



OREM

Oak Ridge Office of Environmental Management

PROGRAM PLAN

FY 2014 to 2024

BIANNUAL UPDATE - FALL 2019

**CONTINUING PROGRESS.
RESTORING THE ENVIRONMENT.
ENABLING MISSIONS.**



U.S. DEPARTMENT OF
ENERGY

TABLE OF CONTENTS

A Message From The Manager	3
Our Mission	4
Core Values	5
The 10-Year Program Plan	6
History and Background	7
Regulatory Framework	11
Cleanup Accomplishments	12
Balancing Priorities	14
Challenges and Considerations	15
Our Goals	16
Progress on the Road to 2024	17
A Look Toward the Future.	35

A MESSAGE FROM THE MANAGER

Dear colleagues and stakeholders:

We released the first edition of our 10-year program plan in fiscal year 2014. It unveiled eight ambitious goals for DOE's Oak Ridge Office of Environmental Management (OREM) that guide our decisions and facilitate clear expectations for our employees through the next decade.

This plan has been incredibly effective toward giving our workforce a uniform vision to strive toward. The goals, objectives, and performance measures listed in this document have remained constant, giving our employees a fixed target to pursue.

While the performance measures have not changed, our progress has. That is why we update the program plan approximately every two years. This edition marks the second update. Each new version highlights and captures the progress our employees and contractors have achieved in reducing risks, improving safety, and removing barriers to new missions and economic opportunities in Oak Ridge.

This document takes OREM through the completion of cleanup at the East Tennessee Technology Park and into a new and exciting phase of cleanup at the Oak Ridge National Laboratory and Y-12 National Security Complex. The work we are performing now is transitioning one of DOE's former uranium enrichment sites into a community-owned asset, and it is laying the foundation for large scale cleanup to begin at some of the nation's most important research and national security assets.

As you read through this edition, you will see many new successes recorded. These successes were made possible through numerous contributing factors. Our leadership team does a tremendous job identifying and proactively planning for new opportunities. We also boast highly qualified and committed employees, strong community and contractor partners, and a clearly defined vision for the future. Together, these elements make Oak Ridge a special and unique site that is setting the standard for excellence within the Environmental Management complex.

As I look at the projects that remain as we approach 2024, I remain optimistic about the future. While considerable work remains to achieve all of the goals listed in this plan, our Congressional delegation is providing exceptional support, and our employees and contractors are using those investments effectively to accomplish the most meaningful and impactful cleanup possible across the site.

As we continue our operations, we are intently focused on maximizing the funding we receive to accomplish the most progress possible and enhance the region. Readers will see proof of this mentality as you go through this latest update. Our team will continue finding ways to achieve our goals and grow closer to realizing our ultimate vision of a fully remediated, modernized, and reindustrialized Oak Ridge Reservation.

Jay Mullis
Manager



OUR MISSION

The U.S. Department of Energy's (DOE) Oak Ridge Reservation occupies more than 32,400 acres within Anderson and Roane counties in East Tennessee. Three sites lie within its borders—they include the East Tennessee Technology Park (ETTP), Y-12 National Security Complex (Y-12), and Oak Ridge National Laboratory (ORNL).

DOE's Oak Ridge Office of Environmental Management (OREM) has cleanup responsibilities at all three of these sites. Its efforts are enhancing safety, opening land for re-development, and modernizing campuses to enable vital ongoing scientific and energy research and national security missions. To accomplish these outcomes, OREM's mission is three-fold.

PROTECT THE REGION'S HEALTH AND ENVIRONMENT

Our work enhances the health and safety of the region. At ETTP, we are removing long-standing, contaminated facilities. At Y-12, we are finding ways to contain and remove mercury from the environment, and at ORNL, we are focused on eliminating waste inventories and reducing radiological risks.



ENABLE DOE'S NATIONAL SECURITY AND SCIENCE MISSIONS ONSITE

At Y-12, we are working to extract mercury from soil and groundwater, remove deteriorating facilities, and enable modernization at the site, allowing NNSA to incorporate new facilities to meet 21st century national security missions. Our cleanup at ORNL removes dilapidated facilities and radiological risks to open land for DOE to continue advancing energy, neutron, computational, and materials research.



MAKE CLEAN LAND AVAILABLE FOR FUTURE USE

At ETTP, our ultimate goal is to transform the site into a privately owned and operated industrial park. We are actively eliminating facilities and contaminants to open valuable real estate for reuse and development that will spur economic growth in the region.



CORE VALUES

The leadership and employees in OREM adhere to a set of core values that have proven invaluable as we conduct and accomplish challenging cleanup across the three major cleanup sites. These values provide a clear standard that guide our workforce and contributes to the organization's successful operations and oversight.



The safety and security of our employees, local residents, and the environment is our highest priority



Our results will demonstrate accountability and value for taxpayers' investment



We will value and utilize the diversity, experience, and skills of our people



We will pursue innovation and continuous improvement in every aspect of our operations



We will promote openness, collaboration, and teamwork with our stakeholders

THE 10-YEAR PROGRAM PLAN

This plan builds on the successes our program has accomplished since it was formed in 1989. Over the decades, we have made incredible progress remediating contaminated soil and water and demolishing radioactively contaminated facilities across the Oak Ridge Reservation (see *Cleanup Accomplishments* on page 11).

Contamination areas that once posed a threat to the environment and negatively impact the region have been contained through early actions and institutional controls. Through the years, we have also removed radioactive and hazardous wastes and portions of nuclear material inventories that could pose risks to public health or DOE's research and national security missions.

This plan outlines our approach from fiscal year 2014-2024 to continue safely and cost-effectively reducing the amount of waste and contaminated facilities, soil, and groundwater on the Oak Ridge Reservation. This work is protecting human and environmental health and ushering in a new chapter for DOE, the City of Oak Ridge, and the region. Most notably, this plan sees through the completion of ETPP's cleanup and transitions large-scale demolition and remediation to Y-12 and ORNL.

HISTORY AND BACKGROUND

The U. S. Army Corps of Engineers began acquiring land, in the area that became Oak Ridge, in October 1942 for the Manhattan Project. By March 1943, 56,000 acres were sealed behind fences and major industrial facilities were under construction.

The K-25, S-50, and Y-12 plants were all built to explore different methods to enrich uranium, while the X-10 site was established as a pilot plant for the Graphite Reactor and to explore how to produce plutonium. Throughout the following decades the three major sites— K-25 (present day ETTP), X-10 (present day ORNL), and Y-12— purified isotopes, conducted research, built weapons, and created environmental legacies that OREM is now cleaning and removing.



Above Left: East Tennessee Technology Park

Above: Oak Ridge National Laboratory

Left: Y-12 National Security Complex

EAST TENNESSEE TECHNOLOGY PARK

The K-25 plant was constructed during the Manhattan Project to enrich uranium for the first atomic weapon using the gaseous diffusion process. Due to the success of this technique, the original plant was expanded during the Cold War and employed 12,000 workers. At its peak, the site contained five enormous uranium enrichment facilities—K-25, K-27, K-29, K-31, and K-33— and hundreds of support facilities.

DOE ceased all gaseous diffusion operations at the K-25 plant in 1987. The centrifuge uranium separation program that was also at the plant was terminated in 1985. Environmental cleanup began in the early 1990's to address the deteriorating facilities and the environmental hazards created during decades of enrichment. The site was renamed the East Tennessee Technology Park in 1997 and began its transition into a privately owned and operated industrial park.

Today, OREM is nearing the completion of cleanup at ETPP, and it is also steadily transferring buildings, land, and infrastructure to the Community Reuse Organization of East Tennessee. The non-profit organization then markets and transfers these assets to private industry.

QUICK FACTS

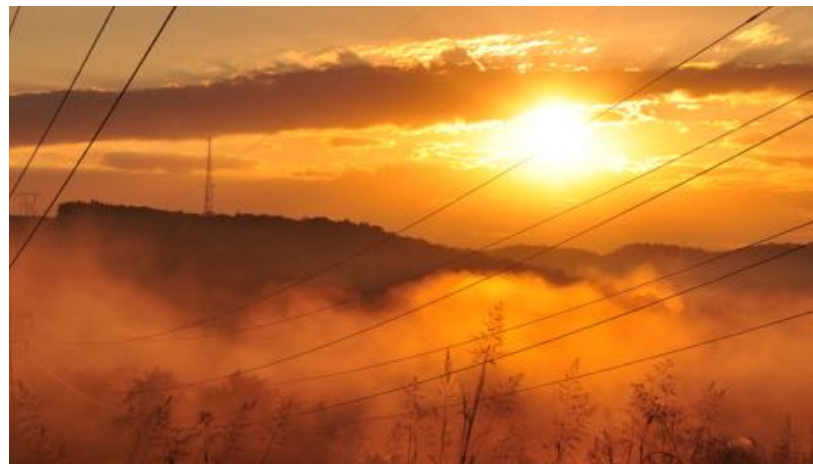
Site manager: DOE Office of EM, Community Reuse Organization of East Tennessee

Employees: 1,700 EM-related, 200 private industry

Size: 2,200 acres

Cleanup priority: Clean and transfer the site to begin large-scale cleanup at Y-12 and ORNL

EM value-added: The cleaned site will offer an abundance of flat real estate and robust infrastructure to attract large industry to the region. The EM program is constructing facilities that will tell the site's rich history for national park visitors, and it also created a 3,000-acre conservation easement adjacent to ETPP that protects wildlife and provides residents with nature-friendly trails.



Y-12 NATIONAL SECURITY COMPLEX

Y-12 was built to enrich uranium for the first atomic weapon using an electromagnetic separation process. By the end of World War II, the plant had more than 22,000 workers.

The Cold War brought change to Y-12 as new processes for separating lithium-6 were added and uranium enrichment missions were conducted elsewhere. During the 1950s and early 1960s, Y-12 used large amounts of mercury in the lithium separation process, and an estimated 700,000 pounds entered the environment. Public and Congressional concern began to mount in the 1970s and escalated in the late 1980s.

With the end of the Cold War, Y-12's mission changed from production to weapons reductions and disassembly. Today, Y-12 has three primary national security missions that protect the United States and its allies. They include maintaining the U.S. nuclear stockpile, reducing global threats through non-proliferation, and fueling the U.S. Nuclear Navy.

Y-12 has evolved to become the complex the nation looks to for support in protecting America's future, developing innovative solutions in manufacturing technologies, prototyping, safeguards and security, and technical computing.

QUICK FACTS

Site manager: National Nuclear Security Administration

Employees: 8,000

Size: 811 acres

Cleanup priority: Large excess contaminated facilities and mercury in soil and groundwater

EM value-added: We are working to remove more than 90 old, deteriorated, and contaminated facilities and remediate the large volume of mercury from the soil and groundwater. These projects will improve safety, modernize the site, open land for vital national security missions, and reduce the footprint to enhance efficient operations at one of the nation's most important national defense assets.



OAK RIDGE NATIONAL LABORATORY

Construction of X-10, also known as the Clinton Laboratories, began in 1943. Its first mission was to develop and test the experimental Graphite Reactor, which went critical in March 1944. It was used initially as a pilot test facility for plutonium production. Since then, 13 reactors were designed and built onsite, and staff developed or participated in developing numerous nuclear materials reprocessing methods.

In the 1960's, research into genetics and the biological effects of radiation were added to the site's mission. In the 1970's, ORNL began ecological and biological research concerning the environmental effects and safety of nuclear power plants. During the 1980s and 1990s, the mission grew to encompass alternative energy and Strategic Defense Initiative research.

Today, ORNL has grown and expanded its capabilities, and it is at the forefront of supercomputing, advanced manufacturing, materials research, neutron science, clean energy, and national security.

QUICK FACTS

Site manager: DOE Office of Science

Employees: 4,400

Size: 4,400 acres

Cleanup priority: Radiologically and chemically contaminated facilities

EM value-added: We are working to remove more than 120 old, deteriorated, contaminated facilities that formerly conducted reactor and isotope production research. These projects will improve safety, modernize the site, and open land for new research at one of DOE's most important science institutions.



REGULATORY FRAMEWORK

As a result of legacy contamination from past operations, in 1989, the U.S. Environmental Protection Agency (EPA) placed the Oak Ridge Reservation on the National Priorities List. The list names national priorities where there are known or threatened releases of hazardous substances (Since then, OREM performed extensive sampling that showed more than 19,000 of the 32,400 acres are clean, and they were eliminated from the list.).

In 1989, DOE responded by establishing the Office of EM to oversee cleanup of hazardous materials at its facilities located across the U.S. Three years later, DOE, EPA, and the Tennessee Department of Environment and Conservation (TDEC), signed the Federal Facility Agreement, which establishes the guidelines and milestones for cleanup in Oak Ridge in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and other laws.

This tri-party agreement provides a checks and balances system to ensure the cleanup in Oak Ridge is prioritized and conducted in a way that best protects human health and the environment in the region. Members of each organization communicate and collaborate regularly as we plan and execute projects.



CLEANUP ACCOMPLISHMENTS

We have made significant progress cleaning the Oak Ridge Reservation. While the transformation is ongoing, it is important to highlight the magnitude of work our employees have already accomplished. Since the EM Program's inception, we have removed hundreds of facilities, remediated environmental legacy sites, constructed critical infrastructure to treat, process, and dispose waste, and helped form key decisions with regulators.



Demolishing old, contaminated facilities

Our efforts have removed hundreds of facilities across ETPP, Y-12, and ORNL. We were the first in the world to demolish all of a site's gaseous diffusion uranium enrichment buildings. Cleanup at ETPP alone has eliminated facilities totaling 12 million square feet.



Waste treatment and removal

We have constructed numerous waste treatment systems and facilities to keep sites safe and remove legacy contamination. The TSCA Incinerator treated 35 million pounds of waste before it was closed and demolished, while the Liquid and Gaseous Waste Treatment System treats millions of gallons of process waste water and over a billion cubic meters of gaseous waste annually. Additionally, we have removed half of the uranium-233 inventory stored at ORNL, and we are almost finished processing and packaging Oak Ridge's inventory of transuranic debris waste.



Risk reduction

We have addressed and eliminated major hazards across Oak Ridge including dispositioning 7,000 cylinders of depleted uranium hexafluoride, emptying waste storage tanks, shipping all spent nuclear fuel offsite, excavating the greatest source of groundwater contamination at ORNL (Tank W-1A), clearing scrap yards, and limiting contamination pathways from old facilities awaiting demolition.



Addressing mercury

We have performed projects to reduce offsite mercury migration since 1985, and we are actively investigating technologies that can effectively remove it from the environment. Our projects have eliminated some of the mercury sources in and around mercury-contaminated tanks and facilities, cleaned storm drain systems, excavated contaminated soil, dredged sediments, re-routed and removed old process piping, extracted nearly five tons of mercury from old equipment, and constructed an onsite mercury treatment system.



Groundwater monitoring and treatment

\$420 million has been invested in capital projects supporting groundwater protection. Annually, we spend \$15 million on groundwater actions, treat 100 million gallons of groundwater, and collect 2,000+ samples across the Oak Ridge Reservation to ensure safety and refine plume modeling.



Innovative transportation

We constructed a private road specifically for waste shipments to our onsite disposal facilities. This road prevents the potential for traffic accidents or spills on public highways. So far, almost 110,000 truckloads have been diverted from local roadways. We have also developed advanced tracking systems to identify the location and contents of each truck while they are in transit.



Reindustrialization and economic development

We are the first site in DOE to launch a reindustrialization program. To date, we have transferred nearly 1,300 acres, 14 buildings, roadways, electrical and sewer systems, and emergency services. These transfers have saved millions of tax dollars, and provide marketable assets to bring private industry to East Tennessee.



Public involvement and input

Since 1995, the Oak Ridge Site Specific Advisory Board has provided independent advice and recommendations to our cleanup program. The federally appointed citizens' advisory panel is comprised of 22 members that reflect the diversity of the region, and their active engagement and insight is invaluable as we formulate cleanup strategies and decisions.

BALANCING PRIORITIES

We have developed a portfolio of projects designed to complete cleanup at ETP, Y-12, and ORNL. All three portfolios are integrated into a single plan that balances risks across all regulator, stakeholder, and mission priorities.

We have already been successful in eliminating many of the risks at ETP. Now our focus is completing the cleanup and transfer of the site to reduce what we call “lifecycle costs”. By completing cleanup faster at ETP, we can avoid higher demolition costs from worsening conditions and eliminate annual infrastructure, surveillance and maintenance, security, and landlord costs.

Since Y-12 performed different operations and maintains a current day mission, its cleanup needs vary greatly from ETP. Our work at Y-12 is focused on removing environmental risks. Mercury from on-site sources continues to migrate into the Upper East Fork Poplar Creek, which enters public water at the site boundary. Our employees are working to plan and execute projects that will reduce mercury migration into waterways and address its sources.

At ORNL, our work is focused on removing nuclear and radiological risks left behind by previous isotope production and reactor research. Currently, the greatest priority is the removal of legacy nuclear materials and onsite waste, removing or overseeing and maintaining old infrastructure, and enhancing safety by eliminating contamination pathways.

While each site has important and pressing cleanup needs, Oak Ridge’s remaining cleanup scope is so large we must carefully prioritize our work and operate within the bounds of our annual budget. Upcoming work is generally ranked in the following order:

- 1. Eliminating any offsite releases**
- 2. Preventing contamination from traveling offsite**
- 3. Controlling sources of onsite contamination**
- 4. Demolishing old, contaminated facilities**
- 5. Addressing soil, groundwater, and surface water**

CHALLENGES AND CONSIDERATIONS

Oak Ridge is very unique within the Office of EM, and our employees are tasked with weighing numerous considerations as they plan and prioritize work. It is comprised of three major cleanup sites that each have different operational histories, risks, cleanup needs, and diverse ongoing missions.

- More than 500,000 people live within a 30-mile radius of our cleanup, and the entire Oak Ridge Reservation is within the Oak Ridge city limits.
- Our site receives one of the highest annual rainfall levels within the EM complex. It also has shallow groundwater capable of carrying contaminants into local waterways.
- Oak Ridge houses the majority of DOE's excess large-scale, deteriorating, and contaminated industrial/nuclear facilities. In fact, the site contains 25% of the facilities listed on DOE's high-risk list, and they require significant maintenance and upkeep.
- Cleanup at Y-12 and ORNL must be conducted without disrupting or threatening more than 10,000 employees conducting vital ongoing national security and research missions.
- We must balance diverse risks and meet regulatory requirements with varying annual budgets, and we have a diverse group of partners and stakeholders with differing priorities and expectations.



Above Left: Satellite view of the Oak Ridge Reservation. **Top Right:** Anticipated cleanup scope at ORNL (labeled in red).
Above Right: Anticipated cleanup scope at Y-12 (labeled in red)

OUR GOALS

This plan focuses on environmental restoration activities that we will perform across the Oak Ridge Reservation from fiscal year 2014-2024. We have established eight goals that will drive the execution of our work during this timeframe. The first four goals are cleanup-centric, while the final four are programmatic goals that address how we perform and accomplish our work. Key objectives have been identified for each goal along with metrics for measuring progress.

Goal 1: Complete ETPP cleanup

Objective 1: Complete all demolition and remedial action consistent with CERCLA agreements

Objective 2: Implement reindustrialization and historic preservation activities at ETPP

Goal 2: Disposition ORNL uranium-233 inventory

Objective 1: Complete uranium-233 direct disposition campaign

Objective 2: Conduct down-blending operations and dispose remaining uranium-233 inventory

Goal 3: Disposition ORNL transuranic waste inventory

Objective 1: Complete disposition of transuranic debris waste

Objective 2: Begin construction of the Sludge Processing Facility

Goal 4: Address Y-12 mercury contamination

Objective 1: Ensure proper planning for future mercury cleanup

Objective 2: Reduce mercury in surface water exiting Y-12

Objective 3: Begin addressing mercury contaminated buildings

Goal 5: Support efficient and effective cleanup of the Oak Ridge Reservation

Objective 1: Support efficient disposition of cleanup waste

Objective 2: Conduct cost efficient base operations at ETPP, ORNL, and Y-12

Objective 3: Routinely evaluate surveillance and maintenance plans to ensure unacceptable risks are identified and addressed

Goal 6: Focus on continuous improvement in safety, security, environmental compliance, and quality performance

Objective 1: Integrate safety, security, and quality into all work aspects through more focused activities

Objective 2: Foster a Safety Conscious Work Environment

Objective 3: Implement all program activities in an environmentally sound manner

Objective 4: Maintain a qualified workforce to ensure federal oversight of work performed

Goal 7: Achieve excellence in project and contract management

Objective 1: Complete projects on time and within budget

Objective 2: Continue to hold contractors accountable for delivering results and ensure contractors' performance is fairly evaluated and documented

Objective 3: Promote the use of small business contractors

Goal 8: Optimize collaboration with external stakeholders and oversight agencies

Objective 1: Provide public access to program information and opportunity to provide input

Objective 2: Collaborate effectively with external regulatory agencies

Objective 3: Maintain a proactive relationship with the Defense Nuclear Facilities Safety Board

PROGRESS ON THE ROAD TO 2024

GOAL 1: COMPLETE ETPP CLEANUP

Objective 1: Complete all demolition and remedial action consistent with CERCLA agreements

PERFORMANCE MEASURES:

- ✓ Complete K-25 D&D
- ✓ Complete K-27 D&D
- Complete ETPP remaining D&D and remediation

We have completed most of the total demolition required at ETPP. OREM is well on its way to successfully achieving Vision 2020, which is the goal to complete all demolitions and major cleanup at the end of 2020. So far, we have removed 12 million square feet of facilities, with only 750,000 square feet remaining.

Since our last update, crews have taken down numerous structures across ETPP as we continue our efforts to clean and transform the site. Workers have taken down the 11 Poplar Creek Facilities, which were the most contaminated buildings remaining at the site. They were also the final structures that formerly supported the site's gaseous diffusion uranium enrichment mission.

During that span, crews also took down the 380,000 square foot Building K-1037, ETPP's largest remaining facility, and removed several former waste processing buildings— the TSCA Incinerator and the Central Neutralization Facility.

Now, teams are performing deactivation and decommissioning inside the K-1200 Complex to prepare those facilities for demolition in 2020. The complex is comprised of several buildings that span more than 235,000 square feet and stand 180 feet tall. The K-1200 Complex was built to develop, test, and demonstrate centrifuge enrichment technology until operations ended in the mid-1980s.

Before we complete all of the transfers at ETPP in the early 2020s, we will also remediate the soils in the main plant area and finalize regulatory commitments regarding surface water and groundwater. OREM and UCOR have worked together to develop a closure plan that lists all of the projects and activities required before the agency completes the transfer to private industry.



Objective 2: Implement reindustrialization and historic preservation activities at ETPP

PERFORMANCE MEASURES:

- ☑ Implement commitments listed in the Memorandum of Agreement for Historic Preservation
- **Complete the transfer of all applicable economic development parcels to the Community Reuse Organization of East Tennessee**
- **Complete transfer of infrastructure to the City of Oak Ridge**

In 2012, OREM signed an agreement to construct a history center, equipment building, and viewing tower to share the story of K-25's workers and technological achievement, and we have made great strides toward those commitments..

The K-25 footprint is within the Manhattan Project National Historic Park. Next door, we are opening a new 7,500 square foot K-25 History Center, and we are finalizing plans to begin constructing the K-25 Equipment Building and Viewing Tower in 2020. Through this investment, OREM is providing the community assets that honor and share the accomplishments of Oak Ridge's former workers, and it provides a significant educational resource for future generations.

In addition, OREM is intently focused on transforming the site into an economic engine for the region. DOE's reindustrialization efforts are giving new life to buildings, land, and equipment that are no longer necessary to serve mission needs and capable of attracting new industry to the area.

Since the last update, we have completed the largest land transfers to date with the K-31/K-33 area and Duct Island. So far, nearly 1,300 acres have been transferred to the community from government ownership and another 400 acres are ready for transfer. A medical isotope company has announced plans to construct a facility on the transferred 206-acre Duct Island area by 2025 that is anticipated to create 200 private sector jobs.



GOAL 2: DISPOSITION ORNL URANIUM-233 INVENTORY

Objective 1: Complete uranium (U)-233 direct disposition campaign

PERFORMANCE MEASURES:

- ✓ Complete transfer of material appropriate for programmatic reuse
- ✓ Ship all CEUSP material to an appropriate disposal facility

Canisters of U-233 are housed in ORNL's Building 3019, which is the oldest operating nuclear facility in the world. The material is in diverse forms and packages with various levels of isotopic purity. Removing the inventory is our highest priority at ORNL because it constitutes a Category I quantity of highly enriched fissile material and requires high security costs and access restrictions to the site.

This inventory included canisters that were eligible for programmatic reuse as well as those eligible for direct disposal. In 2017, we successfully completed shipping and disposal of approximately one-half of the U-233 inventory through the Direct Disposition Campaign. The work was completed 10 months ahead of schedule, saving approximately \$9 million.



Objective 2: Conduct down-blending operations and dispose the remaining U-233 inventory

PERFORMANCE MEASURES:

- Prepare Building 2026 for down-blending operations
- Process, package, and dispose remaining inventory

The remaining canisters containing uranium-233 require down-blending to concentrations that are below criticality levels. The Office of Science has transferred Building 2026 to the Office of EM to provide an area to conduct these down-blending activities. This facility is located directly across from Building 3019, where the uranium inventory is stored. This transfer simplifies logistics when material is transported for processing.

Since the last update, we have been working on the Building 2026 Processing Preparation Project, which is essential to the Uranium-233 Processing Campaign. Through this \$18.6 million project, crews are modifying the hot cells in the facility and installing processing equipment that is required to dissolve, downblend, and solidify the remaining inventory of uranium-233.

The original approach involved processing the remaining inventory beginning in fall 2020, when the hot cell modifications are complete. However, the team identified a subset of material that employees can process in gloveboxes beginning in fall 2019. This approach accelerates the start of processing by a year and saves significant costs. Processing and downblending activities are scheduled for completion in 2024.



GOAL 3: DISPOSITION ORNL TRANSURANIC WASTE INVENTORY

Objective 1: Complete disposition of transuranic (TRU) debris waste

PERFORMANCE MEASURES:

- Complete processing and disposition of contact-handled debris
- Complete processing and disposition of remote-handled debris

Processing transuranic waste is an important component of Oak Ridge's cleanup portfolio, and its disposition is critical to achieving our mission to protect the public and the environment. The Transuranic Waste Processing Center allows us to process and repackage transuranic materials for disposal offsite. Transuranic materials that are heavier than uranium on the periodic table.

Currently, the contractor at the facility is processing, repackaging, and certifying transuranic debris waste for disposal at the Waste Isolation Pilot Plant (WIPP). Through our workforce's innovation, we were able to continue processing activities despite WIPP's suspension. Together, we designed new containers to encase the packages of processed remote-handled waste for safe, long-term storage until they could be transported offsite. WIPP is once again accepting waste, and we resumed shipping waste there in August 2017. Our aim is to complete all transuranic debris processing and certification in 2021.



Objective 2: Begin construction of the Sludge Processing Facility

PERFORMANCE MEASURES:

- Complete design, construction, and operation of the Sludge Processing Mock Test Facility
- Test and advance sludge processing technology
- Complete final design of the Sludge Processing Facility

Tens of thousands of gallons of transuranic sludges are stored in underground tanks at ORNL. Our commitment to regulators is to remove all of this waste from Oak Ridge. First, however, we need a facility and equipment capable of extracting the sludges and processing them into a solid form for disposal as low-level waste.

We awarded a contract to complete the design of the Sludge Processing Mock Test Facility. This facility will advance the technical maturity levels of the equipment and systems we will ultimately use to treat and process this material. Currently, we anticipate constructing the test facility in 2020 and completing testing in 2022. Then, we will apply those advances in technology to the design of the Sludge Processing Facility.



GOAL 4: ADDRESS Y-12 MERCURY CONTAMINATION

Objective 1: Ensure proper planning for future mercury cleanup

PERFORMANCE MEASURES:

- ✓ Finalize strategic plan for mercury remediation at Y-12
- ✓ Complete comprehensive mercury technology development plan
- ✓ Complete evaluation of mercury treatment, stabilization, disposition options

Mercury cleanup at Y-12 is one of OREM's highest priorities, and our ongoing research is positioning us for success when we begin transitioning workers to Y-12. We developed a Comprehensive Mercury Technology Development Plan and a Strategic Plan that serves as a roadmap for what must occur to complete the mercury cleanup at the site.

OREM is supporting research at the Oak Ridge National Laboratory's Aquatic Ecology Laboratory that is expanding our understanding of mercury in the environment, advancing technology development, and identifying solutions for remediation of the East Fork Poplar Creek.

We are continuing this strong partnership and funding an expansion of the Aquatic Ecology Laboratory that opens this fall. The expansion allows mercury-contaminated stream water to flow through the facility so researchers can test mercury removal technologies in more stream-like settings. This first-of-a-kind capability will help researchers discover which technologies may be scaled up for field testing and offer the most effective remediation results.

Working together, the Office of EM and the Office of Science are gaining a deeper understanding of the local environment and finding answers to aid cleanup. This research is helping OREM find new tools and approaches that can be more effective, reduce costs, and accelerate cleanup schedules to address Oak Ridge's complex mercury challenge.



Objective 2: Reduce mercury in surface water exiting the Y-12 facility

PERFORMANCE MEASURE:

- Complete construction and begin operation of the Outfall 200 Mercury Treatment Facility

Many of the large structures that must be demolished at Y-12 are contaminated with mercury and have mercury trapped in the soil and groundwater beneath them. The Mercury Treatment Facility will enable large-scale cleanup and demolition to begin at Y-12 by providing a means to prevent mercury contamination from traveling offsite as buildings come down and the area is disrupted.

The Mercury Treatment Facility is designed to treat up to 3,000 gallons of surface water per minute and store 2 million gallons of excess stormwater.

Since the last update, we completed all site preparations necessary for the headworks facility and the treatment facility. Additionally, we awarded APTIM-North Wind Construction JV, LLC a \$91.7 million contract for its construction. Construction teams mobilized in summer 2019 and work is underway to build this vital piece of infrastructure.



Objective 3: Begin addressing mercury contaminated buildings

PERFORMANCE MEASURE:

- ☑ Begin pre-demolition activities for the mercury source buildings

Preparations to decontaminate and decommission Y-12's large mercury-use facilities will include characterizing the buildings and equipment, identifying and analyzing treatment methods for the building debris to meet regulatory land disposal restrictions, and conducting risk reduction activities.

Our cleanup program developed an integrated cleanup plan to begin addressing more than 90 excess, contaminated facilities at Y-12. While an immense amount of work remains, we are encouraged with the work already underway through the increased funds Congress provided.

Since the last update, we removed all of the old, deteriorated, mercury-contaminated Column Exchange (COLEX) equipment on the west side of Alpha-4. Crews also drained and cleaned out the equipment on the east end of Alpha-4. These projects enabled OREM to retrieve more than 4.6 tons of mercury, prevent a large environmental release, and continue preparing Alpha-4 for eventual demolition.

During this time, employees also tested decontamination methods to clean old mercury process piping, and they began field testing a newly developed fogging fixative and application process aimed at controlling mercury vapors during future deactivation and demolition projects at Y-12's hazardous, mercury-contaminated buildings.



GOAL 5: SUPPORT EFFICIENT AND EFFECTIVE CLEANUP OF THE OAK RIDGE RESERVATION

Objective 1: Support efficient disposition of cleanup waste

PERFORMANCE MEASURE:

- Construct Phase I of the Environmental Management Disposal Facility

The Environmental Management Waste Management Facility, Oak Ridge's onsite CERCLA disposal facility, is expected to reach its full capacity in the early to mid 2020's. Construction of a new low-level disposal facility, called the Environmental Management Disposal Facility, involves identifying a site and constructing the first two disposal cells. This project is vital to the future of Oak Ridge's environmental cleanup program. This facility will allow us to conduct projects safely and efficiently, and it will help us continue our cleanup progress and momentum.



Since the last update, OREM released a Proposed Plan to the public for the project. The document, which was approved by EPA and TDEC, included a preferred site for the new engineered disposal facility. This site is known as the Central Bear Creek Valley option. OREM offered a 120-day public comment period and numerous outreach opportunities to share the contents of the plan, answer questions, and receive input directly from the community.

We responded to all of the input we received from the public comment period in our Responsiveness Summary, which is part of the draft Record of Decision. We will submit that document to EPA and TDEC in fall 2019, and we are working with them to address any outstanding issues and advance this project to the design and construction phase.



Objective 2: Conduct cost efficient base operations at ETP, Y-12, and ORNL

PERFORMANCE MEASURE:

- ✓ Reduce UCOR's costs of base operations by 5%

We use contract structures that incentivize contractors to continually search for opportunities to perform their work at the best value. This reduces the cost of base operations and allows more funds to be directed toward environmental cleanup. This requirement was added to the EM Annual Performance Agreement, and our cleanup program developed a plan with our contractor, UCOR, that allowed us to achieve this objective over the lifetime of their contract.

Objective 3: Routinely evaluate surveillance and maintenance plans to ensure risks are identified and addressed

PERFORMANCE MEASURES:

- ✓ Partner with contractor to identify new/emerging risks from excess facilities
- ✓ Ensure OREM baseline reflects balanced priorities between surveillance and maintenance and cleanup scope
- ✓ Identify and abate hazards and stabilize excess facilities awaiting demolition
- ✓ Begin D&D on high-risk excess contaminated facilities

Oak Ridge has more than 220 excess, contaminated facilities at Y-12 and ORNL. Conducting surveillance and maintenance at these facilities comprises a significant portion of work under the base operations

scope at each site. As part of these efforts, our employees work to identify potential or emerging risks so plans are in place to conduct essential projects before critical failures occur.



Previously, we assembled teams that evaluated facilities across Oak Ridge's cleanup sites. Their study provided an understanding of the costs of current risks and potential scenarios to allow OREM to plan and prioritize future projects. That information has been incredibly valuable when Congress began providing additional funds to address Oak Ridge's inventory of excess contaminated facilities earlier than expected.

Since the last update, we have demolished two high-risk facilities, and we are preparing five more for demolition in 2020. Crews have also retrieved nearly 10,000 pounds of mercury when they cleaned out and removed old equipment at Y-12—preventing a large environmental release. Currently, teams at ORNL are conducting decommissioning activities in former research reactors to reduce risks and pave the way for their demolition.

GOAL 6: FOCUS ON CONTINUOUS IMPROVEMENT IN SAFETY, SECURITY, ENVIRONMENTAL COMPLIANCE, AND QUALITY PERFORMANCE

Objective 1: Integrate safety, security, and quality into all work aspects through more focused activities

PERFORMANCE MEASURES:

- ✓ Complete the annual Integrated Safety Management System Declaration
- ✓ Complete key documentation to support organization standup
- ✓ Execute/manage annual integrated assessment schedule

We understand the importance of continuous improvement and the potential that results from aligning purpose, people, and values. Our organization will continue to strive for continuous improvement and diligently complete assessments to identify any areas for advancement. One of the most crucial methods to accomplish continuous improvement is developing performance measures that direct operations toward safer, more efficient operations. This is also achieved through dedicated leadership that provide opportunities, constructive feedback, and guidance to keep a focused workforce executing at the highest level.



Objective 2: Foster a Safety Conscious Work Environment

PERFORMANCE MEASURES:

- ✓ Complete a safety conscious work environment self-assessment, evaluate results, and identify follow-on actions
- ✓ Ensure contractors maintain an average Total Recordable Case (TRC) rate of < 1.1 and a Days Away from Work, Restricted Work, or Transfer Case (DART) rate of < 0.6

We completed a Safety Conscious Work Environment (SCWE) self-assessment in 2013, and the organization conducted a follow-up in 2015. Both surveys revealed that our organization has a work environment where workers feel free to raise safety concerns to management without fear of retaliation. While this is a positive outcome, it also identified areas for improvement. We developed a SCWE Plan of Action to address the results of the 2013 and 2015 survey and strengthen our organization.

We not only expect a safe workplace for our employees, but we also hold our contractors to the same standards. We emphasize those expectations regularly, realizing that high performing culture requires constant attention. Through strong partnerships and diligent federal oversight, we are pleased with the safety record and culture within Oak Ridge's EM portfolio. To date, all of our contractors are achieving our TRC and DART goals.



Objective 3: Implement all program activities in an environmentally sound manner

PERFORMANCE MEASURES:

- ✓ Meet all required environmental reporting requirements within required timeframes
- ✓ Receive zero Notices of Violation or other non-compliance notifications for all gaseous, liquid, and solid waste treatment and disposal facilities
- ✓ Maintain an active pollution prevention and waste minimization program

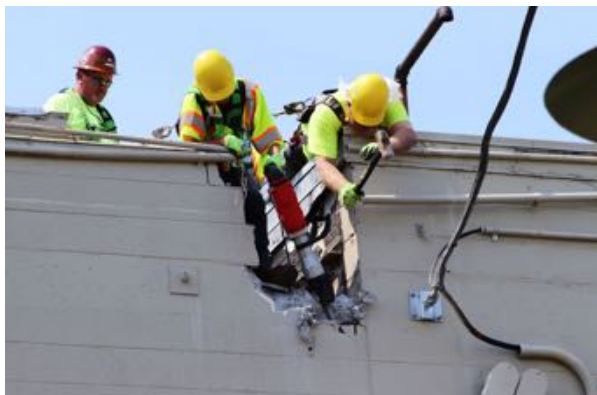
Our most important responsibility is the protection of human health and the environment. The organization places a primary focus on accelerating cleanup when possible and reducing the generation and subsequent release of hazardous substances into the environment. Performing this work in accordance with requirements is an important component of our work, and we are committed to continue our focus on environmental compliance.

Objective 4: Maintain a qualified workforce to ensure federal oversight of work performed

PERFORMANCE MEASURES:

- ✓ Develop annual workforce and succession plans
- ✓ Ensure Federal Project Directors and their deputies are certified at the correct level and all project managers are certified at level one as a minimum
- ✓ Maintain 100% completion of information technology, technical qualifications, and site security training
- ✓ Participate in team building activities that promote collaboration and communication

Our federal workforce is the organization's most important asset. Employees must have the training and experience required to successfully manage projects and provide effective oversight to the contractors performing work in Oak Ridge. Our organization will continue to find and develop employees to ensure that we do not lose capability when retirements occur. We will also work to strengthen the EM program in Oak Ridge by fostering a professional environment that promotes collaboration and communication among each of our business units.



GOAL 7: ACHIEVE EXCELLENCE IN PROJECT AND CONTRACT MANAGEMENT

Objective 1: Complete projects on time and within budget

PERFORMANCE MEASURES:

- ✓ Maintain alignment between baselines and contracts by approving baseline change proposals soon after contract modifications
- ✓ Evaluate and update project documentation (Project Execution Plans, Integrated Project Team Charters, etc.) on at least an annual basis
- ✓ Complete 90% of projects within 10% of the original cost and schedule in the Performance Baseline and address root cause of 110% cost/schedule performance index variances promptly

Our primary objective is to successfully complete all of our cleanup projects despite challenges often inherent with this type of work, including fiscal constraints. We emphasize balancing contract and project management with financial management to ensure we are good stewards of the taxpayer dollars entrusted to us. We strive to accomplish the maximum amount of work possible with the funds Congress provides. With this in mind, one of the core values for our organization is to perform extensive, strategic planning and complete our projects on time and within budget.

Objective 2: Continue to hold contractors accountable for delivering results and ensure contractors' performance is fairly evaluated and documented

PERFORMANCE MEASURES:

- ✓ 90% of Contractor Performance Assessment Reporting System evaluations are completed within 120 days of the end of the evaluation period
- ✓ Average number of days for disposition of contract change proposals/requests for equitable adjustment are less than 180 days
- ✓ 100% of all Performance Evaluation Management Plans are issued in accordance with the contract terms
- ✓ 90% of fee determinations/decisions are provided within contractual requirement or the established target for each contract
- ✓ Establish partnering agreements with prime contractors and hold partnering meetings per agreement

We rely heavily on contractors to perform the majority of environmental cleanup work across the Oak Ridge Reservation. Effectively managing those contracts and fostering a cooperative culture is a critical responsibility of the organization. We must ensure that contractors remain focused on results, using the basic principles of contract management. Those principles include monitoring performance, efficiently managing contract changes, and maintaining strong and productive relationships.

Objective 3: Promote the use of small business contractors

PERFORMANCE MEASURES:

- ✓ Award 7.5% of funding to small business contractors to meet EM Headquarters' goals

We understand the importance of creating an environment that maximizes participation by small, HUBZone, veteran-owned, small disadvantaged, service-disabled veteran owned, and woman-owned businesses. Small business firms are critical to the success of the EM program and the broader economy, and we appreciate their significant contributions to the program's successes. Our organization will continue to be a strong advocate for small businesses and will identify contracting opportunities for them while supporting the small business goals of the EM program nationally.



GOAL 8: OPTIMIZE COLLABORATION WITH EXTERNAL STAKEHOLDERS AND OVERSIGHT AGENCIES

Objective 1: Provide public access to program information and opportunity to provide input

PERFORMANCE MEASURES:

- ✓ Hold regular Site Specific Advisory Board meetings throughout the year; provide written responses to all recommendations within 60 days
- ✓ Issue the Cleanup Progress Report to the Oak Ridge Community annually
- ✓ Issue media announcements for all major program events
- ✓ Hold annual public workshop on budget development effort
- ✓ Participate annually in four community events relevant to the OREM mission

The Oak Ridge community is a tremendous asset to the EM program. We provide many opportunities throughout the year for residents and stakeholders to provide input on topics that are important to them. In turn, we are responsible for communicating the program's progress, successes, and challenges to the public. We are committed to identifying additional opportunities to engage those who have an interest in our achievements and current and upcoming projects.



Objective 2: Collaborate effectively with external regulatory agencies

PERFORMANCE MEASURES:

- ✓ Meet or successfully renegotiate 90% of all enforceable regulatory milestones with EPA and TDEC
- ✓ Obtain formal input from EPA and TDEC on the annual budget submittal
- ✓ Conduct routine project team meetings between working level staff on all cleanup projects
- ✓ Conduct at least three meetings annually with senior management from EPA/TDEC/ OREM to coordinate program implementation

The EPA and TDEC are our partners in our mission to complete the cleanup of the Oak Ridge Reservation. We cannot succeed without positive, professional relationships with our environmental regulators. We have committed to collaborate with the regulators by proactively engaging them throughout the planning process, creating “win-win” opportunities for combined success, and enabling a safer, cleaner environment for future generations.



Objective 3: Maintain a proactive relationship with the Defense Nuclear Facilities Safety Board (DNFSB)

PERFORMANCE MEASURES:

- ✓ Work to ensure there are no DNFSB findings on OREM facilities
- ✓ Conduct monthly meetings with the site representatives
- ✓ Respond promptly to DNFSB requests, typically within 30 days

The Defense Nuclear Facilities Safety Board is an independent organization within the executive branch chartered with the responsibility of providing recommendations and advice to the President and the Secretary of Energy regarding public health and safety issues at DOE defense nuclear facilities. We will maintain a positive relationship by regularly communicating project successes and challenges and by promptly responding to their requests for information.

A LOOK TOWARD THE FUTURE

Completing the cleanup goals identified in this plan will make large portions of our budget available for new goals beginning in FY 2025. Our work will focus on the remaining demolition and environmental remediation projects at Y-12 and ORNL.

At Y-12, we will demolish the large, mercury-contaminated facilities and address the contamination sources beneath these structures. We will also remove the many other excess and deteriorating facilities onsite to enable the important ongoing national security missions. At ORNL, we will remove old reactor and research facilities that contain nuclear and radiological contamination, and we will conduct extensive soil remediation. This will greatly enhance safety, and enable the site to continue its extraordinary contributions to innovation and scientific research.

Every day, we are working toward our vision of a remediated, reindustrialized, and modernized Oak Ridge. Our contributions are transforming the site by removing barriers to economic development, eliminating risks, and opening land for important ongoing missions that are benefiting our nation.





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