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**Oak Ridge Reservation Federal Facility Agreement
Quarterly Report
for the Environmental Restoration Program**

Volume 4. July–September 1995

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**Oak Ridge Reservation Federal Facility Agreement
Quarterly Report
for the Environmental Restoration Program**

Volume 4. July–September 1995

Environmental Restoration Division
P.O. Box 2003
Oak Ridge, Tennessee 37831-7298

Date Issued—October 1995

Prepared for the
U.S. Department of Energy
Office of Environmental Management
under budget and reporting code EW 20

LOCKHEED MARTIN ENERGY SYSTEMS, INC.
managing the
Environmental Management Activities at the
Oak Ridge K-25 Site Paducah Gaseous Diffusion Plant
Oak Ridge Y-12 Plant Portsmouth Gaseous Diffusion Plant
Oak Ridge National Laboratory
under contract DE-AC05-84OR21400
for the
U.S. DEPARTMENT OF ENERGY

This document has been approved for release
to the public by:

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Asst. Technical Information Officer Date
Oak Ridge K-25 Site

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PREFACE

This *Oak Ridge Reservation Federal Facility Agreement Quarterly Report for the Environmental Restoration Program* was prepared to satisfy requirements for progress reporting on Environmental Restoration Program (ER) activities as specified in the Oak Ridge Reservation Federal Facility Agreement (FFA) established between the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency, and the Tennessee Department of Environment and Conservation. The reporting period covered in this document is July–September 1995.

This work was performed under work breakdown structure 1.4.12.2.3.04 (activity data sheet 8304). Publication of this document meets an FFA milestone defined as 30 days following the end of the applicable reporting period. This document provides information about ER Program activities conducted on the Oak Ridge Reservation under the FFA. Specifically, it includes information on milestones scheduled for completion during the reporting period, as well as scheduled for completion during the next reporting period (quarter); accomplishments of the ER Program; concerns related to program work; and scheduled activities for the next quarter. It also provides a listing of the identity and assigned tasks of each of the U.S. Department of Energy contractors performing ER Program work under the FFA.

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ABBREVIATIONS

ACB	Auxiliary Charcoal Bed
CA	Characterization Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DNAPL	dense nonaqueous-phase liquid
DOE	U. S. Department of Energy
DOE-ORO	U. S. Department of Energy Oak Ridge Operations Office
DTSF	Diked Tank Storage Facility
Energy Systems	Lockheed Martin Energy Systems*
EPA	Environmental Protection Agency
EPIC	Engineering Projects Information Center
ER	Environmental Restoration
FFA	Federal Facility Agreement
FS	Feasibility Study
GAAT	Gunitite and Associated Tanks
IDY	Interim Drum Yard
ISV	in situ vitrification
K-25 Site	Oak Ridge K-25 Site
LEFPC	Lower East Fork Poplar Creek
LLLW	liquid low-level radioactive waste
LWBR	Lower Watts Bar Reservoir
MSRE	Molten Salt Reactor Experiment
MSS	multispectral scanner
NHF	New Hydrofracture Facility
NPDES	National Pollutant Discharge Elimination System
OHF	Old Hydrofracture Facility
ORAU	Oak Ridge Associated Universities
OREIS	Oak Ridge Environmental Information System
ORNL	Oak Ridge National Laboratory
OU	operable unit
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
RI/FS	Remedial Investigation/Feasibility Study
RIWP	Remedial Investigation Work Plan
RMPE	reduction of mercury in plant effluents
ROD	Record of Decision
S&M	surveillance and maintenance
SCF	South Campus Facility
SWSA	solid waste storage area
TDEC	Tennessee Department of Environment and Conservation
UEFPC	Upper East Fork Poplar Creek

*Formerly Martin Marietta Energy Systems.

WAG	waste area grouping
WBR	Watts Bar Reservoir
WOC	White Oak Creek
WOL	White Oak Lake
Y-12 Plant	Oak Ridge Y-12 Plant

1. EXECUTIVE SUMMARY

This quarterly progress report satisfies requirements for the Environmental Restoration (ER) Program that are specified in the Oak Ridge Reservation Federal Facility Agreement (FFA) established between the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the Tennessee Department of Environment and Conservation (TDEC). The reporting period covered herein is July through September 1995 (fourth quarter of FY 1995).

Sections 1.1 and 1.2 provide respectively the milestones scheduled for completion during the reporting period and a list of documents that have been proposed for transmittal during the following quarter but have not been approved as FY 1995 commitments.

1.1 DOCUMENTS TRANSMITTED TO THE REGULATORS

The following documents were transmitted to the regulators during the fourth quarter of FY 1995 and can be requested from the Information Resource Center in Oak Ridge.

- Kerr Hollow Quarry Record of Decision (ROD) (DOE/OR/02-1398&D1)
- Upper East Fork Poplar Creek (UEFPC) Operable Unit (OU) 1 Remedial Investigation (RI) Work Plan (DOE/OR/01-1396&D1)
- Waste Evaporator Facility Action Memorandum (DOE/OR/02-1381&D1)
- Core Hole 8 Plume Remedial Action Report (Ph. 1) (DOE/OR/01-1380&D1)
- Waste Area Grouping (WAG) 2 Surface Water ERMA Report (DOE/OR/01-1413&D1)
- WAG 4 Interim Action Proposed Plan (DOE/OR/02-1490&D1)
- Active Liquid Low-level Radioactive Waste (LLLW) Tanks Structural Integrity Assessment Category C Tanks and Pipelines (DOE/OR/01-1385&D1)
- Active LLLW Tanks Bethel Valley Upgrade Design Assessment (DOE/OR/03-1418&D1)
- WC-14 Remedial Action Report (DOE/OR/01-1397)
- K-1407 B and C Ponds Remedial Action Report (DOE/OR/01-1371&D1)
- Preliminary Ecological Risk Assessment (DOE/OR/01-1407&D1)
- Clinch River and Poplar Creek RI/Feasibility Study (FS) (DOE/OR/01-1393&D1)
- South Campus ROD (DOE/OR/02-1383&D1)
- ORR Site Management Plan (DOE/OR/1001/R4&D1)
- Remedial Site Evaluation Reports (3)
 - Contractor's Spoil Area (DOE/OR/01-1390&D1)
 - K-1410 and K-1031 Facility (DOE/OR/01-1412&D1)
 - K-901-A Holding Pond (DOE/OR/01-1386&D1)

Regulatory commitment status

Document title	Appendix E commitment date	Transmittal date
Kerr Hollow Quarry ROD	08/22/95	08/21/95
Upper EFPC OU 1 RI Work Plan	09/29/95	09/28/95
Waste Evaporator Facility Action Memorandum	07/30/95	07/28/95
Core Hole 8 Plume Remedial Action Report (Ph. 1)	08/30/95	08/30/95
WAG 2 Surface Water ERMA Report	09/29/95	09/28/95
Active LLLW Tanks Structural Integrity Assessment Category C Tanks & Pipelines	09/29/95	09/25/95
Active LLLW Tanks Bethel Valley Upgrade Design Assess.	09/29/95	09/29/95
WC-14 Remedial Action Report	07/31/95	07/30/95
K-1407 B and C Ponds Remedial Action Report	07/31/95	07/28/95
Preliminary Ecological Risk Assessment	08/31/95	08/30/95
Clinch River and Poplar Creek RI/FS	09/18/95	09/17/95
South Campus ROD	11/20/95	8/25/95
ORR Site Management Plan	09/29/95	09/28/95
Remedial Site Evaluation Reports (3)		
Contractor's Spoil Area (DOE/OR/01-1390&D1)	09/29/95	09/28/95
K-1410 and K-1031 Facility (DOE/OR/01-1412&D1)	09/29/95	09/28/95
K-901-A Holding Pond (DOE/OR/01-1386&D1)	09/29/95	09/28/95

1.2 DOCUMENTS PROPOSED FOR TRANSMITTAL TO THE REGULATORS

The following documents have been proposed for transmittal to the regulators during the first quarter of FY 1996.

- Lower East Fork Poplar Creek (LEFPC) RD Work Plan
- Annual Status Report on FFA Compliance for LLLW Tank Systems for FY 1995

2. SIGNIFICANT ACCOMPLISHMENTS

The following significant accomplishments are noted for the Environmental Restoration (ER) Program during the fourth quarter of FY 1995.

The Tennessee Society of Professional Engineers presented its 1995 Industrial Achievement award to the Energy Systems WAG 5 Seeps Project. This project, the first ER Incentive Contract project, successfully installed treatment systems on WAG 5 Seeps C and D and eliminated 30% of the total ^{90}Sr loading to the White Oak Creek (WOC) system.

The original plans for the K-25 K-1070 C/D Classified Burial Grounds Project involved submittal of a separate RI Report and an FS. Applying the Streamlined Approach for ER methodology, the RI Report and the FS were combined into one document, and the overall schedule and cost for delivery of the two documents will be reduced by \$438K.

Three negotiations on the K-25 K-901 OU resulted in a \$1,586,434 cost savings by use of a multidisciplinary team to conduct thorough technical and business evaluations. In addition to the respective cost savings, the clarification of the data management assumptions provided the framework for subsequent negotiations and associated cost savings.

The notification letters designating the members of the Oak Ridge Environmental Management Site Specific Advisory Board were sent, and the first meeting was held on September 21, 1995. There are twenty members of diverse interests and ethnic backgrounds on the board representing the surrounding communities. The purpose of the Site Specific Advisory Board is to help guide the Environmental Management Enrichment Facilities Program for the ORR.

The Final Draft of the "Common Ground Process" was released on September 15, 1995, for public comment. A public meeting was held on this subject on September 26. Approximately 50 citizens attended the afternoon and evening sessions. A number of improvements to the process and recommendations were given at the meeting. The Common Ground Team will document comments and accommodate suggestions in the final deliverables, which will be available at the first of the calendar year.

The ROD for the South Campus Facility (SCF) was transmitted to EPA and TDEC ahead of schedule. The final disposition of the investigation-derived waste at the SCF was completed. This waste has been accumulated in 183 drums from activities completed more than two years ago and has been stored until now. The 32 drums that had trichloroethylene groundwater waste from the areas addressed in the no-action ROD were emptied into the facility built as part of the treatability study.

The quarterly stakeholders public meeting was held on July 18 at Pollard Auditorium in Oak Ridge. Topics included environmental management activities associated with Y-12's Bear Creek Valley, Oak Ridge National Laboratory's (ORNL's) gunite tanks, spent nuclear fuel, the Environmental Assessment for Scrap Nickel, the Site Specific Advisory Board, Chestnut Ridge, DOE's Incentive Projects, depleted cylinders of UF_6 and mixed waste, the Toxic Substances Control Act Incinerator, and other waste-management issues. The meeting was well attended, as more than two hundred people were present.

On August 15 a public meeting was held at the Garden Plaza Hotel in Oak Ridge to inform stakeholders about DOE's statutorily required Baseline Environmental Monitoring Report and to receive input from the public about the Baseline Environmental Monitoring Report process and assumptions. More than 70 people attended the meeting.

Issued the "Risk Assessment Pathway/Transport Modeling for the Gunitite and Associated Tanks, Oak Ridge National Laboratory, Oak Ridge, Tennessee" to TDEC and EPA for comment/ information.

3. TECHNICAL STATUS

3.1 OAK RIDGE Y-12 PLANT

The original mission of the Y-12 Plant, built adjacent to the city of Oak Ridge in 1943 as part of the Manhattan Project, was to separate the fissionable isotope of uranium (^{235}U) by the electromagnetic process. Since the discontinuation of this process and until 1993 the facility evolved to support highly sophisticated manufacturing and development engineering associated with the production and fabrication of nuclear weapons components. Currently, the work force is refocusing the unique technical capabilities and expertise at the facility to provide (1) weapons dismantlement and storage, (2) enriched uranium material storage and management, (3) weapons process technology and development support, (4) renovation or decontamination and decommissioning of stand-by or shut-down buildings, (5) transfer of DOE-developed technology to enhance the competitiveness of the nation's industry in world-wide markets, and (6) maintenance and support of the National Security Program Office for DOE.

An additional facility priority is the clean-up or mitigation of environmental pollution resulting from past waste management practices on portions of the 800-acre site. The remedial action strategy integrates the numerous applicable federal and state regulations for efficient compliance and approaches both investigation and remediation efforts on a watershed basis. Three watersheds or hydrogeologic regimes have been identified at the facility: (1) Bear Creek, (2) UEFPC, and (3) Chestnut Ridge.

3.1.1 Upper East Fork Poplar Creek

Description

The UEFPC Characterization Area (CA) consists of both surface water and groundwater components of the UEFPC watershed and appropriate sources located within that watershed. This complex CA, which contains multiple contaminants, multiple contaminant sources, and commingled plumes, is a point of origin for both off-site surface water and groundwater contamination. The CA is bounded (in general) by the base of Pine Ridge to the north and Chestnut Ridge to the south. The boundary extends westward, where it abuts the boundary of the Bear Creek CA, and eastward to the DOE property line. The CA will also address a carbon-tetrachloride contaminated groundwater plume that extends past the DOE property line and surface water in UEFPC to where the scope of LEFPC begins.

Numerous primary sources exist within the CA. Infiltration from the S-3 Area dominates contamination in the western portion of the CA. The Salvage Yard, the S-2 Area, and the 81-10 Area are also known contaminant source areas in the CA. There are ~200 additional Resource Conservation and Recover Act (RCRA) Solid Waste Management Units within the boundaries of the CA. Many of these Solid Waste Management Units are of known low priority as contaminant sources to the environment; however, ~100 of these sites need additional evaluation.

Because of the wealth of historical data available for this CA, a streamlined RI/FS approach has been proposed and accepted by the FFA parties. This approach will use historical data to the fullest extent possible to complete the RI/FS, it will focus additional data collection efforts on FS needs, and it will use uncertainty management techniques to bound rather than fill data deficiencies. Because the

CA is underlain by an extensive storm sewer system, a subbasin approach will be used to link information from potential source areas (i.e., soil data and inventories) to historical surface water and shallow groundwater data. This approach, together with groundwater contaminant plume maps, will allow large areas of the plant (each subbasin) to be prioritized according to the relative contaminant contributions to surface water and groundwater.

In March 1994, DOE announced that elevated levels of four industrial solvents had been found in wells installed by the U.S. Geological Survey, located ~0.5 mile east of the Oak Ridge Y-12 Plant in the Union Valley Industrial Park. Elevated levels of these same solvents, which are known as volatile organic compounds, have also been found in groundwater monitoring wells at the Y-12 Plant. As a result of this finding, DOE is continuing to monitor the contaminated groundwater plume and the direction it is moving.

Accomplishments

Issued the RI Work Plan to the regulators for comment. This was an FFA deliverable that outlined a coordinated, streamlined investigation with abbreviated review cycles. Although this document is titled a work plan, a remedial site evaluation will need to be submitted before the field work decision document to document conclusions on historical data.

Reviewed the regulator comments on the Union Valley Report (Y/ER-206/R1) and published a comment resolution document. Since this was not an FFA deliverable, a modified document will not be issued.

The initial meeting of the dense nonaqueous-phase liquid (DNAPL) Task Team (composed of representatives from Energy Systems, DOE, Jacobs, CDM Federal, and TDEC) was held, and the DNAPL issues are being documented in meeting minutes. Agreement was reached that regular meetings would not be required for this task team; however, other technical task team meetings are planned.

The sump identification effort has progressed to the point that 90% of all suspect buildings have been toured and the sumps cataloged.

Concerns

None.

Scheduled Activities for Next Quarter

Continue analysis of existing data.

3.1.2 Bear Creek Valley

Description

The Bear Creek Valley comprises the following: groundwater, surface water, floodplain soils, the S-3 Ponds, the Oil Landfarm Waste Management Area, and the Burial Grounds Waste Management Area. The Oil Landfarm Waste Management Area consists of the Oil Landfarm Hazardous Waste Disposal Unit, Sanitary Landfill I, the Boneyard/Burnyard, and the Chemical Storage Area. The Burial Grounds Waste Management Area consists of Burial Grounds A, B, C, D,

E, and J and Oil Retention Ponds 1 and 2. These units were used until the 1980s as the primary area for the disposal of various types of hazardous and nonhazardous wastes generated at the Y-12 Plant.

Groundwater, surface water, floodplain soils, and source units are being evaluated as a single OU to ensure that (1) a consistent approach to remediation is implemented across the valley and (2) remedial actions at specific sites are prioritized to achieve the greatest risk reduction. Groundwater, surface water, and floodplain soils in Bear Creek Valley will be characterized over an area that extends west from a topographic high near the west end of the Y-12 Plant (the S-3 Waste Management Area) to the point where Bear Creek exits the valley near State Highway 95.

The primary groundwater contaminants in the Bear Creek hydrologic regime are nitrates, volatile organic compounds, radionuclides, and, to a lesser extent, trace metals. DNAPLs have been discovered at a depth of 270 ft below the Bear Creek Burial Grounds. These liquids consist primarily of perchloroethylene, trichloroethylene, 1,1,1-trichloroacetic acid, and high concentrations of polychlorinated biphenyls (PCBs).

Below is a description of each of the source units in the Bear Creek Valley:

S-3 Ponds. The S-3 Ponds are part of the S-3 Waste Management Area. They were constructed in 1951 and consisted of four unlined surface impoundments covering an area of roughly 400 ft on each side, with a total storage capacity of ~10 million gal. During its operation, up to 5500 gal/d of effluent were pumped to the pond. Primary contaminants were nitrates and uranium, with lesser concentrations of heavy metals and organic solvents. In 1988, the S-3 Ponds were closed as a RCRA landfill. An asphalt parking lot was constructed over the cap to complete site closure.

Oil Landfarm Hazardous Waste Disposal Unit. The Oil Landfarm Hazardous Waste Disposal Unit was used for the land application of waste oils and coolants that contained beryllium compounds, depleted uranium, PCBs, and chlorinated organic compounds. Disposal operations were discontinued in 1982. In 1990, the site was closed as a landfill with a multilayered engineered cap.

Sanitary Landfill I. Sanitary Landfill I received various types of nonhazardous waste from the Y-12 Plant. Waste disposal at Sanitary Landfill I was terminated in 1982, and the site was graded, capped, and closed in 1983 in accordance with TDEC regulations for sanitary landfills.

Boneyard/Burnyard. The Boneyard/Burnyard consists of ~8 acres used from 1943 to 1970 as a disposal site for waste from the Y-12 Plant. Burning and disposal of debris and sanitary, metallic, chemical, and radioactive wastes are known to have occurred. The site has been abandoned and is predominately covered with grassy vegetation.

Chemical Storage Area. The Chemical Storage Area overlays the southeastern portion of the Boneyard/Burnyard. The Chemical Storage Area is ~2 acres in size and was used to burn or neutralize liquid and gaseous wastes from 1975 until 1981. The Chemical Storage Area is presently covered with a RCRA-type cap.

Burial Grounds. Burial Grounds A, B, C, D, E, and J, located on the southern slope of Pine Ridge ~2 miles west of the Y-12 Plant, cover an area of ~5000 by 3000 ft. Each disposal unit consists of a series of trenches excavated to depths of 14 to 25 ft below grade. The trenches received a variety of hazardous and nonhazardous solid and liquid wastes. All hazardous waste disposal operations were discontinued in 1981. All trenches known to have received RCRA hazardous material have been capped as part of a RCRA closure.

Oil Retention Ponds. Oil Retention Ponds 1 and 2 were constructed to intercept seepage from burial trenches. Both ponds were RCRA-closed in 1990. A wide range of contaminants may have been disposed of in the Bear Creek Burial Grounds. Volatile organic compounds in soil resulting from groundwater transport are of primary concern.

The nature and extent of soil contamination within each of the listed source units and the nature and extent of groundwater, surface water, and floodplain soils contamination in Bear Creek Valley will be determined during the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) investigation.

Accomplishments

Completed the groundwater sampling for collection of radionuclide data to support the RI Report. This sampling was necessary because Minimum Detectable Activities for radionuclides in groundwater data sets are not sufficiently low for use in the human health risk assessment.

Concerns

Concern: The need for additional groundwater sampling has resulted in a schedule delay for the RI/FS Reports. **Impact:** If the schedule delay is not approved, the RI Report will not contain a complete Risk Assessment. **Action:** A letter was submitted to the regulators that included justification for the delay.

Scheduled Activities for Next Quarter

The in-situ grouting technology demonstration being conducted in support of the Bear Creek FS will be completed.

Ecological sampling supporting the radiological risk assessment will be completed.

Work will continue on preparation of the RI and FS Reports for Bear Creek Valley.

3.1.3 Bear Creek Operable Unit 2

Description

Bear Creek OU 2 consists of the Rust Spoil Area, Spoil Area 1, and the SY-200 Yard.

Rust Spoil Area. The Rust Spoil Area is located in Bear Creek Valley <0.5 mile west of the Y-12 Plant on Old Bear Creek Road. The Rust Spoil Area was used from 1975 to 1983 for the disposal of spoil material generated during various renovation, maintenance, and construction operations at the Y-12 Plant. Disposed material was periodically graded, resulting in changes in topography and in filling of part of the Bear Creek channel. Approximately 100,000 yd³ of nonuranium-contaminated construction spoils were disposed of at the site. Small quantities of solvent-contaminated material and material containing asbestos, mercury, and uranium may have been disposed of in this area. Soil contamination is of primary concern.

Spoil Area 1. Spoil Area 1 is located near the southwest end of the Y-12 Plant, bounded by Old Bear Creek Road and West Patrol Road. Spoil Area 1 was used for the disposal of ~100,000 yd³ of nonhazardous, nonradiologically contaminated construction debris. Although plant controls

eliminated the disposal of hazardous and radioactive wastes, past plant practices indicate that some of the construction material may have been contaminated with trace amounts of asbestos, mercury, beryllium, thorium, and uranium.

SY-200 Yard. The SY-200 Yard is a 200- by 300-ft aboveground storage area located adjacent to Old Bear Creek Road. Materials from several Y-12 and ORNL divisions included PCB transformers, lead shielding plates, and radioactively contaminated materials. Soil contamination is of primary concern.

Accomplishments

Received regulatory approval on the Proposed Plan. The preferred alternative includes maintenance of existing caps at the SY-200 Yard and Spoil Area 1. Potential groundwater contamination associated with the Rust Spoil Area will be evaluated in the Bear Creek OU RI Report.

Concerns

None.

Scheduled Activities for Next Quarter

The Public Comment Period for the Proposed Plan will be completed.

Preparation of the ROD will continue.

3.1.4 Chestnut Ridge Operable Unit 2

Description

Chestnut Ridge OU 2 consists of the Filled Coal Ash Pond and Upper McCoy Branch. The Filled Coal Ash Pond is situated within the McCoy Branch watershed ~0.5 mile south of the Y-12 Plant. The pond was constructed in 1955 to serve as a settling basin for coal ash from the Y-12 steam plant. By 1967, the pond had filled, spilling sediments directly into McCoy Branch. From 1967 to 1989, ash was carried within McCoy Branch to Rogers Quarry, ~0.5 mile downstream of the Coal Ash Pond.

Impacts to surface water, stream sediments, and groundwater from metals, including uranium and major ions, are of concern. Biomonitoring of aquatic organisms in McCoy Branch and Rogers Quarry has shown a biological impact potentially from the ash pond operations.

Accomplishments

Completed the Public Comment period on the Proposed Plan and incorporated comments. No major comments were received.

Concerns

None.

Scheduled Activities for Next Quarter

Preparation of the ROD will continue.

3.1.5 Reduction of Mercury in Plant Effluents

Description

The reduction of mercury in plant effluents (RMPE) subproject has undergone a major rescoping activity to define projects required to support the Clean Water Act, National Pollutant Discharge Elimination System (NPDES) requirements. The formal Baseline Change Proposal has been submitted. The new project scope consists of the Mercury Use Building Source Elimination and the Mercury Treatment Facility.

Mercury Use Areas. From 1955 through 1963, a column-exchange process involving large quantities of mercury was employed to separate lithium isotopes. The Mercury Use Areas include buildings and other facilities that have been designated as possible sources of mercury contamination because of known, suspected, or presumed releases. The area of investigation includes soils surrounding and drainages associated with the following buildings and adjoining areas: 9201-2, 9201-5, 9202, 9204-4, 9733-1, 9733-2, and mercury flask storage areas and deflasking facilities.

Mercury Use Building Source Elimination. Mercury-contaminated storm drains and sumps in the Mercury Use Building—which consists of buildings 9201-2, 9201-4, 9201-5, and 9204-4—will be bypassed by the installation of new piping that will provide for a clean transport of water from the building. This activity will be conducted in a phased manner.

Interim Mercury Treatment Unit. A new on-line effluent treatment process will be installed in Building 9201-2 to remove mercury from Y-12 Plant storm water. The design is for a demonstration treatment process with associated pumps and piping to collect the contaminated sump water for treatment. Following startup and demonstration of the interim facility capabilities, technical work will focus on optimization of the system components up to and including total system replacement, if cost justified, to meet NPDES requirements.

Central Mercury Treatment Facility. The mercury-contaminated waters from the Mercury Use Building sumps (9201-4, 9201-5, and 9204-4) will be collected, and long-term treatment will be performed at the Central Mercury Treatment Facility. The facility will be housed at the existing Central Pollution Control Facility.

Accomplishments

Completed the source elimination work in 9204-4.

Ordered the tanks for the 9204-4 source collection project.

Completed the study to evaluate upgrading the Interim Mercury Treatment Unit to a permanent system and ordered the selected new carbon columns.

Began operation of the Mercury Air Stripping Test Facility at Outfall 51.

Completed the Central Mercury Treatment System installation/site preparation design and issued a contract for the treatment system columns.

Concerns

Concern: The latest NPDES permit requires UEFPC to be at state water quality standard for mercury on the last day of the permit. **Impact:** This is unattainable and will require that the permit be appealed. **Action:** The ongoing CERCLA activities for UEFPC, which will result in a Proposed Plan and ROD, will be considered as a vehicle to obtain relief from the NPDES permit requirements. Under the current RI/FS schedule, the ROD will not be complete by the last day of the permit, and other interim alternatives under the CERCLA process are being considered.

Scheduled Activities for Next Quarter

None.

3.1.6 Kerr Hollow Quarry*Description*

Kerr Hollow Quarry was a former rock and gravel quarry that was abandoned in the late 1940s when it filled with water. Since at least 1951, the Y-12 Plant and ORNL have used Kerr Hollow Quarry for the treatment of water-reactive materials and potentially explosive chemicals and for the disposal of empty compressed gas cylinders. Kerr Hollow Quarry was not intended for use as a hazardous waste storage or disposal facility, but used as a treatment facility and permitted as such. It was used strictly for the emergency handling of reactive, corrosive, and ignitable wastes when personnel safety was of primary concern.

Kerr Hollow Quarry was a permitted facility under NPDES Permit No. TN 0002968--Outfall 301 for the treatment of certain potentially explosive chemicals or water-reactive metals. The permit required monitoring the Kerr Hollow Quarry outfall following a treatment operation, with results reported quarterly to TDEC.

The empty compressed gas cylinders, positioned on the northwest bank of the quarry, were removed from the area and returned to the Y-12 Plant for disposal. Prior to the early 1970s, however, such gas cylinders were discarded in the quarry. A RCRA closure was completed on this project, which removed the remaining cylinders from the quarry.

Accomplishments

Submitted the D1 ROD to EPA and TDEC for their review and also the D2 ROD for approval.

Concerns

None.

Scheduled Activities for Next Quarter

None.

3.1.7 Resource Conservation and Recovery Act Closures

Description

This subproject consists of three areas: (1) the Building 9409-5 Diked Tank Storage Facility (DTSF), (2) the Garage Underground Storage Tanks, and (3) the Interim Drum Yard (IDY).

YS-017 Building 9409-5 DTSF. The Building 9409-5 DTSF is a RCRA-permitted, outdoor, concrete, diked area with a capacity of ~238,000 gal. This facility was constructed in 1942 as a four-cell cooling tower basin, but it was modified in 1980 for use as a secondary containment facility for tanks and drums of liquid waste. These tanks and drums have contained, at various times, liquid waste coolant, solvents, and waste oils, all of which may have contained PCBs. Some of the waste liquids stored in this facility were known to have contained uranium and beryllium. Chromium may be present as a result of the water treatments used during cooling tower operations. All tanks have been removed from the facility, and the closure plan has been submitted. Closure plan approval is pending.

YS-019 Garage Underground Storage Tanks. The Garage Underground Storage Tanks were part of an on-site facility for servicing motor vehicles. This facility included a gas station with associated underground fuel tanks, underground piping, dispensing pumps, a building, and ancillary fixtures. Two tanks were previously used to store unleaded gasoline (a 20,000-gal tank) and leaded gasoline (a 10,000-gal tank). The tanks were subsequently diverted from their initial use to the storage of waste oils containing the spent solvents perchloroethylene and Freon-113 and measurable quantities of PCB and uranium. A third empty tank in the same dirt emplacement with the two RCRA tanks contained waste oil that was not hazardous as defined by current regulations.

Surface soil shows evidence of spills/leaks that occurred during sampling and transfer operations. These tanks were originally gasoline storage tanks and were later converted to store the following:

- largest tank—unleaded gasoline, 1975 to 1979; waste oil, 1980 to present; and
- smaller tanks—gasoline, 1962 to 1979; waste oil, 1980 to present.

Clean closure of the tanks began in 1988 with the excavation, decontamination, and removal of the tanks; the sampling of surrounding soil; and the removal of contaminated soil. As a subproject, the three contaminated tanks were cleaned and removed in early 1994. The RCRA closure package—which includes closure certification by the independent Registered Professional Engineer, the closure summary report, and supporting closure documentation—has been transmitted to the state regulators for review.

YS-030 IDY. The IDY west of Building 9720-32 is a RCRA, outdoor, tented storage facility for containerized hazardous waste. Drums are stored on wooden pallets placed on gravel lined with a plastic tarp covering native soil.

Wastes stored at the facility consist of mercury, metals, acrylonitrile, methylene chloride, organics, Freon-113, cyanide, PCBs, uranyl nitrate, penetrant solution and emulsifiers, asbestos, and sodium hypochlorite.

Soil sampling indicated that the underlying surface soil and gravel were contaminated. All waste stored at this site was shipped off site for final disposal or transferred to a RCRA-permitted storage facility on the ORR. The tent structures and diking were also removed to prepare the site for sampling

and characterization activities. Analytical results indicated that the soil in two areas had some contamination above RCRA clean closure criteria for cadmium and mercury. Spot soil removal is proposed for these two areas, and after three attempts at overexcavation, the site would be closed with contamination in place. Any further investigatory or remedial action would be conducted according to the requirements of CERCLA. Closure Plan approval is pending.

Accomplishments

Awaiting state approval of IDY and DTSF closure plans.

Concerns

None.

Scheduled Activities for Next Quarter

Upon approval of phase, implementation required.

3.2 OAK RIDGE NATIONAL LABORATORY

ORNL was built 10 miles southwest of the city of Oak Ridge in 1943 as part of the World War II Manhattan Project. The original mission of ORNL was to produce and chemically separate the first gram quantities of plutonium as part of the national effort to produce the atomic bomb. ORNL's current missions are to conduct applied research and engineering development in support of DOE programs in nuclear fusion and fission, energy conservation, fossil fuels, and other energy technologies and to perform basic scientific research in selected areas of the physical, life, and environmental sciences.

An additional mission of ORNL is to clean up or mitigate environmental impacts resulting from past waste management practices on portions of the 3560-acre site. The remedial action strategy integrates the numerous applicable federal and state regulations for efficient compliance and approaches for both investigations and remediation efforts on a WAG basis. A WAG is a grouping of potentially contaminated sites based on drainage area and similar waste characteristics. These contaminated sites are further divided into three classifications based on existing information whether it is scoping or RI data. These areas are as follows: (1) study area—existing information on these areas indicates a small probability of contributing to environmental contamination, or insufficient information exists to determine environmental impacts; (2) remedial project areas—existing information indicates that the potential environmental impact is of concern; and (3) OUs—considered a discrete action that comprises an incremental step toward comprehensively addressing site problems.

3.2.1 Oak Ridge National Laboratory Waste Area Grouping 1 Gunite and Associated Tanks

Description

The Gunite and Associated Tanks (GAAT) and appurtenances were constructed in 1943 and 1951 to handle and store the radioactive and chemical liquid waste generated by ORNL operations. These tanks are in the center of ORNL adjacent to the main pedestrian traffic thoroughfares; office buildings,

research facilities, and the cafeteria are nearby. The GAAT area includes six Gunitite tanks in the South Tank Farm; four Gunitite tanks and four stainless-steel tanks in the North Tank Farm; and two separate Gunitite tanks associated with Building 3550.

South Tank Farm. The South Tank Farm includes tanks W-5 through W-10, which are 170,000-gal capacity Gunitite tanks originally used for storage of radioactive liquid (radiochemical and metal) wastes and later for precipitation of radionuclides into sludge at the bottom of the tanks. These tanks were taken out of service in the late 1970s.

North Tank Farm. The North Tank Farm contains four Gunitite tanks (W-1 through W-4) ranging in capacities from 4,800 to 42,500 gal and four stainless-steel tanks (W-13, W-14, W-15, and W-1A) ranging in capacity from 2,000 to 4,000 gal. These tanks were installed in 1950 to handle the increased volumes and level of radioactivity by providing better collection and segregation of waste types, as well as sampling and measurement of waste volumes and rates of accumulation from each source. These tanks were taken out of service in the late 1950s and early 1960s except for tank W-1A, which was removed later in the 1980s.

Building 3550 Laboratory Waste Tanks. Building 3550 laboratory waste tanks (W-11 and TH-4) are Gunitite tanks with capacities of 1,500 and 14,000 gal, respectively, used for storage of thorium and uranium LLLW from various research laboratories in Building 3550. Tanks W-11 and TH-4 were taken out of service in 1948 and 1970, respectively.

Although most of the accumulated liquid and solid waste was removed from these tanks between 1982 and 1984 during a sludge disposal campaign, some residual wastes remain with some additional accumulation of liquids from infiltration into these tanks. Latest reports show an estimated 45,000 gal of sludge and solids and more than 350,000 gal of liquid remain in the tanks, which constitutes 90% of ORNL's inactive tanks radioactive waste inventory. This waste is referred to and handled as mixed or mixed-transuranic waste that must be handled by remotely operated systems.

While preparing the RI/FS report, DOE recognized that additional information would be required to verify that the remedial alternative could meet the CERCLA threshold criteria, to properly evaluate the balancing criteria, and to compare the remedial action alternatives. Given these needs, DOE, EPA, and TDEC agreed that a treatability study would be prepared to better identify more cost-effective remediation approaches with less uncertainty and clearer strategies.

Accomplishments

Issued Technical Memorandum "Results of Fall 1994 Sampling of Gunitite and Associated Tanks" and provided it to TDEC and EPA for information.

Completed the Phase II characterization field sampling and measurement activities, including obtaining sonar measurements for tanks W-3, -4, -5, -6, -8, -9, and -10, obtaining 23 sludge samples from tanks W-3 through W-10 and performing video inspection of W-3, -4, -5, -6, and -10.

Completed the design package and soil sampling for the North Tank Farm site preparation, risers, and platforms and initiated construction activities including placing the concrete for the first platform footers.

Initiated modifications to the Cold Test Facility.

Conducted the preliminary design review for the modified light duty utility arm. This review provided the basis for establishing an incentive based contract with Westinghouse-Hanford and SPAR Aerospace for fabrication of the arm.

Initiated the transfer of 50,000 gal of highly contaminated supernate from tank W-8. This is the first transfer from an inactive tank performed under the new FFA requirements.

Received regulator comments for the Baseline Treatability Study Work Plan (D1).

Concerns

None.

Scheduled Activities for Next Quarter

Complete and issue process flow diagrams, process and instrumentation drawings, and facility modification work packages.

Incorporate regulator comments and issue Baseline Treatability Study Work Plan (D2).

Issue the Risk Assessment document to the regulators for their review.

3.2.2 Oak Ridge National Laboratory Waste Area Grouping 1 Core Hole 8

Description

The contaminated groundwater plume identified with Core Hole 8 is being remediated using a new system to collect, transfer, and treat contaminated groundwater from an underground stream before it enters storm sewers at ORNL. From three catch drains, the groundwater is pumped to ORNL's Process Waste Treatment Facility, where contaminants are removed and the treated water is released.

The project received its name after rock and groundwater samples taken from Core Hole 8 (a WAG 1 sampling site located just west of the North Tank Farm) were found to be contaminated with ⁹⁰Sr. This discovery provided a key to understanding how groundwater contaminated with ⁹⁰Sr was getting into ORNL storm sewers. The plume originally flowed into the ORNL storm sewers, and from there into First Creek. First Creek empties into WOC, which in turn feeds the Clinch River.

Accomplishments

Submitted the Remedial Action Report to the regulators for review.

Concerns

None.

Scheduled Activities for Next Quarter

Respond to regulator comments on the Remedial Action Report.

Continue operations and monitoring of the plume collection and transfer system.

3.2.3 Oak Ridge National Laboratory Waste Area Grouping 1 Surface Impoundments

Description

The WAG 1 Surface Impoundments consists of four surface impoundments located in the south central portion of the ORNL main plant area. A brief description of each of the five impoundments follows.

Basin 3513. This unlined impoundment was constructed in 1944 in natural clays to serve as a settling basin for untreated waste waters before their discharge into the adjacent WOC. This impoundment is no longer used, but water levels are maintained to provide shielding for radioactive sediments.

Basin 3524. This unlined impoundment was constructed in 1943 in natural clays to serve as an intermediate storage, collection, and mixing basin for the process waste treatment system located in Building 3544. Currently, this impoundment is used only as surge capacity for storm water during peak storm events.

Basins 3539 and 3540. These clay-lined impoundments were constructed in 1964 to serve as surge capacity for process waste streams, primarily from the Building 4500 complex. Currently the ponds are used as surge capacity for storm water during peak storm events.

Accomplishments

Received regulator comments for the D1 RI/FS.

Concerns

None.

Scheduled Activities for Next Quarter

Incorporate regulator comments and issue the RI/FS (D2).

Continue work on the Proposed Plan.

3.2.4 Oak Ridge National Laboratory Waste Area Grouping 1 Groundwater

Description

The WAG 1 groundwater activities focus on shallow groundwater that discharges to surface streams within WAG 1. The potential exists for contaminant migration from various sources within WAG 1 through both shallow and deeper groundwater to off-WAG receptors. Having the identification of potential locations for early actions as its objective, this project is entering a period of monitoring and characterization to identify contaminant sources and their migration pathways.

Accomplishments

Obtained a second round of samples, and began preparations to initiate source investigations in FY 1996.

Concerns

None.

Scheduled Activities for Next Quarter

Continue discussions regarding the integration of this activity into an ORR monitoring program.

3.2.5 Inactive Liquid Low-level Radioactive Waste Tanks*Description*

LLLWs have been collected at ORNL since 1943 in tank systems used for the storage, transfer, and treatment of the collected LLLW. Some of the tanks are no longer in use and have been classified as removed from service. Liquids and sludges remain in many of the tanks; several tanks receive inleakage from groundwater and rainwater. The tanks are located in WAGs 1, 5, 8, and 9.

Accomplishments

The maintenance activity for the Batch I Series tanks 3013, 3001-B, and 3004-B were complete at the end of September 1995. Tank T-30 was contaminated with various radionuclides and produced severe work delays in its remediation. However, the tank is scheduled to be extracted from its vault, transported to an on-site storage facility, and the vault backfilled with a controllable low strength material by the third week of October.

Conducted a data quality objective (DQO) meeting with DOE, Energy Systems, TDEC, and EPA personnel to fully identify all data needs associated with the characterization and sluicing of sludge in the WAG 5 Old Hydrofracture Facility (OHF) tanks (T-1 thru T-4, T-9) to Melton Valley Storage Tanks.

Performed a screening risk assessment of the WAG 5 OHF tank contents. The conclusion of the assessment revealed that a imminent off-site risk to human health and the environment exists if the tanks are breached.

The demonstration of the W-12 valve pit was completed. The decontamination activities were accomplished in two phases. The first was to remove the large items from the pit, and the second to vacuum the silt from the area under the leaking flange. The radiological surveys indicate a substantial decontamination factor was achieved.

Concerns

None.

Scheduled Activities for Next Quarter

Finalize DQOs for the OHF tanks by the end of October to provide a clear and concise roadmap for the sludge-transfer removal action.

Sample the WAG 5 OHF tanks and analyze samples by the end of December 1995.

Initiate work on the site characterization summary report.

Perform an integrity inspection of the OHF tanks and ancillary pipeline to ensure that the system is capable of sluicing the slurry to Melton Valley Storage Tanks.

Complete removal of Tank T-30.

3.2.6 Active Liquid Low-level Radioactive Waste Tanks

Description

LLLWs have been collected at ORNL since 1943 in tank systems used for storage, transfer, and neutralization. The stated objective of the FFA as it relates to the tank systems (Appendix F) is to ensure structural integrity, containment, detection of releases, and source control pending final remedial action at the site. The FFA requires that leaking LLLW tank systems be immediately removed from service. It also requires that LLLW tank systems that do not meet the design and performance requirements established for secondary containment and leak detection be either upgraded or replaced.

Accomplishments

Initiated installation of cathodic protection equipment on Phase II System 9 (Building 3544 to Valve Box 1).

Completed monthly leak testing on 10 active, singly-contained LLLW tanks <3,000 gallons and 3 active, singly-contained LLLW tanks >3,000 gallons. Level trends in one tank >3,000 gallons were assessed; inflows continue to prevent conclusive testing.

Completed the final report summarizing the experimental work and cost estimate for removal of PCBs from Tank WC-14 sludges. To remediate the tank, PCBs must be removed from the tank. Then the tank contents can be transferred to the Melton Valley Storage Tanks before final disposal.

Design activities this quarter focused on the LLLW transfer cask needed for transporting waste from Building 3047. The needs of the 3047 program were evaluated and a commercially available cask was identified. The N-55 cask appears to satisfy the facility needs. The Transportation Technology Group has reviewed the issues related to transport, certification, and compliance. A report was prepared and distributed in September. A means for collection and loading of wastes from 3025E, 3047, and for unloading the waste at the Transported Waste Receiving Facility also were explored. AutoCAD sketches were prepared and building configuration sketches were used to identify and evaluate several concepts.

Submitted the Structural Integrity Assessments for the Category C LLLW Tank Systems at ORNL to EPA and TDEC in September. The certifications of each tank system component in the structural integrity assessments were based on the results of leak tests, a review of design drawings, and a qualitative corrosion assessment.

Issued the following D1 documents:

- *Structural Integrity Assessments for the Category C Liquid Low-Level Waste Tank Systems at the Oak Ridge National Laboratory;*

- *Design Assessment for the Bethel Valley FFA Upgrades at Oak Ridge National Laboratory, under the Federal Facility Agreement; and*
- *Remedial Action Report for the Waste Area Grouping 1 Tank WC-14 Removal Action at Oak Ridge National Laboratory.*

Issued the following D2 documents:

- *Risk Characterization for Tank LA-104, issued as change pages to Risk Characterization Data Manual for the Inactive Liquid Low-Level Waste Tanks at Oak Ridge National Laboratory;*
- *Waste Characterization for Tank LA-104, issued as change pages to Waste Characterization Data Manual for the Inactive Liquid Low-Level Waste Tanks at Oak Ridge National Laboratory; and*
- *Implementation Plan for Liquid Low-Level Radioactive Waste Tank Systems for Fiscal Year 1995 at Oak Ridge National Laboratory Under the Federal Facility Agreement.*

Concerns

None.

Scheduled Activities for Next Quarter

Issue an Annual Status Report on FFA Compliance for LLLW Tank Systems for FY 1995 to the regulators for their information.

3.2.7 Oak Ridge National Laboratory Waste Area Grouping 2

Description

ORNL WAG 2 comprises two sites. The first site consists of the area encompassed by the stream channels of WOC and Melton Branch; the second site includes White Oak Lake (WOL), White Oak Dam, and the WOC Embayment before the confluence with the Clinch River as described in the following text.

WOC and Melton Branch. WOC and its tributaries are located in Melton and Bethel valleys. WOC flows into the Clinch River at River Mile 20.8, ~1.5 miles north of the junction of Interstate 40 and State Highway 95. WOC and its tributaries represent the major drainage system for ORNL and the surrounding facilities.

WOL, White Oak Dam, and WOC Embayment. WOL is located upstream of White Oak Dam and just south of the ORNL main complex. WOC Embayment encompasses the area downstream of White Oak Dam to the confluence of WOC with the Clinch River (0.6 miles). WOL is a surface impoundment that serves as a final settling basin for particle-reactive contaminants from ORNL operations and waste storage areas. Contaminants of concern identified to date are ⁹⁰Sr, ¹³⁷Cs, ⁶⁰Co; thorium; uranium; transuranics; metals (mercury, zinc, and chromium); and some organic compounds (including PCBs) located primarily in bottom sediments.

Site-wide surface water and groundwater assessment activities will continue as part of the ORNL Area Surface Water Program and the ORNL Area Groundwater Program, respectively. By drawing

together data collection and assessment activities, the Surface Water and Groundwater Programs will provide ER the management tools needed for timely decision making to conduct remedial actions with maximum efficiency and cost-effectiveness.

Accomplishments

The WAG 2 Surface Water ERMA Report was submitted to the regulators for their review.

Completed RI field sampling, including subsurface invertebrate biota sampling. Continued evaluation of floodplain soil characterization, soil erosion rates, and Intermediate Holding Pond radiological inventory data to determine the potential for off-site transport of contaminated sediments and for uptake of contamination of biota and initiated preparation of task data reports. Data and information from these subtasks are being used to support the sediment transport modeling task. Data packages that include gamma data, metals, organics, and radionuclides from samples in the WOC floodplain and Intermediate Holding Pond area were completed.

Continued analyzing data and conducting modeling runs on the extensive data describing movement of contaminated sediments during storms. Completed the data analysis report on a major 1995 storm event in support of this effort.

Analyzed and compared tritium and ^{90}Sr 1993 and 1994 seep data to determine average annual contributions to the tritium and ^{90}Sr fluxes going off site at White Oak Dam from different sources. Results will also be combined with risk calculations to help prioritize contaminant source areas.

The regulatory permit and approval to proceed were received and clean-out operations are proceeding on the WOC weir in WAG 2. Regulatory approval to conduct clean out of the Melton Branch weir was approved. Both actions are under the ORNL Surface Water Program.

Concerns

None.

Scheduled Activities for Next Quarter

Continue analysis and interpretation of data, complete validation of all data, and report results, as well as continue sediment transport modeling and analysis activities.

Complete clean out of the main weirs on WOC and Melton Branch in WAG 2.

Complete the laboratory analysis of biota samples collected during the RI.

3.2.8 Oak Ridge National Laboratory Waste Area Grouping 4 Seeps Collection and Treatment

Description

WAG 4 is located in Melton Valley, immediately south of the main plant area through a gap in Haw Ridge. This WAG consists of three areas: (1) Solid Waste Storage Area (SWSA) 4, which is a shallow land burial ground containing radioactive and hazardous wastes; (2) two pilot-scale LLLW waste seepage trenches; and (3) an underground pipeline used for transferring liquid radioactive wastes from the ORNL main complex to waste pits and trenches (WAG 7). Currently, SWSA 4 trenches, used for waste disposal from 1951 through 1959 for solid low-level radioactive waste from

around the country and until 1973 for disposal of uncontaminated construction debris/fill, are being investigated to determine key source trenches contributing to off-site migration of ^{90}Sr .

This project consists of defining an interim remedial action that will isolate or collect and treat the key source trenches in SWSA 4. Additional field activities are underway to fully delineate the trench boundaries to allow for a focused remedial alternative for a smaller area and a single-phased design and construction approach to be used (i.e., reduce remediation cost).

Accomplishments

Completed the WAG 4 Site Investigation Report and transmitted it to the regulators in August 1995. The report identifies 4 trench areas that contribute the majority of the ^{90}Sr contamination existing in WAG 4.

Issued the D1 version of the Interim Action Proposed Plan to the regulators in September 1995. The Plan shows grouting of the trenches as the preferred interim remedial alternative.

Concerns

None.

Scheduled Activities for Next Quarter

Issue the D2 version of the Interim Action Proposed Plan to the regulators.

3.2.9 Oak Ridge National Laboratory Waste Area Grouping 5

Description

WAG 5 is a 70-acre site consisting of a burial ground (SWSA 5 South), a transuranic waste storage area (SWSA 5 North), LLLW storage tanks and other components of the OHF and New Hydrofracture Facility (NHF), two small surface impoundments, and several areas used for landfilling.

SWSA 5 South. SWSA 5 is an ~50-acre area that received waste between 1959 and 1973, during which time more than 220 unlined trenches and nearly 1,000 unlined auger holes were used for disposal of ~3,000,000 ft³ of solid waste containing 210,000 Ci of radioactivity. Radionuclides included tritium, fission products, fissile materials, uranium-thorium elements, and transuranics. Some of the trenches in SWSA 5 were expanded and used for landfilling, and adjacent ravines typically were used for the disposal of construction debris or scrap metal.

SWSA 5 North. SWSA 5 North is an ~10-acre area that received alpha-contaminated and transuranic wastes between 1970 and 1981, during which time 27 unlined trenches and 8 stainless-steel-lined storage vaults were used for retrievable storage of waste in concrete boxes, wooden and metal boxes, and 55-gal drums.

OHF. From 1964 to 1979, OHF was used for permanent disposal of liquid radioactive waste in shale formations of depths between 780 and 950 ft. More than 2 million gal of LLLW and grout mixture containing several hundred thousand curies of beta-gamma radionuclides—primarily ^{137}Cs , ^{90}Sr , and ^{60}Co with lesser amounts of ^{233}U , ^{239}Pu , ^{244}Cm , and ^{241}Am —were injected. This facility also

contains five, carbon-steel, underground storage tanks that ranged in volume from 13,000 to 25,000 gal. These tanks were used for storage off LLLW before mixing with grout for injection. Also, there are LLLW lines and leak/spill sites associated with the OHF.

NHF. From 1982 to 1984, the improved NHF replaced the OHF and was also used for permanent disposal of LLLW. This facility also contains a 4,000-gal capacity stainless-steel tank and a 40,000-gal capacity concrete tank that were used for collection of potential hot cell leakage and collection of drainage from the injection well cell during NHF operations, respectively.

Surface Impoundments. The OHF Impoundment is a 100,000-gal capacity, unlined surface impoundment used from 1964 to 1979 for emergency storage of grout overflows that occurred twice during its operational period. The Process Waste Sludge Basin is a PVC-lined basin used from 1976 to 1981 for the storage and decontamination of sludge produced by the ORNL Process Waste Treatment Plant.

Two separate projects are ongoing in WAG 5. The WAG 5 RI collected analyzed and reported to the regulators multimedia data for remediation planning. The second project was initiated to collect and treat contaminated groundwater from two seeps (Areas C and D) identified during the RI efforts as primary off-site releases of ^{90}Sr from WAG 5. The construction on this project has been completed, but the process continues. Results of the RI indicate that the SWSA 5 trenches inundated by groundwater are the most active sources and greatest contributors of off-site migration with ^3H and ^{90}Sr fluxes at White Oak Dam from WAG 5 sources contributing 81% and 49% of the total flux.

Accomplishments

WAG 5 RI:

Transmitted the D2 version of the WAG 5 RI Report to EPA and TDEC.

Completed a review of the classified data and will report findings regarding uncertainties to meet FFA Appendix I requirements.

WAG 5 Seeps Collection and Treatment:

Issued the initial WAG 5 Seeps C and D Performance Monitoring Assessment to the regulators for information. Subsequent reporting will be accomplished this quarterly report.

The zeolite filter is continuing to remove >90% of the ^{90}Sr in the water collected. During last quarter, the system reduced the amount of ^{90}Sr released at White Oak Dam by 34 %. White Oak Dam data for the fourth quarter is being evaluated and will be reported in the next quarterly report.

Concerns

None.

Scheduled Activities for Next Quarter

Continue work on the FS. Operations and monitoring of Seeps C and D will continue under the surveillance and maintenance program.

3.2.10 Oak Ridge National Laboratory Waste Area Grouping 6

Description

ORNL WAG 6 consists of SWSA 6, the Emergency Waste Basin, and the Explosives Detonation Trench as briefly described in the following text.

SWSA 6. SWSA 6 is located northwest of WOC near White Oak Dam and State Highway 95. This 68-acre site is still in operation as a waste burial ground for solid low-level radioactive waste. Contaminants of concern include radionuclides and hazardous chemicals.

Emergency Waste Basin. The Emergency Waste Basin is located north of SWSA 6. It is a 2-acre basin constructed as an LLLW or process-waste holding basin for use when ORNL might be unable to release wastes to WOC. The basin has never been used, and no releases have been detected in the stream leaving the basin; however, surface contamination has been found in the basin.

Explosive Detonation Trench. The Explosives Detonation Trench is located in the central northeastern part of SWSA 6. It was used to detonate explosives and shock-sensitive chemicals requiring disposal. Explosive wastes were laid in the bottom of the trench and detonated with a small plastic explosive charge. No releases are believed to have occurred.

Accomplishments

Completed baseline sampling of groundwater monitoring wells and surface water devices on September 25, 1995.

Concerns

None.

Scheduled Activities for Next Quarter

Issue the SWSA 6 Post Closure Permit Application to DOE by October 6, 1995.

Place contracts to initiate routine monitoring activities for FY 1996.

3.2.11 Oak Ridge National Laboratory Area-wide Groundwater Program

Description

Groundwater flowpaths and restoration activities are not constrained by WAG boundaries. Therefore, groundwater activities associated with individual contaminant/WAG source OUs have been integrated over a larger geographic area. The area-wide groundwater OU underlying of Melton Valley and Bethel Valley has been established and will be the focus of multi-year, long-term characterization and monitoring activities. Focused remedial actions will be implemented as required.

Accomplishments

None.

Concerns

None.

Scheduled Activities for Next Quarter

Continue discussions regarding the integration of this activity into an ORR monitoring program.

3.2.12 Molten Salt Reactor Experiment Uranium Remediation Project*Description*

The Molten Salt Reactor Experiment (MSRE) is located in Building 7503 in Melton Valley, WAG 8. It was part of the Atomic Energy Commission's Molten Salt Reactor Program, which was built to investigate the concept for central power station applications. The reactor first went critical on June 1, 1965, and was shutdown on December 12, 1969. A Surveillance and Maintenance program was initiated on the shutdown facility and continues. Elevated radiation readings indicated migration of radioactive contamination outside of the fuel drain tank cells. Subsequent analyses and tests showed evidence of UF_6 in the Auxiliary Charcoal Bed, located in the Charcoal Bed Cell.

A remediation program plan was formulated in 1993, and immediate actions to place the facility in a safer condition were initiated in 1994. Water was removed from the Charcoal Bed Cell, a criticality alarm was installed, and personnel were relocated from office spaces in buildings 7503 and 7509.

A senior review board of independent, recognized nuclear industry experts assessed the MSRE remediation project in February 1995. The board noted that actions already taken at the facility, currently in progress, or planned for the near future, have been and will be effective in reducing the risks at MSRE. The board also noted that the facility is in a safer condition than it was a few months ago.

Accomplishments

Performed extensive gamma survey mapping of buildings 7503 and 7509 to ensure confidence in the knowledge of the extent of uranium migration. The reactor/drain tank cell atmosphere was also sampled.

Fabricated and installed the Charcoal Bed Cell Shield Plug Restraint to contain the aerosol of a carbon-fluorine exothermic reaction within the cell.

Continued preparations to partition the off-gas system to completely stop migration of uranium from the off-gas piping to the Auxiliary Charcoal Bed (ACB). The failure mechanism of a remotely located isolation valve was diagnosed, and its repair and closure is underway. Closure of this valve will isolate the largest amount of F_2 and UF_6 available for reaction with charcoal.

Designed the Interim Vent System, which is now being fabricated. Installation of this system will prevent gas pressure buildup after partitioning of the Charcoal Bed Trap from the Fuel Drain Tanks and allow reactive gas removal.

Concerns

Concern: FY 96 worst-case and FY 97 projected funding may impact the progress at MSRE. **Impact:** These funding impacts will not affect the proposed FFA deliverables, but they may affect active progress. **Action:** The extent of funding impacts is being analyzed.

Concern: Between August 5 and August 22, the pressure in the Off-Gas Piping System unexpectedly decreased from 2 psig to 0.7 psig while daytime average temperatures remained constant. A potential problem analysis initiated several investigative actions, one of which confirmed that the outlet valve on the ACB was leaking through its valve seat. **Impact:** There was no release of radioactive material because the reactive gases were absorbed by the ACB. It is estimated that an additional ≤ 45 grams of uranium was deposited on the Charcoal Bed. **Action:** An alternate valve was closed and the leakage stopped.

Concern: On September 18, 1995, ^{233}U was detected in an inactive helium purge line in fuel processing equipment adjacent to the drain tank cell. This condition was discovered during planned gamma surveys of equipment in the vicinity of the drain tank cell. **Impact:** The initial analysis of the distribution of uranium throughout the off-gas system was based on the assumption that freeze valves were an absolute block to the migration of gaseous uranium. This assumption allowed the evaluation to eliminate certain process equipment in other areas of the Molten Salt Reactor. The recent detection of uranium in the fuel processing system is an indication that at least one or more of the freeze valves are not impervious to gas migration. **Action:** An action plan was instituted and an update to the MSRE Occurrence Report was filed. Additional studies are underway to evaluate the consequences in other areas previously assumed to be free of uranium.

Scheduled Activities for Next Quarter

Hold a stakeholders' workshop on the Action Memorandum, which explains the current status and future plans for the first phase of MSRE facility remediation.

Complete the Off-gas System Partitioning by November 1995.

The Senior Review Board will evaluate MSRE Remediation Project progress and advise on future actions required for project completion.

Estimate, based on nondestructive assay measurements, the quantities of ^{233}U in the Fuel Processing System components.

Identify potential water sources in the Fuel Processing Cell and the Fuel Processing System.

Begin writing the EE/CA for uranium deposits removal.

3.2.13 Waste Evaporator Facility

Description

Building 3506 (Waste Evaporator Facility) is located adjacent to the South Tank Farm in the main plant area. Building 3506 operated as an evaporator from 1949 to 1954, and after decontamination it was used as an experimental facility to demonstrate contaminated waste incineration. The primary project objective is the demolition of the above-grade portions of the facility. This action would remove an obstacle inhibiting access in the South Tank Farm and would

facilitate the continued remedial activities at the GAAT OU. This decontamination and decommissioning activity is being conducted as a non-time-critical removal action under CERCLA.

Accomplishments

Approved and issued the D2 version of the Action Memorandum.

Awarded a contract to the demolition subcontractor.

Concerns

None.

Scheduled Activities for Next Quarter

Initiate demolition field work.

3.3 OAK RIDGE K-25 SITE

The Oak Ridge K-25 Site was built as part of the Manhattan Project during World War II to supply enriched uranium for nuclear weapons production. Construction of the K-25 Site started in 1943, and Building K-25, the first diffusion facility for large-scale separation of ^{235}U , was fully operable by August 1945. Additional buildings involved in the enrichment process were operable by 1956. In response to the national postwar nuclear emphasis, plant operations were modified to include the production of uranium compatible with reactors used to generate electric power. Because of the declining demand for enriched uranium, the enrichment process was placed on standby in 1985 and shut down in 1987. The K-25 Site now has a multipurpose mission that includes serving as the location of many contractor central staff functions, operating waste treatment facilities, serving as a center for applied technology, and supporting the development of the Advanced Vapor Laser Isotope Separation uranium enrichment technology.

3.3.1 K-901 Area

Description

The K-901 area consists of a contaminated burial ground, landfarm, holding pond, and two construction waste disposal areas. The area is located northwest of the main plant.

K-1070-A Old Contaminated Burial Ground, northwest of Building K-33, was used for the disposal of several types of material from the 1940s to 1976. The burial ground contains $\sim 35,575 \text{ ft}^3$ of uranium-contaminated material and 2430 ft^3 of thorium-contaminated material. Other material includes UF_6 cylinders, beryllium chips, boron, radioactive NaF , oil, rags, and so forth. The K-1070-A Landfarm received $\sim 5000 \text{ ft}^3$ of fuller's earth between 1979 and 1985. The fuller's earth was laden with concentrated acids, sludges, and other degradation products from uranium enrichment cascade oil.

The K-901-A Holding Pond received chromated, cooling-tower water blowdown and a variety of other wastes from barrels drained into the pond in the late 1950s. The K-901 Waste Disposal Area and K-901-A Sanitary Disposal areas each received construction wastes beginning in the 1940s. Small pockets of radioactive contamination have been found at the K-901-A Sanitary Disposal Area.

Accomplishments

Transmitted D1 version of the Remedial Site Evaluation Report for the K-901-A Holding Pond to TDEC and EPA

Completed installation of bedrock monitoring well inside the K-1070-A Burial Ground.

Concerns

None.

Scheduled Activities for Next Quarter

Continue field activities.

3.3.2 K-1070

Description

The K-1070 area consists of the K-1070-C/D Classified Burial Ground, located on a hill at the eastern edge of the K-25 Site. The burial ground is composed of several disposal areas: large trenches, small pits, three earthen dike areas, a landfarm, and a concrete pad. Both low-level radioactive and nonradioactive, nonhazardous waste materials and equipment were buried in the large trenches. The small pits were used to empty drums of hazardous waste. The dikes, which received RCRA closure approval from the State of Tennessee, were used for surface storage of drummed wastes. The landfarm is a road onto which potentially contaminated oils were sprayed for dust suppression. The concrete pad was used for compaction of metal drums before burial. Contaminants of concern at the burial ground are volatile and semivolatile organics, uranium-contaminated scrap metal, uranium compounds, lead, and other metals. An interim remedial action was initiated in January 1994 for the SW 31 Leachate Seep, which is located immediately west of the site and has been likely contaminated by the burial ground.

Accomplishments

Conducted a value engineering session on K-1070 OU in situ treatment technologies on July 18. New milestones for submittal of the Proposed Plan and ROD were approved at the FFA Project Managers Meeting.

Provided TDEC with a copy of the Value Engineering Study performed for the G pit. Planning has begun for collection of additional information on the G pit. The RI/FS report is being reviewed by EPA/TDEC.

Concerns

None.

Scheduled Activities for Next Quarter

Complete Engineering Studies for in situ treatment technologies.

3.3.3 K-1070 SW-31 Spring Project Operable Unit

Description

This project work involves implementing an interim remedial action for the K-1070 Leachate seep (SW-31) to reduce risk to human health and the environment and to achieve compliance with a proposed permit modification. The seep appeared after an attempted reclamation of the area bordering the west end of the K-1070-C/D Burial Ground, which was swampy and had an unpleasant smell. The K-1070-C/D Classified Burial Ground was used to dispose of a variety of equipment and waste, including solvents and hazardous chemicals. The remedial action chosen involves air stripping the discharged water to remove volatile contaminants after pretreatment to remove iron, followed by carbon filtration (polishing) to remove PCBs. The Central Neutralization Facility will be upgraded by adding unit processes during a second phase of construction.

Accomplishments

During Phase 2 Central Neutralization Facility upgrade, a crack in the concrete equipment pad was discovered near the sump. The crack was repaired and the majority of the individual equipment pads have been completed. The equipment concrete pad and containment walls were hydro-tested. To date 2.6 million gal of spring water have been treated as part of Phase 1 remedial actions.

Concerns

Concern: A 12-week delay is forecasted for completion of construction. **Impact:** After receipt of major procurement items a re-evaluation of the schedule will be made to expedite completion and to avoid any additional treatment costs. This will not affect the 8/14/96 FFA milestone. **Action:** A cost-benefit study into using incentives will be made at that time.

Scheduled Activities for the Next Quarter

Continue Phase 2 construction.

3.3.4 K-1407 Area

Description

The K-1407 area contains seven solid waste management units: the K-1407-A Neutralization Pit, the K-1407-B Holding Pond, the K-1407-C Retention Basin, K-1407-C and K-1417 Soil, the K-1070-B Old Classified Burial Ground, the K-1700 Stream (Mitchell Branch), and the K-1202 Hazardous Waste Storage Tanks. The K-1407-A Neutralization Pit and the K-1407-B Holding Pond are regulated as RCRA Interim Status Units. The K-1407 area is located east of the K-25 building at the northern edge of the K-25 Site.

The K-1407-A Neutralization Pit is a 33,000-gal reaction pit where sulfuric acid and calcium hydroxide are added to neutralize corrosive waste streams. The neutralization pit has processed various cleaning solutions and has received heavy metals.

The K-1407-B Holding Pond received neutralized cleaning solutions from the cleaning of nickel-plated steel pipes. The pond also received a variety of organic and radioactive wastes from other sources. The K-1407-C Retention Basin was used for storing sludges from the B Pond. Between 1987 and 1989, waste sludge was extracted from the ponds. Residual contaminants remaining in the pond soils required remedial action.

K-1407-C and K-1417 Soil is located north of the K-1407-C Pond. Uranium is the only suspected contaminant in this soil.

Under CERCLA, Remedial Action construction activities consisting of filling the ponds with rock and compacted soil were completed the second quarter of FY 95.

Buried at the K-1070-B Old Classified Burial Ground is a collection of materials, equipment, and scrap taken from the S-50 thermal diffusion plant; K-1131 feed plant; and K-25, K-27, and K-29 diffusion buildings. Contaminants include lead, uranium, and other metals.

The K-1700 Stream (Mitchell Branch) has received wastes from a variety of sources, including the K-1407-B Holding Pond and several area underground storm drain systems.

The K-1202 Hazardous Waste Storage Tanks consist of two elevated storage tanks of 15,000-gal capacity each. The tanks originally contained processing equipment lubricant oils, but in recent years the tanks have been used for the interim storage of mixed wastes.

Another site, K-1407 contaminated debris, was discovered during closure operations and will be added to Appendix C in the FFA. This site consists of buried radioactively contaminated solid wastes and is located on the south side of the K-1407-C Retention Basin. A preliminary assessment was prepared for this site. Apparent risks posed by this buried debris do not warrant any remedial actions at this time.

Accomplishments

Issued K-1407 B/C Ponds Remedial Action Report to EPA and TDEC for review July 25, 1995.

Concerns

None.

Scheduled Activities for Next Quarter

Submit K-1407 Contaminated Debris Site Evaluation to EPA and TDEC.

Finalize Administrative Record Post Decision File.

3.3.5 K-25 Site Groundwater

Description

The K-25 Site Groundwater Program provides for the assessment and remediation of groundwater at the 1500-acre K-25 Site.

The K-25 Site Groundwater Program includes several data-gathering activities that have been designed to characterize the subsurface characteristics and flow regime of the site, provide information on whether or not any contamination may be migrating off-site, and establish the relationship of groundwater to surface water. The contaminants in the groundwater at the K-25 Site are radionuclides, principally ^{238}U ; organic compounds; and heavy metals, including principally Pb (lead) and Hg (mercury).

Accomplishments

Submitted K-25 Site Groundwater Program slug test data to the Oak Ridge Environmental Information System (OREIS). This was the first transmittal of slug test results to be received by OREIS.

Concerns

None.

Scheduled Activities for Next Quarter

Continue field activities and preparation of a Remedial Site Evaluation.

3.3.6 Surveillance and Maintenance

Description

This activity includes those tasks necessary to manage the Surveillance and Maintenance Program and to ensure adequate containment and site control at inactive wastes sites and other contaminated areas prior to final remediation and following the completion of the remediation. The major tasks consist of program and project management, routine surveillance and maintenance, and special activities. The sites include areas such as classified and/or contaminated burial grounds, scrap yards, switchyards, cooling tower basins, landfills, soil piles, and the grounds around inactive facilities. The level of effort involved is expected to remain relatively constant for the near term, with a decrease in activities as the site characterizations and remediations are implemented. There is a potential for a subsequent increase in effort in the long term if surveillance and maintenance (S&M) are required as part of the final site remediation.

The area that Surveillance and Maintenance encompasses consists of designated inactive wastes sites around the K-25 Site. Contaminants found within the surveillance and maintenance sites include radionuclides, including principally ^{238}U ; organic compounds; heavy metals, including principally Pb (lead) and Hg (mercury); PCBs; and asbestos.

Accomplishments

Coordinated the corrective actions for 44 noted S&M deficiencies during June. The corrective actions accomplished represent 62% of the total S&M deficiencies on backlog.

Terminated a Memorandum of Understanding for the K-1070-C/D Classified Burial Ground covering joint responsibilities between the Environmental ER Division and the Facility and Property Management Department. The Memorandum of Understanding was put into place to cover the K-1070 OU RI, which is now complete. The remedial action plan for this area is being coordinated through ER.

Concerns

None.

Scheduled Activities for Next Quarter

Continue routine maintenance activities.

3.4 OAK RIDGE RESERVATION BOUNDARY AREAS

The ORR Boundary Areas consist of the Clinch River/Poplar Creek area, Lower Watts Bar Reservoir (LWBR), LEFPC, Oak Ridge Associated Universities (ORAU), SCF, and Freels Bend Area.

Clinch River/Poplar Creek focuses on portions of the portions of Poplar Creek and the Clinch and Tennessee rivers that may have been adversely affected by contaminants released from ORR from the mid-1940s to the present. Melton Hill Reservoir and Clinch River, downstream from Melton Hill Dam, form the southern and eastern boundaries of the reservation.

Watts Bar Reservoir (WBR) is located on the Tennessee River just below its confluence with the Clinch River and is the first impoundment downstream of ORR. Contaminants released from the reservation into these water systems include a variety of radionuclides, metals, and organic compounds, with PCBs and cesium being of particular concern. The PCBs are identified as a concern through fish ingestion, and the cesium is a risk only if deep-channel sediments are dredged and the spoils placed on land.

LEFPC extends from the outfall of Lake Reality at the Y-12 Plant boundary downstream to the stream's confluence with Poplar Creek. Originating within the Y-12 Plant, it consists of a 23-km stream and associated 550-acre floodplain. LEFPC became contaminated with mercury and trace levels of other metals, organics, and radionuclides.

ORAU SCF is located within the city limits of Oak Ridge and is bounded by Bethel Road, State Highway 62, Hall Ridge, and Clinch River. SCF was originally established in 1945 to study the accidental irradiation of cattle that occurred during the test of the first atomic bomb over Alamogordo, New Mexico. Soon its scope included studies on the introduction and migration of radioisotopes in the food chain. After investigation, the primary contaminant of concern was a small trichloroethane plume located on the site.

The Freels Bend Area was used to support research conducted on SCF. Controlled herds of some animals were maintained on pasture land there with ancillary barns and out buildings. In addition, a Low-Dose Rate Facility and a Variable-Dose Rate Facility were located on the site, along with three reported animal burial sites.

3.4.1 Clinch River/Poplar Creek

Description

The Clinch River RI focuses on the portions of Poplar Creek and the Clinch and Tennessee rivers that may have been adversely affected by contaminants released from the mid-1940s to the present from the DOE ORR. Melton Hill Reservoir and Clinch River, downstream from Melton Hill Dam, form the eastern and southern boundaries of ORR. Poplar Creek drains the K-25 Site and receives inflow from EFPC. Clinch River enters the Tennessee river system of multipurpose impoundments near Kingston, Tennessee, 34 km downstream from the Oak Ridge complex. This WAG/OU/study area includes Poplar Creek, Melton Hill Reservoir, and Clinch River from Melton Hill Dam to Kingston.

The contaminants released from ORR originate from research, industrial, and waste disposal activities conducted at ORNL, the Y-12 Plant, and the K-25 Site. The contaminants of concern in the river/reservoir system were determined by preliminary human-health risk screening, using a variety of exposure pathways, and nonconservative screening. PCBs were identified as contaminants of concern through fish ingestion. TDEC has a fish consumption advisory in effect for Melton Hill

Reservoir and the Clinch River arm of WBR and other area reservoirs. Poplar Creek is posted by TDEC, advising against fish consumption and water contact because of mercury, metals, and organic chemical contamination. Arsenic, chromium, mercury, selenium, zinc, ^{137}Cs , and ^{60}Co are a risk only if deep-channel sediments are dredged and dredge spoil is used for agriculture.

Accomplishments

Submitted the Clinch River/Poplar Creek RI/FS documents (D1 versions) to TDEC and EPA on September 17, 1995.

Concerns

None.

Scheduled Activities for Next Quarter

Respond to regulator comments on the D1 RI/FS document.

3.4.2 Lower Watts Bar Reservoir Operable Unit

Description

WBR is the first Tennessee river impoundment located downstream of ORR. The Tennessee Valley Authority's Watts Bar Dam, completed in 1942, is situated at Tennessee River Kilometer 853.6 (River Mile 530.5). The reservoir receives inflow from both the Tennessee and the Clinch rivers. This WAG/OU/study area consists of that portion of the reservoir that extends from Tennessee River Kilometer 913.1 (River Mile 567.5; mouth of the Clinch River at Kingston) to Watts Bar Dam.

The source of ORR contaminants in this OU is the Clinch River. Because the dam was completed before the start of operations at ORR, and also because the reservoir acts as an efficient trap for sediments and any associated particle-reactive contaminants, much of these contaminants have accumulated in the bottom of WBR over the years. The contaminants of concern and exposure pathways are the same as for the Clinch River OU, with PCBs in fish posing the greatest risk. TDEC has issued a fish consumption advisory for WBR. A fish consumption advisory is also in effect for Fort London and Tellico reservoirs, located upstream of WBR and ORR. Sediment contaminant concentrations, because of dilution by the Tennessee River and the greater spatial extent of the reservoir as compared to the Clinch River, are generally lower in WBR than in the Clinch River. Screening-level human health risk analyses indicate that contaminants in sediment pose a risk only if deep channel sediments are dredged and the dredged spoil is used for agriculture.

Accomplishments

The final ROD was approved on 9/29/95.

On September 14, 1995, CR-ERP and ER managers met with several interested members of the public and with Congressman Wamp's staff representative to discuss concerns relating to CERCLA process implementation in both the Clinch River/Poplar Creek and LWBR OUs.

Concerns

None.

Scheduled Activities for Next Quarter

The Remedial Action Work Plan will be submitted to the regulators for their review.

3.4.3 South Campus Facility Operable Unit

Description

The SCF OU is located within the city limits of Oak Ridge, Tennessee. It is bounded by Bethel Valley Road to the north, State Highway 62 to the east, Haw Ridge and the Clinch River to the south, and the western section of Bethel Valley to the west.

A research facility operated by ORAU, SCF was originally established in 1945 to study the accidental irradiation of cattle that occurred during the testing of the first atomic bomb near Alamogordo, New Mexico. The scope of research soon included studies on the introduction and migration of radioisotopes in the food chain as well as various other agricultural problems.

The boundaries of SCF encompass ~25 buildings and 130 acres of pasture land, but there is no enclosing fence. Access to the SCF property is generally unrestricted. Although several signs are posted to limit access, no fences or barriers exist to preclude access.

No documented evidence is available as to waste composition or quantity that may have been released to the environment at this location. Limited data exist, however, that identify potential hazardous waste sources and pathways. In addition, previous analytical data and the results of an inspection at this site indicate the presence of target compound list organics in the groundwater.

An RI at SCF was conducted in FY 1993. SCF areas included in the RI are the wastewater treatment plant, ponds, various laboratories, and animal containment facilities. The RI determined that the primary contaminant of concern is trichloroethane, which is present in a small plume in the unconsolidated zone.

Accomplishments

Issued the D1 version of the ROD for regulatory review on August 25, 1995.

Submitted the document *Treatability Study Report for Trichloroethene Removal in a Constructed Wetlands System (DOE/OR/02-1388&D1)* to the regulators on June 29, 1995. The EPA returned a letter of July 10, 1995, in which they stated that they would not formally comment on the document and that a D2 version would not be required.

Concerns

None.

Scheduled Activities for Next Quarter

Resolve comments on the ROD and prepare the D2 ROD for transmittal to the regulators.

3.4.4 Freels Bend Study Area

Description

The Freels Bend Study Area was used to support research conducted at the ORAU SCF. This area is located southwest of the SCF and is bounded on three sides by the Clinch River. Control herds of some animals were maintained on pasture land here with ancillary barns and outbuildings. The research facilities included the Low Dose Rate Irradiation Facility and the Variable Dose Rate Irradiation Facility. Each of these facilities was used to expose and irradiate test animals that were subsequently observed over a period of time for exposure effects. The sources were removed from the Low Dose Rate Irradiation Facility; however, six sealed ^{60}Co sources still remain stored at the Variable Dose Rate Irradiation Facility.

There are three reported disposal areas for animal carcasses and miscellaneous wastes in the Freels Bend Area. These areas have been termed Animal Burial Sites I, II, and III. Access to the 70 acres of the Freels Bend Area is restricted and not open to the general public, although the area is not fenced. The entrance to the access road is blocked with a locked bar gate.

A Site Investigation was performed at Freels Bend Area in FY 1993. The regions investigated included those associated with the irradiation facilities, animal burial locations, and three small impoundments used in the care of control herds maintained at the Freels Bend Area. Contaminants of concern included radionuclides, organics, and metals. The findings of the Site Investigation were presented to the regulators in November 1993, at which time the regulators agreed that DOE should submit a No Further Investigation petition for the Freels Bend Study Area.

Accomplishments

Removed the waste remaining after completion of field activities at the Low Dose Rate Irradiation Facility for treatment at ORNL on August 1, 1995. Two documents, *Freels Bend Area Maintenance Action Completion Report* and the *No Further Investigation Determination for the Low Dose Rate Irradiation Facility* were submitted.

Concerns

None.

Scheduled Activities for Next Quarter

None.

3.4.5 Lower East Fork Poplar Creek Operable Unit

The LEFPC OU extends from the outfall at Lake Reality at the Y-12 Plant boundary downstream to the stream's confluence with Poplar Creek. The LEFPC site consists of the 23-km stream and an associated 650-acre floodplain.

Beginning in 1952, the Y-12 Plant began production-scale separation of lithium isotopes, which required the use of millions of kilograms of mercury. This process resulted in the release of 108,000 to 212,000 kg (239,000 to 470,000 lb) of mercury into EFPC between 1953 and 1983. More than 20 tributaries and treated effluent from the Oak Ridge Sewage Treatment Plant flow into the creek. Although the primary mercury discharges from the Y-12 Plant were eliminated in 1963, mercury continues to be released in EFPC from the Y-12 Plant and secondary sources (e.g., building drain

systems, sewers, and connecting lines). The current release is ~20 g/day (0.7 oz/day) down from 100 g/day (3.5 oz/day) in 1985. Portions of the sewers were relined in 1986-87 to reduce mercury contamination. Efforts continue to further reduce mercury discharges (e.g., decontamination and decommissioning, RMPE, and remediation of mercury-use areas). The Y-12 ER Program has responsibility for the surface water in EFPC. Releases are regulated under the Clean Water Act NPDES permit for the Y-12 Plant.

Also, the Sewer Line Beltway was constructed near LEFPC by the city of Oak Ridge during 1982 and 1983 and contains more than 10 miles of sanitary interceptor sewers and force mains. In certain instances, EFPC floodplain soils were used to provide topsoil. No records were kept to document the backfill procedures and locations.

The cleanup objective for the site is to prevent an unacceptable risk of exposure to mercury-contaminated soils. Currently, risk levels are unacceptable in the EFPC-Sewer Line Beltway soils. DOE encouraged public participation to ensure that the remedy selected for the EFPC-Sewer Line Beltway met the needs of the local community and provides an effective solution to the problem. The community was greatly involved in raising the cleanup level from 180 ppm (January 1995) to 400 ppm (August 1995).

Accomplishments

Received approval on the D2 ROD on August 18, 1995. Established highest global remediation level and resulted in \$139M in cost avoidances this fiscal year.

Concerns

Concern: Long lead items of Disposal Unit Remedial Design are behind schedule. **Impact:** This delay will impact achieving the 15-month window for start of construction. **Action:** Initiate and accelerate remedial design.

Scheduled Activities for Next Quarter

The ROD indicates the excavation of contaminated soils from the floodplain >400 ppm Hg. The soils will be disposed of in a permitted landfill at the Y-12 Plant, and the excavated areas will be backfilled with clean soil.

Submit the Remedial Design Work Plan to the regulators by October 13, 1995, for review and comment. The Remedial Design Work Plan has planned for an accelerated approval.

The 15-month start of construction is associated with initiating access agreements with property owners.

3.5 TECHNICAL PROGRAMS AND TECHNICAL OVERSIGHT

3.5.1 Oak Ridge Environmental Information System

Description

OREIS is a centralized, standardized, quality-assured, and configuration-controlled environmental data management system. It is composed of hardware, commercial software, customized integration software, a tabular data base, a geographic data base, and support

documentation, including procedures. OREIS fulfills U.S. Department of Energy Oak Ridge Operations Office's (DOE-ORO's) environmental information management obligations under an enforceable FFA [Docket No. 89-04-FF under Sect. 120 of CERCLA and Sections 3008(h) and 6001 of RCRA]. The OREIS project was initiated in September 1990, and the baseline production version of the system (OREIS V2.1) was released in June 1994.

The basic mission of OREIS is efficient retrievability and long-term (>3 years) retention of DOE-ORO environmental data. Its primary users include DOE and its contractors and subcontractors who perform ER, compliance, and surveillance activities. Other users include EPA, TDEC, other agencies, and the public.

The scope of OREIS includes the consolidation of data supporting ER, compliance, and surveillance activities. The types of environmental data incorporated in the OREIS computer system include known quality measurement and spatial data from the following environmental media: groundwater, surface water, sediment, soil, air, and biota. In addition to environmental measurement data, the OREIS data base contains descriptive and qualifier metadata to help document data quality and to enable end users to analyze the appropriateness of the data for secondary uses. The scope does not include performing project-specific activities (e.g., sample tracking, field results data entry, maintenance of equipment calibration records) or serving as project control tools (e.g., cost accounting or milestone tracking) that are available through other computer systems (e.g., the National Sample Tracking System and Progress Tracking System).

Accomplishments

Successfully completed the connection of the TDEC/DOE-O workstation to OREIS. OREIS Systems Support staff connected and reconfigured the TDEC/DOE-O workstation to work in the Energy Systems/OREIS environment after completion of installation and testing of the Integrated Services Digital Network line to TDEC/DOE-O. Electronic mail between the systems is now operational and the central OREIS system has been configured to print on the TDEC/DOE-O workstation's printer.

TDEC/DOE-O personnel experimented with direct access to data and were impressed with the effectiveness of OREIS tools to aid TDEC/DOE-O oversight efforts. OREIS User Support staff provided a training/demonstration session to TDEC/DOE-O personnel on how to access the OREIS database directly from their workstation. OREIS tools (Oracle Browser™, SAS™, Arc/Info™) were used to produce a graphic showing high mercury data sampling locations with corresponding measurement values. The demonstration was successful in showing the effectiveness of OREIS in providing useful data analysis reports for current oversight activities of TDEC/DOE-O personnel. OREIS User Support staff will continue periodic visits to TDEC/DOE-O for specialized training.

The first of new GIS Base Map data was made available to OREIS users. Two new directory paths were added to the Geographic Data Base to contain new, higher resolution raster and vector data. Photo coverages, base map tiles, and themes from Phase 1 of the Base Map project were made available to OREIS users.

The first of new Remote Sensing data was made available to OREIS users. Approximately 14 gigabytes of remote sensing data have been added to OREIS. These data include natural color, color infrared, multispectral scanner (MSS), pre-dawn thermal, and gamma radiation for the ORR.

OREIS staff presented a two-day in-house orientation to EPA Region IV personnel on the data contents of OREIS and processes for direct access to OREIS data via telnet. As part of the orientation, EPA staff asked to see the K-25 Rad Survey data and were pleased with the capability to have direct

access to data of specific interest. All necessary paperwork was completed for six EPA staff to be registered OREIS users and they also will be added to the OREIS News Group. Several streamlining options for access to electronic data were discussed during the orientation. Participants also were shown how to access the OREIS Home Page.

Concerns

None.

Scheduled Activities for Next Quarter

Begin technical specification for air emissions data, which is the next compliance data type to be added to OREIS.

Incorporate risk assessment models and associated data into OREIS.

Continue to load GIS base map and remote sensing data.

Implement the newly structured OREIS data model.

Conduct a quarterly ER surveillance of the OREIS program.

Begin loading Y-12 groundwater data.

Implement the newly structured OREIS data model.

Conduct a quarterly ER surveillance of the OREIS program.

Begin loading Y-12 groundwater data.

3.5.2 Remote Sensing and Special Surveys Program

Description

Remote sensing technologies provide efficient means for acquiring data for site identification and characterization, change detection, regional and local monitoring, and acquiring updated information to support geographic data bases (e.g., facility data, land cover, topography). The objectives of the Remote Sensing Program are to promote and manage routine examinations of the ORR and associated off-site areas and to process and analyze remotely sensed data that can be used in ER site characterization and cleanup activities. Surveys occur on a biannual basis with selected remote sensing surveys as needed during other times of the year for use in site-specific studies. The biannual approach provides an effective means for early detection of environmental problems that could develop as waste containment vessels degrade, and it also aids in monitoring improvements gained from restoration efforts and cleanup activities.

Accomplishments

Completed delivery of selected aerial multispectral data to OREIS. More than 4 Gigabytes of data were delivered to the OREIS program for inclusion in OREIS. Data were delivered in five categories, including raw, unrectified MSS imagery, georectified MSS imagery, derived products (e.g., landcover classifications and normalized difference vegetative index imagery, and annotated MSS imagery.

Prepared a series of fifteen annotated graphic images of Clinch River and adjoining water bodies to depict thermal characteristics shown by imagery collected March 19 and 23, 1994, at an altitude of 2000 ft. Calibrated water temperatures have been color coded to highlight thermal differences. The images cover the Clinch River and Melton Lake from the southwest end of the K-25 Plant upstream as far as Solway.

Issued the report *Technical Report on Airborne Geophysical Data Processing in GIS Systems*. This report describes the development of data processing procedures to facilitate the data organization, manipulation, coordinate transformation, analysis, and display of the geophysical data delivered to OREIS.

Updated Oak Ridge National Environmental Research Park Terrestrial Sensitive Area System coverage (August, 1995) was digitized and provided to OREIS. Updates include: additions of new Natural Areas 46-48, boundary corrections based on 1995 survey data and Tennessee Heritage Program point files, and entry of site names into the data table.

Rare species and Natural Community locations in Oak Ridge Reservation Parcel ED-1 were mapped and digitized for use in the Environmental Assessment of the proposed Parcel ED-1 lease. This data is shown in figures 3-11, 3-12, and 3-13 of the Draft Environmental Assessment (August, 1995) DOE/EA-1113.

Concerns

None.

Scheduled Activities for Next Quarter

Issue a progress report on the Environmentally Sensitive Areas Surveys.

3.5.3 Risk Assessment Program

Description

A risk assessment, as defined in the DOE-ORO *Interim Policy Guidance on Environmental Restoration Risk Assessment Initiation, Implementation, and Interaction*, is the process of identifying, defining, and characterizing the adverse consequences of exposure to hazardous and radioactive materials. Under the ER Division, risk assessment includes the performance of a baseline risk assessment, refinement of preliminary remediation goals, and risk evaluation of remedial alternatives. Risk assessment may have both a human health risk assessment component and an environmental risk assessment component, whereby the human health risk assessment identifies, analyzes, and characterizes adverse health effects in human receptors and the environmental risk assessment identifies, analyzes, and characterizes adverse impacts on other environmental receptors (i.e., local flora and fauna).

The Risk Assessment Council was established to ensure consistent implementation of established methodology and technical defensibility of all risk assessments produced as part of the remedial activities on the ORR and for the other DOE-ORO facilities: Paducah and Portsmouth. The Risk Assessment Council is a multidisciplinary team of site risk assessment team leaders and other Energy Systems personnel with expertise in the following areas: human health risk, ecological risk,

toxicology information and data bases, risk model validation, sensitivity/uncertainty analyses, and risk assessment project implementation. As outlined in the DOE-ORO interim policy guidance, the Risk Assessment Council is responsible for the following:

- providing advice and guidance on appropriate risk assessment methodology and procedures;
- developing appropriate methods, procedures, models, and/or data needed to fulfill risk assessment needs of the site programs;
- providing appropriate review of site programs' risk assessment implementation to ensure consistent application and interpretation of risk assessment guidance and methodology; and
- supporting ER Division risk assessment needs through the research and development of information to correct critical risk assessment data gaps.

Accomplishments

Presented the preliminary results of the Bear Creek Valley surface water human health risk assessment Preliminary Remediation Goal screening at the August 1995 Regulator/Surface Water Workshop meeting.

Delivered the Human Health Risk Assessment portion of the UEFPC CA RI Work Plan.

Concerns

None.

Scheduled Activities for Next Quarter

None.

3.5.4 Federal Facility Agreement and Tennessee Oversight Agreement

Description

Section 120 of CERCLA requires federal facilities listed on the National Priorities List to enter into an FFA with the EPA. The ORR was added to the National Priorities List in the fall of 1990. Subsequently DOE, EPA, and TDEC entered into this agreement. The primary purpose of the FFA is to establish a procedural framework and schedule for investigating and remediating contaminant releases at a site (the ORR) that pose a threat to human health and the environment.

The Tennessee Oversight Agreement obligates Tennessee to pursue a "program of independent monitoring and oversight," primarily related to DOE compliance with environmental laws, DOE radiation protection programs, and joint Tennessee-DOE emergency preparedness and response activities. The Tennessee Oversight Agreement obligates DOE to provide technical and financial support for Tennessee's oversight of and participation in the FFA, in addition to establishing and maintaining compliance programs.

Accomplishments

Submitted the revised FFA Appendix C to the regulators for their review.

Submitted the ORR Site Management Plan (Rev. 4) to the regulators for their review. Comments will be resolved in the Rev. 5 and presented to the public.

One FFA Project Managers meeting was held in July, and another was held in September. A presentation was given on the HSWA Permit modification that is currently being negotiated.

The RCRA/CERCLA Task Team, composed of DOE and Energy Systems representatives of the three installations and central organizations, completed work on DOE's suggested revisions to EPA's HSWA permit model language. This language reflects the ORR HSWA permit administrative requirements coordinated with the ORR FFA administrative process. A recommended draft modification of the ORR HSWA Permit was provided to the FFA Project Managers for their review.

A workshop was held with DOE and contractor representatives from the Savannah River site, ORR, and Paducah to discuss lessons learned, successes and failures, and interfaces with EPA Region IV and State RPMs in the implementation of the FFA at the three National Priority Listing sites. Savannah River has suggested the establishment of quarterly meetings like this one to discuss issues of a similar political/technical nature.

Concerns

None.

Scheduled Activities for Next Quarter

Submit the FY 96, 97, and 98 milestones to the regulators for their review.

The next FFA Project Managers' meeting is scheduled for November 14, 1995.

4. REMEDIAL ACTION CONTRACTOR ASSIGNMENTS

Each FFA quarterly report includes a listing of the identity and assigned tasks of each of the DOE contractors performing work under the FFA. The primary contractors—Energy Systems, Foster Wheeler, Jacobs Engineering, and MK-Ferguson of Oak Ridge Company—will be performing work at all locations within the ORR. The following is included to satisfy this requirement.

4.1 OAK RIDGE Y-12 PLANT

Advanced Sciences, Inc. (ASI)—Provides laboratory and field support.

Army Corps of Engineers—Hydro-acoustic study of the Clinch River arm of Watts Bar Reservoir to determine water depth and the distribution, thickness, and type of bottom sediments.

ATI—Project Management Plans for Upper EFPC OU 1; Conduct of Operations compliance support for multiple programs.

Automated Sciences Group (ASG)—Provides support for various tasks in the management, collection, analysis, and interpretation of biota, water, and sediment samples. Also, provides program management assistance for the Clinch River ER Program.

Battelle/Pacific Northwest Laboratories (PNL)—Provides support for water, sediment, and contaminant modeling tasks.

Camber—Health and Safety Plans for UEFPC RMPE.

CDM Federal—Development of an RI Work Plan for UEFPC OU 1. Development of a Union Valley Interim Study Remedial Site Evaluation for Upper EFPC OU 1.

CH2M Hill—Provision of comments on previous RI plans for the Filled Coal Ash Pond. *[Closed]*

Colorado State University—Consulting concerning the DNAPLs in the Bear Creek Burial Ground. *[Closed]*

The Earth Technology Corporation—Development of the RI Plan and RI of the S-2, Coal Pile Trench, Salvage Yard, and Building 81-10 sites. Sub-subcontractors include *Singleton Labs and A. L. Clark* for drilling, *IT Corporation* for analytical support, *H&R Technical* for data management and health and safety support, and *International Waste Management Systems* for engineering support. *[Closed]*

ENSERCH—Baseline planning support for ORAU. *[Closed]*

ECE, Inc.—Hydrogeological consulting and modeling support.

ETE Consulting Engineering Inc.—Provision of professional services.

Foster Wheeler Environmental Corporation—Design prime contractor, LEFPC.

Geraghty & Miller, Inc.—Support in preparation of all post closure permit applications and preparation of the Bear Creek Valley OU 4 RI Plan.

Highland Drilling Company—Characterization well drilling.

Jacobs Engineering (DOE prime contractor)—Prepares the decision documents (FS and ROD) in support of the new LWBR OU. Preparation of integrated RCRA/CERCLA/NEPA decision documents, including FSs, Proposed Plans, RODs, Environmental Assessments, Environmental Impact Statements, documents for interim actions, and cost estimates associated with these documents. Provision of technical support for RIs, assessments, and investigations for off-site

locations; remedial action verification, DOE, and Energy Systems community relations activities, requirements associated with the Administrative Record; and risk assessments. PP/ROD prime contractor LEFPC OU.

JAYCOR—Provides support of data management activities and document maintenance in the production of risk assessment documents for the Clinch River ER Program.

Michigan State University—Breeding and raising mink in conjunction with the Clinch River ER Program's study of reproductive effects of ingesting fish from the Clinch River/WBR System.

Midwest Technical, Inc.—Provides support of data management activities and document maintenance in the production of risk assessment documents for the Clinch River ER Program.

MK-Ferguson of Oak Ridge Company—Baseline planning support for ORAU. Construction contractor, LEFPC OU.

ORAU—Provides radioanalytical support for Phase 1 of the RI.

ORACLE—Provides support in the design and implementation of ORACLE-based databases and applications.

Oak Ridge Institute of Science and Energy—Provides risk assessment and contaminant transport modeling support.

PAI—Technical support for UEFPC RMPE project development.

Paralax—Business management support to projects.

PEER Consultants—Provides computer programming and bar coding support for the Clinch River ER Program.

Queen's University—The use of alcohol flooding to remediate sites contaminated by DNAPL; progress report submitted 5/31/94.

SAIC—Field sampling in Bear Creek Valley, development of an RI Report for Bear Creek Valley OU 2 and Bear Creek Valley OU, data management support, support for ER strategic plan development, and field mobilization. Provides support in the compilation of data packages, validation and verification of data packages, and analytical services coordination for Clinch River. Support Preparation of ROD for LEFPC OU.

SENEC, Oak Ridge—Provides support for human health risk assessment.

SONSUB—Subcontract for the closure of Kerr Hollow Quarry. *[Closed]*

Southern Illinois University—Provides assistance in biological data collection and sample design.

Tennessee Valley Authority (via interagency agreement)—The interagency agreement provides support for the following tasks: (1) sedimentation range cross sections; (2) aerial photography and topographic mapping of WOC Embayment; (3) numerical modeling of water, sediment, and contaminant transport in Clinch River/WBR; (4) sampling and analysis of water and sediment from potential sources of contaminants; (5) review of TVA sediment-disturbing activities; (6) sampling and contaminant analysis of key fish species in the Tennessee River System; (7) sediment and water toxicity studies; and (9) benthic macroinvertebrate community study at monitoring stations within the Clinch River and Poplar Creek. *[Tasks 1, 2 and 5 are closed]*

University of California-Davis—Provides quantitative histopathological analysis of target organs of fish.

University of Kansas—Support for geophysical studies concerning DNAPL migration. *[Closed]*

University of Tennessee—Hydrogeological support planned for RMPE as subcontractor to PAI. Provides assistance in data collection; data compilation; database development and management;

development of procedures and maintenance/coordination of training; coordination of the Clinch River/WAG2 document management center with the other DMCs in Energy Systems Oak Ridge; study of pollutant material transport, distribution, and characterization; and program management.

University of Waterloo—Consulting concerning the DNAPLs in the Bear Creek Burial Ground and PCB experiments. *[Closed]*

4.2 OAK RIDGE NATIONAL LABORATORY

Advanced Sciences, Inc. (ASI)—Administrative support, field coordination, and technical integration.

Advanced Systems Technology—Waste characterization processing and transportation assistance.

Analysas—Administrative support.

ATI—Structural integrity assessments for active LLLW tanks.

Automated Sciences Group—Biological data analysis, support for management, and analysis and interpretation of biological data from laboratory and field studies.

Battelle Pacific Northwest Laboratory—Design and fabrication services for an in situ vitrification off-gas hood and filtration system.

Bechtel National, Inc. (Team members also include CH2M Hill; PEER; ERC, Inc.; and IT Corporation)—RI activities for WAGs 1, 5, 6, and 10. Assessments will also be conducted of the inactive tanks as required by the FFA.

CDM Federal Programs—Preparation of a regulatory review and sampling and analysis plan for the WAG 6 performance monitoring activity.

CER—Assistance in preparing the WAG 6 well plugging and abandonment plan.

ChemRad Inc.—Walkover survey. *[Closed]*

Colorado Logging COLOG—Logging and ambient and stress testing of wells at WAG 5.

Dr. David Daniel—Assistance in evaluating the suitability of soil for caps.

Drevel University—Provision of technical personnel and knowledge. *[Closed]*

ECOTECH—Assistance in the analysis of surface water.

EDGE, Inc.—Groundwater monitoring of wells.

Environmental Consulting Engineers—Preparation of remediation and postremediation monitoring plans for WAG 6 and monitoring in WAG 2 and WAG 5 removal action investigation.

ERC, Edge—Geotechnical tests.

ETE Consulting Engineers—Survey services.

Foster Wheeler—Remedial design activities.

Geotek Drilling—Drilling services.

Gilbert Commonwealth—Assistance with preparing cost account plans and project documentation such as project management plans, health and safety plans, waste management plans, current year work plans, and configuration control support documents. Valve replacement for active LLLW tanks.

Harco—Cathodic protection for active LLLW tanks.

H. Kent Hepworth, PE. Ph D.—Technical assistance with remedial actions in support of the WAG 6 facility manager.

Highland Drilling Company—Construction and well plugging and abandonment services.

H&R Technical Associates, Inc.—Technical and administrative support in assembling reports, preparing minutes of meetings, and reviewing reports.

Hydrocomp—Expert review of field monitoring and modeling of contaminated sediment transport in WOC. *[Closed]*

IT Corp.—Final closure certification on the 3001 Storage Canal RCRA Interim Closure. *[Closed]*

Jacobs ER Team—Preparation of integrated RCRA/CERCLA/National Environmental Policy Act (NEPA) decision documents, including FSs, Proposed Plans, RODs, EAs, Environmental Impact Statements, documents for interim actions, and cost estimates associated with these documents. Provision of technical support for the performance of RIs, assessments and investigations of off-site locations, and remedial action verification; support for DOE and Energy Systems community relations activities; and support for the adherence to requirements associated with the Administrative Record and performance of risk assessments.

JAYCOR—Sampling and analysis support for benthic macroinvertebrate samples from WOC and its tributaries (*no longer supporting benthic macroinvertebrate samples*).

JBf Associates—Technical Advisory Group support and appraisal of the Underground Storage Tank Program.

Kansas Geological Survey—Collection of seismic reflection data for WAG 10.

Knoxville College—Data base support and technical support for sample collections.

Lockheed—Analytical services.

MAC Tech—Implementation of DQOs for the Streamlined Approach for the ER Program.

Midwest Technical, Inc.—Assistance in budgeting, planning, and cost tracking and provision of laboratory and field technical support.

MK-Ferguson of Oak Ridge Company—Construction management. Valve replacement/cathodic protection for active low-level radioactive waste tanks.

North Carolina State University—Assistance in biological monitoring and abatement tasks.

Northern Arizona University—Technical direction for surveillance and maintenance and WAG 5 cryogenic.

ORAU—Field services coordination.

OGDEN—Geotechnical services as required to support the remedial design architect-engineer and the Performance Assessment Program.

Peer Consultants—Administrative support (team member of SAIC).

Performance Development Corporation—Technical and administrative support for active low-level radioactive waste tanks.

Radian—Preparation of environmental assessments and CERCLA decision documents. *[Closed]*

SAIC—Monitoring coordination, performance assessments, and hydrologic modeling for the WAG 6 Performance Assessment Program.

Scientific Ecology Group (SEG)—Field demonstration on waste stabilization in burial trenches.

Solutions To Environmental Problems—Provided trailer and parking installation support.

Southwest Research—Outside laboratory services.

S. M. Stoller Corporation—Administrative support.

Temp Systems—Assistance with administrative functions and surface water monitoring.

Tennessee Valley Authority Interagency Agreement—Technical supervision of FY 1992 drilling activities, including drilling three core holes and instrumenting them with multiport measuring systems (Westbay systems) and selecting monitoring intervals using core data, geophysical logs, and flowmeter data via the agreement.

TMA Eberline—Outside laboratory analytical services.

University of California—Assistance in biological monitoring and abatement tasks.

University of California Davis—Histopathological analyses of fish tissues.

University of Mississippi—Development of a special sensor for monitoring soil moisture and contaminant leaching.

University of Tennessee—Assistance in performing data collection; data compilation; development of performance criteria, maintenance programs, and quality assurance plans; and oversight of surface-water monitoring station upgrade activities.

U.S. Geological Service—Assistance in performing surface water monitoring.

Vista Research, Inc.—LLLW tank system leak testing methodology development.

4.3 OAK RIDGE K-25 SITE

Adams Craft Hertz Walker—Site surveying (for the Pond Waste Management Project).

Advanced Sciences, Inc.—Data validation.

Analysas Corporation—Records management (for the Pond Waste Management Project).

Battelle, Columbus Laboratories—Preparation of a simplified environmental assessment (for the Pond Waste Management Project).

Brooks Rand Laboratory—Mercury speciation analyses.

CDM Federal Programs—Preliminary Assessment/Site Inspection and RCRA Facility Investigation Work Plan preparation.

Chemrad Tennessee Corporation—Ultrasonic Ranging and Data System support.

CompuChem Laboratories—Chemical/radiological analyses.

COR, Inc.—Inventory Management Information System prototype development support (for the Pond Waste Management Project).

Dennis Weiter Assoc.—Study of available filter press operations (for the Pond Waste Management Project).

Enterprise Advisory Services, Inc.—Management systems support.

ESE Biosciences Group—Bioremediation of a former underground storage tank site. *[Closed]*

ETE Consulting Engineers—Surveying.

Geraghty and Miller—Technical support (for the K-25 Site Groundwater Protection Program). *[Closed]*

GH Cofer—Professional services.

Gilbert Commonwealth—Estimating support.

Highland Drilling—Characterization well drilling and drilling services for the K-25 Site Groundwater Protection Program. *[Closed]*

HSW Environmental Consultants, Inc.—Technical support (for the K-25 Site Groundwater Protection Program).

Jacobs ER Team—Preparation of integrated RCRA/CERCLA/NEPA decision documents, including FSs, Proposed Plans, RODs, EAs, Environmental Impact Statements, documents for interim actions, and cost estimates associated with these documents. Provision of technical support for the performance of RIs, assessments and investigations of off-site locations, and remedial action verification; support for DOE and Energy Systems community relations activities; and support for the adherence to requirements associated with the Administrative Record and performance of risk assessments.

Labat-Anderson—Assistance for Radian Corporation in the environmental assessment of the K-1407-B and -C Ponds. *[Closed]*

Lockwood Greene—On-site project engineering support and Title II design (for the Pond Waste Management Project). *[Closed]*

A. L. Lotts—Operational Readiness Review Board support (is an independent member) (for the Pond Waste Management Project). *[Closed]*

PAI—Technical consulting and generation of a project management plan and operational oversight management plan (for the Pond Waste Management Project).

SAIC—RI subcontract services for the K-770 and K-1070 OUs.

Tenera—Technical consulting and assistance in conduct of operations (for the Pond Waste Management Project). *[Closed]*

University of Tennessee, Industrial Engineering Department—Assistance in planning for storage layout and warehousing (for the Pond Waste Management Project). *[Closed]*

4.4 OAK RIDGE RESERVATION BOUNDARY AREAS

Advanced Sciences, Inc. (ASI)—Laboratory and field support.

Analytical Projects Office at Martin Marietta Energy Systems, Oak Ridge—Processing of all contracts for the analysis of samples collected. The Analytical Projects Office and Energy Systems Procurement determine which labs will perform analyses.

Army Corps of Engineers—Hydroacoustic study of the Clinch River arm of WBR to determine the water depth and the distribution, thickness, and type of bottom sediments.

Automated Sciences Group (ASG)—Support for various tasks in the management, collection, analysis, and interpretation of biota, water, and sediment samples. Also, provides program management assistance for the Clinch River ER Program.

Battelle/Pacific Northwest Laboratories (PNL)—Support for water, sediment, and contaminant modeling tasks.

Foster Wheeler Environmental Corporation—Baseline planning support for ORAU. Design and estimating services as the prime contractor for LEFPC.

Gilbert/Commonwealth—Scheduling for LEFPC.

Jacobs ER Team—Preparation of integrated RCRA/CERCLA/NEPA decision documents, including FSs, Proposed Plans, RODs, EAs, Environmental Impact Statements, documents for interim actions, and cost estimates associated with these documents. Provision of technical support for RIs, assessments and investigations of off-site locations, and remedial action verification; support for DOE and Energy Systems community relations activities; and support for the adherence to requirements associated with the Administrative Record and performance of risk assessments. Prepares the decision documents (FS and ROD) in support of the new LWBR OU. Is the prime contractor for the Proposed Plan and ROD for LEFPC.

JAYCOR—Data management activities and document maintenance in the production of risk assessment documents for the Clinch River ER Program.

Michigan State University—Breeding and raising of mink in conjunction with the Clinch River ER Program's study of reproductive effects of ingesting fish from the Clinch River-WBR System.

Midwest Technical, Inc.—Support of data management activities and document maintenance in the production of risk assessment documents for the Clinch River ER Program.

MK-Ferguson—Baseline planning support for ORAU. Is the construction contractor for LEFPC.

ORAU—Radioanalytical support for Phase 1 of the RI.

Oak Ridge Institute of Science and Energy—Risk assessment and contaminant transport modeling support.

ORACLE—Support in the design and implementation of ORACLE-based databases and applications.

PEER Consultants—Computer programming and bar coding support for the Clinch River ER Program.

Science Applications International Corporation (SAIC)—Support in the compilation of data packages; validation and verification of data packages; and coordination of analytical services. Provides support preparation of ROD for LEFPC.

SENEs, Oak Ridge—Support for human health risk assessments.

Southern Illinois University—Assistance in biological data collection and sample design.

Tennessee Valley Authority (via an interagency agreement)—Support for the following tasks: (1) cross sections of sedimentation ranges; (2) aerial photography and topographic mapping of WOC Embayment; (3) numerical modeling of water, sediment, and contaminant transport in Clinch River/WBR; (4) sampling and analysis of water and sediment from potential sources of contaminants; (5) review of Tennessee Valley Authority sediment-disturbing activities; (6) sampling and contaminant analysis of key fish species in the Tennessee River System; (7) sediment and water toxicity studies; and (8) benthic macroinvertebrate community study of monitoring stations within the Clinch River and Poplar Creek. *[Tasks 1, 2, and 5 are closed]*

University of California-Davis—Quantitative histopathological analysis of target organs of fish.

University of Tennessee—Assistance in data collection; data compilation; data base development and management; development of procedures and maintenance/coordination of training; coordination of the Clinch River/WAG 2 document management center with the other DMCs at Energy Systems in Oak Ridge; study of pollutant material transport, distribution, and characterization; and program management.

4.5 LOCKHEED MARTIN ENERGY SYSTEMS ENVIRONMENTAL RESTORATION CENTRAL DIVISION

CDM Federal Programs—Regulatory compliance support and waste analysis support on the Portsmouth project.

Ecotect Laboratory Services, Inc.—Laboratory sample analysis.

Ekotek Laboratory Services, Inc.—Radiological/analytical data analysis.

H&R Technical Associates, Inc.—Consultation on cost/schedule control systems and groundwater data base management.

Lietzke Soil Services—Soil consulting services.

Lockheed Analytical Services—Chemical/analytical data analysis.

Lockheed Engineering and Sciences Company—Laboratory sample analysis.

Maxima Corporation—Project management.

Micro-Frame Technologies—Off-site training and professional training support.

Premier, Inc.—FFA implementation support.

SAIC—Site-specific plan support for the development of OREIS; training support; activity data sheet support; cost/schedule control system training; scheduling and technical support; waste management treatment, storage, and disposal analysis; analytical needs assessment; support services for preparation of the five-year plan; data management support; and FFA implementation support.

University of Tennessee—Soil characterization, hydrogeology, and data base management support.

University of Waterloo (Canada)—Groundwater modeling.

4.6 JACOBS ENGINEERING

Geraghty & Miller—Environmental sciences and groundwater support for the production of integrated decision documents.

Lockwood Greene—Environmental engineering support for the production of integrated decision documents.

PAI Corporation—Support for the production of integrated decision documents.

STEP—Support for the production of integrated decision documents.

The University of Tennessee—Training and other support for the production of integrated decision documents.

United Science Industries—Support for the production of integrated decision documents.