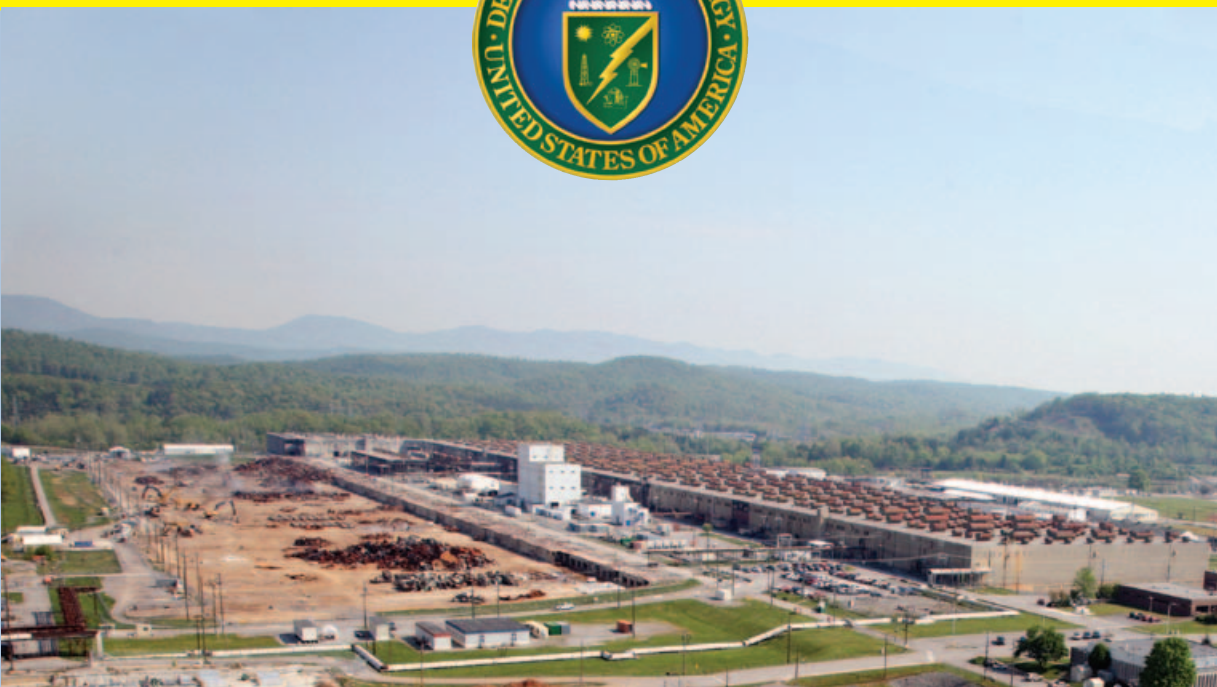


FY 2010

# Cleanup Progress

Annual Report  
to the Oak Ridge Community



This report was produced by  
Bechtel Jacobs Company LLC,  
DOE's Environmental Management  
Contractor for the Oak Ridge Reservation.



# Message from the Manager

## Department of Energy Oak Ridge Office

To the Oak Ridge Community:

Fiscal Year 2010 has been an extremely busy year for our Environmental Management (EM) program in Oak Ridge. We obligated all of the \$755 million we received through the American Recovery and Reinvestment Act (ARRA), and we completed other projects critical to the environmental health of our community. The past year has been filled with notable successes, and we are excited for the coming year as we build on our recent achievements and prepare to face the challenges we encounter every year.

Needless to say, we spent much of our resources this year on the 36 EM projects funded through ARRA. This influx of funds has allowed us to get a jump start on the critical environmental cleanup work here, and we are noticing visible changes to the landscape of the Reservation. We are ridding parts of the Y-12 Complex and Oak Ridge National Laboratory (ORNL) of unneeded facilities, allowing for access to soil contamination and clearing the way for future growth and development.

At ORNL, Building 3026 and the east portion of the 2000 complex have been removed, and soon an additional 34 facilities will be demolished in areas across the Lab's central campus. Additional funding is going to characterize contaminated soils and address known groundwater contamination sources, such as Tank W-1A and the SWSA 3 Burial Ground.

Y-12 and East Tennessee Technology Park (ETTP) have also benefited from EM's ARRA funds. At Y-12, the last building on Engineering Row, Building 9735, was demolished, and four of the seven buildings in the dilapidated Biology Complex are gone. At ETTP, work has begun on demolishing the 1.4 million ft<sup>2</sup> K-33 Building.

In addition to our ARRA projects, our base funded work continues as well. Demolition of the west wing of the K-25 Building is complete, and pre-demolition activities continue in the east wing and north tower. We are also in the midst of selecting the contractor who will complete significant portions of the environmental cleanup at ETTP.

Our Reindustrialization Program had notable achievements in FY 2010. The Community Reuse Organization of East Tennessee has continued its effort to transform ETTP into a private sector industrial park. With this year's construction of two new speculative buildings on transferred property, that vision is becoming more of a reality.

And most importantly, we have continued and strengthened our valuable relationships with all of our stakeholders and members of this wonderful community. We could not ask for a better partner than the people of Oak Ridge and the surrounding communities. The informed and educated input that you provide is truly appreciated, valued, and cannot be overstated. Specifically, I would like to thank the Oak Ridge Site Specific Advisory Board for its continued advice and recommendations on our environmental cleanup activities.

Due to the efforts of the dedicated employees from the Department of Energy and our contractors, we are successfully addressing vital projects while boosting employment and stimulating the regional economy. Though we're extremely proud of the successes we have enjoyed this year, we have already turned our attention to the challenges we face moving forward. It is our promise that we will strive to stay intensely focused on accomplishing our work safely and will remain good stewards of the tax dollars we spend to do our work. Thank you again for your support. I look forward to another successful year.



Gerald Boyd



**EM** *Environmental Management*

safety ❖ performance ❖ cleanup ❖ closure

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# Introduction

Because of past waste disposal practices and unintentional releases, portions of land and facilities on the 33,750-acre DOE Oak Ridge Reservation are contaminated with radioactive elements, mercury, asbestos, polychlorinated biphenyls, and industrial wastes. Several cleanup programs are under way to correct the contamination remaining from years of energy research and weapons production.

The Environmental Management (EM) Program is responsible for Reservation cleanup.

The contaminated portions of the Reservation, as well as certain impacted areas off the Reservation, are on the U.S. Environmental Protection Agency's National Priorities List, a list of hazardous waste sites across the nation that are to be cleaned up under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Efforts are under way

to delineate the contaminated areas of the Oak Ridge National Priorities List Site, which DOE is cleaning up under a Federal Facility Agreement with the Environmental Protection Agency and the State of Tennessee.

In FY 2010 (October 1, 2009, to September 30, 2010), cleanup efforts were under way at all three sites on the Reservation. At East Tennessee Technology Park (ETTP), the west wing of the massive K-25 Building was demolished and all debris removed. Work continued on preparing the rest of the building for demolition. This former gaseous diffusion building is the largest facility on the Reservation. Workers also prepared two additional gaseous diffusion buildings—the K-27 and K-33 buildings—for demolition.

Several other cleanup projects took place in FY 2010 at ETTP, including remediation of contaminated ponds, demolition of various facilities, and soil remediation at



*EMWMF Cell 5 expansion activities*

contaminated disposal sites. DOE's goal for ETPP is to transform the site into a private industrial park, and great strides were made in FY 2010 to achieve that goal. Several roads as well as the electrical distribution system were turned over to the City of Oak Ridge. Land parcels were also transferred, and two speculative buildings for prospective new private industry tenants were built.

At Oak Ridge National Laboratory, buildings that posed worker and environmental concerns were demolished, characterization efforts were initiated to identify soil and sediment contamination, and waste storage area remediation efforts were under way or completed.

At Y-12, legacy waste removal and demolition of facilities were top priorities. Much progress was also made on removal of scrap from the Old Salvage Yard in FY 2010.

Funding from the American Recovery and Reinvestment Act of 2009 (ARRA) has allowed more cleanup work to be performed on the Reservation and has created and retained jobs for the local area.

DOE Oak Ridge received \$1.36 billion under the Act, with a large portion of that amount—\$755 million—going to EM projects. More than 30 cleanup projects across the Reservation have received ARRA funding.

ARRA was signed into law in February 2009. A direct response to the economic crisis, ARRA was designed to:

- create new jobs as well as save existing ones,
- spur economic activity and invest in long-term economic growth, and
- foster unprecedented levels of accountability and transparency in government spending.

You can track the status of all ARRA funding, including the DOE Oak Ridge projects, on the Web site [www.recovery.gov](http://www.recovery.gov).



*ETTP pond barrier repair*



*K-33 tie line isolation*



ARRA funding is being used by various projects across the Oak Ridge Reservation. All projects in this publication using ARRA funding are denoted with the symbol at left.

# Commonly Used Terms

## CERCLA

**CERCLA:** The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 established prohibitions and requirements concerning closed and abandoned hazardous waste sites, provided for liability of persons responsible for hazardous waste releases at these sites, and established a trust fund to provide cleanup when no responsible party could be identified. The law authorizes two kinds of response actions: short-term removals, where actions may be taken to address releases or threatened releases requiring prompt response, and long-term remedial actions, which permanently and significantly reduce the dangers associated with releases or threats of releases. Long-term actions can be conducted at sites on the Environmental Protection Agency's (EPA's) National Priorities List, a listing of the nation's most hazardous waste sites. The Oak Ridge Reservation was added to that list in 1989.

## EMWMF

**Environmental Management Waste Management Facility:** The *Record of Decision for the Disposal of Oak Ridge Reservation Comprehensive Environmental Response, Compensation, and Liability Act of 1980 Waste, Oak Ridge, Tennessee* was issued in 1999 to construct a dedicated disposal facility on the Reservation to receive low-level radioactive waste, Resource Conservation and Recovery Act hazardous waste, Toxic Substances Control Act waste, and mixed wastes generated from cleanup programs conducted under CERCLA. While the ROD did not establish a formal name for this facility, it has been designated as the Environmental Management Waste Management Facility.

**Federal Facility Agreement:** Cleanup activities are performed in accordance with state and federal laws, and CERCLA requires an interagency agreement to facilitate the interaction between state and federal entities (for the DOE Oak Ridge Office, that would be DOE, EPA, and the Tennessee Department of Environment and Conservation). The Federal Facility Agreement for Oak Ridge was initiated in January 1992 to satisfy the interagency agreement requirement.

## FFA

## ROD

**Record of Decision:** Under the CERCLA process, a Record of Decision formally documents the selection of a preferred cleanup method at Superfund sites after a series of steps, including a Remedial Investigation/Feasibility Study. After a preferred cleanup alternative is selected, it is presented to the public for comment in a Proposed Plan. EPA, the state, and the lead agency then select a remedy and document it in the Record of Decision.

**Removal Actions:** Some cleanup activities on the Oak Ridge Reservation are conducted as Removal Actions under CERCLA. These actions provide an important method for moving sites more quickly through the CERCLA process. When a site presents a relatively time-sensitive, non-complex problem that can and should be addressed, a Removal Action would be warranted.

## RmA



# East Tennessee Technology Park



**T**he former K-25 Site began operations during World War II as part of the Manhattan Project. Its original mission was to produce enriched uranium for use in atomic weapons. The 2,200-acre plant site was permanently shut down in 1987 and is undergoing cleanup for ultimate conversion to a private sector industrial park. Restoration of the environment, decontamination and decommissioning of facilities, and disposition of wastes are currently the major activities at the site.





# K-25 Building West Wing Demolished

The west wing of the K-25 Building has been demolished, and debris from the demolition has been removed from the site.

The K-25 Building, built during the Manhattan Project, occupied approximately 40 acres and contained more than 3,000 stages of gaseous diffusion and associated auxiliary equipment. Each stage consists of a converter, two compressors, two compressor motors, and associated piping.

Most of the demolition debris has been shipped to the Environmental Management Waste Management Facility (EMWMF), a Reservation disposal facility built near the Y-12 National Security Complex to handle waste from CERCLA cleanup activities.

Pre-demolition activities continued in the east wing, including the removal of high-risk equipment. Workers also continued performing vent, purge, drain, and inspection activities; asbestos removal; and draining of lubrication oil and coolant from the process system in both the east and north wings.

Measures were previously taken to improve the safety of workers inside the facility, including the installation of nets and barriers to add protection from falling debris.



# ETTP Transformation Continues

More than 220 facilities at ETTP have been demolished during the past several years as the site is being transformed to a private sector industrial park. Except for a select few, most buildings at the former gaseous diffusion plant are slated for demolition.

The facilities that remain will be transferred to private sector organizations under the Reindustrialization Program.

## Reindustrialization

In FY 2010, two facilities and two land parcels at the former gaseous diffusion plant were transferred for private sector use, bringing the total transfers at the site to eleven facilities (which include some complexes of multiple small buildings) and seven land parcels. Two speculative buildings were constructed under the Reindustrialization Program near the K-1007 Building.

## Demolition Projects

In addition to demolishing the K-25 Building west wing, workers have been preparing two other gaseous diffusion buildings for demolition: K-27 and K-33.

The K-27 Building is similar to the K-25 Building in terms of process and is approximately 900 ft long, 400 ft wide, and 58 ft in height. Pre-demolition work that has been completed includes removal of asbestos, hazardous material, and loose material, and draining of lubrication oil and coolant.

DOE has awarded a contract for the demolition of the K-33 Building. One of the last steps necessary before demolition begins—isolation of the tie line connecting that building to the K-31 Building—was completed.

Also in FY 2010, six low-risk/low-complexity facilities were demolished.

## National Priorities List Boundary

Final data were collected in FY 2010 to characterize five parcels surrounding ETTP in order to determine if these parcels can be removed from the National Priorities List site boundary, which encompasses the contaminated sites on the Reservation. The entire Reservation was originally placed on the National Priorities List, but EPA has since clarified that listed sites are based on contaminated areas, not property boundaries.



*Workers complete the final steps in isolating the tie line that connected the K-33 Building to the K-31 Building*

## East Tennessee Technology Park



 = Demolished

 = Leased/transferred

 = Demolition ready

## ETTP Cleanup At a Glance\*

Facilities demolished	224
UF <sub>6</sub> cylinders removed	7,000
Waste removed from site	1 million yd <sup>3</sup> of waste
Total area remediated	2.11 million ft <sup>2</sup>

\*Totals since cleanup operations began

# Contaminated Surface Water, Groundwater at ETTP Addressed

Remediation activities to reduce ETTP groundwater and surface water contamination continued in FY 2010.

## Pond Restoration

Fish removal, recontouring, and revegetation were completed at the ETTP P1 Pond (located next to Building K-1007).

Fish removal was also conducted in two additional ETTP ponds located adjacent to Highway 58, with approximately 8.5 tons of fish recovered from all three. Removal of the fish was necessary because the species that were in the ponds would stir the contaminated sediment at the bottom of the ponds.

The pond was restocked with fish species that are less likely to stir the pond sediment. Barriers were placed to prevent fish from migrating into the pond from Poplar Creek.

The fish barrier was damaged during FY 2010 after a severe weather event. Undesirable fish that reentered the pond were removed, and the fish barrier was repaired.

## Releases to Mitchell Branch

In FY 2010, DOE approved a non-time-critical Removal Action for a long-term solution to the release of hexavalent chromium into Mitchell Branch. The Removal Action Work Plan and conceptual design



*Workers repair a fish barrier at the ETTP P1 Pond to prevent fish from migrating into the pond from Poplar Creek*

were completed in FY 2010. DOE had previously approved a time-critical Action Memorandum to address releases of hexavalent chromium from an unknown source to Mitchell Branch in FY 2007.

These releases were affecting the ambient water quality. In response, DOE completed a time-critical Removal Action to extract and dispose the contaminated groundwater.

Since completion of the Removal Actions, the concentration of chromium in Mitchell Branch has been reduced to ambient water quality.

### Groundwater Treatability Study

A two-phase groundwater treatability study at ETTP began in FY 2009 to support selection of a sitewide groundwater remedy.

The purpose of the study was to determine the feasibility of in situ treatment technologies to restore the groundwater. Two in situ technologies have been identified as possibilities, and one or both may be suitable: thermal conductive heating and biological treatment.

The purpose of the first phase of the study was to characterize and delineate suspected areas of solvent contamination. Seven boreholes were installed to depths of 110 to 160 feet below ground surface in FY 2009.

In FY 2010, Dense Non-Aqueous Phase Liquid (DNAPL) was detected in one of the boreholes in the vicinity of the former K-1401 Vapor Degreasing Tank. DNAPLs are a group of organic substances that are relatively insoluble in water and more dense than water. Seven additional boreholes were installed to further delineate the lateral extent of DNAPL contamination.

A workshop was held in September 2010 to review the data and select a technology for a Phase II Pilot Field Study. The workshop concluded that in situ thermal treatment may be appropriate for DNAPL treatment in the weathered bedrock zone, that in situ thermal or biological treatment may be appropriate for treatment of the unconsolidated zone, and that a waiver may be appropriate for the deep bedrock zone. The objective of the study is to determine if these technologies would be effective in reducing the mass of contamination in the groundwater and reducing the risk of exposure to human health and the environment.



*A liner impregnated with indicator chemicals was inserted in boreholes to determine the presence of DNAPLs. The purple stain indicates that DNAPLs contacted the liner.*



*Workers scan drill corings to detect contaminants*

# Soil Remediation Activities Continue at K-770, K-1070-B Burial Ground

The soil at ETTP is to be remediated to a level that protects a future industrial work force and the underlying groundwater. Records of Decision (RODs), which detail the selected cleanup methods, are in place that address soil, slabs, subsurface structures, and burial grounds for both zones.

The Zone 1 Interim ROD was signed in November 2002 and covers the 1,400-acre area surrounding ETTP outside the main plant perimeter. The Zone 2 ROD was signed in April 2005 and covers the 800 acres in the main plant area.

Remediation of contaminated soil continued at the K-770 Scrapyard, and approximately 97,000 yd<sup>3</sup> of soil has been shipped to EMWMF for disposal. Remediation of the K-770 Scrapyard was 99% complete at the end of FY 2010.

Work was initiated in FY 2010 to prepare a Zone 1 Final ROD that will address groundwater and ecological protection. Field work on that project will be initiated in FY 2011.

In Zone 2, work in Exposure Units (EUs) 31 and 32 was completed, and remediation of the K-1070-B Burial Ground continued. EU 31 is in the center of ETTP and spans approximately 21 acres. A Phased Construction Completion Report (PCCR) was completed that documented the characterization of the EU, the remediation of the K-1035 slab and underlying soil, the removal of

the K-1401 slab, and the backfilling of the K-1401 basement.

EU 32 also is in the center of ETTP and spans approximately 18.4 acres. A PCCR was prepared that documented the characterization of the EU and the remediation of the K-1066-G Yard, which consisted of the removal of equipment and material that was stored there.

Through the end of FY 2010, approximately 93,000 yd<sup>3</sup> were excavated from the K-1070-B Burial Ground. Excavation of the trenches was initiated, and the groundwater collection, filtering, and transfer system to the Central Neutralization Facility was installed.



*Workers place straw on the remediated K-770 Scrapyard*

*A load of asbestos-contaminated soil from the K-770 Scrapyard is being covered in preparation for shipment to EMWMF*





# Reindustrialization Program Continues Effort to Privatize ETTP

With the property and infrastructure transfers and upgrades in FY 2010, the DOE Oak Ridge Office Reindustrialization Program marked a turning point in realizing DOE's vision to transform ETTP into a private sector business/industrial park.

Approximately 145 contiguous acres, with supporting infrastructure located along Highway 58 at the front portion of ETTP, are available for economic development. Additional land areas at ETTP are in various stages of the transfer process, and utility infrastructure improvements continue to support expansion of ETTP.

In FY 2010, the Reindustrialization Program transferred Land Parcels ED-8 and K-792 Switchyard Complex (including Buildings K-796-A and K-791-B) to the Community Reuse Organization of East Tennessee (CROET).

DOE has now transferred ownership of approximately 170 acres of land (see chart on next page) and

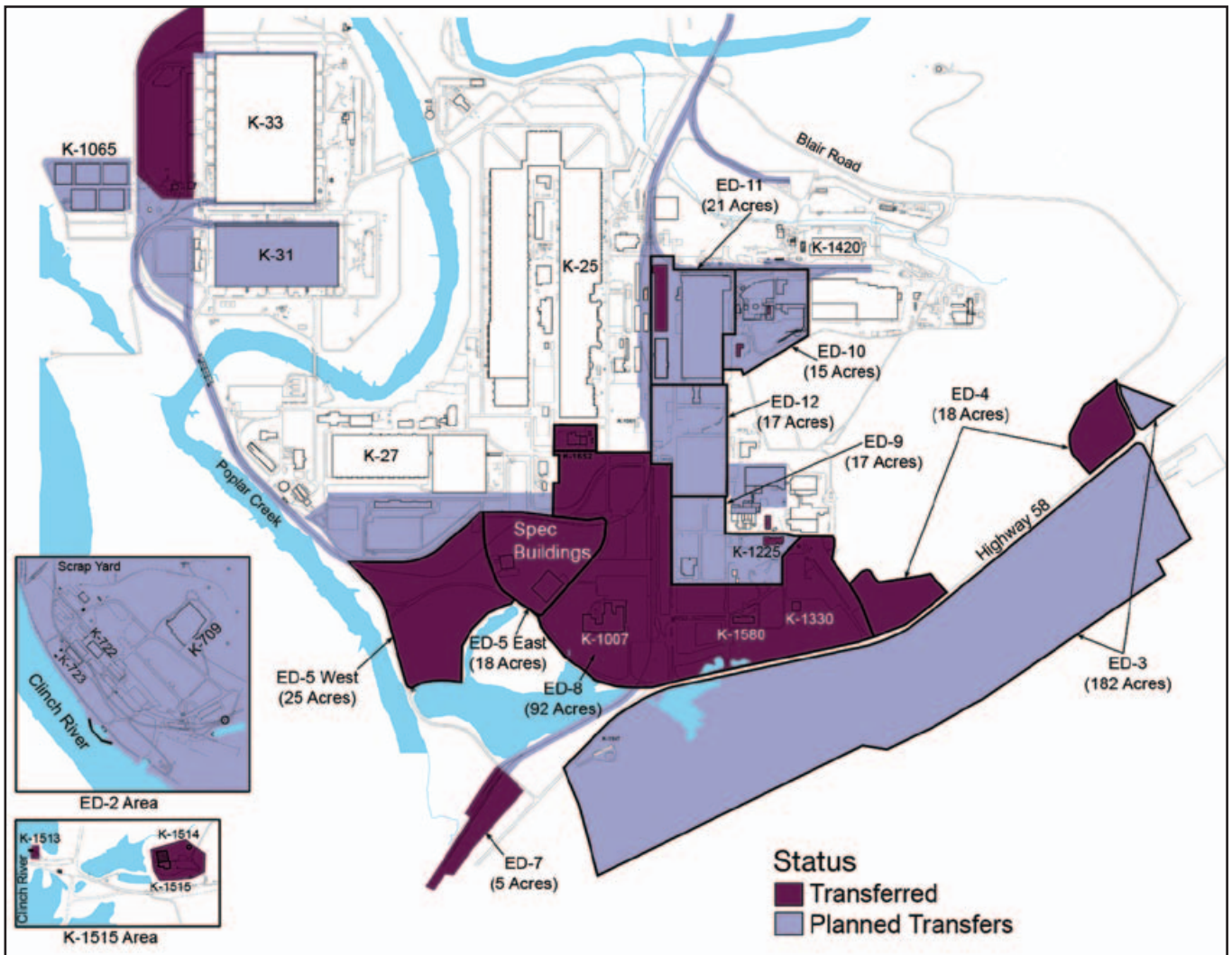
332,000 in building square footage at ETTP. These transfers have been made via a provision in CERCLA that allows for transfer of property for economic development purposes.

DOE transferred the Phase I Electrical Distribution System in February 2010 and several site roadways to the City of Oak Ridge in May and June 2010. The Phase I portion of the electrical system included all direct off-site main plant power lines. The roadway transition included 1.3 miles of roads at the main site entry and arterial roadways to provide public access to privately owned buildings at ETTP.

CROET completed construction of two speculative buildings and upgraded the fire protection systems in the privately owned buildings at ETTP, while the City constructed a new power line from their substation to serve the speculative buildings and the ED-5 East and West land parcels.



*Ribbon cutting ceremony, featuring DOE and Oak Ridge city officials, for the new speculative buildings at ETTP*



*Status of property transfers at ETPP*

*Workers install new landscaping at the ETPP main entrance*



# Oak Ridge National Laboratory



Oak Ridge National Laboratory (ORNL) has become one of the world's most modern campuses for scientific discovery in materials and chemical sciences, nuclear science, energy research, and super-computing. However, among all this modern infrastructure are large contaminated areas that resulted from past operations and waste disposal practices. The Environmental Management Program has divided ORNL into two major cleanup areas: Bethel Valley and Melton Valley. The Bethel Valley area includes reactors and the principal research facilities, and the Melton Valley Area was used for reactors and waste management.



*A worker collects a waste characterization sample from the 2061 Smoke Stack, a non-reactor facility slated for demolition*

# Bethel Valley Non-Reactor Facilities Cleanup Activities Progressing

Startup activities were in progress in FY 2010 for demolition and legacy material removal at some of the non-reactor facilities in Bethel Valley at ORNL. These contaminated facilities are no longer needed and are slated for demolition.

A total of 34 buildings have been identified for immediate demolition using ARRA funding. This work will also involve removal of excess items, referred to as legacy materials, in these facilities. Legacy materials are items that require minimal effort (such as unbolting or unplugging) to remove from the buildings. Removing these items will reduce risk, allow access to underlying soil that may be contaminated, and facilitate site modernization. Asbestos abatement activities are under way at several of these facilities.

Cleanup will also include demolition and legacy material removal of Building 3038, Building 2026, and the Building 3026 C&D Hot Cells (a wooden structure surrounding these cells was removed in FY 2010—see article on next page).



*Workers open a cooling water pump system in preparation for characterizing the waste in Building 3103, one of the 34 non-reactor facilities to be demolished*



## Demolition Completed at 3026 C&D

Demolition was completed on the wooden superstructure of one of the highest hazard excess facilities at ORNL—the 3026 C&D Radioisotope Development Laboratory. This building, one of the original Manhattan Project facilities, had a footprint of approximately 24,000 ft<sup>2</sup> and contained several hot cells and associated pipes and ducts that were highly contaminated.

The wooden structure in which the hot cells were located had deteriorated significantly over the years due to age and roof leaks. A roof failure in 2007 damaged the fire suppression sprinkler system, requiring it to be deactivated. This deactivation presented potential fire hazards to nearby facilities and the potential for contaminant release if a fire occurred in the facility.

DOE determined that the resulting risks warranted implementing a time-critical Removal Action to remove the 3026 C&D wooden structure and stabilize the hot cells.

The activities required to prepare for final demolition of the wooden superstructure included removal of asbestos-containing materials (floor tile, transite, thermal insulation); removal of certain hazardous materials, such as lead shielding, light bulbs, mercury switches, and oils; and removal of hot cell piping and ductwork. Required pre-demolition abatements were completed in November 2009.

Demolition and stabilization were completed in February 2010. More than 160 shipments of building debris, representing 1.7 million pounds of waste, were sent to EMWMF. An additional 25 yd<sup>3</sup> of waste was processed and dispositioned



via alternative pathways. Of special note was that for personnel safety, a portion of the building had to be demolished with friable asbestos in place. This required the use of supersacks for debris packaging.

As a final step in this phase of the 3026 C&D work, the entire remaining hot cell structures and building slab were coated with polyurea. The polyurea's proper-

ties of fast reactivity and relative insensitivity to moisture make it useful for large surface area projects, such as secondary containment and manhole and tunnel coatings. With this final stabilization coating in place, the 3026 C&D area was transitioned on September 23, 2010, to DOE's contractor responsible for removing the hot cells for this next phase of work.



*3026 facility before demolition*



*Remaining hot cells with polyurea coating*



*Workers erect a tent structure over the Tank W-1A area*

## Tank W-1A Removal Under Way

A groundwater plume of contamination emanates from contaminated soil surrounding Tank W-1A in the central portion of ORNL and migrates to a nearby creek.

The principal plume contaminants are strontium-90 and uranium isotopes. Since late 1994, DOE has been implementing various actions to minimize the release of groundwater contaminants into First Creek. Final remediation of Tank W-1A had been on hold pending funding, but in 2009 the project received ARRA funds.

Planned remediation includes excavating, packaging, and transporting waste for disposal, as well as removing, size-reducing, containerizing, and transporting the concrete pad and tank supports and tank shell to the Nevada National Security Site. The project has completed installation of a weather enclosure in FY 2010, and field work is expected to be completed in Fall 2011.

Additionally, soil sampling and characterization along a Tank W-1A feed pipeline to delineate the extent,

type, and concentration of contamination north of the Tank W-1A site has been completed. The data are being evaluated to determine the scope of the soils in this area that will be removed.



*Weather enclosure nearing completion*



# Six Facilities in the 2000 Complex Demolished in First Phase

Six facilities in the 2000 Complex at ORNL have been demolished. The complex, located in the north-west corner of the ORNL central campus, includes eight facilities and structures totaling 58,000 ft<sup>2</sup>.

The facilities were constructed in the late 1940s to support various ORNL research projects. They include Buildings 2000, 2001, and 2024, and their ancillary support facilities 2019, 2034, 2087, 2088, and 2092. The facilities were in severe disrepair and had been vacant for approximately six years.

The specific hazards encountered in this facility complex include the extremely poor physical condition of the structures, constant flaking of PCB-containing paint, extensive quantities of friable and non-friable asbestos in restricted attic areas, and radiologically contaminated ductwork and fume hoods. DOE determined that the resulting risks warranted implementing a time-critical Removal Action. The demolition project was divided into two phases.

In FY 2010, demolition of the first phase (2000 Complex East) was completed. This phase consisted of the demolition of six buildings (2001, 2019, 2024, 2087, 2088 and 2092) with a combined area of approximately 35,000 ft<sup>2</sup>. Also in FY 2010, the contract was awarded, contractor mobilized, and hazardous material abatement commenced on the second and final phase (2000 Complex West), which consists of the 2000 and 2034 buildings with a combined area of 23,200 ft<sup>2</sup>.

Fiscal Year 2010 Phase 1 demolition work resulted in 278 shipments of building debris, representing more than 5700 yd<sup>3</sup> of waste shipped to the Y-12 landfill and 75 yd<sup>3</sup> to EMWFM.



*2000 Complex demolition activities*

*Placement of capping material at SWSA 1*



## **SWSA 1 Remediation at Bethel Valley Burial Grounds Completed**

The Bethel Valley Burial Grounds Project includes capping of two solid waste storage areas: SWSA 1 in Central Bethel Valley and SWSA 3 in West Bethel Valley. Remediation of contaminated hot spots and placement of cover over disposal areas in the vicinity of the two SWSAs are also part of the project.

The work in the vicinity of SWSA 1 was completed in October 2010. Capping of SWSA 1 involved placement of several layers of cap material to prevent migration of contaminants as a result of infiltration of water. SWSA 1 is divided by a road that required reconstruction as part of the placement of the cap.

Two disposal areas near SWSA 1—the Former Waste Pile Area and the Nonradioactive Wastewater Treatment Plant Debris Pile—were covered with additional soil and the area re-seeded during FY 2010.

The work in the vicinity of SWSA 3 is ongoing. Workers have begun placing some of the miscellaneous debris recovered and generated during remedial action operations on SWSA 3. Workers have cleared vegetation in the area adjacent to SWSA 3 and the Closed Scrap Metal Area to construct the upgradient French drain. The areas

around the adjacent Contractor’s Landfill East and West have been cleared, and placement of additional soil has also been initiated. Hot spots have been sampled, and the data are being evaluated. Ancillary activities include surveying, geophysical investigations, well investigations, well plugging and abandonment, and well installation. These ancillary activities have been completed in the vicinity of SWSA 1 and are ongoing in the vicinity of SWSA 3.

Regulators have been notified of elements of the scope that varied significantly from what was prescribed in the Bethel Valley Record of Decision. These elements, detailed in a document called an “Explanation of Significant Differences,” include conducting characterization activities as pre-construction activities rather than as predesign or design activities, placing a RCRA-type cap over two large hot spots and a debris pile rather than excavating contaminated material, modifying the upgradient trench for effectiveness, and changing the future land use designation of certain areas from “Unrestricted” to “Recreational” because they will be under the RCRA-type cap.

# Design Being Prepared to Process Large U-233 Inventory at ORNL

Oak Ridge has a significant inventory of Uranium-233 (U-233) currently stored in Building 3019A. U-233 is a special nuclear material that requires strict safeguards and security controls to protect against access. The U-233 Material Downblending and Disposition Project was initiated to address safeguards and security requirements, eliminate safety and nuclear criticality concerns, and ship the material to an approved disposal site.

Treating the U-233 inventory as expeditiously as possible will reduce the substantial annual costs associated with safeguards and security requirements, eliminate the risk of a nuclear criticality event, and avoid the need for future facility upgrades to Building 3019A to ensure safe storage of the inventory.

The U-233 Material Downblending and Disposition Project dismantled two facilities—Buildings 3136 and 3074—in FY 2010 to allow for construction of an annex facility to Building 3019A at ORNL. The annex that is planned will be used to house drying and packaging operations.

The dismantlement of the buildings was performed as a CERCLA Time-Critical Removal Action. Building 3136 was a wood framed structure with sheet metal siding. Constructed in 1984 and operated as a document storage facility the 600 ft<sup>2</sup> single story building was the first of two facilities to be dismantled.

Building 3074 was constructed in 1951 and operated as the hot cell

manipulators repair and maintenance shop. The 3,500 ft<sup>2</sup> single story facility contained asbestos material, lead-based paint, polychlorinated biphenyl-containing material, and radioactive contamination. Building debris meeting the definition of mixed low-level waste was sent to the Nevada National Security Site for disposal while the debris meeting the definition of low-level waste was disposed at Clive, Utah.

The last of the Time-Critical Removal Actions (3020 Stack) is yet to be characterized for disposal. The stack, which has operated since the 1940s, is known to be radioactively contaminated and require disposal as a low-level waste. Asbestos-containing materials and PCB-containing materials may also be present. Prior to dismantlement, a replacement stack will be constructed to allow the 3020 stack to be taken out of

service. Due to expected funding reductions, the 3020 stack dismantlement activities have been placed on hold temporarily.

The U-233 Material Downblending and Disposition Project has experienced challenges during the design phase of the project. In 2009, geological surveys of the area proposed for construction of the annex found voids in the rock formations requiring modifications to the structural design of the facility. In addition, hazard analyses of a thoron release during operations identified a potential for radiological dose impacts to on-site workers, which could result in design changes to the ventilation systems.

These changes resulted in significant design modifications, causing delays in completing design. However, final design is expected to be completed in FY 2011.



*3019 Complex*

# Soils, Sediment to be Remediated

The Bethel Valley Soils and Sediment Project will characterize, scope, and complete remediation of contaminated soils and sediments necessary to protect workers and groundwater in the area.

The Remedial Action Work Plan for the project provides the approach that will be followed to characterize and evaluate soils and sediments, ensuring that the soil cleanup requirements for Bethel Valley are met. The Work Plan was approved by the regulators in early FY 2010. The cleanup strategy includes a series of workshops, called Data Quality Objective (DQO) sessions, to identify sampling needs in specific portions of Bethel Valley. A number of core team DQO sessions have been conducted, and field assessment activities, which

focused on portions of Bethel Valley west of the ORNL main campus, have been completed. These areas, which surround the SWSA 3 Burial Ground, have also been sampled, and analytical data results are being validated and assessed to determine if additional sampling will be necessary to scope any required soils remediation within these areas.

These efforts have resulted in more than 487 acres of the Raccoon Creek area being identified as requiring no action. Additional DQO sessions and field characterization activities on the remaining areas will be continued in FY 2011. Sampling within the northwest corner of the central campus will be performed first to support excavation of the slabs and contaminated soils in the area.



*Field sampling in Bethel Valley*

# Bethel Valley Groundwater Addressed

Several activities were initiated in FY 2010 to address Bethel Valley groundwater plumes, including the following:

## 7000 Area Groundwater Treatability Study

The 7000 Area covers the maintenance facilities on the east end of ORNL. A treatability study was initiated in FY 2010 to determine the feasibility of using bacteria to eliminate trichloroethylene in groundwater.

The FY 2010 field activities included sampling of groundwater to determine the presence of naturally occurring dechlorinating microbes, analyzing groundwater to determine the degradation capacity of the indigenous microbes, and injecting dye into several wells to determine the groundwater transport characteristics. DOE will perform a pilot study at four wells in the 7000 area to determine if full-scale bioremediation is feasible.

## Corehole 8 Intercept Extraction System

Surface water monitoring in First Creek has indicated the Strontium-90 in groundwater is bypassing the Corehole 8 intercept extraction system and surfacing at First Creek on the west side of ORNL. A groundwater engineering study performed under the Bethel Valley ROD concluded that the Corehole 8 plume is moving along the bedrock deeper than the current interceptor

extraction system components. The solution is to install deeper extraction wells to intercept the deep groundwater before it reaches First Creek. The Tank W-1A project is addressing the source of the Strontium-90 in the Corehole 8 plume.

A shallow Geoprobe groundwater sampling campaign was initiated in the summer of FY 2010 to determine the best location for new extraction wells. The driller started drilling these new wells. Three wells will be connected to the extraction system in FY 2011 and the system upgraded with larger pumps and controllers for the multiple extraction components.

## SWSA 3 Exit Pathway Monitoring

Three new monitoring wells were installed west of Highway 95 along Raccoon Creek. The wells were installed to monitor a Strontium-90 plume that originates at the SWSA 3 landfill. Strontium-90 in the groundwater has been shown to flow both to the west, under Highway 95, surfacing in the Raccoon Creek headwaters, and to the east, surfacing in a tributary flowing to First Creek within the ORNL campus. Wells were installed in the shallow water table, at 50 feet and 100 feet depths. Information about these wells will be published in the SWSA 3 Remedial Action Report at the conclusion of the capping activities.

*Workers are installing one of three new monitoring wells along Raccoon Creek*



# Monitoring Wells Checking for Potential Off-Site Contamination

DOE has completed installation of monitoring wells opposite the Oak Ridge Reservation side of the Clinch River to monitor for potential ORNL site-related contaminants.

The Melton Valley Off-site Monitoring Well project installed 16 new monitoring wells that are constructed to depths equivalent to monitoring zones on the DOE side of the river. The new wells were drilled to depths from 250 to 650 feet deep. Geophysical logging and in situ permeability testing was conducted on each of the wells. Two of the proposed well sites adjacent to the river utilized previously operated drinking water wells to install multiple zoned wells in the open borehole.

The driller demobilized and the well sites were restored in August 2010. Field work was completed with repairs to Jones Road and Upper Jones Road. The new wells are now included in the Melton Valley monitoring network and incorporated into the recently proposed Melton Valley Monitoring Plan. The 16 new wells and 5 nearby residential wells will be sampled quarterly with initial results published in the FY 2011 Remedial Effectiveness Report.



*Well drilling at Melton Valley*



# Y-12 National Security Complex



**T**he Y-12 National Security Complex is a premier manufacturing facility dedicated to making our nation and the world a safer place. The Y-12 Complex helps ensure a safe and reliable U.S. nuclear weapons deterrent. The site also retrieves and stores nuclear materials, fuels the nation's naval reactors, and performs complementary work for other government and private-sector entities.

# UEFPC Remediation Under Way

Remediation of the Upper East Fork Poplar Creek Watershed is being conducted in two stages under Records of Decision using a phased approach. Phase 1 addresses remediation of mercury-contaminated soil, sediment, and groundwater discharges that contribute contamination to surface water.

The initial project of the Phase 1 Record of Decision, construction of the Big Springs Water Treatment System, was completed in 2006. The system has been fully operational since September 2006, removing mercury from local spring and sump waters that discharge to Upper East Fork Poplar Creek.

With ARRA funding, cleanup and repair of storm sewers in the West End Mercury Area (historic mercury use area) was initiated in FY 2009. The initial phase, videotaping the storm sewer system, has been completed and the videotape has been evaluated. The storm sewers consist of more than 20,000 linear feet of pipe, which were inspected by a track-mounted video camera. An engineering study was completed in 2009 that documented the results of the camera survey and the extent of remediation required, as the pipes are a known mercury pathway to Upper East Fork Poplar Creek. A Remedial Design Report was prepared during 2010 that specifies the method of accomplishment for storm sewer remediation and was approved by the Environmental Protection Agency and the State of Tennessee. Sewer remediation is scheduled to start in FY 2011.



*At left, Y-12 Environmental Compliance personnel perform field analysis following the collection of a mercury sample. Below, EM and subcontractor staff review video assessment data for the West End Mercury Area.*







*Old Salvage Yard West*



*Workers cut materials for samples*



*Old Salvage Yard East*

## Scrap Removed from Old Salvage Yard

At the end of FY 2010, a total of 15.7 million pounds of scrap had been removed from the Old Salvage Yard, located at the west end of the Y-12 National Security Complex within and outside the high-security boundary. Of that amount, 8.7 million pounds were shipped to EMWMF and 7 million pounds to the Nevada National Security Site.

The 7-acre site, established in the early 1970s, was used for storing scrap metal and liquid hazardous wastes from Y-12 operations until 1999.

The cleanup project will remove approximately 23,700 cubic meters of potentially radioactively contaminated scrap metal in piles and approximately 1,100 containers (B-24 and B-25) of radioactive scrap metal. The Old Salvage Yard received scrap into open piles until 1995, when new procedures required that all scrap metal be placed inside containers.

The primary contaminants of concern in the scrap yard include uranium and thorium. Forklifts, an abandoned crane, and other equipment are also being removed.

In addition to the material removal and disposition, the Old Salvage Yard Scrap Removal Project received additional ARRA funding in August 2010 for soil characterization. Based on the results of that characterization, Y-12 anticipates remediating those soils to the extent required by regulators.



# ARRA-Funded Removal Actions Ongoing at Y-12



ARRA funding was used in FY 2010 to expedite removal of legacy wastes and building demolition at the Y-12 National Security Complex.

## Building 9206 Filter House Removal

The Building 9206 Filter House Removal Project at Y-12 National Security Complex is unlike other ARRA-funded deactivation and demolition projects. Only a section of the building will be demolished rather than the complete structure. This project will also deactivate the recovery furnace exhaust system.

Deactivating the recovery furnace exhaust system reduces exposure from potential release of radiological and hazardous materials in out-of-service equipment. Deactivation also eliminates the need for daily monitoring of the process systems. As of September 2010, the Building 9206 Filter House Project was 70 percent complete and the team had removed and disposed a total of 41 m<sup>3</sup> of waste.

## Building 9735 Demolition

Demolition of Building 9735, the last building to be removed from Engineering Row, was completed in July 2010. Demolition of Engineering Row reduced the Y-12 facility by 92,690 ft<sup>2</sup>. The other six buildings that once comprised Engineering Row were demolished in 2008.

The project involved complete deactivation and demolition of the building as well as the disposition of 2,964 m<sup>3</sup> of material and waste to the Y-12 Sanitary and Industrial Waste Landfills and approximately 8 m<sup>3</sup> to the Nevada National Security Site. In addition to eliminating safety risks, this project allowed Y-12 to add an employee parking area.

## Alpha 5 Legacy Material Disposition Project

Alpha 5 (Building 9201-5) is the largest building at Y-12, measuring 613,642 ft<sup>2</sup>. The Alpha 5 Legacy Material Disposition Project is tasked with removing and disposing legacy materials from the building as well as characterizing the building materials to prepare for eventual deactivation and demolition by the EM Program.

Y-12 reached the first project milestone in March with the completion of the fourth



*Radiological control technicians and material handlers check Alpha 5 containers before disposal*

floor cleanup. The second floor was also cleared, and total material removal on that floor was 7,082 m<sup>3</sup>. The building is scheduled to be emptied completely by September 30, 2011.

### **Beta 4 Legacy Material Disposition Project**

The Beta 4 Legacy Material Disposition Project comprises removal and disposal of legacy materials from the second floor of Building 9204-4, also known as Beta 4, to prepare for deactivation and demolition of the facility as part of the site transformation plan. Beta 4 is a large, three-story building that features a flat roof and is supported by a cast-concrete foundation.

Disposition plans for Beta 4 waste were accelerated with ARRA funding. Results of these efforts are improved site safety and security, reduced operating costs, and reduced environmental risk to site personnel and to the immediate and surrounding areas. The Beta 4 project was 96% complete at the end of FY 2010.

### **Biology Complex and Building 9769 Deactivation and Demolition Project**

The Biology Complex and Building 9769 Deactivation and Demolition Project comprises four of the seven buildings in the Biology Complex, which are being deactivated and demolished. Buildings 9211, 9220, 9224, and 9769 are being razed, and approximately 28,324 m<sup>3</sup> of waste are being shipped off site.

The Biology Complex project is part of Y-12's ongoing footprint reduction effort, designed to minimize maintenance and security costs. The project eliminates 135,812 ft<sup>2</sup> of unused building space and the risk associated with the deteriorated facilities. These buildings have been vacant since late 2003. All four of these buildings were demolished.



*Hazardous material abatement in Building 9220, part of the Biology Complex*



*Biology Complex demolition*

# 81-10 Area Being Characterized

Building 81-10 at the Y-12 Complex once housed a mercury retort furnace for recovering mercury from contaminated equipment, sludges, soils, and other wastes. Contaminated materials were also stored at the site and, during its operational period, thousands of pounds of mercury were spilled and lost to the environment in the 81-10 area.

In 1995, workers removed the building structure to the foundation as well as the furnace and remaining drums of mercury-contaminated soil. In 1998, the Building 81-10 sump and Basin 9822 were remediated.

A field investigation of contaminated soils was conducted at the 81-10 area to address data gaps identified by previous studies. The primary objectives were to define the nature and extent of mercury contamination in site soils and to determine whether this contamination is a source to Upper East Fork Poplar Creek.

Thirty-one borehole locations were investigated using a combination of field screening instrumentation and soil sampling for laboratory analysis. X-ray

fluorescence measurements were collected on every foot of each extracted core.

Soil samples were analyzed, among other things, for radionuclides, metals, semivolatile organics, volatile organics, and polychlorinated biphenyls.

Where found, mercury contamination is relatively shallow. Exceptions are noted along the northern edge of the former furnace footprint where visible mercury was observed in two boreholes. However, results from this investigation coupled with previous investigations in the area leads to the conclusion that this mercury contamination is not significantly impacting the Upper East Fork Poplar Creek.

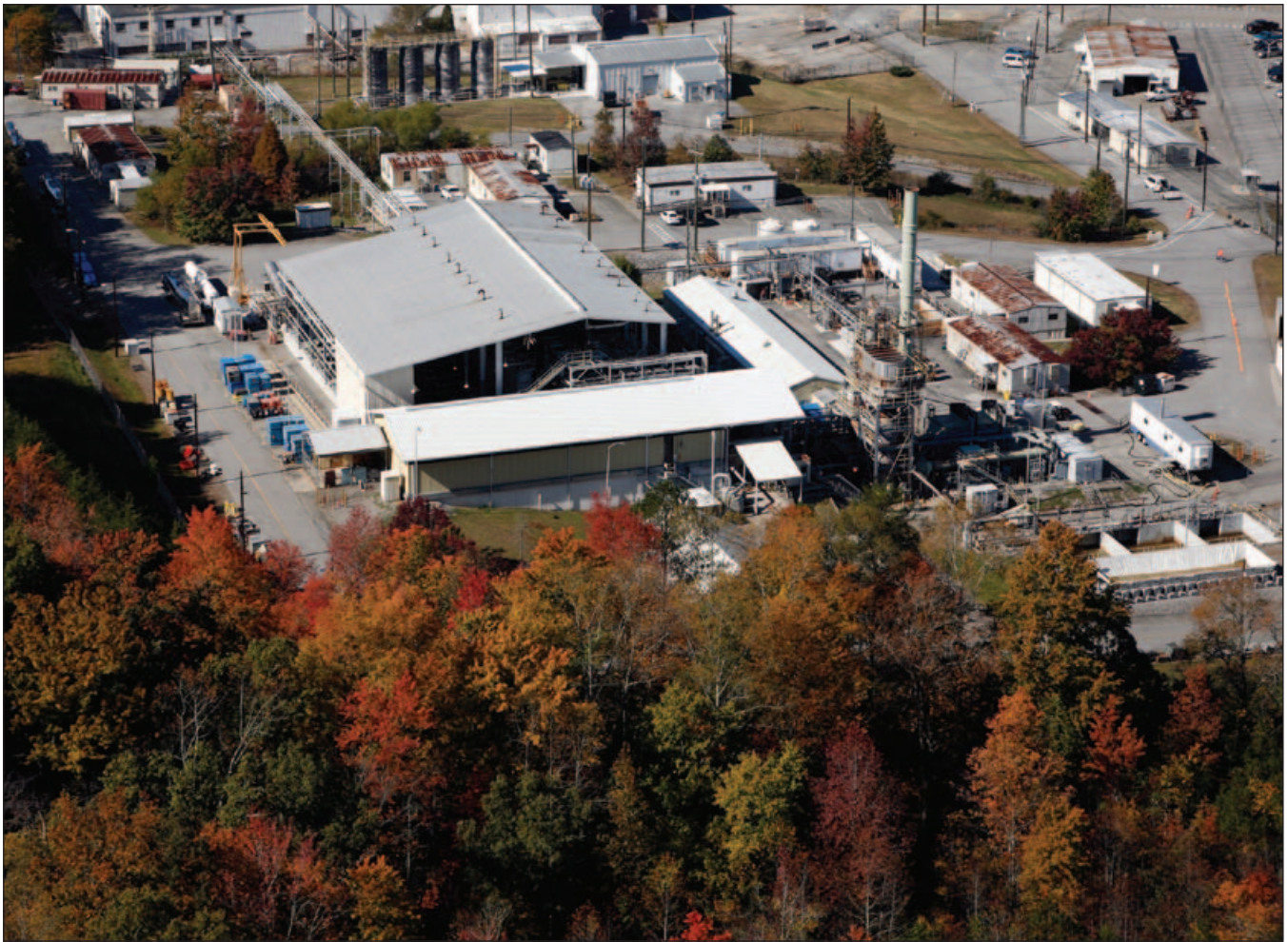


*Soil sampling at the 81-10 area, a known mercury-use area at the Y-12 National Security Complex*

# Waste Management



Wastes on the Oak Ridge Reservation are being disposed in a variety of ways. Much of the waste is going into the on-site Environmental Management Waste Management Facility. Wastewater is treated at the Central Neutralization Facility at ETTP and the Process Waste Treatment Complex at ORNL.



## TSCA Incinerator Permanently Shut Down After Operating 19 Years

The Toxic Substances Control Act (TSCA) Incinerator, located at ETTP, was shut down permanently on December 2, 2009, after treating 35.6 million pounds of liquid and solid waste over a 19-year period.

The TSCA Incinerator was a one-of-a-kind thermal treatment unit. It played a key role in treating radioactive PCB and hazardous wastes (mixed wastes) from the Oak Ridge Reservation, as well as other facilities across the DOE complex, thus facilitating compliance with regulatory and site closure milestones.

Closure activities at the Incinerator will continue through FY 2011 to remove residual waste such as sludge, ash, and scrubber packing material.

The Incinerator is named after a law passed in 1976 that provides EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures.



# Generated Wastes Disposed at Oak Ridge Reservation Landfills

Much of the waste generated during FY 2010 clean-up activities was disposed at facilities on the Oak Ridge Reservation.

EMWMF, located in Bear Creek Valley west of the Y-12 Complex, is an engineered landfill that accepts waste generated from cleanup activities on the Oak Ridge Reservation. It currently consists of four active disposal cells, with a fifth cell awaiting final regulatory approval for use and a sixth cell under construction at the end of FY 2010 (see article on next page).

EMWMF accepts low-level radioactive and hazardous wastes that meet specific waste acceptance criteria developed in accordance with agreements with state and federal regulators.

Waste types that qualify for disposal include soil, dried sludge and sediment, solidified wastes, stabilized waste, building debris, scrap equipment, and personal protective equipment.

During FY 2010, EMWMF operations collected, analyzed, and dispositioned approximately 4.8 million gallons of leachate and 1.3 million gallons of contact water at the ORNL Liquid/Gaseous Waste Operations Facility. An additional 10 million gallons of contact water was collected, analyzed, and released to the storm water retention basin after determining that it met the release criteria. Operating practices also effectively controlled site erosion and sediments.

EMWMF received approximately 22,700 truckloads of waste accounting for approximately 262,000 tons during FY 2010. Projects that have disposed of waste at EMWMF during the year include the following:

- K-25 Building Demolition Project, including waste generated from the west wing demolition;
- ETTP Decontamination and Decommissioning Project, including K-770 Scrapyard, K-1070-B Burial Ground, and K-1036/K-1058 demolition debris;
- Y-12 Old Salvage Yard Project, Alpha 5 Project, and Biology Project; and
- ORNL Building 3026 and 2000 Complex.

DOE also operates the Oak Ridge Reservation Landfills (ORRL), which are solid waste disposal facilities located south the Y-12 Complex on Chestnut Ridge.

The ORRL are engineered facilities used for the disposal of sanitary, industrial, construction, and demolition waste. In FY 2010, approximately 139,000 yd<sup>3</sup> of industrial wastes, construction/demolition wastes, and spoil materials waste were disposed in the ORRL.

Operation of the ORRL generated approximately 1.48 million gallons of leachate that was collected, monitored, and discharged to the Y-12 National Security Complex sanitary sewer system, which discharges to the Oak Ridge sewer system under an industrial sewer user permit.



*Waste disposal at EMWMF*

# Waste Disposal Facilities Expand

Construction of the ARRA-funded EMWMF expansion was completed ahead of schedule and under budget in May 2010. The addition of Cell 5 brings the capacity of EMWMF up to 1,650,000 yd<sup>3</sup>. The extra capacity is well-timed as waste disposal operations started in Cell 4 during 2010 and the total airspace consumed is approaching 900,000 yd<sup>3</sup>.

A sixth cell is being added and will bring the total facility capacity to 2,180,000 yd<sup>3</sup>. Construction of Cell 6 started in May with major excavation and earth-moving to construct the perimeter cell berms. All earthwork, the geologic buffer layer, the low permeability clay liner, and the secondary geomembrane liner were completed ahead of schedule.

Other major accomplishments included setting the two new 30,000-gal leachate storage tanks on their foundations at the new leachate tank farm and installing the leachate manholes and lift station for Cell 6.

At the end of FY 2010, workers were focused on completing the in-cell liner components (primary geomembrane, leachate collection layer, and protective cover), completing all leachate piping, erecting four

above-ground tanks to store contact water, and installing security lighting, instrumentation, and controls for the new components. The Cell 6 construction effort is scheduled to conclude in April 2011.

Construction of the ARRA-funded expansion at the Oak Ridge Reservation Landfills, located near the Y-12 Complex, started in April 2010. When completed, Area 4 at Industrial Landfill V will add 385,000 yd<sup>3</sup> of capacity.

A new Truck Receiving Station will enhance the safety and productivity of operations by providing permanent steel platforms for performing the required load inspections instead of having to use ladders. Also, a leachate header was installed at Industrial Landfill IV to pump leachate into the City of Oak Ridge sewer system for disposal.



*Liner placement on EMWMF Cell 5*





*Above, workers are finishing the concrete placed around the Cell 5 leachate headers.*

*The concrete stabilizes the leachate pipes as they exit Cell 5 and go through the berm to the leachate manhole. At right, schedule delays caused by extremely wet weather had workers using every available hour of daylight to recover the schedule.*



# Alternative Reservation Disposal Sites Being Explored for Future Waste

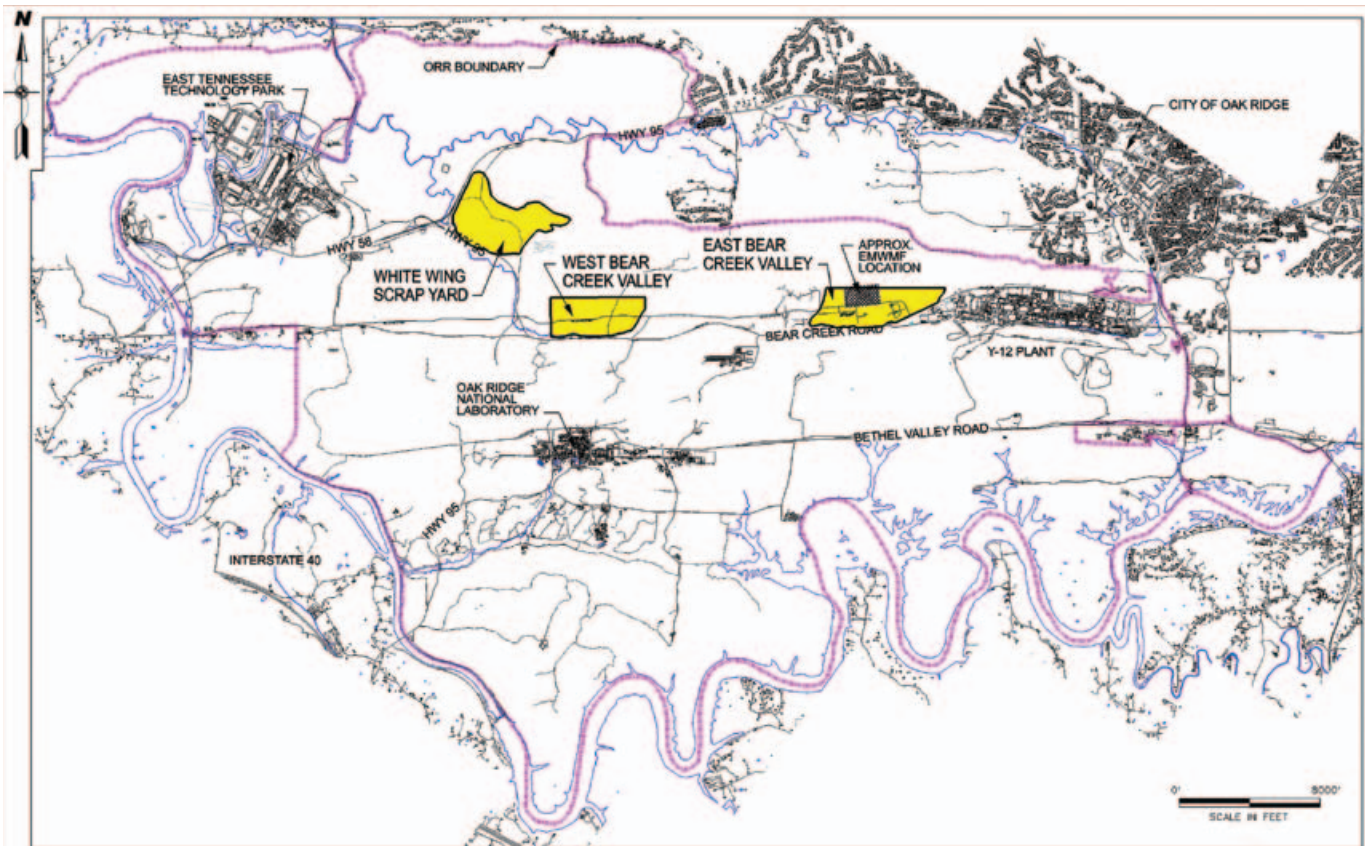
EMWMF began operations in 2002 to provide on-site waste disposal capacity from remediation of the Oak Ridge Reservation. Although it is being expanded to its maximum capacity, EMWMF will not be able to handle all of the waste expected to be generated from Reservation cleanup activities.

Further expansion at EMWMF is constrained by physical limitations of the site. Therefore, DOE is considering other locations to build a new disposal facility. DOE began evaluating disposal alternatives in FY 2010 for future Reservation cleanup waste.

Similar to the CERCLA process that was completed for the existing EMWMF, DOE will evaluate the following alternatives detailed in a Focused Feasibility Study:

- No action
- On-site disposal (constructing and operating a new disposal facility on the Reservation)
- Off-site disposal (shipping to an off-site facility)

The on-site disposal alternative includes consideration of options for siting a new facility in the East Bear Creek Valley area or in two other candidate areas (White Wing Scrap Yard and West Bear Creek Valley).



*New CERCLA disposal facility candidate locations*



*Transuranic Waste Processing Center*

## TRU Waste Treatment Continues

Transuranic radioactive waste, or TRU, is one of several types of waste handled on the Oak Ridge Reservation. Transuranic waste contains man-made elements heavier than uranium, such as plutonium, hence the name “trans,” or “beyond,” uranium.

TRU waste material is generally associated with the human manipulation of fissionable material dating back to the Manhattan Project and primarily consists of clothing, tools, rags, residues, soil, and debris.

The TRU Waste Processing Center’s (TWPC’s) function is to characterize and package TRU waste for transportation and disposition at DOE’s Waste Isolation Pilot Plant (WIPP) in New Mexico, which provides permanent isolation and disposal in underground salt caverns.

Any mixed low-level waste or low-level waste processed from the TRU waste inventory is prepared for compliant disposal at the Nevada National Security Site.

Currently, two waste streams, contact-handled (CH) TRU solids and remote-handled (RH) TRU solids, are being processed at the TWPC. ARRA funding was provided to the TWPC to accelerate the project scope. This increase in funding allowed for early startup of a second shift at the site, resulting in an increase in

CH-TRU and RH-TRU production that will be realized during the next few years.

During FY 2010, the TWPC processed 41.5 m<sup>3</sup> of the RH-TRU waste, reaching a total of 65 m<sup>3</sup> of processed RH waste. The TWPC also processed 283.7 m<sup>3</sup> of CH-TRU waste, reaching a total of 813 m<sup>3</sup> of processed CH-TRU waste.

The TWPC has shipped a total of 33 m<sup>3</sup> of original RH-TRU inventory and 580 m<sup>3</sup> of original CH-TRU waste inventory to disposal facilities. It also completed significant RH hot cell processing improvements.

During FY 2010, the Central Characterization Project, working with the assistance of TWPC personnel, continued the development of documentation required for certification of TRU waste for shipment to WIPP.

Processing of the final waste stream, RH sludge, is scheduled to begin in 2013.



# Millions of Gallons of Wastewater Treated at Reservation Facilities

The Central Neutralization Facility, located at ETTP, treated 9.5 million gallons of wastewater in FY 2010. The facility is ETTP's primary wastewater treatment facility and processes both hazardous and nonhazardous waste streams arising from multiple waste treatment facilities and remediation projects.

The facility removes heavy metals and suspended solids from the wastewater, adjusts pH, and discharges the treated effluent into the Clinch River. Sludge from the treatment facility is treated, packaged, and disposed off-site.

With the shutdown of the TSCA Incinerator, the Central Neutralization Facility operated at a reduced capacity on day shift only instead of the previous 24/7 operation. The main waste stream is the hexavalent chromium-contaminated groundwater collected from Mitchell Branch. The facility also continued to treat wastewaters generated at the TSCA Incinerator to support the closure

activities. It will be shut down in FY 2011 for decommissioning after establishing a smaller chromated water treatment unit that will sit within the existing Central Neutralization Facility footprint.

At ORNL, approximately 120 million gallons of wastewater were treated and released at the Process Waste Treatment Complex. In addition, the liquid low-level waste evaporator at ORNL treated 120,800 gallons of such waste. A total of 2.2 billion m<sup>3</sup> of gaseous waste was treated at the ORNL 3039 Stack Facility.

These waste treatment activities supported both EM and Office of Science mission activities in a safe and compliant manner during FY 2010.

The National Nuclear Security Administration (NNSA) at the Y-12 Complex treated 116.5 million gallons of contaminated ground/sump water at the Groundwater Treatment Facility, the Central Mercury Treatment System, Big Springs Water Treatment System, and the

East End Volatile Organic Compounds (VOC) Treatment System.

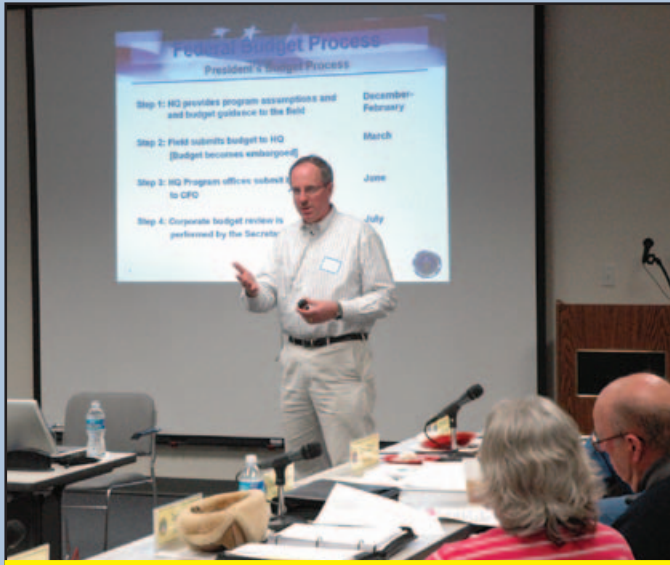
The Big Springs Water Treatment System treated 104 million gallons of mercury-contaminated groundwater. The East End Volatile Organic Compound Treatment System treated 11 million gallons of VOC-contaminated groundwater. The West End Treatment Facility and the Central Pollution Control Facility at the Y-12 Complex processed 1.2 million gallons of wastewater primarily in support of NNSA operational activities.

The Central Pollution Control Facility also down-blended more than 37,000 gallons of enriched wastewaters using legacy and newly generated uranium oxides from on-site storage.



*Central Neutralization Facility control room*

# Public Involvement



The public is involved in all cleanup decisions made by DOE. To keep the public informed, DOE provides information to the public through a variety of outlets, including fact sheets, public notices in newspapers, meetings, the monthly *Public Involvement News* newsletter, and other publications.

# Public Involvement Plan Updated

DOE has updated the *Public Involvement Plan for CERCLA Activities on the Oak Ridge Reservation*. This document describes public involvement opportunities in DOE EM activities performed under CERCLA.

The document is updated every three years to reflect the status of the cleanup decision-making process and to detail the continued avenues for public participation. It is forwarded to EPA and the Tennessee Department of Environment and Conservation for review after the initial update, and comments from these agencies are incorporated into the final document. The Tennessee

Department of Environment and Conservation had no comments on the document. Comments from EPA were being addressed at the end of FY 2010.

The public is entitled to participate in DOE decision-making processes, and DOE encourages such participation.

Effective public involvement and good community relations rest on a foundation of positive relationships. DOE managers and staff build and nurture such relationships, and this plan details the methods by which public input is incorporated into the decision-making.



## Public Involvement Plan

for CERCLA Activities at the  
U.S. Department of Energy  
Oak Ridge Reservation

2010  
Update



# ORSSAB Stays Busy With Various Activities, Recommendations

The Oak Ridge Site Specific Advisory Board (ORSSAB) is a federally appointed citizens' panel that provides independent advice and recommendations to the DOE Oak Ridge EM Program. The board was formed in 1995 and is composed of up to 20 members, chosen to reflect the diversity of gender, race, occupation, views, and interests of persons living near the DOE Oak Ridge Reservation. Members are appointed by DOE and serve voluntarily, without compensation. ORSSAB continued its mission during FY 2010 with a number of activities. Information about ORSSAB activities can be found on a quarterly basis in its *Advocate* newsletter, which also features articles on current EM projects and includes information on how the public can learn about the EM Program and provide comment on its activities. To subscribe to the *Advocate*, see [www.oakridge.doe.gov/em/ssab](http://www.oakridge.doe.gov/em/ssab).



## Museum Kiosk

In April 2010, ORSSAB debuted a new three-sided kiosk for its exhibit at the American Museum of Science and Energy in Oak Ridge.

The kiosk features three touch-screen monitors that lead visitors through key aspects of the DOE EM program: site cleanup activities, history, and long-term stewardship. Each monitor allows museum visitors to explore these three aspects in depth with detailed programs and videos.

Located on the second floor of the museum, the ORSSAB exhibit was first installed in February 2005. The exhibit features a variety of displays and posters to tell the story of the Oak Ridge EM program.

Featured is a scale model of EMWFMF, which provides visitors an idea of the magnitude of the cleanup effort on the Oak Ridge Reservation. A smaller touch-screen kiosk takes visitors on an interactive journey through the cleanup process at the Gunite Tanks, one of the highly successful remediation projects at ORNL. Suspended over the exhibit is one of the remotely controlled planes that used infrared photography to survey waste disposal sites on the reservation.

A variety of colorful posters inform visitors about cleanup program topics, including an overview of the EM program, the challenges the program faces in Oak Ridge, and reindustrialization of ETTP. A poster explaining what ORSSAB is and what it does is featured prominently, and another explains how the remotely controlled airplane overhead was used by the cleanup program.

The museum is located at 300 South Tulane Ave. in Oak Ridge. Information is available at [www.amse.org](http://www.amse.org).



ORSSAB's Museum Kiosk

## EM SSAB Chairs Meeting

On April 28–29, 2010, ORSSAB hosted the SSAB chairs meeting at the DoubleTree Hotel in Oak Ridge. The chairs of the SSABs from across the DOE complex meet twice a year to hear presentations and discuss EM projects and policy, share ideas and concerns among sites, and identify and work on common issues.

The day before the meeting began, many of the participants went on a day-long tour of the Oak Ridge Reservation. They were treated to two talks by ORSSAB member Steve Stow—one on the history of the Graphite Reactor and the other on the role of Oak Ridge during the Manhattan Project. That evening they gathered at the American Museum of Science and Energy for a reception and tour of the museum.

On the first day of the meeting, DOE Assistant Secretary for EM, Inés Triay, provided an update on the EM program. Other topics on the agenda included a round robin presentation from the chairs outlining issues specific to their sites, a detailed presentation on how EM develops its budget and prioritizes projects, and a discussion of waste disposition issues. The second day of the meeting was dedicated to stewardship issues, includ-

ing a background overview, stewardship at closed and ongoing mission sites, and next steps for stewardship.

## Support, Public Outreach for EM Projects

During FY 2010, ORSSAB was actively involved in providing a public forum for major projects that had significant impact on the Oak Ridge EM program this year and that will continue to have ramifications for years to come. Through presentations at the ORSSAB board and committee meetings, the public was able to receive detailed briefings on a variety of topics, such as:

- Groundwater treatability study under way at ETTP
- Engineering study to remove fuel salt from the Molten Salt Reactor
- Transuranic Waste Processing Facility
- Building 3019/U-233 Project
- Corehole 8/Tank W-1A Removal Project
- ARRA projects

## CERCLA Five-Year Review Visits

Every five years, the DOE Oak Ridge Office and Bechtel Jacobs Company prepare a comprehensive report that evaluates how well environmental cleanup



*EM SSAB Chairs Meeting*



remedies are working. The report, known as the CERCLA Five-Year Review, provides DOE, EPA, TDEC, and the public with information on the effectiveness of remediation efforts and details any new information that questions the protectiveness of the efforts.

Before the final report is published, DOE and Bechtel Jacobs Company provide opportunities for EPA and TDEC personnel and members of the public to visit the remediated sites. Briefings are provided by DOE and Bechtel Jacobs Company concerning what was done and how well remedies are working. Visits began in July and continued through September 2010. Two ORSSAB members went on several of the trips, and their observations will be valuable in any subsequent recommendation ORSSAB may make on the Five-Year Review when it is published in 2011.

This is the third Five-Year Review for the Oak Ridge Reservation. When the report is published, a public meeting will be held to provide citizens with an overview of the results. ORSSAB co-hosted with DOE the last public meeting in 2006.

## Recommendations

In FY 2010, the board generated twelve local recommendations on cleanup-related issues. ORSSAB also worked with the chairs of the other seven SSABs that comprise the national EM SSAB to draft joint recommendations to DOE on two important topics: the 2012 baseline budget and inclusion of option periods in all future DOE requests for proposals for prime contracts. Following are summaries of three key recommendations. Complete text of all recommendations is available at [www.oakridge.doe.gov/em/ssab/recc.htm](http://www.oakridge.doe.gov/em/ssab/recc.htm).

**Recommendation for a National Stewardship Workshop**—In 1999 ORSSAB hosted a national stewardship workshop that was attended by more than 100 stakeholders from across the country who were interested in stewardship. Long-term stewardship responsibility for closure sites is now in the hands of the DOE Office of Legacy Management. Responsibility for stewardship at sites with ongoing missions when cleanup is finished is not completely clear, and the issues from the 1999 workshop remain unresolved. As a result, ORSSAB recommended that DOE sponsor another national workshop.



*ORSSAB member David Martin, foreground, gets an explanation of some of the finer points of the White Oak Creek Embayment during one of the site visits performed recently in preparation for the CERCLA Five-Year Review.*

In response to the recommendation, DOE noted that the Office of Legacy Management was already planning a conference on stewardship at closed mission sites in November 2010. With ORSSAB's recommendation, the conference was expanded to include a discussion of stewardship at ongoing mission sites, and a stakeholder panel on the topic was added to the agenda.

**Recommendations the Long-term Stewardship Implementation Plan**—As far back as 1998, the End Use Working Group, organized through ORSSAB, recommended that DOE develop a stewardship implementation plan for the Oak Ridge Reservation. In 2003, ORSSAB submitted a draft strategic plan for long-term

stewardship to DOE and in 2004 provided DOE with an annotated outline for a stewardship implementation plan that would carry out the strategic plan. Although work on the plan was begun right away, work was suspended when it was suggested by DOE that a stewardship directive, signed by the DOE Oak Ridge manager, was needed to execute the plan.

Work then began to draft a directive, with ORSSAB input. The process had to go through a number of DOE Oak Ridge offices, and about the time it was ready to be signed DOE Oak Ridge suspended the use of directives. In April 2009, the ORSSAB Stewardship Committee asked that work resume on the implementation plan. In November 2009, Bechtel Jacobs Company submitted a draft plan. The Stewardship Committee reviewed the plan and determined that it was ready for DOE to approve and employ.

During a period of more than 10 years, ORSSAB, through its Stewardship Committee, maintained continual pressure on DOE to follow through with its commitment to develop a stewardship implementation plan, which was finally delivered late in 2009.

**Recommendation on a Phased Approach for Addressing Off-Site Contamination in Melton Valley**— Since the late 1940s, radioactive and chemical waste from operations at ORNL and other sites had been disposed in waste repositories and in deep geologic strata in Melton Valley in the western part of the DOE Oak Ridge Reservation. Even though major steps have been taken to hold the waste in check, low levels of strontium and high pH readings have been observed in a line of

picket wells on the western boundary of Melton Valley. High pH levels have also been noted in wells on private property across the Clinch River from the DOE reservation. Some ORSSAB members who are experts in geology suspect the high pH levels can be traced to the alkaline condition of wastes that have been injected in deep geologic strata in a process known as hydrofracture. In fact, ORSSAB had previously addressed the issue with a recommendation that the FY 2011 budget include money to investigate the hydrofracture sites for possible contaminant migration.

DOE's response to the recommendation on the budget request, was that its priority was to determine if contamination was leaving the reservation and moving off-site. DOE is currently drilling monitoring wells on private property on the west side of the Clinch River. ORSSAB felt the response did not go far enough in determining the origin of contaminants. It then recommended a phased approach for addressing off-site contamination. The first step would be to develop a data set for groundwater chemistry. The second step would be an analysis to better understand groundwater transport systems in Melton Valley. The third step would be to determine the need for additional wells, how many might be needed, and how much it would cost. Only after the phases were concluded would there be discussion of additional monitoring wells.

ORSSAB's suggestion for a phased approach could result in a cost-savings for taxpayers if sampling and analyses indicate no need for additional monitoring or treatment wells.



*ORSSAB members*

# Public Involved in Various Decisions Affecting the Oak Ridge Reservation

Comments were solicited on a variety of significant Oak Ridge Reservation Office documents and plans in FY 2010 for CERCLA and non-CERCLA activities. Issues to which the public provided input include the following:

- Environmental Assessment for the U-233 Material Downblending and Disposition Project at ORNL
- Draft Sitewide Environmental Impact Statement for the Oak Ridge Y-12 National Security Complex
- Notice of Wetlands Involvement pertaining to a three-story parking structure and parking lot to be built in the east campus region of ORNL
- Environmental Assessment that evaluates the potential impact of transferring 1,600 acres of DOE property located at ETTP and surrounding area to private industry
- Hazardous waste permit modification that would increase permitted storage for ORNL Building 7860A and three TRU Processing Center units
- Engineering Evaluation/Cost Analysis for the reduction of hexavalent chromium releases into Mitchell Branch at ETTP
- Covenant Deferral Request to transfer Parcel 10 at ETTP to Heritage Center LLC
- Covenant Deferral Request to transfer Parcel 9 at ETTP to Heritage Center LLC
- Engineering Evaluation/Cost Analysis for the deactivation and demolition of buildings at the Y-12 Complex

To keep the public informed about comment periods and other matters related to cleanup activities on the Oak Ridge Reservation, DOE publishes a monthly newsletter called *Public Involvement News*. DOE also keeps the public informed by publishing notices in local newspapers and conducting public meetings.



# DOE Information Center

The DOE Information Center, located at 475 Oak Ridge Turnpike, Oak Ridge, Tenn., is a one-stop information facility that maintains a collection of more than 40,000 documents involving environmental activities in Oak Ridge.

The Center hosts various meetings, including the ORSSAB meetings, relevant to cleanup activities in Oak Ridge. Staff are available Monday through Friday, 8 a.m. to 5 p.m., to assist with your information needs. A web site is available for users to search for information at the Center. Go to [www.oakridge.doe.gov](http://www.oakridge.doe.gov) and click on "Public Activities." Select the "Online Catalog" to begin the search.



*DOE Information Center staff, from left: Eva Butler, Julia Beach, and Wanda Joyce*

**Phone: 865-241-4780**

**475 Oak Ridge Turnpike  
Oak Ridge, Tenn.**



## FY 2010 Stats

Average number of visitors per month	142
Number of public meetings held	127
Total citizen inquiries	2,098
Total number of documents at Center	45,234
Total number of documents on-line	12,268

**Visit the DOE Information Center on the  
Web at [www.oakridge.doe.gov/info\\_cntr](http://www.oakridge.doe.gov/info_cntr)**

# Information Resources

DOE Information Center  
475 Oak Ridge Turnpike  
Oak Ridge, Tennessee 37830  
Phone: (865) 241-4780  
Fax: (865) 574-3521  
E-mail: DOEIC@oro.doe.gov  
Hours 8 a.m. to 5 p.m., Monday – Friday

DOE Public Affairs Office  
(865) 576-0885

DOE-ORO Public Information Line  
1-800-382-6938

Oak Ridge Site Specific Advisory Board  
(865) 241-4583, (865) 241-4584  
1-800-382-6938

Tennessee Department of Environment  
and Conservation  
(865) 481-0995

U.S. Environmental Protection Agency  
Region IV  
1-800-241-1754

Agency for Toxic Substances and  
Disease Registry  
1-888-422-8737

## Internet Sites

DOE Main Web Site	<a href="http://www.energy.gov">www.energy.gov</a>
DOE-ORO Home Page	<a href="http://www.oakridge.doe.gov">www.oakridge.doe.gov</a>
DOE-ORO Environmental Management Program	<a href="http://www.oakridge.doe.gov/external">www.oakridge.doe.gov/external</a> (Click on “Programs,” then select “Environmental Management”)
Oak Ridge Site Specific Advisory Board	<a href="http://www.oakridge.doe.gov/em/ssab">www.oakridge.doe.gov/em/ssab</a>
Agency for Toxic Substances and Disease Registry	<a href="http://www.atsdr.cdc.gov">www.atsdr.cdc.gov</a>
U.S. Environmental Protection Agency	<a href="http://www.epa.gov/region4/">www.epa.gov/region4/</a>
Tennessee Department of Environment and Conservation	<a href="http://www.state.tn.us/environment/">www.state.tn.us/environment/</a>
DOE Information Center	<a href="http://www.oakridge.doe.gov/info_cntr">www.oakridge.doe.gov/info_cntr</a>
American Recovery and Reinvestment Act	<a href="http://www.recovery.gov">www.recovery.gov</a> <a href="http://www.energy.gov/recovery">www.energy.gov/recovery</a>

# Commonly Used Acronyms

ARRA	American Recovery and Reinvestment Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CH	Contact-handled
CROET	Community Reuse Organization of East Tennessee
DNAPLs	Dense, non-aqueous phase liquids
DOE	U.S. Department of Energy
EM	Environmental Management
EMWMF	Environmental Management Waste Management Facility
EPA	U.S. Environmental Protection Agency
ETTP	East Tennessee Technology Park
EU	Exposure unit
FY	Fiscal year
NNSA	National Nuclear Security Administration
ORNL	Oak Ridge National Laboratory
ORRL	Oak Ridge Reservation Landfills
ORSSAB	Oak Ridge Site Specific Advisory Board
PCB	Polychlorinated biphenyl
PCCR	Phased Construction Completion Report
RH	Remote-handled
ROD	Record of Decision
SWSA	Solid Waste Storage Area
TDEC	Tennessee Department of Environment and Conservation
TRU	Transuranic
TSCA	Toxic Substances Control Act
TWPC	Transuranic Waste Processing Center
UEFPC	Upper East Fork Poplar Creek
VOC	Volatile organic compound
WIPP	Waste Isolation Pilot Plant in New Mexico

**For more information, please contact the DOE Public Affairs Office  
at (865) 576-0885 or 1-800-382-6938.**

