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Final

**Meeting Minutes Transmittal/Approval**  
**Unit Manager's Meeting: 100 Aggregate Area/100 Area Operable Units**  
**2440 Stevens Center, Room 1200, Richland, Washington**  
**March 31, 1994**

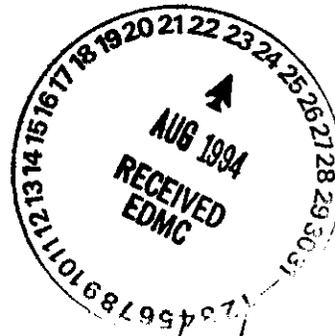
FROM/APPROVAL: *Eric D Goller* Date 5/26/94  
 Eric D. Goller, 100 Area Unit Manager, RL (A5-19)

APPROVAL: *Walter W. Doyle (For)* Date 5-26-94  
 Jack W. Donnelly, 100 Aggregate Area Unit Manager, WA Department of Ecology

APPROVAL: *Dennis Faulk* Date 5-26-94  
 Dennis Faulk, 100 Aggregate Area Unit Manager, EPA (B5-01)

Meeting Minutes are attached. Minutes are comprised of the following:

- Attachment #1 - Meeting Summary
- Attachment #2 - Attendance Record
- Attachment #3 - Agenda
- Attachment #4 - Action Item Status List
- Attachment #5 - March Unit Manager's Meeting 100 Area Status Package
- Attachment #6 - Codisposal Treatability Test Plan & Vitrification Crucible Study
- Attachment #7 - 100 Area Soil Washing Tests



Prepared by: *Kay Kimmel* Date: 5/25/94  
 Kay Kimmel, Bob Scheck GSSC (B1-42)

Concurrence by: *Bob Henckel* Date: 5/26/94  
 Bob Henckel, WHC Coordinator (H6-02)

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**Attachment #1  
Meeting and Summary of Commitments and Agreements**

**Unit Manager's Meeting: 100 Aggregate Area/100 Area Operable Units  
March 31, 1994**

1. **SIGNING OF THE FEBRUARY 100 AREA UNIT MANAGER'S MEETING MINUTES -**  
Minutes were reviewed and approved with no changes.
2. **ACTION ITEM UPDATE: (See Attachment 4 for complete status, items listed below indicate the update to Action Items made during the meeting):**

1AAMS.15 No additional information.  
1AAMS.16 No additional information.  
1AAMS.19 No additional information.

3. **NEW ACTION ITEMS:**

No new action items were initiated.

4. **100 AREA ACTIVITIES:**

**100 Area Status**

- Operable Unit Status: Attachment #5 was provided for general information on the 100 Areas Operable Units.
- 100-DR-1 Executive Summary: Ted Wooley led a discussion on the language and proposed text for the executive summary of the 100-DR-1 LFI. The Tri-Parties have agreed to specific changes; Ecology requested these changes be incorporated in the latest revision of the document.
- 100-HR-1 Milestone Letter from Ecology - The Milestone Letter discusses disposition of the 500 cubic yards of soil retained in the Terra-Stor structure. RL would like to dispose of the soil in a manner that will provide a benefit, without the limitations imposed by a milestone. RL indicated that since the soil is well characterized, has known contaminant levels, and is a known quantity, it considers this soil as an asset and would like to use the soil for other programs as they are defined.

**100 Area Treatability Studies**

- Overview of Co-Disposal Test Plan - John Ludowise provided an overview of the Codisposal Treatability Test Plan and the Vitrification Crucible Study (see Attachment #6). The intent is to use this technology to stabilize areas such as burial boxes or buried pipelines using stabilized waste matter from other sites. Ecology suggested that within the ERDF CAMU there would be no legal ramifications for codisposal and that ERDF could incorporate stabilization and solidification in its design. However, in using this waste outside ERDF, there may be disposal restrictions.

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- 118-B-1 Burial Ground Status: Jil Frain provided a brief summary of the objectives for this treatability study. She indicated the scoping activities were completed as scheduled on February 15. Subsequently, two additional objectives concerning waste packaging and soil/waste interface are being considered for addition to the test plan. The work will support the development of the Proposed Plan and ROD. The test plan is tentatively scheduled to be issued on May 31. Excavation would begin on August 31, on schedule. A concurrent RL and Regulator review of the test plan may be necessary in order to maintain the schedule.
- Status of Soil Washing Treatability Test: Jim Field provided the status of the soil washing activities (see Attachment #7). He indicated a white paper concerning the use of field XRF and other analytical strategies is currently under review by RL and will be provided to the regulators. A meeting to resolve regulator comments on DOE/RL-93-107 Draft A will be moved from 4/11/94 to the afternoon of 4/13/94. A specific discussion of Target Performance Levels (TPLs) is tentatively scheduled for April 6. Ted Wooley will request the Department of Health to attend these discussions. Bob Scheck, Joan Woolard and Ted Wooley will meet April 1 at 1:00 to discuss Ecology's requirements concerning the TPLs and prepare an agenda for the April 6 meeting.

J. Field indicated that Requests For Proposal went out for bid on seven separate packages for equipment on the treatability test. He noted that proposals were not returned on some packages and these are now being processed for re-bid.

## 5. INFORMATION ITEMS:

- Ecology would like an update on Columbia River activities in future meetings.
- EPA requested official transmittal of the 100 Area Feasibility Study Phases 1 and 2 within the next ten days along with the approved 100-BC-2 Work Plan. RL indicated they will provide the requested transmittal letter.

## 6. NEXT MEETINGS: The next meetings are scheduled for April 27 and 28, May 25 and 26, June 29 and 30, 1994.

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**Attachment #3  
Agenda**

**Unit Manager's Meeting: 100 Aggregate Area/100 Area Operable Units  
March 31, 1994**

**100 Area General Discussions**

- \* 100 Area Status - R. Henckel
  - DR-1 Executive Summary
  - HR-1 Milestone Letter from Ecology
  
- \* 100 Area Treatability Studies
  - Status of Soil Washing Treatability Test - J. Field
  - Overview of Codisposal Test Plan - J. Ludowise
  - 118-B-1 Burial Ground - Jil Frain

Operable Unit Status - Questions - N. Naiknimbalkar/J. Ayres/  
D. Biggerstaff/A. Krug/J. Roberts

Action Item Status

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## Attachment #4

**Unit Manager's Meeting: 100 Aggregate Area/100 Area Operable Units  
March 31, 1994**

## Action Item Status List

ITEM NO.	ACTION	STATUS
1AAMS.15	Provide response to April 2 EPA letter concerning river seeps. Action: Eric Goller (RL) 7/29/92.	Open (7/29/92). In DOE for transmittal (8/26/92). Letter is pending (03/31/94).
1AAMS.16	DOE should transmit Revision 1 of M-30-01.	Open (7/29/92). In DOE for transmittal (8/26/92). Letter is pending (03/31/94).
1AAMS.19	Meet, before the end of the month, with RL, EPA and Ecology concerned parties to discuss ERDF waste acceptance criteria and expected volumes. Action: Bryan Foley	Open 02/23/94.

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**100 AREA UNIT MANAGERS MEETING**

**MARCH, 1994**

**STATUS PACKAGE**

100  
AREA  
UNIT  
MANAGERS  
MEETING  
MARCH  
1994  
STATUS  
PACKAGE

## 100 AREA TREATABILITY TEST STATUS

Soil Washing

Data received to date indicates that after being rinsed with water, rocks from the 116-F-4 crib still contain Cs-137 activity above soil washing test performance levels. As a result, additional tests are being conducted to evaluate chemical extraction and/or grinding processes to treat the rocks. 100-F centrifugal barrel grinding soil tests are in progress. All tests are expected to be completed by mid March. A draft report for review by RL is scheduled to be completed by April 30, 1994.

A meeting was held on March 2, 1994 to discuss scope and objectives for the 100-DR-1 Soil Washing Test. It is expected that an NPL agreement form will be prepared and submitted at the UMM for RL and regulator concurrence with meeting minutes.

Purchase requisitions are being processed and procedures developed for 100-DR-1 pilot scale soil washing tests. Changes and additions to the test plan (DOE/RL-92-51) will be identified in the procedures, which will be reviewed by RL and the regulators. A draft of the procedures is scheduled to be submitted to RL by the end of April 22, 1994.

Co-Disposal

The test plan was prepared and transmitted to DOE-RL for review and comment. Comments are expected by the middle of March.

Ex Situ Vitrification

## PNL Crucible Tests

Tests conducted by PNL demonstrated the applicability of vitrification to the soil washing fines and provided data on the performance of actual, vitrified soil washing fines. A report detailing the results of these vitrification studies is being reviewed by DOE-RL and should be available by April.

## Minimum Additive Waste Stabilization (MAWS) Program

Under the Minimum Additive Waste Stabilization (MAWS) Program Approximately 30 kg of soil fines excavated from the 116-F-4 trench were shipped to the Vitreous State Laboratory (VSL) located at the Catholic University of America (CUA) in early January. Five crucible melts have been completed and the glass is undergoing leaching analysis. Seven to 12 more crucible melts will be performed depending on the results of the leach testing.

## Vortec Combustion and Melting System

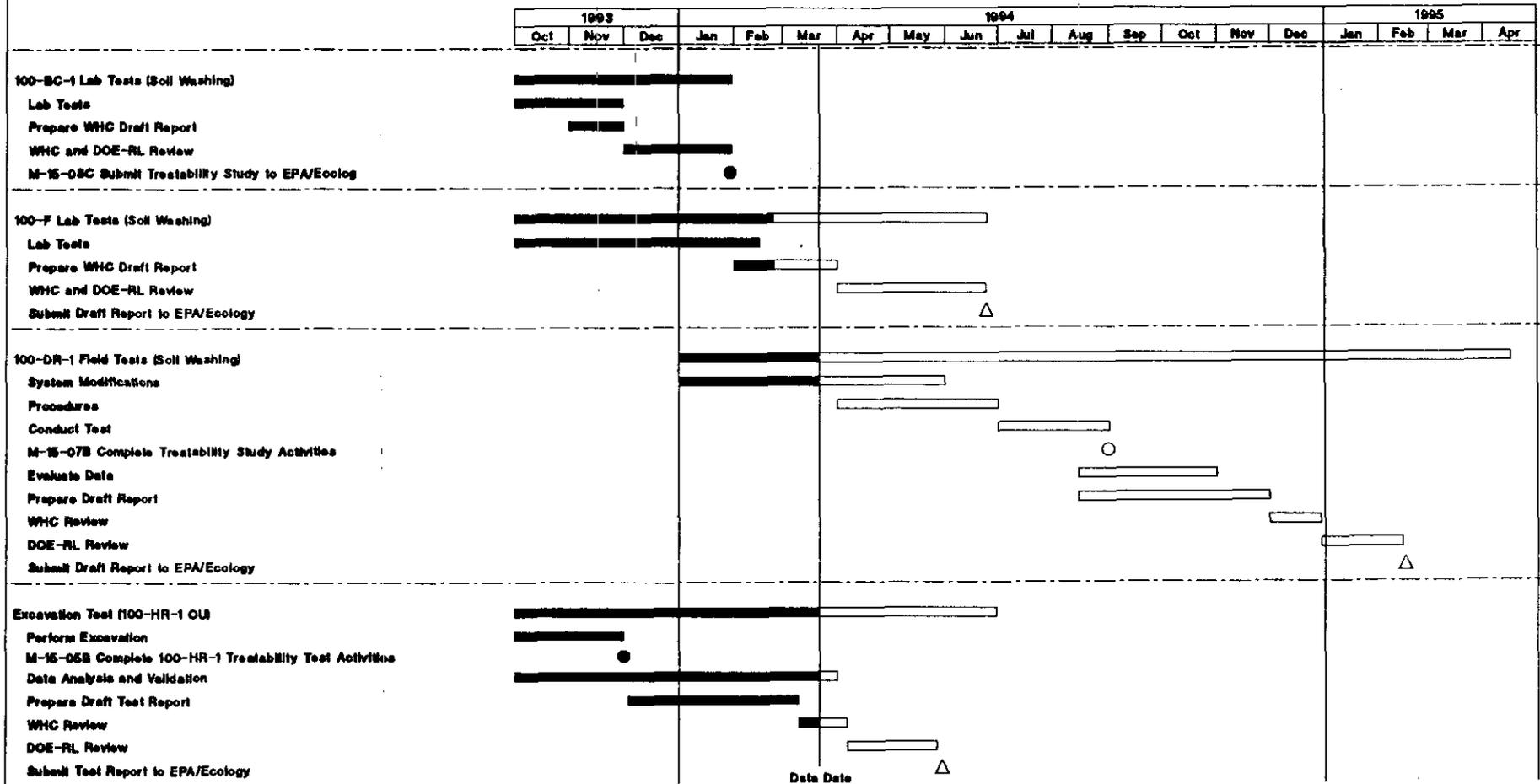
In early January, Hanford was selected as the site for Phase III testing. By late March, WHC will begin assisting Vortec in developing the test plan and procedures, NEPA and safety documentation.

**100-HR-1 Excavation Treatability Test**

The 100 Area Excavation Treatability Test Report, Draft A, is currently being reviewed within WHC. Comments are due March 17, 1994. A draft will be submitted for DOE review the first of April. The final report will be transmitted to EPA and Ecology by May 31, 1994.

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### 100-Area Treatability Tests



Date Date  
18 Mar 94

TPA Milestone ○  
WHC Key Milestone △

Project: 100-Area Treatability Studies      Date: 18Mar94 9:14  
**100 AREA TREATABILITY TESTS**  
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B AREA

100-BC-1 QRA and LFI Reports

TASK 11: 100-BC-1 QRA (WHC-SD-EN-RA-003, Rev. 0) has been reviewed by the regulators. ~~Comment resolutions were agreed upon and are currently being incorporated into the document.~~

TASK 13: 100-BC-1 LFI (DOE/RL-93-06 Draft A) has been reviewed by the regulators. Comment resolutions were agreed upon and are currently being incorporated into the document.

100-BC-1 FFS Report

Task was initiated in January, 1994 and is currently on schedule.

100-BC-2 QRA and LFI Reports

TASK 11: The 100-BC-2 QRA was initiated in January, 1994 and is currently on schedule.

TASK 13: The 100-BC-2 LFI was initiated in January, 1994 and is currently on schedule.

100-BC-5 QRA and LFI Reports

TASK 11: 100-BC-5 QRA (WHC-SD-EN-RA-006, Rev. 0) has been reviewed by the regulators. Comment resolutions were agreed upon and are currently being incorporated into the document.

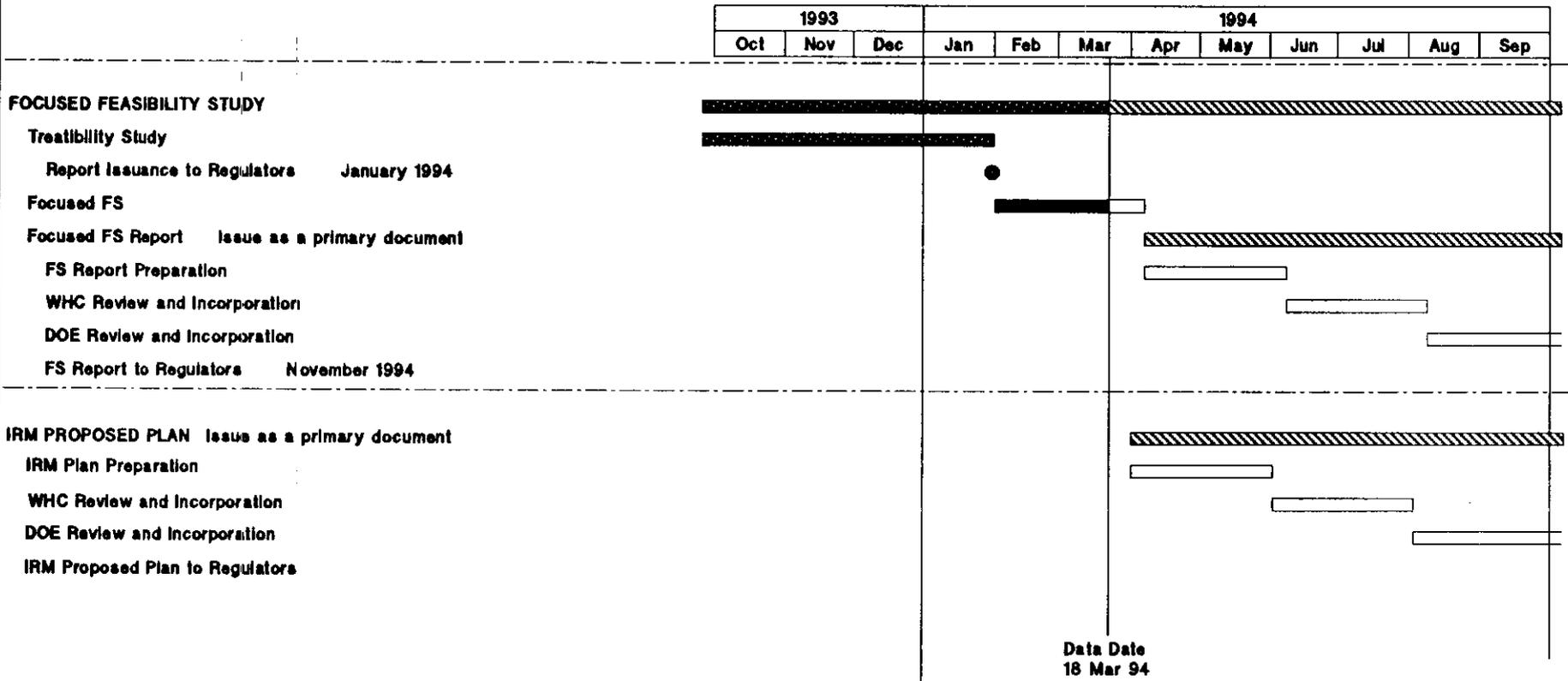
TASK 13: 100-BC-5 LFI (DOE/RL-93-37 Draft A) has been reviewed by the regulators. Comment resolutions were agreed upon and are currently being incorporated into the document.

100-BC-5 FFS Report

Task was initiated in January, 1994 and is currently on schedule.

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### 100-BC-1 OPERABLE UNIT



Data Date  
18 Mar 94

Project: 100-BC-1	DOE-RL 90-07	Date: 18 Mar 94 13:17
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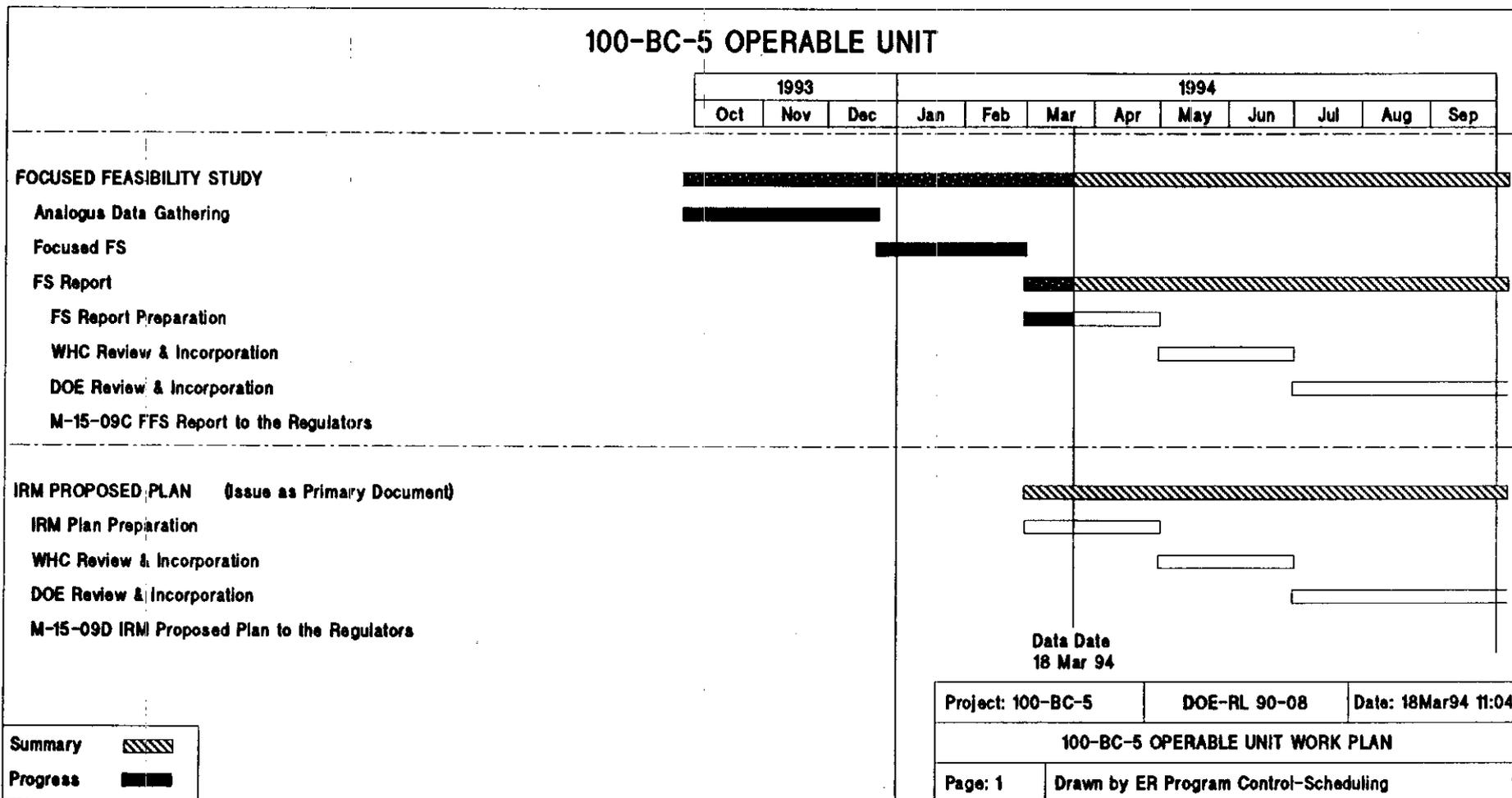
100-BC-1 OPERABLE UNIT WORK PLAN

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### 100-BC-5 OPERABLE UNIT



K AREA

100-KR-1 QRA and LFI Reports

TASK 11: 100-KR-1 QRA (WHC-SD-EN-RA-009, Rev. 0) was submitted for Regulatory review on February 28, 1994. The regulatory comments are anticipated by April 14, 1994.

TASK 13: 100-KR-1 LFI (DOE/RL 93-78 Draft A) was submitted for Regulatory review on February 28, 1994. The regulatory comments are anticipated by April 14, 1994.

100-KR-4 QRA and LFI Reports

Task 11: Regulatory comments have been received and are being responded to.

Task 13: Regulatory comments have been received and are being responded to.

2800-5276-16  
9/12/95-002



D AREA

100-DR-1

Qualitative Risk Assessment

Task 11: Qualitative Risk Assessment report Regulatory comments have been addressed and the resolutions to specific comments were agreed upon by all parties on March 1, 1994. The final report will be issued after incorporation of agreed upon resolutions into the document.

-----LFI Report

Task 13: Limited Field Investigation (LFI) report Regulatory comments have been addressed and the resolutions to specific comments were agreed upon by all parties on March 1, 1994. The final report will be issued after incorporation of agreed upon resolutions into the document.

100-DR-2

100-DR-2 Work Plan

- o A change control form is being processed to combine 100-DR-3 Operable Unit into 100-DR-2 Operable Unit. The change control form and associated transmittals have been reviewed and agreed upon by the Regulators and DOE-RL.

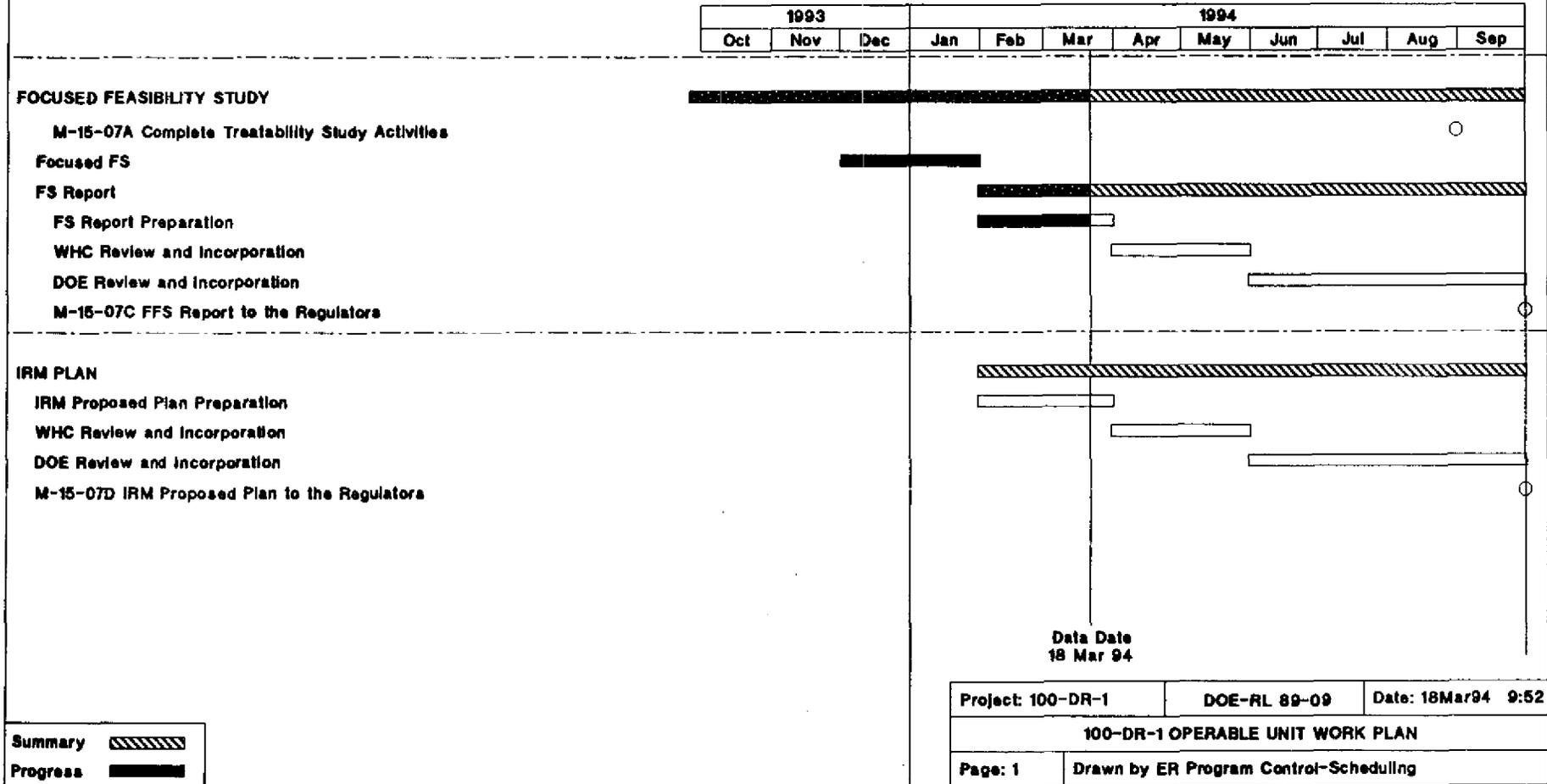
100-DR-2 LFI Report

Task 13: A kick-off meeting is planned for March 10, 1994 to initiate preparation of the 100-DR-2 LFI document. The document will combine LFI/QRA into one document.

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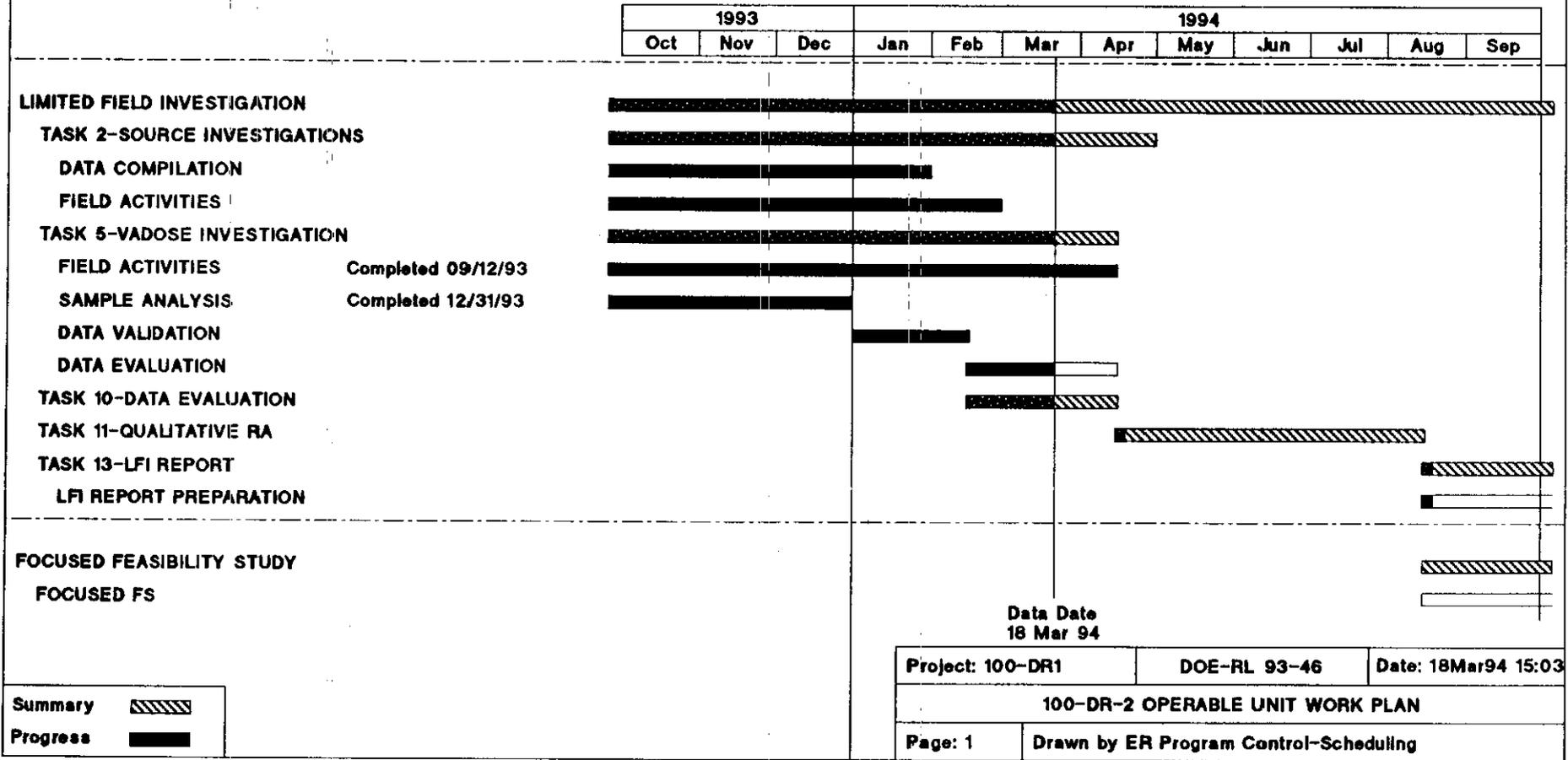


### 100-DR-1 OPERABLE UNIT



Summary   
 Progress

### 100-DR-2 OPERABLE UNIT



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18 Mar 94

H AREA

100-HR-1

TASK 11: 100-HR-1 QRA (WHC-SD-EN-RA-004, Rev. 0). The comments resolution meeting was completed on 22 Feb 1994.

TASK 13: 100-HR-1 LFI (DOE/RL-93-51, Draft A). The comments resolution meeting was completed on 25 Feb 1994.

100-HR-2

PLANNING DOCUMENT: Public review took place from January 24 through February 24, 1994. WHC has not yet received any comments.

100-HR-2 RADIOLOGICAL SURFACE SURVEY: The rad survey for 100-HR-2 began March 7, 1994. It's anticipated to take approximately six weeks to complete.

TASK 11 and TASK 13 - QRA and LFI REPORT: The QRA Report and the LFI Report will be combined into one report for the 100-HR-2 OU. Preparation of the report was started in February and is due to the Regulators for review on September 23, 1994.

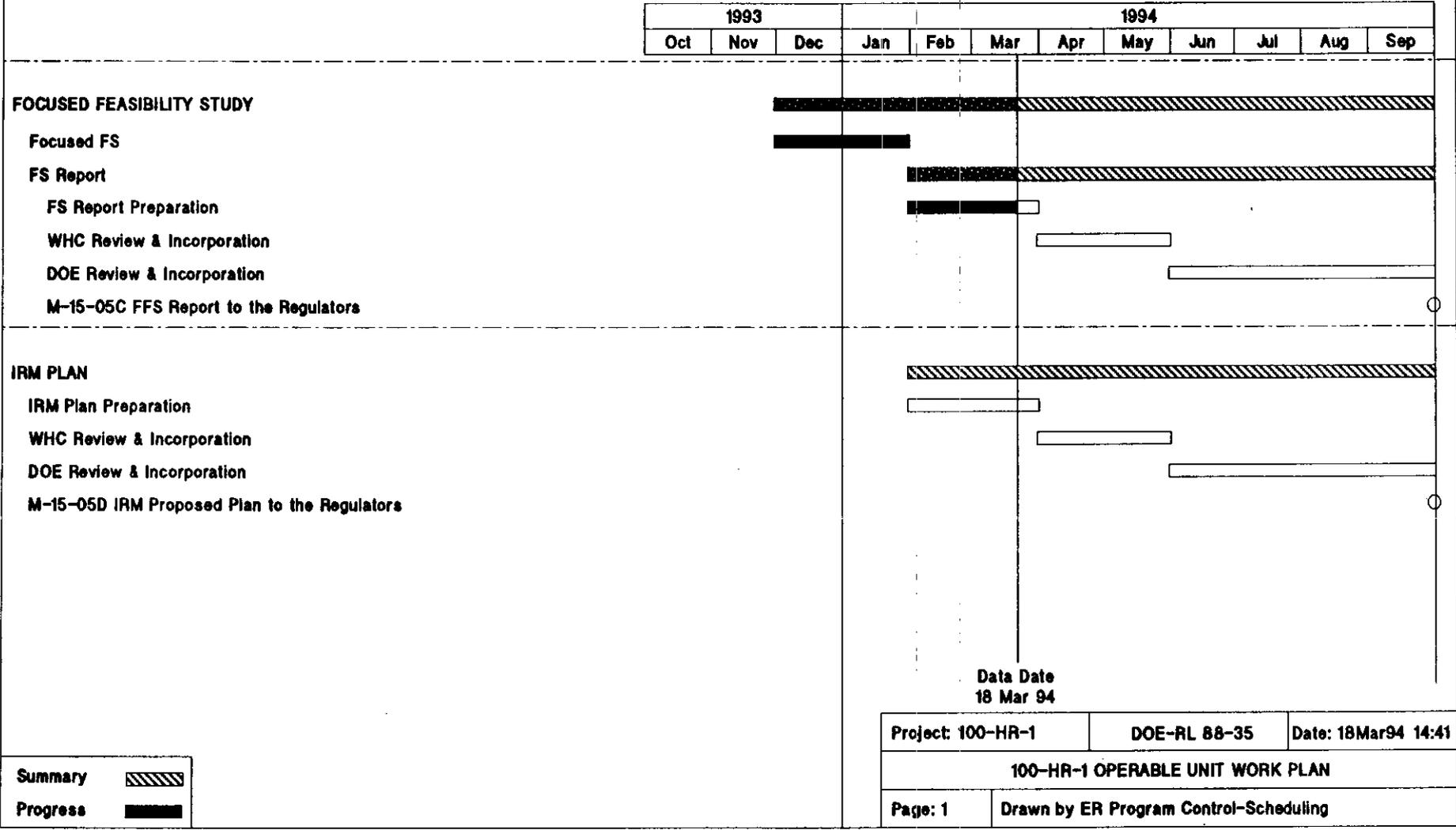
100-HR-3

Task 6- GROUNDWATER INVESTIGATION

- ° WHC is currently responding to regulator comments on the Qualitative Risk Assessment and Limited Field Investigation Report.
- ° The 5th Round Data Validation Report was submitted to DOE on Feb 3, 1993.
- ° The 6th Round of groundwater sampling (reduced analyte list) was conducted in February.

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### 100-HR-1 OPERABLE UNIT







F Area

100-FR-1

TASK 11: 100-FR-1 QRA (WHC-SD-EN-RA-013, Rev. 0) is in process. The internal WHC review draft is due on 15 Mar 1994.

TASK 13: 100-FR-1 LFI (DOE/RL-93-82, WHC Internal Draft) is in process. The internal review draft is due on 15 Mar 1994.

100-FR-3

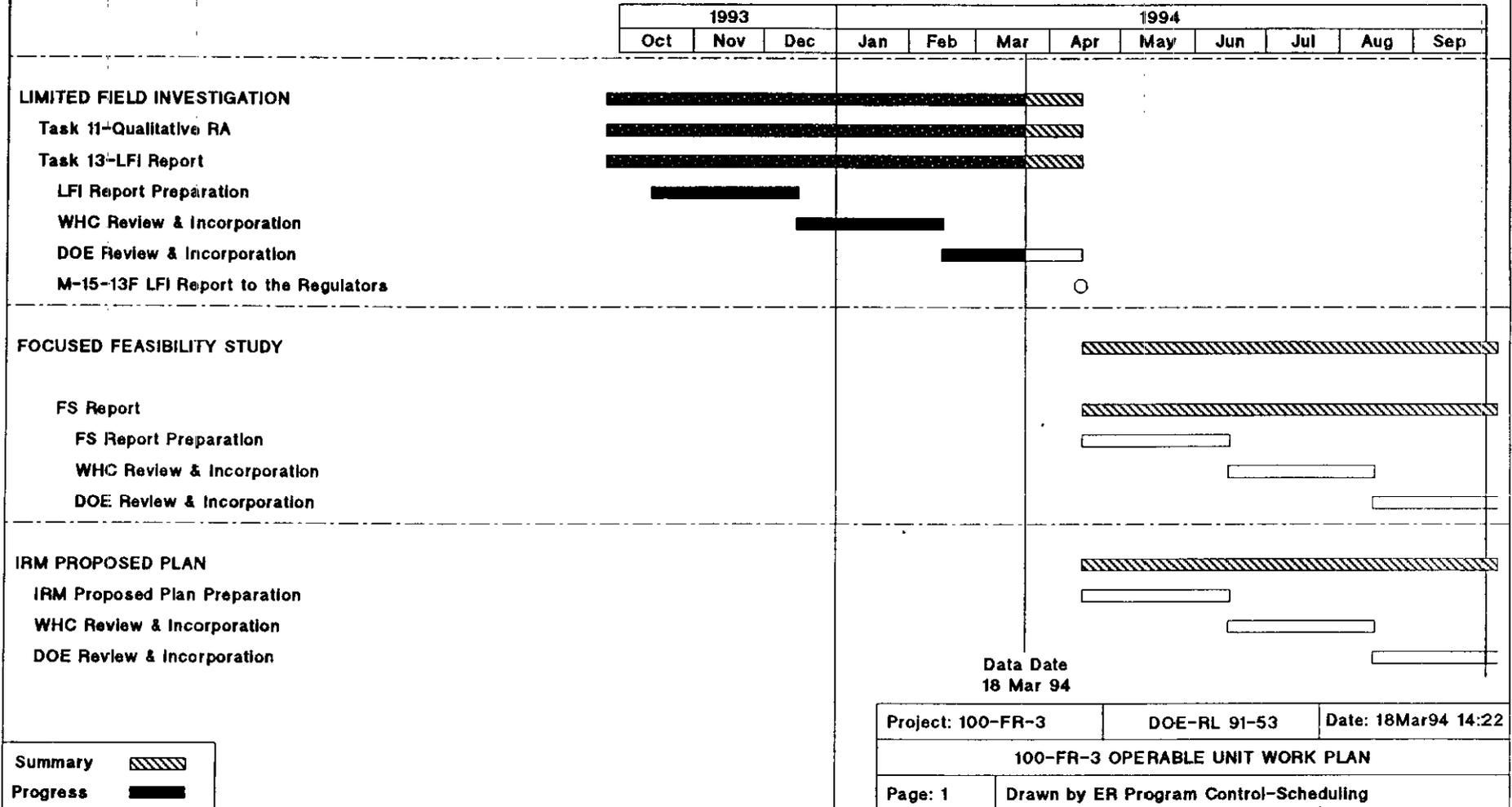
TASK 6 - GROUNDWATER INVESTIGATION

- The fifth round of groundwater sampling is now scheduled for April 1994.
- The fourth round of groundwater data validation will be delivered approximately mid-March 1994 (the report is due to the regulators on 25 March).
- The LFI and QRA reports are on schedule to be submitted to the regulators on April 14, 1994.

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### 100-FR-3 OPERABLE UNIT



N AREA

100-NR-1

100-NR-1 Operable Unit Work Plan

- As part of the TPA negotiations, a 100-N Area Pilot Project has been selected to demonstrate coordination of ongoing cleanup activities with facility transition, stabilization, and D&D activities. Discussions between the three parties and Westinghouse are ongoing. It was agreed to proceed with production of the work plans even though the Pilot Project scope has not been finalized. The work plan will refer to a 100 N Area Pilot Project Program Management Plan for details of integrating the 100 N activities. The regulators are currently reviewing a redline draft of the work plan. The public review draft is scheduled to be delivered to the regulators April 29, 1994.

100-NR-1 Qualitative Risk Assessment

- A draft of the QRA Report is undergoing Westinghouse review. As part of the document revision associated with the comment resolution process, the 1301-N (116-N-1) and 1325-N (116-N-3) sites will be included as high priority sites on the IRM pathway.

100-NR-1 Limited Field Investigation Report

- A draft of the LFI Report is undergoing Westinghouse review. As part of the document revision associated with the comment resolution process, the 1301-N (116-N-1) and 1325-N (116-N-3) sites will be included as high priority sites on the IRM pathway.

100 NR-2

100-NR-2 Operable Unit Work Plan

- As part of the TPA negotiations, a 100-N Area Pilot Project has been selected to demonstrate coordination of ongoing cleanup activities with facility transition, stabilization, and D&D activities. Discussions between the three parties and Westinghouse are ongoing. It was agreed to proceed with production of the work plans even though the Pilot Project scope has not been finalized. The work plan will refer to a 100 N Area Pilot Project Program Management Plan for details of integrating the 100 N activities. The regulators are currently reviewing a redline draft of the work plan. The public review draft is scheduled to be delivered to the regulators April 29, 1994.

100-NR-2 Qualitative Risk Assessment

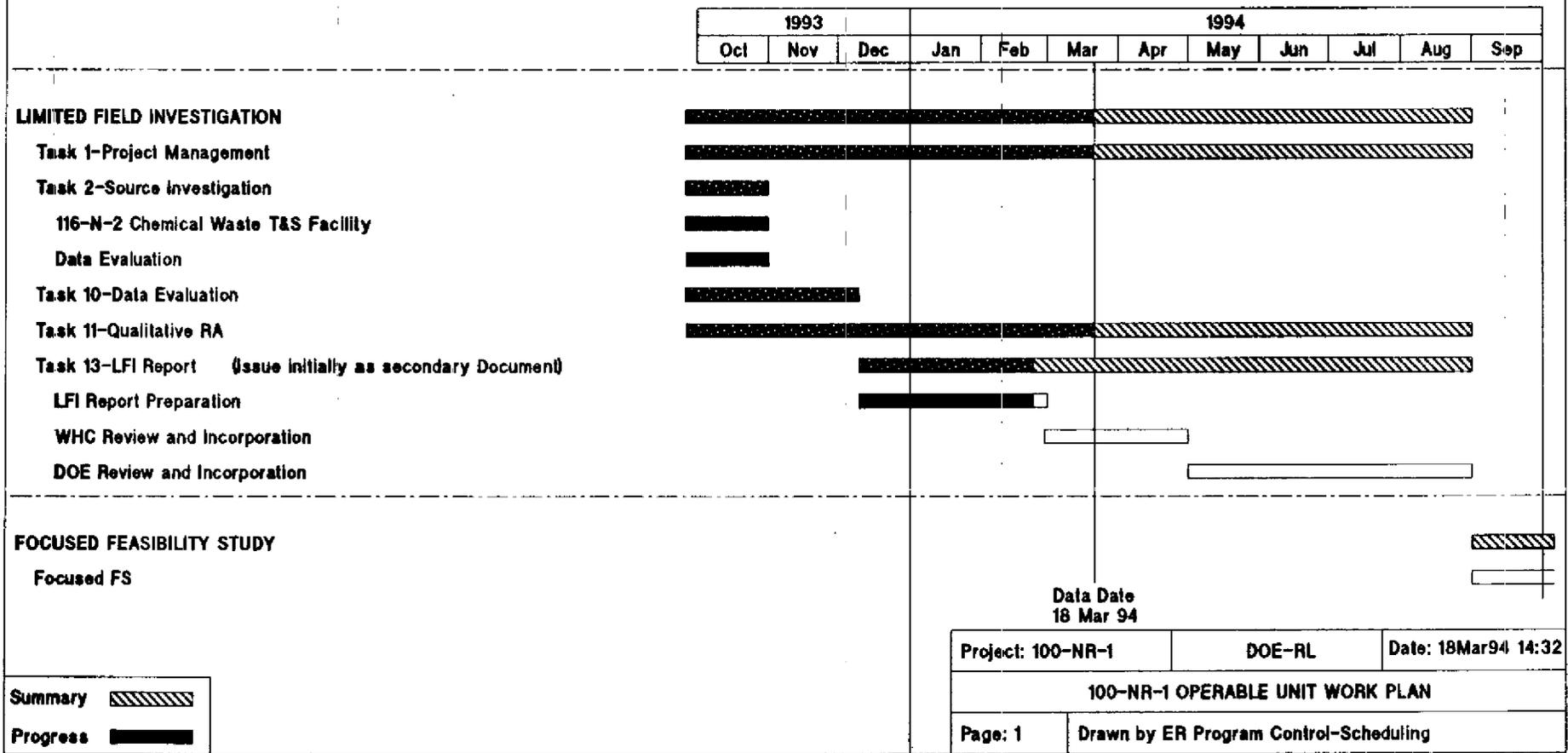
- A draft of the QRA Report is undergoing Westinghouse review. As part of the document revision associated with the comment resolution process, the 1301-N (116-N-1) and 1325-N (116-N-3) sites will be included as high priority sites on the IRM pathway.

100-NR-2 Limited Field Investigation Report

- A draft of the LFI Report is undergoing Westinghouse review. As part of the document revision associated with the comment resolution process, the 1301-N (116-N-1) and 1325-N (116-N-3) sites will be included as high priority sites on the IRM pathway.

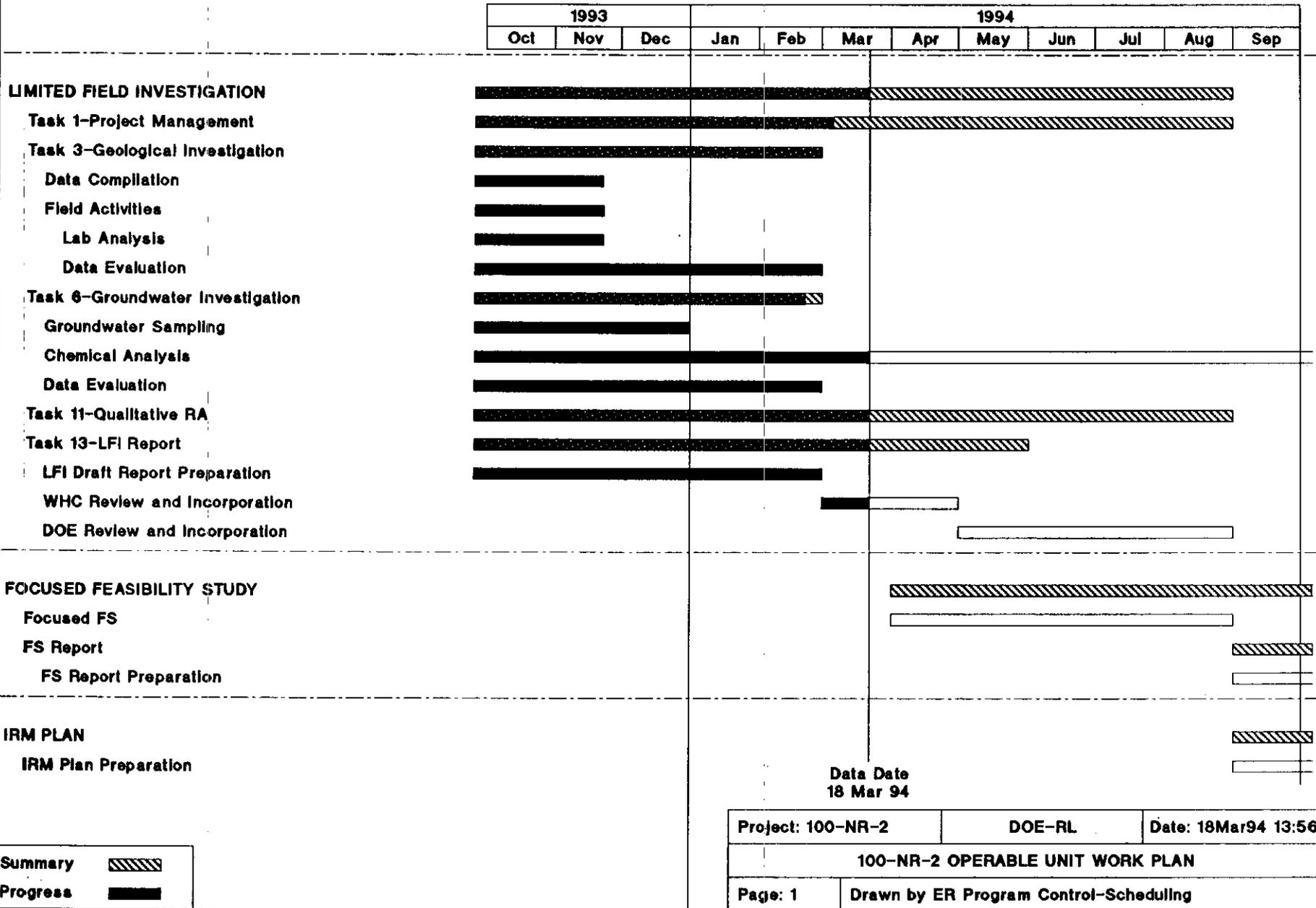
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### 100-NR-1 OPERABLE UNIT



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### 100-NR-2 OPERABLE UNIT



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18 Mar 94

Project: 100-NR-2	DOE-RL	Date: 18Mar94 13:56
100-NR-2 OPERABLE UNIT WORK PLAN		
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**Codisposal Treatability Test Plan &  
Vitrification Crucible Study**

**John Ludowise  
Environmental Engineering Support Group  
Westinghouse Hanford Company**

**March 31, 1994**

## Agenda

- **Solidification -- Codisposal treatability test plan synopsis**
- **Vitrification -- Update on Minimum Additive Waste Stabilization (MAWS) Crucible Testing**

## Solidification - Codisposal

### Description

- **Blend contaminated wastes with cementitious materials, polymers, or other additives to use for beneficial purposes**
  - **Among applications being considered are using the stabilized waste for open void fill, structural fill, pipeline fill, and/or ERDF subsidence control**
  - **May combine waste streams from numerous sources such as remediation activity wastes (i.e. soil washing fines), well purge water, and power plant ash**
  - **Reduces need to dispose of the materials as traditional solid, low-level, or mixed waste**

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# Solidification - Codisposal

# Solidification - Codisposal

## Objective

- **Demonstrate the ability to produce a stable waste formulation for the application of co-disposal**

## Work Scope

- **Laboratory qualification of mix formulations**
  - **Develop specific waste formulations**
  - **Perform qualification testing (time of set; compressive strength; freeze-thaw; TCLP; etc.)**

## Solidification - Codisposal

### Status

- Test plan being reviewed by RL and WHC; available for regulatory review in April
- Laboratory work to begin in July, dependant on finalizing scope of work

# Solidification - Codisposal

## PURPOSE AND SCOPE

- **Identify a range of cement-based formulations that could be used for beneficial purposes:**
  - **Burial box fill**
  - **Pipeline fill**
  - **Landfill disposal**
  - **Environmental Restoration Disposal Facility (ERDF) subsidence control**
  
- **Limited to Portland cement based formulations**
  
- **Other formulations (e.g., sulfur cement and polymer) may be evaluated in the future if suitable applications are identified**

## Solidification - Codisposal

### TESTS

- **Both surrogate and radioactive soils used**
  - **Rheology (Flow)**
  - **Shrinkage**
  - **Bleed**
  - **Time of set**
  - **Shear strength**
  - **Unconfined compressive strength (UCS)**
  - **Leachability - MTCLP (less material, no organic analysis compared with TCLP)**
  - **Permeability**
  - **Durability (freeze/thaw and wet/dry)**
  - **Temperature rise on mixing and curing**

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# Solidification - Codisposal

## APPROACH

- **Four testing phases**
  - **Surrogate (uncontaminated soil) to screen formulations**
  - **Spikes to compare leachability against formulations**
  - **Contaminated soils to build statistical confidence levels**
  - **Optional phase to optimize formulations**

# Minimum Additive Waste Stabilization (MAWS)

## Overview

- **MAWS is a program run by DOE-HQ**
- **Vitrification system that uses various waste streams as resources**
  - **Soil washing fines plus low level tank waste at Hanford**
- **Produces a vitrified waste form that minimizes the use of additives**

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**Minimum Additive Waste Stabilization (MAWS)**

# MAWS Crucible Testing

## General Description

- **Crucible testing of Hanford waste streams being conducted under the Compositional envelope testing**
  - **Vitreous State Laboratory (VSL) at Catholic University of America (CUA) is conducting the tests**
  - **A task under the MAWS Program**
- **Will generate data regarding formulations that combine Hanford soil washing fines with low level tank waste**
  - **Waste loadings**
  - **Glass durability (leach resistance)**

# MAWS Crucible Testing

## Hanford waste materials

- Soil from 100-F Excavation Treatability Test (shipped to VSL in January)
- Surrogate (non-radioactive) liquid representing waste from Hanford tank farms

## MAWS Crucible Testing

### Status

- **Chemical analysis; physical characterization; radionuclide analysis completed - radionuclide data still raw data**
- **Tank waste surrogate mixed**
- **Five crucible melts completed; glass undergoing leaching analysis**
- **Seven to 12 more crucible melts will be performed depending on results of the leach testing**
- **Final report expected December 1994**

# MAWS Crucible Testing

#6/Page 13 of 13

## Soil Analysis

Oxide	116-F-4 Fines, Weight Percent, Average of 18 Samples	Typical Hanford Range, Weight Percent (from PNL-4800, Suppl. 1)
$\text{Al}_2\text{O}_3$	13.50	12.5 - 14.4
$\text{B}_2\text{O}_3$	0.52	
BaO	0.11	
CaO	4.34	5.37 - 6.81
$\text{Fe}_2\text{O}_3$	5.24	8.16 - 11.50
$\text{K}_2\text{O}$	2.29	1.43 - 2.45
MgO	2.01	1.41 - 3.40
$\text{MnO}_2$	0.17	
$\text{Na}_2\text{O}$	3.44	2.69 - 3.23
$\text{P}_2\text{O}_5$	0.32	
$\text{SiO}_2$	67.15	58.0 - 64.4
SrO	0.05	
$\text{TiO}_2$	0.82	
$\text{U}_3\text{O}_8$	0.05	
Sum	100.00	--

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# 100 AREA SOIL WASHING TESTS

## MARCH, 1993 UNIT MANAGERS MEETING

- NPL Agreement #64 submitted for minutes
- White Paper on XRF and analytical strategies submitted to RL, 3/29/94
- Additional NPL agreement form to be prepared for concurrence with analytical strategies.
- Comments on DOE/RL-93-107, Draft A were received
  - In general, most comments accepted
  - PNL/WHC will resolve comments this week
  - Comment responses to be sent to RL the week of 4/4
  - Comment resolution meeting proposed the week of 4/11.
- ~~● Question on TPL's will require the most work~~
- 100-DR-1 Treatability Schedule and Procurement Status
- 100-F Laboratory tests status

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# 100 AREA SOIL WASHING TEST SCHEDULE

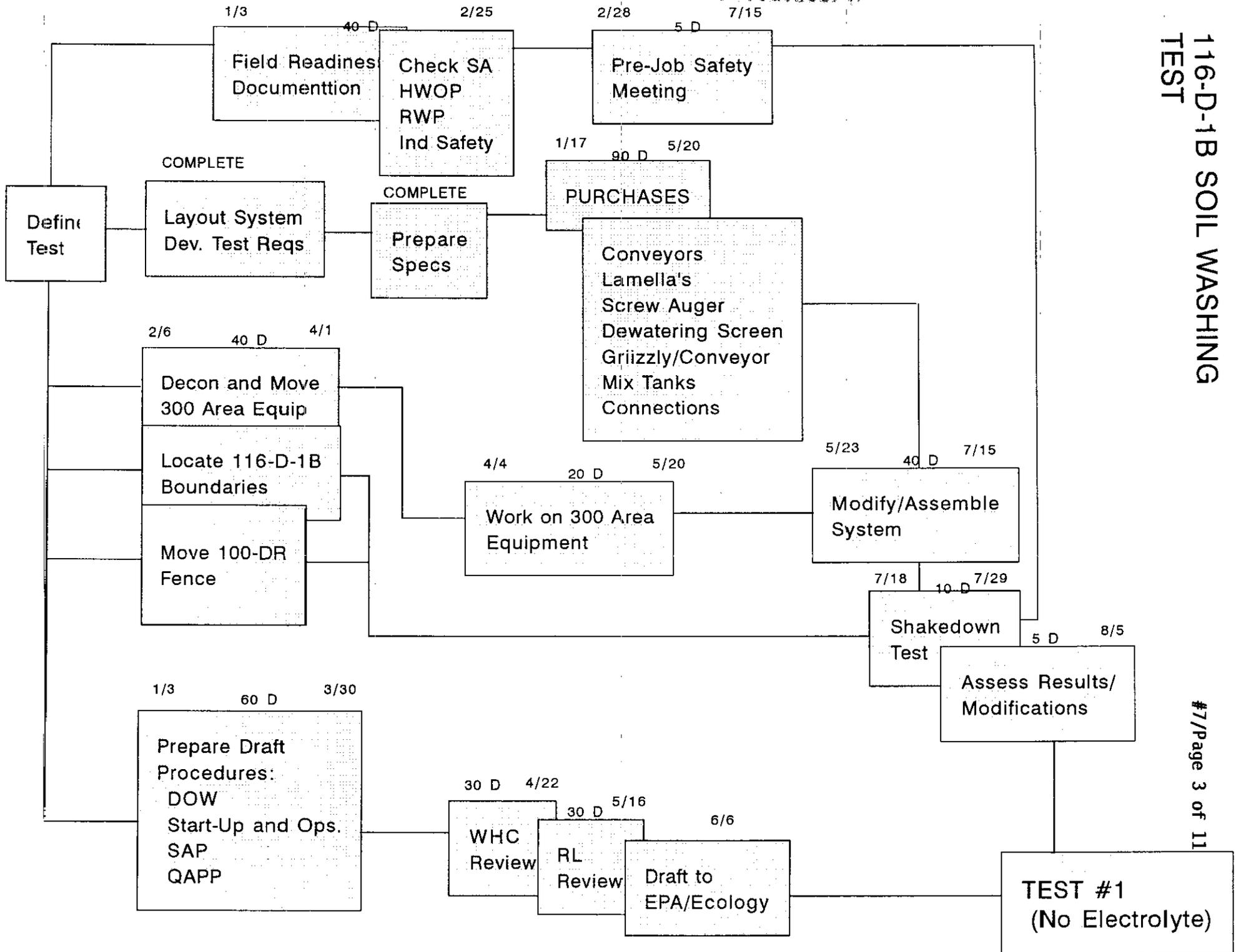
## MARCH, 1994

TASK	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB
100-F LAB TESTS														
LAB TESTS	████████████████████													
PREPARE DRAFT			████████████████											
WHC/RL REVIEW					██████████									
DRAFT TO EPA/ECOLOGY						▼								
100-DR-1 FIELD TEST														
PROCUREMENT	██													
PREPARE PROCEDURES		████████████████												
WHC REVIEW				██████████										
RL REVIEW					██████████									
DRAFT TO EPA/ECOLOGY						▼								
TEST DOCUMENTATION			██											
LAB TESTING			██											
ASSEMBLE SYSTEM					██████████									
SHAKE DOWN						██████████								
TEST #1								██████████						
TEST #2								██████████						
SAMPLE ANALYSES								████████████████████						
PREPARE DRAFT REPORT								██						
WHC/RL REVIEW												██		
DRAFT TO EPA/ECOLOGY														▼

8/31/94

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116-D-1B SOIL WASHING TEST



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## 100 AREA SOIL WASHING BENCH-SCALE TEST PROCEDURES

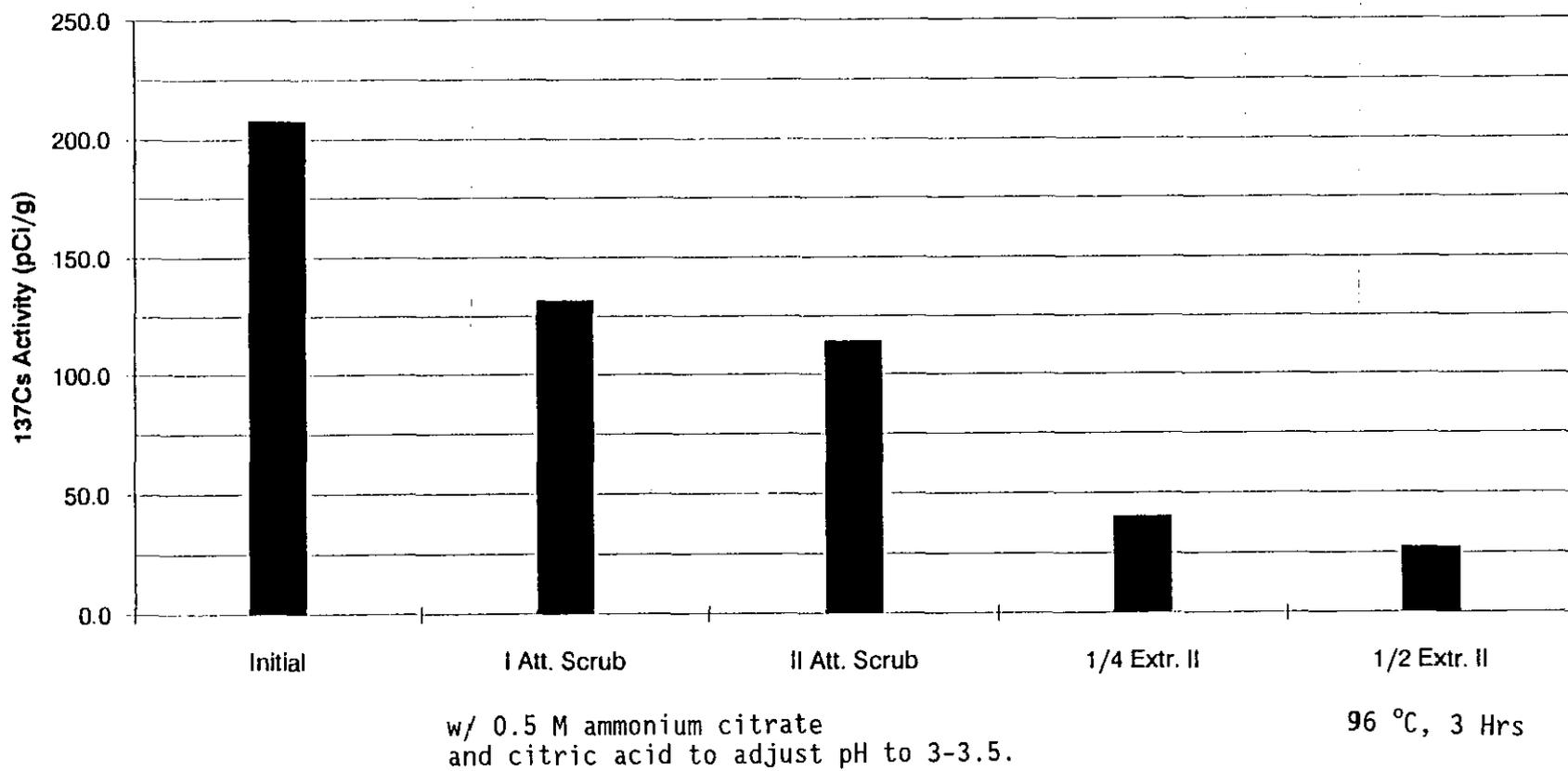
Task Status (116-F-4 Soil) March 29, 1994

Task	Completed	In Progress
Chemical and Isotopic Analyses	■	
Moisture Content	■	
Soil pH	■	
Specific Gravity	■	
Particle Size Distribution	■	
Total Organic Carbon	■	
Exchangeable cations	■	
Toxicity Characteristic Leaching Procedure	■	
Sequential Extraction	■	
Optical and Electron Microscopy	■	
Mineralogy by X-ray Diffraction Analysis	■	
Wet Screening	■	
Attrition Scrubbing	■	
Autogenous Grinding		■
Chemical Extraction	■	
Combination Tests	■	
Waste Water Treatment		■
Report		■

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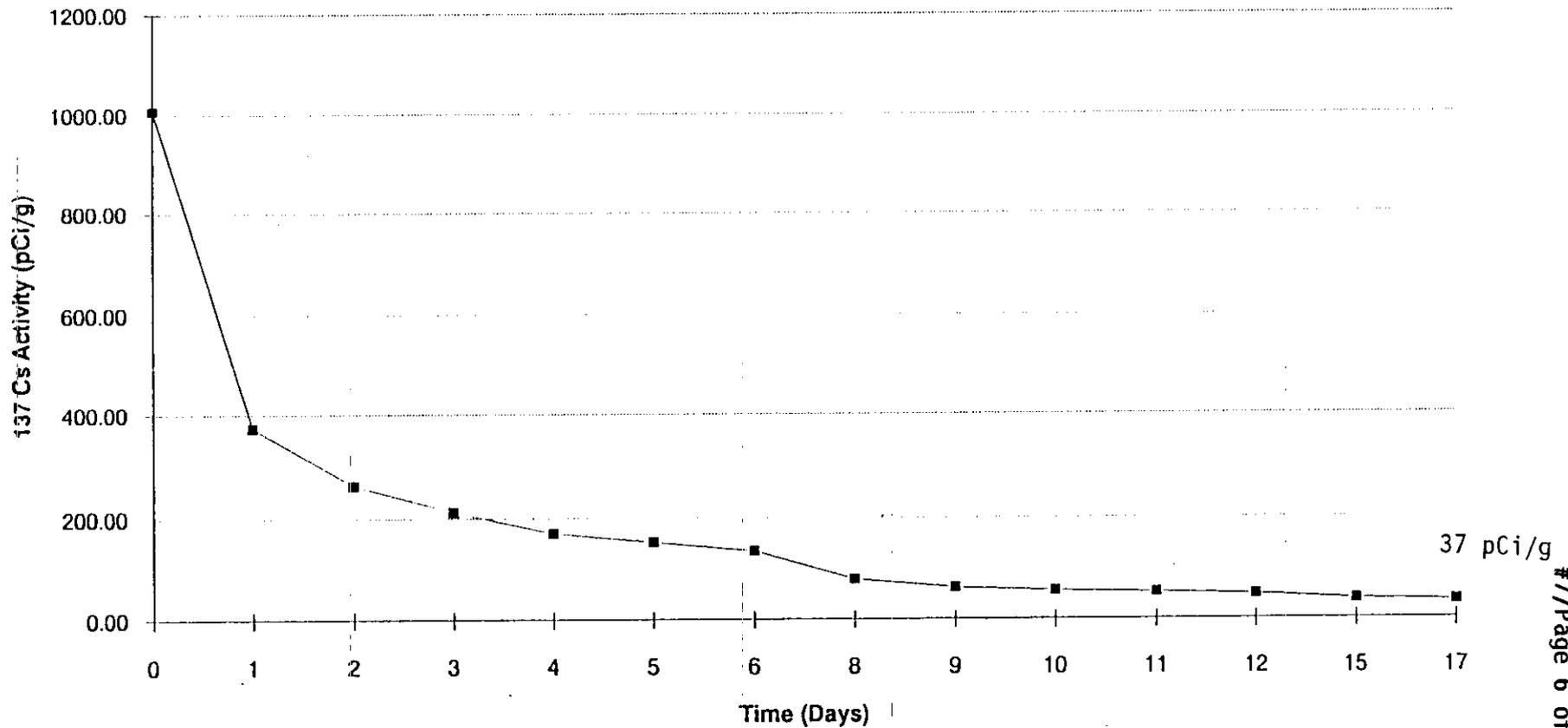
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Preliminary Data from Combination Tests (2 mm-0.25 mm Size Fraction from  
116-F-4 Pluto Crib)



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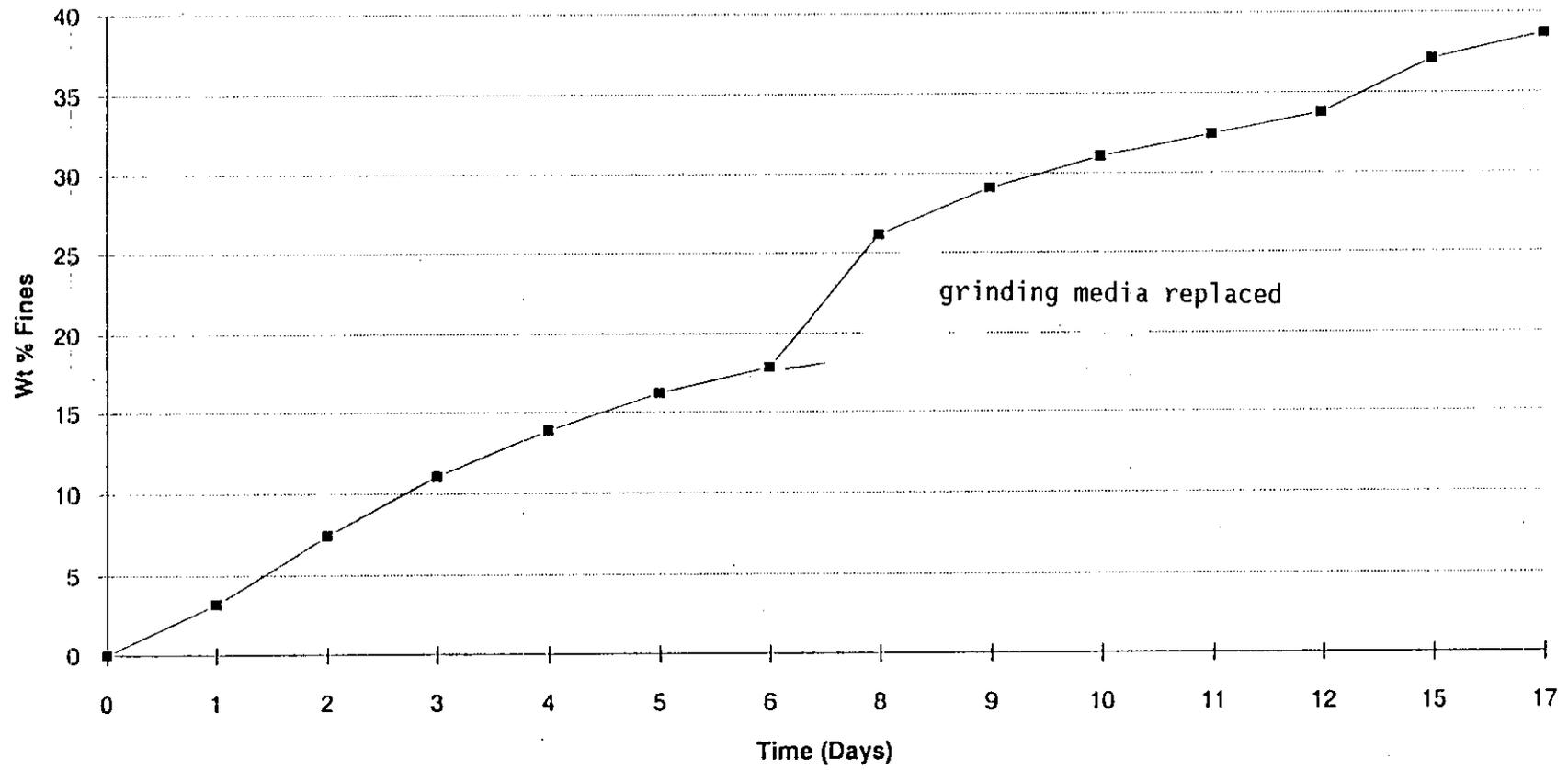
## Preliminary Wet Surface Grinding Experiment (4 cm dia. rock from 116-F-4)



- Time shown for this small scale experiment is much faster in the field
- One rock tumbled for several days
- No visible fissures in the rock
- Rinsed daily prior to measuring activity
- Three mm thickness removed from the rock due to tumbling

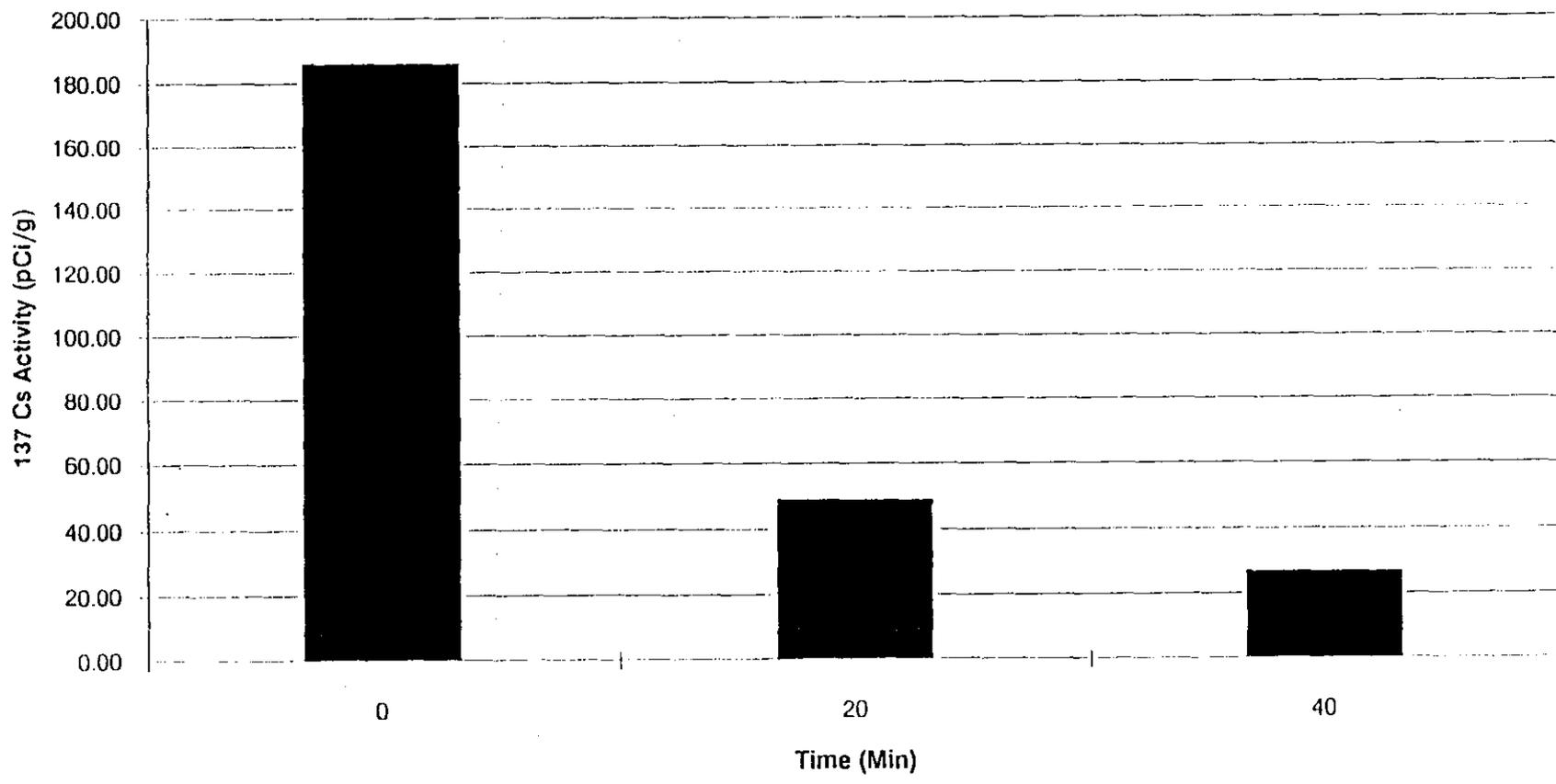
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## Preliminary Wet Surface Grinding Experiment (4 cm dia. rock from 116-F-4)



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### Centrifugal Barrel Grinding with Water (1.5" Rocks from 116-F-4 Pluto Crib)



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Control Number 64	100 NPL Agreement/Change Control Form  <input type="checkbox"/> Change <input checked="" type="checkbox"/> Agreement <input type="checkbox"/> Information Operable Unit: <u>100-DR-1</u>	Date Submitted: 3/22/94 Date Approved:
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Document Number and Title: 100-DR-1 Treatability Scope and Objectives	Date Document Last Issued: NA
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Originator: J. G. Field Phone: 376-3753

**Summary Description:**

Signatures are for concurrence with the attached scope and objectives for the 100-DR-1 pilot scale soil washing test. The scope and objectives were discussed in a working meeting held 3/2/94.

A separate NPL Agreement/Change Control Form will be prepared to further address analytical levels and methods.

See also, NPL Agreement/ Change Control Form #60.

**Justification and Impact of Change:**

This agreement does not impact previous schedules or established TPA milestones.

<i>N. M. Naiknimbalkar</i> N. M. Naiknimbalkar WHC Operable Unit Coordinator	<u>3/22/94</u> Date
<i>E. D. Goller</i> E. D. Goller DOE Unit Manager	<u>3/22/94</u> Date
<i>T. Wooley</i> T. Wooley Ecology Unit Manager For Dennis Faulk	<u>3/22/94</u> Date
<i>D. A. Faulk</i> D. A. Faulk Env. Protection Agency Unit Manager	<u>3/22/94</u> Date

Per Action Plan for Implementation of the Hanford Consent Order and Compliance Agreement Section 9.3

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## 1.0 REQUIREMENTS AND SCOPE

- 1.1 A shake down test will be performed in which equipment is set up, operating experience is obtained, and operating parameters for the test are selected.
- 1.2 Field Test #1 will consist of 2 parts: a. wet sieving with water only; and b. by wet sieving and attrition scrubbing with water only. Processes will include a trommel, screens, attrition scrubber, dewatering screens, a clarifier, and recycling of process water.
- 1.3 Field Test #2 will be the same as Test #1 except a mixture of 0.5 M ammonium citrate and citric acid (electrolyte) will be added to the attrition scrubber to enhance removal of Cs-137 and inhibit readsorption.
- 1.4 Field tests will process soil particles < 150 mm (6 in) dia. at 10 ton/hr. Time of processing and amount to be determined by field engineer. The system will operate during normal working hours. WHC estimates 200 tons of processed soil may be an adequate amount for Test #1 and Test #2 if the system works well. An undetermined amount of soil will be processed in shake-down tests. After the M-15-07-B milestone commitment is met, additional material from 100-DR-1 or other sites may be processed contingent on funding and resources.
- 1.5 Target Performance Levels (TPL's) for the test will be accessible soil levels for radionuclides included in WHC-CM-7-5, Environmental Compliance Manual (1988) Table 6.2 for:

$^{60}\text{Co}$ ,  $^{134}\text{Cs}$ ,  $^{137}\text{Cs}$ ,  $^{152}\text{Eu}$ ,  $^{154}\text{Eu}$ ,  $^{155}\text{Eu}$ ,  $^{90}\text{Sr}$ ,  $^{235}\text{U}$ ,  $^{238}\text{U}$ ,  $^{239/240}\text{Pu}$ .

Results of the pilot scale soil washing test at 116-D-1B will evaluate system performance over a range of residuals down to levels listed in the previous revision of the WHC Environmental Compliance Manual conveyed in the Test Plan (DOE/RL-92-15, Rev. 0).

- 1.6 Due to schedule limitations, the prototype system tested will be made up of on-site EPA equipment used in 300 Area soil washing tests and equipment parts to be procured.
- 1.7 Offsite TCLP analyses will be conducted in Test #2 for fine soils < 0.25 mm and for 2 mm to 0.25 mm soils. In addition, radiochemical analyses of extract will be performed off-site.
- 1.8 In addition to field tests, water treatment recycle tests will be conducted in the laboratory using available sediment from the bench scale testing. These include:

Bench scale recycle batch processes where contaminant buildup and other process factors will be assessed. Water treatment will include flocculation and filtration.

Water treatment tests using process effluent from the field tests, and/or ion exchange water treatment.

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1.9 Contaminated soils < 0.25 mm will be placed in appropriate containers and handle in accordance with the waste control plan. Remaining soils are to be returned to the site after the test is completed. Process effluent will be treated, if needed to meet purgewater acceptance standards, and evaporated or discharged.

## 2.0 OBJECTIVES AND MEASUREMENTS

2.1 Verify Chemical and radioactivity analyses of processed soils from the pilot scale treatability test are consistent with laboratory scale treatability test results.

2.2 Verify the percent reduction (by wt) that can be achieved for the soils processed is consistent with laboratory indications.

Sieve soils to determine the percent of soil particles in each size fraction before and after processing.

2.3 Assess water treatment requirements and recycling needs, including efficiency of treatment in removing contaminants from process effluent, and contaminant build up.

EPA Level II and V analyses will be conducted for feed water, effluent prior to treatment, and treated effluent samples.

2.4 Provide data on performance of the process equipment to allow scale-up to a full-scale system (eg. 100 ton/hr).

- o Determine operating utility requirements (chemical consumption, power, water etc.)
- o Record Settings of Equipment Controls
- o Determine Energy Input Requirements.
- o Determine Soil Water feed ratios, chemical ratios, pressure, flow rates, etc.

2.5 Assess emissions and/or environmental impacts.

Record and report ALARA practices, air monitoring results, exposure levels, if any, detected by Health Physics Personnel.

2.6 Use real time radiation monitors

Install sodium iodide detectors to monitor processed soils. Data will be used as needed to make field changes required to improve system performance, and to assess the viability of real time monitors for process control.

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