25
Actual	0	0	0	0	0	0	0	0				

Charges are shown under 1.1.5, and will be adjusted when requested CENRTC funding is received from DOE.

FY94 Major Procurements:

Equipment for material transport interface development: \$75K

Key Milestones and Markers:

	Item	Scheduled Date ⁽¹⁾	Status
L161-1.1	Select standard transport container designs	Jun '94	Open
L161-1.2	Finalize transport handling capacity	Jul '94	Open
L161-1.3	Finalize transport equipment selection	Aug '94	Open
L161-1.4	Complete validation of bagless interface	Sep '94	Open
L161-1	60% Preliminary Design Review	Sep '94	Open

⁽¹⁾ All except essential activities deferred to accommodate reduced DOE funding guidance. Dates be revised upon DOE budget decision and longer-term DOE funding guidance.

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WBS Element: 1.6.2. Analytical Laboratory

Task Description:

The principal objective of the Analytical Laboratory is to provide analysis for process control, material control, and regulatory requirements. Analytical Laboratory 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 Laboratory includes Analytical Laboratory Equipment, Local Process I&C, and Process Off-Gas.

Summary of Activities:

Due to the reduced-funding guidance and imbalance of OPEX/CENRTC funds, only essential activities are being completed. Activities are reported under WBS 1.1.5, *Program Support*.

Cost Summary: FY94 Budget: \$50K CENRTC

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	0	0	0	0	0	7	7	7	7	7	7	8
Actual	0	0	0	0	0	0	0	0				

Charges are shown under 1.1.5, and will be adjusted when requested CENRTC funding is received from DOE.

Major Procurements:

None

Key Milestones and Markers:

As part of the CDR activities, the title and description for this WBS element was revised from "Analytical Laboratory Transport and Storage" to better reflect this Project work element. Milestones and markers will be revised to reflect detailed tasks when the MWMF Project is authorized.

	Item	Scheduled Date	Status
L162-1.1	Select standard transport container designs	Jun '94	Open
L162-1.2	Finalize transport handling capacity	Jun '94	Open
L162-1.3	Finalize transport equipment selection	Aug '94	Open
L162-1	90% Preliminary Design Review	Sep '94	Open

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WBS Element: 1.6.3. Water Treatment

Task Description:

The principal objectives of Water Treatment are to manage aqueous streams to meet discharge requirements and address future waste water management regulations that would affect an operating mixed waste treatment facility. The Water Treatment Project element provides the management, system analysis and support, design (Title I, II, III), engineering, procurement, and installation of the Water Treatment equipment, Title III inspection, and acceptance test procedures (ATP) covering both equipment and system integration activities.

Summary of Activities:

Due to the reduced-funding guidance and imbalance of OPEX/CENRTC funds, only essential activities are being completed. Activities are reported under WBS 1.1.5, *Program Support*.

Cost Summary: FY94 Budget: \$150K CENRTC

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	0	0	0	0	0	11	11	21	25	23	31	28
Actual	0	0	0	0	0	0	0	0				

Charges are shown under 1.1.5, and will be adjusted when requested CENRTC funding is received from DOE.

FY94 Major Procurements:

None for this reporting period.

Key Milestones and Markers:

		Scheduled	
Item		Date ⁽¹⁾	Status
L163-1	Complete Water Treatment Process Flow Diagram	Jun '94	Open
L163-2.1	Complete P& ID for Water Treatment	Jul '94	Open
L163-2.2	Complete Tanks and Water Treatment units layout	Aug '94	Open
L163-2	90% Preliminary Design Review	Sep '94	Open

⁽¹⁾ All except essential activities have been deferred to accommodate reduced DOE funding guidance. Dates will be revised upon longer-term DOE funding guidance.

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WBS Element: 1.6.4. Final Forms

Task Description:

The Final Forms task will immobilize the solid residues from the primary treatment processes as solid waste forms. Final Forms will also condition the wastes resulting from secondary support processes that are integral to the primary treatment processes. The waste forms types are (1) ceramics for ash, (2) thermosetting-polymer encapsulation for salt, and (3) sulfur-polymer cement for volatiles.

Summary of Activities:

Studies of ceramic waste forms simulating residues from the primary treatments are continuing. Mineral-phase analytical standards are being prepared. Analysis of specimens is being delayed by equipment problems of support organizations. Equipment selection is proceeding. Sintering surrogate waste-form pellets heaped in a crucible, rather than as a single layer on a tray, was successful (no sticking or breakage). It is therefore likely that an accessory tray loader for the pellet press (~\$60K) will not be needed.

Cost Summary: FY94 Budget: \$550K CENRTC

(NOTE: revised actual costs reflect revised cost data.)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	18	9	25	27	31	29	31	44	114	109	61	52
Actual	18	9	19	38	36	21	20	40				

FY94 Major Procurements:

Polymer immobilization evaluation for NaCl wastes: \$20K

Blender/granular (trial unit): \$20K

Furnace (trial unit): \$20K

Rotary calciner (trial unit): \$20K

Key Milestones and Markers:

Item	Scheduled Date	Status
L164-1.1 Complete preliminary process flow diagram	Jul '94	Complete
L164-1.2 Complete preliminary equipment layout	Aug '94	Complete
L164-1.1 Complete preliminary process parameters for ceramic forms	Sep '94	In Progress
L164-1 90% Preliminary Design Review	Sep '94	Open
L164-2 Complete NaCl encapsulation evaluation	Sep '94	Proposal in hand

WBS Element: 1.6.5. Supervisory Instrumentation and Control

Task Description:

Instrumentation and Control (I&C) systems will provide and integrate controls to develop, 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 Central Monitoring and Control, Safety Control Systems, Standard Process I&C, Analytical Laboratory I&C, and intercom communication, surveillance CCTV, and telepresence systems.

Summary of Activities:

- The evaluation of SCADA (Supervisory Control and Data Acquisition process control environments) systems and FEPs (front-end-processors) was revived as the primary focus of activity in May. Second-round vendor visits were conducted for InTouch/WonderWare, CIM-21/ISI, Wintelligent/ICOM, Process Vision/Comdale, FactoryLink/US Data, RTAP/Hewlett-Packard, PLC-5/Allen-Bradley and Simatic-TI545/Siemens-TI. Installation visits were made to Chevron Oil in Richmond and Pipeline Systems, Inc. in Walnut Creek. Evaluation criteria and selection weighting factors have been established—performance ranking is in progress. This evaluation and selection process will be concluded in June, at which time we will be prepared to purchase system hardware and software to conduct Engineering Development rapid-prototype testing.
- Discussions with Pipeline Systems, Inc. also included dialogue regarding their capabilities and participation as a third-party control system integrator.
- The MWMF—*Guideline for the Preparation of I&C System Design Documents* document was completed and issued.
- The MWMF Instrumentation and Equipment Database is in the implementation phase, and will be released in June for use by MWMF system designers and engineers as they begin Title I design.

Cost Summary: FY94 Budget: \$1200K CENRTC

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Plan	20	20	20	35	55	70	90	315	90	140	170	175
Actual	19	21	25	11	22	17	6	32				

FY94 Major Procurements:

Process Control System FEP hardware/software, fast prototype: \$45K

Supervisory Control System hardware/software, fast prototype components: \$135K

Handling system open architecture controller, fast prototype components: \$30K

Telerobotics platform, fast prototype components: \$60K

Teleoperator controller, fast prototype components: \$60K

Key Milestones and Markers:

Item	Scheduled Date ⁽¹⁾	Status
L165-1.1 Complete general arrangement plan	Mar '94	Complete
L165-1.2 Select process Control System FEP hardware, software	Apr '94	In Progress
L165-1.3 Select supervisory Control System hardware, software	Apr '94	In Progress
L165-1.4 Select Handling System's open architecture controller	Jul '94	Open
L165-1.5 Select Analytical Laboratory LIMS	Jul '94	Open
L165-1.6 Select telerobotics platform	Aug '94	Open
L165-1.7 Select teleoperator controller	Sep '94	Open
L165-1 90% Preliminary Design Review	Sep '94	Open

(1) All except essential activities have been deferred to accommodate reduced DOE funding guidance. Dates will be revised upon longer-term DOE funding guidance.

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