REDUCTION OF EM FOOTPRINT
OFFICE OF ENVIRONMENTAL MANAGEMENT
DECEMBER 2008

EM strategic planning efforts are underway to identify approaches to maximize risk reduction by completing cleanup activities that reduce the legacy footprint of the EM complex.

- Footprint reduction accelerates clean-up and reduces life-cycle legacy costs.
- Footprint reduction uses proven technologies within an established regulatory framework.
- Footprint reduction makes large tracts of land and infrastructure available to support the Nation's energy independence mission.
- Footprint reduction creates new infrastructure and new jobs.
- EM can achieve about ninety percent footprint reduction for a total reduction of 775 square miles to 105 square miles at large sites by 2015 or earlier.
- EM has 106 sites of which 86 have been completed: small sites completions would complete 12 more by 2015.
- Investments in the near term of up to $4B could result in life-cycle savings close to $7B and net a potential of 4000 additional contractor jobs.

Capabilities and Benefits

EM is using its independently reviewed baselines and outyear planning estimates to establish a basis for strategic planning for the program to evaluate alternatives in policy, program priorities or consideration of various business cases. Although analyses so far indicate that our current baseline planning levels of about $6B can fully support high risk activities of radioactive tank waste, special nuclear materials and spent nuclear fuel, additional investments in the program could yield significant cleanup progress and life cycle savings if directed to *small site completions* and *footprint reduction* at our large sites. Funding these initiatives means that new appropriations could be quickly deployed to ship wastes for disposal, to cleanup and demolish contaminated buildings, and to remediate contaminated groundwater and soils.

We believe that the program is well positioned to quickly leverage additional investments to yield substantial benefits to address a range of potential Administration goals:

- EM has on-the-shelf plans to redress past environmental injuries by utilizing flexible contract vehicles and contractors poised to bring on additional subcontract personnel to quickly expand cleanup workforces.

- EM has a proven track record of significant expenditures in the year of appropriation. In FY 2008, EM spent in excess of 75% providing added stimulus to some communities already experiencing depressed conditions (e.g. South Carolina, Kentucky, Ohio).

- EM work has been characterized by Senate staffers as "boots on the ground". Added jobs will be primarily blue-collar environmental workers.

- EM can be characterized as a "green initiative" in multiple ways:
  - Fulfilling the Government's responsibility to address nuclear weapons waste
  - Allowing early completion of legal compliance agreement milestones
  - Enabling reuse of Departmental facilities for other energy missions or community reuse

At EM's largest sites, i.e., the Hanford Site, Oak Ridge, Idaho National Laboratory, Savannah River Site, Portsmouth, and Paducah, opportunities exist to reduce the site footprint by focusing cleanup on Decontamination and Decommissioning, soil and groundwater remediation, and solid waste disposition, all of which have proven technologies and an established regulatory framework. EM's success in these areas can be leveraged to maximize efficiency providing the basis for footprint reduction. Ultimately, completion of these types of cleanup activities reduce the surveillance and maintenance costs associated with managing large tracts of land and allows EM to focus on managing radioactive tank waste, special nuclear material and/or spent nuclear fuel which do not lend themselves to quick, inexpensive, or uncomplicated technical or regulatory solutions.

EM's success as previously proven at Rocky Flats, Colorado and Fernald, Ohio can be leveraged to maximum efficiency thereby providing the basis for footprint reduction. Ultimately, completion of these types of cleanup activities reduces the monitoring and maintenance costs required for contaminated land areas and structures. Thus, allowing EM to focus on dispositioning highly radioactive tank waste, special nuclear material (mainly plutonium and uranium) and used (spent) nuclear fuel that require complex and expensive technical and regulatory solutions.

Footprint reduction would free up Departmental resources: large, secure tracts of land; state-of-the-art facilities and technologies; and a highly trained and experienced work force. All of which could then be leveraged in establishing advanced-technology energy parks on DOE sites to both produce energy and demonstrate advanced technologies; and accelerating their replication across the Nation.

Status of Footprint Reduction

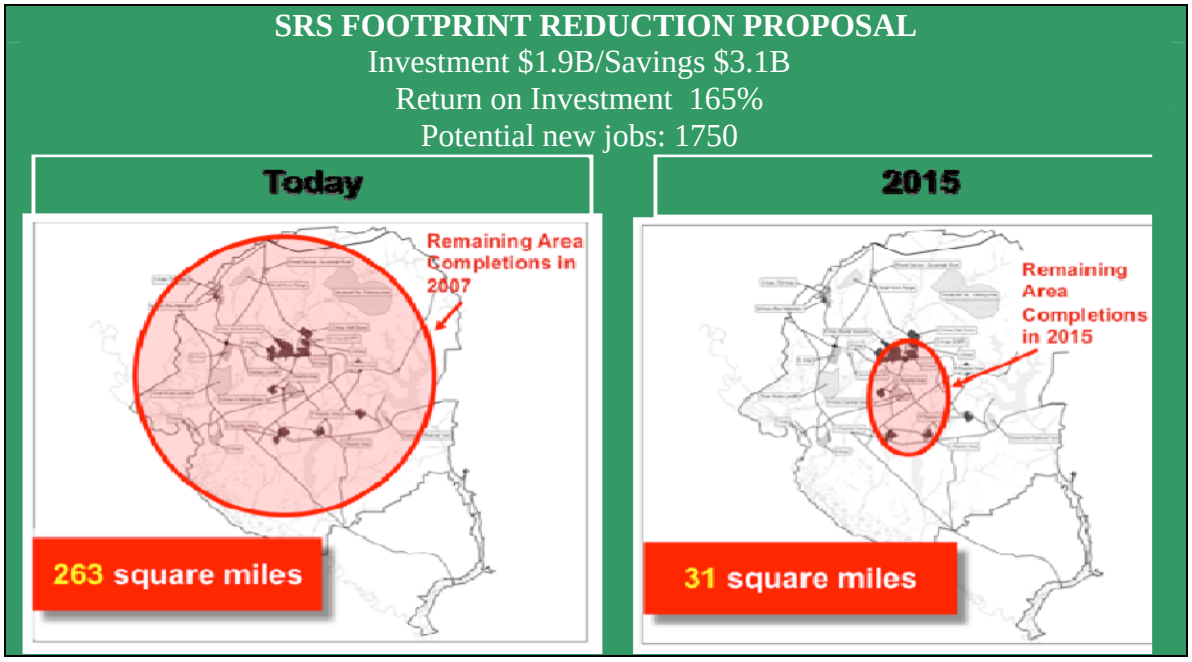
EM directed its sites to identify footprint reduction and near term completion opportunities. EM has worked collaboratively with its field sites to define aggressive, but achievable scenarios for accelerating cleanup of distinct and discrete sites or portions of large sites to meet footprint reduction objectives.

Proposals for Footprint Reduction

EM has identified several footprint reduction and near term completion opportunities. If EM were to successfully implement its footprint reduction initiative it could effectively reduce the EM footprint by approximately 90 percent by 2015 or earlier. EM would need additional funds to achieve its 2015 footprint reduction goals. As a result, the footprint reduction initiative could realize a Return on Investments (ROI) of more than 100 percent at four of its largest sites (Savannah River Site, Hanford Site, Oak Ridge Reservation,

Idaho National Laboratory). We are still analyzing similar opportunities at Portsmouth and Paducah and expect that the savings will also be substantial.

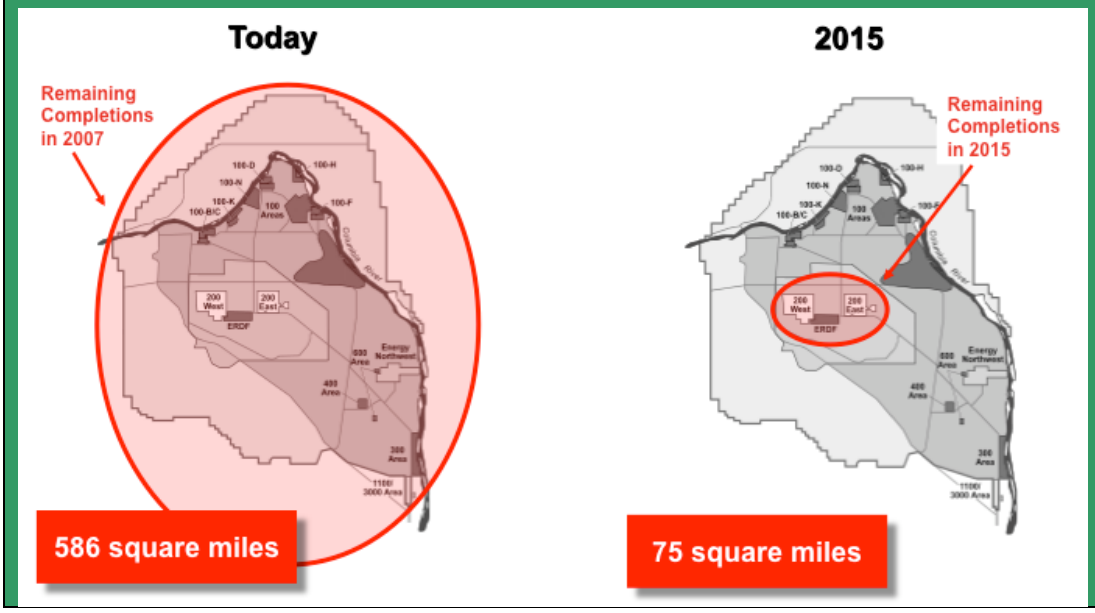
For example, the Savannah River Site, accelerated cleanup of numerous reactor and industrial areas and associated soil contamination could result in the release of a large majority of the entire site from access and security restrictions, nominally more than 200 square miles (see figure below). This land, along with the infrastructure and trained workforce that currently supports major industrial and nuclear operations and chemical processing, would be available for other uses such as advanced energy projects. The estimated investment of nearly $2 billion through 2015 for acceleration would result in a greater than 160 percent return on investment of 90 percent.



Similar analyses were conducted for the other large sites yielding similar savings and significant reductions in footprint. Those sites are Hanford, Idaho, and Oak Ridge: ORNL, Y-12, and East Tennessee Technology Park. We are continuing to analyze other cases at Portsmouth in Ohio and Paducah in Kentucky. We anticipate similar results allowing investments to energize these depressed economies and freeing up land for potential reuse.

HANFORD FOOTPRINT REDUCTION PROPOSAL

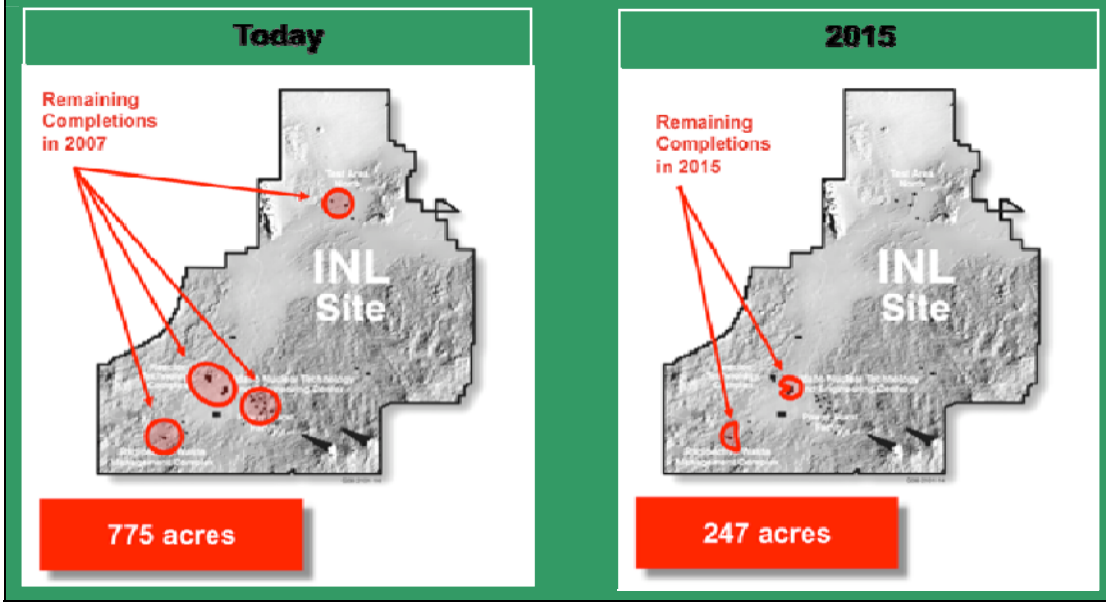
Investment: $340M/Savings $1.1B
Return on Investment 320%
Potential new Jobs: 670



87% percent footprint reduction
Reduces highest environmental risk and provides largest return on investment
Closes the River Corridor by 2015
Completes D&D of the Plutonium Finishing Plant by 2015
Affects River Corridor, groundwater and K Basin D&D

IDAHO NATIONAL LABORATORYFOOTPRINT REDUCTION PROPOSAL

Investment: $220M/Savings $290M
Return on Investment 130%
Potential new Jobs: 370



68% Footprint Reduction
Accelerate D&D of facilities [which facilities] from FY 2021-2030 timeframe into FY 2012 – 2015
Nearly all financial gain is a result of assuming contractor CPI of 1.5 is maintained on accelerated scope

Oak Ridge Reservation Results
Investment $940M/Savings $720M
Return on Investment 75%
Potential new jobs: 1100

OAK RIDGE NATIONAL LABORATORY CENTRAL CAMPUS FOOTPRINT REDUCTION PROPOSAL

Today

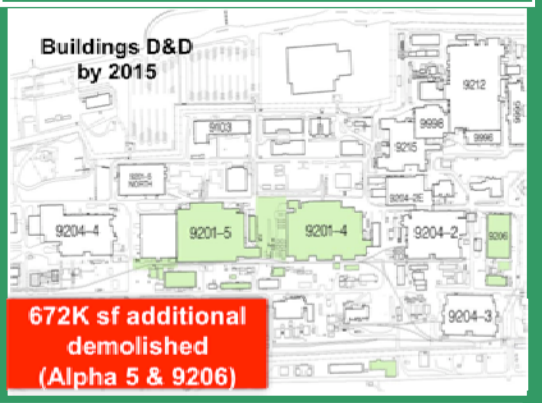
2015

Covers approximately 100 acres in the heart of the main campus area of ORNL.
Savings from reduced costs for S&M, accelerated D&D scope, operations savings from new liquid waste system – process waste treatment options
Over 80% of cleanup to be completed by FY15, with a few essential buildings with ongoing operations remaining, along with remediation of underlying soils

Y-12 FOOTPRINT REDUCTION PROPOSAL

Today

2015



Demolish high risk facilities by FY15
Buildings Alpha 4, Alpha 5 and 9206, located in the heart of the Y-12 plant
Addresses the greatest risk to the work force and the environment at Y-12
Represent over 1.1 million square feet
Would not be demolished until FY 22 otherwise

Portsmouth and Paducah Proposals

The Portsmouth and Paducah Gaseous Diffusion Plants are slated for Decontamination and Decommissioning (D&D). Cost estimates for this work have been based on lessons learned form the Oak Ridge (K-25) Gaseous Diffusion Plant D&D. An initial investment of $270M at Portsmouth could yield a potential cost avoidance of $1.6B. Similar investments could be made at Paducah once the site is retired from its current uranium enrichment mission.

Status and Proposals for Near Term Completions

Small sites analyzed near-term completion options that accelerate their remaining EM work scope. This footprint reduction would allow management to focus resources on large site cleanup. Without additional investments, 10 sites will be finished by 2015. Six additional sites could also be accelerated from current planning completions – Brookhaven and West Valley in New York, Nevada Test Site, Argonne National Laboratory in Illinois, Energy Technology Engineering Center (ETEC) in California, and Moab in Utah.

Sites with Active EM Programs as of 2008

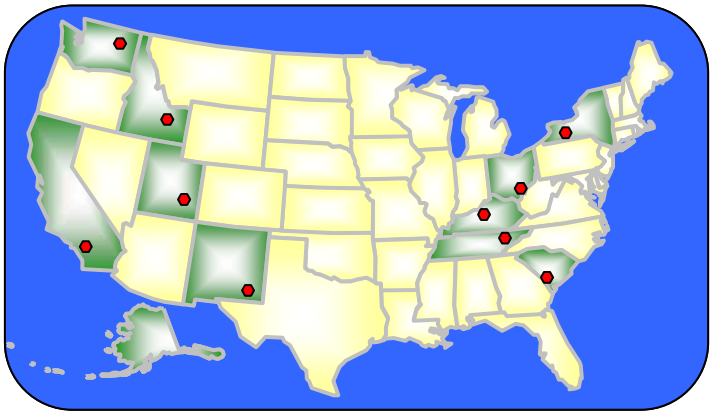
Examples of work at sites that can be accelerated:

- Brookhaven National Laboratory involves the decommissioning of two research reactors with accelerated completion in 2012.

- Uranium Mill Tailings Remedial Action Project in Moab, Utah, cleanup would be accelerated by 9 years, from 2028 to 2019. This project involves the remediation of the former uranium-ore processing facility.

- At ETEC, the remaining work is focused on the D&D of nuclear and non-nuclear facilities, remediation of a few soil contamination areas, and one groundwater plume. The scope of this project is being re-evaluated as the result of new legislative requirements.

Remaining Active EM Sites in 2015



- The West Valley Demonstration Project is divided into two phases. The first phase involves the relocation of canisters of radioactive tank waste to a newly constructed on-site facility for temporary storage, the remediation of contaminated soil areas, and the decommissioning of several nuclear facilities including the original reprocessing plant and stabilization facility. Completion of this work would be accelerated to 2018. The second phase of work would be completed at a later date when a disposition alternative is selected for the high-level waste

Energy Parks Initiative

This section describes an innovative concept to leverage internal US Department of Energy (DOE) resources, in partnership with industry and regional stakeholders, to establish Energy Parks. Designated tracts of land would be transferred to a third party for rapid development of large scale energy-related facilities, particularly those with potential to significantly influence energy, environment, and economy. Relevant technologies include but are not limited to, wind, solar, biomass, nuclear power, desalinization, geothermal, liquefied natural gas transfer stations, hydrogen generation, central-station coal power with carbon sequestration, and specialty manufacturing capability.

The Nation is facing several significant energy and environmental challenges:

- Providing secure, safe, and affordable energy supplies
- Promoting energy sources to protect the environment

EM's extensive resources that can be applied to these concerns include the following:

- Large tracts of land, including buffer zones

- Site environments that have been well characterized
- Existing infrastructure, including electrical transmission lines, abundant water supplies, roads, and railroads
- On-site resources that can be used to harness energy from renewable resources (e.g. solar, wind, geothermal)
- Nuclear operations and nuclear materials management capabilities
- State-of-the-art technologies and facilities
- Thousands of highly trained and experienced scientists, engineers, craftspeople, and equipment and process
- Established relationships with local and state regulators and surrounding communities

A way to leverage these DOE/EM assets to address the Nation's critical national energy and environmental needs is through the Energy Parks Initiative (EPI). Under the EPI, DOE would work with the commercial sector and stakeholders to facilitate the building and operating of commercial energy supply facilities. In addition to the EM resources listed above, the EPI could involve other DOE tools such as loan guarantees to assist in the development of energy facilities.

A significant benefit of implementing the EPI is that states and local communities would see that there are future activities which could provide jobs and a tax base. Without that future, some local stakeholders, including labor unions, view the completion of the EM mission as a negative event. At some EM sites, like Savannah River, there is already interest by the local community reuse organizations in utilizing part of the site for energy facilities.

Also, very preliminary feedback from some members of the energy industry indicates a significant interest in the energy parks concept, subject to a demonstrable return on investment.

The impact of transforming DOE sites to Energy Parks in all types of clean fuel / green energy production would be:

a. Energy production with clean technologies sited on "brownfields" with existing infrastructure and a trained workforce.
b. Accelerate the siting and permitting of new energy facilities due to extensive meteorological, technical and natural resource data gathered over the past 50 years of DOE Operations; these sites are as close to license ready than any other sites in the US.
c. Transition of the current work force and recruit the future work force to take advantage of the wealth of technical knowledge and operational experience.
d. Potential to create thousands of new jobs for the long term.

The initiative involves four phases: (1) initial evaluation of key assets for which accelerated completion of the EM mission is feasible, and in collaboration with state and local stakeholders, define the boundaries for opportunity; (2) optimizing the value of the assets in relation to opportunity; (3) enabling development by a third party; and (4) participation, as appropriate, in achieving performance objectives.

An investment of about $25 million would initiate phases (1), (2) and (3). The approach emphasizes early success, enabling the initiation of the process and public visibility within six months of Secretarial commitment, such as to secure industry commitment to Energy Parks at a DOE site.

EM has been carrying out preliminary planning activities such as working on a Request for Interest to be able to move out expeditiously if the new Administration chooses to pursue the EPI.

Summary

EM has strategic planning efforts underway to identify ways to reduce the legacy footprint of the EM complex. These footprint reduction efforts will lower monitoring and maintenance costs enabling EM to focus on critical long term activities like managing highly radioactive liquid tank waste. They will also enable the leveraging of DOE/EM site assets to address National energy and environmental goals through the Energy Parks Initiatives.