OREM

Oak Ridge Office of Environmental Management

October 2015

Program Plan

FY 2014 to 2024

U.S. DEPARTMENT OF ENERGY

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Table of Contents

A message from Sue Cange

Dear colleagues:

These are exciting times for the Oak Ridge Office of Environmental Management (OREM). It has been two years since we issued the first edition of our 10-year program plan, and there is already a need to incorporate numerous edits to capture the progress happening across the Oak Ridge Reservation. Reflecting on our recent accomplishments reinforces my enthusiasm for the future.

Progress always begins with a clear vision forward. Through your collaboration and planning, we developed a program plan that provides OREM a roadmap through 2024. It has facilitated clear expectations for the entire staff and ensured we are all striving toward the same goals and objectives. This unity and focus has enabled tremendous advances, and we must maintain our resolve as we begin new phases of work.

While we should be very proud of our past accomplishments, there is much left to do to realize our vision of a fully remediated Oak Ridge Reservation. This plan identifies the remaining cleanup priorities at the East Tennessee Technology Park, and the projects that pave the way for major cleanup activities at the Y-12 National Security Complex and the Oak Ridge National Laboratory. Our plan also established programmatic goals for continual organizational improvement and effective federal oversight, which we must remain focused on in order to succeed.

While we often work in an environment that is complex and full of uncertainties, you have been able to find innovative ways to safely and efficiently accomplish our work. That is a testament to your professionalism and ability, and I am extremely proud to be a member of the OREM team. Together, we are setting a precedent within the complex for our success, teamwork, and partnerships.

I want to thank each of you for your commitment to this plan and using it to guide our operations. I believe our unified vision is a key contributor to our recent successes. Despite the difficulties and complexities inherent with cleanup, I firmly believe that our team will continue finding ways to achieve OREM's established goals and grow closer to realizing our vision of a fully remediated, modernized, and reindustrialized Oak Ridge Reservation.

Sue Cange
Manager

2015 Program Plan Update

Since the 2013 version of the OREM Program Plan, readers will observe noteworthy additions when going through OREM's goals, objectives, and performance measures beginning on page 26. In addition, the vision and hard work from the members of our organization has positioned us for more milestones and completions in the near future.

With regard to Goal 1, we have made substantial progress at ETTP. In addition to the remarkable progress to remediate the site, we are continuing reindustrialization efforts, and commemorating the historical significance of the site. Since 2013, we have finished demolishing the K-25 and K-31 buildings. With the early completion of K-25, OREM chose to begin demolishing K-31 with the trained and qualified workers that were already onsite while crews completed the K-27 building decommissioning and deactivation. In this updated version, readers will see the addition of a reference to Vision 2016—a vision to remove all of the former uranium enrichment gaseous diffusion facilities at ETTP by 2016. This vision is now within reach due to the progress at the site.

Our objectives in Goal 2 remain unchanged; however there has been some important progress with the disposition of U-233. Our U-233 direct disposition campaign is underway, and we have an expected completion date of FY 2018. We are also making progress with preparations to the facility that will downblend the remaining inventory, which is a crucial element in our ORNL cleanup strategy.

We have altered Goal 3 since our previous edition. With the unexpected suspension of the Waste Isolation Pilot Plant, our TRU Processing and Disposition Program has been adjusting plans to continue work. Despite temporary shutdown of the disposal facility, we have found ways to continue processing transuranic contaminated debris. However, revised baseline projections have impacted timelines, and we had to remove Objective 2 to "complete the processing of sludges and disposition the solidified forms of TRU waste" by 2024. We have replaced it with "Begin construction of the Sludge Processing Facility." To achieve this, OREM will advance the maturity of sludge processing technology through the design, construction, and operations of a test facility. Designs are already underway for this new facility, and we expect to begin construction in 2016 which paves the way to address one of the longstanding legacy issues at ORNL.

In Goal 4, we have completed almost all of our performance measures in Objective 1: "ensuring proper planning for future mercury cleanup," and we are taking crucial steps to move forward on Objective 2. We have an approved Proposed Plan with regulators that names DOE's preferred option for the design of the Mercury Treatment Facility.

As you know this facility is vital to our ability to begin Objective 3.

In Goal 5, we are continuing our planning and outreach efforts to site and construct the Environmental Management Disposal Facility. Readers will also notice several examples listed under Objective 3 of how our employees are diligently conducting surveillance and maintenance to identify and reduce risks posed by our deteriorating facilities. There is an effort underway to identify new and emerging risks from excess facilities before they worsen and strain budgets further. We have also renewed our effort to reduce the cost of base operations and increase our efficiency across the program.

With regard to Goal 6, OREM has matured organizationally since it was formed in 2012. The EM program has completed the documents required for organizational standup and Quality Assurance certifications, and the program has brought new responsibilities in-house to improve coordination and self-sufficiency. The program has also conducted a second evaluation of its Safety Conscious Work Environment listed in Objective 2.

In Goal 7, OREM altered Objective 3. Previously, the objective listed a small business contracting goal of 5 percent. Since then, the goal has increased to 7.5 percent. DOE and OREM have long been supporters of small business, and our program continuously searches for opportunities to utilize them when possible.

While Goal 8 remains unchanged, it lists objectives that are pivotal for the future of OREM. It requires frequent and open communication with the public to promote involvement and foster advocacy in the community. Objectives also include cooperative, productive relationships with our regulators and safety oversight organizations.

Vision

The Oak Ridge Reservation occupies approximately 33,500 acres. It is located in East Tennessee, within the city limits of Oak Ridge. Three sites lie within its borders: the East Tennessee Technology Park (ETTP), Y-12 National Security Complex (Y-12), and Oak Ridge National Laboratory (ORNL).

In 2014, the U. S. Department of Energy (DOE) adopted three agency-level goals designed to guide its mission to advance America's sciences, energy security and economic growth, while minimizing the nation's environmental and national security threats. Our work in the Oak Ridge Office of Environmental Management (OREM) contributes to DOE achieving all three of its listed goals.

Our cleanup plan for the Oak Ridge Reservation involves completing cleanup activities at ETTP, Y-12, and ORNL by removing environmental, safety, and health risks in a cost-effective manner and within a framework supported by our stakeholders. Our efforts are enhancing safety, opening land for re-development, and modernizing campuses that are conducting vital scientific and energy research and national security missions.

DOE Strategic Plan of 2014

Goal 1 Science and Energy: Advance foundational science, innovate energy technologies, and inform data driven policies that enhance U.S. economic growth and job creation, energy security, and environmental quality, with emphasis on implementation of the President's Climate Action Plan to mitigate the risks of and enhance resilience against climate change.

Goal 2 Nuclear Security: Strengthen national security by maintaining and modernizing the nuclear stockpile and nuclear security infrastructure, reducing global nuclear threats, providing for nuclear propulsion, improving physical and cybersecurity, and strengthening key science, technology, and engineering capabilities.

Goal 3 Management and performance: Position the Department of Energy to meet the challenges of the 21st century and the nation's Manhattan Project and Cold War legacy responsibilities by employing effective management and refining operational and support capabilities to pursue departmental missions.

“The Oak Ridge Reservation will be remediated, modernized, and reindustrialized as an enduring national asset.”

Mission

Complete the cleanup of the Oak Ridge Reservation to:

- Protect the region's health and environment
- Make clean land available for future use
- Enable the Department of Energy's vital missions of Science, Energy, and National Security

Core Values

- Place the highest priority on safety and security
- Value the diversity, experience, and skills of our people
- Operate in an open manner- promoting collaboration and teamwork with our stakeholders
- Encourage innovation and continuous improvement in everything we do
- Demonstrate accountability by being good stewards of the taxpayers' money


CAUTION


Heritage
center
HERITAGE CENTER BLVD
MAIN ENTRANCE

Perspective

Perspective

The Corps of Engineers began acquiring land in East Tennessee for the Manhattan Project in October 1942. By March 1943, some 56,000 acres were sealed behind the fences and checkpoints of the Clinton Engineer Works and several major industrial facilities were under construction. The K-25 and Y-12 plants were built to separate the fissile isotope uranium-235 from uranium-238, and the X-10 site was established as a pilot plant for the Graphite Reactor which was used to produce plutonium.

Throughout the next 60 years, these three sites— K-25, (now called ETTP) Y-12, and X-10 (now called ORNL) — purified isotopes, conducted research, and built weapons, which created environmental legacies that require decades of cleanup.

As a result of legacy contamination, in 1989 the U.S. Environmental Protection Agency (EPA) placed the Oak Ridge Reservation on the National Priorities List. This list is comprised of property and facilities suspected to pose a threat to human health and/or the environment, and cleanup is conducted under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

In 1989, DOE established the Office of Environmental Management was established to oversee the cleanup of hazardous materials at its facilities throughout the United States, including the Oak Ridge Reservation. 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 CERCLA regulations and other laws.

Early in OREM's history, a dedicated group of community members, regulatory agencies, and DOE and contractor personnel engaged in a comprehensive effort to propose land use end-states for all acreage impacted by contamination on the Oak Ridge Reservation. CERCLA Records of Decision for each of the area's major watersheds have been signed, based largely on the end-use recommendations provided by this group.

The Environmental Protection Agency placed the Oak Ridge Reservation on the National Priorities List in 1989. Three years later, DOE, EPA, and TDEC signed the Federal Facility Agreement to guide and assess the cleanup progress.

OREM Accomplishments

OREM has made significant progress cleaning the Oak Ridge Reservation. Off-site environmental legacy waste sites affected by past DOE operations have been remediated. Regulatory processes and decisions, along with critical infrastructure such as waste treatment facilities and on-site disposal cells, have been implemented to support demolition, disposition, and remediation at the sites.

Several reservation-wide initiatives have been accomplished, such as the Legacy Material Disposition Program that dispositioned more than 100 million pounds of mixed waste. Through characterization, the footprint of the National Priority List property that requires cleanup has significantly decreased from the original 33,508 acres to 14,115 acres. Some of the major accomplishments made to date at each of the three sites are summarized here.

ETTP

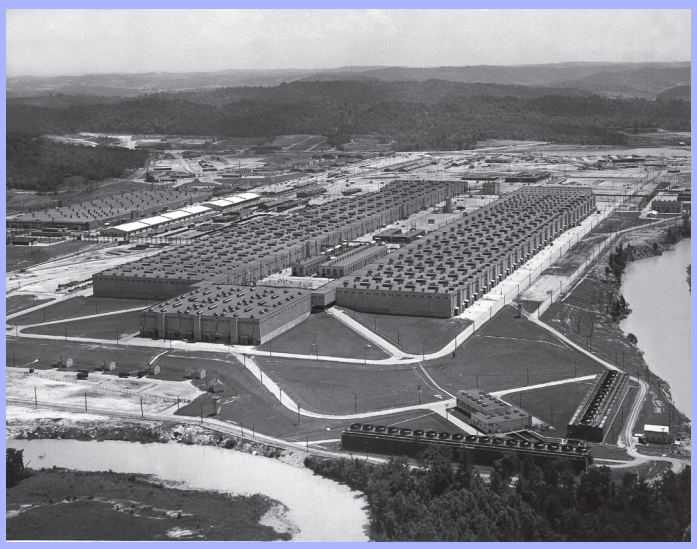
- Demolished more than 400 facilities, including 4 of the 5 gaseous diffusion buildings: K-25, K-29, K-31, and K-33.
- Constructed, operated, and closed the Toxic Substances Control Act Incinerator, which successfully treated 35 million pounds of waste.
- Dispositioned 7,000 depleted uranium hexafluoride cylinders to an off-site facility.

ORNL

- Completed Melton Valley cleanup, including construction of 145 acres of protective soil caps, demolition of 34 facilities, and disposition of 37,000 cubic yards of waste.
- Processed 98% of the contact handled-TRU waste and 85% of remote handled-TRU waste at the TRU Waste Processing Center (TWPC) for disposition offsite.
- Removed Tank W-1A, a principal source of groundwater contamination in the central campus and grouted six massive gunite tanks.

Y-12

- Constructed and operate the 2.2 M cubic yard Environmental Management Waste Management Facility for disposal of CERCLA waste.
- Constructed two treatment systems that annually remove mercury from 110 million gallons of water.
- Removed and dispositioned thousands of pounds of mercury-contaminated sludge from Y-12's West End Mercury Area storm sewer system during two different events that collectively cleaned over 14,000 feet of piping.



ETTP 1947

Y-12 1946

- Transitioned 332,000 square feet of building space and ~700 acres of land to the private sector under the reindustrialization mission.

ORNL 1947

- Removed 42 facilities from ORNL's central campus, eliminating risks to workers and allowing for future missions.
- Completed first phase of U-233 Direct Disposition project.

- Removed five large mercury-contaminated tanks and more than 650 pounds of mercury that eliminated potential risk of mercury vapors.
- Removed all waste and material from the 7-acre Old Salvage Yard, and remediated the area's soil.
- Demolished four dilapidated Biology Complex facilities and cleaned out Alpha 5 and a portion of Beta 4 in preparation for future demolition.

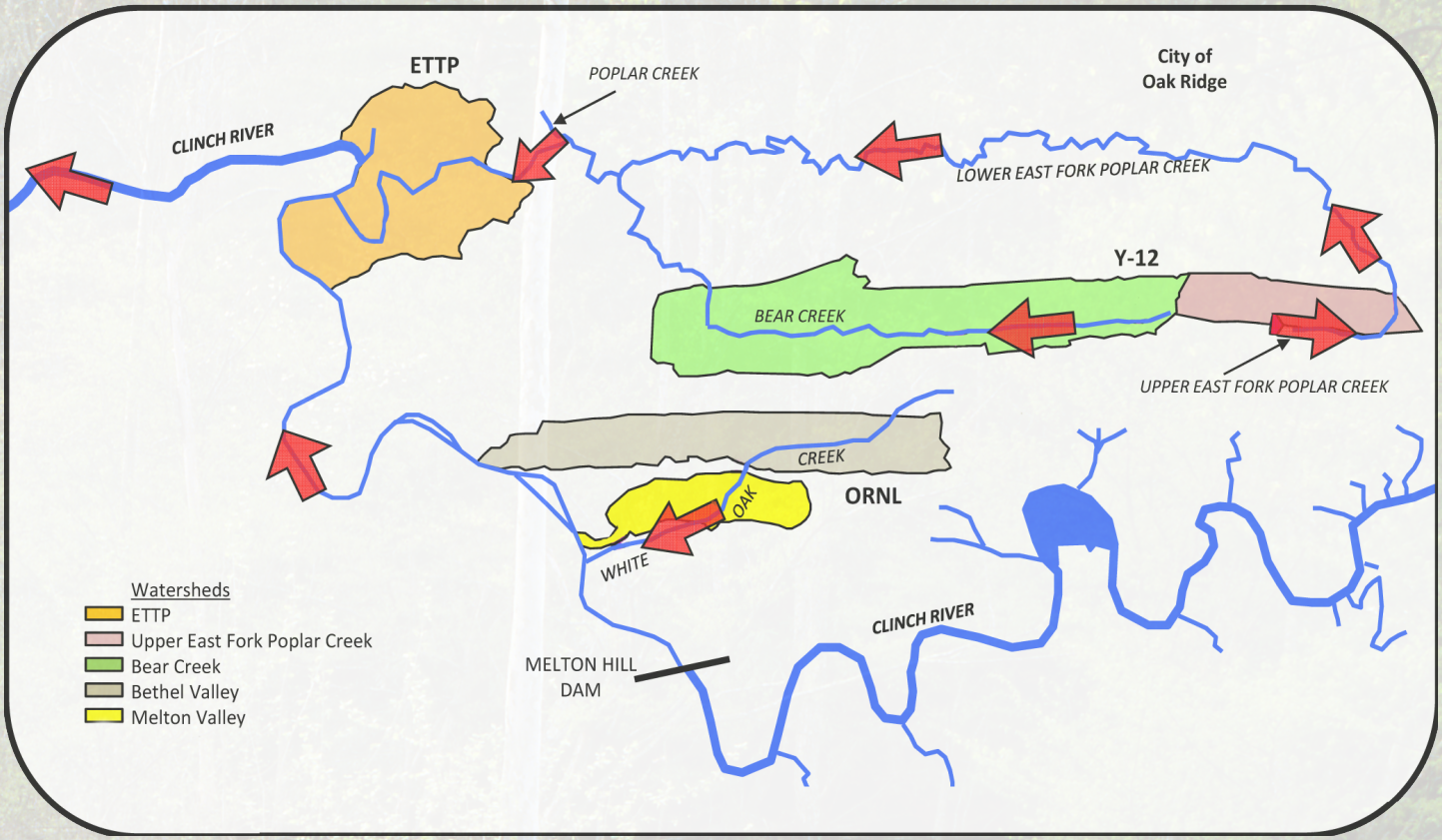
Balancing Priorities

Based on the watershed approach, OREM has developed a portfolio of projects designed to complete remediation at ETTP, ORNL, and Y-12. All three portfolios are integrated into a single plan for the reservation that balances risks across all regulator, stakeholder, and mission priorities within the OREM Program.

Many of the risks at ETTP have already been mitigated, and the focus is now on demolishing legacy facilities and reducing lifecycle costs. The focus at the site is on reducing lifecycle cost risk. Delays in completing the work increase the demolition cost due to building deterioration as well as infrastructure, surveillance and maintenance, security, and landlord costs for every year the cleanup is delayed.

At Y-12, mercury from on-site sources continues to migrate into Upper East Fork Poplar Creek, which enters public water at the site boundary. This poses a high environmental risk, and it is the driver for completing the near-term work to reduce mercury in surface waters at Y-12 through construction of an onsite treatment facility (the Outfall 200 Mercury Treatment Facility).

ORNL's greatest focus remains the removal of legacy nuclear materials and onsite waste. OREM has made some progress dispositioning U-233 canisters and on-site stored transuranic waste; however, these projects are not yet complete and remain the highest nuclear/radiological risk at ORNL.

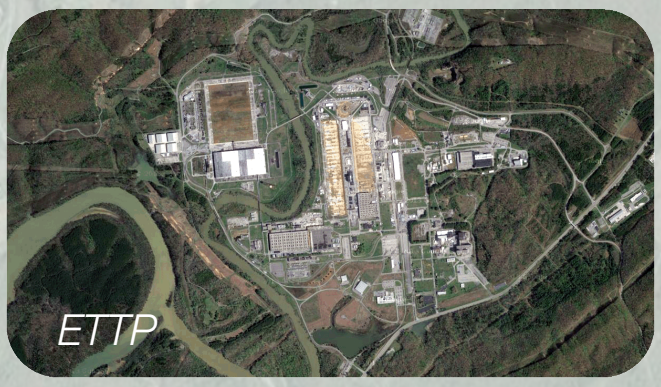


Early in the cleanup process, OREM defined a strategy for cleaning the three sites based on a watershed approach. This approach reflects an understanding of each site's specific geologic setting and potential contaminant migration pathways. It provides a logical grouping of work and a meaningful and measureable method for managing areas of contamination, tracking contaminants of concern, analyzing environmental effects, making decisions, and defining projects within each site. Based on available resources (e.g., funding, workers, disposal capacities, etc.) and further analysis, the cleanup scope for all three sites is then integrated and prioritized.

At ETTP, regulatory commitments, National Historic Preservation agreements, and the continuation of contracted demolition scope make the K-27 building's demolition a high priority for OREM. At ORNL, Defense Nuclear Facilities Safety Board findings and continuation of contracted scope result in the uranium-233 and transuranic waste disposition projects are also a high priority. The urgency to reduce Y-12's mercury migration in public waters completes the top priorities in the OREM Program during the next decade.

Challenges

- Three unique sites with different operational histories and diverse ongoing missions
- More than 500,000 people live within a 30-mile radius
- High levels of rainfall, coupled with shallow groundwater, carry contaminants to local waterways
- Excess large-scale, deteriorating, and contaminated industrial/nuclear facilities require periodic, significant maintenance activities
- Need for vigilant surveillance of contents and conditions
- Diverse group of partners and stakeholders with differing priorities and expectations



Constraints

- Increasing obligations and requirements with limited funding
- Meeting regulatory requirements and milestones
- Conducting cleanup without disrupting ongoing, nationally vital missions
- Ability to treat large volumes of mercury-contaminated soils in a cost-effective manner is not currently available

Risks

- **Environmental risk:** mercury is migrating into surface waters above guideline levels
- **Nuclear/radiological risk:** must disposition remaining legacy waste and highly radioactive material
- **Lifecycle cost risk:** demolition and maintenance costs increase as buildings deteriorate from extended schedules, due to reduced funding
- **Deteriorating facilities:** creates potential for contaminant exposure to the environment and threatens worker safety
- **Unknown contaminant volumes:** indeterminate amount of contaminated soils to be addressed
- **Cleanup decisions:** future groundwater and surface water final decisions have yet to be determined

Key Assumptions

OREM develops remediation strategies for each site to account for their differing contaminants and conditions. The program develops plans based on CERCLA studies to determine the best cleanup approaches that will accomplish acceptable end states. Projects are defined to fulfill the remedial action decisions. Prioritization and sequencing are first performed at the site level, and then integrated at the reservation level.

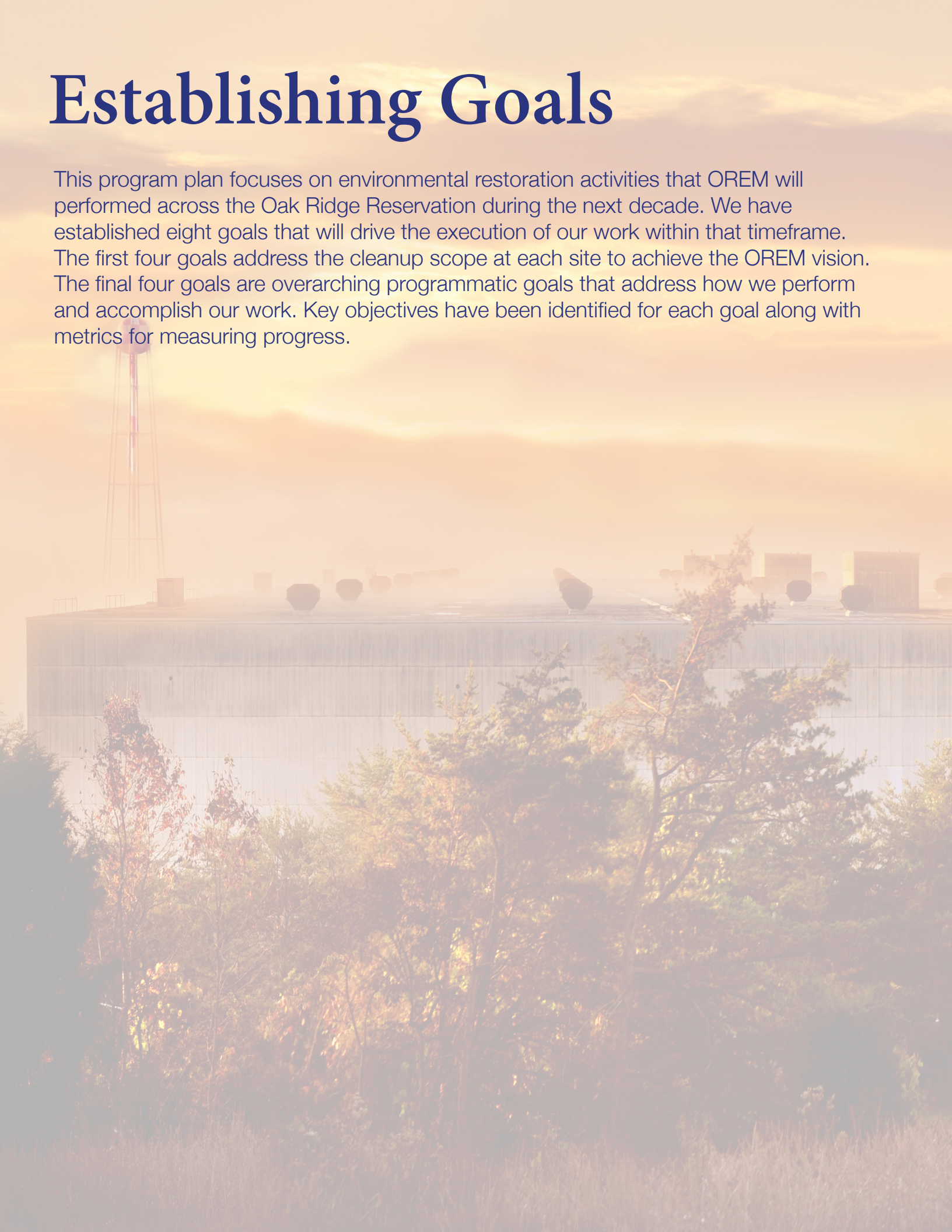
Assumptions are inherent in any process to define scope, schedule, and cost of work. Key assumptions for the OREM Program include:

- Cleanup is implemented under CERCLA, in accordance with the Federal Facility Agreement of the ORR.
- Annual funding at approximately $420 million through fiscal year 2018, then funding is adjusted for annual escalation.
- End states are determined based on meeting land-use requirements specified in the CERCLA decision documents.
- Remaining groundwater contamination challenges will be managed by monitoring, use restrictions, and implementing hydraulic isolation measures for current burial grounds. Using engineering systems to actively restore groundwater is expected to be limited.

- Surface water contamination will be controlled by implementing measures to minimize contaminant migration into streams—with the goal of meeting state regulatory standards. Removing contaminated sediments will be limited to isolated stream reaches.
- Prioritization of work is a balanced tradeoff of four elements: risk, regulatory commitments, external stakeholder interests, and mission support needs.
- Work is generally ranked in the following order (highest to lowest):
    - Mitigate off-site releases
    - Reduce contamination migration off-site
    - Control sources of on-site contamination
    - Demolish legacy facilities
    - Address remaining media (soil, groundwater, surface water)

Establishing Goals

This program plan focuses on environmental restoration activities that OREM will performed across the Oak Ridge Reservation during the next decade. We have established eight goals that will drive the execution of our work within that timeframe. The first four goals address the cleanup scope at each site to achieve the OREM vision. The final four goals are overarching 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 ETTP cleanup (see page 26)
Objective 1: Complete all demolition and remedial action consistent with CERCLA agreements
Objective 2: Implement reindustrialization and historic preservation activities at ETTP

Goal 2: Disposition ORNL uranium-233 inventory (see page 28)
Objective 1: Complete uranium-233 direct disposition campaign
Objective 2: Conduct downblending operations and dispose remaining uranium-233 inventory

Goal 3: Disposition ORNL transuranic waste inventory (see page 29)
Objective 1: Complete disposition of transuranic debris
Objective 2: Begin construction of the Sludge Processing Facility

Goal 4: Address Y-12 mercury contamination (see page 30)
Objective 1: Ensure proper planning for future mercury cleanup
Objective 2: Reduce mercury in surface water exiting the Y-12 facility
Objective 3: Begin to address mercury contaminated buildings

Goal 5: Support efficient and effective cleanup of the Oak Ridge Reservation (see page 32)
Objective 1: Support efficient disposition of cleanup waste
Objective 2: Conduct cost efficient base operations at ETTP, 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 (see page 34)
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 (see page 36)
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 (see page 38)
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

Strategy

Strategy: cleanup

Integrated Cleanup Plan

This plan builds on the successes of the past several decades. Substantial progress has been made remediating contaminated soil and water and demolishing radioactively contaminated facilities. Contamination areas that posed a threat to populations and migration into the environment have been contained through early actions or institutional controls. OREM is dispositioning radioactive and hazardous wastes and portions of nuclear material inventories that threaten public health or pose a risk to the Department's research and national security missions. This plan outlines OREM's approach during the next decade to continue to safely and cost-effectively reduce the legacy of contaminated facilities, materials, and media (including soil, surface water and groundwater) on the ORR.

Completing the four OREM Program cleanup goals during the next decade will accomplish significant risk reduction, and it will allow OREM budgets to be directed toward follow-on demolition and remediation at Y-12 and ORNL.

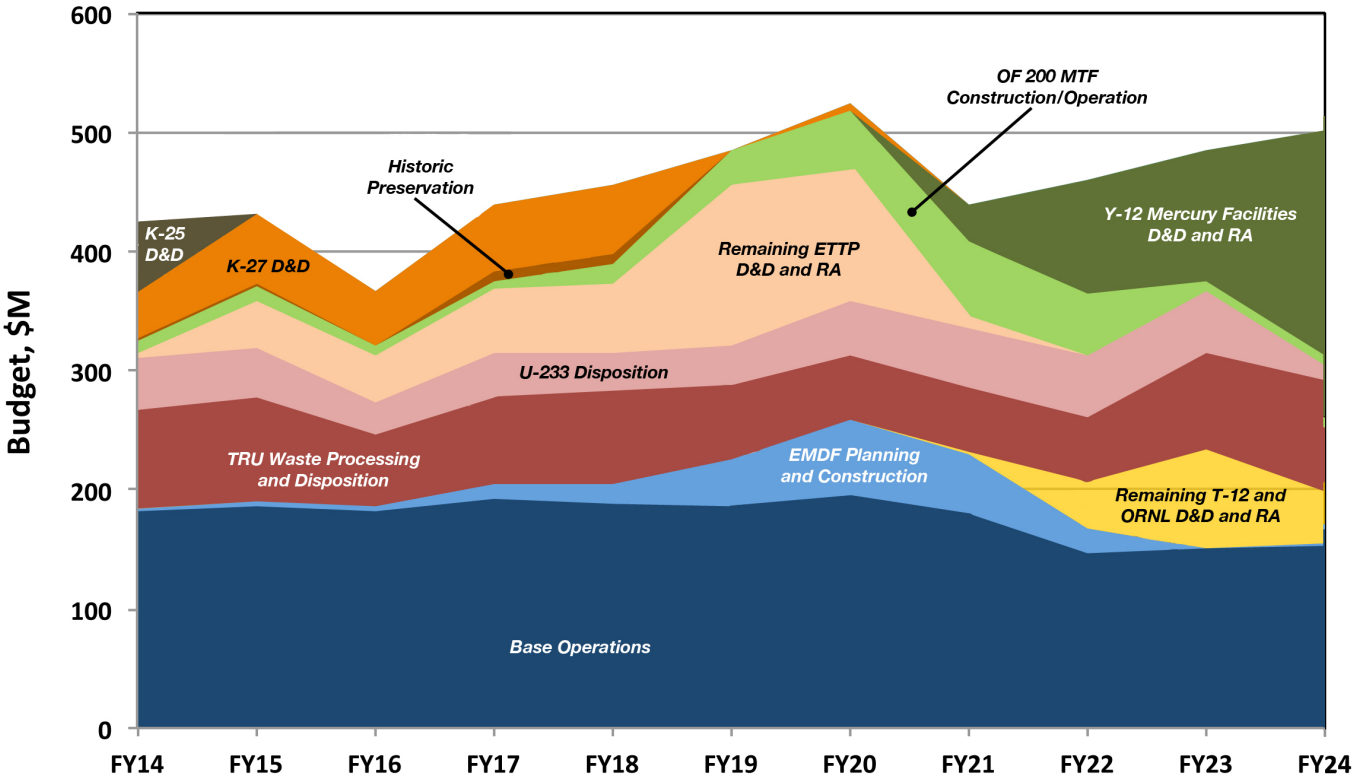
The first four goals of this program capture the cleanup scope for the ORR through fiscal year 2024:

Goal 1: Complete ETTP cleanup
Goal 2: Disposition ORNL uranium-233 inventory
Goal 3: Disposition ORNL transuranic waste inventory
Goal 4: Address Y-12 mercury contamination

OREM will complete Goals 1-3 and the first objective of Goal 4 within the timeframe of this program plan. The second and third objectives of Goal 4 will lead into the future demolition and remediation at Y-12 and ORNL.

The schedule and accompanying graphic illustrate the prioritized work

scope completion and the associated forecasted costs for the four cleanup goals that we will complete over the course of the next decade.



OREM planned funding profile for cleanup - FY 2014 to 2024

Oak Ridge Environmental Management Cleanup Schedule	Fiscal Years (2014 - 2024)										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
GOAL 1: Complete ETTP cleanup											
K-25 D&D											
K-27 D&D											
Historical Preservation Activities											
Remainder of ETTP D&D and RA											
GOAL 2: Disposition the Building 3019 uranium-233 inventory											
U-233 Disposition											
GOAL 3: Complete disposition of ORNL transuranic waste inventory											
TRU Waste Processing and Disposition											
GOAL 4: Address mercury contamination at Y-12											
Outfall 200 Mercury Treatment Facility Planning, Construction, and Operations											
Mercury process buildings D&D											
GOAL 5: Support efficient and effective cleanup of the Oak Ridge Reservation											
On-site disposal (Environmental Management Disposal Facility) planning and construction											
Base Operations (treatment and disposal facilities operations, S&M, Infrastructure)											

OREM integrated cleanup schedule - FY 2014 to 2024

Goal 1: Complete ETTP cleanup

- *Objective 1:* Complete all demolition and remedial action consistent with CERCLA agreements
- *Objective 2:* Implement reindustrialization and historic preservation activities at ETTP

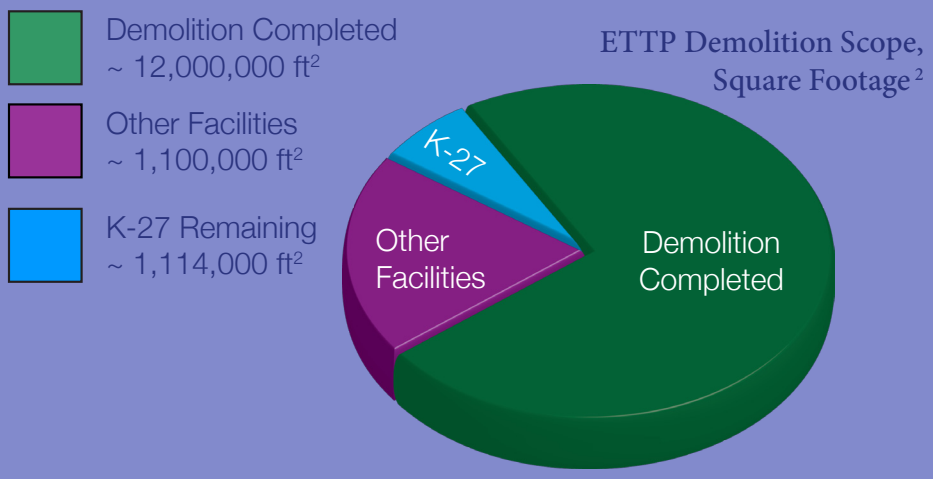
Objective 1: Complete all demolition and remedial action consistent with CERCLA agreements

Performance Measures:

- *Complete K-25 D&D[1] (Completed December 2013)*
- *Complete K-27 D&D*
- *Complete ETTP remaining D&D and remediation (Completed K-31 demo in June 2015)*

OREM has completed a significant percentage of demolition at ETTP. Only one of the five former gaseous diffusion uranium enrichment facilities remains, Building K-27. We are working to declare that the building is "demo ready" in late 2015. This moves our program much closer toward accomplishing Vision 2016, which entails demolishing all of the former gaseous diffusion facilities by the end of the calendar year 2016. Oak Ridge will be the first site in the world to successfully complete this milestone. However, there are other facilities that require demolition to achieve OREM's ultimate vision for the site, including the former Barrier Plant, centrifuge facilities, and other important support facilities. Planning and characterization of some of these facilities is already underway.

OREM will remediate the soils within the main plant and complete final decisions on surface water and groundwater to enable final closure and transfer of ETTP. in the early 2020s. OREM and UCOR are working together on a closure plan that lists all of the projects and activities required before the agency completes the transfer of the site to private industry.



[1] D&D refers to multiple actions including deactivation, decontamination, decommissioning, and demolition

[2] Data as of 8/13/2015

Objective 2: Implement reindustrialization and historic preservation activities at ETTP

Performance Measures:

- *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*
- *Implement commitments in the Memorandum of Agreement for Historic Preservation*

OREM's historic preservation tasks will recognize and commemorate all of the employees and work performed at the former K-25 site. Before the end of 2015, OREM is launching a K-25 virtual museum that includes in-depth narrative about the facility's history and operations, a 3-D tour of the facility, and interviews with former workers. Also in this timeframe, OREM will receive the preliminary design from the professional site design team, and the consulting parties will have an opportunity to review the preliminary design for the history center, equipment building, and K-25 footprint interpretation.

In addition, the EM program is intently focused on ETTP's cleanup to transform the site into an economic engine for the region. The Department's reindustrialization efforts are transitioning underutilized assets to the private sector to accelerate environmental cleanup and promote economic development. Through the program, DOE is giving new life to buildings, land, and equipment that are no longer necessary to serve mission needs and attracting new industry to the area. Activities are underway to support future potential transfers of the K-31/K-33 footprint and former Powerhouse area. In addition, transfer of land at the site is being evaluated by the Metropolitan Knoxville Airport Authority for a proposed airport.

At ETTP's Heritage Center, DOE has already transferred utility systems, roads, 11 buildings, and approximately 200 acres for private sector use. At the Horizon Center, DOE transferred 500 acres for development. The area is now home of the Carbon Fiber Technology Facility, which serves as a national test center for government and commercial partners to scale-up emerging carbon fiber technology, and CVMR, an international metals research and manufacturing company that will create hundreds of local jobs.

Goal 2: Disposition ORNL uranium-233 inventory

- *Objective 1:* Complete uranium-233 direct disposition campaign
- *Objective 2:* Conduct downblending operations and dispose remaining uranium-233 inventory

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

Performance Measures:

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

Canisters of U-233 are housed in ORNL's Building 3019. Building 3019 was constructed in 1943, and it is the oldest operating nuclear facility in the world. The material is in diverse forms and packages, with various levels of isotopic purity. The inventory constitutes a Category I quantity of weapons-usable fissile material, requiring high security costs and access restrictions for ORNL as a whole.

Approximately one-half of the canisters will be dispositioned through the Direct Disposition Campaign. This inventory includes canisters that are eligible for programmatic reuse as well as those eligible for direct disposal. Disposition of these canisters is underway and it is scheduled to be completed in fiscal year 2018.

Objective 2: Conduct downblending operations and dispose remaining U-233 inventory

Performance Measures:

- *Prepare Building 2026 for downblending operations*
- *Process, package, and dispose remaining inventory*

The remaining canisters containing uranium-233 will require downblending of the material to concentrations that are below criticality levels. Project planning documents are being prepared and early preparations have begun in Building 2026 to accomplish this work in existing hot cells. Work is progressing on the project, and approval of the conceptual design is expected in the first quarter of fiscal year 2016. The downblended material will be solidified. Upon conversion to a solid form, the packaged waste will be disposed of off-site.

Goal 3: Disposition ORNL transuranic waste inventory

- *Objective 1:* Complete disposition of transuranic debris
- *Objective 2:* Begin construction of the Sludge Processing Facility

Objective 1: Complete disposition of transuranic (TRU) debris

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 EM's mission to protect the public and the environment. The Transuranic Waste Processing Center allows OREM to process and repackage transuranic materials for disposal off-site. Currently, the contractor at the facility is processing, re-packaging, and certifying legacy remote-handled waste for disposal at the Waste Isolation Pilot Plant (WIPP). In order to continue TRU disposition activities following WIPP's suspension, DOE and its contractors designed new containers that encase the packages of processed remote-handled waste for safe long-term storage until it can be transported offsite. The Site Treatment Plan, approved by TDEC, outlines the planned treatment and delineates milestones to accomplish the processing and certification of these wastes. Our aim is to complete all TRU debris processing and certification by 2018.

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***

Thousands of gallons of legacy transuranic sludges are stored in underground tanks at ORNL. Our commitment to regulators is to remove all of this waste from Oak Ridge, and disposition it offsite. First, however, we need a facility and equipment that can extract the sludges and process them into a solid form suitable for disposal as low-level waste. OREM has already awarded a contract to complete the design of a mock test facility that will advance the technical maturity level of the equipment and systems used to treat and process this material. Design work is ongoing for the mock test facility, and we plan to begin construction in 2016. This facility is important because it allows us to learn and test technologies on a pilot scale so we can employ the most efficient processes and machinery when we complete the final design for the Sludge Processing Facility in 2023. Then, we expect construction to begin in 2024.

Goal 4: Address Y-12 mercury contamination

- *Objective 1:* Ensure proper planning for future mercury cleanup
- *Objective 2:* Reduce mercury in surface water exiting the Y-12 facility
- *Objective 3:* Begin to address mercury contaminated buildings

Objective 1: Ensure proper planning for future mercury cleanup

Performance Measures:

- *Finalize strategic plan for mercury remediation at Y-12 (Completed in Jan. 2014)*
- *Complete evaluation of mercury treatment, stabilization, disposition options*
- *Complete comprehensive mercury technology development plan (Completed Sept. 2014)*

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 from ETTP to Y-12. OREM has developed a Comprehensive Mercury Technology Development Plan, and we have been evaluating soil treatment options and microencapsulation technologies to utilize for future mercury cleanup projects at the site. The results and application of these studies are crucial for site remediation. This work is also enabling a deeper level of understanding of mercury behavior in the East Fork Poplar Creek environment.

OREM has also developed a Strategic Plan for mercury remediation at Y-12 that serves as a roadmap for the many actions that must occur to complete the remediation of mercury contamination at Y-12. Soil remediation planning has already begun. Technology development and initial testing of soil treatment methods has been successful, but it requires additional work to identify scale-up needs and complete cost-benefit analyses. Development and implementation of innovative technologies in the field may allow reductions in cleanup costs, which will translate into achieving more cleanup annually.

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*

Conceptual design of the facility is complete, and the preliminary design is underway. The Mercury Treatment Facility will remove mercury from the Y-12 West End Mercury Area. The proposed design for the facility has the capability to

treat 3,000 gallons of surface water per minute and the ability to collect and store 2 million gallons of stormwater flow in excess of its treatment capacity. This facility is necessary before OREM can begin large-scale demolition projects at Y-12. In 2015, regulators approved OREM's Proposed Plan that identifies our preferred option for the facility's construction.


Alpha 5 facility

Objective 3: Begin to address mercury contaminated buildings

Performance Measure:

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

Preparations for D&D of large mercury-use facilities will include identification and analysis of treatment methods for building debris to meet regulatory land disposal restrictions; building and equipment characterization activities; development of regulatory documents; and operational activities such as asbestos abatement and removal. Most recently, OREM completed a study on debris treatment and disposal which supported in-cell macroencapsulation of the mercury-contaminated debris.

At the request of DOE's excess facility working group, Oak Ridge has developed an integrated cleanup plan to begin addressing and removing excess, contaminated facilities at Y-12 beginning in FY17. With a modest increase in budget, we will be able to begin addressing the emerging risks associated with the rapid degradation of excess facilities that are now well past their design life.

Strategy: programmatic

Four programmatic goals have been defined to guide and strengthen the framework that supports, manages, oversees, and ultimately safely accomplishes the cleanup scope.

- **Goal 5:** *Support efficient and effective cleanup of the Oak Ridge Reservation*
- **Goal 6:** *Focus on continuous improvement in safety, security, environmental compliance, and quality performance*
- **Goal 7:** *Achieve excellence in project and contract management*
- **Goal 8:** *Optimize collaboration with external stakeholders and oversight agencies*

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 ETTP, Y-12, and ORNL
- *Objective 3:* Routinely evaluate surveillance and maintenance plans to ensure unacceptable risks are identified and addressed

Certain activities and services are required to maintain each site in a safe and stable condition and to support the cleanup work on the reservation. These base operations include waste treatment, processing, and disposal operations; surveillance and maintenance of waste and inactive facilities; water quality monitoring and reporting; and landlord activities such as providing security and maintaining infrastructure at ETTP. Base operations is a recurring, annually-funded priority at each site, based upon supporting cleanup operations, maintaining safety, and mitigating risks.

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 2020's. Construction of a new CERCLA disposal facility, called Environmental Management Disposal Facility, involves identifying a site and constructing the first two disposal cells. The preferred site is located near the existing Environmental Management Waste Management Facility, so that the facilities can share infrastructure and support facilities. Currently, we are in the process of working with our regulators to reach an agreement on the preferred alternative for the location where we will dispose of our future waste.

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

Performance Measure:

- *Reduce costs of base operations by 5%*

Contractors are incentivized to continually search for opportunities to perform work for the best value, resulting in a reduction in base operations costs to the program. More funds can be directed toward environmental cleanup if the cost of surveillance and maintenance and other landlord activities decrease. This requirement has been added to the EM Annual Performance Agreement, and OREM has developed a plan with our contractor, UCOR, to achieve this objective.

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

Performance Measure:

- *Partner with contractor to identify new/emerging risks from excess facilities*
- *Ensure OREM baseline reflects balanced priorities between surveillance and maintenance and cleanup scope*

Surveillance and maintenance of excess facilities and legacy waste comprises a significant portion of work under the base operations scope at each site. Many of these activities include monitoring and routine maintenance procedures. Sometimes non-routine measures are planned in advance; however, many non-routine maintenance events are unforeseen. As an example, in 2014, employees discovered a leaking reactor pool in Oak Ridge Research Reactor, a non-operational facility that is awaiting cleanup. Our contractor has removed components that were the source of 96 percent of the radiation in the pool, and they have drained the water from the pool. A concrete cap will be placed over the pool for shielding.

It is imperative to complete forward-looking risk analyses to direct surveillance and maintenance activities and minimize non-routine events. In 2014, OREM and its contractors assembled teams that evaluated facilities across Oak Ridge's three cleanup sites to help eliminate unanticipated events and increase preparedness. Employees conducted walk-throughs that identified all of the hazards, risks, and potential issues associated with each facility. This study also provided an understanding of the costs of current risks and potential scenarios to allow OREM to plan and prioritize future projects.

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

OREM strives daily, from the planning of operational activities and projects through execution of our work, to continuously improve performance in terms of safety, security, compliance, and quality.

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 (Completed in December 2014)*
- *Execute/manage annual integrated assessment schedule*

OREM understands the importance of continuous improvement and the synergy and power that result from aligning purpose, people, and values. Our organization will continue to strive for continuous improvement and diligently complete assessments to identify any areas to advance. One of the most crucial methods to accomplish continuous improvement is developing performance measures that direct operations toward safer, more efficient operations. The other key is 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 (Completed in 2013 and 2015)*
- *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*

OREM completed a Safety Conscious Work Environment (SCWE) self-assessment in 2013,

and the organization conducted a follow-up in 2015. Both surveys revealed that OREM has a work environment where workers feel free to raise safety concerns to management without fear of retaliation. While this is a positive outcome, the SCWE self-assessment identified areas for improvement regarding the organizational culture. A SCWE Plan of Action was developed to begin to address the results of the 2013 survey and a new plan is being developed to strengthen the work environment for the OREM organization based on the 2015 evaluation results.

We not only expect a safe workplace for our employees, but we also hold our contractors to the same standards. We emphasize those expectations and priorities 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***

OREM's most important responsibility is the protection of human health and the environment. The organization places a primary focus on accelerating cleanup where 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 to our work; therefore we will continue to 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***

The OREM workforce is the organization's most important asset. Employees must have the training and experience required to successfully manage projects and provide effective federal oversight to the contractors performing work in Oak Ridge. The organization will continue to find and develop employees, ensuring we do not lose capability when retirements occur. In addition, OREM will work to strengthen itself 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
- *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

Effective project management sets the course for successful project execution and guides it to completion. Excellence in project management and contract management will result in achieving many other goals and objectives within the program.

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*
- *Complete 90% of projects within 10% of the original cost and schedule in the Performance Baseline and address root cause of ±10% cost/schedule performance index variances promptly*
- *Submit annual fiscal year work plans for operational activities before start of the fiscal year*
- *Evaluate and update project documentation (Project Execution Plans, Integrated Project Team Charters, etc.) on at least an annual basis*

The primary objective for the OREM program is to successfully complete all of its projects despite certain challenges including but not limited to fiscal constraints. OREM emphasizes balancing contract and project management with financial management to ensure we are good stewards of the taxpayer dollars entrusted to us. OREM strives to accomplish the maximum amount of work possible from the funds it receives. Therefore, it is imperative that projects are properly planned and completed 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*
- *80% of contract change proposals/requests for equitable adjustment are dispositioned within 180 days*
- *100% of all Performance Evaluation Management Plans are issued unilaterally, 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*

OREM relies on contractors to perform a majority of the environmental cleanup work on the Oak Ridge Reservation. Effectively managing those contracts 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 fostering positive, teaming relationships.

Objective 3: Promote the use of small business contractors

Performance Measure:

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

OREM understands the importance of creating an environment that maximizes participation by small, small disadvantaged, HUBZone, veteran-owned, 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 OREM fully appreciates their significant contributions to the program's successes. OREM will continue to be a strong advocate of small businesses, and it 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 oversite 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

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 Environmental Management program. OREM provides many opportunities throughout the year for stakeholders to provide input on the things important to them, and in turn, OREM is responsible for communicating its progress, successes, and challenges to the public. OREM is committed to identifying additional opportunities to engage those who have an interest in our achievements.

Objective 2: Collaborate effectively with external regulatory agencies

Performance Measures:

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

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. OREM has committed to collaborate with the regulators by proactively engaging them throughout the process of planning our work and creating "win-win" opportunities for combined success.

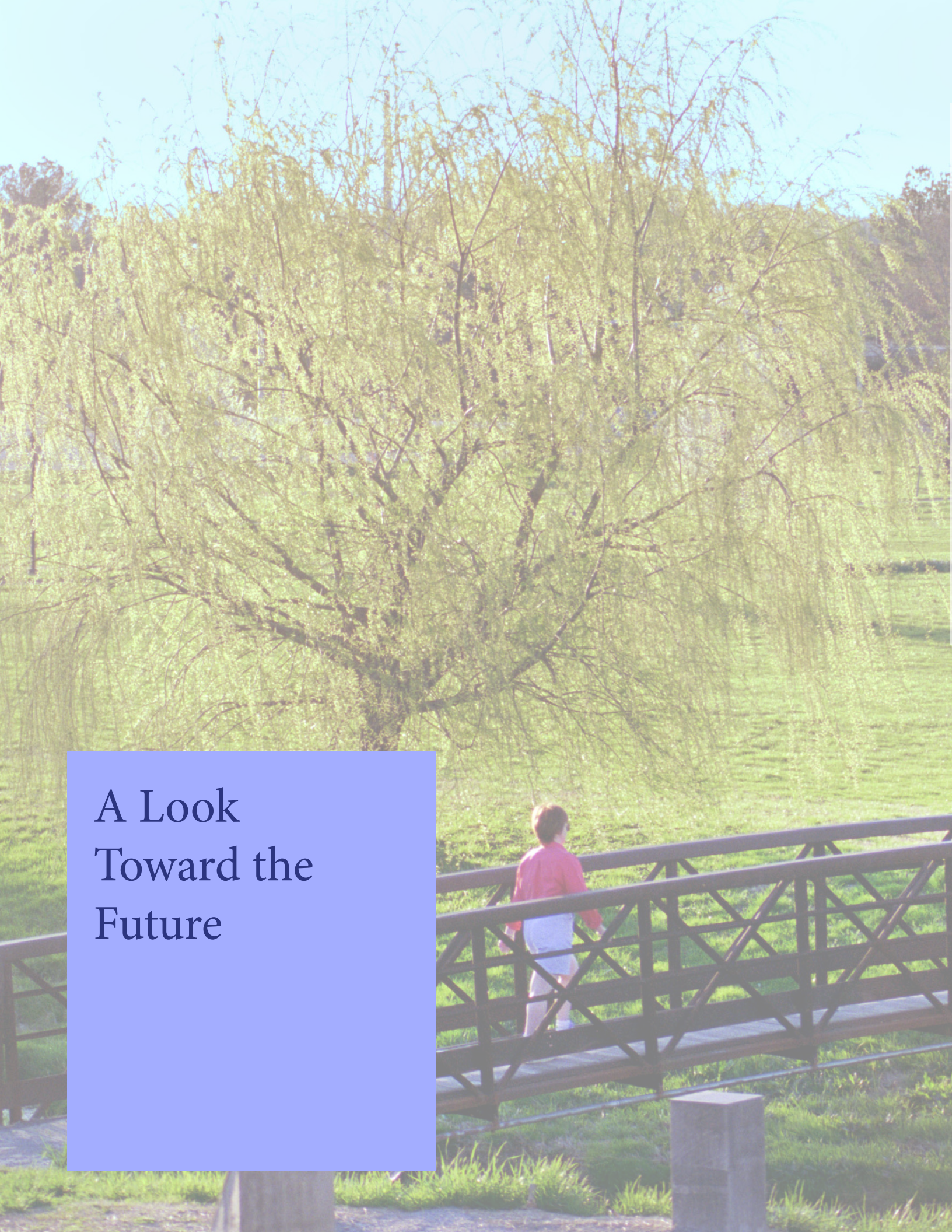
Objective 3: Maintain a proactive relationship with the Defense Nuclear Facilities Safety Board (DNFSB)

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 Department of Energy defense nuclear facilities. OREM will maintain a positive relationship by communicating project successes and challenges early and often and by promptly responding to requests for information.

"Collaboration and open communication with our stakeholders and oversight agencies adds value to the program by promoting clarity and mutual understanding."



A Look Toward the Future

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

OREM will demolish mercury use facilities and several other large facility complexes at Y-12. The cleanup program will also address and remove reactor and hot cell facilities, as well as other unique structures at ORNL that require specialized, remote-handling during demolition. Finally, OREM will conduct extensive soil remediation at both sites.

When Y-12 and ORNL's demolition and remediation are complete, OREM will make a final decision regarding groundwater and surface water cleanup and begin long-term stewardship. Long-term stewardship includes land-use controls, monitoring and maintenance, and information management. Together, these practices ensure protection for the people and environment near our former cleanup sites.

U.S. DEPARTMENT OF ENERGY