

## Oak Ridge National Laboratory Central Campus Cleanup - 10574

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### ABSTRACT

The Integrated Facility Disposition Program (IFDP) will eliminate the high risk legacies of the Manhattan Project and Cold War, complete the Oak Ridge Reservation (ORR) environmental cleanup mission, and enable ongoing modernization of the Oak Ridge National Laboratory (ORNL) and Y-12 National Security Complex (Y-12). The Department of Energy (DOE) approved the IFDP Critical Decision-1, *Alternative Selection and Cost Range* in November 2009. In 2009 funding was provided through the American Recovery and Reinvestment Act (ARRA) that “jump started” the IFDP through the ORNL Central Campus Cleanup.

### INTRODUCTION

The DOE Oak Ridge Reservation (ORR) was created in the early 1940s as part of the World War II Manhattan Project to support the development of the world’s first atomic weapon. As shown in Figure 1 the 34,000 acre ORR was originally comprised of three sites; ORNL, Y-12, and the K-25 Site Gaseous Diffusion Plant Site which is now the East Tennessee Technology Park (ETTP).

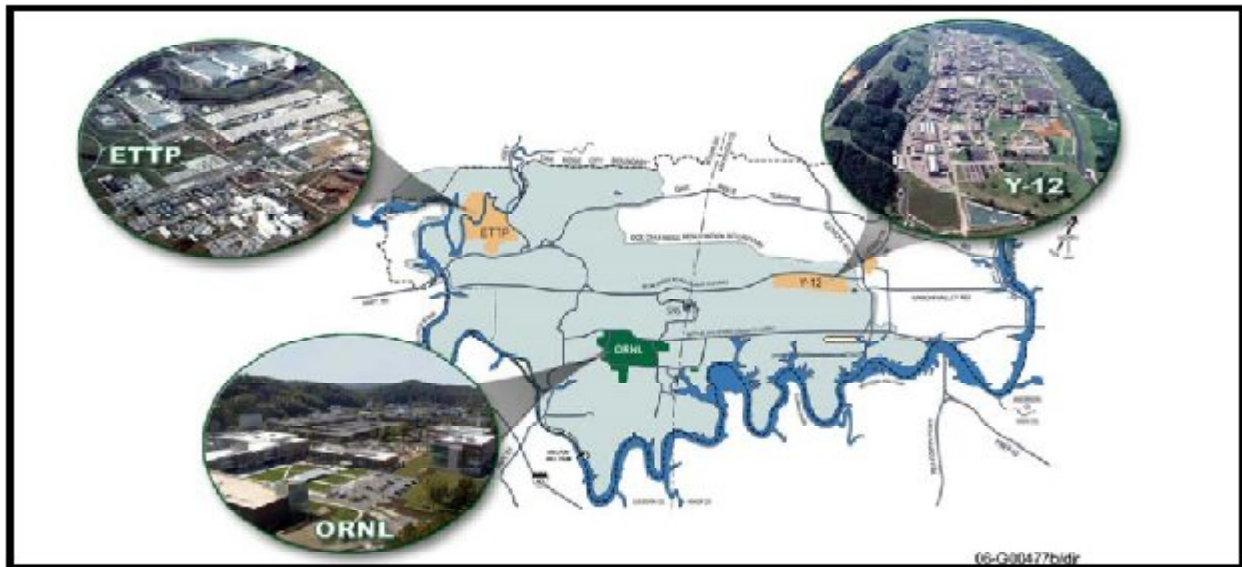


Fig. 1. Oak Ridge Reservation Location of Major Facilities

As part of the Manhattan Project, Y-12 was designed to separate U-235 from natural uranium using the electromagnetic separation process; ORNL was established to pioneer a method for producing and separating plutonium; and the K-25 site (currently the ETTP) was created to produce highly enriched uranium for use in atomic weapons. Each site now has its own distinct purpose: ORNL is an energy

research and development laboratory; Y-12 manufactures, stores, and disassembles nuclear weapons components; and the ETTP is currently undergoing environmental restoration and facility disposition as part of its conversion to a private industrial park.

Over the past 60 years, mission-critical operations and past waste disposal practices have led to radioactive and hazardous materials contamination. To address the legacy of environmental contamination the ORR was placed on the National Priorities List in 1989. This action established the regulatory framework for environmental cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986. In 1992, the DOE Oak Ridge Operations (ORO) was established as the lead agency responsible for environmental cleanup of the ORR with the creation of the Federal Facility Agreement among the U. S. Environmental Protection Agency, the Tennessee Department of Environment and Conservation and DOE. Since DOE is the lead agency, environmental cleanup on the ORR is performed under the DOE ORO Environmental Management (EM) Program whose mission is risk reduction and cleanup of the environmental legacy from the nation's nuclear weapons research and production programs.

Modernization efforts have increased the environmental cleanup needs at ORNL and Y-12. For example, excess facilities have been identified which are no longer needed for current and prospective DOE missions. These excess facilities pose an increased human health risk, hinder current and future ORNL and Y-12 modernization efforts, and prevent access to underlying contaminated soil and groundwater in need of remedial action. The Office of Science (SC), the Office of Nuclear Energy (NE), and the National Nuclear Security Administration (NNSA) have identified more than 490,000 square meters (m<sup>2</sup>) (5.3 million square feet (ft<sup>2</sup>)) of facility space which is or will become excess over the next 20 years. These newly identified contaminated buildings and underlying soil and groundwater pose an unacceptable risk to worker safety and health and to the mission of some of DOE's most important programs.

The original EM baseline was prepared over a decade ago. Although substantial cleanup progress has been made through previous CERCLA actions, today's EM life-cycle baseline only accounts for a fraction of the cleanup scope that currently exists at ORNL and Y-12. Furthermore, the current EM life-cycle baseline does not account for the effects of continuing facility deterioration at ORNL and Y-12. Since the environmental cleanup effort impacts multiple DOE programs in Oak Ridge (EM, SC, NNSA, and NE) and modernization initiatives have created additional environmental liabilities, the IFDP has been created.

IFDP will eliminate the high risk legacies of the Manhattan Project and the Cold War, complete the DOE EM cleanup mission in Oak Ridge, and enable on-going modernization of ORNL and Y-12. IFDP will integrate and re-sequence the current EM baseline scope with the new cleanup scope resulting in enhanced risk reduction, greater cost savings, and more rapid and efficient performance of work, in accordance with the Critical Decision (CD) Process described in DOE O 413.3A, *Program and Project Management Policy for the Acquisition of Capital Assets*, July 28, 2006, and its implementation manual, DOE Manual (M) 413.3-1.

CD-0, *Approve Mission Need*, was received in June 2007. CD-1, *Approve Alternative Selection and Cost Range*, was received in November 2008. CD-2/3 *Approve Performance Baseline/ Approve Start of Construction* are expected to be achieved in phases as individual projects mature. CD-4, *Approve Start of Operations*, will only be required for waste operations facilities.

## **INTEGRATED FACILITY DISPOSITION PROGRAM AT OAK RIDGE NATIONAL LABORATORY**

DOE has invested \$500 million over the last ten years to modernize ORNL facilities and consolidate staff to the main campus. Key accomplishments include:

- 70 excess facilities have been demolished
- 176,000 gross m<sup>2</sup> (1.9M gross ft<sup>2</sup>) of space have been vacated
- A program tax was established to fund legacy material disposition that disposed 17,000 chemical items and 2,550 cubic meters (m<sup>3</sup>) of low-level waste (LLW) and mixed waste
- Mercury discharge to White Oak Creek was reduced by 80%
- \$239 million has been programmed to modernize infrastructure and relocate missions and staff from the Central Campus area including construction of a new sewage treatment plant

The IFDP end state vision for ORNL includes complete removal and disposition of existing legacy waste/material, complete demolition of 327 excess facilities, complete remedial actions at 119 sites including finalized Records of Decision for groundwater and surface water, reconfiguration of aged and oversized waste treatment facilities, and release of acreage for future re-development in critical areas.

### **Deactivation and Decommissioning**

Most ORNL decontamination and decommissioning (D&D) will consist of standard activities such as removal and disposition of legacy waste and facility process equipment, along with demolition and size-reduction of building structures using standard heavy equipment. However, some D&D activities will require innovative approaches and technologies to be successful. All waste material generated during the facility D&D process will be properly managed, packaged, and transported to the designated disposal site. ORNL D&D will be conducted in a logical sequence that promotes efficient completion. Sequencing drivers include both hard drivers (e.g., waste treatment availability, regulatory milestones, scheduled SC replacement facilities, anticipated funding, facility endpoints, and subsequent IFDP actions) and soft drivers (e.g., risk reduction actions, construction sequencing, and “ready to go” facilities). ORNL facilities designated for D&D have been grouped based on key sequencing drivers to facilitate planning as follows: Central Campus Area and Other Bethel Valley (BV) Facilities; Melton Valley (MV) & MV Reactors; Waste Treatment Facilities; and, 3019 Complex.

ORNL has a variety of facility types including standard offices, laboratories, hot cells, reactors, research and testing facilities, and facility operations and storage buildings. The following are the four major categories of ORNL facilities designated for D&D as part of the IFDP: 18 Hot Cells and 8 Reactor Facilities; 148 Ancillary/Support Facilities; 152 Waste Operations Facilities; and one Historical Preservation Facility. Figure 2 shows the facilities in the ORNL BV area that are part of the IFDP.

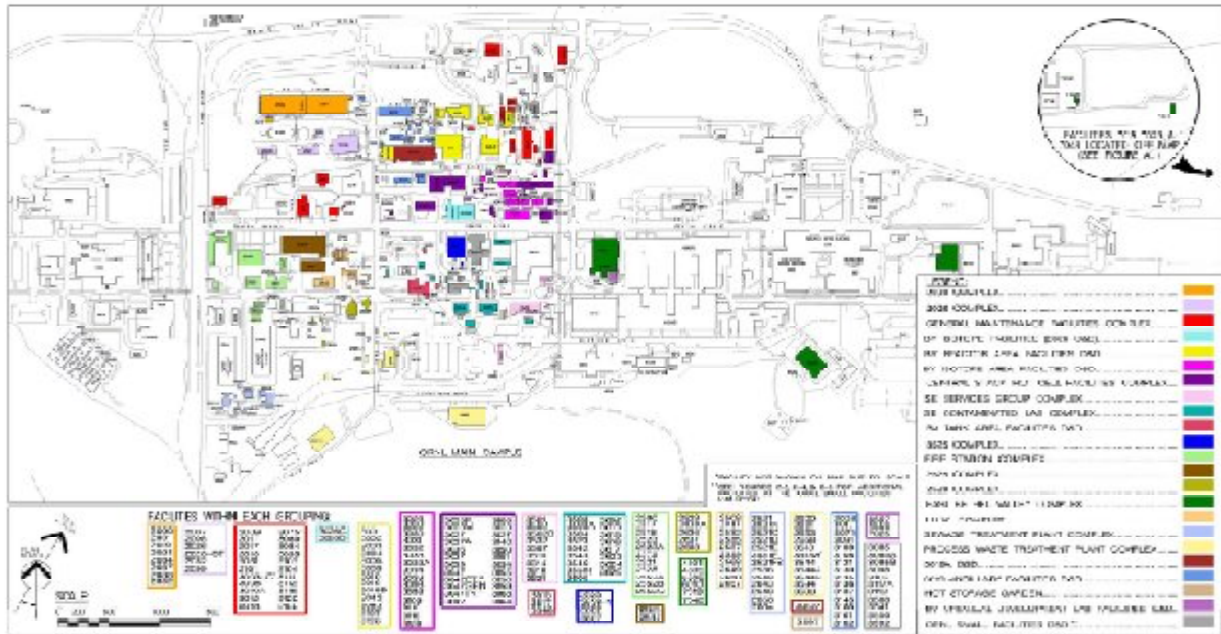


Fig. 2. ORNL Bethel Valley Facility Decontamination and Decommissioning Groupings

### Remedial Action (RA)

Specific ORNL RA will be selected to meet the unique characteristics and hazards of each RA site. Potential RA to be used to eliminate environmental contaminant sources at ORNL includes the following: removal of contaminated soil, sediment, vegetation and debris; installation of multi-layer caps over waste areas; installation of diversion trenches; removal of slabs, substructures (e.g., basements, ducts, tunnels); plugging and abandoning wells; grouting and removal of inactive pipelines and installation of grout walls; emptying and grouting or removing underground tanks; and, installation of groundwater extraction, bioremediation, and groundwater treatment and monitoring systems. Alternatives for groundwater remediation will be developed after removal of contaminated sources, and surface water contamination should be mitigated by soil and groundwater cleanup.

### Facilities Reconfiguration and Waste Operations

IFDP reconfiguration activities at ORNL will involve both the modification of existing facilities and the construction of new waste facilities. Waste operations will be performed under the IFDP Operations scope.

The recommended alternative for ORNL facilities for treatment of groundwater, process wastewater, and gaseous waste include: a restructured BV groundwater treatment facility; diversion of BV process wastewater drains to a new sanitary waste treatment system to be built by DOE SC; a new MV process wastewater treatment facility; and, upgrades to the 4500 Area Gaseous Waste System.

IFDP will generate significant volumes of highly radioactive and “difficult to manage” waste. Staging and storage capacity is critical to assure IFDP work is not interrupted when processing delays are experienced or sequencing of work results in waste being generated that cannot be immediately processed, and to allow waste that has a unique endpoint (e.g. Nevada Test Site [NTS] or Waste Isolation Pilot Plant [WIPP]) to be stored until full cross-country waste shipments can be properly planned and scheduled. In order to facilitate safe and compliant management, a Radioactive Waste Staging and Storage Facility (RWSSF) will be constructed. A new contact handled (CH) building constructed as part of the RWSSF will be used to store containers of CH transuranic (TRU) and CH-LLW. A new remote

handled (RH) building constructed as part of the RWSSF will be used for the staging and storage of RH-TRU and special case LLW.

The IFDP will be required to characterize, treat, package, and dispose of various solid waste streams for which no treatment capability currently exists on the ORR. Legacy waste including hot cell materials, activated reactor components, orphan waste, and waste generated from D&D of hot cells, reactors, and other radioactively contaminated facilities will require additional treatment/processing. These waste streams contain approximately 27 million curies (Sr-90 inhalation equivalents) with dose rates as high as one million R/hr. Waste items that must be handled range from less than an inch in all dimensions to extremely large components; the largest identified to date being 2.7-m x 2.7-m x 2.7-m (9-ft x 9-ft x 9-ft), 36,000-kg (40-ton) casks. In order to safely manage and disposition these IFDP materials, hot cells will be required with capabilities and design features that include the following: mating casks and carriers that are in use and/or needed to meet disposal site waste acceptance criteria (WAC); shielding and processing capabilities for high dose materials/wastes; processing large monoliths, some of which have been grouted and will require mechanical disassembly; size reducing TRU waste components to allow repackaging in 0.21 m<sup>3</sup> (55 gallon) drums for disposal; down-blending high activity sources to meet disposal site WAC; and solidifying liquid low level radioactive waste (LLLW) for disposal. Therefore, the IFDP recommended alternative for RH material treatment and processing is the construction of the Remote Handled Solids Processing facility (RHSPF).

The current IFDP Life-Cycle Cost Estimate was prepared for preliminary planning purposes and is considered appropriate for CD-1. The approved cost range for the ORNL portion of IFDP is \$3.645 billion – \$5.332 billion with a schedule range of 26 to 29 years.

The CD-1 is based upon a severely constrained budget projection and anticipated that such constraints will continue. Environmental compliance activities have been given high priority, but cannot, in all cases, be fully funded without jeopardizing other highly critical activities necessary to avoid unreasonable risk to human health and/or national security. Funding to begin work on the IFDP was not expected to be available for several years.

Then the unexpected happened. There was a national economic crisis, and the American Recovery and Reinvestment Act (ARRA) was passed which provides \$6 billion to DOE EM for additional environmental cleanup. Approximately \$336 million was budgeted for “shovel ready” cleanup work at ORNL that was identified in the IFDP CD-1, leading to the creation of the Central Campus Cleanup projects.

#### **THE CENTRAL CAMPUS CLEANUP AT OAK RIDGE NATIONAL LABORATORY**

The primary criteria for ORNL Central Campus Cleanup projects proposed for ARRA funding was that they were “shovel ready” and would result in near term jobs creation. Secondary criteria included: significant health, safety, environmental, and mission risk reduction; regulatory/compliance drivers; preparation of areas and infrastructure to facilitate future cleanup work; footprint reduction; and release of areas for future ORNL re-development.

Approximately 2/3 of the EM ARRA funding at ORNL is focused on cleanup projects located in the Central Campus area. The remainder of the funding is targeted to support accelerated operations at the TRU Waste Processing Center (TWPC) and installation of additional MV monitoring wells.

Following is a summary of the ARRA projects included in the Central Campus Cleanup and at other ORNL locations

- Demolition of over 40 excess facilities
- Disposition of legacy materials from 8 facilities
- Removal of Tank W-1A
- Capping of Solid Waste Storage Areas (SWSAs) 1 & 3

Following are descriptions of the projects that make up the Central Campus Cleanup effort organized by WBS including summary description, drivers, and method of accomplishment. Cost information is not provided since some procurement activities are underway.

### **Defense funded projects**

BV Isotope Facilities - Bldg 3026 Wooden Superstructure Demolition - Building 3026 is a 1,858 m<sup>2</sup> (20,000 ft<sup>2</sup>) hot cell and laboratory facility that is comprised of two adjoining facilities separated by a common wall with separate air handling equipment. Building 3026C is located on the west side and Building 3026D is located on the east side. Building 3026 was one of the original Clinton Laboratory buildings constructed in 1943 through 1945 to support the war effort. It was later used for a variety of isotope processing and research activities. The facility has been unoccupied since 1998 and environmental controls have been deactivated for approximately ten years. Since this time the facility has fallen into severe disrepair and structural failures in 2007 required shutdown of the building fire protection sprinkler system.

The objective of the Building 3026 C&D wooden structure demolition project is to demolish the exterior wooden structure of Building 3026. The driver for this project is to reduce risk by eliminating the fire hazard associated with the wooden structure and the potential for radioactive and hazardous material release in the event of a major building structural failure. UT-Battelle, LLC (UT-Battelle), the ORNL Management and Operations (M&O) contractor is executing this CERCLA Time Critical Removal Action project including characterizing the facility for waste disposal, removing the manipulators from the highly contaminated hot cells, isolating the facility from active utilities, and disposing of selected waste streams. UT-Battelle subcontractor Clauss Construction, Inc is performing asbestos abatement, other demolition preparation, facility demolition, and waste disposal at the Environmental Management Waste Management Facility (EMWMF).

BV Isotope Facilities - Bldg 3026 Hot Cells Demolition - The Building 3026 C&D Hot Cells demolition project will complete the facility D&D actions initiated by the Building 3026 stabilization and wooden structure demolition project. The project objectives are to: remove any remaining legacy materials; abate hazardous materials; characterize hot cells and process equipment, as needed, to meet disposal WAC requirements; decontaminate the demolition materials as needed to meet applicable Department of Transportation guidelines and meet dose based radiation criteria; apply lockdown fixative in hot cells; saw cut and remove hot cell concrete to slab or grade; and, decontaminate the slab. The driver for this project is to reduce risk by removing the remaining highly contaminated concrete hot cell structures. The project will be executed by a DOE EM Indefinite Delivery/Indefinite Quantity (ID/IQ) contractor.

ORNL Small Facilities Complex Demolition - The ORNL Small Facilities D&D project is located primarily in the northeast and southeast portions of the ORNL main campus area in BV. This project includes the following eleven facilities and structures totaling 3,326 m<sup>2</sup> (35,802 ft<sup>2</sup>): 3085 – Oak Ridge Research Reactor (ORRR) Pump House (265 m<sup>2</sup>)(2,856 ft<sup>2</sup>); 3085A - Above Ground Demineralized Water Tanks (33 m<sup>2</sup>)(360 ft<sup>2</sup>); 3085B - Above Ground Demineralized Water Tanks (33 m<sup>2</sup>)(360 ft<sup>2</sup>); 3098 - Filter Facility for Low Intensity Test Reactor and Bulk Shielding Reactor (BSR) (22 m<sup>2</sup>)(240 ft<sup>2</sup>); 3102 - ORRR Heat Exchanger (105 m<sup>2</sup>)(1,125 ft<sup>2</sup>); 3117A - Sulfuric Acid Tank (11 m<sup>2</sup>)(122 ft<sup>2</sup>); 3119 - BSR Heat Exchanger and Pump House (64 m<sup>2</sup>)(690 ft<sup>2</sup>); 3508 - Electrical Services (1,288 m<sup>2</sup>)(13,863 ft<sup>2</sup>);

3541 – Molten Salt Reactor (MSR) Process Development Laboratory (81 m<sup>2</sup>)(870 ft<sup>2</sup>); 3550 - Research Lab Annex (1,306 m<sup>2</sup>)(14,036 ft<sup>2</sup>); and, 3592 - Coal Conversion Facility (119 m<sup>2</sup>)(1,280 ft<sup>2</sup>).

Historically, these facilities were used in support of reactor area operations and for various laboratory support activities. Facility contaminants include radiological contaminants, asbestos, beryllium, and polychlorinated biphenyls (PCBs). Drivers for this project are to: provide work and laydown areas for future demotion of adjacent reactor and hot cell facilities; reduce footprint; and, provide areas for future ORNL re-development.

Corehole 8 Remediation - Tank W-1A is located north of Central Avenue and just east of Third Street in the North Tank Farm. Leaks of LLLW from this tank are the source of the subsurface radioactively contaminated Corehole 8 groundwater plume. This project will: characterize the tank and surrounding contaminated soil; excavate the tank, concrete supports and pad, and surrounding contaminated soil; and, package/transport the waste to appropriate off-site disposal at the NTS and WIPP. The driver for this project is to eliminate the source of the most extensively contaminated ORNL groundwater plume that will facilitate natural attenuation/treatment of the subsurface contamination. The project will be executed by Bechtel Jacobs Company, LLC (BJC) and their subcontractors.

BV Burial Grounds (Cap SWSA 1 and 3) - This subproject will hydrologically isolate two major sources of contaminant releases - SWSA 1 and SWSA 3 - and remove and dispose of associated “hot spot” soil contamination in the BV area of ORNL. Hydrologic isolation consists of placing separate multi-layer caps over the two waste areas to minimize generation of contaminated groundwater from waste and prevent direct exposure to contamination. An up-gradient trench at SWSA 3 will divert clean water away from waste to enhance hydrologic isolation effectiveness. The SWSA 3 area cap will follow Resource Conservation and Recovery Act guidance for landfill caps. A simple low-permeability cap will be placed at SWSA 1.

Additionally, soil covers to prevent direct exposure will be installed and maintained at the Former Waste Pile Area and the Non-radioactive Wastewater Treatment Plant Debris Pile near SWSA 1, and the Contractor’s Landfill near SWSA 3. Contaminated hot spot soil will be disposed below the SWSA 3 cap. If necessary, some radiologically contaminated waste that meets the facility WAC may be disposed at the EMWMF or off-site disposal facilities.

The driver for this project is to eliminate radioactivity releases from the SWSA areas. The project will be executed by the DOE EM ID/IQ contractor LATA-Sharp Remediation Services.

MV Sentinel Wells - The DOE groundwater monitoring well network at ORNL will be expanded to include an area off DOE property to the southwest of MV and across the Clinch River. The monitoring well network expansion is needed to determine the potential for site-related contaminants to migrate beyond the DOE property and into privately owned wells.

The project is envisioned to include site access rights and drill pad preparation for installation of approximately four well clusters consisting of four wells each. Following well installation, each well will be monitored to determine groundwater flow potential under the River, along with sampling to evaluate groundwater chemistry, and to detect potential DOE site-related contaminants.

The driver for this project is to provide data that can reduce uncertainty about ORNL groundwater contamination migrating offsite. Accurate data will allow DOE to provide reliable information to the public concerning groundwater conditions beyond the ORR. The project will be executed by BJC and their subcontractors.

BV Isotope Facilities - Bldg 3038 Remove Legacy Material and Prepare for Demolition - Building 3038, the 722 m<sup>2</sup> (7,773 ft<sup>2</sup>) Alpha Handling Facility, is located in the Central Campus area of ORNL and was constructed in 1951. Historically, Building 3038 housed the packaging, inspection and shipping activities for radioisotopes. Facility contaminants include asbestos and low levels of residual fixed and transferable radioactive surface contamination. This facility has experienced significant degradation and was the source of a major Sr-90 release in 2002.

The objective of the Building 3038 Project is to: characterize and remove legacy materials (defined as being easily removable items that involve minimal efforts for removal e.g., no unbolting, unplugging, wire cutting, or cold cutting); deactivate the facility; and, perform abatements and equipment removal in order to prepare for D&D activities. The drivers for this project are to: reduce health, safety and mission risk by de-inventorying the degraded facility, prepare the facility for D&D, and reduce footprint. The project will be executed by a DOE ID/IQ contractor.

TRU Waste – The TWPC was constructed to characterize, package, and transport stored and newly generated TRU waste to WIPP, or other appropriate disposal facilities. The TRU waste consists of CH and RH solid waste, and RH sludge waste located in underground storage tanks at several locations at ORNL. This project will provide support for expanded operations to accelerate completion of waste processing activities. The driver for this project is to meet regulatory agreements to process and dispose TRU waste. The project will be executed by a DOE EM contractor.

### **Non Defense**

2000 Complex Demolition - This project is located in the northwest portion of the ORNL Central Campus area and consists of eight facilities and structures totaling approximately 5,574 m<sup>2</sup> (60,000 ft<sup>2</sup>). The complex includes Buildings 2000, 2001, and 2024 and ancillary support facilities 2019, 2034, 2087, 2088 and 2092. The facilities are in severe disrepair and have been vacant for approximately six years. Paint on the exterior surface of the facilities has been the source of PCBs released to the surrounding environment. Historically, these facilities were used in support of the Clinton Laboratory research in the late 1940s. Facility contaminants include asbestos, beryllium, heavy metals, (e.g., cadmium and lead), PCBs, and radiological contamination.

The drivers for this action are to: meet regulatory commitments to eliminate the PCB environmental release; reduce footprint; and, provide areas that can be redeveloped to support the Oak Ridge Science and Technology Park development. UT-Battelle is executing the project in two phases – the 2000 Complex East D&D project and the 2000 Complex West D&D project. UT-Battelle will be characterizing the facility for waste disposal. UT-Battelle subcontractor SEC, Inc is performing asbestos abatement, other demolition preparation, facility demolition, and waste disposal at the Oak Ridge Sanitary/Industrial Landfill and EMWMF for the 2000 Complex East projects. The request for proposal for the 2000 Complex West project is planned to be issued in early calendar year 2010.

Central Campus Legacy Material - Clean Out Facilities to Be Demolished - The objective of the Central Campus Legacy Material Disposition project is to remove material from six facilities and other miscellaneous legacy materials including six radioisotope thermoelectric generators located within the ORNL Central Campus area. This scope will include cleanout of Buildings 3025M, 3095, 3112, 3503A, 3550T and 4501. D&D of four of the buildings will be completed under separate ARRA projects. Buildings 3095 and 3112 will be demolished under the General Maintenance Facilities D&D project and Buildings 3503A and 3550T will be demolished under the Southeast Contaminated Lab Complex D&D project. Buildings 3025M and 4501 D&D are planned to be demolished as part of future IFDP activities.

The driver for this action is to prepare ORNL excess facilities for D&D. The project will be executed by a DOE EM ID/IQ contractor.



General Maintenance Facilities Complex Demolition - The objective of the General Maintenance Facilities D&D Project is to demolish 16 facilities in ORNL's Central Campus totaling approximately 5,147 m<sup>2</sup> (55,400 ft<sup>2</sup>). This project is comprised of the following facilities: 2009 - Cafeteria Warehouse (406 m<sup>2</sup>)(4,368 ft<sup>2</sup>); 2011 - Electric & Air Conditioning Service Center (617 m<sup>2</sup>)(6,636 ft<sup>2</sup>); 2017 - East Research Service Shop (21 m<sup>2</sup>)(228 ft<sup>2</sup>); 2018 - Elect & Air Conditioning Service Center (726 m<sup>2</sup>)(7,817 ft<sup>2</sup>); 2061 - Smoke Stack (29 m<sup>2</sup>)(314 ft<sup>2</sup>); 2517 - Human Resources & Diversity Training / Programs (271 m<sup>2</sup>) (2,922 ft<sup>2</sup>); 3008 - Source & Special Material Vault (52 m<sup>2</sup>)(561 ft<sup>2</sup>); 3012 - Rolling Mill (952 m<sup>2</sup>) (10,245 ft<sup>2</sup>); 3044 - West Complex Field Shop (553 m<sup>2</sup>)(5,952 ft<sup>2</sup>); 3084 - Neutron Spectrometer Station 2 (36 m<sup>2</sup>)(392 ft<sup>2</sup>); 3095 - Reactor Area Equipment Building (651 m<sup>2</sup>)(7,008 ft<sup>2</sup>); 3103 - Basin w/cover and Pump House (ORRR Cooling Tower No. 3) (531 m<sup>2</sup>)(5,720 ft<sup>2</sup>); 3111 - Sentry Post No 8b (14 m<sup>2</sup>) (149 ft<sup>2</sup>); 3112 - Misc. Storage Building (17 m<sup>2</sup>)(182 ft<sup>2</sup>); 3115 - Condensed Matter Science Division Office and Engineering Science and Technology Division Laboratory (258 m<sup>2</sup>)(2,782 ft<sup>2</sup>); and, 3132 - Emergency Generator for 3127, 3129, 3027 with Diesel Tank (7 m<sup>2</sup>)(75 ft<sup>2</sup>).

Historically, these facilities were used in support of reactor area operations and for various laboratory support activities. Facility contaminants include radiological contaminants, asbestos, beryllium, and PCBs. Drivers for this project are to: provide work and laydown areas for future demotion of adjacent reactor and hot cell facilities; reduce footprint; and, to provide area for development of the Oak Ridge Science and Technology Park. The project will be executed by a DOE EM ID/IQ contractor.

Southeast Lab Complex Demolition - The objective of the Southeast Contaminated Laboratory Complex D&D Project is to demolish seven facilities in ORNL's Central Campus totaling approximately 2,295m<sup>2</sup> (24,700 ft<sup>2</sup>). This project is comprised of the following facilities: 3503 - High Radiation Level Chemical Engineering Lab (1,189 m<sup>2</sup>)(12,798 ft<sup>2</sup>); 3503A - Building 3503 Storage Pad (186 m<sup>2</sup>)(2,000 ft<sup>2</sup>); 3504 - Geosciences Laboratory (680 m<sup>2</sup>)(7,320 ft<sup>2</sup>); 3543 - MSR Development Lab (57 m<sup>2</sup>)(612 ft<sup>2</sup>); 3550T - Van Trailer (29 m<sup>2</sup>)(314 ft<sup>2</sup>); 3605 - Treatment, Storage, and Disposal Storage Building (36 m<sup>2</sup>) (387 ft<sup>2</sup>); 3629 - Guniting and Associated Tanks Maintenance Tent (120 m<sup>2</sup>)(1,287 ft<sup>2</sup>)

Historically, these facilities were used in support of hot cell operations and for various laboratory support activities. Facility contaminants include radiological contaminants, asbestos, and PCBs. Drivers for this project are to: provide laydown/staging areas for future 3517 D&D; reduce footprint; and, provide areas for future ORNL re-development. The project will be executed by a DOE EM ID/IQ contractor.

2026 Complex - Remove Legacy Material - The objective of the Building 2026 Legacy Material Removal Project is to perform sampling and characterization, abate and remove the hazardous materials (e.g. asbestos), and remove and disposition all remaining legacy waste. Building 2026, the Radioactive Materials Analytical Laboratory (RMAL), is a 2,615 m<sup>2</sup> (28,144 ft<sup>2</sup>) facility located in the northwest quadrant of the main plant area of ORNL.

The RMAL facility was constructed in 1964, with additions constructed in 1966 and 1985. Historically, the facility received, stored, assayed, and disposed of a wide variety of radioactive materials. Additionally, the facility provided a wide range of analytical chemistry and other research and development (R&D) support, including inorganic, organic, and radiochemical analyses and medical isotope extraction. The RMAL facility contains: hot cell structures; glovebox and radiochemical laboratories; and operating, utility, and office areas. Contaminants of concern include asbestos, beryllium, lead, PCBs, and radiological contamination.

The drivers for this project are to: reduce risk by eliminating the radioactive contamination associated with the Category 3 facility; and, prepare 2026 for D&D. The project will be executed by a DOE EM ID/IQ contractor.

One of the major challenges facing the Central Campus Cleanup effort is the large amount of work to be performed in a relatively short time in a small congested area of an ongoing, world class R&D laboratory. To provide some perspective, the current ORNL annual funding of approximately \$1.4 billion/yr supports approximately 4,300 regular employees and 4,000 guests. The EM and SC ARRA funded work, along with other SC construction projects represents almost \$500 million of work that will be accomplished over the next 2-3 years. As indicated in Figure 3, the Central Campus area and the adjacent 4500 area where this work is located, cover about a six block area. Pedestrian and vehicular traffic, strained parking areas, and the large amount of construction and cleanup related traffic in this area pose significant coordination challenges.

The large number of DOE contractor organizations involved in this work also present unique coordination and integration challenges. As shown in Figure 4, thirteen DOE contractors will be performing work in or near the Central Campus Cleanup area. Following are the contractors and a brief description of their work scope.

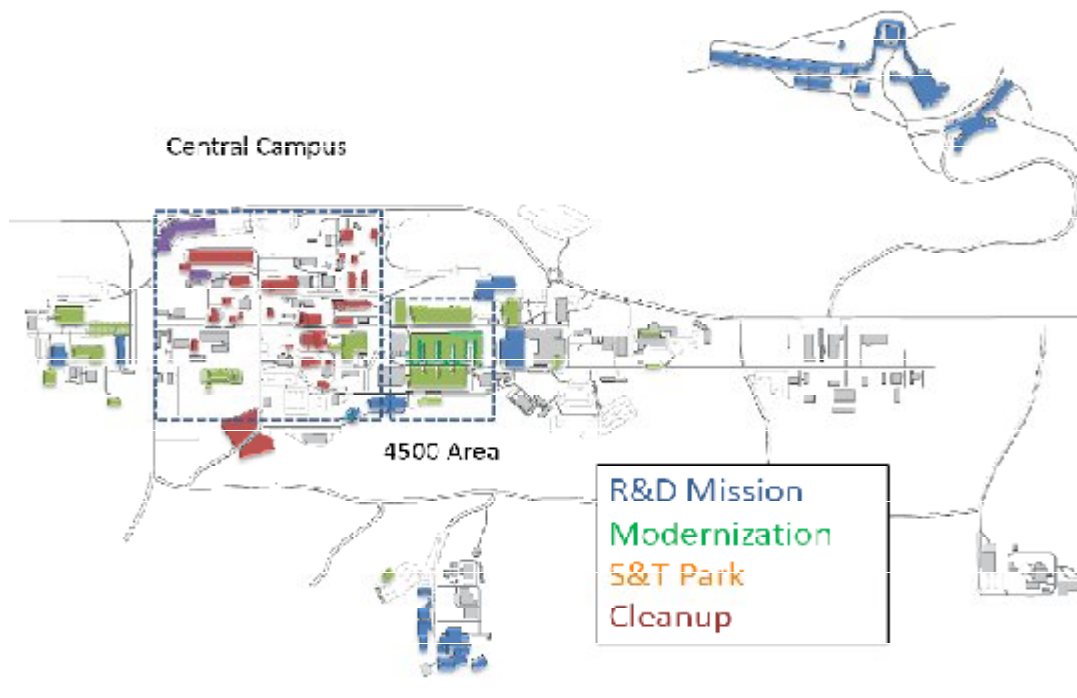


Fig. 3. Central Campus Area at ORNL

## Central Campus ARRA funded cleanup

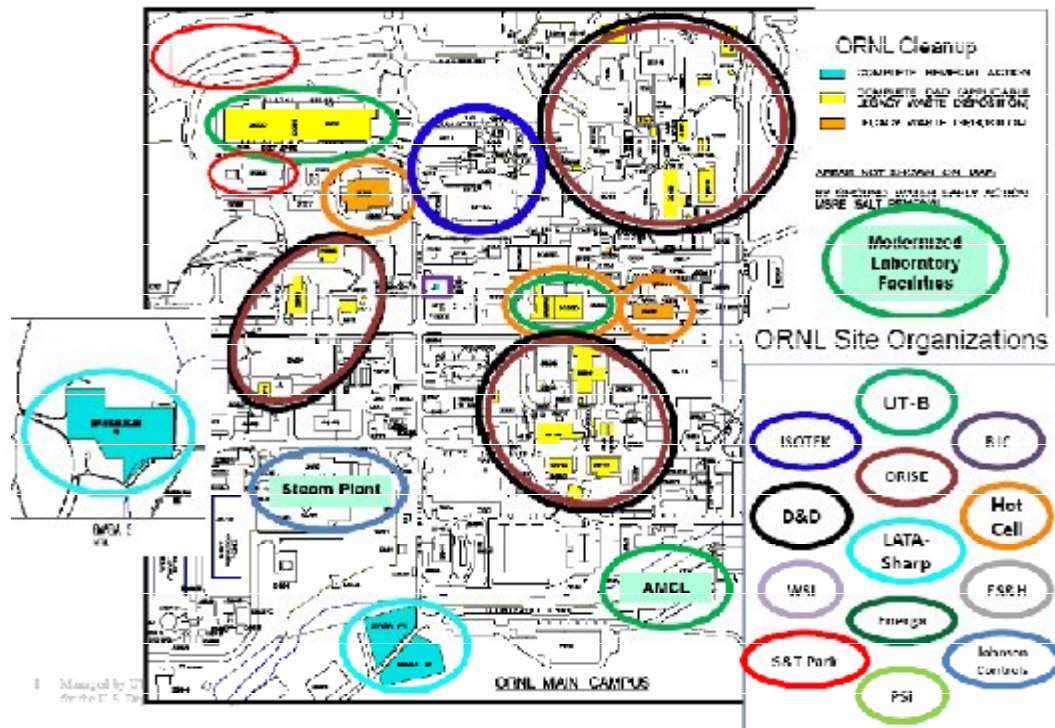


Fig. 4. Central Campus ARRA Funded Cleanup

UT-Battelle – UT-Battelle is the M&O prime contractor for ORNL and is responsible for “landlord” and mission activities at the site. UT-Battelle is also executing three ARRA projects for EM – the 3026 C&D Wooden Superstructure Demolition, the 2000 Complex East Demolition, and the 2000 Complex West Demolition projects. In addition UT-Battelle is supporting DOE EM in the integration of work among the EM contractors, and between the EM contractors and the ORNL site operations and mission activities, and in preparing the IFDP CD-2/3 documents.

Bechtel Jacobs Company LLC (BJC) – BJC is the EM prime contractor for cleanup work in Oak Ridge. BJC will be executing the ARRA funded Corehole 8 Remediation and MV Sentinel Wells projects. In addition, BJC performs base funded EM program work at ORNL involving surveillance and maintenance of EM facilities, operation of waste treatment facilities, and other selected cleanup projects.

Oak Ridge Institute for Science and Education (ORISE) – ORISE is performing ARRA funded characterization for waste disposal for facilities included in the Small Facilities Complex Demolition, General Maintenance Facilities Complex Demolition, Southeast Lab Complex Demolition, and Central Campus Legacy Material Disposition projects.

LATA-Sharp Remediation Services (LSRS) – LSRS will be executing the ARRA funded BV Burial Grounds (Cap SWSA 1 and 3) project through the EM ID/IQ contract.

D&D – An EM ID/IQ contractor will execute the ARRA funded BV Facility D&D - Small Facilities Complex Demolition, General Maintenance Facilities Complex Demolition, Southeast Lab Complex Demolition, and Central Campus Legacy Material Disposition projects.

Hot Cell - An EM ID/IQ contractor will execute the ARRA funded BV Isotope Facilities D&D - Bldg 3026 Hot Cells Demolition, Bldg 3038 - Remove Legacy Material and Prepare for Demolition, and 2026 Complex - Remove Legacy Material projects.

ISOTEK – ISOTEK is executing the EM base program funded U-233 waste disposition project at the 3019 facility complex that will characterize, process, package, and stage materials for disposal off-site.

Wastren Advantage Inc. – Wastren Advantage Inc. is executing the ARRA funded TWPC operation that will characterize, process, package, and transport waste to WIPP or other disposal sites.

Wackenhut Services Inc (WSI) – WSI is the DOE base program funded contractor executing security services for the ORR. WSI provides security services to ORNL, and will support the Central Campus Cleanup effort by providing security control at Reeves Road (the haul road for waste going from ORNL to the EMWMF) and the entrance to the SWSA 3 capping area.

Environment, Safety, and Health Inc (ES&H) – ES&H is the DOE Reservation Management support contractor. ESH maintains Bethel Valley and Reeves Road which will be used to haul waste materials to the Sanitary/Industrial Landfill and EMWMF respectively.

PSI – PSI is the DOE contractor issuing badges at ORNL.

Johnson Controls Inc (JCI) - JCI is the DOE contractor executing the Energy Savings Performance Contract funded steam plant and steam distribution system upgrades.

Oak Ridge S&T Park – The Oak Ridge S&T Park includes several private contractors working through the Community Reuse Organization of East Tennessee (CROET) to provide a conduit to access and utilize technology developed at ORNL.

Several activities are underway to ensure that the ARRA funded cleanup work is safely and efficiently executed and that this work is integrated with ORNL operations. EM is establishing integration functions among its contractors at ORNL. Integrated Project Teams will be established for each of the projects that will include responsible EM Project Managers, subcontractors, and other support functions. Regular weekly and daily meetings will be held to plan and execute the project work scope. An EM Integration Center will be established in the Central Campus area where DOE and contractor representatives can work hand in hand to plan, coordinate, and safely execute EM cleanup work throughout the Central Campus area. The UT-Battelle Environmental Management Program Office will be supporting EM in this activity and will be the conduit to integrate this work with appropriate Laboratory planning and execution organizations. The EM cleanup work will be included in the ORNL master planning and scheduling system maintained by the UT-Battelle Facilities and Operations Directorate. Finally, ORNL support organizations (e.g. Laboratory Shift Superintendent, emergency response, security, safety, environmental compliance) will participate with EM and their cleanup contractors in regularly scheduled coordination meetings at the EM Integration Center.

## **CONCLUSION**

IFDP and the Central Campus Cleanup at ORNL are “first of their kind” projects in which EM, SC, and NE missions are integrated to fulfill the Department’s strategic goals of protecting our environment, national security assets, energy R&D, and economic security to support our human capital and competitive edge.

IFDP presents mutually beneficial opportunities for mission-critical advancement for SC, NE, and EM. In support of the Department's national defense and research and development missions, completion of IFDP will enable:

- EM to reduce risk by completing environmental cleanup of the ORNL site
- SC, and NE to reduce mission risk and surveillance and maintenance (S&M) expenditures associated with excess contaminated facilities
- ORNL to proceed with modernization and to focus on their programmatic mission performance

The remediation and demolition actions performed during the IFDP will complete regulatory obligations for site restoration, remove Manhattan Project and Cold War legacies, and enable the development of new facilities and missions critical to the Department's agenda.

Delaying work on IFDP will have serious impacts to the future mission readiness of ORNL. The inability to go forward with remediation of facilities and property at the ORNL site will pose unacceptable risks to the safety of employees. Additionally, key research and national security program missions are at risk due to their proximity to contaminated facilities. Continued deterioration of research and processing facilities built during the Manhattan Project and Cold War era will accelerate risk and S&M cost.

The existing EM baseline was prepared over a decade ago. Extraordinary cleanup progress has been made; however, existing missions have also evolved and ORNL has gone through dramatic renewal. Recognizing these changes to the Oak Ridge landscape today and building them into existing priorities dramatically increases DOE efficiency in achieving its overall corporate mission. IFDP will integrate and re-sequence the current EM baseline scope based on today's risk with the new cleanup scope and the ARRA funded cleanup work, resulting in enhanced risk reduction, larger cost savings, and more rapid and efficient performance of the work.

The IFDP is the federal priority of the Oak Ridge community and enjoys strong bi-partisan support from the Governor and from the region's congressional delegation.