



FY 2025 Cleanup Progress



Annual Report on Oak Ridge
Reservation Cleanup

Message from the Manager

DOE Oak Ridge Office of Environmental Management

To the Oak Ridge Regional Community:

The U.S. Department of Energy's (DOE) Oak Ridge Office of Environmental Management (OREM) and its contractors and partners maintained steady progress in Fiscal Year 2025 on projects that are transforming all three sites in Oak Ridge and creating a bevy of new economic opportunities for the region. We are proud to share the details of those efforts in this year's Cleanup Progress Report.

Our employees maximized tax dollars in Fiscal Year 2025 by pushing forward wide-ranging projects, including building deactivation, demolitions, waste processing and disposal, and reindustrialization. That work removed hazards, reduced inventories of nuclear material, and opened land for DOE missions and private sector developments.

Crews have approached the halfway mark on the Alpha-2 demolition project. Taking down the 2.5-acre former uranium enrichment facility is the largest teardown yet at the Y-12 National Security Complex (Y-12), and removing it will provide much needed space for new infrastructure to support modernization and national security missions.

Workers were also busy preparing for other Y-12 demolition projects. Crews are in the final stages of deactivating Beta-1 and the early stages of cleanup in the massive Alpha-4 building. Both are Manhattan Project-era uranium enrichment facilities with sprawling footprints at the site.

Demolition crews have also been busy at the Oak Ridge National Laboratory (ORNL). Crews took down Building 3003, a support structure for the Oak Ridge Graphite Reactor dating back to 1943. They also removed a portion of the final hot cell from the former Radioisotope Development Laboratory, which is one of the most contaminated structures at ORNL.

Other teams performed deactivation activities in 17 buildings at ORNL. That list includes decades-old former research reactors, isotope labs, and support facilities. This year's efforts are laying the groundwork for major near-term skyline changes in the heart of ORNL that you'll read about in our next edition.



Old buildings weren't the only things disappearing. OREM also continued reducing inventories of nuclear material and radiological waste from storage in Oak Ridge during Fiscal Year 2025.

We advanced the highest priority cleanup project at ORNL by processing and disposing of 77 canisters of uranium-233, surging past the annual goal of 50 canisters. That processing campaign is now approximately 40% complete. Employees also completed eight shipments of transuranic waste, totaling 232 drums, to the Waste Isolation Pilot Plant in New Mexico for permanent disposal.

OREM also achieved a breakthrough to eliminate a complex waste that's been stored at ORNL for the past 50 years. We completed two shipments of large aluminum and steel containers filled with highly reactive metals—called sodium shields. Through a successful technology demonstration, this material was converted into a stable glass for disposal. The success of this project provides a pathway to eliminate the remainder of that waste.

I'm incredibly proud of how our efforts have continued transitioning the East Tennessee Technology Park (ETTP) from a nuclear remediation site into a thriving industrial center that benefits the community. We transferred another 50 acres for economic development this year, bringing the total to more than 1,800 acres. Employees also made progress toward transferring other parcels that will make hundreds of additional acres of land available for reuse in the months ahead. This transferred land is now home to more than 25 businesses and counting. Together, these companies are making a projected capital investment of \$8 billion and expect to generate 2,500 private sector jobs.

Additionally, OREM and its regulators are setting an impressive standard nationally both for our coordination and results. We've signed four records of decisions over the past three years, including one this year that confirms all necessary soil cleanup is complete in the 1,400-acre area surrounding ETTP's main plant area. This process enables the reuse of land for continuing economic development.

Finally, our team fulfilled a long-standing commitment for historic preservation. Crews completed construction of the William J. Wilcox, Jr. K-25 Interpretive Center. The city now has a new attraction that provides a venue for visitors to visualize the size and scope of one of World War II's most historically significant sites.

Simply put, this level of success would not be possible without the support and involvement we enjoy from the Oak Ridge community. Thank you for your role in helping advance cleanup. We look forward to kicking off another productive year.

Erik Olds



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Introduction

In Fiscal Year 2025, cleanup progress continued across the Oak Ridge Reservation with a focus on removing unnecessary facilities at Oak Ridge National Laboratory and the Y-12 National Security Complex. The DOE Oak Ridge Office of Environmental Management also continued facilitating economic development and nuclear innovation thanks to the successful cleanup of the East Tennessee Technology Park, which has made large tracts of land available for reuse.

The Oak Ridge Reservation has played key roles in our nation's defense and energy research. However, past operations during the Manhattan Project and Cold War-era created legacies that require environmental cleanup and placed areas of the reservation on the U.S. Environmental Protection Agency's (EPA) National Priorities List, which includes sites nationwide that require cleanup under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). These areas on the Oak Ridge Reservation have been defined, and OREM is working to clean and restore them under a partnership with the EPA and the Tennessee Department of Environment and Conservation (TDEC).

Together, through the support provided by contractors, labor, Congress, and state and local officials, OREM is enhancing safety, removing barriers to economic development, and enabling vital missions in science, energy, and national security.





Oak Ridge National Laboratory

The Oak Ridge National Laboratory is DOE's largest multi-program national laboratory that conducts cutting-edge research in energy, materials and chemical sciences, nuclear science, and supercomputing. The site also houses numerous old, contaminated buildings and forms of waste from previous research and operations in past decades.

Workers demolish Graphite Reactor support facility

OREM and cleanup contractor UCOR have safely completed demolition of an unneeded ORNL facility—Building 3003, a support structure for the historic Oak Ridge Graphite Reactor.

Demolishing Building 3003 frees up more than 10,000 square feet of additional property that will be essential for upcoming demolition projects as well as modernizing ORNL's central campus.

Building 3003 was built in 1943 as a fan house supporting the Graphite Reactor—now part of the Manhattan Project National Historical Park—and was later modified and repurposed as a research facility.

Constructed in only nine months in 1943, the Oak Ridge Graphite Reactor was the second reactor in the world to achieve criticality and the first reactor designed for continuous use. It supported nuclear energy and medical research missions for 20 years before being shut down in 1963. It was designated a national historic landmark in 1965.

Located on a small footprint in a heavily congested area on top of a hill, Building 3003 provided many challenges during demolition. To overcome spatial constraints, OREM and UCOR developed a plan to use the footprint of the recently demolished Low Intensity Test Reactor for demolition support activities. Workers

built a ramp between the two sites for debris transfer, and two additional pieces of demolition equipment were used for downsizing and loadout operations to avoid further congesting the 3003 footprint. The team members safely transported over 80 debris shipments to an onsite disposal facility.

Planning and preparation are ongoing for the demolition of the remaining Oak Ridge Graphite Reactor support facility structures, including the Building 3002 filter house and 3018 stack.



Above, demolition begins on Building 3003. Below, an aerial view of the facility during demolition.



Portion of final 3026 hot cell demolished

Workers have demolished the B sub-cell portion of the final hot cell at the former Radioisotope Development Laboratory (Building 3026). This project is removing one of the most contaminated structures from ORNL's central campus. The hot cells inside the former facility were heavily shielded concrete rooms that provided researchers protection from highly radioactive material. The lab's outer structure and five hot cells were previously demolished.

Crews are transporting waste on the intermodal rail system that was installed several years ago to manage the waste loadout from demolition of these cells. The team has shipped 38 cubic yards of waste weighing 112,000 pounds. They have also been training on remote-operated equipment to use during deactivation due to high radioactivity in sub cell A. Crews are scheduled to finish the final aboveground demolition in 2026.



Workers demolish a portion of the final hot cell that was part of the former Radioisotope Development Laboratory

3038 and Isotope Row being prepped for demolition

OREM and UCOR are making significant progress characterizing and deactivating numerous facilities at ORNL that are planned for demolition. These include the site's Isotope Development Lab, Building 3038, and a group of radioisotope processing facilities called Isotope Row.

At Building 3038, workers achieved a major milestone as five hot cells located in the facility were separated and three of them removed. Workers are now in the process of removing the other cells and planning the last major deactivation activity for this building. Leading up to cell removal, teams applied a foaming agent that immobilized contamination while cutting the pass-through chamber that connected the hot cells together. Stringent safety controls are necessary

because of the hazardous materials contained in Building 3038. Constructed in 1949, this analytical and packing building contained equipment that was utilized for processing, conversion, and dispensing of radioactive isotopes. Past uses include the study of transuranic elements, fabrication of alpha- and neutron-emitting targets and sources, shipment of radioisotopes, and production of yttrium (90Y) for medical uses.

Adjacent to Building 3038, a group of 11 facilities known as Isotope Row are in various phases of demolition preparation, and those teardowns are scheduled to begin next year. These facilities were constructed in the 1950s and 60s to process radioisotopes. UCOR crews working in these facilities



Workers remove a hot cell from Building 3038

are also challenged with highly contaminated process systems and months of relentless heat in high hazard environments.

Most buildings are in various stages of decontamination activities, pipe and duct removal, and radiological surveys.

Examples of work in progress include Building 3029, where workers are preparing to remove highly irradiated sources from Hot Cell 2 that cannot be extracted by hand. The plan is to use a remotely operated robotic system to keep the workers safe and reduce exposure.

In Buildings 3030 and 3031, final deactivation activities include removing and disposing of one hot cell from each building.

Many of the buildings require central ventilation

system duct removal to be completed before they are demolition ready. The duct runs the length of Isotope Row outside the building and will be a major focus in the next year. Clearing away these facilities in the years ahead removes hazards, enhances safety, and opens space to expand ORNL's research missions.



Waste being removed from an Isotope Row building



After testing, MSRE CPS system ready to go online

A new continuous purge system (CPS) at the Molten Salt Reactor Experiment (MSRE) facility is almost ready to begin operations after workers completed readiness and reliability testing throughout FY 2025.

MSRE was a test reactor that operated at ORNL from June 1965 until December 1969. The reactor salt and flush salt retain economic value. They remain stored in the fuel and flush drain tanks for future use either by ORNL or by other industrial entities. An off-gassing system is required to keep this critical

storage unit safe until the salts are removed and the facility is demolished. The current Reactive Gas Removal System is nearing the end of its design life, necessitating the need for the new purge system.

Crews completed project installation work in mid-2024. After the testing this fiscal year, the CPS is anticipated to go online in 2026. The previous system is planned to remain in place and in ready status until workers firmly establish CPS operational reliability. The CPS will support many years of safe material storage at the MSRE.

New approach to address release potential

To address any key health or environmental risks more quickly, OREM is preparing an Engineering Evaluation/Cost Analysis to assess and address the potential for future releases of contaminants at MSRE. This replaces the Remedial Investigation Report approach that was planned previously. It will

use the same nondestructive assay measurements and modeling methodology and results documented for remediation investigation, and it makes the best use of federal funds. The new approach also allows for a quicker response through the CERCLA removal action process.

OREM exceeds U-233 processing goals

OREM and its contractor, Isotek Systems LLC, made tremendous progress processing uranium-233 (U-233) at ORNL, exceeding goals set for the fiscal year.

An Environmental Management priority was to process 50 canisters of U-233 during the fiscal year. The Isotek team soared past that goal by processing 77 canisters, advancing the highest priority cleanup project at the site.

After completing facility upgrades and in-depth safety planning in 2022, OREM and Isotek began conducting significant processing operations on the remaining inventory of U-233 stored at ORNL. OREM and Isotek are tasked with eliminating the U-233 inventory stored at ORNL because it presents risks and is costly to keep safe and secure.

U-233 is a manufactured isotope created as an alternative nuclear fuel source in the 1950s, but it proved to be nonviable. The nation's inventory of U-233 was later sent to ORNL for long-term storage.

OREM finished disposing of approximately half of the U-233 inventory in 2017. The remaining material requires processing and downblending to convert it

into a form safe for shipment and disposal. Conducting those operations involves the use of heavily shielded rooms, known as hot cells, to keep employees safe as they process the high-dose material. With the hot cell upgrades complete, employees have processed approximately 40 percent of the remaining inventory of U-233 and shipped 490,000 pounds of waste since the processing campaign began.

The current phase of the project, using hot cells, has enabled Isotek to enhance productivity by processing larger amounts of U-233. It also allows employees to extract more medical isotopes than the previous phase, which used gloveboxes.

Isotek extracts thorium-229 from the U-233 and supplies it to TerraPower, which then uses the material to create the actinium-225 needed for next-generation cancer treatment research. TerraPower, through a collaboration agreement with Cardinal Health, produces and distributes actinium-225. This public-private partnership could produce up to half a million doses of next-generation cancer treatments annually, 100 times more than currently available worldwide.



Workers load processed and downblended U-233 into a shipping cask for shipping and disposal.



Y-12 National Security Complex

The Y-12 National Security Complex is a premier manufacturing facility dedicated to protecting our nation. Y-12 helps ensure a safe and reliable nuclear weapons deterrent. The site also retrieves and stores nuclear materials from around the world, fuels the nation's naval reactors, and performs highly skilled, specialized manufacturing for government agencies and private-sector entities.

Demolition reaches halfway point at Alpha-2

Crews finished demolishing nearly half of the Alpha-2 building by the end of FY 2025. Demolition of this Manhattan Project-era uranium enrichment complex started in 2024, and workers steadily brought down more than 150,000 square feet of the facility. This project marks the largest demolition activity ever at Y-12.

The Alpha-2 facility occupies nearly 2.5 acres of land, and it is one of the largest high-risk facilities at Y-12. More than 60 percent of the facilities throughout the National Nuclear Security Administration (NNSA) complex are over 40 years old. Projects like this are clearing away outdated, contaminated infrastructure and opening space for modernization efforts. Workers

began deactivating the Alpha-2 complex in 2020. That work included removing the last of the hazardous waste and draining oil from equipment. Crews had to clear various areas of the basement to allow it to be filled with controlled low-strength material (a concrete mixture). The material provides structural support for heavy equipment that is on the slab during demolition. Workers also had to plug storm drainage areas around Alpha-2 as one of the last preparatory steps to demolition.

While deactivation was going on inside Alpha-2, a separate project was underway on the outside to reroute active utilities around the building, including steam, gas, and water lines.



Demolition underway at the Alpha-2 Building



Deactivation progressing on former enrichment facilities

OREM and UCOR made considerable progress deactivating Alpha-4 and Beta-1 in preparation for future demolition. DOE also began initial planning for the upcoming deactivation and demolition of Beta-4, another enrichment facility. To address some of these mercury-contaminated facilities, UCOR developed a first-of-its-kind mercury worker safety program.

Beta-1: Beta-1 (Building 9204-1) is a two-story building spanning approximately 210,500 square feet. Beta-1 deactivation activities were focused in the basement of the building. Crews treated and discharged more than 9 million gallons of water from the basement using a special water treatment skid system that successfully achieves water quality standards needed for discharge. A second unit was built this year to accommodate the groundwater that

continued to intrude into the basement. Keeping the water levels low meant that the team could perform characterization sample collection, clean 820 feet of mercury-contaminated pipe, and complete foaming of 2,028 feet of thorium-contaminated lines. As workers completed deactivation in areas of the basement, they placed controlled low-strength material (a concrete mixture) to support the future heavy equipment needed for demolition. Workers drilled over 500 holes in the first floor to pour the material.

Alpha-4: During 2025, workers continued preparing Alpha-4 (Building 9201-4), a 561,000-square-foot, four-story facility, for deactivation. Alpha-4 is one of Y-12's largest high-risk facilities, with elemental mercury contaminating much of the structure. Like Alpha-2 and Beta-1, Alpha-4 was used to enrich



Workers perform deactivation activities in Beta-1



Air flow testing being conducted in Alpha-4

uranium. As part of preparing for building deactivation, workers have continued to sort and sample materials and characterize legacy waste containers. They have prepared 394 out of the 447 legacy waste boxes and drums for disposal. Workers also conducted infrastructure activities to support future work.

Beta-4: OREM has started initial planning to deactivate the three-story, 300,000-square-foot Beta-4 building. Crews have conducted pre-mobilization activities such as soil sampling, installing worker facilities (showers, restrooms, etc.), and planning to bring the building to a cold-and-dark status (disconnection of all utilities).

Declassification effort saves millions of dollars

As workers prepare to tear down the Alpha-4 building, they must process and disposition thousands of pieces of classified equipment and systems—a costly process. However, OREM and UCOR have identified a more cost-effective way to address this important step in preparing the building for demolition.

Approximately 3,000 items in the 561,000-square-foot building, originally used for uranium separation operations, were identified as being classified. Removing them, which requires special handling and disposition, would have taken 4.5 years at a cost of \$66 million.

Officials identified an opportunity to reduce the scope of removing these classified pieces

of equipment, saving both money and time. By declassifying equipment and systems when possible, the number of items requiring classified disposal was reduced from 3,000 items to only 300. As a result, the schedule was decreased by 1.5 years, saving \$16 million in cost.



Alpha-4

Old Steam Plant: Crews removed the exterior asbestos of the Old Steam Plant (Building 9401-01), a smaller single-story building. The interior deactivation activities were completed in 2021.

Built in 1943, this building first served as a steam plant for the east end of Y-12 and was later used for fuel testing, storage, and recycling. The demolition of this building is planned for 2026.

Significant concrete, structural steel installed at Mercury Treatment Facility



Construction of the Mercury Treatment Facility

Because many of the Y-12 buildings to be demolished have mercury contamination, OREM and UCOR are building infrastructure that will help prevent mercury migration during those cleanup projects. This facility is designed to prevent mercury releases into the Upper East Fork Poplar Creek during demolition of Y-12's large mercury contaminated facilities including Alpha-4, Alpha-5, and Beta-4.

Workers completed significant concrete activities at the headworks facility in FY 2025, including the storm flow structures, which allowed them to backfill to a 930-foot elevation to reduce water management risks. Workers also completed major structural steel activities to enclose the treatment facility.

Scrapyard cleanup will enable land reuse



Workers perform sampling activities at White Wing Scrap Yard

Activities at White Wing Scrap Yard (WWSY) have shifted from a sitewide remedial investigation for early remedial action to characterization for a time-critical removal action.

The change in approach is to ensure that the adjacent Self Sufficiency Parcel 2 (SSP-2), slated for land transfer, has not been compromised by historical activities at WWSY. Characterization activities have included:

- visual and radiological surveys of approximately 100 acres
- two rounds (dry/wet season) of groundwater sampling across the WWSY area
- two rounds (dry/wet season) of surface water sampling
- one round of sediment sampling in the tributaries that collect runoff from WWSY
- excavation of test pits at historical geophysical anomaly locations and potential drum burial areas



- collection of numerous soil samples across the WWSY area

Before completing the above activities, workers cleared small brush across approximately 45 acres to allow characterization teams access to areas that had been previously inaccessible due to unmanaged vegetation growth over the past 30+ years. The clearing also helped the teams identify safety hazards that had previously been hidden by the overgrowth.

The project management team is in the process of developing the Time-Critical Action Memorandum that will outline the cleanup of soils in areas closest to the SSP-2 parcel, which is planned for the spring of 2026. The team is also developing a Waste Handling Plan that will help determine the final disposition pathway for CERCLA waste across the entire WWSY area.



Water sampling at White Wing Scrapyard



East Tennessee Technology Park

The former Oak Ridge Gaseous Diffusion Plant 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 was shut down permanently in 1987. All building demolition was completed in 2020 and soil remediation was completed in 2024, facilitating the site's transformation into a multi-use industrial park.

Final ETPP Zone 2 fieldwork initiated

ETPP is divided into two cleanup regions: Zone 1, a 1,400-acre area outside the main plant, and Zone 2, an 800-acre area that comprises the main plant area. UCOR completed major soil remediation at ETPP last year. The last remaining field activities under the ETPP Zone 2 Record of Decision began in FY 2025, with the completion of work for the electrical duct banks. The duct banks contained cables that once supplied power to K-25 and nearby facilities from the K-704 switch house. Vaults with manhole access were constructed along each duct to access the electrical cables, with most of the cables removed from the vaults in the late 1970s.

The work included assessing 95 manholes, sampling of water in 60 manholes and sediment in 24 manholes, and completing four Data Quality Assessment presentations that were based on data obtained in each quadrant of the duct banks to enable faster

approvals in areas where redevelopment work was planned. Workers dewatered and grouted 27 manholes in the two eastern quadrants, completing all activities in that area. Dewatering and grouting of the manholes in the two western quadrants and additional characterization at one of the western manholes are expected to be complete in FY 2026. The completion of this work will eliminate any remaining hazards that these manholes may pose for future redevelopment.

Officials signed the Zone 1 Final Soils ROD in FY 2025, and the remedial action report for Zone 1 soils is currently in preparation. For Zone 2, the completion reports for EU Z2-11, -16, -30, -35, and -39 were transmitted to EPA and TDEC, with the completion report for EU Z2-20, -21, 22 in preparation. OREM anticipates the future completion report for the Zone 2 duct banks to be the last item before starting the remedial action report.



Evaluating remaining media at ETPP

OREM and UCOR are evaluating other remaining media (surface water and sediment) across Zones 1 and 2 to determine if further action is needed. Onsite ponds and streams associated with site activities are being characterized. Sites being

evaluated include the K-1007-P ponds (along Highway 58), K-901 Pond, K-720 Slough, K-770 Embayment, Oxbow Lake, the K-720 Beaver Ponds, (near the Powerhouse Greenway Trail), and Mitchell Branch.

Groundwater remediation preparation underway

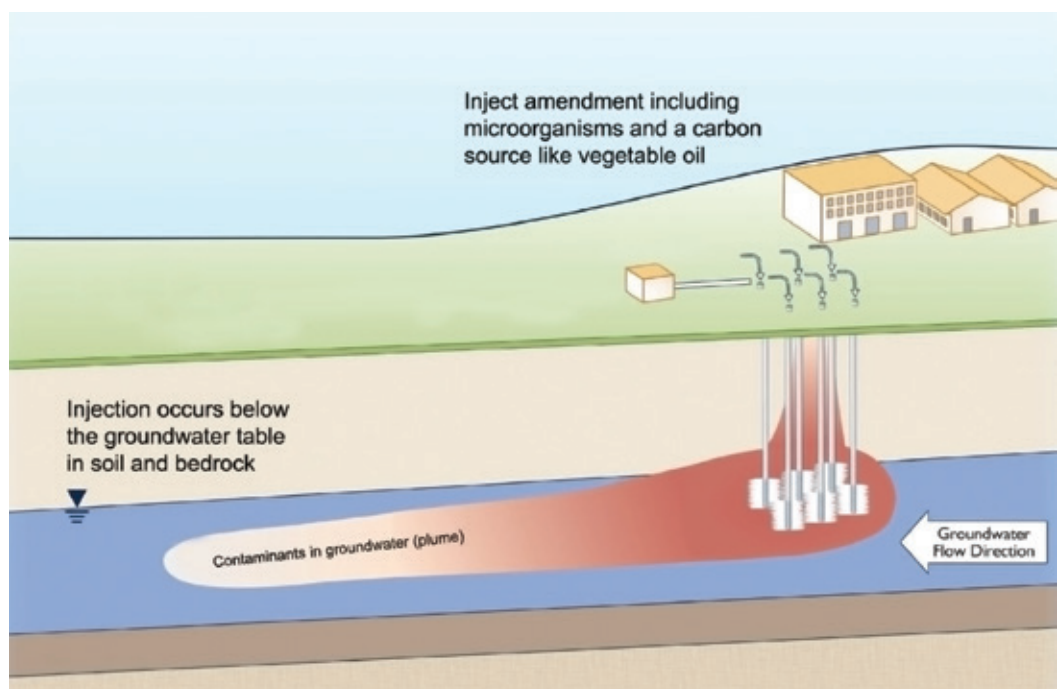
Following the decades-long cleanup of contaminated buildings, infrastructure, and soil at ETPP, OREM and UCOR are focused on groundwater remediation, which is the final phase of cleanup at the site. Officials continued preparing the planning to support the two ETPP groundwater Records of Decision (ROD)—the Main Plant Area Interim Record of Decision (IROD) and K-31/K-33 Area ROD—through FY 2025.

The selected remedy for K-31/K-33 area is called monitored natural attenuation. Through that approach, constituent concentrations in groundwater will decline naturally to levels that do not pose risks to human health or the environment. Land use controls restricting the use of groundwater also continue to be implemented at the site.

Active treatment at six groundwater plumes through enhanced in situ bioremediation is the selected remedy under the Main Plant Area IROD. This remedy modifies and augments environmental conditions to encourage the growth of microorganisms capable of reducing organic contaminants in the subsurface. This interim response action aligns with the overall groundwater

remediation strategy for the Main Plant Area through reduction in groundwater contaminant mass, while providing additional characterization data for the Main Plant Area final ROD. ETPP is the first site on the ORR to implement full-scale groundwater remediation under an IROD. During these remediation efforts, land use controls across ETPP are in place to protect the public by prohibiting use of groundwater.

These significant regulatory achievements are a result of a commitment to partnership and collaboration and demonstrate the effectiveness of the recently revised regulatory framework among OREM, EPA, and TDEC.



Enhanced in situ bioremediation

K-25 Interpretive Center opens

The William J. Wilcox, Jr. K-25 Interpretive Center opened to the public in August 2025. Visitors to the former Oak Ridge Gaseous Diffusion Plant can now view the footprint of what was once the world's largest building from an elevated viewing platform inside the facility. It overlooks the footprint of the historic former mile-long K-25 Building.

K-25 was a gaseous diffusion uranium enrichment process building constructed in Oak Ridge during the Manhattan Project in 1943. It produced enriched uranium that contributed to the weaponry that helped end World War II.

The center is named after Oak Ridge's first official historian, an original resident of the Secret City when it came into existence in the 1940s. The late Wilcox ultimately became the technical director for all research and development programs for the plant. He used his extensive knowledge from his 43 years of service to educate future generations about what was accomplished at the site.

OREM engaged the U.S. Army Corps of Engineers to manage construction of the interpretive center through an interagency agreement. The Corps employed construction contractor Geiger Brothers to build it. UCOR and subcontractor Smee + Busby Architects designed the facility and provided engineering support during construction.

In addition to the expansive view of the former K-25 Building footprint, visitors can immerse themselves in exhibits that include a scale model of the K-25 Building as it appeared in 1945, digital photographs and animated videos of the K-25 Building and site, and graphic panels that inform visitors of the importance of this historic structure. Exhibit design was performed by Hilferty and Associates, and Capitol Museum Services fabricated and installed the exhibits under subcontract to UCOR.

In FY 2026, OREM plans to install visual indicators at each corner of the building footprint to illustrate the original dimensions and height of the structure.



Visitors can view a scaled version of the K-25 Building

K-25
Interpretive
Center
ribbon-cutting
ceremony





ETTP becoming hub for nuclear innovation

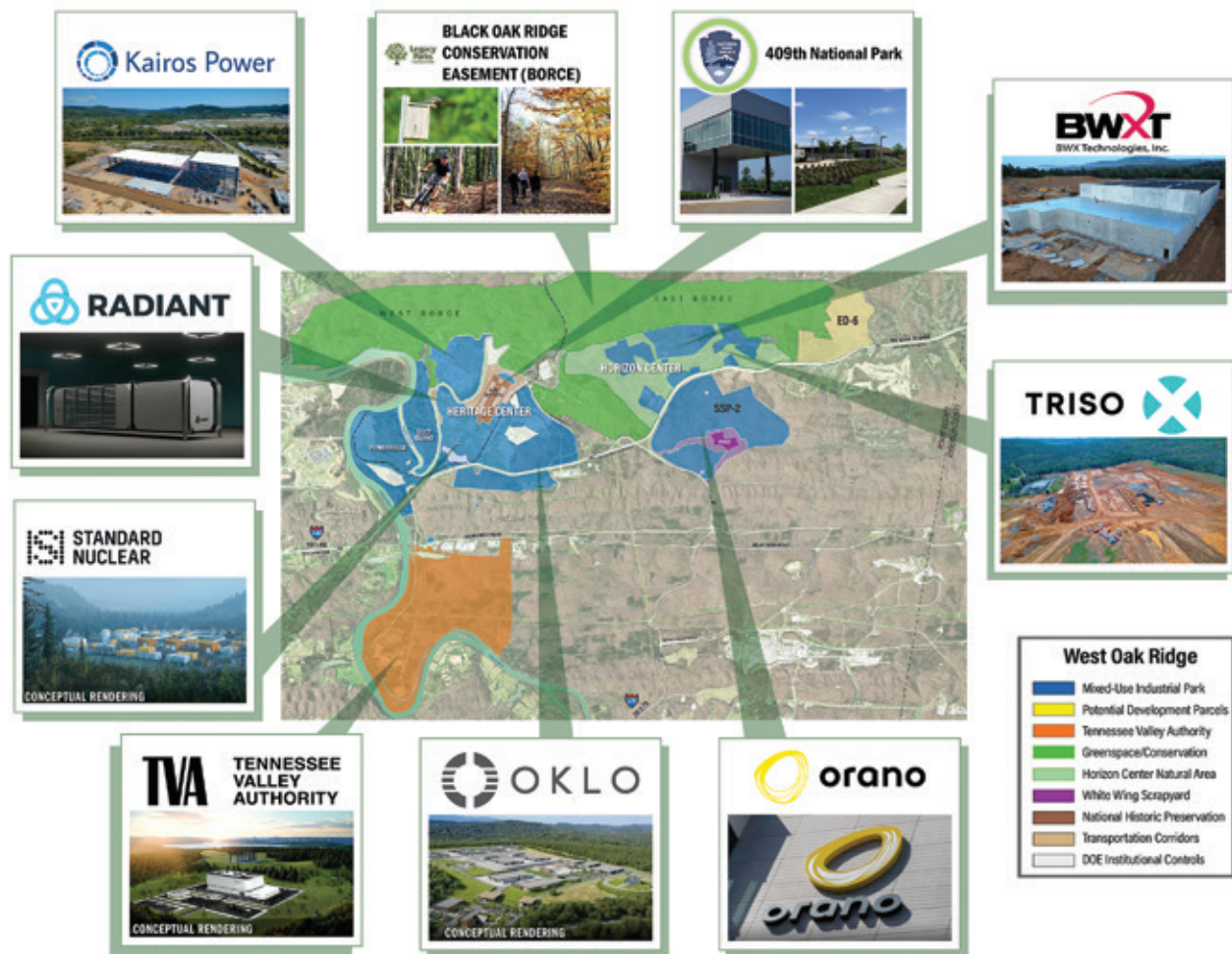
The OREM Reindustrialization Program's vision for ETTP, following extensive environmental cleanup of the site, has led to the transformation of the former government uranium enrichment complex into a mixed-reuse industrial park. The transformation of the site has attracted several companies that are making significant investments in nuclear technology.

In 2025, OREM completed the transfer of the former K-27 and K-29 sites at ETTP to the Industrial Development Board of Oak Ridge. The 32.5-acre parcel is the site of the former K-27 and K-29 process buildings, two of the five main gaseous diffusion facilities that produced enriched uranium for decades. This transfer brings the total land transferred for economic reuse and development to 1,832 acres. This acreage is providing flat land near robust utilities and infrastructure to attract new industry to the site.

Due to the success of cleanup, reindustrialization, local workforce development, and the economic

development efforts behind the state's Nuclear Energy Fund, several new nuclear companies announced commitments to invest and build facilities on transferred land. Nano Nuclear, partnered with Laser Isotope Separation Technologies, established their Nuclear Technology Headquarters and announced a contract within DOE's Low-Enriched Uranium Enrichment Acquisition Program to advance the nuclear fuel pipeline. Oklo announced bringing the country's first commercial nuclear fuel recycling plant to Oak Ridge, with a \$1.7 billion investment that is expected to generate 800 new jobs. Radiant Industries announced a \$280 million investment with 175 new jobs in manufacturing portable microreactors.

The emerging hub for nuclear innovation and production, especially at ETTP, is also an acknowledgement of the successful environmental cleanup of the site.



Development at ETTP and on the Oak Ridge Reservation



Waste Management and Operations

Wastes generated from cleanup activities on the Oak Ridge Reservation are addressed in a variety of ways. Most of the volume is disposed onsite in the Environmental Management Waste Management Facility or the Oak Ridge Reservation Landfills. However, the highly contaminated material is shipped offsite. Wastewater is treated at various facilities on the Oak Ridge Reservation.

Onsite facilities handling most cleanup wastes

Most of the waste generated during FY 2025 cleanup activities in Oak Ridge went to disposal facilities on the Oak Ridge Reservation—namely, the Environmental Management Waste Management Facility (EMWMF) and the Oak Ridge Reservation Landfills (ORRL). These disposal facilities are vital to cleanup progress and success, enabling OREM to accomplish more cleanup by avoiding costly and unnecessary offsite waste shipments.

EMWMF receives low-level radioactive and hazardous soil and building debris for disposal that meets specific criteria. In FY 2025, EMWMF received 2,076 waste shipments from cleanup projects at ORNL and Y-12 and 26 clean fill shipments for maintenance of the enhanced operational cover and construction of access roads and dump ramps within the landfill. The EMWMF landfill has a design capacity of 2.331 million cubic yards and has reached 85.7 percent of its capacity.

EMWMF generated 12.15 million gallons of landfill wastewater in FY 2025. Approximately 4.15 million gallons of leachate (water that enters the leachate collection system) was transported by tanker to the ORNL Liquid and Gaseous Waste Operations for treatment and discharge. Workers treated approximately 8 million gallons of contact water (water that contacts waste but does not enter the leachate collection system) and released it to Bear Creek after laboratory analysis verified it met all regulatory limits and discharge standards.

Other notable accomplishments at EMWMF for FY 2025 include:

- Began receiving waste from Y-12 Alpha-2 and the ORNL Building 3026 Hot Cell B.
- Continued to maximize use of available landfill airspace. Removed the temporary synthetic rain cover from portions of the northern sides of Cells 1-3, placed additional waste in the area, verified the grade, and covered the debris with waste clay and a membrane to minimize infiltration.
- Continued construction of a new dump ramp atop Cell 5.

- Upgraded onsite offices. Demolished the 5-plex Building 1316-B. Set up new office trailers in the East Complex and moved personnel from 9983-GV to the new complex.
- Continued upgrading the landfill water management systems. Replaced the heat trace/insulation and various controls/gauges at the Leachate Tank Farm. Began refurbishing the contact water conditioning system.
- Installed two additional groundwater monitoring wells west of the EMWMF landfill, culminating years of coordination with EPA and TDEC.

ORRL accepts sanitary and industrial waste and construction/demolition debris. In FY 2025, these three active landfills received 9,034 waste shipments, totaling 128,560 cubic yards of waste.

In FY 2025, ORRL compliantly discharged 4.9 million gallons of leachate from the three active landfills to the Y-12 sanitary sewer system.

The spoil area expansion (sedimentation pond area) was completed in FY 2025. Environmental studies are being conducted on the acreage reserved for the future expansion of the spoils area. Workers completed seep mitigations for Sanitary Landfill II (a closed landfill) in FY 2025.

In FY 2025, ORRL continued improvements for sediment and erosion controls. These measures included upgrading drainage features, which significantly reduces the amount of sediment released from these landfills. TDEC inspections in FY 2025 noted excellent sediment and erosion controls with no areas of concern or violations.

In addition, the Environmental Management Disposal Facility (EMDF) and Landfill Operations projects worked together to find beneficial use for the excess EMDF spoils that generated savings for other projects. Excess mulch and soil from EMDF were used at another landfill site. Workers placed nearly 600 cubic yards of mulch around the site for erosion and sediment control and then placed about 40,000 cubic yards of soil as a maintenance action to recontour the area, improving drainage.



EMWMF

Groundwater monitoring underway at EMDF site

The Environmental Management Disposal Facility (EMDF) is needed for waste generated from ORNL and Y-12 cleanup as EMWMF is nearing capacity. Construction activities continued in FY 2025 and design efforts are underway.

Workers began fieldwork for the Groundwater Field Demonstration in February 2024 and completed construction of the cover system in November 2024. They completed additional utility extension construction in April 2025.

The cover system replicates conditions following construction of the landfill liner system. Groundwater elevations are being monitored for two wet seasons following installation of the cover to ensure the liner system will be above the groundwater elevation in this area. The first wet season monitoring was completed in early 2025, and a Technical Memorandum was prepared to document the results. The second wet season will end on April 30, 2026. The landfill final cell design will be based on the information from the wet season monitoring.

Teams are also advancing the design of the Landfill Water Treatment System for the future EMDF. A treatment optimization study began in February 2025

and will be completed in FY 2026. This information will inform the specifics of the water treatment system.

OREM continues to work with EPA and TDEC on regulatory documents for the EMDF landfill. OREM prepared and submitted the Waste Acceptance Criteria Compliance Plan to EPA and TDEC for review in FY 2025 and expects it to be approved in FY 2026.



Workers perform groundwater monitoring at EMDF



Advanced technologies assisting in remediation

OREM is performing technology development to support mercury and other types of cleanup on the Oak Ridge Reservation. To support this objective, employees achieved significant goals in 2025.

Workers completed full scale treatability tests where FerroBlack® was sprayed on the walls, floors, and equipment to reduce mercury vapor in two locations in Alpha-4. Use of FerroBlack® has the potential to significantly reduce mercury vapor generation because it is an active chemical capture process rather than a simple encapsulant.

The results indicated that room mercury vapor concentrations decreased significantly immediately after application and stayed considerably lower. OREM and UCOR started studies to understand the disposal requirements of material that has been sprayed with FerroBlack®. This aspect of the study will be completed in FY 2026.

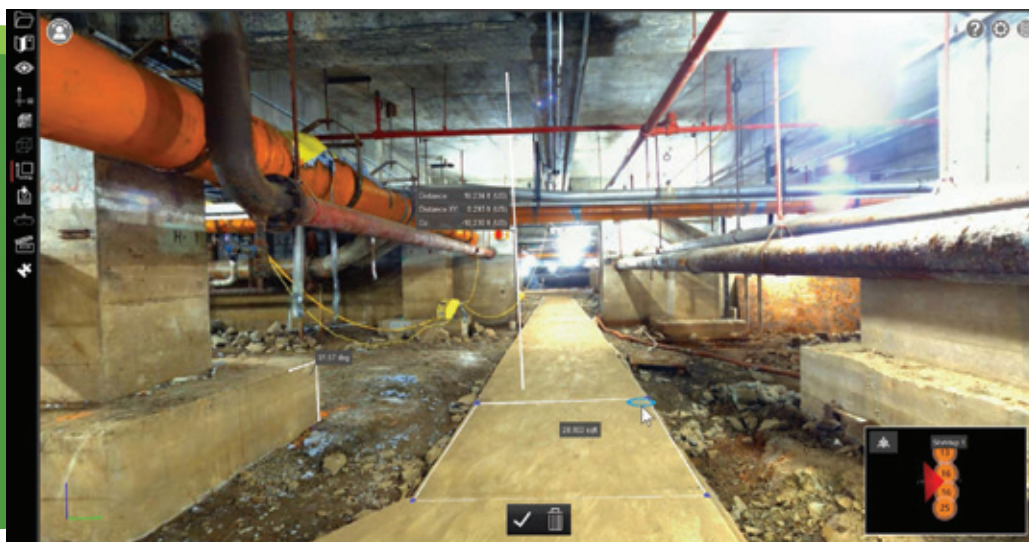
The ORNL Aquatic Ecology Laboratory completed a lab analysis study on FerroBlack® and other potential vapor reducing products. Based on the results, workers conducted a bench scale test with the FerroBlack® product placed in two small waste disposal boxes with mercury-contaminated equipment. The results showed a reduction in mercury vapor levels. The team

implemented a full-scale test of a mercury vapor filtration system in Alpha-4. Workers set up a portable air filtration system in a contaminated portion of the building and tested three different filtration media. The filtration material reduced the effluent concentrations by 65 to 97 percent. The addition of a filtration system to a ventilation system will result in notable reductions in mercury concentrations, allowing for a safer work environment in mercury-contaminated facilities.

The team purchased a Trimble X9 LiDAR system and trained individuals in its use. Workers used the 3-D laser scanner in ORNL and Y-12 facilities to remotely map the locations of various piping and equipment components. These tests were used to collect location survey data and to train users on post-processing and data management. This technology will be helpful in assessing and documenting what components exist in a new facility and what components are left behind once deactivation is complete.

Also at ORNL's Aquatic Ecology Laboratory, workers conducted laboratory experiments using brominated activated carbon to test its mercury sorption properties. The results showed that the material worked faster and sorbed more mercury than other sorbents that were tested, proving it could be a key tool in mercury remediation efforts.

The LiDAR technology allows measurements to be taken remotely inside buildings



TWPC processing, shipping wastes off Reservation

The Transuranic Waste Processing Center (TWPC) successfully completed eight shipments, totaling 232 drums, of legacy transuranic waste to the Waste Isolation Pilot Plant (WIPP) in New Mexico. Including these shipments, TWPC has shipped more than 7,200 containers to WIPP. That figure represents 94% of Oak Ridge's inventory of the lower-contaminated contact-handled transuranic waste and 80% of higher-contaminated remote-handled waste. TWPC officials also concluded a federal readiness assessment of controls needed to support oxide processing at the facility.

A DOE team issued its final report in August 2025 based on a 10-day review of the facility's preparations, training, systems, processes, and overall readiness to conduct oxide processing activities. DOE authorized start-up, enabling TWPC to begin processing non-reactive oxides.

Workers will repackage legacy oxides from ORNL into a vented overpack before being packaged into a container for shipment to WIPP. TWPC has been working on implementing controls to support oxide processing since 2018.

TWPC also successfully completed processing of the first 7 cubic meters of cellulosic waste ahead of schedule, meeting an incremental milestone established by DOE. The 7 cubic meters represent about one-third of the total volume of cellulosic waste contained in more than 100 drums stored at TWPC.

This work followed the first approval in the DOE complex by the Carlsbad Field Office for a new waste treatment process for non-compliant cellulosic waste such as cotton rags, paper towels, cheese cloth, and absorbent pads that potentially contain oxidizing chemicals. After sorting cellulosic wastes from compliant waste, the team encapsulates the cellulosic material in grout and repackages the waste into a compliant container for characterization, certification, and shipment to WIPP.

TWPC also shipped its first 10-drum overpack, further streamlining the transfer of transuranic waste containers to WIPP. The overpack is designed to hold up to 10 standard 55-gallon drums and can also be used for larger items that don't fit into standard drums. It provides an additional layer of protection and containment for smaller containers during storage

or transportation. The 10-drum overpack differs from the usual method of loading, which involves shrink-wrapping together seven 55-gallon drums of waste and then loading them into a container.

During FY 2025, TWPC successfully completed the processing and shipment of a specialized radioactive source to an out-of-state facility for permanent disposal. The shipment consisted of approximately 10 curies of Radium-226 Boron in a solid sealed source that had been used in neutron bombardment experiments at ORNL in the 1970s.

In another key development, an enhanced imaging capability developed by UT-Battelle is helping TWPC better understand the contents of waste containers and improve planning for their processing. The technology currently being used did not allow technicians to see past lead shielding in the containers, limiting their ability to accurately characterize the contents. The advanced UT-Battelle technology, with a much higher energy level, permits analysts to see past the lead shielding, revealing more of the container's actual contents.



A worker prepares to process legacy oxides



Workers take samples across the reservation to determine the nature and extent of contamination

Thousands of samples help guide remediation

In FY 2025, workers collected 22,142 groundwater, surface water, soil, sediment, biota, and miscellaneous solid and aqueous samples. They analyzed them to:

- identify areas of contamination,
- determine the nature and extent of contamination,
- determine when remedial actions are complete,
- provide information for the disposal of remediation waste, and
- assist in evaluating the long-term effectiveness of remediation.

This characterization supported activities including but not limited to:

- environmental characterization associated with remedial actions
- environmental compliance monitoring
- waste compliance and disposition sampling
- water treatment system performance and compliance sampling
- remedial investigation sampling associated with ETP Zone 1 Groundwater, the ETP Main Plant Area Remedial Investigation Work Plan, Bear Creek Valley Additional Mercury Sources, and the Y-12 Bear Creek Burial Grounds

- monitoring of active operations in support of the EMWMF and Oak Ridge Reservation Landfills and ORNL Liquid and Gaseous Waste Operations
- long-term performance and trend monitoring of completed actions for future decisions

This level of effort touches all aspects of the 32,000-acre Oak Ridge Reservation.

The Sample Management Office managed almost 36,000 samples (a combination of environmental, deactivation and demolition characterization, waste, bioassay, and industrial hygiene) by utilizing 14 analytical laboratory facilities for which data verification was completed at 100%. Workers performed nearly 4,500 validations of raw data packages and supported 19 audits/assessments of commercial analytical laboratories and treatment storage and disposal facilities. In addition, the Sample Management Office managed and uploaded 397,996 records to the Oak Ridge Environmental Information System. It also completed design, development, and implementation of a replacement database of environmental data that is used to support OREM's cleanup mission.

Groundwater monitoring gauges protectiveness

OREM continued to implement its groundwater strategy for the Oak Ridge Reservation in FY 2025. The *Phased Groundwater Remedial Investigation Work Plan for the Bethel Valley Final Groundwater Record of Decision* (DOE/OR/01-2824&D2) was approved in April 2021 with Phase 1 field activities commencing in FY 2024 and continuing through FY 2025. Field activities included drilling three new boreholes. Workers will document results in a Phase 1 Remedial Investigation Report once all Phase 1 well installation and monitoring are completed.

The ORR groundwater strategy involved developing a regional groundwater flow model that provides a framework for subsequent site-specific modeling for other ORR projects. OREM envisions groundwater modeling as a multi-year, ongoing effort with model applications in support of remediation and decision-making and interfaces with other projects. The site-specific flow models are tools that may be used to support future investigations and remediation under CERCLA.

In FY 2025, site-specific models were developed to support the upcoming monitored natural attenuation project for K-31/K-33 at ETPP. Additionally, workers collected new field data at the Bear Creek Burial Ground in support of the North Tributary 8 removal action was compared against previous modeling results as a quality assurance step.

The annual, administrative watershed-based schedule for CERCLA five-year reviews at the Oak Ridge National Priorities List site continued during FY 2025 with the submittal of the *2025 CERCLA Five-Year Review for the Bear Creek Valley Administrative Watershed on the U.S. Department of Energy Oak Ridge Site, Oak Ridge, Tennessee*

(DOE/OR/01-2990&D1) in August 2025. The objective of the five-year review is to evaluate the success of completed CERCLA remedial actions in protecting human health and the environment. Also in FY 2025, OREM completed planning meetings for the upcoming 2027 CERCLA Five-Year Review for Clinch River/Poplar Creek and Lower Watts Bar Reservoir.

Through the annual Remediation Effectiveness Report, OREM continued to evaluate the effectiveness, based on environmental media monitoring, of completed remedial actions or environmental media removal actions as addressed in the *2025 Remediation Effectiveness Report for the U.S. Department of Energy Oak Ridge Site Oak Ridge, Tennessee* (DOE/OR/01-2989&D1).

Long-term performance monitoring of groundwater, surface water, sediment, and/or biological media (e.g., fish, biota surveys) to assess performance continues to demonstrate that completed remedial and removal actions are meeting their objectives. Baseline monitoring of watershed conditions and trends for those media will inform future decisions on the Oak Ridge National Priorities List site. Included in the Remediation Effectiveness Report is the annual verification that land use controls and engineered remedies are properly implemented for completed actions.





Public Involvement

The public is involved in cleanup decisions made by DOE. To keep the public informed, DOE provides information through a variety of outlets, including tours, meetings, briefings, conferences, media outreach, fact sheets, public notices, websites, social media, and various publications.

Media Day held for Alpha-2 project



OREM showcased the demolition progress underway at Y-12's Alpha-2 building during a media event in FY 2025. OREM coordinated with UCOR, Consolidated Nuclear Services, and the National Nuclear Security Administration to highlight the scale and importance of this cleanup project. Before demolition began,

Alpha-2 was an 80-foot-tall structure measuring 325,000 square feet and covering 2.5 acres. OREM's cleanup work at Y-12 is transforming the site, making it safer, enabling modernization, and providing space for crucial new facilities.

Environmental Cleanup Update meeting held

OREM and UCOR hosted an Environmental Cleanup Update meeting in Kingston during FY 2025 to provide the public a status on current cleanup efforts and information on upcoming projects. The event featured a poster session with subject matter experts on hand to answer questions.





Advisory board encourages public input on DOE cleanup

The Oak Ridge Site Specific Advisory Board (ORSSAB) is a federally chartered volunteer citizens panel that provides independent advice and recommendations to the DOE Oak Ridge Office of Environmental Management. ORSSAB meetings provide DOE and regulators at the U.S. Environmental Protection Agency and the Tennessee Department of Environment and Conservation with a forum to communicate with and understand stakeholders' perspectives. Because all meetings are open to the public, it also serves as a venue for members of the community to express their views or ask questions.

In 2025, the board issued a recommendation on the site's budget request and discussed ongoing development of the planned new onsite waste disposal facility, the Environmental Management Disposal Facility (EMDF). Since 1995, ORSSAB has provided nearly 300 recommendations to OREM on all important aspects of the cleanup program, such as land use and reindustrialization; stewardship; cleanup standards, activities and budgets; and waste management. Every major record of decision developed under EM had ORSSAB involvement, and none of the final records of decision have been at odds with majority opinions.

Board members also support OREM efforts outside of meetings. This year members toured excess facilities around the Oak Ridge Reservation; gave input during Five Year Review meetings with agencies covering various ongoing cleanup project progress; and attended the opening of the William J. Wilcox Jr. K-25 Interpretive Center, which was part of several previous recommendations to DOE regarding historic preservation. Additionally, the board sent a representative to the Waste Management Symposia in Phoenix, Arizona. These opportunities allow members to bring back

knowledge to improve their service to OREM. The board encourages interested individuals to apply for membership to receive additional insights into cleanup activities. Members tour the site, are offered opportunities to learn about other sites, and receive continuing education. The board conducts an annual recruitment event but welcomes applicants to submit their information at any time through its website.

ORSSAB may have up to 22 members. Individuals apply for membership and are selected annually by DOE to reflect the variety of residents in the multi-county area that surrounds the Oak Ridge Reservation. Technical expertise is not a requirement for membership, although some members may have those skills. DOE strives to have a good mix of educational backgrounds and experiences among members.

ORSSAB meets the second Wednesday of most months at 6 p.m. in Oak Ridge and virtually through Zoom. The board also has two standing committees. All meetings are open to the public and feature comment periods. Meeting videos are also posted to the board's YouTube channel, www.youtube.com/user/ORSSAB. Staff members maintain a social media presence at www.facebook.com/ORSSAB and publish a quarterly newsletter, the *Advocate*. More information about the board and its activities is available at www.energy.gov/orssab or email questions to orssab@orem.doe.gov.



ORSSAB members

Websites for Additional Information

DOE OREM Public Information
(865) 574-4912
www.energy.gov/orem

Oak Ridge Site Specific Advisory Board
(865) 241-4583, (865) 241-4584
1-800-382-6938
www.energy.gov/orssab

Tennessee Department of Environment
and Conservation–DOE Oversight Office
(865) 481-0995
<https://tdec.tn.gov/>

U.S. Environmental Protection Agency
Region 4
1-800-241-1754
www.epa.gov/aboutepa/about-epa-region-4-southeast

Commonly Used Acronyms

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CPS	Continuous Purge System
DOE	U.S. Department of Energy
EM	Environmental Management
EMDF	Environmental Management Disposal Facility
EMWMF	Environmental Management Waste Management Facility
EPA	U.S. Environmental Protection Agency
ETTP	East Tennessee Technology Park
FY	Fiscal Year
IROD	Interim Record of Decision
MSRE	Molten Salt Reactor Experiment
NNSA	National Nuclear Security Administration
OREM	Oak Ridge Office of Environmental Management
ORNL	Oak Ridge National Laboratory
ORRL	Oak Ridge Reservation Landfills
ORSSAB	Oak Ridge Site Specific Advisory Board
ROD	Record of Decision
SSP	Self Sufficiency Parcel
TDEC	Tennessee Department of Environment and Conservation
TRU	Transuranic
TWPC	Transuranic Waste Processing Center
U-233	Uranium-233
WIPP	Waste Isolation Pilot Plant
WWSY	White Wing Scrap Yard
Y-12	Y-12 National Security Complex

DOE Information Center

The DOE Information Center is located at the Office of Scientific and Technical Information, Building 1916 – T1, 1 Science.gov Way, Oak Ridge, Tennessee 37831; Email: doeic@science.doe.gov; Hours: 8 a.m. to 5 p.m., Monday – Friday; <http://doeic.science.energy.gov>; Phone: (865) 241-4780

Commonly Used Terms

CERCLA

CERCLA: The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) 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, which governs cleanup operations on the Oak Ridge Reservation, authorizes two kinds of response actions: short-term removal actions, 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 U.S. Environmental Protection Agency'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.

FFA

Federal Facility Agreement: CERCLA requires an agreement between state and federal entities to guide cleanup work at CERCLA sites. For OREM, the parties of this agreement, called a Federal Facility Agreement, are DOE, the U.S. Environmental Protection Agency, and the Tennessee Department of Environment and Conservation. The Federal Facility Agreement for Oak Ridge was initiated in January 1992.

RmA

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.

RA

Remedial Actions: Remedial actions are long-term response actions that seek to permanently and significantly reduce the risks associated with the release or threat of release of hazardous substances.

RI/FS

Remedial Investigation/Feasibility Study: The purpose of the remedial investigation/feasibility study (RI/FS) is to assess site conditions and evaluate alternatives to the extent necessary to select a remedy. Developing and conducting an RI/FS generally includes the following activities: project scoping, data collection, risk assessments, treatability studies, and analysis of alternatives. The scope and timing of these activities should be tailored to the nature and complexity of the problem and the response alternatives being considered.

ROD

Record of Decision: Under the CERCLA process, a Record of Decision (ROD) formally documents the selection of a preferred cleanup method after a series of steps, including an RI/FS. A preferred cleanup alternative is selected and 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 ROD.

Fiscal Year: The 2025 fiscal year spans from Oct. 1, 2024, to Sept. 30, 2025.

For more information, please contact
the DOE Oak Ridge Public Affairs Office at (865) 574-4912.