

Comprehensive Integrated Planning Process for the Oak Ridge Operations Sites

- Oak Ridge Reservation, Oak Ridge, Tennessee
- Paducah Gaseous Diffusion Plant, Paducah, Kentucky
- Portsmouth Gaseous Diffusion Plant, Piketon, Ohio

September 1999

Prepared by
Bechtel Jacobs Company LLC,
Lockheed Martin Energy Research Corporation,
and
Lockheed Martin Energy Systems, Inc.
for the
U.S. DEPARTMENT OF ENERGY

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ABBREVIATIONS

AM	Assistant Manager (DOE)
ATDD-NOAA	Atmospheric Turbulence Diffusion Division–National Oceanic and Atmospheric Administration
AVLIS	Atomic Vapor Laser Isotope Separation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CROET	Community Reuse Organization of East Tennessee
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
DOE-AL	DOE Albuquerque Field Office
DOE-HQ	DOE Headquarters
DOE-ORO	DOE Oak Ridge Operations
DP	Defense Programs (DOE)
EF	Enrichment Facilities (DOE)
EIS	Environmental Impact Statement
EM	Environmental Management (DOE)
EM/EF	Environmental Management/Enrichment Facilities (DOE)
ES&H	environmental, safety, and health
ESHQ&I	environmental, safety, health, quality, and infrastructure
ETNG	East Tennessee Natural Gas
ETTP	East Tennessee Technology Park
ETMC	East Tennessee Mechanical Contractors
FY	fiscal year
GIS	geographic information system
HEU	highly enriched uranium
HFIR	High Flux Isotope Reactor
LMER	Lockheed Martin Energy Research Corporation
LMES	Lockheed Martin Energy Systems, Inc.
M&I	management and integration
M&O	management and operating
NABIR	Natural and Accelerated Bioremediation Research
NFI	no further investigation
NPL	National Priorities List

ORAU	Oak Ridge Associated Universities
ORCMT	Oak Ridge Centers for Manufacturing Technology
ORISE	Oak Ridge Institute for Science and Education
ORNL	Oak Ridge National Laboratory
ORO	Oak Ridge Operations
ORR	Oak Ridge Reservation
ORRMT	ORR Management Team (DOE)
OSTI	Office of Scientific and Technical Information
PACRO	Paducah Area Community Reuse Organization
PEIS	Programmatic Environmental Impact Statement
PGDP	Paducah Gaseous Diffusion Plant
PIDAS	Perimeter Intrusion Detection and Assessment System
PORTS	Portsmouth Gaseous Diffusion Plant
R&D	research and development
RMO	Reservation Management Organization
S&M	surveillance and maintenance
SC	DOE Office of Science
SMS	Site Management Services
SODI	Southern Ohio Diversification initiative
SSAB	Site Specific Advisory Board
TCE	trichloroethylene
TVA	Tennessee Valley Authority
UEFPC	Upper East Fork Poplar Creek
URL	Uniform Resource Locator
USEC	United States Enrichment Corporation
WKWMA	West Kentucky Wildlife Management Area
Y-SIM	Y-12 Site Integrated Modernization

INTRODUCTION

This plan, entitled *Comprehensive Integrated Planning Process for the Oak Ridge Operations Sites*, is intended to assist the U.S. Department of Energy (DOE) and contractor personnel in implementing a comprehensive integrated planning process consistent with DOE Order 430.1A, “Life Cycle Asset Management,” and Oak Ridge Operations (ORO) Order 430 on sites under the jurisdiction of DOE-ORO. Those sites are the Oak Ridge Reservation, in Oak Ridge, Tennessee; the Paducah Gaseous Diffusion Plant, in Paducah, Kentucky; and the Portsmouth Gaseous Diffusion Plant, in Piketon, Ohio. DOE contractors at these sites are charged with developing and producing this plan, which is referred to as simply the *Comprehensive Integrated Plan*.

The long-term goals of the comprehensive integrated planning process, in order of priority, are to support DOE critical missions and to stimulate the economy while maintaining a quality environment. In support of that process, the *Comprehensive Integrated Plan* serves as a summary document, providing information from other planning efforts regarding vision statements, missions, contextual conditions, resources and facilities, decision processes, and stakeholder involvement. The plan is a planning reference that identifies primary issues regarding major changes in land and facility use and serves all programs and functions on the sites, as well as DOE-ORO and DOE Headquarters.

The Oak Ridge Reservation is a valuable national resource and is managed on the basis of the principles of ecosystem management and sustainable development. The Portsmouth and Paducah sites, while occupying smaller land areas, are also managed under ecosystem management principles when possible. Economic, ecological, social, and cultural factors, along with missions, guide the land- and facility-use decisions at these sites.

This plan combines and updates the comprehensive integrated plans for the Oak Ridge Reservation (ORNL/M-6545, May 1998) and for the Portsmouth and Paducah gaseous diffusion plants (BJC/PAD-97, March 1999). The current ORR plan is located at <http://www.ornl.gov/~dmsi/cip/> on the World Wide Web.

1. REGIONAL OVERVIEW FOR OAK RIDGE

The Oak Ridge Reservation (ORR) is located in Roane and Anderson counties in East Tennessee, mostly within the corporate limits of the city of Oak Ridge¹ (population 27,310, 1990 census). The ORR boundary lies in the southern and southwestern quadrant of the city limits. About 15 miles to the east is the city of Knoxville (population 165,121, 1990 census). Whereas these cities serve as the principal residences of ORR employees, the entire area from which ORR facilities draw employees encompasses more than 15 counties and has a total labor force of 357,000. This labor force is highly diverse, and many people are specially trained for production or high-technology-oriented industry. Refer to Fig. 1 for the location of the ORR.

¹The phrase "city of Oak Ridge" is used in this plan to denote the geographic location in contrast with "City of Oak Ridge," which denotes the political entity that acts as a legal agent.

1.1 Regional Socioeconomic Impact

The U.S. Department of Energy (DOE) Oak Ridge Operations (ORO) provides a major source of economic benefits for the State of Tennessee and its residents. With an annual operating budget of \$2 billion dollars, DOE has significant impact on the state's economy through the creation of jobs and income and through expansions in state and local tax bases. Even though DOE is primarily present in Anderson and Roane counties, the economic benefits accrue statewide. According to Matthew Murray and Paula Dowell (1999) of the Center for Business and Economic Research at the University of Tennessee, the economic consequences of DOE payroll and non-payroll spending in the State of Tennessee include the following.

- Spending by DOE led to an increase of more than \$1.9 billion in the State of Tennessee's gross state product in 1998.
- Total personal income generated in the State of Tennessee by DOE in 1998 was nearly \$1.3 billion. Each dollar spent by DOE in Tennessee translated into a total of \$1.91 in personal income for the state's residents.
- DOE spending supported 39,482 full-time jobs in the state in 1998, meaning that for every DOE job, 1.9 additional

jobs were supported in other sectors of the state economy.

- The average salary of the employees of DOE and its affiliates was 38% percent higher than the statewide average.
- DOE and its affiliates attract a highly skilled and educated workforce, including 1005 employees with Ph.D. degrees. In addition, 2719 employees hold master's degrees, and 4600 employees hold bachelor's degrees.
- DOE-funded activities generated over \$43.3 million in state sales tax revenue and \$16.2 million in local sales tax revenue in 1998.

1.2 Community Attitudes and Stakeholder Involvement

DOE has many past and ongoing efforts to ensure that a broad range of stakeholder concerns, ranging from local public attitudes to attitudes of the global technical and scientific community, are assessed and incorporated into the reservation decision-making process. Stakeholder input, which facilitates decision making in collaboration with the public as well as state and federal agencies, is crucial to the successful implementation of policy.

Figure 1.

The Oak Ridge National Laboratory (ORNL), the Oak Ridge Y-12 Plant, and the East Tennessee Technology Park (ETTP) (formerly known as the K-25 Site) provide opportunities for public review of many activities, and the Environmental Management (EM) organizations sponsor regular stakeholder involvement at the project level as well as the program level. The stakeholder involvement in the 1998 comprehensive integrated planning process consisted of a public review of draft documents at strategic locations. Updates, such as this, will be made available at public locations and will be available on the World Wide Web. Refer to Sect. 4 (4.1.6, 4.2.6, and 4.3.6) of this document for a description of current stakeholder involvement activities at each of the plant sites.

1.3 Adjacent Land Use and Physical Characteristics

Land uses near the ORR are predominantly rural, with agricultural and forest land dominating. The city of Oak Ridge has residential areas primarily along the northern and eastern boundaries of the reservation. Some Roane County residents have homes adjacent to the western boundary. The Clinch River forms a boundary between Knox County, Loudon County, and portions of Roane County.

The area is characterized by a ridge and valley topography that results in moderate to severe slopes and provides security and isolation for the ORR.

The hydrogeology of the ORR is complex. Highly fractured interbedded shale-limestone units predominate, and karst features are prevalent in some areas. These characteristics make it difficult to predict and monitor movement of groundwater. Protecting groundwater quality on the ORR is extremely important to ensure that potential contamination does not spread to the surrounding region.

2. OVERVIEW OF THE OAK RIDGE RESERVATION

The ORR currently consists of 34,513 acres of federally owned land and is the site of four DOE installations: the ETTP, the Y-12 Plant, ORNL, and the Oak Ridge Institute for Science and Education (ORISE). The DOE Office of Science (SC) is the landlord for the ORR.

2.1 Oak Ridge Reservation Vision

The ORR serves as an integrated science, education, industrial, and technology complex managed by DOE in partnership with the private sector—supporting a dynamic regional and national economy.

The intent of the federal government is to manage the ORR as a single parcel. DOE will retain sole responsibility and will continue to manage it in support of DOE missions. Future use is to include a mixture of activities that are compatible with and contribute to ongoing and anticipated DOE missions. According to current plans, the reservation will be used to support many of the same programs it currently supports while adapting to changing national goals and interests and to reduced federal budgets.

2.2 Planning Assumptions

The following important points related to the way DOE missions affect future ORR land use emerged from a stakeholder involvement effort called the Common Ground Process.

- DOE missions will be given priority for future use of the ORR.
- Because it is impossible to know the nature of all future DOE activities, planning should preserve reasonable flexibility to allow the establishment of other DOE activities on the ORR. Where the nature of future DOE activities is known, appropriate sites should be reserved for those purposes.
- Among DOE activities included in future ORR land-use plans are research and development (R&D), environmental restoration, and the treatment and long-term management of wastes generated on the ORR.
- Because of the risks associated with some DOE operations, it is appropriate to maintain buffer areas within the reservation and to coordinate an emergency planning and response capability with state and local governments.

A significant portion of the reservation will be maintained as federal land. A robust R&D mission is anticipated to continue for ORNL. ORNL includes a primary site, where most of the facilities are located, and the National Environmental Research Park, where outdoor laboratory research is performed. An industrial capability will continue at the Y-12 Plant to support the maintenance of the enduring nuclear weapons inventory. DOE Defense Programs (DP) work will continue to be performed at the Y-12 Plant, and the manufacturing footprint will be reduced consistent with the expected workload.

Future use planning will primarily support ongoing and anticipated DOE missions. Portions of the reservation will be used to promote the development of private-sector enterprises in ways that are consistent with and complementary to DOE missions. Support also has been expressed for various forms of passive recreational use that are compatible with anticipated research, industrial, and conservation uses of the reservation.

DOE's reindustrialization initiative is highlighted at ETTP, where private industry is directly involved in cleanup operations as well as leasing of land and facilities for nongovernment work.

The reindustrialization and/or reuse of DOE facilities to directly or indirectly offset the cost of cleaning up contaminated facilities will have a dramatic effect on the reservation. DOE's current plans are to substantially complete currently planned environmental restoration of its facilities by 2006. DOE's current cleanup plans are documented in *Accelerating Cleanup: Paths to Closure* (1999).

Public-private partnerships will be used to further the programmatic interests of DOE, including those associated with environmental cleanup. Select areas of land may be sold or made available for private industrial development if and when DOE determines that it is appropriate to do so.

DOE will privatize facilities and the operation of utilities that serve ETTP. The ORR's primary electrical power transmission system, including the 161-kV transmission lines and the substations at the Y-12 Plant, ORNL, and ETTP, is currently maintained and operated by the Y-12 Plant's Facilities Management Organization. DOE is negotiating with the Tennessee Valley Authority (TVA) about the transfer of the operation and maintenance responsibility for the DOE-owned 161-kV transmission lines. The Y-12 Plant is reviewing with DOE the possibility of conveying the responsibility for the "river lines" portion of its electrical

distribution system (located east and southeast of the Y-12 Plant) to the City of Oak Ridge.² These river lines support activities to the south of the Y-12 Plant and are not mission-essential to the plant's operations. Two important facilities supported by the river lines are the Water (River) Pumping Station and the Water Booster Station, which support the Water Treatment Plant located north of the Y-12 Plant. Current plans call for the Water Treatment Plant and operating system to be turned over to the City of Oak Ridge in March 2000. If the water system is conveyed to the City of Oak Ridge, then the electrical supply to the Water Treatment Plant will need to be supplied from the city's electrical system. If the Water Treatment Plant is to be operated by the City of Oak Ridge, it appears logical for the city to control the electrical system that supports it.

²"City of Oak Ridge" is used here to denote the political entity in contrast with the geographic location.

For the next 10 years, significant defederalization and private development is expected at the ETTP and the east end of the Y-12 Plant. During this time frame, significant areas of the reservation need to be retained in order to discharge the current mission of DOE in Oak Ridge and to provide the ability to pursue future initiatives, particularly the construction and operation of major scientific facilities, such as the Spallation Neutron Source.

2.3 History

For more than 55 years, government missions and operations have been the primary factor in the development of the Oak Ridge installations. In 1942, approximately 58,575 acres (the original acreage of the ORR) were purchased to build facilities for large-scale production of fissionable material for the world's first nuclear weapons. In 1943, construction began on the X-10 nuclear research facility (now known as ORNL), the first uranium enrichment facility (the Y-12 Plant), and a gaseous diffusion enrichment facility (currently known as ETTP). By mid-1945, "the city behind the fence," so-called because of the extensive use of security checkpoints and fences on the reservation, had a population of 75,000, and employment at the three installations reached a peak of 82,000. The end of

World War II came shortly thereafter in September 1945, and the population of Oak Ridge began to decline as people began returning to their pre-war occupations.

A summary of management changes on the ORR since 1947 follows.

- In January 1947, the Atomic Energy Commission assumed control of the operations at Oak Ridge as part of its mandate to oversee the nation's nuclear energy effort. The Union Carbide Nuclear Division was contracted to manage the land and installations for the government, implementing the strategic long-range plans of the Atomic Energy Commission to sustain Oak Ridge as a center of nuclear research and production.
- In 1974, the Energy Research and Development Administration assumed the Atomic Energy Commission's responsibilities to manage and oversee the Oak Ridge lands and installations.
- With the formation of DOE in 1977, oversight of the Oak Ridge installations became the responsibility of DOE-ORO.
- In 1984, Martin Marietta Energy Systems, Inc., replaced Union Carbide Nuclear Division as the prime contractor to DOE for ORR management. Through a merger with the Lockheed Corporation, Martin Marietta Energy

Systems, Inc., became Lockheed Martin Energy Systems, Inc. (LMES) in 1995.

- In January 1996, Lockheed Martin Energy Research Corporation (LMER) was established and became prime contractor for ORNL, which includes the Oak Ridge National Environmental Research Park.
- In April 1998, Bechtel Jacobs Company LLC became the management and integration (M&I) contractor for Environmental Management and Enrichment Facilities at ETTP.
- In April 1999, DOE SC was designated landlord for the ORR.

Since the end of the Cold War, the missions for the installations on the ORR have changed, as described below.

- The Oak Ridge Gaseous Diffusion Plant Cascade was placed in "ready standby" mode in 1985 and permanently shut down in 1987. The plant was renamed the Oak Ridge K-25 Site in 1990. The mission of the site, managed by the DOE's EM Program, became to demonstrate technology development for environmental restoration, waste management, and decontamination and decommissioning (D&D). In 1997 the site was renamed the East Tennessee Technology Park to reflect its new mission of reindustrialization. The

LMES management and operating (M&O) contract for ETTP expired March 31, 1998, and was transitioned to an M&I contractor, Bechtel Jacobs Company.

- The Y-12 Plant's mission changed from nuclear weapons production to limited production and increased emphasis on maintaining the capability to produce secondaries and cases (capability assurance) and to provide storage. The Y-12 Plant remains essential to the core stockpile management mission of the Nuclear Weapons Complex Defense Programs. The current M&O contract with LMES has been extended through March 2001.
- ORNL has become DOE's largest multiprogram R&D laboratory. Because the federal government owns the ORR and its status has been protected over a period of five decades, during which intensive characterization of the physical and biological components of the landscape has occurred, the ORR is perhaps the most intensively and extensively studied and understood parcel of land its size in the world. For this reason, the ORR plays an important role in the national environmental research agenda; it is one of a few sites in the nation where large-scale ecological research, environmental technology, and measurement science

intersect against a backdrop of 30 years of environmental monitoring and research on these lands. A new subsidiary, LMER, was formed as the M&O contractor at ORNL in 1996. The current M&O contract with LMER extends through March 2000.

- Oak Ridge Associated Universities (ORAU) operates ORISE for DOE through a contract that extends through September 1999.

2.4 Summary of Land Conveyances

The population of neighboring counties, primarily Knox County, is growing toward the ORR. Roane and Anderson counties and the City of Oak Ridge have continued to request that DOE release some underutilized properties for commercial, industrial, and residential land uses. DOE has evaluated and responded to these requests on a case-by-case basis as summarized in this section.

Of the original 58,575 acres of land purchased in 1942 by the federal government, 24,062 acres have been sold and 34,513 acres remain within the ORR. A summary of these conveyances is presented below.

- Private entities and homeowners: 12,685 acres, including permanent road easements granted to the city, counties, and state as well as land for rail service, area churches, house lots, country club and golf course development, sporting clubs, quarry operations, cemetery association, and Girl and Boy Scout organizations in addition to conveyances and exchanges for a medical complex;
- City of Oak Ridge: 5,960 acres for development purposes, such as residential, commercial, industrial, and school sites as well as utilities, roads, municipal properties, and public housing;
- TVA: 2,992 acres;
- State of Tennessee: 2,316 acres for health, forestry, agricultural research, and a biomedical graduate school;
- Other federal agencies: 73 acres;
- Anderson County: 27 acres; and
- Oliver Springs: 9 acres.

In 1979 the Secretary of Energy approved a program to permit DOE to make financial assistance payments to the City of Oak Ridge for a 5-year period under the authority of the Atomic Energy Community Act of 1955. The city submitted a self-sufficiency plan, which proposed that DOE

sell land to the city for industrial and commercial development. DOE-ORO determined that the land could be transferred directly at fair market value to the city in support of the self-sufficiency program rather than being reported as excess to the General Services Administration for screening and subsequent disposal. When the self-sufficiency program ended, certain remaining designated parcels that had been in review at the time were “grandfathered,” thus permitting DOE to consider those transfers should the land become excess to the needs of DOE.

2.5 Reservation-Wide Land Uses and Missions

2.5.1 Current Land Uses

This section describes (1) the primary land-use designations on the ORR, (2) specific activities and uses that are reservation-wide, and (3) key land-use considerations (the National Environmental Research Park, surveillance and maintenance of infrastructure outside the plant sites, and ecosystem management).

The primary land-use designations for sites on the ORR are shown in Fig. 2 and listed as follows.

- ORNL: Institutional and research (national research laboratory);
- Y-12: Industrial (defense support, manufacturing, and storage);
- ETTP: Mixed industrial (EM and reindustrialization);
- ORISE: Institutional and environmental laboratory; and
- Areas outside the primary mission areas: Mixed research and future DOE initiatives.

Specific activities and uses that are reservation-wide are listed as follows.

- Oak Ridge National Environmental Research Park;
- environmental research and demonstration areas;
- safety training facilities and associated safety buffers (surface danger zones);
- transportation;
- utilities;
- public use areas (Clark Center Recreation Park, visitor centers, greenways);

- ecological resources management;
- land application of biosolids;
- education;
- wetland mitigation;
- waste management;
- environmental monitoring;
- environmental restoration;
- protected cultural resources;
- conservation of unique ecological resources:
 - State Natural Areas,
 - Oak Ridge Wildlife Management Area,
 - Nature Conservancy–ranked biodiversity sites,
 - Nature Conservancy–designated landscape complexes,
 - Research Park endangered species habitats (natural areas),
 - Research Park endangered species potential habitats (reference areas), and
 - Wetlands;
- Oak Ridge National Environmental Research Park Biosphere Reserve; and
- emergency response planning zones.

National Environmental Research Park.

The mixed-use activity that occupies the largest portion of the ORR is the Oak Ridge National Environmental Research Park, comprising more than 20,000 acres. The Research Park is an outdoor laboratory for studying the nature of present and future environmental consequences stemming from DOE's mission. It provides a protected land area for research and education in environmental sciences. It is used to demonstrate that environmental quality can be compatible with energy technology development and does not preclude planned and selected development and other activities approved through the land-use approval process discussed in Sect. 3.4.

The National Environmental Research Park is an ORNL User Facility with more than 700 users from colleges, universities, industries, Lockheed Martin, and other (i.e., non-DOE) state and federal government agencies from 1993 through 1997. The Research Park coordinates natural resource management for the ORR. Some contaminated areas exist in the Research Park, and it serves as a buffer area for ongoing hazardous operations at the DOE's Oak Ridge installations.

Figure 2.

Scenic and Wildlife Management

Refuge. The Three Bend Scenic and Wildlife Management Refuge Area consists of approximately 3000 acres of the ORR set aside June 23, 1999, by Secretary of Energy Bill Richardson as a conservation and wildlife management area. The agreement between DOE and the Tennessee Wildlife Resources Agency (TWRA) calls for the land to be cooperatively managed for preservation purposes under a use permit.

Surveillance and Maintenance of Infrastructure Outside the Plant Sites.

The policy of the responsible organizations at each of the sites is to conduct surveillance and maintenance activities to maintain the exterior properties (areas outside main fences) within their geographic area of responsibility in a safe and environmentally sound condition. Maintenance on state highways and city-owned roads that cross the ORR is not the responsibility of DOE contractors.

East Tennessee Mechanical Contractors (ETMC) is the DOE prime contractor responsible for selected infrastructure maintenance outside the main security fences within the ORR. ETMC performs maintenance on selected paved and unpaved DOE roads; culverts and bridges associated with the selected roads; cemeteries; selected fields, yards, and firing ranges; and George Jones Memorial Baptist

Church. ETMC also operates a DOE-owned water treatment plant (which provides potable water to most of the ORR and Oak Ridge), a raw water booster station, a water intake and pumping station, and raw water lines and treated water lines up to the Oak Ridge city limits and the boundaries of the Y-12 Plant and ORNL. DOE is negotiating with the City of Oak Ridge about the transfer of the water treatment plant, associated auxiliary facilities, and the raw and treated water distribution lines.

The major utilities serving the ORR are electrical power, raw and treated water, natural gas, and telecommunications (see Fig. 3). Utility suppliers with specific maintenance and surveillance responsibilities include

- TVA,
- East Tennessee Natural Gas (ETNG),
- City of Rockwood,
- Oak Ridge Utility District,
- BellSouth,
- Cumberland Utility Board,
- City of Oak Ridge, and
- US West.

The Y-12 Plant's Facility Management Organization has the overall operational and maintenance responsibility for the DOE-owned power lines across the ORR and for DOE-owned gas lines from the ETNG metering stations that feed the ORR installations. The gas line from the ETNG metering station that feeds ETTP is managed, operated, and maintained by Operations Management International, Inc. DOE is presently negotiating with TVA about the transfer of the operation and maintenance responsibility for the DOE-owned 161-kV transmission line. More specific information on surveillance and maintenance responsibilities is provided in the *Oak Ridge Reservation Management Plan* (1999).

Ecosystem Management. DOE has committed to exercising stewardship over its assets on the basis of ecosystem management principles (*Stewards of a National Resource*, 1995). An ecosystem is an interconnected community of living things, including humans, and the physical environment within which they interact (*The Ecosystem Approach: Healthy Ecosystems and Sustainable Economies*, 1995). Ecosystem management integrates ecological, economic, and social factors (*Comprehensive Land-Use Planning Process Guide*, 1996). Land-use planning for the DOE ORR incorporates elements that promote ecosystem management, such

Figure 3

as clustering like uses, preserving clean areas, reusing disturbed areas, preventing pollution, protecting natural and cultural resources, balancing costs and benefits, considering future generations, optimizing appropriate recreational use, ensuring compatibility with the surrounding landscape, and integrating stakeholder input.

2.5.2 Future Land Uses

Future land uses are dependent on funding for missions, activities, and projects. The current proposed future initiatives on the ORR are as follows:

- Spallation Neutron Source;
- environmental research on the National Environmental Research Park;
- EM waste management facility;
- ORNL expansion (e.g., new facilities, infrastructure);
- Laboratory for Comparative and Functional Genomics;
- Center for Biological Sciences;
- Transuranic Waste Handling, Packaging, and Solidification Facility;
- Joint Institute for Neutron Sciences;
- Engineering Technology Complex;

- Fusion Materials Irradiation Facility; and
- reindustrialization/commercial development.

Figure 2 shows the currently known potential sites for proposed DOE facilities on the ORR.

Other portions of the reservation have been identified for additional uses, as described in other planning documents [e.g., *Oak Ridge National Laboratory Land and Facilities Plan* (1999)].

2.5.3 Non-Site-Specific Missions

Each of the installations on the ORR supports its own mission; however, three missions involving enhanced interface and partnerships with private industry are reservation-wide: environment management, reindustrialization, and technology transfer. These missions are described here.

Environmental Management. DOE-ORO has incorporated aggressive management and productivity goals into its planning for the accelerated completion of the DOE EM mission. Key to the accomplishment of these goals are the following assumptions.

- Reindustrialization will be the primary method of accomplishment for D&D of the ETPP.

- The EM waste management facility will be operational on the ORR in fiscal year (FY) 2000 for wastes resulting from Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) actions.
- The watershed approach will be implemented for assessment and cleanup of the ORR (refer to Fig. 4).

Stakeholder Involvement. DOE-ORO has had extensive stakeholder involvement in its EM planning effort. A series of public meetings are held at which the planning assumptions and results of project sequencing are discussed. A representative board of public stakeholders has been chartered as part of the formal review process for EM activities. Known as the Site Specific Advisory Board (SSAB), the group is intended to make recommendations to DOE and its regulators in the areas of environmental restoration, waste management, and related activities. One outcome of this board's activities has been the assignment of future land-use designations for specific areas requiring remediation and restoration. Contractors will use these designations to establish acceptable risk levels and corresponding cleanup levels. Issues are documented, and paths forward for implementation are identified. The public meetings have been collaborative and cooperative.

Figure 4.

EM Future-Land-Use Assumptions. As stated in *Accelerating Cleanup: Paths to Closure, Oak Ridge Operations Office*, published by DOE in Sept. 1999, the assumed EM future land uses for the ORR are (1) controlled access (in waste management areas), (2) industrial use, and (3) open space (in conservation areas). Assumed future land uses for ORR off-site areas are (1) industrial use and (2) recreational use (in conservation areas). An additional assumption is that institutional controls will be required for only a small portion of the ORR that is under the stewardship of the EM program. Details about the end uses, scope, and long-term stewardship of ORO sites are in the cleanup plan.

Reindustrialization. The goal of reindustrialization is to accelerate the cleanup of the ORR, reduce the cost of EM activities within DOE-ORO, and create new business opportunities and jobs for the region.

The emphasis of reindustrialization is to

- defederalize ETTP by the year 2010;
- transition the underutilized physical, nonphysical, and infrastructure assets within the ORR to the private sector; and
- reuse DOE facilities and assets to accelerate cleanup and reduce costs, resulting in the creation of private-sector jobs.

Technology Transfer. The technology transfer mission is to conduct activities that transfer benefit from federal research to U.S. industrial competitiveness and regional economic growth by means of

- intellectual property licenses,
- tangible research products,
- cooperative R&D agreements,
- technical consulting,
- personnel exchanges,
- science education,
- reimbursable work for others,
- information exchanges, and
- user centers.

The individual missions of each of the four installations are described in Sect. 4.

3. THE OAK RIDGE RESERVATION LAND- AND FACILITY-USE PROCESS

Each site on the ORR has a committee and process in place to identify, plan, and implement land- and facility-use changes on the basis of programmatic need (refer to Sect. 4 for a discussion of each individual site). Each site also ensures project review for various compliance issues. This section describes the objectives, land-use priorities, and the review process that constitute the ORR land- and facility-use process for proposed changes in land use outside the immediate plant site boundaries.

3.1 Goals

The review process for proposed major ORR activities and land-use changes includes consideration of the goals presented here.

- Proposed changes should incorporate the ORR vision for land use.
- Proposed changes require safe and environmentally responsible evaluation and operation.

- Proposed changes should contribute to regional economic development.
- Similar activities and uses should be clustered to achieve synergistic benefits, except where programmatic requirements dictate a specific location.
- Proposed changes should give priority and due consideration to the reuse of disturbed areas, thereby preserving clean areas and optimizing future-use options for the reservation.
- Desired projects or activities should either minimize pollution or serve as innovative approaches to cleaning up existing disturbed areas.
- Proposed changes should be compatible with adjacent uses.

3.2 Land-Use Priorities

The following priorities have been established so that conflicts between competing uses can be resolved. Decisions concerning proposed activities or land-use changes are made on a case-by-case basis to ensure compatibility with these priorities.

Priority 1—Preserve and protect land needed to meet the requirements of existing and future DOE mission-related facilities and programs that require large, biologically and physically diverse

protected land areas so DOE can continue to meet its local, regional, and national mission obligations.

Priority 2—Maintain land and facilities to promote sustainable economic development for the region through enhanced DOE missions, as well as through technology transfer and reindustrialization.

Priority 3—Protect the environment, meet the requirements of scientific and technical education, and support educational research opportunities on the ORR.

3.3 Review Process

When proposed changes in land use are outside the immediate plant site boundaries, a comprehensive and integrated process is used to ensure the proper planning, coordination, and communication among DOE and the various contractor representatives. These proposed changes in land use are evaluated by subject matter experts, program managers, and senior management (if potential impacts are significant). Recommendations for changes in land use are made by senior management on the basis of these evaluations. The roles and responsibilities of the key DOE and contractor personnel/committees involved in the ORR land- and facility-use decision-making process are described as follows.

DOE ORO Manager—The final ORO approval authority for all land- and facility-use changes submitted from internal and external sources. May initiate changes as needed. Forwards new requests through the review process.

DOE Assistant Managers (AMs)—Group consists of all DOE AMs; reviews and approves or rejects proposed land- and facility-use changes. May initiate changes as needed. Forwards approved changes to the ORO Manager.

DOE AM for Uranium and Engineering—Provides oversight management and coordination of land- and facility-use change process. Reviews ORR Management Team recommendations and coordinates with other AMs.

DOE ORR Management Team (ORRMT)—Consists of staff representatives from all major programs and functions within DOE-ORO. Coordinates and integrates all ORR land-use management activities outside the plant boundaries. Reviews, comments on, and makes recommendations for proposed land- and facility-use changes submitted by contractor organizations [Contractors' Land Use Committee and Reservation Management Organization (RMO)] and external organizations or individuals. Also

reviews DOE-initiated activities involving land-use changes and real estate actions.

Contractors' Land Use Committee—Consists of representatives from senior (vice president–level) management of LMER, LMES, and Bechtel Jacobs Company. Reviews, comments on, and approves proposed activities and recommends changes in land-use changes submitted by the RMO. Chaired by LMER.

Contractors' RMO—Consists of contractor representatives. Obtains review and comments from subject-matter experts and makes recommendations on proposed activities as well as land- and facility-use changes submitted by other process groups and individuals, project managers, and other internal contractor organizations. Provides communication, coordination, and integration services to DOE for ORR land-use management activities outside the developed areas within each plant site. Provides coordination and interface with contractor site organizations that have land- and facility-use responsibilities. Facilitates land- and facility-use planning services as needed. Chaired by LMER.

3.4 Description of the Land-Use Approval Process

3.4.1 Changes in Primary Land-Use Designations

The primary ORR land-use designations (including the DOE Oak Ridge National Environmental Research Park) shown in Fig. 2 are as follows:

- institutional/research at ORNL, industrial at the Y-12 Plant, mixed industrial at ETTP (including Parcel ED-1),
- institutional/environmental laboratory at ORISE, and
- mixed research/future DOE initiatives on areas outside primary sites.

Changes in the designation of these areas or portions of these areas require review through the Land-Use Approval Process.

Proposed land-use designation changes or significant resource-altering activities generally originate internally from DOE and contractor personnel but may come from external sources also. Land-use designation changes typically have potential to impact activities and resources within the areas to be changed. DOE and/or externally proposed land-use changes go

directly to DOE ORRMT for review. Evaluation of impacts on activities and resources resulting from land-use designation changes is solicited, as required, from RMO by DOE ORRMT.

Contractor-generated proposals for land-use designation changes will be screened by RMO prior to submission to DOE ORRMT to ensure compatibility with mission and compliance requirements.

Significant or controversial issues identified by RMO are raised to the Contractors' Land Use Committee for recommendation/discussion with DOE AMs.

Following DOE ORRMT's review of proposed changes in land-use designations, recommendations are forwarded to the DOE AMs for review through the DOE AM for projects and technical services. Final land-use decisions rest with the DOE-ORO Manager.

Decisions regarding determination of excess land are handled by the ORO Real Estate Office and are coordinated with the DOE ORRMT and DOE Headquarters (DOE-HQ).

3.4.2 Changes in Activities on the Oak Ridge Reservation

Multiple activities occur within the primary land-use designations described previously. Types of activities that require review include any proposal with a potential impact on resources, current uses, or future initiatives.

Requests for changes in activities on the ORR generally originate from DOE contractor personnel. In addition, some may originate from DOE or external sources and, as appropriate, are forwarded to RMO for evaluation and recommendation.

RMO reviews proposed changes to evaluate the potential for impact on various ORR resources or users. Input is solicited from subject matter experts with detailed knowledge of the location, resources, or other activities associated or potentially impacted. Input from subject matter experts is summarized and evaluated by RMO.

Additionally, project leaders are encouraged to obtain RMO input on their proposals as early as possible in order to become aware of potential conflicts at the initial stages of the planning process. This is followed by formal RMO review later.

Activity changes may need only RMO and DOE ORRMT review; however, in the case

of significant or potentially controversial changes, recommendations are forwarded from the DOE ORRMT and the Contractors' Land Use Committee through the DOE AMs to the DOE-ORO Manager for the final decision.

A final approval or rejection is then communicated through the DOE ORRMT Chair to the RMO Chair, who will inform the originating party.

Figure 5 illustrates the land-use process for the ORR.

Figure 5.

4. RESOURCES OF THE OAK RIDGE RESERVATION

Each installation on the ORR and the two other prime contractors with real property management responsibilities (i.e., ETMC and ORAU) have been assigned real property management responsibilities for certain geographic areas on the ORR (see Fig. 6). Portions of the National Environmental Research Park overlap the geographic areas of responsibility for the Y-12 Plant, ORAU, and ETMC. Within these areas of overlap, the Y-12 Plant, ORAU, and ETMC have real property management responsibilities.

4.1 Oak Ridge National Laboratory

4.1.1 Mission

ORNL is a multiprogram science, technology, and energy laboratory with distinctive capabilities in materials science and engineering, neutron science and technology, energy production, end-use technologies, mammalian genetics, and ecological research.

In support of DOE's missions, ORNL conducts basic and applied R&D to create scientific knowledge and technological solutions that strengthen the nation's leadership in key areas of science; increase the availability of clean, abundant energy; restore and protect the environment; and contribute to national security.

ORNL's R&D in science and technology supports the delivery of the scientific advances and technical innovations that enable DOE to carry out its missions. The laboratory conducts R&D for DOE in basic energy sciences, biological and environmental research, fusion energy sciences, advanced scientific computing research, nuclear physics, and high-energy physics. Activities are listed as follows.

Science and technology

- materials science and engineering
- analytical and separations chemistry
- environmental and social sciences
- plasma science and fusion technology
- instrumentation and measurement science and technology
- nuclear physics and nuclear astrophysics with radioactive ion beams
- neutron science
- functional genomics, proteomics, biotechnology, and bioengineering
- high-performance computing, with emphasis on computer and

computational science, distributed computing, and informatics

Energy resources

- energy-efficient technologies for buildings, industrial transportation, and utility end-use
- biomass with a focus on renewable energy feedstock and conversion technologies
- fossil fuel emphasizing applied materials, fuel cells, efficient turbine systems, and carbon sequestration
- nuclear technology and safety

Environmental quality

- environmental science management
- environmental technology development
- health and environmental risk assessment

National security

- management and disposition of weapons-related nuclear material
- promoting nonproliferation and international nuclear safety, with a growing emphasis on reducing the threat from biological, chemical, and nuclear agents
- strategic computing for safe stockpile stewardship

Figure 6

Figure 6 - Legend

These capabilities and areas of R&D emphasis are described more fully in the *Oak Ridge National Laboratory Institutional Plan, FY 1999 through FY 2003* (1998) at http://www.ornl.gov/inst_plan/IP_Outline.html on the World Wide Web.

4.1.2 Land Use

The ORR is a unique and irreplaceable resource for DOE to address its national science and technology missions. Land-use planning will identify and prioritize needs for preservation of reservation land to meet the requirements of existing and future scientific facilities, environmental research, education, and other compatible uses.

ORNL management's expectation is that facilities and land currently in or candidate for the DOE EM program within the ORNL area of responsibility will be returned to ORNL for future use in support of DOE's R&D programmatic activities after all remedial actions have been completed.

The ORNL primary site is approximately 4,250 acres, the National Environmental Research Park is approximately 20,000 acres, and the additional reservation area for which ORNL has contractual management responsibility (Solway Bend) is approximately 350 acres. Within the main site, the land use is categorized as

“institutional” or “research” to support the core competencies listed above. The Oak Ridge National Environmental Research Park also includes uses that provide the foundation for and support ORNL core competencies. Specific uses include those in the following list.

Environmental research and demonstration areas and facilities

- neutron science research
- Walker Branch Watershed Research Facility
- Global Change Field Research Facility
- Free-Air CO₂ Enrichment Facility
- environmental research areas
- Bear Creek Valley Hydrology Field Sites
- Field Lysimeter Facility
- National Oceanic and Atmospheric Administration Field Research Facility

National Environmental Research Park

- research and demonstration areas
- ecological resources management
- wetland mitigation
- State Natural Areas
- Oak Ridge Wildlife Management Area
- Nature Conservancy–ranked biodiversity areas
- Nature Conservancy–designated landscape complexes

- Research Park Natural Areas and Reference Areas
- Wetlands
- Oak Ridge National Environmental Research Park Biosphere Reserve

Education

- Ecological and Physical Sciences Study Center

Environmental monitoring

Ecological restoration

Protection of cultural resources

Emergency planning zones

Environmental research is supported by DOE as well as other federal agencies (e.g., National Science Foundation, U.S. Environmental Protection Agency, U.S. Department of Agriculture, and U.S. Department of Defense).

Land Requirements. A primary priority for land-use planning on the ORR is to retain the necessary land for existing and future scientific research facilities, programs, and various initiatives. The ORNL area has candidate sites for new initiatives by DOE and guest users. The following current and future proposed projects require land:

- Spallation Neutron Source;
- ORNL expansion (new facilities);

- Laboratory for Comparative and Functional Genomics;
- Transuranic Waste Handling, Packaging, and Solidification Facility;
- Isotope Separator On-Line Facility;
- Joint Institute for Neutron Sciences;
- Engineering Technology Complex;
- Large-Scale Environmental Studies Area;
- Stream Catchment Nutrient Research;
- Natural and Accelerated Bioremediation Research (NABIR) Field Research Center;
- Unexploded Ordnance/Landmine Detection Facility;
- Fusion Materials Irradiation Facility;
- Environmental R&D;
- Transportation and Packaging Facility;
- Center for Computational Sciences; and
- Advanced Materials Characterization Laboratory.

Major scientific research programs of the DOE Office of Energy Research require a considerable portion of the land base of the ORR to meet mission objectives. The following research areas have been

identified as important in pursuing future ecosystem or environmental research:

- Copper Ridge Research Area;
- Bull Bluff Watersheds;
- White Wing Research Area;
- Walker Branch Watershed;
- Freels Bend Research Area;
- Melton Branch Watershed;
- Bear Creek Valley Hydrology Field Sites;
- Global Change Field Research Facility;
- Pine Ridge Forested Catchments
- Raccoon Creek Research Area; and
- Chestnut Ridge.

Future environmental partnership areas include (1) State Natural Areas (potential additions), with many locations around the ORR, and (2) wetland mitigation potential areas, such as Freels Bend, Bull Bluff, and lower Bearden Creek. The *Oak Ridge National Laboratory Land and Facilities Plan* (1999) provides detailed maps of current and future reservation land and facility uses. It is located on the World Wide Web at

<http://www.ornl.gov/~dmsi/landUse/> (note:

the “U” in “landUse” in the URL must be capitalized).

4.1.3 Facility Use

Current Facility Uses. Approximately 517 buildings, trailers, and other major facilities totaling 3.4 million square feet are located throughout the main ORNL site. ORNL facilities are also located outside the primary site boundary and at the Y-12 Plant. The distribution of ORNL’s space is as follows.

Location	Area (square feet)
Main ORNL site	3,428,924
ORNL at Y-12 site	1,381,666
Off-site (lease)	62,169
Total	4,872,759

Note: Square footage of ORNL facilities at the Y-12 Plant includes trailers. It is 1,379,230 square feet without trailers.

About 156 facilities (buildings, structures, experimental systems, and equipment) at ORNL sites, including ORNL facilities at the Y-12 Plant, are currently inactive or projected to become inactive because the programs for which they were built have ended. Figures 7 and 8 show current facility uses, including inactive/projected inactive

Figure 7.

Figure 8.

facilities at ORNL. Figure 9 shows inactive/projected inactive ORNL facilities at the Y-12 Plant. Of the identified inactive/projected inactive facilities, approximately 100 facilities have been accepted into either the EM40 or EM60 programs. These programs manage and ultimately dispose of facilities that have exceeded their useful life and that require continual surveillance and maintenance to ensure safe shutdown. Funding for these programs of decontamination and decommissioning will be supplied by DOE EM. The other 56 facilities are currently inactive or will become so by FY 2005 because of a lack of definable mission and a continuing trend of declining budgets. Furthermore, it is expected that additional ORNL assets will become inactive as a result of obsolescence and deterioration. It is expected that additional contaminated facilities will be accepted into the DOE EM programs (EM40/EM60) beginning in FY 2002. Only 24 of the 56 facilities are contaminated; therefore, the 32 noncontaminated facilities must be managed to final disposition by ORNL. The objective of the ORNL Surplus/Inactive Facilities Program is to address these legacy facilities, achieving compliance with environmental, safety, and health (ES&H) requirements while maintaining the necessary safety envelope through final disposition of the facilities.

Future Facility Uses. Major proposed initiatives in the Bethel Valley area include the Laboratory for Comparative and Functional Genomics, the Center for Computational Sciences, the Advanced Materials Characterization Laboratory, and the Isotope Separator On-Line Facility. The proposed site for the Spallation Neutron Source is located north of the main ORNL complex in Bethel Valley. Figure 10 shows the proposed locations of these facilities.

The major proposed initiative in the Melton Valley area is the High Flux Isotope Reactor upgrade and refurbishment, which would make the facility the most powerful research reactor in the world and greatly enhance the ORNL's already unique neutron science capabilities and programs. Other major proposed initiatives in Melton Valley include the Engineering Technology Complex and a Fusion Materials Irradiation Facility. These proposed initiatives reflect ORNL's long-term objective of consolidating all R&D facilities at the ORNL main complex including facilities currently housed at the Y-12 Plant. Areas for waste operations and facilities are also proposed for Melton Valley. Refer to Fig. 11 for the location of the proposed facilities in Melton Valley.

User Facilities at ORNL. An important part of DOE's science mission is to provide large-scale, complex scientific facilities for

laboratory, academic, and industrial users. ORNL has 16 designated national user facilities:

- Advanced Propulsion Technology Center,
- Bioprocessing Research and Development Center,
- Buildings Technology Center,
- Californium User Facility,
- Computational Center for Industrial Innovation,
- High Flux Isotope Reactor,
- High Temperature Materials Laboratory,
- Holifield Radioactive Ion Beam Facility,
- Metals Processing Laboratory User Center,
- Metrology Research and Development Laboratory,
- Mouse Genetics Research Facility,
- Oak Ridge Centers for Manufacturing Technology (joint ORNL and Y-12 Plant facility),
- Oak Ridge Electron Linear Accelerator,

Figure 9.

Figure 10

Figure 11

- Oak Ridge National Environmental Research Park,
- Physical Properties Research Facility (proposed),
- Shared Research Equipment Program, and
- Surface Modification and Characterization Research Center.

4.1.4 Infrastructure Needs

ORNL has one of the oldest physical plants in the DOE laboratory system. Appropriate infrastructure upgrades will be required as facilities and utility systems age. Major infrastructure upgrades currently under way or planned for the near future include the following.

The Laboratory's chiller systems will have been completely replaced and upgraded by the year 2000.

Upgrades to the steam distribution system are nearing completion, and a plan to convert the steam plant from coal fired (with gas backup) to gas fired (with oil backup) has been developed.

Implementation began in FY 1998 with the addition of a second gas-fired boiler through a line-item project. This conversion should be completed by the year 2004.

General plant projects and line items are planned (1) to provide new or to renovate existing research and support facilities; (2) to upgrade, replace, or renovate the electrical, fire protection, heating, ventilating, and air conditioning systems; and (3) to support other projects.

Refer to the *FY 2001 Environment, Safety, Health, Quality, and Infrastructure Budget Formulation Submission for Oak Ridge National Laboratory* (1999) for a complete listing of proposed infrastructure upgrades.

4.1.5 Site and Facility Planning/Reuse Activities

Within the Operations, Environment, Safety, and Health Directorate, the Office of Capital Asset Management carries out capital asset management and facility planning for ORNL. This group develops the Integrated Facilities Plan (see Sect. 3 in *Oak Ridge National Laboratory Land and Facilities Plan*, 1999) and Environmental, Safety, Health, Quality, and Infrastructure (ESHQ&I) Budget Formulation Submissions for DOE's Life-Cycle Asset Management Process. The Integrated Facilities Plan contains technical site information and site development plans and serves as the master plan for future site development. ESHQ&I Budget Formulation Submissions serve as the

primary document to support planning and budgeting efforts in this area.

The disposition of orphaned and/or inactive and projected inactive facilities that have not already been accepted into DOE EM programs must be determined. Funding in future years is uncertain. Should no further facilities be added to the DOE EM programs, the burden of disposition of inactive/projected inactive facilities would fall on currently funded programs. Significant negative impacts will be experienced for R&D and/or landlord programs, with the resultant decline in research activities and continued deterioration of infrastructure conditions. The *Oak Ridge National Laboratory Land and Facilities Plan* (1999) provides detailed current and future facility information. It is located on the World Wide Web at <http://www.ornl.gov/~dmsi/landUse/> (note: the "U" in "landUse" in the URL must be capitalized).

4.1.6 Stakeholder Involvement

ORNL stakeholders include those who use the land for DOE mission activities, those who fund activities on the ORR, those with state or federal regulatory interest, neighbors who may be impacted by land-use decisions, and those with a perspective on regional/national/international impacts

of ORR land-use decisions. ORNL has frequent stakeholder interaction with various sponsors, the Neutron Users Group, the Tennessee Wildlife Resources Agency, the Tennessee Department of Environment and Conservation, the Tennessee Natural Heritage Program, and others.

Stakeholder input was obtained through summarizing existing comments from local stakeholders (e.g., the Common Ground Process that solicited input from stakeholders in the surrounding region in 1995) and is supplemented by requesting input from external stakeholders not represented in the Common Ground Process.

Responses of stakeholders external to ORNL and participants in the Common Ground Process, as well as public comments received informally throughout the planning, is evaluated for compatibility with the ORNL vision for land use. Where appropriate and possible, these responses are incorporated into the plan of current land uses and planning for future land uses.

4.2 The Y-12 Plant

4.2.1 Mission

The Y-12 Plant's mission is to meet the needs of the DOE, other government

agencies, and private industry through a commitment to excellence in the use of a technology-based manufacturing center. Mission activities include the following:

- production of complex components and assemblies;
- safe and secure storage of nuclear materials;
- dismantlement, disposition, evaluation, and assessment of weapon components;
- transition of the plant size to meet DOE needs;
- transfer of technology to private industry;
- maintenance of DOE capabilities;
- national prototype center; and
- support of other national priorities.

These mission activities will be accomplished in a cost-effective manner by integrating manufacturing, engineering, and development technologies while protecting the health and safety of the public and employees and protecting the environment.

4.2.2 Land Use

The main area of the Y-12 Plant covers approximately 811 acres, with about 630 acres enclosed by the outer perimeter

security fence. The total area of the ORR for which the Y-12 Plant is responsible is approximately 5428 acres. The main plant area contains about

7.6 million square feet of floor space, housing mission-related operations for the following three primary DOE programmatic offices.

Defense Programs (DP)—The landlord program for the Y-12 Plant, DP is the primary user of facilities in the execution of its DOE mission.

Office of Science (SC)—SC performs work for the ORNL mission in facilities located at the Y-12 Plant. These facilities, comprising nearly 20% of the Y-12 Plant's total space, are not considered part of the DP footprint.

Environmental Management (EM)—EM provides waste management, D&D, and environmental restoration services to the Y-12 Plant, and occupies several buildings at the plant. EM also provides surveillance and maintenance to Building 9201-4, a 561,900-square-foot facility that has been transferred to EM ownership. EM-occupied facilities are not considered to be a part of the DP footprint.

Within the main plant site, the primary uses are manufacturing and storage, technology transfer and work for others, and

environmental restoration and waste management. As a result of the ridge and valley terrain upon which it is built, the Y-12 Plant has evolved in a long, linear configuration. Approximately 1/2 mile wide from north to south and 2-1/2 miles long from east to west, the Y-12 Plant may be broadly conceptualized as having three main areas: the East End mission support area, the West End manufacturing area, and the West End environmental area.

Generally speaking, the East End mission support area is primarily devoted to the ORNL facilities at the Y-12 Plant and the Oak Ridge Centers for Manufacturing Technology (ORCMT), which is responsible for the technology transfer and work-for-others programs. The main Administration Building houses LMES senior management functions as well as the DOE Y-12 Site Office, the Office of Assistant Manager of Defense Programs, and the Defense Nuclear Facility Safety Board. Additionally, this area of the plant is the residence of many other technical and general plant support services such as Engineering, Site Management Services, Guard Headquarters, Medical, and related activities. The West End manufacturing area comprises the majority of the Y-12 Plant's DP operations and is generally housed inside the high-security Perimeter Intrusion Detection and Assessment System (PIDAS) fence. The area within PIDAS

contains Y-12's manufacturing and both nuclear and nonnuclear material storage operations. Just west of the PIDAS boundary, MK-Ferguson occupies more than 260,000 square feet of facilities in support of plant construction activities. Also in the general area but outside the PIDAS boundary are DOE's Transportation Safeguards Division facilities. The West End environmental management area, managed by EM, contains tank farms, waste management treatment facilities, and storage areas.

Areas outside the main plant site but within the Y-12 Plant's ORR area of responsibility are used primarily for a buffer area between the Y-12 Plant's nuclear operations and the public, as well as for environmental restoration and waste management activities. Other activities include environmental monitoring and research and the protection of sensitive cultural and natural resources. Areas outside the Y-12 Plant's main site and outside the contiguous area of responsibility include Clark Center Recreation Park (approximately 80 acres), the Central Training Facility (approximately 150 acres), and the K-1650 Central Control Facility.

Land Requirements. Overall land requirements outside the Y-12 Plant's existing ORR area of responsibility are not

expected to increase in the foreseeable future. As the Y-12 Plant is modernized within the next decade, however, increasing development pressure from new construction will occur within and around the plant's currently developed area. As facility space at the Y-12 Plant is rendered surplus to the DP mission needs because of right-sizing or being replaced by modernized facilities, the use of this space will be evaluated for various end-use scenarios, including demolition.

4.2.3 Facility Use

Current Facility Uses. The Y-12 Plant supports 582 facilities composed of buildings and other structures. These facilities total approximately 7.6 million square feet of space. The Y-12 Plant began downsizing its manufacturing operations in the early 1990s. This effort has resulted in several thousand square feet of manufacturing floor space being identified as surplus to the DP mission. Much of the surplus space is in over-50-year-old contaminated facilities that are extremely expensive both to operate and to upgrade to modern ES&H standards. Surplus and candidate surplus facilities are shown in Fig. 12. The site continues to move to a consolidated and right-sized DP production footprint. Figure 13 shows the existing primary land uses at the Y-12 Plant. The

distribution and area of the Y-12 Plant's buildings by function are shown here.

Function buildings	Number of	Space
	(square feet)	
Y-12 Plant	486	5,201,527
ORNL at Y-12	29	1,379,230
Environmental Management	24	769,604
MK-Ferguson and other	43	261,457
Total	582	7,611,818

Note: This table does not include the Y-12 Plant's trailers. The square footage of ORNL at Y-12 is 1,381,666 if trailers are included.

Future Facility Uses. The major focus of DP planning at present is the Y-12 Site Integrated Modernization (Y-SIM) program. This program will mainly affect facilities in the West End manufacturing area. Through Y-SIM, production facilities dating from the 1940s and 1950s will be modernized or replaced in order to meet long-term stockpile-management missions into the twenty-first century. The first step in this modernization program will be the construction of a new secure facility for storing the nation's highly enriched uranium (HEU). Other facilities to follow will be a modernized enriched uranium manufacturing facility, a special materials facility, and related manufacturing

facilities. Planning for the scope and timing of future Y-SIM components is under way. However, during the modernization process, the plant must also address its existing facilities. Some will continue to be used even after completion of Y-SIM. Others will be needed to meet mission requirements during the period of Y-SIM planning and construction. The modernization program is anticipated to encompass some mix of both new construction and upgrades to existing buildings during the next 10–20 years.

The Y-12 Plant East End mission support area will experience change as areas are adapted to new uses, to technical information exchanges, and to skills transfer and as plant functions potentially are outsourced. Partnerships among governments, universities, and private industry are creating an open and inclusive infrastructure for leveraging resources and broadening participation. Technology application, industrial opportunities such as precision manufacturing and specialized analysis, a national prototype development program, modeling, and reindustrialization activities with private industry will present opportunities for future facility use and economic development.

4.2.4 Infrastructure Needs

To ensure the nation's continued and viable nuclear posture, it is critical that the evaluation, surveillance, maintenance, repair, and dismantlement capabilities at the Y-12 Plant be maintained. To support the Y-12 Plant's missions into the next century, manufacturing technologies supporting stockpile evaluation and maintenance need to be modernized, information systems need to be upgraded, aging process equipment needs to be replaced or upgraded, and facilities and site infrastructure need to be modernized.

4.2.5 Site and Facility Planning/Reuse Activities

The primary focus of the Y-12 Plant's current site and facility planning/reuse activities are facility transition and the Y-12 Site Integrated Modernization (Y-SIM) effort.

Site and facility reuse activities to date have included developing documentation about underutilized facilities and facilities that are or will be surplus to the needs of DOE in general and DP in particular. Examples of this documentation include program plans and guidance on the management of surplus facilities. Additionally, the Y-12 Plant has participated in site visits by potential reuse organizations.

Figure 12.

Figure 13.

The Y-12 plant has served the defense needs of the country for over 50 years, and many of its facilities are showing the effects of stress and age. It is in the best interest of DOE and national defense to ensure that the plant's capabilities are extended into the 21st century. Toward that end, the Y-SIM program is currently planning to replace or upgrade existing critical processes and facilities that are unique to the Y-12 Plant. A Site-Wide Environmental Impact Statement (SWEIS) is being prepared to support Y-SIM.

In addition, a 10-year program and operating plan for submittal to the DOE Albuquerque Field Office (DOE-AL) is being developed.

Other integral planning efforts of the plant are day-to-day site planning, the management of both office and non-office space, and the management of the Y-12 Plant's site infrastructure improvements.

4.2.6 Stakeholder Involvement

The Y-12 Plant's site planning involves its stakeholders in the planning process at both local and remote locations. The Y-12 Plant's site planning documents are essentially a roll-up of programmatic support and mission activities at the Y-12 Plant. Major activities enumerated in the documents (e.g., proposed storage of highly

enriched uranium and the Programmatic Environmental Impact Statement for Stockpile Stewardship and Management) have been and will continue to be the subject of extensive public meetings, reviews, and comments. The Y-12 Plant SWEIS is expected to be completed the summer of 2000.

Remote planning stakeholders for the Y-12 Plant consist primarily of the DOE DP and Facilities Management programs at DOE-AL and DOE-HQ locations. Planning documents are distributed to DOE-AL and to DOE-HQ stakeholder organizations, and visits to these organizations and to other DOE sites are planned annually to share, comment, and benchmark site-planning documents and related activities [e.g., geographic information systems (GISs) and facility transition]. Furthermore, the Y-12 Plant participates in annual DOE conferences and workshops by attendance and presentation where pertinent.

4.3 East Tennessee Technology Park

4.3.1 Mission

The mission of the ETTP is to reindustrialize and reuse site assets (i.e., facilities, equipment, materials, utilities, trained workforce) through leasing of

underutilized facilities and incorporation of commercial industrial organizations as partners in the ongoing environmental restoration, D&D, waste treatment and disposal, and diffusion technology development activities.

Specific activities include the following:

- management of the Toxic Substances Control Act Incinerator, a unique mixed-waste treatment facility;
- support of risk-based environmental cleanup programs for contaminated facilities and natural resources at DOE facilities in Oak Ridge and in Paducah, Kentucky, and Portsmouth, Ohio;
- treatment, storage, and disposal of hazardous and radioactive wastes; and
- cost-effective support services for ETTP users.

The emphasis of the reindustrialization mission is to defederalize ETTP by the year 2010.

4.3.2 Land Use

The ETTP main site comprises 725 acres enclosed within a security fence, and the ETTP geographic area of responsibility consists of approximately 5942 acres, including ED-1 and ED-2.

Current Land Uses Inside the Security

Fence. Existing land uses within the security fence are typically mixed industrial, with much of the area undergoing environmental restoration. Tenants include DOE prime contractors, M&I operations, M&I subcontractors, Community Reuse Organization of East Tennessee (CROET) lessees, and sublessees.

Current Land Uses Outside the Security

Fence. Much of this land has been maintained as natural areas (open space and forest management land). Many areas are protected and managed as sensitive cultural and natural resources. Some areas are designated as being available for “alternative uses” in connection with reindustrialization. Other uses are as follows:

- Parcel ED-1 (a lease to CROET that became effective April 28, 1998);
- Parcel ED-2 (a lease to CROET that became effective September 15, 1997);
- Parcel ED-3 (environmental assessment is under way);
- the Visitor’s Overlook Center;
- the Transportation Safeguards Division Maintenance Facility (funded by DOE-AL);

- a few areas of contamination listed in the Federal Facility Agreement (most notably the K-1070A Burial Ground, the Contractor’s Spoil Area, the K-901A Holding Pond, the K-901 South Waste Disposal Area, and the 1007-P1 Holding Pond).

Three significant land areas within the ETTP site outside the fence, comprising approximately 2400 acres of the total 5942 acres within the ETTP area of responsibility, were reviewed during FY 1997 by the Environmental Restoration Footprint Reduction Program for removal from the National Priorities List under CERCLA. Of these areas, approximately 2300 acres of land are being recommended to the Federal Facilities Agreement parties for removal from CERCLA requirements because there is no evidence of any surface contamination on this land.

Land Requirements. The DOE-ORO is preparing an environmental assessment to evaluate the potential impact of leasing parcel ED-3 on the ORR. Under the proposed action, DOE would lease approximately 450 acres of land to CROET and would designate approximately 1520 acres of adjacent land as buffer areas. The buffer areas would not be leased, although DOE could license their use.

Parcel ED-3 is located on the ORR in Roane County, within the ETTP area of responsibility. The land runs along portions of State Road 327 (Blair Road) and State Road 58 (Oak Ridge Turnpike). The buffer area includes portions of Black Oak Ridge, McKinney Ridge, and Pine Ridge adjacent to parcel ED-1.

Under the proposed action, the land (excluding the buffer areas) would be marketed and developed for mixed uses. CROET would sublease portions as suitable tenants are identified. The environmental assessment will present the impacts of the proposed action, discuss alternatives, and determine whether and under what circumstances further study may be needed. The buffer area contains land within both the ETTP and the ORNL areas of responsibility.

The Reindustrialization Team prepared a predecisional *Preliminary ETTP Master Land Use Plan* (June 1997) to identify future land-use requirements as well as to serve as a starting point for several follow-on activities. The predecisional *Preliminary ETTP Master Land Use Plan* represents a 20- to 30-year period for implementation; many of the features in the plan are based upon the completion of the EM Accelerated Cleanup Plan by 2006. The predecisional *Preliminary ETTP Master Land Use Plan*

is illustrated in Fig. 14. Plan objectives include the following seven focus objectives:

- serve as a guidance for ETTP transition from federal to private management,
- reinforce aesthetic site amenities to attract and retain long-term tenants,
- provide a tool for developing a comprehensive site management plan,
- promote compatible adjacent tenant uses,
- serve as a basis for development sequencing,
- help analyze required site infrastructure, and
- justify to stakeholders the long-term sustainable development and use of the site.

A GIS land analysis was performed on the ETTP site in early 1997 to provide information to the predecisional *Preliminary ETTP Master Land Use Plan*. The purpose of the GIS analysis was to identify parcels outside the security fence that could be made available for alternative uses, including industrial development in conjunction with site reindustrialization and privatization. Buffers were applied to protected resources and areas, and the GIS then plotted remaining areas of land that contained areas with less than 15% slopes.

These parcels were deemed suitable parcels for potential reindustrialization and are included in the predecisional *Preliminary ETTP Master Land Use Plan*.

Desired land uses/elements were grouped by land-use categories adopted by the SSAB Oak Ridge Reservation End Use Working Group, a DOE-sponsored public stakeholder group. These initial end-use categories (in the order of most- to least-restricted future uses) were as follows: (1) restricted, (2) industrial/commercial, (3) conservation, (4) recreational, (5) residential, and (6) agricultural.

The predecisional *Preliminary ETTP Master Land Use Plan* presented the following land-use assumptions.

- Mixed light industrial uses will include commercial office, R&D, and laboratory facilities, where appropriate, to serve the needs of site tenants.
- Heavy industrial uses will include manufacturing; warehousing and distribution; and waste storage, treatment, and disposal facilities.
- Recreational uses will be limited to passive recreation facilities, such as “greenway” walking and jogging trails, which may be integrated with preserved archeological or historic sites or with historic experience “remnant” or

“memory” exhibits. Agricultural uses on the ETTP site will be limited to forest management areas, which are primarily conservation-use areas to maintain healthy forested land as well as open space.

- Residential uses on the ETTP site area will be limited to potential lodge/conference facilities located adjacent to the potential mixed light industrial/R&D/office facilities on west Black Oak Ridge.
- These existing land uses will continue to be protected: natural areas identified as Biodiversity Significance Ranked habitats, significant archeological and historical sites, and 100-year floodplain areas, with appropriate buffer areas for the latter.
- The K-29, K-31, and K-33 buildings will be decontaminated to a level that will allow future industrial use of these buildings through private long-term industrial leases.
- The demolition of the K-25 and K-27 buildings will include engineered fill of the below-grade areas of each building (using appropriately crushed or compacted demolition building debris, if possible) before capping, allowing future site industrial development and reuse. The K-770 Contaminated Scrap Metal Yard and K-1070C/D Burial Grounds

Figure 14.

will be assessed to allow future industrial use with minimum use as storage and laydown areas or for vehicle parking.

4.3.3 Facility Use

Current Facility Uses. Of the total 14 million square feet of building space at the site, 90% (12.5 million square feet) of space is under the purview of the EM D&D Program. Space in approximately 25 buildings is now under lease or under Memoranda of Understanding for leasing through CROET as a part of the reindustrialization mission for the site. CROET is a private-sector organization established by DOE to lease underutilized facilities on the ORR. CROET leases facilities from DOE and then subleases them to private industry.

Facilities at the site are grouped by DOE, with the majority categorized as administrative (10), storage (12), production (13), service (14), laboratory (15), and utility plants (34).

Facilities at the ETTP site include the only licensed mixed-waste incinerator in the country, low-level and special nuclear material storage and handling areas, prior gaseous diffusion facilities in the process of being remediated and salvaged for metal-recycling initiatives, electron microscopy and specific elemental analysis laboratories,

and testing facilities. Of these facilities, many are included in reindustrialization initiatives with private industry partners.

Future Facility Uses. DOE has negotiated prime contracts with private industry for metal recycling/remediation projects in shutdown process buildings, such as the metal recycling contract for Buildings K-29, K-31, and K-33 (signed August 25, 5, 1997) and the K-1200 Equipment Removal Project Contract, a no-cost (\$1, actual payment waived) fixed-price contract that was awarded on November 2, 1998. Many of these contractors or lessees will accomplish environmental remediation of existing buildings as a part of material-recycling activities in these buildings, thereby reducing the environmental remediation “mortgages” at the site.

4.3.4 Infrastructure Needs

Short-term ETTP infrastructure needs (over the next 5–10 years) are being determined through an assessment of needs by two sets of users: (1) Environmental Management and Enrichment Facilities (EM/EF) mission-related site occupants who, under the new M&I contract, will complete the environmental cleanup of the site and (2) reindustrialization tenants who participate in the site cleanup activities or are bringing immediate alternative industrial reuses for the site’s future as a

defederalized, privately managed industrial park. Infrastructure needs that translate into major capital upgrades are prioritized. The *FY 1997 Integrated Strategic Plan* integrates planning by many different on-site programs and divisions, addressing infrastructure as one of its focus areas, promoting the sharing of complementary needs as well as resolution of conflicting infrastructure needs.

The ORR Reindustrialization Division is responsible for identifying long-term infrastructure needs for ETTP. According to the Reindustrialization Team in the *FY 1997 Integrated Strategic Plan*, “*necessary infrastructure*” is defined as including the (1) electrical distribution system, (2) sewer system, (3) natural gas distribution system, (4) potable water system, (5) steam supply system, (6) rail system, (7) common grounds and roads, and (8) security for required federal classified and protected areas.

In the reindustrialization section of the *FY 1997 Integrated Strategic Plan*, long-term management of “*necessary infrastructure*” is described as being subcontracted to private-sector firms during the site’s transition from a DOE-operated facility to a privately managed industrial park via CROET. The first such contract was for the management and operations of ETTP utility systems by a private-sector

utility systems M&O contractor. Final infrastructure outsourcing as DOE reduces its footprint on the site will transition to CROET.

In the *FY 1997 Integrated Strategic Plan*, the Reindustrialization Team defines “Desired Infrastructure” as including industrial security; fire/medical and environmental emergency response; radiological safety; mail/parcel service; food service; transportation service; building maintenance and janitorial service; computer/electronics maintenance; vehicle/heavy equipment maintenance; fueling service; waste pickup; design/engineering, telecommunications, analytical laboratory, and copy/photographic services; continuing education/training; records management; material inventory/property management; and conference services. On the premise of tenant freedom of choice from a variety of sources (in-house personnel, private contract, or DOE contract), the demand for private services will dictate whether private firms supplying those services locate at the ETTP.

The *East Tennessee Technology Park FY 1998 Integrated Strategic Plan* (1997), seeks resolution of many crosscutting ETTP issues by grouping issues under overarching strategic objectives that identify what needs to be accomplished.

Then plans of action, stated as tactical objectives, are developed for each issue. These action plans denote how and when actions will be completed. Each focus area of the Integrated Strategic Plan identifies the goals that need to be met, along with fiscal year projects that accomplish those goals. Thus each area is informed about the activities under other areas. Each focus area next studies activities of the other areas, analyzes possible conflicts and compatibilities, and addresses crosscutting issues with resolutions for conflicts and strategies for enhancing cooperation. Some of the important issues in the current Integrated Strategic Plan are (1) management and budgeting of short-term infrastructure support needs by EM mission activities and early reindustrialization tenants until final transition to a private industrial park after site remediation; (2) coordination of EM, Enrichment Facilities, and other DOE program activities; and (3) resolution of management and budgeting of “returned facilities” (facilities returned by CROET to DOE after leasing activities are completed) and “orphan facilities” (unowned facilities not supported by any existing DOE program direct funding source, steward, or “parent”).

4.3.5 Site and Facility Planning/ Reuse Activities

The two primary nonprogrammatic ETTP site and facility planning documents are the ETTP Integrated Strategic Plan and the ETTP Master Land Use Plan. Each plan has its own important objectives.

The ETTP Integrated Strategic Plan is an iterative process, begun by the DOE Site Office in 1995, to use a multiprogrammatic, multidisciplinary approach to integrate the activities of separately managed Energy Research, Waste Management, Reindustrialization, and Site Operations organizations by identifying issues for resolution. The role of the *East Tennessee Technology Park FY 1998 Integrated Strategic Plan* is (1) to identify strategic site activities under focus areas and to share, discuss, and summarize these activities, identifying crosscutting issues for resolution, and (2) to develop action plans in the form of tactical objectives to resolve conflicts and enhance synergy among activities. The ETTP Integrated Strategic Plan focuses on the site’s ultimate destination while identifying the impact of that destination on the following year’s direction and focus, with an understanding of out-year goals.

The predecisional *Preliminary ETTP Master Land Use Plan*, described

previously under Sect. 4.3.2, “Land Use,” is the longest-focus planning activity at the site, considering the long-term future use of the site 20 years hence. The *Preliminary ETTP Master Land Use Plan* therefore provides initial guidance and recommendations to the public stakeholder group, the SSAB End Use Working Group, whose responsibility it will be to assess the site’s planned remediation levels based on ETTP’s long-term “end state,” including Parcel ED-1. The final ETTP Master Land Use Plan will then provide guidance for the sequencing of reindustrialization, as well as a zoning plan for long-term site redevelopment.

4.3.6 Stakeholder Involvement

The ETTP EM organization has made and continues to make public stakeholder presentations, holds public workshops, and integrates public stakeholder feedback into the EM Accelerated Cleanup Plan, as well as into various cleanup projects, such as the watershed approach to the ORR, the Mixed Waste Treatment Facility, and K-901A and the remediation plans for the K-1007-P1 settlement ponds (see *Removal Action Work Plan for the K-901-A Pond, East Tennessee Technology Park, Oak Ridge, Tennessee*, September 1997; *Removal Action Work Plan for the K-1007-P1 Pond*, March 1998).

Stakeholders for the ETTP Master Land Use Plan are listed here as examples of the types of stakeholders who are typically involved in reviewing and commenting on ETTP activities:

- DOE;
- CROET (and private companies that have leases or Memoranda of Understanding);
- LMES, LMER, Bechtel Jacobs Company, and other DOE contractors;
- SSAB Oak Ridge Reservation End Use Working Group;
- SSAB Land-Use Subcommittee;
- Local Oversight Committee;
- Oak Ridge Environmental Quality Advisory Board;
- U.S. Environmental Protection Agency;
- Tennessee Department of Environment and Conservation;
- City of Oak Ridge;
- Roane, Anderson, and other surrounding counties; and
- local citizens.

4.4 Oak Ridge Institute for Science and Education

4.4.1 Mission

The ORISE mission is to develop and provide critical research and operational capabilities in workforce health and safety, national security, environmental assessments, science education, and technical training for DOE and other government agencies.

ORISE has seven core competencies, listed as follows.

1. Conducting research and training in workforce health, safety, and security—occupational epidemiology, internal dosimetry and biomarkers of exposure, human and personnel reliability, hands-on radiation safety and ES&H compliance training, and criticality safety and training assessments.
2. Providing worldwide emergency preparedness, response, and training—comprehensive emergency planning (nuclear, chemical, and biological), national security and counterterrorism support, emergency exercises and drills and crisis management training, radiation medicine and pathology, physical and biological dosimetry, radiation accident response registry,

- and emergency public information and risk communication.
3. Performing hazardous-site characterization and cleanup verification—radiological-survey technology development and training, equipment development and evaluation, and laboratory quality assurance.
 4. Developing and implementing technical training systems—training and performance systems and evaluations; management of training networks, distance learning, and computer-based and other instructional systems development.
 5. Developing and administering fellowship and research-participation programs—science and engineering workforce needs, trends, and assessments; program evaluations; faculty development; and academic access to federal research facilities.
 6. Integrating scientific and technical resources for multidisciplinary programs—assessments of policy issues and research trends, support for science advisory committees and face-to-face and on-line stakeholder meetings, personnel and environmental security, peer/merit research and proposal reviews, technical standards

development, and meteorological research coordination.

7. Creating collaborative research partnerships—user facilities (e.g., University Radioactive Ion Beam), governmental-academic-industrial research partnerships, and multidisciplinary teaming arrangements.

4.4.2 Land Use

The ORISE Scarboro Operations Site on the ORR is located on approximately 247 acres of ORR land. Land uses at the site include laboratory and office facilities, sample archives, support services, and storage.

Figure 15 depicts existing on-site land use at the ORISE Scarboro Operations Site.

Land Requirements. Existing land is adequate for ORISE to support its current DOE missions; however, future development or growth will require additional land. The site is losing about 40 acres to the State of Tennessee Department of Transportation for the planned overpass at the intersection of Bethel Valley Road and South Illinois Avenue. In addition, 18.6 acres located between the proposed overpass and the Scarboro facility (i.e., self-sufficiency parcel G) soon will be

transferred to the City of Oak Ridge. The only developable land will remain on the west side of Scarboro Creek. Because no ORISE town sites have land for development, the remaining land at the Scarboro Operations Site is ORISE's only available land for future growth.

4.4.3 Facility Use

Current Facility Uses. ORISE is the steward of 13 buildings on the ORR and 10 buildings at town sites, with a total of 111,276 gross square feet. The ages of the buildings are categorized as follows: more than 50 years (1 building), 31 to 40 years (18 buildings), 21 to 30 years (2 buildings), and 11 to 20 years (2 buildings).

A breakdown of nonsurplus facilities by space type follows:

- office (16%),
- laboratory (21.5%),
- sample archives and storage (55.9%),
- training (1.2%), and
- miscellaneous (5.4%).

Figure 15.

Approximately 27% of the total space needs rehabilitation. Two of the facilities at the Scarboro Operations Site are surplus, require decontamination, and have no future programmatic need. These are orphaned and have no programmatic funding for support. They have not been accepted into the EM40 or EM60 programs. Funding has been requested for cleanup and demolition. One building is on standby status for potential program use once it is decontaminated and completely rehabilitated. A single building has been cleared for demolition once funding is secured. All other buildings are currently utilized.

ORISE town site facilities and their uses are as follows:

- ORAU Main Campus: administrative and education (privately owned by ORAU);
- East Vance Road Facility: biomedical research;
- Laboratory Road Facility: training;
- South Illinois Facility: Atmospheric Turbulence Diffusion Division–National Oceanic and Atmospheric Administration (ATDD-NOAA) facilities for meteorological and atmospheric diffusion research (see Sect. 4.5.1); and

- Warehouse Road Facility: administrative.

Future Facility Uses. The *Oak Ridge Institute for Science and Education 1994 Site Development Plan* provides a description of the ORISE facilities plans and viable options. The site's Master Plan indicates how potential program growth over the next 20 years can be accommodated on existing DOE property by using rehabilitated existing facilities and constructing new facilities at the Scarboro Operations Site. In general, the existing conditions and the planning present a preferred alternative with a future net gain of 108,000 square feet of building space. This scenario assumes fulfillment of the stated site and facilities goals. The *Oak Ridge Institute for Science and Education 1994 Site Development Plan* includes a total of 170,000 square feet of new construction over the next 20 years. In addition, several existing buildings located at the site will need significant upgrade, renovation, and/or reconfiguration. As with any list of projects spanning an extended period of time, the details of the plan are subject to modification as priorities change, future budgets become firm, and new or changing program requirements become known. Figure 16 depicts future land and facility use at the Scarboro Operations Site.

4.4.4 Infrastructure Needs

The site infrastructure is sufficient to meet current needs. The site's Master Plan identified site improvements if growth or change is warranted. Except for electrical services at the ORISE Scarboro Operations Site (which are supplied by the Y-12 Plant), all utility services are procured from the City of Oak Ridge and the Oak Ridge Utility District. ORISE plans to switch all electrical services to the City of Oak Ridge in FY 2000.

4.4.5 Site and Facility Planning/Reuse Activities

An ORISE Facilities Management Section helps conduct an organized and quality-based approach to managing its facilities. This group assists in long-range planning and management of the sites. The group also helps to establish priorities for infrastructure and capital improvements and to ensure facilities are able to meet current and future program requirements. Identified projects are estimated and submitted to DOE for possible funding through the annual budget submission process.

Figure 16

4.4.6 Stakeholder Involvement

The stakeholders of ORISE are principally the member universities and their client research grant providers.

4.5 Other DOE Properties

4.5.1 Current Land Use and Facility Use

These are the primary DOE properties outside of the four installation sites:

- American Museum of Science and Energy,
- ATDD-NOAA Facility,
- Building 2714,
- Central Training Facility,
- checking stations (gatehouses),
- Clark Center Recreation Park,
- Federal Office Building,
- George Jones Memorial Baptist Church,
- Office of Scientific and Technical Information (OSTI),
- Parcel ED-1,
- Parcel ED-2,

- Transportation Safeguards Division Firing Range,
- Transportation Safeguards Maintenance Facility,
- Water Intake Station,
- Water Treatment Plant, and
- 55 Jefferson.

The primary DOE properties outside the installation sites are shown in Fig. 6 and described here.

Clark Center Recreation Park is an 80-acre public park. It consists of an office/toilet building, three shelters, a boat ramp, improved parking areas, two softball fields, an unguarded swimming area, and a paved access road. The park is currently operated by the Corporate and Community Affairs Office of the LMES Recreation Department. DOE is working with the State of Tennessee to possibly transfer management responsibilities.

The Central Training Facility is used exclusively by LMES security forces and consists of a small office building, an indoor firing range, a classroom/storage trailer, another storage trailer, on-site parking, fitness facilities (an outdoor track), and numerous outdoor firing ranges. The site, including a buffer area, is south of

Bear Creek Road, less than 1 mile southeast of ETTP, and currently consists of about 150 acres.

The Transportation Safeguards Maintenance Facility is the former Stone & Webster (OS-3) warehouse, located about 1 mile east of ETTP, on the south side of State Route 58 (Oak Ridge Turnpike), near the intersection with Blair Road. The building is situated on a 20-acre site and has undergone major modifications, including the addition of security fencing, paved parking, and paved access around the building. Additional expansions include a target range with a safety buffer zone, a fitness facility, and the eventual relocation of office facilities from the Y-12 Plant. The total site area constitutes about 100 acres. The maintenance facility is operated and maintained by the Y-12 Plant's Facilities Management Organization and funded by DOE-AL.

OSTI is located in two masonry buildings constructed as warehouses in the 1940s: Buildings 1916T-1 and 1916T-2. Building 1916T-1 houses the main OSTI functions as well as other occupants. Portions of this building were converted to office space in the 1950s, and additional bays were added in the 1950s and 1960s. Currently, the building has one office bay and seven other bays for a total space of 135,000 square feet. Building 1916T-2

houses OSTI's subcontractor in charge of distribution and storage. The two OSTI buildings are located on a 7-acre tract that parallels the Oak Ridge Turnpike about 2 miles east of the Federal Office Building. Because of their age and configuration, they are classified as Class B buildings (i.e., semipermanent buildings, constructed primarily of wood, which may need to be renewed, renovated, or rehabilitated in the near future) but are deemed adequate for current functions.

In 1975, the American Museum of Science and Energy was moved from its original facility (55–59 Jefferson Circle) to a 17-acre site contiguous to the ORAU campus, on South Tulane Avenue in Oak Ridge. The masonry structure contains about 55,400 square feet (33,932 for exhibition space and 21,468 for offices and related space). This facility contains the energy house, which is licensed to the City of Oak Ridge for use by the Convention and Visitors' Bureau. The building is considered adequate for its current use. The museum also has warehouse space in OSTI's Building 1916T-2 complex. The museum is managed by ORNL.

The Water Treatment Plant, located on Pine Ridge just north of the Y-12 Plant, can process an estimated 28 million gallons per day. The sanitary (treated) water is stored in four reservoirs that have a combined

capacity of 10 million gallons. From the reservoirs, water is supplied by gravity flow to the Y-12 Plant, ORNL, the ORISE Scarboro Operations Site, and Oak Ridge. The water treatment plant, managed and operated by ETMC for DOE, is in the process of being transferred to the City of Oak Ridge.

The Water Intake Station, located at Solway Bend, is managed and operated by ETMC for DOE and is in the process of being transferred to the City of Oak Ridge.

The facility at 55 Jefferson is a DOE-owned facility comprising approximately 46,000 square feet on a 3-acre site located on Jefferson Circle along the Oak Ridge Turnpike in Oak Ridge. The primary facility use is DOE EM. The building is a temporary wood-frame structure constructed in the 1940s.

Building 2714 is a DOE-owned facility that DOE shares with ORISE (referred to as the "Laboratory Road Facility" in Sect. 4.4.3). The facility comprises approximately 18,000 square feet and is located in Oak Ridge immediately south of the Federal Office Building.

The Federal Office Building is owned by the General Services Administration and is maintained by DOE. DOE ORO offices occupy the vast majority of space in the

building, which consists of 113,000 square feet and is located in Oak Ridge.

The Transportation Safeguards Division Firing Range is located to the east of the Central Training Facility and is operated by DOE-AL.

The surface danger zones for the Central Training Facility and the Transportation Safeguards Division Firing Range overlap and together comprise about 2500 acres. Parcel ED-1 comprises 957 acres leased to CROET (effective April 28, 1998). CROET is authorized to lease facilities from DOE and sublease to the private sector for purposes of economic development. The lease is for a period of 10 years and contains an option for an additional 30-year period. CROET is responsible for the protection and maintenance of all portions of the property at all times and will report directly to DOE.

Parcel ED-2 consists of a barge facility and an adjacent 15-acre area located in the K-700 area west of the main ETTP site. ED-2 and the barge facility have already been leased to CROET, which intends to offer the barge facility to the business community on a fee basis. Present CROET plans are to develop the facility, in conjunction with adjacent rail service and interstate corridor, as a mini-port authority. The balance of ED-2, also leased to

CROET, includes two subleased portions and another portion proposed for use as a laydown area supporting the barge facility.

The ATDD-NOAA Facility is composed of a wood-frame building built in the 1940s and several smaller buildings at 456 South Illinois Avenue in Oak Ridge. ATDD conducts meteorological and atmospheric diffusion research that is jointly supported by DOE and NOAA. It also provides services to other DOE contractors and operates the Weather Instrument Telemetry Monitoring System for DOE.

George Jones Memorial Baptist Church, located within the ETPP, predates World War II and is included in the National Register of Historic Places.

Checking stations (gatehouses) are historic structures located on Oak Ridge Turnpike (Turnpike Checking Station), Scarborough Road (Midway Checking Station, also known as Bear Creek Road Checking Station), and Bethel Valley Road (Bethel Valley Road Checking Station, a small building south of Bethel Valley Road). DOE manages these historic facilities.

5. OVERVIEW OF THE PADUCAH GASEOUS DIFFUSION PLANT

5.1 Mission

The DOE mission at the Paducah Gaseous Diffusion Plant (PGDP) includes the following:

- plan and execute the EM Program to address legacy wastes/contamination from previous DOE operations,
- serve as the landlord for enrichment facilities leased to the United States Enrichment Corporation (USEC),
- manage DOE's Enrichment Facility (EF) Program [e.g., depleted uranium hexafluoride (UF₆) cylinders], and
- maximize future opportunities to reuse site assets and infrastructure through reindustrialization.

5.2 Land Use

PGDP is located in western Kentucky about 3 miles south of the Ohio River and about 15 miles west of the city of Paducah. The plant is situated on a 3423-acre parcel of DOE-owned land. The primary operations

associated with the enrichment process are located on 748 acres inside the plant security fence. Of the remaining DOE acreage outside the fence, 1986 acres are licensed to the Kentucky Department of Fish and Wildlife, serving as a portion of the West Kentucky Wildlife Management Area (WKWMA), which is used yearly by many hunters and fishermen. The remaining area surrounding WKWMA is predominantly rural with the exception of TVA-owned property north of the plant.

Figure 17 depicts the current land use on and around the PGDP site. The Water Policy Boundary in Fig. 17 was established by DOE after groundwater samples from some residential wells near PGDP evidenced trichloroethylene (TCE) and ⁹⁹Tc contamination. In response to that discovery, DOE immediately provided temporary bottled water to the affected residents and sampled the remaining wells in the area to assess the extent of contamination. On the basis of the assessment, DOE established a water policy extending the municipal water line to individuals within the affected area at DOE expense and offered to pay their water bills.

5.3 Current Facility Use

In operation since the early 1950s, PGDP is an active uranium enrichment facility,

supplying enriched uranium for both government and commercial use. To maintain the diffusion process, extensive support facilities are required, including a steam plant, electrical switchyards, cooling towers, cleaning and decontamination facilities, water and wastewater treatment plants, and maintenance and laboratory facilities.

The Energy Policy Act of 1992, which amended the Atomic Energy Act of 1954, transferred responsibility for uranium enrichment to a newly created government corporation, USEC, which later made the transition to a publicly held company in 1998. In accordance with the Energy Policy Act, USEC assumed full responsibility on July 1, 1993, for uranium enrichment operations at PGDP. However, the act specifically required DOE to retain liability for any preexisting conditions before the transition, including responsibility for D&D, waste management, depleted UF₆ cylinders, and environmental remediation.

Current and near-term uses at PGDP are dictated by an existing lease between DOE and USEC, which has a primary term through 1999 with exclusive options for USEC to extend the lease for additional periods. Under the agreement, USEC has leased only those facilities and areas necessary to support uranium enrichment. The remaining facilities

Figure 17.

and property excluded from the current lease agreement were retained by DOE; they are either being used to support DOE's EM and EF programs or are subject to surveillance and maintenance until D&D or alternative reuse can be identified. Additionally, the lease agreement provides USEC the right of refusal to obtain any real property associated with PGDP that is not part of the existing lease agreement. Figure 18 depicts facilities currently leased to USEC.

5.4 Infrastructure Needs

USEC is responsible for identifying and meeting the infrastructure needs to support the operation of the enrichment production facilities. However, DOE's existing EM and EF missions necessitate routine evaluation of the infrastructure. With regard to management of the depleted UF₆ cylinders, several cylinder storage areas were recently constructed, and additional yards are planned during the next few years. However, if a future DOE decision identifies Paducah as a key location for expanded interim storage and/or processing of depleted UF₆, then additional infrastructure or facility upgrades must be assessed to accommodate the expanded scope of responsibility.

On the basis of current waste projections by the EM Program, existing storage facilities will most likely have adequate capacity to accommodate existing legacy wastes and future waste streams generated by the remedial action program. However, funding has been requested to upgrade some storage facilities to meet DOE fire protection codes and Occupational Safety and Health Administration safety standards. Additionally, new landfill cells for the C-746-U Landfill must be constructed to provide adequate capacity for future disposal. If USEC decides to shut down PGDP in the near future, additional waste management facilities might also be required to support active D&D of PGDP.

The shutdown of PGDP or the relocation of additional industry to PGDP would significantly expand DOE-ORO's current mission by placing greater emphasis on reindustrialization. In either case, some of PGDP's existing support facilities would be essential to site reuse, including PGDP's electrical switchyards, water and wastewater treatment facilities, cooling towers, the steam plant, and other related facilities. Depending on the kind of industry that would relocate to PGDP, new infrastructure or modifications to the existing infrastructure could be expected and would need to be assessed as part of any reindustrialization effort.

5.5 Site and Facility Planning/Reuse Activities

Several ongoing initiatives are under way to further evaluate alternative missions in coordination with the Paducah Area Community Reuse Organization (PACRO). On September 15, 1997, DOE Headquarters' Office of Worker and Community Transition officially recognized PACRO as the designated community reuse organization for PGDP. DOE established the community reuse program in 1993 to minimize negative effects of workforce restructuring at DOE facilities with a historical role in the nation's defense by providing assistance to the communities involved. DOE has given PACRO a \$400,000 planning grant, and Secretary of Energy Bill Richardson has pledged an additional \$6 million to implement findings and strategies from the planning stage. PACRO studies and planning are under way in four areas: (1) training of the plant workforce, (2) reuse of available facilities and assets at PGDP, (3) entrepreneurial opportunities, and (4) new strategies for regional economic development.

Figure 18.

Most of the work of DOE and PACRO in facility and site reuse will begin sometime in the future (as yet undetermined) when USEC ends its lease of the uranium enrichment facilities at PGDP and returns them to DOE. However, specific ideas for potential reuse of PGDP have already been identified. These include DOE's plans to build depleted UF₆ conversion facilities at Paducah and Portsmouth. In addition to the PACRO planning for facility and site reuse, DOE published several documents, including one about alternative missions, as part of its PGDP Turnover Contingency Planning Project in 1995–96.

Because a primary goal of DOE is to facilitate future reuse of facilities at PGDP, a key element of the EM mission is to pursue a remediation strategy that would result in an end state that maximizes unrestricted industrial use at PGDP. Figure 19 depicts the end states projected for the PGDP site. Nevertheless, the nature of the groundwater contamination at PGDP and the possibility that some landfills will remain capped in place may restrict future groundwater use and soil excavation activities at some locations.

In addition, the desired future use of these facilities and the corresponding cleanup levels will probably make it necessary to restrict residential development on the DOE reservation to ensure protection of human health and the environment.

5.6 Stakeholder Involvement

PACRO members include stakeholders from McCracken, Ballard, Graves, and Marshall counties in Kentucky and Massac County in southern Illinois. PACRO members represent business, industry, education, economic development, government, DOE, Bechtel Jacobs Company LLC, and USEC.

In addition to the PACRO initiatives, DOE began preliminary discussions with stakeholders on future-land-use planning during a public workshop at Paducah June 30, 1994. Additional presentations on future land use have been routinely discussed during subsequent workshops and meetings, including a series of briefings provided to the SSAB.

Generally, most stakeholders support a continued industrial/commercial presence on-site that would preserve existing jobs and continue to contribute to the regional economy.

Figure 19.

6. OVERVIEW OF THE PORTSMOUTH GASEOUS DIFFUSION PLANT

6.1 Mission

The DOE mission at the Portsmouth Gaseous Diffusion Plant (PORTS) includes the following:

- plan and execute the EM Program to address legacy contamination from previous DOE operations,
- serve as the landlord for enrichment facilities leased to USEC,
- manage the DOE EF Program (e.g., depleted UF₆ cylinders), and
- maximize future opportunities to reuse site assets and infrastructure through reindustrialization.

6.2 Land Use

PORTS is located in rural Pike County in south central Ohio. The plant is situated on a 3714-acre parcel of DOE-owned land. Primary operations associated with the enrichment process and associated central

development are located on 1200 acres surrounded by a perimeter road. The reservation land outside the perimeter road is used for several purposes, including a water treatment plant, lagoons for the process wastewater, former sanitary and inert landfills, and open and forested buffer areas. Figure 20 depicts current land located at the PORTS site. The entire reservation is restricted industrial with controlled access within the limited security area as well as closed sites.

6.3 Current Facility Use

In operation since the early 1950s, PORTS is an active uranium enrichment facility supplying enriched uranium for government and commercial use. To maintain the diffusion process, extensive support facilities are required, including a steam plant, electrical switchyards, cooling towers, cleaning and decontamination facilities, water and wastewater treatment plants, and maintenance and laboratory facilities.

The Energy Policy Act of 1992 transferred responsibility for uranium enrichment to USEC, a newly created government corporation that became a publicly held company in 1998. In accordance with the Energy Policy Act, USEC assumed full responsibility on July 1, 1993, for uranium

enrichment operations at PORTS. However, DOE retains liability for any preexisting conditions before the transition, including responsibility for D&D, waste management, depleted UF₆ cylinders, and environmental remediation.

Current and near-term uses at PORTS are dictated by an existing lease between DOE and USEC, which has a primary term through July 1, 2004, with exclusive options for USEC to extend the lease for additional periods. Under the agreement, USEC has leased only those facilities and areas necessary to support uranium enrichment. The remaining facilities and property excluded from the current lease agreement were retained by DOE; they are either being used to support DOE's EM and EF programs or are subject to surveillance and maintenance until D&D or alternative reuse can be identified. Additionally, the lease agreement provides USEC the first right of refusal to obtain any real property associated with PORTS that is not part of the existing lease agreement. Figure 21 depicts the facilities currently leased to USEC.

Figure 20.

Figure 21.

6.4 Infrastructure Needs

USEC is responsible for meeting the infrastructure needs to support the operation of the enrichment production facilities. However, DOE's existing EM

and EF missions require routine evaluation of infrastructure needs. With regard to management of the depleted UF₆ cylinders, no significant infrastructure needs are currently expected for the next several years because cylinder storage areas have recently been constructed. However, if DOE decides in the future to identify PORTS as a key location for expanded interim storage and/or processing of depleted UF₆, then the need for additional infrastructure or upgrades must be assessed to accommodate the expanded scope of responsibility.

Under the EM Program, current waste projections indicate that the existing storage facilities will most likely have adequate capacity to accommodate existing legacy wastes and future waste streams generated by the remedial action program. If USEC decides to shut down PORTS in the near future, additional waste management facilities might be required to support active D&D of PORTS.

The shutdown of PORTS or the relocation of additional industry to PORTS would

significantly expand DOE's current mission to include a greater emphasis on reindustrialization. In either case, some existing support facilities at PORTS will be essential to site reuse, including the plant's electrical switchyards, water and wastewater treatment facilities, cooling towers, the steam plant, and other related facilities. Depending on the nature of industry that would relocate to PORTS, new infrastructure or modifications to the existing infrastructure could be expected and would need to be assessed as part of any reindustrialization effort.

6.5 Site and Facility Planning/Reuse Activities

Several ongoing initiatives are under way to further evaluate alternative missions in coordination with the Southern Ohio Diversification Initiative (SODI) founded in 1995. DOE Headquarters' Office of Worker and Community Transition officially recognizes SODI as the designated community reuse organization for PORTS. DOE established such organizations in 1993 to minimize negative effects of workforce restructuring at DOE facilities with a historical role in the nation's defense by providing assistance to the communities involved.

In February 1996, DOE gave SODI an initial planning grant of \$325,000. An additional planning grant of \$175,000 was issued in August 1997. In March 1998, DOE announced a \$6.5 million community-transition funding grant toward SODI projects, including industrial parks in Pike and Scioto counties. SODI's mission is to actively promote the reuse of underutilized lands, buildings, and facilities at PORTS and to promote further economic diversification of the region to offset impacts from the plant's changing mission.

Most of the work of DOE and SODI in facility and site reuse will begin sometime in the future (as yet undetermined) when USEC ends its lease of the uranium enrichment facilities at PORTS and returns them to DOE. The first lease between DOE and SODI was signed on April 1, 1998, for 6–8 acres on the north side of the plant property to be used as a right-of-way for a railroad spur and use of existing rail facilities. A portion of this property was in turn subleased by SODI to the Mead Corporation for access to the rail line for a new wood grading operation constructed on Shuster Road. This operation employs approximately 15 people. Meanwhile, specific ideas for potential reuse of PORTS have been identified. These include DOE's plans to build depleted UF₆ conversion facilities at Paducah and Portsmouth.

Because of SODI's regional mission, several projects already have been undertaken, including the initial private development of 340 acres of a potential 1000-acre industrial site just north of the plant. The industrial site received its first tenant in late 1998—a local cabinet manufacturer who invested \$57 million in constructing a 1-million-square-foot facility, where the manufacturer plans to employ approximately 150 personnel. SODI has submitted an additional grant request to DOE for \$5.9 million for 10 other projects estimated to provide 850 jobs over the next 5 years. See Fig. 22, which depicts the projected end use at PORTS in FY 2006. The area outside the perimeter road will be designated for recreational use. The area inside the perimeter will be made available for industrial use. Some small areas will be controlled or have restrictions on their use.

6.6 Stakeholder Involvement

SODI's 16-member board includes stakeholders from Pike, Ross, Jackson, and Scioto counties in southern Ohio. SODI members represent business, industry, education, economic development, government, DOE, Bechtel Jacobs Company LLC, and USEC.

Presentations on future land use and other regional topics are routinely discussed during workshops and meetings.

Generally, the stakeholders support a continued industrial/commercial presence on-site that would preserve existing jobs, create new jobs, and continue to contribute to the regional economy.

Figure 22.

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