DOE/EA-1113-A

ENVIRONMENTAL ASSESSMENT ADDENDUM FOR THE PROPOSED TITLE TRANSFER OF PARCEL ED-1

April 2003

U.S. Department of Energy
Oak Ridge Operations
Oak Ridge, Tennessee

DOE/EA-1113-A

ENVIRONMENTAL ASSESSMENT ADDENDUM FOR THE PROPOSED TITLE TRANSFER OF PARCEL ED-1

Date Issued—April 2003

U.S. Department of Energy
Oak Ridge Operations

02-088(doc)/040203

CONTENTS

FIGURES

TABLES

ACRONYMS

CFR	*Code of Federal Regulations*
CROET	Community Reuse Organization of East Tennessee
DOE	U.S. Department of Energy
DOE-ORO	U.S. Department of Energy-Oak Ridge Operations
EA	Environmental Assessment
EFPC	East Fork Poplar Creek
EIS	Environmental Impact Statement
E.O.	Executive Order
EPA	U.S. Environmental Protection Agency
ETTP	East Tennessee Technology Park
FONSI	Finding of No Significant Impact
FR	*Federal Register*
FRP	Facilities Revitalization Project
FWS	U.S. Fish and Wildlife Service
FY	fiscal year
gpm	gallons per minute
JINS	Joint Institute for Neutron Sciences
MAP	Mitigation Action Plan
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
PIF	Partners In Flight
ROD	Record of Decision
ROI	Region of Influence
ROW	right-of-way
SNS	Spallation Neutron Source
SR	State Route
TDEC	Tennessee Department of Environmental Conservation
TDOT	Tennessee Department of Transportation
TN-SHPO	Tennessee-State Historic Preservation Office
TRU	transuranic
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Association
Y-12	Y-12 National Security Complex

1. INTRODUCTION

1.1 PURPOSE AND NEED FOR U.S. DEPARTMENT OF ENERGY ACTION

The purpose for U.S. Department of Energy (DOE) action is the title transfer of excess DOE real property in order to continue to support economic development in the region. This proposed action is being evaluated in response to a proposal from Horizon Center LLC, a subsidiary of the Community Reuse Organization of East Tennessee (CROET), requesting transfer of title of the presently leased Parcel ED-1 (also known as Horizon Center) (Fig. 1.1). DOE's action is needed to help offset economic losses resulting from DOE downsizing, facility closures, and workforce restructuring. DOE also recognizes that transferring excess land for economic development purposes can benefit the federal government by reducing or eliminating landlord costs.

1.2 BACKGROUND

In January 1996 DOE executed a lease for the approximate 957-acre Parcel ED-1 to CROET to develop an industrial/business park. The lease subsequently became effective in April 1998. This action was preceded by an Environmental Assessment (EA) (DOE 1996a) resulting in a finding of no significant impact (FONSI) that was conditional upon the implementation of mitigation and monitoring.

In accordance with 10 *Code of Federal Regulations* (*CFR*) 1021.331, a Mitigation Action Plan (MAP) (DOE 1996b) was prepared that described measures to be implemented to monitor and mitigate potentially significant adverse impacts that could occur from development on Parcel ED-1. The MAP accomplished this by excluding areas of Parcel ED-1 from disturbance and development, and requiring that surveys and monitoring be conducted prior to disturbance (pre-development) and during industrial operations (post-development). The objectives of these measures included (1) protection of wildlife habitat, plant communities, threatened and endangered species, water resources, wetlands, and historic and archaeological resources; (2) maintenance of habitat connections to reduce the ecological effects of fragmentation; (3) pre- and post-construction assessment of natural succession and impacts of development on natural communities and populations using data collected during monitoring; and (4) identification of additional mitigation, as needed, to remediate the actual significant adverse effects of development.

A requirement of the MAP was the preparation of annual reports by DOE to document baseline conditions; compile survey data and monitoring status; and describe planning, construction, and operational phases of the development. The 1997 Annual Report (DOE 1997a) documented pre-development conditions to use as a baseline, and it established monitoring sites for future use. The 1998 Annual Report (DOE 1998) described progress toward meeting objectives of the MAP during the site development planning and early construction phases. Specifically, the report addressed development alternatives, pre-construction surveys, and monitoring plans during construction.

A plan was developed to meet economic development goals while adhering to the commitments in the FONSI and MAP. A main goal of the development plan was to maximize developable acreage while preserving important ecological and scenic features of the parcel. To meet this goal, developable areas were designated and are adjacent to the boundary of the Natural Area (formerly referred to as the Exclusion Area) (Fig. 1.2). The Natural Area comprises approximately 489 acres and includes East Fork Poplar Creek (EFPC) and its 100-year floodplain, a minimum of a 100-ft stream buffer, and other important ecological and scenic features. Planning and layout of the site also relied heavily on several

ecological studies designed to avoid federally or state-listed species and to minimize the impact to stream and floodplain crossings. The objective of the 1999 and 2000 Annual Reports (DOE 1999a and 2000a) was to document the commitment to monitor specified environmental resources during early site construction and operation as development matured.

CROET awarded construction contracts for clearing right-of-ways for roads, utilities, borrow areas, and a sub-leased parcel soon after the lease was activated in the summer of 1998 (Fig. 1.3). Permits were obtained for construction of culverts and bridges in late 1998 and construction began soon afterward. Construction was completed in 1999. Permits were obtained for sewer and water distribution systems in 1999. Construction began on the first sub-leased parcel (the Theragenics Center) in the summer of 1999. Grading and the foundation for the Theragenics building were completed by the last of November and erection of steel began in December. A major emphasis in 2000 was directed toward completion of road construction, installation of underground utilities in the road right-of-ways, and the completion of the construction on the Theragenics Center.

Three new sites were cleared and prepared for construction in 2000 (Fig. 1.3). The first of these was an addition to the Communications Center and fiber optic hub facility located on about 1 acre near the middle of Parcel ED-1. A second was the erection of a new telecommunications tower on a 0.25-acre site in the northwest sector of the parcel. The third involved clearing and grading of approximately 15 acres along the Oak Ridge Turnpike [State Route (SR) 95] immediately east of the west entrance to the parcel. Activities since 2000 have primarily been to clear brush and remove dead pines (due to the Southern pine beetle infestation), at the corner properties where the park roads intersect with the Oak Ridge Turnpike, and other routine maintenance activities.

On February 21, 2002, CROET submitted a proposal to DOE requesting the title transfer of Parcel ED-1 (Appendix A). On August 19, 2002, CROET submitted a supplement to their proposal requesting that the transfer be to their subsidiary, Horizon Center LLC. As part of the evaluation of the proposal, DOE began to meet the requirements necessary to support the proposed transfer of title, including reviewing and updating the existing National Environmental Policy Act documentation.

One of the first actions by DOE after receipt of CROET's proposal was to convene a peer review of the existing MAP. The Peer Review Team met in Oak Ridge on March 12-14, 2002. The goals of the Team were the following:

1. Assess the monitoring data collected to date and establish if the requirements of the MAP have been met.

2. Determine if changes to the MAP are warranted due to the intended future use of Parcel ED-1 and plans for activities adjacent to the parcel [e.g., Tennessee Department of Transportation (TDOT) expansion of SR 95].

3. Clarify the future monitoring and mitigation requirements, including defining when mitigation is necessary.

4. Identify when the next review of the MAP should be conducted.

DOE initiated preparation of this EA Addendum soon after the peer review. In addition, the recommendations of the Peer Review Team were incorporated into a revised MAP.

2. DESCRIPTION OF TRANSFER ALTERNATIVE (NEW PROPOSED ACTION)

DOE, in its EA prepared in 1996, analyzed two alternatives: the proposed action for leasing Parcel ED-1 and no action. Two other alternatives: lease of other Oak Ridge Reservation (ORR) land and disposal (e.g., sale, donation, transfer to another federal agency, or exchange) of Parcel ED-1 were dismissed from further consideration. DOE concluded, in the EA, that no other parcels of sufficient size and contiguity were available on the ORR to meet the requirements for an industrial park. Further, DOE determined that the alternative of disposal did not meet the stated purpose and need, and it should retain title of the property in order to encourage the kind of investment necessary for long-term commercial development and maintain measures to preserve environmentally sensitive areas.

CROET indicated in their proposal to DOE that, based on the 6 years of time that has elapsed between the decision to lease Parcel ED-1 and the present, the kind of investment necessary for long-term, commercial development of the parcel is not possible without ownership of the land. The lease option has limited the marketability of Parcel ED-1, mainly due to private sector financing issues with some prospective companies. While the current lease mechanism does provide development opportunities, transfer of title to Horizon Center LLC is necessary for the ultimate development of the parcel. CROET, the City of Oak Ridge, and the state of Tennessee have also made a considerable investment (~$14.25 million) in infrastructure improvements to make Parcel ED-1 developable and competitive. According to CROET, and consistent with similar land parcels planned for industrial/business development, transfer is essential for the site to be viable.

The purpose of this EA Addendum is to supplement the EA completed in 1996 by analyzing the proposal to transfer title of Parcel ED-1 to Horizon Center LLC. The proposed action is transfer of title of the entire Parcel ED-1. However, as an option, DOE could choose to only transfer the developable portion of Parcel ED-1. The remaining property would stay under DOE ownership and control. Requirements would be included in the appropriate documents to ensure that the Natural Area is maintained and protected. Another option is to transfer all of Parcel ED-1, except for EFPC and its floodplain, which would remain under DOE ownership and control in order to address possible future requirements under the Comprehensive Environmental Response, Compensation, and Liability Act. The potential for adverse impacts to occur would be greater from the transfer of the entire parcel than from either of the two options. For purposes of comparison, it was determined that if DOE chose not to transfer Parcel ED-1 (i.e., no action) the current lease with CROET would continue.

Under the proposed transfer of title, Horizon Center LLC would continue the development of Parcel ED-1 as an industrial/business park for research and development, medical technology, manufacturing, distribution, and corporate headquarters office facilities. Continued development would be located in areas outside of the existing Natural Area. The developable acreage is approximately 489 acres of the 957-acre parcel and consists of seven major development areas, ranging in size from 11 to 148 acres (see Fig. 2.1).

Horizon Center LLC would be responsible for the continued protection of the remaining 468 acres of the 957-acre parcel. Conditions of the transfer documents would ensure that Horizon Center LLC continued to provide protection of wildlife habitat, sensitive plant communities, threatened and endangered species, water resources, wetlands, and historic and archaeological resources within the Natural Area. If Horizon Center LLC fails to abide by the provisions of the transfer documents, then ultimately, DOE has the right of judicial enforcement of the Quitclaim deed.

Title of Parcel ED-1 would be transferred under Sect. 161(g) of the Atomic Energy Act of 1954. The process that would be used is described in a DOE-issued interim final rule, "Transfer of Real Property at Defense Nuclear Facilities for Economic Development" (10 *CFR* Part 770). The rule became effective on February 29, 2000 [65 *Federal Register (FR)* 10685]. The *FR* notice of the rule is provided in Appendix B. The deed will contain restrictions ensuring 1) continued protection of the Natural Area and 2) uses of the developable areas are consistent with those analyzed in the 1996 EA. The requirement to comply with the provisions of the MAP will be in the appropriate documents.

This proposed action does not differ substantially from the proposed action described in the EA prepared for leasing Parcel ED-1 to CROET. The major difference is that ownership of the property would be transferred to Horizon Center LLC. It is still their intent to develop the parcel as an industrial/business park. Industrial uses would still be limited to those analyzed in the 1996 EA and would be required to conform to the City of Oak Ridge Zoning Ordinance (Chap. 7, Sect. 6-713 IND-2, Industrial Districts). The restriction of certain uses that would not be permitted (i.e., airport, wholesaling facilities, bulk oil and similar storage facilities) is also included as part of this proposed action.

Based on a study commissioned by a partnership between CROET, the City of Oak Ridge, and the Oak Ridge Chamber's New Century Alliance, cluster groupings of industry types were identified for targeted recruitment for Parcel ED-1. These industries are consistent with those analyzed in the EA and include:

- Plastic Materials and Resins
- Biotech Products and Pharmaceuticals
- Radio and Television Communications Equipment
- Motor Vehicle Parts and Accessories
- Surgical and Medical Instruments and Apparatus
- Electro Medical and Electrotherapeutic Apparatus
- Professional Computer Services

3. AFFECTED ENVIRONMENT

The following sections update information found in the "Affected Environment" section of the Parcel ED-1 EA prepared in 1996 (DOE 1996a). As stated in Sect. 1.2, several changes have taken place on Parcel ED-1 since the activation of CROET's lease in 1998, including road, bridge, and utility construction; clearing and grading of some development areas; and building construction. For certain resources, the affected environment information presented in the 1996 EA is still valid and has not changed. For this reason the following resources are not addressed in this section of the EA Addendum: geology, climate and air quality, water resources, and various information under socioeconomics. A Floodplain Assessment was completed for the proposed action in accordance with 10 *CFR* 1022, Compliance with Floodplain/Wetlands Environmental Review Requirements. The Floodplain Assessment is presented in Appendix C.

3.1 LAND USE

The completion of initial development activities at Parcel ED-1 has changed the land use and appearance of the parcel consistent with the existing EA and MAP. Parcel ED-1 was a relatively undisturbed area with the previous land use consisting of wildlife management, silviculture, ecosystem research, and environmental monitoring. The visual character of the parcel is now that of an industrial/business park, which is the goal of the development plan. Since 1998, over 100 acres have been

cleared and graded for construction purposes. Development has also included construction of roads and utilities, two bridges across EFPC, borrow areas, and the clearing and grading of other areas. Construction has also been completed on a portion of one of the developable parcels (the Theragenics Center). In addition, the Communications Center and a telecommunications tower have been constructed (Fig. 1.3). Theragenics Corporation, the first company to locate within the park, currently is leasing 21 acres from CROET and has an option on an additional 21 acres. Theragenics Corporation has built an approximate $30-million facility that will be used for the manufacture of a proprietary radioactive seed implant for the treatment of prostate cancer.

In 1999, DOE granted a license to the City of Oak Ridge to use the existing DOE patrol road for the Oak Ridge North Boundary Greenway. An approximate 1.5-mile long section of the greenway is located along the western boundary of Parcel ED-1 (Fig. 2.1).

In a letter dated August 21, 1995, and again on August 21, 2001, the U.S. Environmental Protection Agency (EPA) concurred with DOE's determination that Parcel ED-1 is not contaminated, with the exception of EFPC and Bear Creek and their associated floodplains (see Appendix D).

3.2 ECOLOGICAL RESOURCES

In 1997 Lockwood Greene Engineers, Inc., under contract to CROET, created a development plan for Parcel ED-1. A key objective was to maximize the developable acreage while preserving the important ecological and scenic features of the parcel. The development plan concepts were discussed with the U.S. Fish and Wildlife Service (FWS), Tennessee Department of Environment and Conservation (TDEC), and the Tennessee Wildlife Resources Agency (TWRA) and were approved by DOE. Information on the development plan and agency coordination is provided in the 1998 and 1999 Annual Reports (DOE 1998 and 1999a).

Master planning and layout of the site relied heavily on several ecological studies designed to avoid threatened and endangered species, unique or sensitive habitats, and to minimize impacts at stream and floodplain crossings. As data were collected, the Natural Area boundaries were slightly reconfigured (see Fig. 2.1). Reconfiguration provided practical utility for development while mitigating impacts to the original designated Exclusion Area. The details of the development plan, including changes to the Natural Area, are presented in the 1998 Annual Report (DOE 1998).

Additional information and data on the ecological resources of Parcel ED-1 have been collected since the initial information was presented in the 1996 EA. This information and these data are included in the annual reports that have been prepared by DOE (DOE 1977a, 1998, 1999a, and –2000a).

The 1996 EA included information on several bird species that use the habitats on Parcel ED-1. It also included nationally declining species identified during a 1995 Partners in Flight (PIF) survey along the proposed northern boundary of the parcel. Since 1996, additional PIF surveys have been conducted and additional nationally declining species have been documented on site in the DOE Annual Reports (DOE 1997a, 1998, 1999a, 2000a). Also, Executive Order (E.O.) 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, was issued in January 2001. In addition to the bird species listed in the 1996 EA, the Prairie Warbler, Blue-winged Warbler, Prothonotary Warbler, and the Cerulean Warbler have been identified as occurring on the site.

The Cerulean Warbler is state-listed as "Deemed In Need of Management" and is being considered for state listing as "Threatened," as well as being considered for federal listing because of a sharp decline in its range-wide population. National breeding bird survey data show a roughly 70% decline in the range-wide population of this bird between 1966 and 1998. This decline may be caused by mature forest

habitat loss and fragmentation, short rotation cycles of commercial forests, changes in tree species composition of forests, and nest parasitism by Brown-headed Cowbirds (Hamel 2000). Tennessee breeding bird survey data suggest that the primary period of population decline of the Cerulean Warbler happened prior to 1980 (Nicholson 1997).

In Tennessee, the Cerulean Warbler is found in two different habitat types: bottomland hardwood forests and mesic slopes of mountains. They occur locally across the state, with the highest population densities being in the Cumberland Mountains of the Northern Cumberland Plateau Physiographic Area (Nicholson 1997). Distinct gaps in the regional distribution of the Cerulean Warbler occur in the Southern Ridge and Valley Physiographic Area, in which Parcel ED-1 is located, the Central Basin, and uplands of the Coastal Plain of west Tennessee (Nicholson 1997).

Recent records for the Cerulean Warbler on Parcel ED-1 list singing individuals as being identified for four consecutive years along the North Boundary Greenway in the vicinity of EFPC and Development Area 4. A survey of Cerulean Warbler occurrence was conducted in the spring of 2000 on portions of TWRA's Royal Blue Wildlife Management Area in Campbell and Scott Counties. A total of 343 singing individuals identified as Cerulean Warblers were counted during 8 days of surveys (Welton 2000).

Recently the native vegetation throughout Tennessee has been severely impacted by introduced plant species that are invasive. These plants are called exotics because humans introduce them into a region either deliberately or accidentally. Aggressive exotic species can outcompete and exclude native vegetation and thus, reduce overall plant biodiversity, and affect the development and functioning of natural communities. Of the 167 exotic plant species known to occur on the ORR, 43 are considered to be invasive, aggressive species (Awl et al. 1996). Some of these species include Japanese honeysuckle (*Lonicera japonica*), kudzu (*Pueraria lobata*), microstegium (*Eulalia viminea*), privet (*Ligustrum sinense* and *L. vulgare*), cinnamon vine (*Dioscorea batatas*), multiflora rose (*Rosa multiflora*), autumn olive (*Eleagnus umbellata*), and oriental bittersweet (*Celastrus orbiculatus*). Fourteen exotic plant species have been identified as occurring on Parcel ED-1 and 12 of these are considered to be invasive species. A complete listing of the invasive and aggressive exotic plant species on the ORR and exotic species found on Parcel ED-1 is presented in the 1997 Annual Report (DOE 1997a). Additional information, including a list of invasive exotic plants in Tennessee and their "threat" ranking, is provided by the Southeast Exotic Pest Plant Council (http://www.se-eppc.org).

3.3 SOCIOECONOMICS

3.3.1 Demographic and Economic Characteristics

Table 3.1 summarizes population, per capita income, and wage and salary employment information from 1995 to 2000. Population has increased slightly over the 5-year period; Loudon County showed the fastest growth, while Anderson County showed a slight decline in population. Employment for the region (Anderson, Roane, Knox, and Loudon Counties) grew slowly from 340,422 in 1995 to 364,698 in 2000. Employment actually declined in Roane County, and grew only slightly in Anderson County following declines in 1996 and 1997. Per capita income for the region increased by roughly 4%, growing fastest in Knox and Loudon Counties. Total personal income grew from $11.8 billion to $14.9 billion over the same period (Bureau of Economic Analysis 2002).

Table 3.1. Demographic and economic characteristics in the Oak Ridge Region of Influence

County	1995	1996	1997	1998	1999	2000	Annual growth 1995–2000 (%)
			Anderson				
Population	71,597	71,797	71,736	71,321	71,454	71,269	-0.09
Per capita income ($)	22,179	22,586	23,392	24,500	24,847	26,032	3.26
Total employment	50,088	48,315	48,109	50,139	50,563	50,984	0.36
			Roane				
Population	49,892	50,727	51,179	51,462	51,736	51,943	0.81
Per capita income ($)	19,166	19,160	19,379	20,116	20,895	22,000	2.80
Total employment	27,670	28,043	25,753	25,541	25,099	24,281	-2.58
			Knox				
Population	369,171	373,621	376,767	378,319	380,010	382,723	0.72
Per capita income ($)	23,059	23,736	24,559	26,092	26,582	28,281	4.17
Total employment	247,713	252,955	257,256	261,899	266,030	273,547	2.00
			Loudon				
Population	35,479	36,572	37,427	38,068	38,741	39,253	2.04
Per capita income ($)	20,540	21,108	22,227	23,301	24,385	26,241	5.02
Total employment	14,951	14,894	15,220	14,982	15,269	15,886	1.22
			Region Totals				
Population	526,139	532,717	537,109	539,170	541,941	545,188	0.71
Per capita income ($)	22,401	22,965	23,748	25,113	25,654	27,242	3.99
Total employment	340,422	344,207	346,338	352,561	356,961	364,698	1.39

Source: Bureau of Economic Analysis 2002.

3.3.2 Fiscal Characteristics

Oak Ridge City general fund revenues for fiscal year (FY) 2000 and anticipated revenues for FY 2002 are presented in Table 3.2. The general fund supports the ongoing operations of local governments, as well as community services, such as police protection and parks and recreation. The largest revenue sources have traditionally been local taxes (which include taxes on property, real estate, hotel/motel receipts, and sales) and intergovernmental transfers from the federal or state government. Nearly 90% of the FY 2000 general fund revenue came from these combined sources. Local property taxes are expected to account for nearly half (43%) of the FY 2002 general fund revenues (City of Oak Ridge 2001). For FY 2003, the property tax rate was $2.65 per $100 of assessed value. The assessment rate for industrial property was 40% (Boyer 2002). The City also receives a payment in-lieu-of-tax for the ORR acreage that falls within the city limits. For FY 2001, the payment was based on a value of $5,327/acre, and the farmland assessment rate of 25% (DOE 2002).

3.4 INFRASTRUCTURE AND SUPPORT SERVICES

3.4.1 Transportation

As stated in Sects. 1.2 and 3.1, initial road construction within Parcel ED-1 was completed in 2000. The existing road system within the parcel consists of two, four-lane entrance boulevards off of the Oak Ridge Turnpike that connect into a three-lane central roadway (Fig. 1.2). Construction of the entrance boulevards also necessitated the construction of two bridges across EFPC. The bridges consist of concrete

Table 3.2. City of Oak Ridge Revenues for FY 2000 and FY 2002

Revenues	2000 Actual[a]	2002 Budgeted
Taxes	15,102,649	17,820,500
Licenses and permits	251,324	252,000
Intergovernmental revenues	9,354,396	9,869,000
Charges for services	1,366,592	1,325,721
Fines and forfeitures	301,216	400,000
Other revenues	1,442,300	970,500
Total revenues	27,818,477	30,637,721
Expenditures and other financing		
Expenditures	(13,434,582)	(14,311,671)
Other financing uses[b]	(14,626,371)	(18,033,281)
Total expenditures and other financing	(28,060,953)	(32,344,952)

[a]2001 actuals are not available.
[b]Includes items such as capital projects fund, economic diversification fund, debt service, and schools.
Source: City of Oak Ridge 2001.
FY = fiscal year.

slab decks supported by pre-cast concrete girders, and they are approximately 133 ft long and 70 ft wide. A two-lane access road has also been constructed into the Theragenics Center, and smaller unimproved roads have been cut into some of the development areas for borrow site access and other construction activities.

3.4.2 Water Supply

Domestic and fire protection water supply comes from the ETTP filtration and treatment facility (K-1515) via a connection to an existing water main located south of the Oak Ridge Turnpike (SR 95). A 12-in. potable water line enters Parcel ED-1 along the east side of the west entrance boulevard. Water service through Parcel ED-1 is routed along the road right-of-ways (ROWs). This service provides up to 300 gallons per minute (gpm) for operational needs and an additional 1000-gpm reserve for fire protection. The K-1513 pumping station and the K-1515 facility are currently scheduled for transfer to CROET in FY 2004. If transfer is not achieved, they will be demolished under the Oak Ridge Performance Management Plan. As development increases, plans call for connection to an auxiliary water tank to be constructed on Development Area 6. Future service is planned with a service connection from the City of Oak Ridge system. This future tie-in to the City's system is dependent upon the completion of a new water line that is part of the Partners-for-Progress initiative to extend utilities to the western portion of Oak Ridge (see Sect. 5.1). Completion of the new water line may be 3 years away.

3.4.3 Wastewater

An existing 15-in. line located south of the East Tennessee Technology Park (ETTP) provides sanitary sewer service for Parcel ED-1. This existing line flows to the ETTP wastewater treatment facility (K-1203). At Parcel ED-1, a force-main leaves a pump station located west of the western entrance boulevard and south of EFPC. It extends south, adjacent to the west boulevard to the north side of the Oak Ridge Turnpike. The new force-main runs west along the Turnpike to the ETTP connection location. Under the Oak Ridge Performance Management Plan the K-1203 facility is scheduled for demolition unless it is transferred to CROET or another entity. Future plans include a tie-in to a new City of Oak Ridge wastewater treatment plant (Rarity Ridge), which is currently under construction, west of the Clinch River, approximately 4 miles west of the existing pump station.

3.4.4 Electricity

Initial electrical service to Parcel ED-1 is provided by an extension of the existing 13.8-kV, 3-phase, dual primary-feed service, via overhead line from ETTP. The line extends about 1.7 miles, along an existing transmission line ROW to the Oak Ridge Turnpike, then to Parcel ED-1 where electrical service is distributed through an underground duct-bank to the development areas. This service is satisfactory for the initial phases of development. To address future needs, an addition to the adjacent Tennessee Valley Authority (TVA) Roane Substation is under construction and is expected to be available in 2003.

3.4.5 Natural Gas

Natural gas is provided to Parcel ED-1 from an 8-in., 375-psi pipeline maintained by the Oak Ridge Utility District. The existing high-pressure pipeline is routed east along the north boundary of Parcel ED-1 to the northwest corner of Development Area 6. A 6-in. service line is routed south from a regulator station in an easement along the west boundary of Development Area 6 to the central roadway. Distribution to all other development areas occurs within ROWs of the central roadway and entrance boulevards. To achieve future service redundancy, an extension of the high-pressure main along the north boundary, to a connection at a 10-in., high-pressure main along the Oak Ridge Turnpike, is planned by Oak Ridge Utility District.

3.4.6 Telecommunications

Fiber-optic telecommunications service is provided by extending lines underground from an existing 144 single-mode fiber-optic cable tap near the west boundary of Parcel ED-1. The new fiber-optic lines are routed into the parcel, then to a terminal building that serves as both a communications and visitor center. Fiber-optic service for telephone, computer data lines, cable TV, fire, and security systems is routed along the road ROWs to all development areas via six, 4-in. conduits in an underground duct bank.

3.5 CULTURAL RESOURCES

The previous EA stipulated a need for a cultural and archaeological survey on an 80-acre portion of Parcel ED-1 that was not previously surveyed. The area is located in the western end of the parcel, bounded on the north by EFPC and on the south by McKinney Road. Development Area 4 is located within the area.

During the summer of 1997, archaeologists conducted a Phase I Cultural Resources Survey of the defined area. The objectives were to document and identify resources within the area that could be of historic or cultural significance. This was accomplished by a records search, a site pedestrian survey, and a shovel testing investigation. The results of the survey are presented in the 1998 Annual Report (DOE 1998). Based on the results, DOE determined that the proposed development of the area would have no effect on any archaeological or historical resources. The Tennessee-State Historic Preservation Office (TN-SHPO) concurred with DOE's determination and stated that they had no objection to the implementation of the project (see Appendix D).

Construction activities on Parcel ED-1 have avoided all known cultural resources. The 100-ft buffer placed around the McKamey-Carmichael cemetery has been maintained (DOE 2000a). Sites 40RE195 and 40RE200 are foundation-only mill sites. Both sites are located adjacent to EFPC (DOE 1996a). These sites are protected because they are within the Natural Area. In cooperation with the TN-SHPO, CROET placed millstones from these sites at the Wheat Community Church for preservation and display.

4. ENVIRONMENTAL CONSEQUENCES

Potential environmental impacts that could result from the proposed title transfer of the developable portion of Parcel ED-1 were evaluated for the following: land use, geology and soils, air quality, water resources, ecological resources, cultural resources, socioeconomics, infrastructure and support services, noise, and health and safety. Potential impacts identified were compared with the results of the analysis conducted for the 1996 EA.

Impacts have already occurred on the parcel as a result of construction activities (i.e., roads, bridges, utilities) undertaken by CROET. Remaining development includes the continued build-out of the developable areas as industries and businesses are recruited, and the extension of access roads and utilities into those areas. Based on information from Horizon Center LLC, this would occur in phases so that large areas would not be under development at any one time. Also, CROET's earlier development plan for the parcel included future construction of an additional road bridge crossing EFPC and a rail spur that would cross Poplar Creek and EFPC. Horizon Center LLC has indicated that these are no longer being considered because of cost and other reasons.

The restrictions that provide for environmental protection, which are specified in the current lease, would be carried forward to the appropriate transfer documents. Only the transfer of the entire parcel was evaluated for potential environmental impacts since it was determined that any impacts resulting from the options described in Sect. 2 would be less than the transfer of the entire 957 acres. For purposes of comparison it was determined that if DOE chose not to transfer Parcel ED-1 (i.e., no action) the current lease with CROET would continue.

Land use, threatened and endangered species, cultural resource, and socioeconomic impacts are discussed below only because they are where change could have occurred since CROET began development of the parcel.

4.1 LAND USE

The build-out of Development Area 4 could adversely impact an approximate 1.5-mile section of the North Boundary Greenway that borders the western boundary of Parcel ED-1. Future development of this area would require that the existing DOE patrol road be widened and paved to accommodate traffic that would access the area during construction and facility operations. Currently, the use of this road for the greenway is permitted under a license granted by DOE to the City of Oak Ridge. Upon title transfer of Parcel ED-1, the road would become the property of Horizon Center LLC. One option to offset potential impacts is for the City of Oak Ridge and Horizon Center LLC to enter into discussions regarding the continued use of the greenway. Mitigation measures could be enlisted as well as improvements that could enhance the public's use of the area, such as the construction of a foot/bike path as part of any road improvements that would be needed to provide access into Development Area 4.

Limited encroachment into the 100-year floodplain, which was covered under a U. S. Corps of Engineers Nationwide Permit (33 CFR 330), has already occurred during construction activities associated with the initial development of Parcel ED-1 under the lease. No additional adverse direct or indirect impacts to the floodplain are expected except for potential minor encroachments into two small areas of the floodplain in the developable areas. These encroachments would be for construction of a parking area and road and bridge improvements. The proposed action will conform to all applicable floodplain protection standards including regulation by the U.S. Army Corps of Engineers, Tennessee

Department of Environment and Conservation, and if required, the Tennessee Valley Authority. Additional information is contained in the Floodplain Assessment in Appendix C.

4.2 THREATENED AND ENDANGERED SPECIES

Oak Ridge National Laboratory (ORNL), as part of its pre-development monitoring, and CROET, as part of the design of the development plan for Parcel ED-1, conducted extensive surveys for threatened and endangered plant and animal species, other sensitive or rare species, and any supportive habitat. These surveys are documented in the annual reports that DOE has published (DOE 1997a, 1998, 1999a, 2000a). The surveys resulted in the identification of three protected plant species: goldenseal (*Hydrastis canadensis*) [State Threatened], ginseng (*Panax quinquefolium*) [State Special Concern species because of commercial exploitation], and pink lady slipper (*Cypripedium acaule*) [State Threatened]. The Tennessee dace (*Phoxinus tennesseensis*) state-listed as "Deemed In Need of Management" has been found in Dace Branch (Fig. 2.1). The southeastern shrew (*Sorex longirostris*) and sharp-shinned hawk (*Accipiter striatus*) "Deemed In Need of Management" have also been observed on Parcel ED-1.

The transfer of Parcel ED-1 would not result in any additional impacts to the protected plant species, Tennessee dace, southeastern shrew, or the sharp-shinned hawk. The plant species and Dace Branch are located in the Natural Area, as is the habitat for the southeastern shrew and sharp-shinned hawk. The terms of the transfer documents would ensure the protection of the Natural Area. Encroachment into the sensitive areas where federal or state-listed species are known to be present would be prohibited.

Site preparation and construction activities during 1998 and 1999 resulted in exposing large areas of soil in the vicinity of Dace Branch. Two major storm events in the early spring of 1999 overran the silt fence allowing sediments to enter Dace Branch. In fall 1998, the number of Tennessee dace was 19, a number higher than previously recorded (DOE 1998). In spring 1999, four individuals were found (DOE 1999a). In October 1999, there were only two individuals, and none were found during the spring 2000 sampling (DOE 2000a). A population of Tennessee dace was found upstream of normal sampling location (DBK 0.3). This population was located upstream from influences of construction and downstream from culverts under the Oak Ridge Turnpike. It was believed that these fish would serve to repopulate the downstream reaches of Dace Branch as the stream recovered from the 1999 storm events. Sampling to confirm this has been conducted and the results will be reported in the next Annual Report. Also, the construction activities near Dace Branch have been completed and the disturbed areas surrounding the stream have been stabilized. This is serving to buffer and protect the stream from additional sedimentation. However, it is possible that other future activities, not related to the further development of Horizon Center (e.g., TDOT's expansion of SR 95), could adversely impact Dace Branch.

Impacts to rare and listed bird species were analyzed in the 1996 EA. However, construction activities associated with Development Area 4 could result in adverse impacts to the Cerulean Warbler, Wood Thrush, Kentucky Warbler, and Prothonotary Warbler. Loss of habitat from the complete or partial clearing of the woodland would be the greatest detriment to these species. Adverse impacts from further forest fragmentation could also result from improvements to the existing DOE patrol road to provide access into the area for construction and operational activities. Development could also result in positive impacts to species such as the Blue-winged Warbler and Prairie Warbler that prefer early succession and scrub-shrub habitats. This type of habitat often results when areas are cleared to support construction activities and then left to develop ruderal habitat. However, unless maintained as early succession or scrub-shrub habitat, such as a powerline ROW, the positive impacts of this type of additional habitat would be temporary. Another potential result of increased forest fragmentation from the development of Parcel ED-1 is the potential increases of other nest predators, such as raccoons and skunks. Often,

populations of these species increase as a result of habitat changes and increased human activity, which also provide them greater access to sensitive species.

Although locally important, the loss of a minimal amount of marginal Cerulean Warbler habitat within the Southern Ridge and Valley Physiographic Area would not have a major adverse impact on the species. The recent establishment of 75,000 acres of public access-managed timberland just north of Parcel ED-1 near TWRA's Royal Blue Wildlife Management Area in Campbell and Scott Counties would likely provide significant opportunities for mitigation on a regional basis. With the surface rights to be deeded to the TWRA, the management of this tract, known as the Cumberland Forest, will be performed under restrictive covenants that will ensure the use of environmentally sound timber management practices that will protect the ecosystem. A primary management goal is the protection of rare species (Simmons 2002).

The introduction of, or population changes in, some exotic plant species cannot always be directly linked to any one specific activity in the immediate area or to specific sources. For instance, privet has been widely planted as an ornamental hedge in residential and commercial areas. Because birds favor privet fruits, the seeds can be widely dispersed from their source. In addition, favorable privet habitat includes floodplains where flooding can spread the seeds to downstream areas far from their original source. In this case, the dominance of privet in some areas of the floodplain is an indirect impact of human activities, but the source of the initial introduction and the pattern of subsequent spread would be difficult to determine. In contrast, exotic species that are not readily naturally introduced into new areas because of their dispersal and growth characteristics, can be introduced into and spread throughout a new area as a direct result of human activities, such as propagules attached to vehicles and equipment; intentional introduction in landscaping and erosion control, and; forest clearing, which enables opportunistic species to gain a foothold. In addition, site development may result in habitat alterations that favor the spread of existing exotic species into communities and locations in which they did not occur prior to development.

Horizon Center LLC would only be held accountable for natural succession within the Natural Area, with respect to preventing and controlling exotic/invasive plants in areas of known sensitive plant communities. Horizon Center LLC would also be encouraged to continue its efforts to prevent the introduction of non-native species on Parcel ED-1. Especially important is the continuance of including the native plant recommendations and list of plant species to avoid in the Horizon Center LLC Covenants, Conditions, and Restrictions.

DOE has sent informal consultation letters to the FWS providing them information about the proposed title transfer. As part of this informal consultation, DOE informed the FWS of their decision to transfer title to only the developable portions of Parcel ED-1 and provided them with the Quitclaim Deed conditions applying to the protection of listed species and their habitat. A letter received by DOE from the FWS dated September 18, 2002, stated that the supporting information for the proposed title transfer is adequate and supports the conclusion of not likely to adversely affect. Copies of correspondence from the FWS are included in Appendix D.

4.3 CULTURAL RESOURCES

No impacts to any known archaeological or historical resources located within Parcel ED-1 would result from the title transfer of the parcel. With the transfer, Horizon Center LLC would assume the protection of cultural resources located on Parcel ED-1. The deed would ensure that the fence and 100-ft buffer around the McKamey-Carmichael cemetery would continue to be maintained. Sites 40RE195 and 40RE200 would continue to be protected because they are located within the established Natural Area. In addition, these sites would continue to be inspected annually by CROET to ensure that their integrity has

not been compromised. CROET would report the results of these annual inspections in the Annual Reports prepared as part of the requirements of the MAP.

The deed between DOE and Horizon Center LLC would require that if an unanticipated discovery of cultural materials (e.g., human remains, pottery, bottles, weapon projectiles, and tools) or sites is made during any development activities, all ground-disturbing activities in the vicinity of the discovery would be halted immediately. The property owner would be responsible for contacting the TN-SHPO and the Eastern Band of Cherokee Indians Tribal Historic Preservation Office to initiate and complete consultation prior to any further disturbance of the discovery-site area.

DOE sent notification letters to the TN-SHPO and the Eastern Band of Cherokee Indians Tribal Historic Preservation Office providing them information about the proposed transfer. The TN-SHPO provided a response stating that they had no objections to the proposed transfer contingent on receipt and review of the deed restrictions specific to protection of cultural resources. These restrictions were transmitted on August 22, 2002, and a response from the TN-SHPO approving the action was received on September 5, 2002. The TN-SHPO concurred that the proposed action would not adversely affect any listed properties on the National Register of Historic Places so long as the covenant language contained in the DOE letter dated August 22, 2002, is included in the transfer documents and runs continuously with the land. Copies of the referenced correspondence are included in Appendix D.

4.4 SOCIOECONOMICS

Socioeconomic impacts of the proposed title transfer are limited to the potential revenue impacts for the City of Oak Ridge if the transferred land is sold to private, tax-paying corporations. The acreage developed and demographic and income impacts are unchanged. In addition, any improvements made to the land are taxable, whether the land is leased or owned. For Parcel ED-1, DOE currently provides the City of Oak Ridge a payment in-lieu-of-tax only for the Natural Area. The potential net change in revenue to the City would be the tax collected on the land itself, minus any lost revenues from discontinued payments in-lieu-of-tax.

This analysis assumes that the entire 957 acres would be transferred, of which 468 acres would remain as the Natural Area, and 489 acres would be sold over time for private development. Only the land sold for private development would be taxable. Unimproved industrial land in Oak Ridge has been valued from $17,000 to $35,000 per acre (FLUOR 2001). The total land value for 489 acres would fall between $8.3 million and $17.1 million, and the assessed value would fall between $3.3 million and $6.8 million. Assuming a tax rate of $2.94 per $100 of assessed value, the tax revenue for the transferred property would fall between $98,000 and $201,000. At this rate, the payment in-lieu-of-tax on the 468 acres of the Natural Area would have been about $18,300 ($5,327/acre x 468 acres x 0.25 assessment rate x $2.94/100). Upon transfer, DOE would no longer make the in-lieu-of-tax payment to the City of Oak Ridge. Therefore, the new net revenue could range from $79,300 to $182,700 ($98,000 - $18,300 to $201,000 - $18,300). However, it is not clear whether the City of Oak Ridge would be able to collect property tax on the developable acreage as long as Horizon Center LLC owns it. Actual revenues will depend on the acreage sold, tax status while owned by Horizon Center LLC, and on future land valuations, assessments, and tax rates.

5. CUMULATIVE IMPACTS

Cumulative impacts are those that may result from the incremental impacts of an action considered additively with the impacts of other past, present, and reasonably foreseeable future actions. Cumulative

impacts are considered regardless of the agency or person undertaking the other actions (40 *CFR* 1508.7), and can result from the combined or synergistic effects of individual minor actions over a period of time.

5.1 POTENTIALLY CUMULATIVE ACTIONS

This section describes present actions, as well as reasonably foreseeable future actions, that are considered pertinent to the analysis of cumulative impacts for the proposed title transfer of Parcel ED-1. The probable locations of these actions and their relationship to Parcel ED-1 are shown on Fig. 5.1. The actions are as follows.

ETTP (Heritage Center). DOE has made many of its vacant and/or underutilized facilities at the ETTP available for lease to CROET, who in turn is subleasing these facilities to private sector firms (DOE 1997b). Commercial use of these facilities does not constitute a change of the primary use of the property, which has been industrial for about 60 years. Portions of ETTP are contaminated with hazardous substances and radionuclides and DOE is responsible for environmental cleanup of the site (DOE 1997b). Recently, DOE committed (and EPA and TDEC concurred) to implement a Performance Management Plan, which will include the transfer of title of some of these facilities. In addition to the Oak Ridge Performance Management Plan, property disposal (i.e., title transfer) is being considered under E.O. 12512 "Federal Real Property Management," which mandates that each agency conduct a Utilization Study for federal property under its control.

Parcel ED-3. DOE is also considering the transfer of a parcel of land designated as Parcel ED-3 for economic development purposes. Consistent with the PMP and E.O. 12512, DOE may consider disposal (i.e., title transfer) of this parcel. Parcel ED-3 is located along portions of State Route 327 (Blair Road) and State Route 58 (Oak Ridge Turnpike). If transferred, the property would be marketed for commercial and light industrial uses. The environmental consequences of the proposed transfer of this property were reviewed in a Draft EA (DOE 2000) issued to the public on September 27, 2000. DOE is evaluating a revised footprint that is consistent with one of the alternatives evaluated as a part of the ORR Land Use Planning Process (ORNL 2002).

Roane Regional Business and Technology Park. This industrial park is located north of Interstate 40 between Buttermilk Road and the Clinch River in Roane County. The 655-acre site will include areas for industrial development and greenbelt uses. The land is characterized by rolling topography and is separated into two distinct areas by a creek. The park will be developed in three phases. Phase I development of 200 acres was completed in late 2001, and is expected to house industries that will provide about 500 jobs. Examples of the types of industries expected to locate at the site include information technology, instrumentation, automotive transportation, light metalwork, materials handling, and corporate administrative offices (Human 2000).

Pine Ridge Development. In 1969 the City of Oak Ridge acquired 230 acres of property, identified as Site X, from the then Atomic Energy Commission. The property included the current Valley Industrial Park and a portion of Pine Ridge. In 1999 the City transferred approximately 71 acres of Pine Ridge between South Illinois Avenue, Union Valley Road, and Scarboro Road to the Industrial Development Board who in turn sold the property to a private developer. The area is now being developed for office space, light manufacturing, and storage facilities. The ridge top, which has been clear-cut, is being leveled as much as 60 to 70 ft. The dirt will be used to fill a valley between the ridges and to grade the slopes, creating a plateau for the construction of up to 12 buildings with parking. Once completed, the developer expects between five and 15 tenants. The developer has also stated that he is working with both the University of Tennessee Agricultural Department and Greenways Oak Ridge on plans to revegetate and landscape the development.

Rarity Ridge Development. A private development company has proposed a mixed, residential/commercial development project for the former Boeing property in western Oak Ridge (Roane County). The developer has purchased about 1200 acres from the previous property owner and an additional 182 acres of adjoining floodplain from DOE. DOE completed an EA for the transfer of the floodplain (DOE/EA-1361) and issued a FONSI on January 31, 2001. In February 2000, the Oak Ridge City Council voted to rezone the property from industrial to mixed-use. The Rarity Ridge master plan calls for 1734 single-family homes, 133 townhouses, 2106 multi-family dwelling units, and 1,257,900 ft^2 of commercial space. Over 100 acres are planned for parks; 17 acres for active recreation and over 30 acres in preserve and limited access. In addition, approximately 440 acres will be transferred to a third party for open space and recreational purposes. Property sales are currently in progress.

West End Utility Expansion. Partners-for-Progress, a group of public and private organizations, is working to extend the utility infrastructure to make industrial sites in western Oak Ridge more attractive to prospective industries. Proposed projects include the following:

- provide water and wastewater to Horizon Center, and a new substation;
- construct a wastewater pump station and force-main, plus provide electric service to Heritage Center;
- provide utilities to the Rarity Ridge and Heritage Center sites; and
- provide utilities to the former Clinch River Breeder Reactor site.

The total cost for all projects is estimated to be $15.2 million. DOE-ORO has offered to transfer a 24-in. water line to the City and to fund water and sewer lines through CROET. The City has already begun construction on a new wastewater pumping station, a new water line, and a new force main to serve west-end development. The City is also upgrading the capacity of its sewage treatment plant.

Oak Ridge Industrial Center. The Oak Ridge Industrial Center is located at the site partially developed by TVA for the Clinch River Breeder Reactor prior to 1983. The 1245-acre property is for sale by TVA, and has been considered for development by several manufacturing industries. TVA has graded a 150-acre tract on the property to < 2% slope. The remaining land is rolling to rough terrain, having an 8 to 20% slope (ORCC 1999). The developable land contains tracts with hardwood forests and pine plantations impacted by the Southern pine beetle. The site also contains cultural resources (TVA 1988); TVA has designated a 103-acre tract bordering Grassy Creek as the Grassy Creek Habitat Protection Area to be reserved for protection of bugbane (*Cimicifuga rubifolia*) habitat (TVA 1988). A feeder road may be constructed by TDOT to improve access from SR 58, pending the sale and further industrial development of the property (ORCC 1999).

State Route 58/95 Expansion. TDOT has completed widening a 5.2-mile section of SR 58 to four lanes from the intersection with Interstate 40 to 0.5 miles south of the intersection with SR 95 (TDOT 1999). There is another project under consideration by TDOT to widen an additional 2.8 miles of SR 95 east to Westover Drive in Oak Ridge. Right-of-way plans have been developed for this project but construction funding has not yet bee approved.

Spallation Neutron Source Project. The Spallation Neutron Source (SNS) will be a state-of-the-art, high-flux, short-pulsed neutron source facility occupying about 110 acres near ORNL. The SNS will be located within the ORR on Chestnut Ridge. About 15 permanent buildings covering about 6 acres will be constructed for the project. The SNS facility will generate sub-atomic particles called neutrons for materials testing and other research. Employment to support the design and construction phases will peak in years 2001 and 2002. Operational employment would begin in 2006 and is estimated to continue for 40 years (DOE 1999b). As of October 2002, construction of the SNS has passed the halfway point and should peak in late 2002. Some components have been installed such as the Front End System. Other key facilities, including the Linac and the Storage Ring, are close to completion.

Y-12 Modernization Program. DOE has issued a Final Site-Wide Environmental Impact Statement (EIS) and Record of Decision (DOE 2001a) for the operation of the Y-12 National Security Complex (Y-12) and modernization of facilities. Major actions include construction of an Enriched Uranium Manufacturing Facility, an Assembly/Disassembly/Quality Evaluation Facility, a Depleted Uranium Operations Facility, a Lithium Operations Complex, and other facilities, as needed, to meet Y-12 mission requirements. Planning and design of these modernized facilities are in the very early stages and, thus, no detailed quantitative impacts have been assessed. However, modernized facilities would reduce radiation exposure to workers, incorporate pollution prevention/waste minimization measures in their operation, and reduce emissions to the environment compared to the facilities that are currently operating. Demolition of some facilities is ongoing in order to prepare for the new construction that should begin in 2003.

Oak Ridge National Laboratory Revitalization Project. DOE is implementing a Facilities Revitalization Project (FRP) at ORNL in order to modernize some ORNL facilities, maintain ORNL's competitive research and development capabilities, enhance worker health and safety, and reduce operating costs. The FRP includes constructing new facilities on brownfield land and remodeling numerous existing facilities in order to relocate ORNL staff currently housed at Y-12, other ORR facilities, and in commercial office space. Up to six buildings will potentially be demolished. Approximately 1.8 million ft^2 of space in aging buildings, mostly at Y-12, is being vacated.

Conceptual plans for the FRP include construction of up to 24 new facilities totaling approximately 1.2-million ft^2 in Bethel Valley near the main ORNL entrance, near the West Portal in Melton Valley, and within the footprint for the SNS. Some of the new construction is being funded by the State of Tennessee and the private sector. About 50 acres of brownfield property in Melton Valley has been transferred from DOE to the private sector in support of this proposed action. The environmental consequences of this project were reviewed in an EA and a FONSI was signed June 1, 2001 (DOE 2001b). Construction began in August 2002 on the Joint Institute for Computational Sciences, Research Office Complex, Engineering Technology Facility, and the new facility for the Mouse Genetics and Genomics Program. These facilities should be completed by September 2003.

Transuranic/Alpha Low-Level Waste Treatment Facility. DOE issued the transuranic (TRU) Waste Treatment Facility EIS (DOE 2000c) in June 2000 and its ROD on August 9, 2000. DOE has selected the Low-Temperature Drying Alternative (the preferred alternative in the Final EIS) and is proceeding with the construction, operation, and decontamination and decommissioning of the TRU Waste Treatment Facility at ORNL. The waste to be treated is legacy waste (i.e., waste generated from past isotope productions and research/development that supported national defense and energy initiatives). TRU waste generated from ongoing ORNL operations will also be treated at the facility. The facility is adjacent to the Melton Valley Storage Tanks, where the waste is currently stored. All treated TRU waste will be transported and disposed of at the Waste Isolation Pilot Plant while treated low-level waste will be transported and disposed of at the Nevada Test Site.

5.2 CUMULATIVE IMPACTS BY RESOURCE AREA

Cumulative impacts are discussed below for land use, air quality, socioeconomics, transportation, and biodiversity. Impacts primarily result from the actions presented in Sect. 5.1. The magnitude of the impacts depends on the timing of the actions (i.e., greater potential for impacts if several activities are ongoing at the same time). Several of the actions in Sect. 5.1 are unlikely to impact the proposed transfer of Parcel ED-1 (e.g., SNS, Y-12 Modernization, ORNL, TRU waste treatment) while others (e.g., proposed development of Parcel ED-3, west end utility expansion, and SR 95 expansion) have a greater potential to impact or be impacted by the proposed transfer. Because property is currently leased and is being developed for an industrial/business park, the proposed transfer of title would not have a

large incremental impact on the environment when added to the other past, present, and reasonably foreseeable future actions discussed in Sect. 5.1.

5.2.1 Land Use

Of the original 58,575 acres of land purchased in 1942 by the federal government, 24,340 acres have been conveyed and 34,235 acres remain within the ORR. The purposes that ORR land has been conveyed include: 16,855 acres for residential, commercial, and community development; 1031 acres to federal agencies and for transportation easements; 3208 acres for preservation and recreation; 3239 acres for industrial development; and 7 acres for mission-related purposes. Current land outgrants (lease/license/permit areas) include 3498 acres for preservation/recreation and 485 acres for industrial development. The title transfer of Parcel ED-1 would remove an additional 489 acres of land from the ORR that would continue to be developed into an industrial/business park. The remaining 468 acres of Parcel ED-1 would not be developed and would continue to be protected within the Natural Area. Because the total area is small compared to the remaining ORR land (< 1%), the change in land use would result in negligible cumulative land use impacts.

5.2.2 Air Quality

Although the proposed transfer of Parcel ED-1 does not appear to have the potential to bring about major impacts (e.g., major sources requiring Title V operating permits) to air quality, the overall trend in the Roane and Anderson Counties area does present such a potential. Industrial development, increased traffic, and general population growth could impact air quality.

Construction activities, although exempt from Prevention of Significant Deterioration limits in 40 *CFR* 52.21, can be a major source of emissions, particularly particulates, in the form of fugitive dust. Such sources tend to be of short duration (during the construction period) and largely result in impacts of a localized nature. For example, the proposed widening of SR 95 would produce particulate emissions during disturbance of soils, but these temporary emissions could be minimized by the application of wetting agents during dry periods. Likewise, construction activities on Parcel ED-1 could be mitigated in a similar nature.

5.2.3 Socioeconomics

Several nearby development initiatives may increase employment in the area. Major initiatives include continued reindustrialization of the ETTP (Heritage Center), proposed development of Parcel ED-3 (if approved), the SNS project at ORNL, the Roane Regional Business and Technology Park, Rarity Ridge, and potential development of the Oak Ridge Industrial Center. No information is available on the expected employment associated with developing the Oak Ridge Industrial Center or Rarity Ridge.

The cumulative employment impacts, assuming all the remaining initiatives succeed during the next 10 years, are summarized in Table 5.1. Given the large uncertainties surrounding future success of any of these initiatives, this represents an upper bound on the cumulative employment impacts. The purpose for presenting the upper bound is to determine what the maximum potential impact would be on the local economy including secondary negative and positive effects.

Direct and total employment figures were derived as follows. Parcel ED-3 and ETTP Heritage Center direct employment assumes that each of these sites meets 100% of its job creation goals. Employment for the Roane Regional Business and Technology Park is based on a 20-year development plan which estimates that up to 3500 direct jobs will be created over that time period (Human 1999). The table assumes that half of those jobs (1750) will be created in the next 10 years. Direct and total employment estimates for the SNS

Table 5.1. Estimated cumulative ROI employment impacts for local development initiatives

Parcel	Direct employment impact	Total employment impact		Percent of 2000 employment base	
		Lower bound[a]	Upper bound[b]	Lower bound	Upper bound
ED-3	1,200	2,163	3,438	0.6	0.9
ETTP	2,500	4,507	7,162	1.2	2.0
SNS	744[c]	1,704[c]	1,704[c]	N/A	0.5
Roane Regional Business and Technology Park	1,750	3,155	5,013	0.9	1.4
Cumulative impact	7,694	14,233	21,613	3.9	5.9

[a]Assumes the Regional Input-Output Modeling System (RIMS II) multiplier for miscellaneous manufacturing.
[b]Assumes RIMS II multiplier for motor vehicles and equipment.
[c]Maximum number of direct jobs and total jobs as reported in DOE 1999b.
ETTP = East Tennessee Technology Park.
ROI = Region of Influence.
SNS = Spallation Neutron Source.

are based on figures presented in the final EIS (DOE 1999b); the maximum employment in any year occurs in 2006, when the facility is expected to begin operations. Operating employment is expected to continue for 40 years. As the table shows, the cumulative impact could result in up to 21,613 direct and indirect new jobs, or an increase of 5.9% over 2000 Region of Influence (ROI) employment.

The gains in employment are likely to be offset by the large cuts in DOE-related jobs during the same time period. Between 1996 and 1999, 4457 direct jobs were lost and more jobs are expected to be lost in the next 10 years. It has been assumed that 3500 direct jobs will be lost during this period. Therefore, the cumulative direct and indirect jobs lost from 1996 to 2010 would total 10,977. When subtracted from the cumulative impacts shown above, the net new jobs created would represent between 0.9% and 2.9% of the 2000 ROI employment. This increase, created during a 10-year period, is not expected to create an undue strain on local socioeconomic resources.

5.2.4 Transportation

Cumulative transportation impacts in Roane and Anderson Counties could occur from increased development and growth. These potential impacts could be combined with ongoing and planned activities on the ORR and with the planned expansion of the state highway by TDOT.

The main transportation impacts of commercial and industrial development would be an increase in average daily traffic volumes. However, widening SR 95/58 from the west end of Oak Ridge to the intersection with Interstate 40 should help to reduce local traffic flow.

Associated with increases in traffic is the potential for an increased number of accidents, additional noise and air pollution, and accelerated road deterioration and damage. The increase in average daily traffic volumes could result in inconveniences for other vehicles (personal and commercial) on affected routes and connecting roads. Increased pavement deterioration and damage could increase costs associated with maintaining or resurfacing roads and highways. Although noise associated with increases in traffic is normally not harmful to hearing, increased traffic noise is considered by the public to be a nuisance. Increased accidents put an additional strain on local emergency response personnel. Increased vehicular traffic also has the greatest potential to increase air pollution in the local area because emissions from motor vehicles are poorly regulated. Overall, the continued development of Parcel ED-1 is expected to have little impact on traffic in the area, especially with the planned road improvement projects. It

should be noted, however, that the transfer of title of Parcel ED-1 will not create any additional transportation impact since the parcel is already being developed into an industrial/business park.

5.2.5 Biodiversity

The greatest threat to reduced biodiversity of an area or region is conversion of cover types from natural systems to completely different and maintained systems. As an example, the conversion of an upland hardwood forest to pasture or hayfield (a monoculture) use can result in nearly the same loss of biodiversity as if the woodland were converted to industrial use.

Section 5.1 identifies several projects in the Oak Ridge area that will result in a change to the area's habitat. However, measures are being taken to create and/or maintain ecosystems that will enhance biodiversity. As an example, although Parcel ED-1 is already being developed as an industrial/business park, over half of the property will not be developed and contains corridors and buffers for native vegetation and wildlife species. In addition, approximately 103 acres along Grassy Creek are being reserved for habitat protection at the Oak Ridge Industrial Center (TVA 1988), and about 61 acres of the Roane Regional Business and Technology Park are being left as a greenbelt area. The SNS project is creating wetland habitat to replace habitat lost during construction and a forested pathway will be retained along Chestnut Ridge to minimize effects on terrestrial wildlife movements (DOE 1999b). Additionally, large areas of Blackoak Ridge, McKinney Ridge, and portions of Pine Ridge are not suitable for development and provide a large area to protect ecological resources.

A recently announced regional project has the potential to mitigate many of the potentially adverse ecological impacts that could be associated with the plans for development of the western portion of the ORR. Approximately 75,000 acres in Anderson, Scott, and Campbell Counties will be managed as a multiple-use public forest under a joint agreement between The Conservation Fund (a nonprofit land trust) and Renewable Resources, Inc. (a private timber investment firm). The Conservation Fund purchased the surface rights to the property and Renewable Resources, Inc. purchased the timbering rights. The property is known as the Cumberland Forest (Simmons 2002). This project has, as one of its primary goals, the protection of rare species of the Northern Cumberland Plateau Physiographic Area. Many of the same rare species also are found within the Southern Ridge and Valley Physiographic Area that includes Parcel ED-1.

The agreement calls for Renewable Resources, Inc. to manage the forestland under restrictive covenants that ensure environmentally sound timber management that will protect the ecosystem and provide economic benefits to the surrounding region. The Conservation Fund will transfer its interest to the TWRA, possibly as a new wildlife management area to be established next to the existing Royal Blue Wildlife Management Area, which totals 50,000 acres. This acquisition links Frozen Head State Park and the Royal Blue Wildlife Management Area to create a 140,000-acre tract of public forest. Plans call for creating a 35-mile segment of the Cumberland Trail State Park within this property to link existing trail segments in Frozen Head and Royal Blue (Simmons 2002).

Growth and development in the region surrounding the ORR is putting increased pressure on the biodiversity of the Ridge and Valley Ecoregion. However, the ORR continues to be a biologically rich resource that provides protection for large land areas and the biodiversity found within those protected areas.

6. REFERENCES

Awl, D.J., L.R. Pounds, B.A. Rosensteel, A.L. King, and P.A. Hamlett 1996. *Survey of Protected Vascular Plants on the Oak Ridge Reservation, Oak Ridge, Tennessee,* ES/ER/TM-194, U.S. Department of Energy, Office of Environmental Management, Oak Ridge, Tennessee.

Bureau of Economic Analysis 2002. Regional Accounts Data, Table CA30 (June), available at http://www.bea.doc.gov/bea/regional/reis/. Accessed June 20-21, 2002.

Boyer, P. 2002. Personal communication from Paul Boyer, City of Oak Ridge, to Sharon Bell, SAIC, January 8.

City of Oak Ridge 2001. "City of Oak Ridge, Tennessee Fiscal Year 2002 Annual Budget."

DOE 1996a. *Environmental Assessment – Lease of Parcel ED-1 of the Oak Ridge Reservation by the East Tennessee Economic Council,* DOE/EA-1113, April.

DOE 1996b. *Mitigation Action Plan – Lease of Parcel ED-1 of the Oak Ridge Reservation by the East Tennessee Economic Council,* DOE/EA-1113, April.

DOE 1997a. *Annual Report – Implementation of Mitigation Action Plan for DOE/EA-1113: Lease of Parcel ED-1 of the Oak Ridge Reservation, Oak Ridge, Tennessee, Pre-Development Ecological Surveys,* DOE/EA-1113/MAP-97, November.

DOE 1997b. *Final Environmental Assessment for Lease of Land and Facilities within the East Tennessee Technology Park, Oak Ridge, Tennessee,* DOE/EA-1175, November.

DOE 1998. *Annual Report – Implementation of Mitigation Action Plan for DOE/EA-1113: Lease of Parcel ED-1 of the Oak Ridge Reservation, Oak Ridge, Tennessee,* DOE/EA-1113/MAP-98, December.

DOE 1999a. *Annual Report – Implementation of Mitigation Action Plan for DOE/EA-1113: Lease of Parcel ED-1 of the Oak Ridge Reservation, Oak Ridge, Tennessee,* DOE/EA-1113/MAP-99. December.

DOE 1999b. *Final Environmental Impact Statement: Construction and Operation of the Spallation Neutron Source Facility,* DOE/EIS-0247, U.S. Department of Energy, Office of Science, July.

DOE 2000a. *Annual Report – Implementation of Mitigation Action Plan for DOE/EA/1113: Lease of Parcel ED-1 of the Oak Ridge Reservation, Oak Ridge, Tennessee,* DOE/EA-1113/MAP-00. December.

DOE 2000b. *Draft Environmental Assessment: Lease of Parcel ED-3 of the Oak Ridge Reservation,* DOE/EA 1316, September.

DOE 2000c. *Final Environmental Impact Statement (FEIS) for Treating Transuranic (TRU)/Alpha Low-Level Waste at the Oak Ridge National Laboratory, Oak Ridge, Tennessee,* Department of Energy, Oak Ridge Operations, Oak Ridge, Tennessee, June.

DOE 2001a. *Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex,* Volume I, September.

DOE 2001b. *Finding of No Significant Impact (FONSI) and Environmental Assessment for the Oak Ridge National Laboratory Facilities Revitalization Project,* DOE/EA-1362, U.S. Department of Energy, Oak Ridge Operations Office, Oak Ridge, TN, June.

DOE 2002. Private communication from Marianne Heiskell, Oak Ridge Operations Office, to Wayne Tolbert, SAIC, April 2-3.

FLUOR 2001. *Oak Ridge, TN Final Reports: Economic Development Strategic Assessment*, FLUOR Global Location Strategies, March.

Hamel, P.B. 2000. *Cerulean Warbler Status Assessment*, U.S. Fish and Wildlife Service, Minneapolis, MN.

Human, G. 1999. Personal communication from Gary Human, Roane County Industrial Development Board (RCIDB), to Sharon Bell, SAIC, September 28.

Human, G. 2000. Personal communication from Gary Human, Roane County Industrial Development Board (RCIDB), to Julia Gartseff, SAIC, July.

Nicholson, Charles P. 1997. Atlas of the Breeding Birds of Tennessee. The University of Tennessee Press, Knoxville.

ORCC (Oak Ridge Chamber of Commerce) 1999. Personal communication from Kim Denton, ORCC, to Julia Gartseff, SAIC, November 4.

ORNL (Oak Ridge National Laboratory) 2002. *Land Use Technical Report,* ORNL/TM-2002/132, September.

Simmons, Morgan. 2002. 75,000 acres of woodland to be public; Royal Blue, Frozen Head will be linked. The Knoxville News-Sentinel. August 3.

TDOT (Tennessee Department of Transportation) 1999. Personal communication from TDOT Public Information Office to Julia Gartseff, SAIC, November 4.

Toennison, R. 1999. Personal communication from Rick Toennison, TVA, to Julia Gartseff, SAIC, November 17.

TVA (Tennessee Valley Authority) 1988. *Watts Bar Reservoir Land Management,* August (reprinted September 1992).

Welton, Melinda J. 2000. Cerulean Warbler occurrence on Royal Blue Wildlife Management Area, prepared for Tennessee Natural Heritage Program, Tennessee Wildlife Resources Agency, Tennessee Ornithological Society, and Partners in Flight.