

# 1.0 Program Risk Evaluation

Five major scope elements constitute the Oak Ridge cleanup program: (1) Oak Ridge National Laboratory (ORNL) (containing both Melton Valley and Bethel Valley—the main plant area), (2) East Tennessee Technology Park (ETTP), (3) Legacy Waste Disposition, (4) Waste Operations, and (5) the Y-12 National Security Complex (NSC). The principal risk drivers on the Oak Ridge Reservation (ORR) include radionuclides leaving ORNL and entering surface waters, mercury leaving Y-12 and entering Upper East Fork Poplar Creek, and deteriorating buildings at ETTP that pose an increasing threat to cleanup workers and carry significant mortgage costs. Throughout the 35,000 acres of the ORR, groundwater frequently rises to within several meters of the surface, and surface and contaminant transport problems are compounded by the 140 centimeters of average annual rainfall.

Given this scope and risk, DOE Oak Ridge Operations (ORO) asked "what is the right thing to do?" The answer to this question and the supporting logic and rationale are explained below.

## 1.1 EAST TENNESSEE TECHNOLOGY PARK

Degrading 50-year-old gaseous diffusion buildings and support buildings represent the principal threat. Unstable structures, roof integrity failures, intense rainfall events, and other natural phenomena increase the risk of uncontrolled releases of uranium and other contaminants to Poplar Creek, which feeds the Clinch River. The hazards posed to decontamination and demolition workers also increase every day with advanced building degradation. Coupled with this risk is the burdensome "hotel load" of infrastructure (utilities, security, fire protection, etc.). Every year that closure is delayed, these non-closure infrastructure activities require funding that could otherwise be used for cleanup. The right thing to do is to quickly dispose of the stored legacy waste; demolish the buildings; develop an integrated plan with reindustrialization; and focus on decontamination and decommissioning (D&D) first, followed by soil cleanup to achieve risk and mortgage reduction.

The faster certain materials and equipment are removed from ETTP, the sooner funds now used to maintain the current security posture and risk *management* activities can be redirected to risk *reduction* and closure work.

## 1.2 OAK RIDGE NATIONAL LABORATORY

The Melton Valley burial grounds at ORNL contain areas with high inventories of radioactive wastes. Approximately 140 acres of unlined waste units (e.g., burial grounds, seepage pits and trenches, etc.) have received over 2 million curies of radioactive waste. Melton Valley contributes 90 percent of the strontium and 67 percent of the tritium discharged from DOE property into the Clinch River—a drinking water source and prime recreational area. Interim actions to date have managed this risk, but residential risk levels are currently exceeded immediately downstream of ORNL, which is upstream of the City of Kingston Drinking Water Plant.

Therefore, the highest priority at Oak Ridge is to mitigate ongoing releases of strontium and tritium from the burial grounds. With a signed Record of Decision (ROD) in place, work on hydrologically isolating the buried waste—effectively preventing it from discharging to the Clinch River—can proceed.

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Another key driver is the completion of high-priority and ongoing work in the main plant area (Bethel Valley) to reduce releases to the Clinch River or take advantage of existing Melton Valley cleanup contracts. The balance of Bethel Valley cleanup actions would be temporarily deferred beyond 2008. This deferral will provide the DOE Office of Science (OS) at ORNL adequate time to implement needed revitalization efforts.

### 1.3 BALANCE OF PROGRAM

The balance of the cleanup program includes four major categories of work. The first category is high-priority projects not in Melton Valley or ETTP that are being accelerated because of their high risk reduction:

- remediation of Bethel Valley groundwater contamination sources,
- deactivation of Building 3026 at ORNL to eliminate worker safety concerns,
- installation of water treatment systems to mitigate off-site mercury releases from the Y-12 NSC, and
- bioremediation of an off-site volatile organic compound (VOC) plume at the Y-12 NSC.

The second category is ongoing projects not in Melton Valley or ETTP that need to be completed for risk reduction and/or mortgage reduction:

- retrieval and shipping of spent nuclear fuel (SNF) from ORNL to the Idaho National Engineering and Environmental Laboratory;
- excavation of uranium-contaminated soil from the boneyard/burnyard area at the Y-12 NSC;
- excavation of highly contaminated sediments from surface impoundments in the center of ORNL;
- remediation of Atomic City Auto Parts site, a privately-owned, DOE-contaminated site in the City of Oak Ridge; and
- treatment and disposal of mixed low-level waste (MLLW) and transuranic (TRU) waste.

The third category is lower-priority projects deferred until Melton Valley is completed and ETTP is closed. This deferral is consistent with completing the modernization and revitalization plans at the Y-12 NSC and ORNL. Most of this work is deferred until FY 2008 or beyond. Some of these projects have current regulatory milestones:

- remediation and D&D of the contaminated sites and facilities within the current industrial footprint of the Y-12 NSC,
- remediation and D&D of the contaminated sites and facilities within the current industrial footprint of ORNL,
- remediation of Bear Creek Valley burial grounds, and
- remediation of miscellaneous contaminated sites throughout the ORR.

The fourth category includes key activities that support the accelerated cleanup program. Major elements include:

- operation and expansion of the Environmental Management Waste Management Facility (EMWMF) to provide the necessary disposal capacity to support accelerated cleanup;
- construction and operation of the privatized TRU waste processing facility;
- operation of waste management facilities that are necessary to support cleanup such as groundwater treatment and construction debris landfill operations; and
- other activities such as retiree medical benefits, surveillance, maintenance, and environmental monitoring.

In summary, the results of the program risk evaluation strongly support the need for:

- acceleration of Melton Valley remediation to mitigate risks from current releases,
- acceleration of ETTP closure to reduce mortgage costs and eliminate environmental and safety risks, and
- continuation of selected high-priority risk reduction projects while deferring lower-priority projects at Y-12 and ORNL.