Explanation of Significant Differences for the Record of Decision for Interim Actions for the Melton Valley Watershed at Oak Ridge National Laboratory, Oak Ridge, Tennessee

Deletion of MSRE Ancillary Facilities from the Selected Remedy

This document is approved for public release per review by:

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ORNL Technical Information Officer Date
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for the Record of Decision for Interim Actions
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at Oak Ridge National Laboratory,
Oak Ridge, Tennessee

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U.S. DEPARTMENT OF ENERGY
Site Name and Location

U.S. Department of Energy (DOE)
Oak Ridge Reservation (ORR)
Melton Valley watershed at the Oak Ridge National Laboratory (ORNL)
Oak Ridge, Tennessee
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Introduction and Statement of Purpose

The Melton Valley watershed occupies approximately 1000 acres in the southern portion of ORNL, located on DOE's ORR. Portions of the watershed have been contaminated with a variety of wastes, including liquid and solid low-level radioactive wastes, through past disposal practices. DOE is remediating the Melton Valley watershed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

Remediation of most of the inactive units and contaminated media within Melton Valley is addressed by a CERCLA document entitled Record of Decision for Interim Actions for the Melton Valley Watershed at the Oak Ridge National Laboratory, Oak Ridge, Tennessee (DOE/OR/01-1826&D3). This Melton Valley Record of Decision (MV ROD) was signed on September 21, 2000, by DOE, the Tennessee Department of Environment and Conservation (TDEC), and the U.S. Environmental Protection Agency (EPA). The MV ROD addresses contaminant releases and potential risk or hazard through a combination of remedial activities such as containment, stabilization, removal, treatment, monitoring, and land use controls (LUCs). The selected remedial activities are expected to significantly reduce the release of contaminants from Melton Valley source areas into White Oak Creek, Melton Branch, their tributaries, and the Clinch River.

Since the MV ROD was signed, seven Melton Valley units that were anticipated to be "inactive" before implementation of that ROD was scheduled to be complete have continued to be "active," or are components of active systems, and are expected to remain active; therefore, they will be ineligible for remediation through the scheduled completion of the ROD. These seven units are presented in the MV ROD, Table A.1, List of remedial actions for the selected remedy, Melton Valley watershed, ORNL, Oak Ridge, Tennessee:
These units are the ancillary facilities of the Molten Salt Reactor Experiment (MSRE). Under the MV ROD remedy, four of the seven units require demolition, two of the seven require the removal of the units, and one of the seven requires stabilization with grout. These seven units, as presented in the excerpt below from Table A.1 of the MV ROD, are:

- Building 7503 Septic Tank
- MSRE Diesel Generator House (7555)
- MSRE Filter Pit (Off-Gas Filter House) (7511)
- MSRE Stack (7512)
- MSRE Supply Air Filter House Building (7514)
- MSRE Tanks VT-1 (condensation tank)
- MSRE Tanks VT-2 (expansion tank)

DOE wishes to remove remediation of these seven units from the scope of the remedy selected in the MV ROD and address these units as part of a future CERCLA decision planned to cover the decommissioning and decontamination of the MSRE facilities. In a Core Team meeting on May 18, 2005, and in accordance with 40 Code of Federal Regulations (CFR) 300.435, DOE and the regulators categorized the scope modification as a “significant” change to the MV ROD. In accordance with CERCLA Sect. 117 (c) and 40 CFR 300.435 (c)(2)(i), such a significant change is documented with an Explanation of Significant Differences (ESD). The purpose of this ESD is to explain the basis for deleting the seven MSRE ancillary units from the MV ROD remedy. The locations of all seven units addressed by this ESD are shown in Fig. 1.

This ESD is part of the Administrative Record file, and it and other supporting information can be found at the DOE Information Center, 475 Oak Ridge Turnpike, Oak Ridge, Tennessee 37830, from 8:00 a.m. to 5:00 p.m., Monday through Friday.
Fig 1. Location of units addressed in ESD (DOE/OR/01-2249&D1).
Site History, Contamination, and Selected Remedy

The ORNL historical missions—plutonium production during World War II and nuclear technology development during the postwar era—produced a diverse legacy of contaminated inactive facilities, research areas, and waste disposal areas in Melton Valley. The major problems identified in Melton Valley are the presence of high inventories of short half-life radiological waste and lesser quantities of long half-life radiological wastes, contaminant releases to surface water, and widespread contamination in secondary media.

Melton Valley is currently a restricted area under DOE control. The remediation levels, listed below, have been established in the ROD to achieve the reasonably anticipated future use of each remediation area.

1. The eastern portion of Melton Valley, which contains the reactor sites, will be remediated to a condition that allows industrial use with limited restrictions.

2. Much of the western portion of Melton Valley, occupied by the waste disposal sites, will continue to be a waste management area with wastes contained in place.

3. Surface water, designated as waters of the state, will be remediated consistent with the state’s stream use classification (e.g., recreation and fish and aquatic life). The floodplain soils will be remediated to 2500 μR/h.

Through a variety of source actions, the selected remedy addresses principal threats to human health and the environment posed by contaminated media in the Melton Valley watershed. Hydraulic isolation is preferred for most of Melton Valley because of the magnitude of the principal threat wastes and because of the worker risks and excessive cost entailed if treatment or removal were the primary mechanism for addressing these wastes. However, treatment and removal are included for selected areas to enhance the overall protectiveness of the selected remedy.

Following are the major components of the selected remedy:

- hydraulic isolation (including various combinations of multilayer caps, upgradient diversion trenches, and downgradient collection trenches) for the major contaminant source areas in Melton Valley [e.g., Solid Waste Storage Areas (SWSAs) 4, 5, and 6, and the Seepage Pits and Trenches Area];
- disposal of contaminated soils from the lower 22 trenches in SWSA 5 North;
- in situ grouting of two trenches in the Seepage Pits and Trenches Area;
- demolition of the majority of structures;
- removal of the High Flux Isotope Reactor (HFIR) Waste Collection Basins and the Homogeneous Reactor Experiment (HRE) pond and surrounding contaminated soils;
- maintenance of cryogenics for the HRE pond until removal;
- plugging and abandonment of all wells that have no future use, including the hydrofracture injection and monitoring wells;
• removal or hydraulic isolation of various contaminated surface soils above remediation levels throughout Melton Valley;
• removal of floodplain soil radiologically contaminated at levels greater than 2500 μR/h;
• removal, stabilization, or isolation of inactive waste pipelines as necessary to address contamination;
• in situ grouting of the HRE fuel wells in the Seepage Pits and Trenches Area;
• monitoring to verify the effectiveness of remedial actions and the protection of ecological receptors and to support a future decision for deferred portions of Melton Valley; and
• use of interim LUCs to restrict access to contaminated areas and groundwater.

The scope of the selected remedy does not include active facilities.

**Basis for the Document**

This section summarizes information that prompted and supports significant differences from the selected remedy (i.e., it justifies changing the selected remedy to delete the remediation of seven units).

The seven MSRE ancillary units were planned to be inactive at the time of the overall Melton Valley remediation, and therefore were included in the selected remedy when the various CERCLA documents for the Melton Valley watershed, such as the MV ROD, were developed and approved. It was acknowledged in the MV ROD (see comment column of Table A.1 of the MV ROD) that some units were still active and would be demolished when no longer in use. The selected remedy in the MV ROD also stated, "The selected remedy does not include active facilities." The transition of these units to inactive status has been delayed beyond the MV remediation time frame for these reasons:

1. Planned completion of the MV watershed remediation has been accelerated by DOE from FY 2014 to FY 2007.

2. Remediation of these units would interfere with a separate, ongoing CERCLA action at MSRE to remove the fuel and flush salts, which is scheduled to be completed in FY 2006.

3. Remediation cannot readily begin while the MSRE site is active.

4. There are no technical or environment, safety and health (ES&H) advantages to demolish one building that shares a common wall with another building and at a later time demolish the other building.

5. Remediation as a part of the MSRE decontamination and decommissioning would result in a more consistent remediation of the site.

6. One mobilization effort for these seven facilities and the other MSRE facilities would be more cost effective.
The fuel and flush salt removal is described in the Record of Decision for Interim Action to Remove Fuel and Flush Salts from the Molten Salt Reactor Experiment Facility at the Oak Ridge National Laboratory, Oak Ridge, Tennessee (DOE/OR/02-1671&D2). Upon completion of the fuel and flush salt removal action, the MSRE facility, including the seven ancillary facilities listed in the MV ROD, will be managed under the surveillance and maintenance program until initiation of demolition post FY 2008. Therefore, the transition of the MSRE ancillary facilities to inactive status will not occur until well after the scheduled completion of the MV ROD.

DOE proposes to maintain these ancillary units until no longer required and to remediate the units under a future decision for the decommissioning and decontamination of the MSRE facilities.

**Description of Significant Differences**

The overall impact of deleting the remediation of these seven MSRE units to the Melton Valley remedy is a small decrease in scope and cost. Performance of the Melton Valley remedy remains unchanged. No deletions or new applicable or relevant and appropriate requirements (ARARs) are needed. No major change is needed to the ROD or its supporting analyses. No additional maintenance, monitoring, or LUCs, beyond those established at the watershed level or for units already under the MV ROD, are needed for any of the individual units in this ESD. Deletion of this scope will not adversely impact the current Melton Valley Closure Project scope of work or completion schedule.

Remediation of the seven units will be addressed in the development of the appropriate CERCLA decision-making documentation for the decommissioning and decontamination of the MSRE facility, and these units will not be remediated until the follow-on CERCLA decision on actions for MSRE facilities has been finalized and documented in accordance with the FFA.

**Cost**

The decremental capital cost associated with the remedy changes is approximately $900,000. This cost is less than 1% of the escalated capital cost of $164,846,000 presented in the ROD. There are no additional costs for maintenance, monitoring, or LUCs associated with these units.

**EPA and TDEC Comments**

EPA and TDEC have participated with DOE in the development, early review, and subsequent revision of this ESD. Through signature of this document, EPA and TDEC indicate that they approve the ESD and endorse the deletion of seven units from the scope of the MV ROD selected remedy as presented in this final ESD.
Statutory Determinations

As required under CERCLA Sect. 121, the modified remedy protects human health and the environment, complies with federal and state requirements that are ARARs to the remedial action, is cost-effective, and uses permanent solutions and alternative treatment technologies to the maximum extent practicable. The remedy will be reevaluated in the future. No ARAR waivers are required for this remedy. This ESD does not affect the prior ROD determination that the remedy satisfies the statutory preference for treatment. As required by CERCLA, a review will be conducted no less often than every 5 years after initiation of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

Public Participation Compliance

Prior to issuance of this ESD, DOE developed an information sheet explaining the scope of the proposed change to the MV ROD and the potential impacts to the original decision. On June 20, 2005, the Oak Ridge Site Specific Advisory Board reviewed the information sheet for clarity and completeness. The finalized information sheet was made available to the public at the DOE Information Center.

The public participation requirements set forth in 40 CFR 300.435(c)(2)(i) will be met. After approval of the ESD by the regulators, DOE will publish a public notice of availability and a brief description of the ESD in major local newspapers of general circulation. Also, the ESD will be made available to the public through placement in the Administrative Record file and the DOE Information Center.
APPROVALS

Explanation of Significant Differences for the Record of Decision for Interim Actions for the Melton Valley Watershed at Oak Ridge National Laboratory, Oak Ridge, Tennessee

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DOE/OR/01-2249&D1
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[Signatures and dates]

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