MARTIN MARIETTA

**ENVIRONMENTAL
RESTORATION
PROGRAM**

**Maintenance Action Readiness
Assessment Plan for
Waste Area Grouping 1
Inactive Tanks 3001-B, 3004-B,
T-30, and 3013
at Oak Ridge National Laboratory,
Oak Ridge, Tennessee**

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Environmental Restoration Program Division
Oak Ridge National Laboratory Environmental Restoration Program

**Maintenance Action Readiness Assessment Plan
for Waste Area Grouping 1
Inactive Tanks 3001-B, 3004-B, T-30, and 3013
at Oak Ridge National Laboratory,
Oak Ridge, Tennessee**

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MAINTENANCE ACTION READINESS ASSESSMENT PLAN
FOR WASTE AREA GROUPING 1 INACTIVE TANKS
3001-B, 3004-B, T-30, AND 3013
AT OAK RIDGE NATIONAL LABORATORY,
OAK RIDGE, TENNESSEE

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PREFACE

This Readiness Assessment Plan was prepared to describe the readiness criteria and the organizational responsibilities necessary to ensure that the maintenance action consisting of remediating four inactive liquid low-level radioactive waste tanks in Waste Area Grouping 1 at Oak Ridge National Laboratory is ready to proceed in accordance with Lockheed Martin Energy Systems, Inc. (LMES), Procedure ES-OP-551, "Operational Readiness Review and Assessment Process." This procedure and Environmental Restoration Division Procedure ER/C-P1610, "Conducting Project Readiness Reviews," provided guidance for the preparation of this plan.

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ABBREVIATIONS

DOE	U.S. Department of Energy
ER	Environmental Restoration
LLW	liquid low-level waste
LMES	Lockheed Martin Energy Systems, Inc.
ORNL	Oak Ridge National Laboratory
WAG	Waste Area Grouping

EXECUTIVE SUMMARY

This Readiness Assessment Plan has been prepared to document operational readiness for the maintenance action consisting of remediation of four inactive liquid low-level radioactive tanks in Waste Area Grouping 1 at Oak Ridge National Laboratory. The four tanks to be remediated are Tanks 3001-B, 3004-B, T-30, and 3013. Tanks 3001-B, 3004-B, and T-30 will be removed from the ground. Because of logistical issues associated with excavation and site access, Tank 3013 will be grouted in place and permanently closed.

This project is being performed as a maintenance action rather than an action under the Comprehensive Environmental Response, Compensation, and Liability Act, because the risk to human health and environment is well below the U.S. Environmental Protection Agency's level of concern. The decision to proceed as a maintenance action was documented by an interim action proposed plan, which is included in the administrative record. The administrative record is available for review at the U.S. Department of Energy Information Resource Center, 105 Broadway Avenue, Oak Ridge, Tennessee 37830.

A Readiness Assessment Team has been assembled to review the criteria deemed necessary to conduct the remediation tasks. These criteria include approval of all plans, acquisition of needed equipment, completion of personnel training, and coordination with plant health and safety personnel. Once the criteria have been met and documented, the task will begin. The readiness assessment is expected to be completed by late July 1995, and the task will begin thereafter.

1. INTRODUCTION

1.1 PLAN OVERVIEW

Lockheed Martin Energy Systems, Inc. (LMES), Procedure ES-OP-551, Rev. 1, "Operational Readiness Review and Assessment Process," requires that activities follow a formal, focused, and comprehensive process to determine the activity's readiness to proceed to the next increment of work when management determines that it is necessary. This procedure is aimed at reducing the risks that threaten mission success, and requires that a management-approved "readiness plan" be issued that (1) describes the activity under review, (2) defines the scope of the process, (3) identifies the team members, (4) establishes organizational responsibilities, (5) defines the methodology and criteria to be used for determining readiness, and (6) defines the events that must take place to complete the process. The remediation of four inactive tanks at Waste Area Grouping (WAG) 1 at Oak Ridge National Laboratory (ORNL) is a maintenance action that does not require the formal, focused, and comprehensive readiness assessment process, but that will comply with the intent of ES-OP-551 and of Environmental Restoration (ER) Division Procedure ER/C-P1610, "Conducting Project Readiness Reviews."

This plan was prepared by the ORNL WAG 1 Site Project Readiness Assessment Team, which was established by the WAG 1 Facility Manager, to provide the ORNL ER Program with information on the project team's plan for ensuring that construction activities associated with the project (as defined by the scope of this plan) will be ready to begin when the readiness assessment process is complete. This plan, along with progress reports to be prepared by the review team on the project's readiness, will enable the ER Program to conduct its independent assessment of the project's readiness to proceed successfully and safely in accordance with the project's objectives.

This plan provides an overview of the project and the major milestones that must be met for readiness, the methodology used to develop the criteria, and the events that must take place as part of the review process to determine readiness for each phase of the project. The readiness assessment schedule will be kept by the Project Manager, C. A. Bednarz, and is available for review at the ORNL ER project offices.

1.2 SCOPE OF THE PLAN

Before the project can be initiated, documented evidence must exist showing that the U.S. Department of Energy (DOE) has approved the Conduct of Operations Matrix and the Site Safety and Health Plan; that applicable permits and documentation have been issued and procedures specifically addressing the conduct of the project are in place; that Environmental Management, Health Physics, Engineering, Quality Assurance, and Waste Management personnel have reviewed, and their comments have been incorporated into, the project specifications and plans; that materials, facilities, and equipment to be used to perform the remediation have been identified; that a records system is in place; and that all project documentation has been completed. This plan has been prepared to ensure the safe and successful conduct of the project after these requirements have been satisfied.

2. PROJECT SUPPORT

LMES support for this effort will consist of organizations from ORNL including Health Physics, Environmental Compliance, the Safety and Health Evaluation Support team, the ER Program, Waste Management, and other appropriate entities.

Subcontractor support for this project will include Advanced Systems Technology, Inc., which is responsible for the field implementation, and CDM Federal Programs Corporation and H&R Technical Associates, which are preparing the project documentation.

3. SITE BACKGROUND AND LOGISTICS OF THE MAINTENANCE ACTION

Among the 55 inactive liquid low-level waste (LLW) tanks currently identified and scheduled for remediation at ORNL are four tanks designated as the "Batch I, Series 1" tanks. They are located within WAG 1 and include tanks 3001-B, 3004-B, T-30, and 3013. Before the tanks were emptied in 1992, the remaining liquid contents were sampled and analyzed for Resource Conservation and Recovery Act metals, process metals, anions, alkalinity, organic chemicals, and radionuclides. Preliminary screening of sample results indicated that the only potential contaminants of concern were radionuclides. A risk assessment conservatively estimated risk at less than 1×10^{-6} for the worst-case scenario.

This maintenance action encompasses remediating the tanks; breaking up asphalt and concrete, where necessary; temporarily relocating the Building 3001-B staircase; and shoring excavations. The action also will include

- relocating the staircase leading from the second story of Building 3001 to the concrete pad above Tank 3001-B;
- excavating soil and asphalt above Tank 3001-B;
- excavating soil from around Tank 3013;
- removing vault covers from tanks 3001-B, 3004-B, and T-30;
- sampling pipelines in all four tanks;
- cutting pipelines in all four tanks and any anchoring devices on tanks 3001-B, 3004-B, and T-30, and capping pipelines in tanks 3004-B, T-30, and 3013;
- removing tank flange and aboveground piping sections from Tank 3013;

- welding new lifting lugs on tanks 3001-B, 3004-B, and T-30;
- removing, capping, wrapping, and moving tanks 3001-B, 3004-B, and T-30 to staged Sealand™ containers for transport to Science Ecology Group, Inc., for recycling, and conducting any decontamination and sampling necessary to meet waste acceptance criteria;
- welding new pipe to an existing pipeline to form a continuous pipe run through the Tank 3001-B vault;
- welding endcaps on cut pipes left in place;
- filling vaults and Tank 3013 with grout;
- pouring a concrete pad to replace asphalt in the vicinity of Tank 3001-B and installing a reinforced concrete pad over the grout-filled Tank T-30 vault; and
- backfilling the Tank 3013 excavation.

The radiological conditions of the outer tank surfaces and the vault interiors are not known. Therefore, all work inside and around the tanks will be assumed to be in a contamination area until determined otherwise. Hazardous Waste Operations and Emergency Response (HAZWOPER) boundaries will be set up at each site, and appropriate personal protective equipment will be specified. All vaults are considered to be confined spaces, and Confined Space Entry Permits will be obtained.

The “Service Contract Specification for Inactive Tanks 3001-B, 3004-B, 3013, and T-30” (ESO:PX4836-01) provides general and specific information describing how the activities will be performed. All work conducted under this task will adhere to the requirements of the Service Contract Specification.

Once the tanks are accessible, the exact piping and anchoring configuration will be determined, and the plan for cutting will be finalized. A Sawzall™ or torch will be used to cut through the connecting piping and attached anchoring devices. A Hot Work/Burning permit will be obtained if hot cutting is to occur. In addition to cutting the piping, any anchoring devices will be identified and disconnected. Use of a Sawzall™ also is the preferred method in this case, but, depending on the exact type of anchoring and its configuration, hot cutting may be necessary.

Pipelines in all four tanks will be sampled to determine the presence of flammable, hazardous, or radioactive substances. Lockout/tagout controls will be used to prevent uncontrolled releases. Samples will be drawn from holes drilled into the pipes from the top down. Any liquid draining from the holes will be captured and disposed in accordance with the Waste Management Plan. Once pipe interiors are characterized and the proper controls are established, pipes will be sawed in two places. The removed section will be replaced with a temporary plumber’s plug, except in the case of Tank 3001-B, at which a new section of pipe will be welded in later to form a continuous pipeline.

Various hoisting and lifting activities will be involved in conducting the tank removals. The technical details of these activities (including lifting equipment, weight, key dimensions and center of gravity, and rigging specifics) are included in the "Hoisting and Rigging Program: Ordinary Lift Plan." Based on an evaluation of the activities to be performed, none of the hoisting or rigging tasks were determined to be critical lifts.

After tank removal, each vault will be filled with a controlled, low-strength material composed of

- 50 lb of Type II cement,
- 600 lb of F-Type fly ash,
- 2400 lb of sand, and
- 50 gal of water.

Before grouting, representative samples of the fly ash, sand, and cement will be analyzed. The grout permeability is expected to be approximately 2×10^{-5} cm/s, and the compression strength is expected to be approximately 300 psi.

Welding also will be conducted as part of the maintenance action. Where applicable, socket weld ends will be welded into place (in accordance with American National Standards Institute standard B16.11). After each weld, a liquid-penetration examination will be conducted to confirm the weld's integrity.

3.1 TANK 3001-B

To remove Tank 3001-B, the overlying stairway must be temporarily relocated so that it can continue to serve as a fire exit. The following activities will be conducted as part of removing and relocating the stairs and removing the tank.

1. Using a concrete saw, the posts securing the stairway floor to the underlying pad will be cut from the pad.
2. As specified in the Hoisting and Rigging Plan, the stairway will be rigged and secured to a crane for removal.
3. After the stairway has been rigged, but before it has been moved, the guard rails at the top of the stairway will be cut and modified to reflect the temporary stairway configuration.
4. After the stairway has been cut free, it will be hoisted and placed in the parking lot adjacent to the building. A precast concrete pad will be put in place to support the foot of the stairway.
5. Two "New Jersey Barriers" will be placed on either side of the stairway for protection during its temporary relocation.

6. After the stairway has been removed, the asphalt will be broken up using pneumatic jackhammers, and the resulting asphalt crunches and soil will be excavated using a backhoe. The overburden will be cleared away to allow access to the vault cover for its subsequent removal. The soil will be sampled as it is removed to determine whether it is contaminated. If contaminated, individual scoops of soil will be segregated and boxed for proper disposal, in accordance with the approved Waste Management Plan. The noncontaminated soil will be piled up at the work site and used to backfill and cover the vault.
7. The vault covers will be removed.
8. The inlet and discharge lines will be hot-tapped. Any liquid drained from either line will be containerized and sampled, and will be disposed in accordance with the approved Waste Management Plan. The lines then will be cut.
9. Lugs will be welded onto the tank, and the tank will be removed from the vault, capped, wrapped, and placed in a Sealand™ container. Any decontamination or sampling needed to meet the Waste Acceptance Criteria of Science Ecology Group, Inc., will be performed.
10. A single-wall, Schedule 40 pipe section will be welded to connect the inlet and discharge pipes.
11. After the pipe has been welded and nondestructive examination (i.e., dye-penetrant testing) is completed, the empty vault will be filled with grout.
12. The vault lids will be replaced before the grout sets.
13. The concrete landing will be backfilled and reworked. A new concrete pad will be poured to support the stairs. The concrete pad will consist of 3000-psi concrete reinforced with 6-in. × 6-in. × 6-gauge welded-steel wire.
14. The stairs will be reinstalled.

3.2 TANK 3004-B AND TANK T-30

The vaults containing these tanks are of similar construction, as are the tanks themselves. Therefore, the same process will be used to remove both tanks. The following activities will be conducted as part of the removal task.

1. The vault covers will be removed.
2. The inlet and discharge lines will be hot-tapped. Any liquid drained from either line will be containerized and sampled. The lines then will be cut.
3. The tank will be removed from the vault, capped, wrapped, and placed in a Sealand™ container. Any decontamination and sampling necessary to meet the Waste Acceptance Criteria of Science Ecology Group, Inc., will be performed.

4. The cut lines will be capped.
5. The Tank 3004-B vault will be grouted full to allow replacement of the vault cover. The Tank T-30 vault will be grouted full to allow the placement of a 6-in., reinforced-concrete cap over the vault.
6. A concrete pad will be poured at the Tank 3004-B vault. The Tank T-30 vault lid will be replaced before the grout sets.
7. The ground surface will be backfilled and reworked. The decorative rocks at Tank 3004-B will be replaced.

3.3 TANK 3013

Tank 3013 will be closed in place by cutting all lines and filling the tank with grout. The following activities will be performed to accomplish the work.

1. A silt fence will be erected around and downslope of the site to prevent erosion or runoff during the excavation activities. The silt fence either will be a preassembled fence installed to manufacturer's specifications, or will be constructed to the following specifications.
 - Posts will be spaced 6 ft to 10 ft apart.
 - A geotextile fabric will be installed to a height of 2 to 3 ft above grade and anchored in a trench 6 in. wide and 6 in. deep.
 - The geotextile fabric will be attached to the posts by staples.
 - After installation of the geotextile fabric, the trench will be backfilled.
2. The ground surface around the tank will be hand-excavated to a depth not exceeding 4 ft. The slope ratio from the pit will be 1:1. At this depth, all lines leading into the tank will be exposed, with the exception of a 1/2-in. line at a depth of approximately 6 ft. The 1/2-in. line is currently isolated from Building 3013.
3. The lines will be hot-tapped, and any fluid will be containerized and sampled. The lines then will be cut. Removed piping will be disposed in accordance with the Waste Management Plan.
4. The tank then will be filled with grout.
5. After the tank has been grouted full, all lines will be welded closed and examined using a dye-penetrant test.
6. The pit will be backfilled with soil, sodded, and restored to original site conditions.

3.4 DISPOSAL

Where possible, excavated material will be returned to its point of origin. Other waste generated from the project (e.g., personal protective equipment, concrete/asphalt rubble, excess water) will be disposed of at WAG 6 or at other appropriate facilities. Any water collected from the pipes will be characterized for radiological parameters and then disposed at an ORNL wastewater plant.

After removal, Tanks 3001-B, 3004-B, and T-30 will be capped, wrapped, and placed in Sealand™ containers for transport to Scientific Ecology Group, Inc., where the tanks will be smelted down.

4. PROGRAM MANAGEMENT

The ORNL ER Program Manager (H. L. Boston), the ORNL ER Program Quality Assurance Engineer (P. A. Schrandt), and the WAG 1 Facility Manager (M. L. Whitehead) have identified a need for a minimal readiness assessment for this project as required in ER/C-P1610, "Conducting Project Readiness Reviews." The Readiness Assessment Team will be appointed and is directly responsible for monitoring the project's readiness for operation. L. S. Hawk is responsible for evaluating the readiness assessment plan, coordinating the approval of the plan, and requesting that the ER Program verify the project's readiness to proceed to the required remedial action work.

4.1 ENVIRONMENTAL RESTORATION SITE READINESS ASSESSMENT TEAM CHARTER

The Readiness Assessment Team is a management-appointed multidisciplinary group that has been established (1) to evaluate the state of readiness (to proceed to construction) to remediate the four inactive tanks in WAG 1; (2) to identify and validate supportive, objective evidence of readiness; and (3) to assist the WAG 1 Facility Manager in presenting the evidence of readiness to the ER Program.

The Readiness Assessment Team's specific responsibilities include

- preparing the readiness assessment plan,
- using appropriate techniques to ensure full coverage of all activities,
- preparing the readiness criteria,
- identifying and verifying the visible objective evidence, and
- monitoring and determining the state of readiness and reporting this information to the ORNL ER Program Site Manager.

The Readiness Assessment Team's activities will include reviewing the readiness of facilities and equipment, materials, personnel and training, plans, permits and procedures, and support services.

4.2 READINESS ASSESSMENT TEAM MEMBERS

The Readiness Assessment Team members are

- Russ Carvin (ORNL, Waste Management)
- Brad Copeland (Hazardous Waste Operations and Emergency Response/Safety and Health Evaluation Support Team),
- Harold Cromwell (ORNL, Engineering),
- W. C. Hayes (ORNL, Health Physics),
- Larry Hawk, Chairman (ORNL, Engineering Technology),
- C. S. Mims (DOE),
- E. Mulkey (ORNL, Compliance),
- John Phillips (ORNL, Quality Assurance), and
- Lynn Whitehead (ORNL, ER WAG 1 Facility Manager).

The team will be responsible for reviewing the data, evaluating the risks associated with operation, and making recommendations to the ORNL ER Program regarding readiness for initiation of the project.

5. REVIEW METHODOLOGY

The readiness assessment process is a management tool that establishes and verifies the state of readiness for initiation of an activity. The process begins with the preparation of the Readiness Assessment Plan and the identification of the readiness criteria (specified in the checklist shown in the Appendix). At a meeting of the Readiness Assessment Team (to be convened in mid-July), these criteria will be evaluated for completeness. The readiness assessment process concludes with documentation from the Readiness Assessment Team to the ORNL ER Program Manager that all criteria have been met and that the project is ready to proceed to the field. The ORNL ER Program Manager will review the documentation and, upon concurrence with the Readiness Assessment Team's conclusion, will approve the project.

APPENDIX

CRITERIA FOR READINESS ASSESSMENT FOR MAINTENANCE ACTION TO REMEDIATE INACTIVE TANKS AT WASTE AREA GROUPING 1

APPENDIX
CRITERIA FOR READINESS ASSESSMENT
FOR MAINTENANCE ACTION TO REMEDIATE
INACTIVE TANKS AT WASTE AREA GROUPING 1

The readiness review criteria are the standards by which the maintenance action to remediate inactive tanks at Waste Area Grouping 1 will be judged ready to begin. The readiness review criteria are being defined according to their specific applicability to the activity, and the generic criteria have been defined for events that must be accomplished to achieve readiness.

1. Documentation complete:

- National Environmental Policy Act, Categorical Exclusion
- Site-specific Health and Safety Plan
- Project Management Plan
- Waste Management Plan
- Hoisting and Rigging Plan
- Maintenance Action Work Plan
- Conduct of Operations Matrix
- Readiness Assessment Plan

2. Permits:

- Safety Work Permit
- Penetration/Excavation Permit
- Confined Space Entry Permit
- Radiation Work Permit
- Hot Work/Welding Permit

3. Personnel:

- All personnel available
- All personnel trained
- Health and safety personnel scheduled

4. Equipment:

- Crane (or other hoisting equipment)
- Cutting torch and supplies
- Health and safety monitoring equipment
- Grout plant
- Sealand™ containers for holding tanks

5. Other:

- All activities scheduled/sequenced with team and plant personnel
- Scientific Ecology Group, Inc., notified and ready to receive tanks

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