

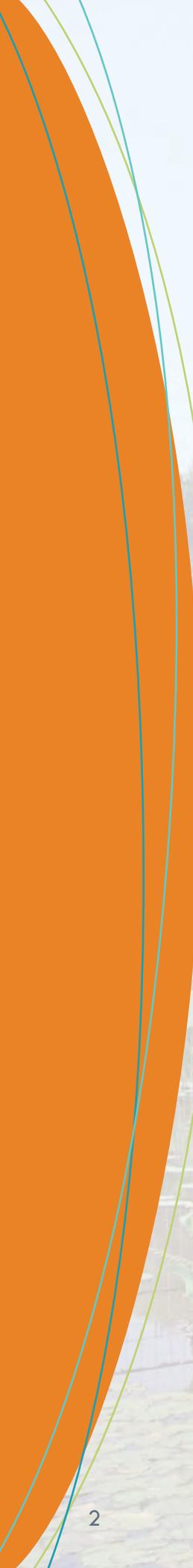


U.S. DEPARTMENT OF
ENERGY



DEPARTMENT OF ENERGY OAK RIDGE OFFICE OF ENVIRONMENTAL MANAGEMENT **ECONOMIC IMPACT ANALYSIS**

The Oak Ridge Office of Environmental Management was established to remove environmental legacies resulting from more than 60 years of nuclear weapons development and government-sponsored nuclear energy research. Each of Oak Ridge's three primary cleanup sites faces unique challenges that present risk and hinder the Department's missions.



DEPARTMENT OF ENERGY

OAK RIDGE

ENVIRONMENTAL

MANAGEMENT

The Oak Ridge Office of Environmental Management (OREM) is a U.S. Department of Energy (DOE) field site located in Oak Ridge, Tennessee. The site dates back to 1942 as part of the Manhattan Project. Engineers established three distinct campuses within the Oak Ridge Reservation to develop enrichment technologies for uranium and plutonium. In the decades since, each of these campuses—the Oak Ridge National Laboratory (ORNL), Y-12 National Security Complex (Y-12), and the former K-25 Gaseous Diffusion Plant, now known as the East Tennessee Technology Park (ETTP)—evolved and conducted different missions for the Department.

While Oak Ridge has a rich history, it also has an increasingly bright future. Our employees realize that their progress directly impacts the Department's other missions and development at the site. At Y-12, we are working to remove mercury soil and groundwater contamination, manage excess facilities, and modernize the site to enable the National Nuclear Security Administration to continue its crucial national security and nuclear non-proliferation responsibilities. At ORNL, we are working to remove excess and contaminated facilities to improve safety and make way for the world's most advanced supercomputing, materials, and energy research. At ETTP, we are executing a portfolio of cleanup projects that demolish facilities, dispose legacy waste, and remediate soil and groundwater to return the land to beneficial reuse—a private sector industrial site with a historical national park.

Our office's primary mission is to protect the region's health and environment, enable the Department's vital missions locally, and make clean land available for future use. To accomplish this, we adhere to several principles as we conduct our operations. We value the skills of our employees, operate in a transparent manner, collaborate with our various stakeholders, encourage innovation and continuous improvement, and demonstrate accountability through good stewardship of taxpayers' money.

OREM's daily operations create jobs and income for area residents and generate substantial tax revenues for state and local governments. Overall spending by OREM and its contractors added approximately \$545 million to Tennessee's state gross domestic product in fiscal year 2014, including \$422 million in Anderson, Roane, and Knox Counties.

OAK RIDGE CLEANUP

In October 1942, the U. S. Army Corps of Engineers began acquiring land for the Manhattan Project. By March 1943, three major industrial facilities were under construction in Oak Ridge. The K-25 (present day ETTP) and Y-12 plants were built to separate uranium, while the X-10 site (present day ORNL) housed the Graphite Reactor, the world's first self-sustaining nuclear reactor. Throughout the next six decades the sites purified isotopes, conducted research, built weapons, and created environmental legacies that the OREM program is now cleaning and removing.

Since 1989, when OREM was formed, the DOE has made great progress remediating contaminated soil and water and demolishing radioactively contaminated facilities. To dispose of wastes generated by environmental restoration activities, including the demolition of the massive process buildings at ETTP, DOE built the Environmental Management Waste Management Facility (EMWMF). The disposal facility has been engineered to safely contain the low-level hazardous wastes from cleanup activities.

After completing the removal of the environmental legacies at the former K-25 site in the next 5-7 years, DOE will continue with cleanup at Y-12 and ORNL. Because DOE's existing waste disposal facility is nearing capacity, another disposal option is needed for waste from Y-12 and ORNL. The ability of both Y-12 and ORNL to deliver and grow their respective missions, and modernize their sites, is directly related to the cleanup and removal of contaminated facilities.

An additional onsite waste disposal facility has been proposed to provide the safest, most timely and cost-effective cleanup strategy.

Demolition is complete for K-33, K-31, K-29, and K-25 (circled in blue); demolition is underway at K-27 (circled in orange).



Debris from demolition at ETTP is disposed on site at the EMWMF.



CURRENT ONSITE WASTE DISPOSAL

The OREM program has extensive experience safely constructing and operating landfills. The current waste disposal facility has operated since 2002 without a safety incident.

The current onsite facility's design includes a 14-foot multi-layered closure cap system. The 15-foot underlying containment system includes a 5-foot multi-layered liner above a 10-foot geologic buffer. Groundwater monitoring is conducted regularly, in accordance with regulatory requirements.

Managing waste on site with ongoing regulatory oversight has demonstrated operation efficiencies and risk reduction. Onsite disposal has eliminated the need to transport waste millions of miles on public roads to offsite disposal facilities. These offsite facilities are outside of the OREM operational footprint and governed by other states, posing risk to the reliable disposal of waste.

Current onsite disposal facility and cross-section of engineered disposal cell



ECONOMIC BENEFITS OF OREM PROGRAMS

OREM’s presence in Tennessee generates substantial economic benefits. Everyday operations create jobs and income for residents and increase state and local tax revenues. A previous study, conducted by the East Tennessee Economic Council for fiscal year (FY) 2013 by the Howard H. Baker Jr. Center for Public Policy at the University of Tennessee, Knoxville, provided estimates of the economic benefits of DOE on the state of Tennessee. A new study, also by the Howard Baker Center, was conducted to specifically assess both the economic impacts of FY14 OREM programs and a potential new onsite disposal facility. Part I of the study summarizes the key economic benefits conveyed in Tennessee, and more specifically in Anderson, Roane, and Knox Counties, using data from FY14. Part II summarizes the economic impacts that a second onsite disposal facility would provide to the state and local economies. Results from both parts confirm that there are substantial environmental and economic benefits of OREM’s current and planned activities on the state as well as on its residents.

Total FY14 Economic Impact of OREM-Related Programs

	Anderson/Roane/ Knox Counties	Tennessee
Output/State GDP	\$422.3 M	\$545.3 M
Personal Income	\$277.9 M	\$316.6 M
Sales Tax Revenue	\$14.9 M	\$16.9 M
Employment	4,800	6,200

Final demolition of the K-31 building at ETTP (above) creates site for industrial reuse.

Employees (below) worked on a project to remove irradiated parts from a reactor pool at ORNL.

PART I

KEY FINDINGS FOR OREM FY14 ACTIVITIES:

- Overall spending by OREM and its contractors added approximately \$545 million to Tennessee’s gross domestic product (GDP) in FY14, including more than \$422 million in Anderson, Roane, and Knox Counties.
- Approximately 6,200 full-time jobs were created in Tennessee by OREM in FY14, including both direct and indirect employment, of which 4,800 were in Anderson, Roane, and Knox Counties.
- OREM-related activities generated roughly \$317 million in total personal income in Tennessee in FY14, of which \$278 million were in the three-county region.
- Spending by OREM and its contractors generated approximately \$17 million in state and local sales tax revenue in Tennessee in FY14. Of this total, nearly \$15 million in tax revenues were generated in the three-county region.
- Direct regional economic impacts include approximately \$511,000 donated by OREM contractors and their employees to various local charities in FY14.

DOE-OREM SPENDING GENERATED JOBS, PAYROLL AND TAX REVENUES

Direct spending by OREM produces state and local benefits through jobs, income, and sales tax sending ripples through the economy. Multiplier effects* are created as the income generated by the direct and indirect effects is spent and re-spent within the local economy.

JOBS:

The estimated 6,200 jobs created in Tennessee through OREM-related spending resulted from 1,900 full-time jobs directly provided by OREM and its major contractors within Anderson, Roane, and Knox Counties in FY14.

Every direct job created by OREM supported an additional 3.2 jobs in Tennessee.

PAYROLL:

OREM-related direct jobs represented a payroll of more than \$146 million in FY14, with an average salary of \$75,500, which is 66% above the average salary in Tennessee.

An additional \$23 million were spent on pension disbursements, bringing the total direct income paid in FY14 to \$168 million to current and former employees.

For every dollar spent on salaries and pensions, approximately \$1.88 was generated in additional state income. Income benefits from OREM-related activities were estimated at more than \$316 million in Tennessee and nearly \$278 million in the three-county region.

TAX REVENUES:

Direct spending for goods and services by OREM and its contractors totaled \$127 million in FY14.

OREM-related spending in the three-county region produced more than \$9 million in direct sales tax revenues. As a result, nearly \$17 million were collected in sales taxes in Tennessee, originating from OREM-related expenditures.

OREM programs direct spending in FY14 totaled more than \$295 million.



A 1-megawatt solar field and spec building at ETPP are examples of site reuse.

**Note on multiplier effect: Translating direct effects into total effects through multiplier analysis requires the use of Regional Input-Output Modeling System (RIMS II) multipliers. The RIMS II multipliers used in this analysis are specific to Tennessee and are calculated by the Bureau of Economic Analysis.*

EXPECTED ECONOMIC IMPACT OF A NEW DISPOSAL FACILITY

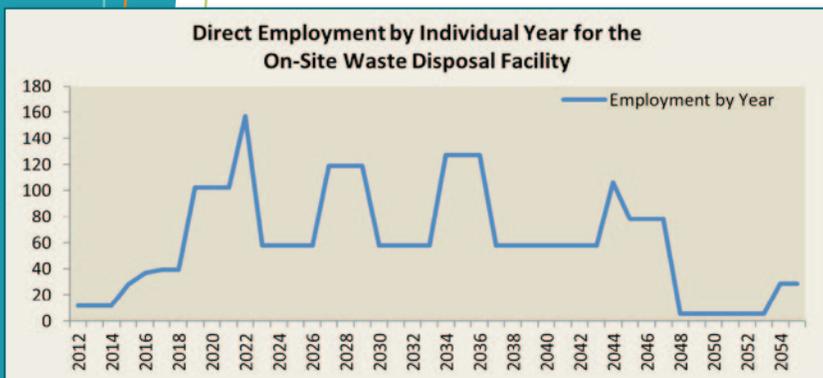
OREM is currently designing a second onsite disposal facility that would enable the safe, timely, and cost-effective cleanup of the Oak Ridge Reservation. This section examines the economic impact of this proposed new facility from the beginning of design in 2012 through facility closure in 2047 and monitoring and maintenance from 2048-2055, after which long-term care would begin.

Part II

KEY FINDINGS FOR A SECOND ONSITE DISPOSAL FACILITY INCLUDING DIRECT, INDIRECT AND MULTIPLIER EFFECTS:

- Spending by OREM and its contractors would add approximately \$1.3 billion to Tennessee’s state GDP over the life of the project. Approximately \$1 billion of which is projected to accrue to Anderson, Roane, and Knox counties.
- OREM-related activities for the project would generate roughly \$695 million in total personal income in Tennessee; of which \$609 million would go to the three-county region.
- Cumulative annual employment (job years) over the life of the project is estimated to reach 6,800. Approximately 5,700 of those job years are projected to be filled in Anderson, Roane, and Knox counties.
- Spending by OREM and its contractors would generate approximately \$54 million in sales tax revenue in Tennessee. Of that total, an estimated \$50 million in tax revenues are projected for the three-county region.

DIRECT BENEFITS OF A SECOND ONSITE DISPOSAL FACILITY



Direct employment for the on-site waste disposal facility would result in an estimated 2,700 job years, a figure based on cumulative employment by year over the life of the project. The number of workers at the facility would vary considerably year-by-year with peaks at each construction phase and during closure.

With a second onsite disposal facility, OREM and its contractors would employ highly-skilled managers, engineers, operators, laborers, foremen, and security professionals.

The study estimates more than \$723 million would be spent by the environmental cleanup program during the life-cycle of the proposed on-site disposal facility. The potential economic impacts associated with these expenditures are substantial.

OREM’s purchase of goods and services from Tennessee businesses to design, construct and operate the second on-site disposal cell would contribute significantly to the sales tax base. OREM and its contractors would directly pay an estimated \$18 million in sales tax over the life of the project.

Current waste disposal facility (aerial view during operations) is projected to reach maximum capacity in 2023 at current funding levels.

ADDITIONAL ECONOMIC BENEFITS FROM A SECOND ONSITE DISPOSAL FACILITY

When circulated through the state economy, spending by OREM for a second onsite disposal facility would generate personal income benefits for residents, and sales tax revenue for state and local governments in Tennessee.

Direct spending over the life of the project is projected to increase Tennessee’s GDP by nearly \$1.3 billion as a result of indirect and multiplier effects.

- This increase in State GDP represents expected benefits of payroll and non-payroll expenditures by OREM.

Economic Benefits of a Second On-Site Waste Disposal Facility		
Impact	Direct	Total
Output/State GDP	\$723.3 M	\$1.3 B
Personal Income	\$351.1 M	\$694.7 M
Sales Tax Revenue	\$18.2 M	\$54.1 M
Cum. Annual Employment	2,700	6,800

Total personal income benefits from OREM activities in Tennessee, related to a second onsite disposal cell, is projected to total almost \$695 million.

- Every dollar of income paid directly to workers of OREM and its contractors is expected to create \$1.96 in total income for Tennessee residents.

Overall direct employment related to the project (2,700) would result in approximately 6,800 full-time job years.

- For every direct job provided by OREM, 2.5 jobs would be supported across the Tennessee economy.

Total sales taxes associated with OREM programs, related to a second onsite disposal facility, would total roughly \$54 million.



Proposed location of additional disposal facility adjacent to current disposal facility

Bear Creek

Bear Creek Rd



This document was developed for the
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