2. Environmental Compliance

It is DOE-ORO and NNSA policy to conduct its operations in compliance with federal, state, and local environmental protection laws, regulations, compliance agreements and decrees, settlement agreements, executive orders, DOE orders (as incorporated into the operating contracts), and best management practices. DOE and its contractors make every effort to conduct operations in compliance with the letter and intent of applicable environmental statutes. The protection of the public, personnel, and the environment is of paramount importance.

Except for the few instances of noncompliance discussed in this chapter, all ORR sites were in substantial compliance with applicable environmental regulations in 2004. Each site achieved a National Pollutant Discharge Elimination System permit compliance rate greater than 99.9% in 2004.

In 2004, all three ORR facilities operated in compliance with the regulatory dose limits of Tennessee Rule 1200-3-11-.08 (Emission Standards for Hazardous Air Pollutants for Radionuclides) and met its emission and test procedures.

No releases of reportable quantities of hazardous chemicals or asbestos were reported under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) by any of the sites.

Several private businesses operate under leasing arrangements at the ETTP under the DOE Reindustrialization Program. Lessees are accountable for complying with all applicable standards and regulations and for obtaining permits and licenses with local, state, and federal agencies as appropriate. Unless specified, lessee operations are not discussed in this report.

2.1 Introduction

DOE's operations on the reservation are required to be in conformance with environmental standards established by a number of federal and state statutes and regulations, executive orders, DOE orders, contract-based standards, and compliance and settlement agreements. However, numerous facilities at the ETTP site have been leased to private entities over the past several years through the DOE Reindustrialization Program. Their level of compliance is not addressed in this report.

Principal among the regulating agencies are the U.S. Environmental Protection Agency (EPA) and the Tennessee Department of Environment and Conservation (TDEC). These agencies issue permits, review compliance reports, participate in joint monitoring programs, inspect facilities and operations, and oversee compliance with applicable regulations.

When environmental issues are identified during routine operations or during ongoing self-assessments of compliance status, the issues are typically discussed with the regulatory agencies. In the following sections, major environmental statutes are summarized for the ORR sites.

2.2 Compliance Activities

2.2.1 Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) was passed in 1976 to address management of the country's huge volume of solid waste. The law requires that EPA regulate the management of hazardous waste, which includes waste solvents, waste chemicals, and many other substances deemed potentially harmful to human health and to the environment. RCRA also regulates underground storage tanks (USTs) used to store petroleum and hazardous substances; recyclable used oil; and batteries, mercury thermostats, selected pesticides, and fluorescent/hazardous-waste lamps as universal wastes.

Subtitle C of RCRA controls all aspects of the management of hazardous waste, from the point of generation to treatment, storage, disposal, and recycle. Hazardous waste generators must follow specific requirements for handling these wastes. In addition, owners and operators of hazardous waste management facilities have operating and/or postclosure care permits.

The Y-12 Complex, ORNL, and ETTP are considered RCRA large-quantity generators of hazardous waste. Each generates both RCRA

hazardous waste and RCRA hazardous waste containing or contaminated with radionuclides (mixed waste). The hazardous and/or mixed wastes are accumulated by individual generators at locations referred to as satellite accumulation areas or 90-day accumulation areas, as appropriate, where they are picked up by waste management personnel and transported to an ORR treatment, storage, disposal, and recycle facility or shipped directly off site for treatment, storage, or disposal. At the end of 2004, the Y-12 Complex had 127 generator accumulation areas for hazardous or mixed waste; ORNL had 361 generator accumulation areas; and ETTP maintained 11. Each site is also regulated as a large-quantity handler of universal waste; however, the types of universal wastes managed as such at each site may vary.

The Union Valley Facility is considered a small-quantity generator of hazardous waste. At the end of 2004, it had eight satellite accumulation areas and one 90-day accumulation area.

ORISE is classified under RCRA as a conditionally exempt small-quantity generator.

ORNL's 0800 Area was classified as a small quantity generator in 2004 as a result of hazardous wastes generated by spills at that ORNL offsite location.

The Central Training Facility on Bear Creek Road, the Office of Secure Transportation Vehicle Maintenance Facility, the National Transportation Research Center, and the Freel's Bend area are also classified as conditionally exempt small-quantity generators.

The Y-12 Complex is registered as a large-quantity generator and a treatment, storage, disposal, and recycle facility under EPA ID Number TN3890090001. During 2004, eleven units operated as interim-status or permitted units. The RCRA units at the Y-12 Complex operate under two permits: TNHW-083 and TNHW-084. Permit TNHW-092 was terminated in 2004 and was not renewed. The permits are modified whenever necessary. During 2004, a Class I permit modification of permit TNHW-084 was made to remove secondary contaminant requirements for storage areas where secondary containment is not required.

ORNL is registered as a large-quantity generator and a treatment, storage, disposal, and recycle facility under EPA ID Number TN1890090003. During 2004, 21 units operated as interim-status or permitted units; another 5 units were proposed (new construction).

ORNL's RCRA units operate under three permits: TNHW-097, TNHW-010A, and TNHW-010 (now TNHW-121); TNHW-010 (TNHW-121) is the existing RCRA Hazardous and Solid Waste Amendments (HSWA) permit for the ORR (see Table 2.1). The permits are modified when necessary. A Class 2 permit modification of the TNHW-10A Permit was submitted and approved in 2004, allowing these units to conduct treatment via neutralization, stabilization, or addition of absorbent. A revised Part A and a Part B permit renewal application for the TNHW-010A permit were submitted in 2004. A Class 2 permit modification of the TNHW-097 permit was submitted to TDEC in late 2004. That modification addressed changes in container types in some units, a change in cooperator for one unit, and fencing changes around Solid Waste Storage Areas (SWSA) 5 and 6 to accommodate remedial actions. Approval of that modification is anticipated for early 2005.

ETTP is registered as a large-quantity generator and a treatment, storage, disposal, and recycle facility under EPA ID Number TN0890090004. ETTP has received three RCRA permits (see Table 2.1). The K-1435 Toxic Substances Control Act (TSCA) Incinerator is a hazardous waste treatment unit operating under a RCRA permit (TNHW-015) issued by TDEC on September 28, 1987. A revised RCRA permit based on trial-burn results was received in December 1995. A reapplication of the permit was submitted to TDEC in March 1997. A trial burn was conducted in 2001, and the results were submitted to TDEC. A second permit (TNHW-015A) is for storage of waste at the incinerator. Permit THHW-117 (formerly TNHW-056) covers container storage at various locations throughout the plant. Permit TNHW-17 was issued September 30, 2004.

2.2.1.1 RCRA Assessments, Closures, and Corrective Measures

The HSWAs to RCRA, passed in 1984, require any facility seeking a RCRA permit to identify, investigate, and (if necessary) clean up all former and current solid waste management units. The original HSWA permit (HSWA

Table 2.1. RCRA operating permits, 2004

Permit number	Building/description
	Y-12 Complex
TNHW-083	Building 9720-9 Container Storage Unit
	Building 9720-25 Container Storage Unit
	Building 9720-31 Container Storage Unit
	Portable Buildings 1 & 2 Container Storage Unit (not currently located at Y-12)
TNHW-084	Building 9206
	Building 9212
	Building 9720-12
	Cyanide Treatment and Storage Unit (closed 2004)
	Organic Handling Unit
TNHW-092	Building 9720-32 (permit terminated 9/30/2004)
	ORNL
TNHW-10A	Building 7507W Container Storage Unit
	Building 7651 Container Storage Unit
	Building 7652 Container Storage Unit
	Building 7653 Container Storage Unit
	Building 7654 Container Storage Unit
	Building 7669 Container Storage Unit
	Portable Buildings 1 & 2 Container Storage Unit
TNHW-097	Building 7572 Container Storage Unit
	Building 7574 Container Storage Unit
	Building 7576 Container Storage Unit
	Building 7577 Container Storage Unit
	Building 7580 Container Storage Unit
	Building 7823 Container Storage Unit
	Building 7824 Container Storage Unit
	Building 7842 Container Storage Unit
	Building 7855 Container Storage Unit
	Building 7878 Container Storage Unit
	Building 7879 Container Storage Unit
	Building 7883 Container Storage Unit
	Building 7884 Container Storage Unit
	ORR
TNHW-121	Hazardous and Solid Waste Amendments only[a]
	ETTP
TNHW-015	K-1435 Toxic Substances Control Act Incinerator
TNHW-015A	K-1425 and K-1435 Container and Tank Storage Units
TNHW-117	Container Storage Units and Waste Pile Units (19 storage units in 2003)

[a]TNHW-010 permit terminated; reissued as TNHW-121 in September 2004.

TN-001) for the ORR was issued by the EPA as an attachment to the RCRA permit for Building 7652 at ORNL. The HSWA permit requires DOE to address past, present, and future releases of hazardous constituents to the environment. The HSWA permit requirement for corrective action has been integrated into the ORR Federal Facility Agreement (see Sect. 2.2.2 for details). In March 1998, EPA and TDEC issued separate drafts of the HSWA permit for DOE review and comment. EPA's was issued as a stand-alone permit; TDEC's was issued as a modification to a Y-12 postclosure permit. A new draft HSWA permit (TNHW-121) was issued solely by TDEC in 2004, and the new permit was finalized in September 2004.

The renewed permit addresses contaminant releases from solid waste management units and from RCRA areas of concern, but also integrates RCRA requirements with cleanups conducted under the Federal Facility Agreement and CERCLA programs (see Sect. 2.2.3).

"Areas of concern" are areas contaminated by a release of hazardous constituents that originated from something other than a solid waste management unit. Under the new HSWA permit, DOE must notify TDEC within 30 days of identification of a new solid waste management unit or new potential areas of concern. DOE has provided to EPA the *2004 Annual Update of the Solid Waste Management Units for the Oak Ridge Reservation* (DOE 2004a) (see Table 2.2).

At the Y-12 Complex, 37 RCRA units have been closed since the mid-1980s. Two permitted units, the Building 9720-32 Container Storage Area and the Cyanide Treatment Unit were closed in 2004.

Since the mid-1980s, ORNL has closed a total of 15 RCRA units. ORNL's SWSA 6 is an interim-status disposal site (landfill) that underwent partial closure beginning in late 1988. Although a revised closure plan for SWSA 6 (which included the eight interim-measure caps, the Hillcut Test Facility, and the Former Explosives Detonation Trench) was submitted in July 1995, actual final remediation of SWSA 6 has been deferred to CERCLA. The Melton Valley Record of Decision, which includes the selected remedy under CERCLA for SWSA 6, was signed in September 2000. A postclosure permit application for SWSA 6 was submitted to TDEC in September 2002; issuance of the postclosure permit is pending. The Interim Record of Decision for ORNL's Bethel Valley was issued in May 2002; its goal is to maintain the ORNL main plant as a controlled industrial-use facility.

At ETTP, the RCRA closure of K-1025C was completed in CY 2004. The only remaining RCRA-permitted vault in the K-25 Building is K-309-2A. RCRA Units K-711 and K-1036A are slated for closure in FY 2005. All other cleanup actions at ETTP are being conducted under CERCLA.

RCRA inspections conducted by TDEC at the facilities resulted in two notices of violations (NOVs) issued in 2004. At the Y-12 Complex, there were no NOVs; at ORNL, there was one NOV; and at ETTP, there was one NOV. Details of the violations are presented in Sect. 2.5.

2.2.1.2 Land Disposal Restrictions

The 1984 RCRA amendments established land disposal restrictions, which prohibited the land disposal of untreated hazardous wastes. The amendments require that all untreated wastes meet treatment standards before land disposal or that they be disposed of in a land disposal unit from which there will be no migration of hazardous constituents for as long as the waste remains hazardous. These restrictions also prohibit storage of restricted hazardous or mixed waste except as necessary to facilitate recovery, treatment, or disposal. Because treatment and disposal capacity for mixed wastes was unavailable for many years, DOE's storage of the mixed wastes over a year constituted RCRA land disposal restriction violations. To become compliant with RCRA, DOE entered into agreements with EPA, and later, with TDEC (see Sect. 2.2.4).

2.2.1.3 RCRA Subtitle D Solid Waste

Located within the boundary of the Y-12 Complex are two Class II operating industrial solid waste disposal landfills and one operating Class IV construction demolition landfill. These facilities are permitted by TDEC and accept solid waste from DOE operations on the ORR. A second Class IV construction demolition landfill (Landfill VI) is closed pending certification. In addition, one Class IV facility (Spoil Area 1) is overfilled by 11,700 yd^3 and has been the

Table 2.2. Summary of 2004 annual update of ORR solid waste management units

Revision[a]	Number of sites/revisions
Additional information/revisions made to solid waste management units	2
Addition of solid waste management units to A-1(a) list	0
Solid waste management units/areas of contamination moved from A-1(a) to A-2	0
Solid waste management units/areas of contamination moved from A-2 to A-1(a)	0

[a]U.S. Department of Energy. 2004a. *Annual Update of the Solid Waste Management Units for the Oak Ridge Reservation*. Submitted to the U.S. Environmental Protection Agency.

subject of a CERCLA remedial investigation/feasibility study. A CERCLA record of decision for this unit was signed in 1997. One Class II facility (Landfill II) has been closed and is subject to postclosure care and maintenance. Associated TDEC permit numbers are noted in Table 2.3.

2.2.1.4 RCRA Underground Storage Tanks

USTs containing petroleum and hazardous substances are regulated under Subtitle I of RCRA, 40 CFR 280. TDEC has been granted authority by EPA to regulate USTs containing petroleum under TDEC Rule 1200-1-15; however, hazardous-substance USTs are still regulated by EPA. Table 2.4 summarizes the status of USTs on the ORR.

ORNL has responsibility for 54 USTs registered with TDEC under Facility ID Number 0-730089. These 54 USTs can be classified as follows:

- 49 USTs closed to meet the RCRA Subtitle I requirements;
- 3 USTs in service that meet the 1998 standards for new UST installations;
- 2 USTs still in service that are deferred or exempt from Subtitle I because they are regulated by other statutes [one UST under the RCRA Subtitle C and one UST under the Clean Water Act (CWA)].

Of the 49 closed USTs, 24 were replaced by double-walled, concrete-encased above-ground storage tanks; 3 were replaced by the new, state-of-the-art USTs; and 22 were not replaced because they were no longer needed. Closure approval letters have been received for all USTs closed between 1988 and 1998.

The Y-12 UST Program includes four active petroleum USTs that meet all current regulatory compliance requirements. Two of these are located at the Office of Secure Transportation Vehicle Maintenance Facility. The UST registration certificates for these tanks are current, and certificates are posted at the UST locations, enabling fuel delivery until March 31, 2006.

All legacy petroleum UST sites at the Y-12 Complex have either been granted final closure by TDEC or have been deferred to the CERCLA process for further investigation and remediation.

The ETTP UST Program includes two active petroleum USTs that meet all current regulatory compliance requirements. The UST registration certificates are updated annually and are conspicuously posted in accordance with TDEC rules. Fourteen other petroleum USTs have been removed or closed in place with TDEC regulators' recommendation of "case closed" status.

Five hazardous substance USTs at ETTP have been removed since 1996. One other hazardous substance UST designed as a spill overflow tank is present at ETTP but has never been activated.

Sixteen known and/or suspected historical USTs that were out of service before January 1, 1974, are also included in the ETTP UST Program as a best management practice. These historical UST sites could be subject to closure requirements if directed by UST regulators. Magnetic and electromagnetic geophysical techniques are being used for detection and characterization of these historical UST sites and other underground structures to provide property database information for reindustrialization of ETTP.

Table 2.3. RCRA Subtitle D landfills, 2004

Facility	TDEC permit number	Comments
Industrial Landfill IV	IDL-01-103-0075	Operating, Class II
Industrial Landfill V	IDL-01-103-0083	Operating, Class II
Construction and Demolition Landfill	DML-01-103-0012	Overfilled, Class IV Subject of CERCLA record of decision
Construction and Demolition Landfill VI	DML-01-103-0036	Postclosure care and maintenance
Construction and Demolition Landfill VII	DML-01-103-0045	Operating, Class IV
Centralized Industrial Landfill II	IDL-01-103-0189	Postclosure care and maintenance

Table 2.4. ORR underground storage tank (UST) status, 2004

	Y-12 Complex	ORNL	ETTP
Active/in-service	4[a]	3	2
Closed	40	51[b]	14
Hazardous substance	3[c]	0[d]	6[e]
Known or suspected sites	0	0	16
Total	47	54	38

[a]Two are located off the Y-12 Complex at the Office of Secure Transportation Vehicle Maintenance Facility.

[b]The 51 "closed" USTs include deferred or excluded tanks of various categories, as detailed in the text.

[c]Two USTs are deferred because they are regulated by the Atomic Energy Act of 1954. The third is a permanently closed methanol UST.

[d]Closed tanks include two hazardous substance tanks, both of which were excavated, removed, and dismantled.

[e]Four USTs were permanently closed that had been used to store natural gas odorant and are regulated under the Pipeline Safety Act. A fifth UST, designed as a spill-overflow tank, has never permanently been placed into service. A sixth UST, which stored a methanol-gasoline mixture, was permanently closed.

2.2.2 Comprehensive Environmental Response, Compensation, and Liability Act

CERCLA, also known as Superfund, was passed in 1980 and was amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA). Under CERCLA, a site is investigated and remediated if it poses significant risk to health or the environment. The EPA National Priorities List is a comprehensive list of sites and facilities that have been found to pose a sufficient threat to human health and/or the environment to warrant cleanup under CERCLA. The ORR was placed on the National Priorities List on November 21, 1989, ensuring that the environmental impacts associated with past and present activities at the ORR are thoroughly investigated and that appropriate remedial actions or corrective measures are taken as necessary to protect human health and the environment. An interagency agreement under Section 120(c) of CERCLA, known as the ORR Federal Facility Agreement, was effective in 1992 among EPA, TDEC, and DOE. The agreement establishes the procedural framework and schedule for developing, implementing, and monitoring response actions on the ORR in accordance with CERCLA. Appendix C of the Federal Facility Agreement lists all of the sites/areas that will be investigated, and possibly remediated, under CERCLA. Milestones for completion of CERCLA documents are available in Appendix E of the agreement.

The progress toward achieving these goals is described in the *2005 Remediation Effectiveness Report for the U.S. Department of Energy Oak Ridge Reservation, Oak Ridge, Tennessee* (DOE 2005a). This report describes the individual remedial actions and provides an overview of some of the monitoring conducted to evaluate the efficacy of those actions.

Staff from NNSA and BWXT Y-12 have provided periodic updates of proposed construction and demolition activities at the Y-12 Complex (including alternative financing projects) to managers and project personnel from the TDEC DOE Oversight Division, EPA Region 4, and DOE-ORO. A CERCLA screening process is used to identify proposed construction and demolition projects that warrant CERCLA oversight. The goal is to ensure that modernization efforts do not impact the effectiveness of previously completed CERCLA environmental remedial actions and that they do not adversely impact future CERCLA environmental remedial actions. A similar CERCLA screening process is being utilized by ORNL (UT-Battelle, LLC) for its revitalization/modernization efforts at ORNL.

2.2.3 RCRA-CERCLA Coordination

The CERCLA response action and RCRA corrective action processes are similar and include four steps with similar purposes (Table 2.5). The ORR Federal Facility Agreement is intended to coordinate the corrective action processes of RCRA required under the HSWA permit with CERCLA response actions.

As a further example, three RCRA postclosure permits, one for each of the three hydrogeologic regimes at Y-12, have been issued to address the seven major closed waste disposal areas at Y-12. Because it falls under the jurisdiction of two postclosure permits, the S-3 Pond Site is described as having two parts (east and west) (see Table 2.6). Groundwater corrective actions required under the postclosure permits have been deferred to CERCLA. Reporting of groundwater monitoring data will comply with RCRA postclosure permit conditions as well as with CERCLA requirements.

2.2.4 Federal Facility Compliance Act

The Federal Facility Compliance Act was signed by Congress to bring federal facilities (including those under DOE) into full compliance with RCRA. The Federal Facility Compliance Act waives the government's sovereign immunity, allowing fines and penalties to be imposed for RCRA violations at DOE facilities. In addition, the act requires that DOE facilities provide comprehensive data to EPA and state regulatory agencies on mixed- waste inventories, treatment capacities, and development of site treatment plans. It ensures that the public will be informed of waste-treatment options and encourages active public participation in the decisions affecting federal facilities. TDEC is the authorized regulatory agency under the act for the DOE facilities in the state of Tennessee.

The ORR Site Treatment Plan calls for low-level waste on the ORR to be treated by a combination of commercial treatment capabilities and existing and modified on-site treatment facilities. Mixed transuranic (TRU) waste streams on the ORR, composed of both contact- and remote-handled wastes, will be treated in the Transuranic Waste Processing Facility only as necessary to meet the waste acceptance criteria for disposal at the Waste Isolation Pilot Plant (WIPP). Construction of the facility was completed in fall 2003, and operations began in early 2004. It is operated by the Foster Wheeler Corporation.

Table 2.5. RCRA corrective action processes and CERCLA response actions

RCRA	CERCLA	Purpose
RCRA facility assessment	Preliminary assessment/site investigation	Identify releases needing further investigation
RCRA facility investigation	Remedial investigation	Characterize nature, extent, and rate of contaminant releases
Corrective measures study	Feasibility study	Evaluate and select remedy
Corrective measures implementation	Remedial design/remedial action	Design and implement chosen remedy

Table 2.6. RCRA postclosure status for former treatment, storage, and disposal units at Y-12

Unit	Major components of closure	Major postclosure requirements
Upper East Fork Poplar Creek Hydrogeologic Regime (RCRA Postclosure Permit No. TNHW-089)		
New Hope Pond	Engineered cap, Upper East Fork Poplar Creek distribution channel	Cap inspection and maintenance. No current groundwater monitoring requirements in lieu of ongoing CERCLA actions in the eastern portion of Y-12
Eastern S-3 Ponds Groundwater Plume	None for groundwater plume, see former S-3 Ponds (S-3 Site) for source area closure	Postclosure corrective action monitoring. Inspection and maintenance of monitoring network
Chestnut Ridge Hydrogeologic Regime (RCRA Postclosure Permit No. TNHW-088)		
Chestnut Ridge Security Pits	Engineered cap	Cap inspection and maintenance. Postclosure corrective action monitoring. Inspection and maintenance of monitoring network and survey benchmarks
Kerr Hollow Quarry	Waste removal, access controls	Access controls inspection and maintenance. Postclosure detection monitoring. Inspection and maintenance of monitoring network and survey benchmarks
Chestnut Ridge Sediment Disposal Basin	Engineered cap	Cap inspection and maintenance. Postclosure detection monitoring. Inspection and maintenance of monitoring network and survey benchmarks
Bear Creek Hydrogeologic Regime (RCRA Postclosure Permit No. TNHW-087)		
Former S-3 Ponds (S-3 Site)	Neutralization and stabilization of wastes, engineered cap, asphalt cover	Cap inspection and maintenance. Postclosure corrective action monitoring. Inspection and maintenance of monitoring network and survey benchmarks
Oil Landfarm	Engineered cap	Cap inspection and maintenance. Postclosure corrective action monitoring. Inspection and maintenance of monitoring network and survey benchmarks
Bear Creek Burial Grounds A, B, and Walk-In Pits	Engineered cap, leachate collection system specific to the burial grounds	Cap inspection and maintenance. Post-closure corrective action monitoring. Inspection and maintenance of monitoring network and survey benchmarks

The ORR Site Treatment Plan provides overall schedules, milestones, and target dates for achieving compliance with land disposal restrictions; a general framework for the establishment and review of milestones; and other provisions for implementing the plan that are enforceable under the commissioner's order.

Semiannual progress reports document the quantity of land-disposal-restriction mixed waste in storage at the end of the previous six-month period and the estimated quantity to be placed in storage for the next five fiscal years. Correspondence dated October 15, 2004, from TDEC to the DOE Office of Environmental Management

(DOE-EM) denied a request from DOE-EM for an extension of the Site Treatment Plan milestones. The annual update of the plan has been issued for CY 2004.

The Site Treatment Plan will terminate in accordance with Sect. 2.7.2 of the Federal Facility Compliance Act, when there is no longer any land-disposal-restriction mixed waste, regardless of when generated, being stored on the ORR, which in the absence of a site treatment plan, would be in violation of RCRA Section 3004(j).

2.2.5 National Environmental Policy Act

The National Environmental Policy Act (NEPA) provides a means to evaluate the potential environmental impact of proposed federal activities and to examine alternatives to those actions. The NEPA review process results in the preparation of NEPA documents in which federal, state, and local environmental regulations and DOE orders applicable to the environmental resource areas must be considered. These environmental resource areas include air, surface water, groundwater, terrestrial and aquatic ecology, threatened and/or endangered species, land use, and environmentally sensitive areas. Environmentally sensitive areas include floodplains, wetlands, prime farm land, habitats for threatened and/or endangered species, historic properties, and archaeological sites. Each ORR site NEPA program maintains compliance with NEPA through the use of its site-level procedures and program descriptions. These procedures and program descriptions assist in establishing effective and responsive communications with program managers and project engineers to establish NEPA as a key consideration in the formative stages of project planning. Table 2.7 notes the types of NEPA activities conducted at the ORR during 2004.

During 2004, ORNL operated under a procedure that provided requirements for project reviews and compliance with NEPA. It called for review of each proposed project, activity, or facility for its potential to result in significant impacts to the environment. To streamline the NEPA review and documentation process, DOE-ORO approved "generic" categorical exclusions that would cover proposed bench- and pilot-scale research activities and generic categorical exclusions that would cover proposed nonresearch activities (i.e., maintenance activities, facilities upgrades, personnel safety enhancements). A categorical exclusion is one of a category of actions defined in 40 CFR 1508.4 that does not individually or cumulatively have a significant effect on the human environment and for which neither an environmental assessment nor an environmental impact statement is normally required. Table 2.7 provides the number of project-specific categorical exclusions that were submitted to DOE-ORO for review and approval during 2004.

The Standards-Based Management System (SBMS) is the delivery system used to manage and control work at ORNL. This system uses three work-control categories: (1) R&D programs and projects; (2) operations, maintenance and services; and (3) office environment (e.g., management, office support, and clerical activities). NEPA is an integral part of SBMS and often utilizes the division's principal investigators, environmental compliance representatives, and environmental protection officers to determine the appropriate NEPA decision. The NEPA decision is based on the approved generic categorical exclusions for a particular division, NEPA training of the person and, when necessary, guidance from the ORNL NEPA compliance coordinator. Projects involving the assignment of a project engineer from ORNL Facilities Development Division, projects that are outside the scope of generic categorical exclusions, and projects that will adversely impact cultural resources are reviewed and documented by the ORNL NEPA compliance coordinator.

DOE implemented the Facilities Revitalization Project at ORNL, and groundbreaking activities for the various infrastructures (e.g., parking lots, utilities) started in March 2002. The Facilities Revitalization Project is being accomplished through a cooperative effort between DOE, the state of Tennessee, and private entities. The environmental assessment and finding of no significant impact (DOE 2001b) that were prepared by DOE addressed the Facilities Revitalization Project phased program approach to cover construction and upgrading of facilities according to ORNL's Strategic Facilities Plan into FY 2011.

Table 2.7. NEPA activities during 2004

Types of NEPA documentation	Y-12 Complex	ORNL	ETTP
Categorical exclusion (CX) recommendation	18	5	0
Specific CX granted	18,3[a]	5	
Approved under general CX documents	43,1[a]	55[b]	17
Environmental assessment	1[a]		

[a]National Nuclear Security Administration Small Business projects.

[b]Projects that were reviewed and documented through the ORNL NEPA compliance coordinator.

In 2004, NEPA reviews at ETTP supported two proposed title transfer actions and a number of tenant modifications and improvements to several leased and nonleased facilities. Other NEPA reviews covered more routine maintenance actions, such as provisions for alternate heat sources in several facilities, modifications at the TSCA incinerator, and installation of trailers and temporary support structures. There were no site-specific categorical exclusions prepared in 2004 for ETTP.

At the Y-12 Complex, 14 job-specific categorical exclusion documents were prepared and were approved in CY 2004 in support of the Infrastructure Reduction Program. The Infrastructure Reduction effort is focused on preparing the Y-12 Complex for modernization. During FY 2004 it reduced the Y-12 Complex "footprint" by over 111,983 ft^2 through building demolition (30 buildings or structures were demolished). In addition, three job-specific categorical exclusions prepared for NNSA small business program were approved. Other general NEPA categorical exclusion reviews covered routine actions, such as office renovations, improvements to security systems, equipment replacements, and infrastructure improvements. A total of 61 NEPA reviews were performed and approved in CY 2004.

The Y-12 NNSA Site Office has prepared a final environmental assessment for the alternate financed facility modernization project (January 2005) to evaluate the need for replacement of existing facilities through collaboration with private entities to construct technical, administrative, and light laboratory facilities.

The Defense National Stockpile Center has prepared a final mercury management environmental impact statement (March 2004) to help determine how to manage its elemental mercury inventory over the long term because mercury is no longer needed for our national defense. The center has selected consolidated storage as its preferred alternative based on a combination of environmental, economic, and technical factors; policy considerations; and public and stakeholder comments. "Preferred alternative" means that, at this time, storing the mercury at one site is the best way to meet the center's objectives. The record of decision was issued April 2004.

2.2.6 National Historic Preservation Act

In March 2003, President Bush signed Executive Order 13287, "Preserve America," directing federal agencies to improve their management of historic properties and to foster heritage tourism in partnership with local communities. Section 106 of the National Historic Preservation Act (NHPA) requires that federal agencies take into account the effects of their undertakings on properties included in or eligible for inclusion in the *National Register of Historic Places* (National Park Service 2003). To comply with Section 106 of the NHPA and its implementing regulations at 36 CFR 800, DOE-ORO was instrumental in the ratification of a programmatic agreement among DOE-ORO, the Tennessee state historic preservation officer, and the Advisory Council on Historic Preservation concerning management of historical and cultural properties on the ORR. The programmatic agreement was ratified on May 6, 1994, and has been incorporated into the approved *Cultural Resource Management Plan, DOE Oak Ridge Reservation* (DOE 2001a). The plan was completed in accordance with stipulations in the programmatic agreement, including historical surveys to identify significant historical properties on the ORR. Because of plans to demolish a significant number of buildings at ORNL and at

the Y-12 Complex site, a second programmatic agreement was drafted. It has been approved by DOE-ORO, the state historic preservation officer, and the Council on February 23, 2005. In concurrent with the programmatic agreement, a historic preservation plan was drafted and was issued (UT-Battelle 2004) for the management and disposition of properties managed by DOE-ORO that included the Office of Science, Nuclear Energy, and EM. Requirements of the programmatic agreement (also stated in the historic preservation plan) includes

1. developing and implementing an interpretive plan for ORNL by 2007,
2. developing an oral history program of current and former ORNL employees by 2005, and
3. conducting a survey to identify significant historical machinery and equipment by 2007.

Significant progress was made in 2004 in developing the oral history program at ORNL. Compliance with NHPA at ORNL, the Y-12 Complex, and ETTP is achieved and maintained in conjunction with NEPA compliance. The scope of proposed actions is reviewed in accordance with the *Cultural Resource Management Plan*. If warranted, consultation is initiated with the state historic preservation officer and the advisory council, and the appropriate level of documentation is prepared and submitted.

The Y-12 Complex developed an Interpretative Plan on Historic Preservation for the Y-12 Complex, which was reviewed by NNSA, DOE ORO, the state historic preservation office, and the advisory council on historic preservation. It was approved by the state historic preservation officer January 28, 2005. The Interpretative Plan examined Y-12's purpose and significant resources in order to establish interpretative themes, goals and objectives for conveying the site's history. The plan identified interpretive themes, analyzed the interpretive needs of the Y-12 Complex, and outlined recommended actions. The actions recommended in the plan are those that can reasonably be expected to be accomplished in 7 to 10 years, the projected life span of the plan. The plan was driven by the site's historic significance and historic resources, as well as the site's operational objectives and security requirements.

The Y-12 Complex, in accordance with the programmatic agreement, submitted to the state historic preservation officer Section 106 recordation, interpretation, and documentation information for the demolition of Buildings 9510-2, 9616-3, 9704-2, 9720-7, 9720-8, and 9767-2. The state historic preservation officer reviewed the information and agreed that the Section 106 documentation adequately mitigated project effects upon properties eligible for listing in the *National Register of Historic Places*.

A phase I archaeological survey of 100 acres was conducted at the Y-12 Complex. The impact area of the project was limited to the area bounded by Scarboro Road, Bear Creek, and the secured area of the Y-12 Complex, west of the project area. It was determined that the project area contained no historic properties or archeological resources eligible for listing in the *National Register of Historic Places*. The archeological survey report was reviewed and approved by the state historic preservation officer, January 28, 2005.

ETTP was surveyed in 1994 to identify properties eligible for inclusion in the *National Register*. An archaeological survey was also completed at ETTP. Eligible properties include the ETTP Main Plant Historic District, which includes facilities within the main plant and contains 120 contributing structures, 37 noncontributing structures, and 11 structures that are not contiguous with the historic district. More detailed information on the properties eligible for inclusion in the *National Register* is provided in the *Cultural Resource Management Plan* (DOE 2001a).

In August 2002, DOE submitted a notification of adverse effect of a proposed undertaking for decontamination and decommissioning of properties located at the ETTP. The proposed project is to decontaminate and demolish or transfer all remaining properties located within the K-25 site main plant and powerhouse historic districts located on the ORR in Roane County, Tennessee, as outlined in the Oak Ridge Comprehensive Closure Plan. The Tennessee state historic preservation officer, the advisory council, and other interested parties were invited to participate in the planning stages of the proposed undertaking and to enter into the consultation process. Consultation began in 2003 to develop a path forward, and a memorandum of

agreement will be negotiated among the consulting parties. During 2004, consultation continued with the advisory council, the state historic preservation officer, and other consulting parties on the decontamination and decommissioning of the K-25 and K-27 Buildings to determine actions to avoid, minimize, or mitigate the adverse effects to these two historical properties. A memorandum of agreement was prepared and signed by all consulting parties. Other ETTP projects were reviewed in accordance with the programmatic agreement or the *Cultural Resource Management Plan*, and no additional adverse effects to historical properties were identified that required notification to the state historic preservation officer. An architectural and engineering firm was retained to develop design proposals for capturing and presenting the historical significance of the K-25 and K-27 facilities in 2003. The report was completed and presented to the consulting parties in 2004. Meetings were held in 2004 with the consulting parties to finalize a memorandum of agreement for the historical interpretation of the K-25 Site. The agreement was signed in 2005.

A survey of all ORISE structures was conducted to comply with the NHPA. Only one structure currently under ORISE stewardship, the Atmospheric Turbulence and Diffusion Division Laboratory main building, was identified as being included in the *National Register*. All actions performed at that site conform to the programmatic agreement with the state historic preservation officer.

2.2.7 Protection of Wetlands

Executive Order 11990 (issued in 1977) was established to mitigate adverse effects to wetlands caused by their destruction or modification and to avoid construction in wetlands wherever possible. Avoidance of these effects is ensured through implementation of the sensitive-resource analysis conducted as part of the DOE NEPA review process. Protective buffer zones and application of best management practices are required for activities on the ORR. Coordination with TDEC, the U.S. Army Corps of Engineers, and sometimes TVA is necessary for activities involving waters of the United States and waters of the state, which include wetlands and floodplains. Generally, this coordination results in permits from the Corps of Engineers, TVA, and/or the state of Tennessee (see Sect. 2.2.12.4 for permitting details). In addition, TDEC has developed a regulatory position on impacted wetlands that includes mitigation: affected wetlands must be replaced in area and function by restoration of disturbed wetlands, construction of wetlands, or enhancement of previously impacted areas.

The ORR implements protection of wetlands through each site's NEPA program in accordance with 10 CFR 1022, "Compliance with Floodplain/Wetlands Environmental Review Requirements." Each of the sites has also conducted surveys for the presence of wetlands and conducts surveys on a project- or program-as-needed basis. In the early to middle 1990s, an effort was initiated to conduct a wetlands survey of the entire reservation (LMES 1995). That effort was not completed, but it was reported in 1995 that wetland surveys and delineations were conducted on about 14,000 acres of the 34,424 acres that made up the reservation (LMER 1996). About 600 acres of wetlands were identified in the areas in which surveys were conducted. Since then, wetland surveys have been conducted on an as-needed basis.

Two surveys of wetlands resources were conducted on the Y-12 Complex. *Identification and Characterization of Wetlands in the Bear Creek Watershed* (MMES 1993) was completed in October 1993, and a wetland survey of selected areas in the Y-12 Complex area of responsibility was completed in October 1994. The first report surveys the Y-12 Complex and surrounding areas; the second report, *Wetland Survey of Selected Areas in the Oak Ridge Y-12 Plant Area of Responsibility, Oak Ridge, Tennessee* (LMES 1997a), surveys additional areas for which restoration activities are planned.

A wetlands survey of ORNL areas, *Wetland Survey of the X-10 Bethel Valley and Melton Valley Groundwater Operable Units at Oak Ridge National Laboratory* (Rosensteel 1996), serves as a reference document to support wetlands assessments for upcoming ORNL projects and activities.

2.2.8 Floodplains Management

Executive Order 11988 (issued in 1977) was established to require federal agencies to avoid to the extent possible adverse impacts associated with the occupancy and modification of flood-

plains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Agencies must determine whether a floodplain is present that may be affected by an action, assess the impacts on such, and consider alternatives to the action. The executive order requires that provisions for early public review and measures for minimizing harm be included in any plans for actions that might occur in the floodplain. Floodplain assessments and the associated notices of involvement and statements of findings are prepared in accordance with 10 CFR 1022, usually as part of the NEPA review and documentation process.

2.2.9 Endangered Species Act

Good stewardship, state laws ("The Rare Plant Protection and Conservation Act of 1985," Tennessee Code Annotated Section 70-8-301 to 314, and "Tennessee Nongame and Endangered or Threatened Wildlife Species Conservation Act of 1974," Tennessee Code Annotated Section 70-8-101 to 110), and federal laws ("Endangered Species Act of 1973," 16 U.S.C. 1531 et seq.) dictate that animal and plant species of concern be considered when a proposed project has the potential to alter their habitat or otherwise harm them. At the federal level, such species are classified as endangered, threatened, or species of concern. At the state level, these species are considered endangered, threatened, of special concern (plants), or in need of management (animals). All such species are termed "special concern" species in this report.

2.2.9.1 Special Concern Animals

Listed animal species known to be present on the reservation (excluding the Clinch River bordering the reservation) are given along with their status in Table 2.8. The list illustrates the diversity of birds on the ORR, which is also habitat for many unlisted species, some of which are in decline nationally or regionally. Other listed species may also be present, although they have not been observed recently. These include several species of mollusks (such as the spiny river snail), amphibians (such as the hellbender), birds (such as Bachman's sparrow), and mammals (such as the smoky shrew). Birds, fish, and aquatic invertebrates are the most thoroughly surveyed animal groups on the ORR. The only federally listed animal species that has been recently observed is the gray bat (federal endangered list), which has been recorded foraging over a pond on the ORR and over waters bordering the ORR (e.g., the Clinch River). The federally threatened bald eagle is increasingly seen in winter and may well begin nesting here within a few years. Similarly, several state-listed bird species, such as the anhinga, olive-sided flycatcher, and little blue heron, are currently uncommon migrants or visitors to the reservation; however, the little blue heron is probably increasing in numbers. Others, such as the cerulean warbler, northern harrier, great egret, and yellow-bellied sapsucker, are migrants or winter residents that do not nest on the reservation. The cerulean warbler is now regarded as a probable nesting bird. The golden-winged warbler (*Vermivora chrysoptera*), listed by the state as in need of management, has been sighted once on the reservation. One federal and state threatened species, the spotfin chub (*Cyprinella monnacha*), has been sighted and collected in the city of Oak Ridge and is possibly present on the ORR.

2.2.9.2 Threatened and Endangered Plants

There are currently 22 listed plant species that have been observed in the last ten years on the ORR; among them are the pink lady's-slipper and Canada lily (Table 2.9). Two species occurring on the ORR, Carey's saxifrage and the purple fringeless orchid, have been removed from the state list as of November 17, 1999. Four species (spreading false-foxglove, Appalachian bugbane, tall larkspur, and butternut) have been under review for listing at the federal level and were listed under the formerly used "C2" candidate designation. These species are now informally referred to as "special concern" species by the U.S. Fish and Wildlife Service.

Two additional species listed by the state, the Michigan lily and the hairy sharp-scaled sedge, were identified in the past on the ORR; however, they have not been found in recent years. Another listed species, large-tooth aspen, was reported in two locations on the ORR in 2002. One of the reports was confirmed, but the observed tree died during the year. In 2004 additional aspen trees were found in the vicinity of

Table 2.8. Animal species of concern reported from the Oak Ridge Reservation[a]

The following list identifies sensitive wildlife species recently found on the Oak Ridge Reservation. Some of these (e.g., anhinga) have been seen only once or a few times; others (e.g., sharp-shinned hawk, southeastern shrew) are comparatively common and widespread on the reservation.

Scientific name	Common name	Status [b]		
		Federal	State	PIF[c]
	Fish			
Phoxinus tennesseensis	Tennessee dace		NM	
	Amphibians and reptiles			
Hemidactylium scutatum	Four-toed salamander		NM	
	Birds			
Accipiter striatus	Sharp-shinned hawk		NM	
Anhinga anhinga	Anhinga		NM	
Caprimulgus carolinensis	Chuck-will's-widow			C
Ardea alba	Great egret		NM	
Circus cyaneus	Northern harrier		NM	
Contopus cooperi	Olive-sided flycatcher		NM	
Dendroica caerulescens	Black-throated blue warbler			C
Dendroica cerulean	Cerulean warbler		NM	C
Dendroica discolor	Prairie warbler			C
Egretta caerulea	Little blue heron		NM	
Egretta thula	Snowy egret		NM	
Falco peregrinus	Peregrine falcon	*d*	E	
Haliaeetus leucocephalus	Bald eagle	T[e]	NM	
Helmitheros vermivorus	Worm-eating warbler			C
Hylocichla mustelina	Wood thrush			C
Lanius ludovicianus	Loggerhead shrike		NM	
Oporornis formosus	Kentucky warbler			C
Pooecetes gramineus	Vesper sparrow		NM	
Protonotaria citrea	Prothonotary warbler			C
Seiurus motacilla	Louisiana waterthrush			C
Sitta pusilla	Brown-headed nuthatch			C
Sphyrapicus varius	Yellow-bellied sapsucker		NM	
Spizella pusilla	Field sparrow			C
Vermivora chrysoptera	Golden-winged warbler		NM	C
Vermivora pinus	Blue-winged warbler			C
	Mammals			
Myotis grisescens	Gray bat	E	E	
Sorex longirostris	Southeastern shrew		NM	

[a]Land and surface waters of the ORR exclusive of the Clinch River, which borders the ORR.
[b]E = endangered, T = threatened, NM = in need of management, C = birds of concern.
[c]Partners in Flight.
[d]The peregrine falcon was federally delisted on August 25, 1999.
[e]The bald eagle was proposed for federal delisting on July 6, 1999.

Table 2.9. Vascular plant species listed by state or federal agencies, 2004

Species	Common name	Habitat on ORR	Status code[a]
Currently known or previously reported from the ORR			
Aureolaria patula	Spreading false-foxglove	River bluff	C2, T
Carex gravida	Heavy sedge	Varied	S
Carex oxylepis var. pubescens[b]	Hairy sharp-scaled sedge	Shaded wetlands	S
Cimicifuga rubifolia	Appalachian bugbane	River slope	C2, T
Cypripedium acaule	Pink lady's-slipper	Dry to rich woods	E, CE
Delphinium exaltatum	Tall larkspur	Barrens and woods	C2, E
Diervilla lonicera	Northern bush-honeysuckle	River bluff	T
Draba ramosissima	Branching whitlow-grass	Limestone cliff	S
Elodea nuttallii	Nuttall waterweed	Pond, embayment	S
Fothergilla major	Mountain witch-alder	Woods	T
Hydrastis canadensis	Golden seal	Rich woods	S, CE
Juglans cinerea	Butternut	Slope near stream	C2, T
Juncus brachycephalus	Small-head rush	Open wetland	S
Lilium canadense	Canada lily	Moist woods	T
Lilium michiganense[c]	Michigan lily	Moist woods	T
Liparis loeselii	Fen orchid	Forested wetland	E
Panax quinquifolius	Ginseng	Rich woods	S, CE
Platanthera flava var. herbiola	Tuberculed rein-orchid	Forested wetland	T
Populus grandidentata[d]	Large-tooth aspen	Dry, woodlands	S
Ruellia purshiana	Pursh's wild-petunia	Dry, open woods	S
Scirpus fluviatilis	River bulrush	Wetland	S
Spiranthes lucida	Shining ladies-tresses	Boggy wetland	T
Thuja occidentalis	Northern white cedar	Rocky river bluffs	S
Viola tripartita var. tripartita	Three-parted violet	Rocky woods	S
Rare plants that occur near and could be present on the ORR			
Agalinis auriculata	Earleaf false foxglove	Calcareous barren	C2, E
Allium burdickii or A. tricoccom[e]	Ramps	Moist woods	S, CE
Berberis canadensis	American barberry	Rocky bluff, creek bank	S
Gnaphalium helleri	Catfoot	Dry woodland edge	S
Lathyrus palustris	A vetch	Moist meadows	S
Liatris cylindracea	Slender blazing star	Calcareous barren	E
Lonicera dioica	Mountain honeysuckle	Rocky river bluff	S
Meehania cordata	Heartleaf meehania	Moist calcareous woods	T
Pedicularis lanceolata	Swamp lousewort	Calcareous wet meadow	T
Pycnanthemum torrei	Torrey's mountain-mint	Calcareous barren edge	S
Solidago ptarmicoides	Prairie goldenrod	Calcareous barren	E

[a]Status codes:

C2 Special concern, under review for federal listing; listed under the formerly used C2 candidate designation. More information needed to determine status.

E Endangered in Tennessee.

T Threatened in Tennessee.

S Special concern in Tennessee.

CE Status due to commercial exploitation.

[b]*Carex oxylepis var. pubescens* has not been observed during recent surveys.

[c]*Lilium michiganense* is believed to have been extirpated from the ORR by the impoundment at Melton Hill.

[d]*Populus grandidentata* was reported in two ORR locations in 2003. One of the reports was confirmed, but the tree died during the year. In 2004 additional trees were found in the vicinity of the dead tree.

[e]Ramps have been reported near the ORR, but there is not sufficient information to determine which of the two species is present or if the occurrence may have been introduced by planting. Both species of ramps have the same state status.

the dead tree. Several state-listed plant species currently found on adjacent lands may be present on the ORR as well, although they have not been located (Table 2.9).

2.2.10 Environmental Justice

On February 11, 1994, Executive Order 12898, "Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations," was promulgated. The executive order requires that federal actions not have the effect of excluding, denying, or discriminating on the basis of race, color, national origin, or income level and that federal agencies must ensure that there are no disproportionate impacts from their actions on low-income and minority communities surrounding their facilities.

An Environmental Justice strategy is in place at DOE-ORO under the direction of the Diversity Programs Office. It addresses the need to communicate DOE activities effectively to minority communities. In addition, the interim scoping team involved in the review and editing of NEPA documents ensures that the language is presented in a manner that does not require stakeholders to possess a technical background for them to effectively participate in the decision-making process.

Planned DOE actions to be addressed under NEPA include an analysis of the health, environmental, economic, and demographic impacts of the planned action on surrounding minority and low-income communities that could be affected by the action.

2.2.11 Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) of 1974 is an environmental statute for the protection of drinking water. This act requires the EPA to establish primary drinking water regulations for contaminants that may cause adverse public health effects. Although many of the requirements of the SDWA apply to public water supply systems, Section 1447 states that each federal agency having jurisdiction over a federally owned or maintained public water system must comply with all federal, state, and local requirements regarding the provision of safe drinking water.

The city of Oak Ridge supplies potable water to the Y-12 Complex and ORNL. The water treatment plant, located north of the Y-12 Complex, is owned by the city of Oak Ridge. The K-1515 sanitary water plant provides drinking water for ETTP and for an industrial park located on Bear Creek Road south of the site. The DOE-owned facility is classified as a nontransient, noncommunity water supply system by TDEC and is subject to state regulations. On April 1, 1998, operation of this leased facility became the responsibility of Operations Management International, Inc., under contract with the Community Reuse Organization of East Tennessee (CROET).

The Y-12 Complex, ORNL, and ETTP perform certain monitoring activities, including analyses for free residual chlorine, bacteriological agents, disinfectant by-products, and copper and lead. The Y-12 Complex and ORNL potable water systems are classified as a nontransient, noncommunity water supply system by TDEC.

The Y-12 Complex and ORNL distribution systems have qualified for triennial lead and copper sampling. The Y-12 Complex distribution system was last sampled in 2002 and is scheduled to be sampled again in 2005; the ORNL system was sampled in 2003. The Y-12 Complex and ORNL were compliant with the lead and copper requirements. In addition, the Y-12 Complex and ORNL drinking water distribution system's bacteriological sample analyses were satisfactory in 2004, as were the ORNL water system's analytical results for disinfection by-products (total trihalomethanes and haloacetic acids).

The Y-12 Complex, ORNL, and ETTP have cross-connection prevention programs to prevent the contamination of potable water through the use of backflow preventers, engineering design, and physical separation. Backflow preventers that fail performance checks are repaired, or the water supply to the equipment is taken out of service.

2.2.12 Clean Water Act

The objective of the CWA is to restore, maintain, and protect the chemical, physical, and biological integrity of the nation's waters. With continued amendments, the CWA serves as the basis for comprehensive federal and state programs to protect the nation's waters from pollut-

ants. Congress continues to work on amendments to and reauthorization of the CWA. (See Appendix C for reference standards for water.)

2.2.12.1 National Pollutant Discharge Elimination System

One of the strategies developed to achieve the goals of the CWA was EPA's establishment of limits on specific pollutants that are allowed to be discharged to waters of the United States by municipal sewage treatment plants and industrial facilities. In 1972, the EPA established the National Pollutant Discharge Elimination System (NPDES) permitting program to regulate compliance with these pollutant limitations. The program was designed to protect surface waters by limiting effluent discharges into streams, reservoirs, wetlands, and other surface waters. Authority for implementation and enforcement of the NPDES program has been delegated by EPA to the state of Tennessee.

Y-12 Complex

The current Y-12 Complex NPDES permit, Permit TN0002968, became effective on July 1, 1995, and expired on April 28, 2000. In October 1999, a complete application for renewal of the Y-12 NPDES permit was submitted to the TDEC. The Y-12 Complex continues to operate under the existing 1995 permit until TDEC completes the renewal process. In late 2004, personnel from the TDEC Division of Water Pollution Control initiated efforts related to renewal of the permit. Presently 90 active point-source discharges or storm water monitoring locations are monitored for compliance with the permit. Monitoring resulted in approximately 9500 laboratory analyses in 2004 in addition to numerous field observations. In 2004 the Y-12 Complex achieved an NPDES permit compliance rate of 100%. There were no NPDES noncompliances (Fig. 2.1).

In September 1999, a consent order agreed to by DOE and the Tennessee Water Quality Board resolved the outstanding permit appeals regarding biotoxicity and mercury limitations in East Fork Poplar Creek. The requirements for in-stream mercury monitoring and limits were deleted from the NPDES permit and were placed under the CERCLA program. The current permit requires storm water characterizations at selected

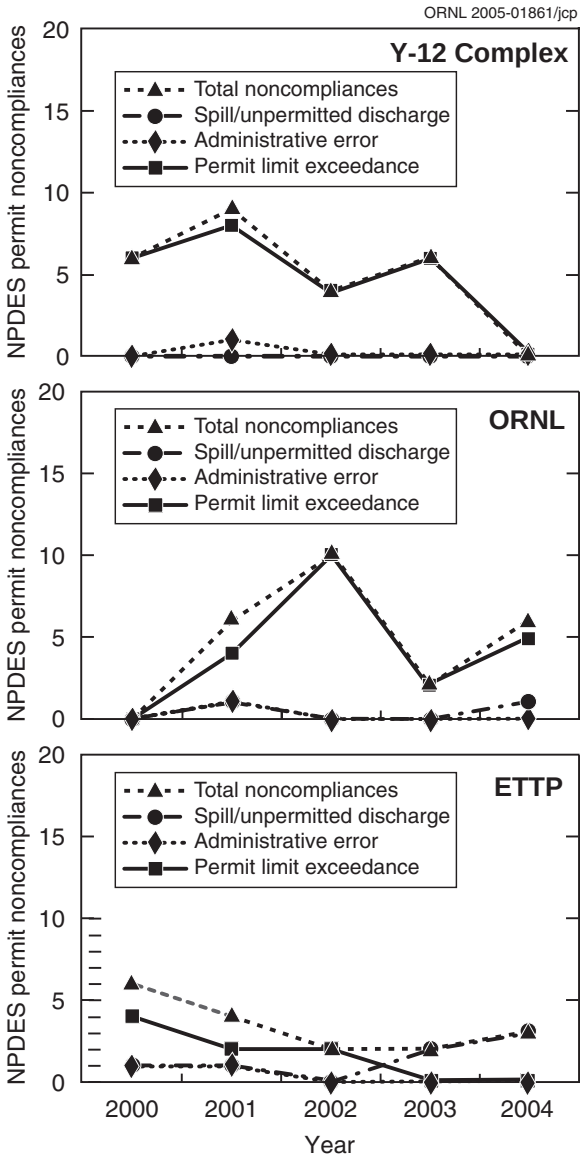

Fig. 2.1. Five-year summary of NPDES noncompliances.

monitoring locations in accordance with the *Storm Water Pollution Prevention Plan for the Oak Ridge Y-12 Plant* (BWXT 2002). Other documents submitted to TDEC in accordance with the NPDES permit include the *Radiological Monitoring Plan* (revised in 1997) (LMES 1997b) and the *Oak Ridge Y-12 Plant Biological Monitoring and Abatement Program Plan* (revised in 2000) (Adams et al. 2000). A report on the analysis of fecal coliform bacteria levels at selected storm water monitoring points has been previously submitted.

ORNL

ORNL is currently operating under NPDES Permit TN0002941, which was renewed by TDEC on December 6, 1996, and went into effect February 3, 1997. A four-volume permit renewal application was submitted to TDEC and EPA in June 2001. The ORNL NPDES permit lists 164 point-source discharges and monitoring points that require compliance monitoring. Approximately 100 of these are storm drains, roof drains, and parking lot drains. Compliance was determined by approximately 6500 laboratory analyses and measurements in 2004, in addition to numerous field observations by ORNL field technicians. The NPDES permit limit compliance rate for all discharge points for 2004 was nearly 100%, with only five out of about 6500 individual measurements exceeding their respective permit limit and one instance where a narrative permit standard was exceeded (Fig. 2.1). Information on the exceedances is provided in Appendix D, Sect. D.3.

The current permit requires ORNL to conduct detailed characterization of numerous storm water outfalls, develop and implement a radiological monitoring plan, develop and implement a storm water pollution prevention plan, implement a revised Biological Monitoring and Abatement Program (BMAP) plan, and develop and implement a chlorine-control strategy. In 1997 DOE appealed certain limits and conditions of the 1996 ORNL permit, including numeric limits on effluent mercury, arsenic, and selenium.

ETTP

The ETTP NPDES Permit TN0002950 went into effect on October 1, 1992. Effluent limitations in the permit were based on water quality, which reflected the trend toward considering the effects of industrial discharges on the quality of the receiving streams. In accordance with the federal regulations requiring the inclusion of storm water discharges in the NPDES permitting program, all storm water outfalls were included in this permit, and development of a storm water pollution prevention plan was required. A major modification was issued effective June 1, 1995. The modification included removal of inactive outfalls, addition of effluent limits for new treatment technologies at the Central Neutralization Facility, addition of new storm drains, and clarification of various requirements. In accordance with this NPDES permit, the ETTP is authorized to discharge process wastewater, cooling water, storm water, steam condensate, and groundwater to the Clinch River, Poplar Creek, and Mitchell Branch.

The ETTP NPDES Permit expired on September 29, 1997. An application for renewal of the permit was submitted to TDEC in March 1997. To facilitate the transfer of ownership and operation of ETTP facilities to other parties, it was determined that separate NPDES permits would be required for each of the ETTP treatment facilities. In addition, it was determined that a separate NPDES permit for the storm water drainage system would be necessary. A general NPDES permit for former outfalls 009 (K-1515 Sanitary Water Plant) and 013 (K-1513 Sanitary Water Intake Backwash Filter) was issued on January 14, 2000, and became effective on March 1, 2000. Issuance of the permit (Permit Number TN0074233) allowed outfalls 009 and 013 to be removed from ETTP NPDES Permit Number TN0002950. A permit for the K-1203 sewage treatment plant (permit number TN0074241) was issued by TDEC and became effective on August 1, 2003. This allowed outfall 005 to be removed from ETTP NPDES Permit Number TN0002950. A permit for the K-1407-J Central Neutralization Facility (permit number TN0074225) was issued on October 7, 2003, and became effective on November 1, 2003. The permit allowed outfall 014 to be removed from ETTP NPDES Permit Number TN0002950. ETTP storm water outfalls continue to discharge under NPDES Permit Number TN0002950; the permit was re-issued on March 1, 2004, with an effective date of April 1, 2004.

The reissued NPDES Permit Number TN0002950 includes 121 storm water outfalls. In CY 2004, 47 spills were reported at ETTP, but only 3 of them resulted in NPDES noncompliances. With approximately 580 laboratory analyses in 2004, this represents a compliance rate of almost 100% (Fig. 2.1). Details of the three noncompliances are given in Sect. 4.4.1 and in Appendix D, Sect. D.2.

2.2.12.2 Sanitary Wastewater

Y-12 Complex

The CWA includes pretreatment regulations for publicly owned treatment works. Sanitary wastewater from the Y-12 Complex is discharged to the city of Oak Ridge treatment works under an industrial and commercial wastewater discharge permit. City personnel performed semiannual inspections on March 10 and September 8, 2004. No deficiencies of the Y-12 Sanitary Sewer Compliance Program were noted during the inspections.

The current industrial user discharge permit was issued for the Y-12 Complex on January 1, 2000, by the city of Oak Ridge. The permit establishes discharge limits for total suspended solids, biochemical oxygen demand, total nitrogen, and various metals, and requires monitoring and reporting of uranium, gross alpha and beta, and several organic compounds. Compliance with the permit is determined from samples taken at the East End Sanitary Sewer Monitoring Station, located on the east end of the complex where the Y-12 system ties into the city's sanitary sewer collection system.

During 2004, the Y-12 Complex experienced no exceedances of the industrial user discharge permit. Compliance to a state-issued operating permit for a holding tank/pump-and-haul at office trailer 9983-AZ was also maintained.

Sanitary sewer radiological sample results at the Y-12 Complex are routinely reviewed to determine compliance with DOE Order 5400.5, "Radiation Protection of the Public and Environment." Sample results are compared to the derived concentration guides (DCGs) listed in the order. No radiological parameter that is monitored (including uranium) has exceeded a DCG.

ORNL

At ORNL, sanitary wastewater is collected, treated, and discharged separately from other liquid wastewater streams through an on-site sewage treatment plant. Wastewater discharged into the system is regulated by means of internally administered waste-acceptance criteria based on the plant's NPDES operating permit parameters. Wastewater streams currently processed through the plant include sanitary sewage from facilities in Bethel and Melton Valleys, area runoff of rainwater that infiltrates the system, and specifically approved small volumes of nonhazardous biodegradable wastes such as scintillation fluids. The effluent stream from the sewage treatment plant is ultimately discharged into White Oak Creek through an NPDES-permitted outfall (X-01). Infiltration into the system and the discharge from the on-site laundry have, at times, caused the sludge generated during the treatment process to become slightly radioactive. ORNL has completed a line-item project for comprehensive upgrades of its sanitary sewage system to reduce infiltration of contaminated groundwater and surface water and to redirect discharges from the laundry to appropriate alternative treatment facilities. The radioactivity level of ORNL sewage treatment plant sludge continues to decline. In 1998, ORNL's sewage sludge was accepted into the city of Oak Ridge's Biosolids Land Application Program. ORNL has transported no sewage sludge to the Oak Ridge sewage treatment plant in 2004 because the plant was undergoing an expansion project. During 2004, ORNL's sewage sludge was dried and handled as solid low-level waste. Shipments of sludge to the city of Oak Ridge may resume in 2005.

ETTP

ETTP domestic wastewater is treated at the on-site K-1203 sewage treatment plant and is discharged pursuant to the NPDES Permit TN0074241; this permit became effective on August 1, 2003. Beginning on April 1, 1998, operation of this leased facility became the responsibility of publicly owned treatment works under a contract with CROET. Bechtel Jacobs Company LLC (BJC) operates a holding tank/pump-and-haul system to dispose of sanitary wastewater from the K-1310-DF facility at ETTP. The permit to operate this system (State Operation Permit No. SOP-99033) was issued April 28, 2000, and expires April 28, 2005. An application to renew the permit was submitted October 20, 2004. Operations reports are submitted each month to the TDEC Environmental Assistance Center; there were no noncompliances or operational problems in 2004. Weskem LLC, a BJC subcontractor, also operates a pump-and-haul system (State Operation Permit

No. SOP-01042) for sanitary waste at ETTP; the permit was issued December 1, 2001, and expires November 30, 2006.

2.2.12.3 Storm Water Protection Permits

Storm water discharges associated with construction activities that disturb one acre or more of land must be NPDES-permitted. Coverage under a general permit is typically approved for a construction project if the proper notice of intent is filed. In June 2003, TDEC issued a General Permit for Storm Water Associated with Construction Activity for the Y-12 Purification Facility, and work related to that permit was completed in 2004. In February 2004 a general permit for storm water associated with construction activity was approved for the Building 9720-82 and Y-12 Hollow-Fill Project. In 2003, ETTP submitted one storm water notice of termination for a power line right-of-way clearing activity after final stabilization had been achieved, all storm water discharges associated with the construction activity had ceased or been eliminated, and temporary erosion and sedimentation control measures had been removed. In 2004, ORNL had six construction projects covered by the Tennessee General Permit for Storm Water Runoff Associated with Construction Activity. These included the SNS project, parking lot improvements, the Advanced Materials Characterization Laboratory, the ORNL Research Support Center, the 7625 Multi-Program High Bay, and the ORNL Water System Upgrade.

2.2.12.4 Aquatic Resources Protection

The Army Corps of Engineers, TVA, and TDEC conduct permitting programs for projects and activities that could affect aquatic resources, including navigable waters, surface waters (including tributaries), and wetlands. These are the Corps of Engineers Section 404 dredge-and-fill permits, TDEC aquatic resource alteration permits, and TVA 26A approvals.

In July 2003, TDEC issued a general permit for maintenance activities for modification to storm drain and NPDES outfall 113 at the Y-12 Purification Facility construction project. This permit is basically an aquatic resources activity. Modifications to outfall 113 were completed in 2004, and final stabilization activities at the bank of East Fork Poplar Creek were under way during December 2004.

In February, 2004, TDEC issued a general NPDES permit for discharges associated with the Building 9720-82 and Hollow-Fill Project.

No TVA or Corps of Engineers permits were issued to the Y-12 Complex in 2004.

In 2004, ORNL had one stream-crossing project that was conducted under an aquatic resource alteration permit. At ETTP, an aquatic resource alteration permit and a Department of the Army permit were obtained for removal/repair of crossovers on Mitchell Branch. Field activities were completed in CY 2004.

2.2.12.5 Oil Pollution Prevention

Section 311 of the CWA regulates the discharge of oils or petroleum products to waters of the United States and requires the development and implementation of a spill prevention, control, and countermeasure plan to minimize the potential for oil discharges. Currently, each facility implements a site-specific plan. This section of the CWA was significantly amended by the Oil Pollution Act of 1990, which has as its primary objective the improvement of responses to oil spills. On July 17, 2002, EPA issued the new final rule for 40 CFR Part 112, "Oil Pollution Prevention and Response; Non-Transportation-Related Onshore and Offshore Facilities," in the *Federal Register*. The rule contains significant changes in the requirements for spill prevention, control, and countermeasure plans, including how the plans are prepared, reviewed, and certified, and the information that must be included in the plans. Existing plans must be amended as necessary to bring them into compliance with rule revisions by February 17, 2006. The amended plans must be fully implemented by August 18, 2006.

2.2.12.6 Clean Water Action Plan

The Clean Water Action Plan, which essentially reflects a commitment by federal agencies to work cooperatively to improve water quality in the United States, is structured around watershed-based approaches in four key areas of need:

- prioritizing and undertaking water quality assessments,

- preparing restoration action strategies,
- developing and refining water quality standards, and
- enhancing stewardship of water resources on federal lands.

On a national level, the Department of Agriculture and the Department of the Interior are developing the Unified Federal Policy for Ensuring a Watershed Approach to Federal Land and Resource Management, to which other agencies (including DOE) are contributing. The goals and principles of this multiagency policy are to

- use a consistent and scientific approach to managing lands and resources and for assessing, protecting, and restoring watersheds;
- identify specific watersheds in which to focus budgetary and other resources and to accelerate improvements in water quality and watershed condition;
- use the results of watershed assessments to guide planning and management activities;
- work closely with states, tribes, local governments, and stakeholders to implement this policy;
- meet CWA responsibilities to adhere to federal, state, tribal, interstate, and local water quality requirements to the same extent as nongovernmental entities; and
- take steps to ensure that federal land and resource management actions are consistent with federal, state, tribal, and, where appropriate, local government water quality management programs.

2.2.13 Clean Air Act

Authority for implementation and enforcement of the Clean Air Act (CAA) has been delegated to the state of Tennessee by EPA as described in the State Implementation Plan. Air pollution control rules are developed and administered by TDEC.

2.2.13.1 General CAA Compliance

The TDEC air pollution control rules ensure compliance with the CAA. The TDEC Air Permit Program is the primary method by which emission sources are reported to and regulated by the state.

CAA compliance program staff participate in regulatory inspections and internal audits to verify compliance with applicable regulations or permit conditions. Air emission sources subject to the permitting requirements are permitted, and relevant compliance documentation for these sources is maintained at each site. In addition, a number of sources that are exempt from permitting requirements under state rules but subject to listing on Title V major source operation permits are documented, and information about them is available upon request from the state. All other exempt sources are documented for internal purposes. Programs for permitting, compliance inspection, and documentation are in place and ensure that all ORR operations remain in compliance with all federal and state air pollution control regulations.

2.2.13.2 Title V Operating Permits

All three sites are subject to the CAA Title V Operating Permit Program. Permit applications were submitted and were determined to be complete by TDEC. During 2004, four Title V permits were issued for operations at the Y-12 Complex and ORNL. The permits were issued to DOE, as owner, and the appropriate prime contractor, as operator. An update to the September 1996 Title V permit application for operations at ETTP was submitted in August 2004. TDEC should begin processing the application following completion of new regulatory emission standard compliance demonstration testing at the TSCA Incinerator at ETTP and the submittal of updated Title V application forms applicable to the results of these tests. The potential target date for the issuance of the Title V permit for ETTP is early 2006.

DOE/NNSA and BWXT Y-12 were issued a Title V permit in November 2004, covering 35 air emission sources and over 100 air emission points. All remaining emission sources are categorized as insignificant and exempt from permitting. The first semiannual report period is April to September 2005; the first report is due in November 2005. One construction permit was issued for the Purification Facility and will be incorporated into the Title V permit when the source becomes operational.

DOE and UT-Battelle were issued a Title V permit in October 2004, covering nine emission sources for ORNL Office of Science Operations.

The first semiannual report period is April to September 2005; the first report is due November 2005. One construction permit was also active for two boilers located at the SNS facility. All remaining emission sources are categorized as insignificant and are exempt from permitting.

DOE and BJC were issued two Title V permits in October and November 2004 for two air emission sources located at ORNL and one source at Y-12. At the end of 2004, there were 88 active air emission sources under DOE control at ETTP. The total includes 30 sources covered by 8 TDEC operating permits and one new application to construct request for TSCA Incinerator. The requested new construction permit for TSCA Incinerator supersedes the previous permit to operate until such time that a Title V permit is issued for ETTP. All remaining active air emission sources are exempt from permitting requirements. Permitted sources under DOE's Reindustrialization Program are not reported in this report except for the portion of the year that the source was under DOE control.

Air permit data are summarized in Appendix E.

2.2.13.3 National Emission Standards for Hazardous Air Pollutants for Radionuclides

Under Section 112 of the CAA, on December 15, 1989, the EPA promulgated National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities at 40 CFR 61, Subpart H. This emission standard limits emissions of radionuclides to the ambient air from DOE facilities not to exceed amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/year. As noted in the preamble to the rule, the entire DOE facility at Oak Ridge, Tennessee, must meet this emission standard.

On June 10, 1996, EPA delegated authority for regulation of airborne radionuclide emissions from DOE facilities in Tennessee to the TDEC Division of Air Pollution Control. TDEC adopted the federal rule verbatim as Tennessee Rule 1200-3-11-.08, Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities. In addition, TDEC codified that all past formal agreements between DOE and EPA, including the March 1994 *Compliance Plan* (MMES 1994a), would be recognized provided that they are current, valid, and supported by appropriate documentation. The TDEC Division of Air Pollution Control has given primary administrative authority of the radionuclide emission standard to the TDEC Division of Radiological Health, which also licenses non-DOE nuclear facilities in the state. However, authority to approve alternative methods and procedures still resides with EPA Region 4.

In October 2001, EPA Region 4 approved two addendums to the compliance plan, Addendum C.1, "Monitoring for Fugitive and Diffuse Sources," and Addendum C.2, "Monitoring Plan for On-Site Receptors." Addendum C.1 formalizes the use of environmental measurements from ambient air monitoring to confirm compliance for fugitive and diffuse sources for the ORR. This compliance approach has been in place since January 1993. Addendum C.2 formalizes EPA guidance, in a February 1, 2001 guidance letter, that allows the use of environmental measurements from ambient air monitors in lieu of continuous stack monitoring as an alternative method to demonstrate compliance with 40 CFR Part 61, Subpart H, for sources that are major when modeled to "on-site" receptors, but minor when modeled to off-site receptors. In March 2005, EPA Region 4 approved a third addendum to the plan, Addendum C.3, "ANSI/HPS N13.1-1999 Upgrade Policy," which clarifies when an existing source on the ORR undergoing a modification must be upgraded to meet the new design criteria of the ANSI/HPS N13.1-1999 Standard in accordance with the September 9, 2002 amendment to 40 CFR Part 61, Subpart H. During the March 2005 approval cycle, the title page to the compliance plan was updated with a DOE document number (DOE/ORO/2196) and a revision to Section 2.1 of the plan was approved that incorporated updated criteria under 10 CFR Part 835.

Beginning in 2000, the TDEC Division of Radiological Health required DOE to assess the dose from airborne radionuclide emissions to members of the public located on the ORR. Specifically, dose was determined for lessees located in areas of the ORR where access to the public is not restricted. Beginning in 2001, dose was also determined for construction workers

supporting activities at construction sites that were deeded to a non-DOE entity.

During 2004, the ORR facilities operated in compliance with the Radionuclide NESHAP dose limit of 10 mrem/year to the most exposed member of the public. Based on modeling of radionuclide emissions from all major and minor point sources, the effective dose equivalent in 2004 to the most exposed member of the public was 0.4 mrem/year.

Continuous sampling for radionuclide emissions is conducted at the ETTP TSCA Incinerator, the K-33 Supercompactor, the K-33 Decontamination Room, major sources at ORNL, and exhaust stacks serving uranium-processing areas at the Y-12 Complex. Compliance with the off-site dose limit is demonstrated by using grab samples and other EPA-approved estimation techniques on the remaining minor emission points and on grouped area sources to estimate confirmatory measurements of emissions. Fugitive emissions continue to be monitored by the ORR Perimeter Air Monitoring System. In addition, ETTP continued to operate a site-specific ambient air monitoring system for surveillance of TSCA Incinerator uranium emissions and fugitive emissions from remedial actions and decontamination and decommissioning projects. In addition to the ORR regulatory compliance program, the EPA and DOE Oversight Division also conduct independent ambient air monitoring programs.

2.2.13.4 NESHAP for Asbestos

The ORR facilities have numerous buildings and equipment that contain asbestos-containing materials. The compliance program for management of removal and disposal of asbestos-containing materials includes demolition and renovation notifications to TDEC and inspections, monitoring, and prescribed work practices for abatement and disposal of asbestos materials. No releases of reportable quantities of asbestos were reported at ETTP, ORNL, or the Y-12 Complex in 2004.

2.2.13.5 NESHAP for Source Categories

The EPA has missed congressionally established promulgation dates for a number of NESHAP "Maximum Achievable Control Technology" (MACT) standards (see 40 CFR Part 63, Subpart B, starting at § 63.50). Sources that may be subject to a delayed standard must comply with the "MACT hammer" permitting provisions in Section 112(j) of the CAA. Impacted sources must submit applications for case-by-case MACT determinations in two parts. Part 1 notifies agencies of the applicability of the delayed MACT standard to the facility. Part 2 is a detailed application based on a number of requirements and is due on a specific date, depending upon the applicable MACT standard.

A number of MACT standards potentially applicable to ORR sources are being developed by EPA (e.g., industrial, commercial, and institutional boilers and process heaters; miscellaneous metal parts (surface coating); site remediation; and off-site waste and recovery operations). In 2003, ORR facilities submitted Part 1 applications regarding applicability of several MACT standards (e.g., industrial heaters/process boilers, site remediation). There are currently only two sources on the ORR subject to MACT standards. One source is the TSCA Incinerator; the other source, registered with the EPA, is a waste drum storage area at ETTP designated for storage of waste received from off site, making this area subject to the Off-Site Waste and Recovery Operations standard.

2.2.13.6 Stratospheric Ozone Protection

DOE remains committed to continued reductions in the use of regulated ozone-depleting substances and, where possible, replacing them with materials that have less ozone-depleting potential. For example, DOE has committed to replacing refrigeration appliances at all DOE installations if the appliances were installed before 1984, contain Class I ozone-depleting substances, and have cooling capacities of 150 tons or greater, except in certain cases where replacement is not economical and will not benefit the environment. All units meeting this criterion at ETTP, ORNL, and the Y-12 Complex have been evaluated and replaced, except for seven units located at ORNL. Six of these units have been or will be decommissioned. Due to a change in facility status, one chiller will be replaced.

2.2.13.7 Chemical Accident Release Prevention

All sites on the ORR have evaluated all DOE processes for inventories of chemicals contained in quantities exceeding thresholds specified in rules pursuant to Title III, Section 112(r), "Prevention of Accidental Releases." No risk management program plans are required for a regulated substance at any DOE facility on the ORR. Administrative measures were implemented for some processes to limit the quantity of a regulated substance that could be present in a process at any given time.

2.2.14 Toxic Substances Control Act

TSCA was passed in 1976 to address the manufacture, processing, distribution in commerce, use, and disposal of chemical substances and mixtures that present an unreasonable risk of injury to human health or the environment. TSCA mandated that EPA identify and control chemical substances manufactured, processed, distributed in commerce, and used within the United States. EPA imposes strict information-gathering requirements on both new and existing chemical substances, including PCBs.

2.2.14.1 Polychlorinated Biphenyls

TSCA specifically bans the manufacture, processing, and distribution in commerce of PCBs but authorizes the continued use of some existing PCBs and PCB equipment. TSCA also imposes marking, storage, and disposal requirements for PCBs. The regulations governing PCBs mandated by TSCA are found at 40 CFR 761 and are administered by EPA. Most of the requirements of 40 CFR 761 are matrix- and concentration-dependent. TDEC restricts PCBs from being disposed of in landfills and classifies PCBs as special wastes under Tennessee solid waste regulations. A special waste approval is required from the state of Tennessee to dispose of solid PCB-contaminated waste in landfills. Several special waste approvals for receipt of drained PCB equipment, PCB remediation waste and PCB bulk product waste (painted construction debris and/or equipment) at the Y-12 landfill have been approved by TDEC.

British Nuclear Fuels Limited (BNFL), a prime contractor to DOE, was contracted to clean up the K-33, K-31, and K-29 facilities at the ETTP. Over the seven year period, BNFL shipped a total net weight or 16,229,107 lb of PCB waste for disposal. The waste was shipped to a number of disposal facilities, including Envirocare of Utah, Trans-Cycle Industries, the Environmental Management Waste Management Facility (EMWMF), and the TSCA Incinerator.

2.2.14.2 PCB Compliance Agreements

The Oak Ridge Reservation Polychlorinated Biphenyl Federal Facilities Compliance Agreement between EPA Region 4 and DOE-ORO became effective on December 16, 1996. The agreement addresses PCB compliance issues at ETTP, ORNL, the Y-12 Complex, and ORISE. It specifically addresses the unauthorized use of PCBs, storage and disposal of PCB wastes, spill cleanup and/or decontamination, PCBs mixed with radioactive materials, PCB R&D, and records and reporting requirements for the ORR.

2.2.14.3 Authorized and Unauthorized Uses of PCBs

Specific applications of PCBs are authorized by EPA for continued use under restricted conditions. A variety of PCB systems and equipment have been in service at the ORR during its 60-year history. Many of these systems and equipment were used in accordance with industry standards at the time, and their continued use was authorized under the 1979 PCB regulations. Systems that were authorized included transformers, capacitors, and other electrical distribution equipment; heat-transfer systems; and hydraulic systems. The vast majority of these PCB uses have been phased out on the ORR. Small amounts of PCBs remain in service in PCB light ballasts; however, ballasts containing PCBs are being replaced by non-PCB ballasts during normal maintenance. Most transformers that contained PCBs either have been retrofilled (replacement of PCB fluid with non-PCB dielectric fluid) to reduce the PCB concentration to below regulated limits or have been removed from service altogether.

The 1979 regulations did not anticipate the use of PCBs in many applications for which they were used. The proposals to the 1998 "Mega Rule" that would have addressed uses still

prevalent on the ORR were omitted from the final rule. As a result, past uses not specifically authorized continue to present compliance issues for DOE under TSCA.

At the ORR, unauthorized uses of PCBs have been found in building materials, lubricants, paint coatings, paint sealants, adhesives, and nonelectrical systems (including a rolling mill and a reactor-positioning device). More such unauthorized uses are likely to be found during the course of decontamination and decommission activities. The most widespread of these unauthorized uses of PCBs are PCBs in paint and PCB-impregnated gaskets in the gaseous diffusion process motor ventilation systems at ETTP. The discoveries of such uses include rubber gasket components used to seal glovebox units, paint coatings used on hydraulic equipment at the Y-12 Complex, and interior and exterior wall paints. In 1998, ORNL reported finding PCBs at regulated levels in roofing paint used on Buildings 2000 and 2001. An annual sampling and monitoring plan was prepared and was submitted for the site. EPA approval of the sampling and monitoring plan was verbally issued on February 11, 1999. Annual monitoring was conducted in 1999, 2000, 2001, 2002, 2003, and 2004. Summaries of the 1999, 2002, 2003, and 2004 results of that sampling were submitted to EPA as required. Submittals of the 2000 and the 2001 monitoring results were not required. In 2004, ORNL reported finding PCBs in paint, high-temperature wiring, and/or tile mastic in additional buildings.

In 2004, BWXT Y-12 reported finding PCBs at regulated levels in interior and exterior paint for several facilities and/or their structural components. The Y-12 Complex issued notification letters to EPA, in accordance with the terms of the Oak Ridge Reservation Polychlorinated Biphenyl Federal Facilities Compliance Agreement, declaring that a pre-TSCA PCB use had been discovered. Administrative controls and postings are in place to ensure that painted surfaces are not disturbed until proper evaluations are conducted. Additionally, administrative and engineering controls are used to ensure the protection of workers and the environment.

In 1998, depleted uranium hexafluoride (UF_6) steel cylinders were found to contain high concentrations of PCBs in the paint. The ETTP notified EPA of the UF_6 cylinder population under terms of the compliance agreement. DOE obtained approval from Regions 4 and 5 to ship contaminated cylinders to the Portsmouth Gaseous Diffusion Plant in Portsmouth, Ohio, in CY 2005. Once the containers arrive at the Portsmouth plant, the product remaining in the cylinders will be processed and the cylinders will be disposed of as PCB bulk product waste. Shipments began in the summer of 2005.

2.2.14.4 ETTP TSCA Incinerator PCB Disposal Approval

The ETTP TSCA Incinerator is currently operating under an extension of EPA Region 4 approval granted on March 20, 1989. This extension is based on submittal of a reapplication for PCB disposal approval filed with EPA Region 4 on December 20, 1991, which was within the time frame allowed for reapplication. Minor amendments, updates, and corrections to this reapplication identified by DOE have been made in the interim and have been submitted to EPA. Since the submittal of the December 20, 1991, reapplication, a joint RCRA/PCB permit reapplication has been under development. This joint reapplication was submitted in March 1997 to TDEC under RCRA for treatment of hazardous wastes and to EPA Region 4 for disposal of PCB wastes. The new reapplication will replace the December 20, 1991, PCB disposal reapplication. In anticipation of this joint application, EPA Region 4 has delayed action on renewal of the PCB incineration approval.

2.2.15 Federal Insecticide, Fungicide, and Rodenticide Act

The Federal Insecticide, Fungicide, and Rodenticide Act governs the sale and use of pesticides and requires that all pesticide products be registered by EPA before they can be sold. If a pesticide can be used according to directions without unreasonable adverse effects on the environment or applicator (i.e., if no special training is required), it is classified for general use. A pesticide that can harm the environment or injure the applicator, even when being used according to directions, is classified for restricted use. The regulations for the application of restricted-use pesticides are presented in 40 CFR 171.

The Y-12 Complex, ETTP, and ORNL maintain procedures for the storage, application, and disposition of pesticides.

No restricted-use pesticide products are used at the Y-12 Complex, ETTP, or ORNL. An inventory of pesticide products is maintained at each facility.

2.2.16 Emergency Planning and Community Right-to-Know Act

The Emergency Planning and Community Right-to-Know Act (EPCRA), also referred to as SARA Title III, requires reporting to federal, state, and local authorities of emergency planning information, hazardous chemical inventories, and releases of certain toxic chemicals to the environment. The ongoing requirements are contained in Sections 302, 303, 304, 311, 312, and 313 of EPCRA and in 40 CFR Parts 355, 370, and 372. Table 2.10 describes the main parts of EPCRA. All DOE-ORO sites in Oak Ridge are in compliance with all aspects of EPCRA. Executive Order 13148, "Greening the Government Through Leadership in Environmental Management," requires all federal agencies to comply with provisions of EPCRA and the Pollution Prevention Act.

2.2.16.1 Planning Notification and Extremely Hazardous Substance Release Notifications (Sections 302–304)

The ORR did not have any releases of extremely hazardous substances, as defined by EPCRA, in 2004.

2.2.16.2 Material Safety Data Sheet/Chemical Inventory (Sections 311–312)

The required Section 311 notifications were made as hazardous materials were determined to be over threshold for the first time. Inventories, locations, and associated hazards of hazardous and extremely hazardous chemicals were submitted in an annual report to state and local emergency responders as required by the Section 312 requirements. Of the chemicals identified for CY 2004 on the ORR, 66 were located at the Y-12 Complex, 31 at ORNL, and 12 at ETTP.

Reindustrialization's private-sector lessees were not included in the CY 2004 submittals. Under terms of their lease, lessees must evaluate their own inventories of hazardous and extremely hazardous chemicals and must submit information as required by the regulations.

2.2.16.3 Toxic Chemical Release Reporting (Section 313)

DOE submits an annual toxic release inventory report to EPA and TDEC on or before July 1 of each year. The report covers the previous calendar year and addresses releases of certain toxic chemicals to air, water, and land as well as waste management, recycling, and pollution prevention activities. Threshold determinations and reports for each of the ORR facilities are made separately. Operations involving toxic re lease inventory chemicals were compared with regulatory thresholds to determine which chemicals exceeded the reporting thresholds based on

Table 2.10. Descriptions of the main parts of EPCRA

Title	Description
Sections 302–303, Planning notification	Requires that local planning committee and state emergency response commission be notified of EPCRA-related planning
Section 304, Extremely hazardous substance release notification	Addresses reporting to state and local authorities of off-site releases
Section 311–312, Material safety data sheet/chemical inventory	Requires that either material safety data sheets (MSDSs) or lists of hazardous chemicals for which MSDSs are required be provided to state and local authorities for emergency planning. Requires that an inventory of hazardous chemicals maintained in quantities over thresholds be reported annually to the U.S. Environmental Protection Agency.
Section 313, Toxic chemical release reporting	Requires that releases of toxic chemicals be reported annually to the U.S. Environmental Protection Agency

amounts manufactured, processed, or otherwise used at each facility. After threshold determinations were made, releases and off-site transfers were calculated for each chemical that exceeded one or more of the thresholds. Filing three separate reports altered threshold determinations of the chemicals to be reported and required the reporting of transfers of the chemicals between the facilities.

The following text explains how the reporting thresholds were exceeded. Table 2.11 summarizes releases and off-site transfers for those chemicals exceeding reporting thresholds.

Y-12 Complex

Total 2004 total reportable toxic releases to air, water, and land and waste transferred off site for treatment, disposal, and recycling remained about the same compared with the amounts reported for the Y-12 Complex in 2003. Releases for most metals decreased in 2004 as a result of declining machining and welding operations. In contrast, nitrate and nitric acid releases increased slightly as a result of increased waste treatment activities. The following list describes the reported chemicals for the Y-12 Complex.

- **Chromium, cobalt, copper compounds, manganese, and nickel.** The processing threshold for each of these metals was exceeded as a result of off-site metal recycling and metal machining and welding operations.
- **Freon 113.** Freon 113 was otherwise used in excess of the reporting threshold as a result of enriched uranium operations.
- **Hydrochloric acid (aerosol form) and sulfuric acid (aerosol form).** Both of these acid aerosols were coincidentally manufactured in excess of the reporting threshold as a combustion by-product from burning coal at the steam plant.
- **Lead and lead compounds.** The otherwise-use threshold for lead was exceeded at the steam plant and the Central Training Facility firing range. The processing threshold for lead was exceeded as a result of off-site metal for recycling.
- **Mercury and mercury compounds.** Mercury compounds were otherwise used and coincidently manufactured as a combustion by-product from burning coal in excess of the 10-lb reporting threshold at the steam plant.
- **Methanol.** Most of the methanol at the Y-12 Complex is otherwise used in the chiller buildings for the brine-methanol system.
- **Nitrate compounds.** Nitrate compounds were coincidentally manufactured in excess of the reporting threshold as by-products of neutralizing nitric acid wastes.
- **Nitric acid.** Nitric acid was used in excess of the otherwise-use threshold as a chemical-processing aid.

ETTP

The otherwise-use activity threshold for PCBs was exceeded at ETTP by the incineration of PCBs in waste received from off site in the TSCA Incinerator.

ORNL

The ORNL Lead Shop processes lead into different shapes for use as shielding in research projects involving radioactive isotopes. Nitrate compounds are coincidentally manufactured as by-products of neutralizing nitric acid waste and as by-products of sewage treatment.

Nitric acid is used to regenerate ion-exchange columns at the Process Waste Treatment Complex and at the High Flux Isotope Reactor (HFIR), in the separation process for californium by the Nuclear Science and Technology Division, and for pH adjustment at the Process Waste Treatment Complex.

2.2.17 Environmental Occurrences

CERCLA requires that the National Response Center be notified if a nonpermitted release of a reportable quantity or more of a hazardous substance (including radionuclides) is released to the environment within a 24-h period. The CWA requires that the National Response Center be notified if an oil spill causes a sheen on navigable waters, such as rivers, lakes, or streams. When notified, the National Response Center alerts federal, state, and local regulatory emergency organizations so that they can determine whether government response is appropriate.

Table 2.11. EPCRA Section 313 toxic chemical release and off-site transfer summary for the ORR, 2004

	Year	Quantity (lb)[a]			
		Y-12 Complex	ORNL	ETTP	Total
Chromium	2003	3,906	*b*	*b*	3,906
	2004	1,465	*b*	*b*	1,465
Cobalt	2003	914	*b*	*b*	914
	2004	*c*	*b*	*b*	*b,c*
Copper/Copper Compounds	2003	8,296	*b*	*b*	8,296
	2004	7,560	*b*	*b*	7,560
Freon 11	2003	*b*	*b*	*b*	*b*
	2004	*b*	*b*	*b*	*b*
Freon 113	2003	32,020	*b*	*b*	32,020
	2004	14,000	*b*	*b*	14,000
Hexachlorobenzene	2003	*b*	*b*	*b*	*b*
	2004	*b*	*b*	*b*	*b*
Hydrochloric acid (aerosol)	2003	116,899	*b*	*b*	116,899
	2004	110,000	*b*	*b*	110,000
Lead/lead compounds	2003	9,342	43,876	72,047	125,265
	2004	62,803	72,357	*b*	135,160
Manganese	2003	6,170	*b*	*b*	6,170
	2004	2,986	*b*	*b*	2,986
Mercury/mercury compounds	2003	48	*b*	*b*	47.6
	2004	59	*b*	*b*	59
Methanol	2003	77,571	*b*	*b*	77,571
	2004	56,017	*b*	*b*	56,017
Nickel	2003	3,319	*b*	*b*	3,319
	2004	2,359	*b*	*b*	2,359
Nitrate compounds	2003	5,651	80,000	*b*	85,651
	2004	6,956	83,000	*b*	89,956
Nitric acid	2003	12,771	81,362	*b*	84,304
	2004	18,200	94,160	*b*	112,360
Ozone	2003	*b*	*b*	*b*	*b, c*
	2004	*b*	*b*	*b*	*b*
PCBs	2003	*b*	*b*	158	158
	2004	*b*	*b*	684	684
Sulfuric acid (aerosol)	2003	58,982	*b*	*b*	58,982
	2004	48,000	*b*	*b*	48,000
Total	2003	335,889	205,238	72,205	603,503
	2004	330,405	249,517	684	580,606

[a]Represents total releases to air, land, and water and includes off-site waste transfers. Also includes quantities released to the environment as a result of remedial actions, catastrophic events, or one-time events not associated with production processes.

[b]No reportable releases because the site did not exceed the applicable Toxic Release Inventory reporting thresholds.

[c]Not applicable because releases were less than 500 lb and hence a Form A was submitted.

During 2004, the Y-12 Complex had no releases of hazardous substances exceeding reportable quantities, no reportable oil sheens, and no fish kills.

During 2004, ETTP had no releases of reportable quantities of hazardous substances and one fish kill. The fish kill was the result of the inadvertent discharge of a fire-retardant solution that had been used to fight a dumpster fire. Although protective booms had been placed around the storm drain catch basins during the fire, some of the material still entered the storm drain network and was discharged to Mitchell Branch, resulting in the deaths of approximately 60 fish. Details are provided in Sect. 4.4.1.

In 2004, ORNL had no releases of reportable quantities of hazardous substances and no fish kills. ORNL had one reportable release of oil. On June 10, 2004, an overturned forklift truck spilled diesel fuel and hydraulic fluid into Melton Branch. The release was contained, and the NRC and the Tennessee Emergency Management Agency were notified.

2.2.18 DOE Order 450.1, Environmental Protection Program

In January 2003, DOE Order 450.1, "Environmental Protection Program," was issued. It encompasses environmental management systems (EMSs), pollution prevention, affirmative procurement, ozone-depleting substances, energy management and fleet management, and beneficial landscaping requirements. The order consolidates and enhances several previously existing executive orders and affirms DOE's approach to improving environmental performance through the use of management systems and aggressive pollution prevention initiatives.

The ORR sites are addressing the requirements of this order as well as all other requirements related to these areas. The 2004 efforts and associated results across the ORR are summarized in the remainder of this section.

2.2.18.1 Implementation of Environmental Management Systems

An EMS is a continuing cycle of planning, implementing, evaluating, and improving processes and actions undertaken to achieve environmental goals. The EMSs are to be integrated with the sites' Integrated Safety Management System (ISMS) by December 2005. ISMS and EMS both strive for continual improvement through a "plan-do-check-act" cycle. Under ISMS, the term "safety" also encompasses environmental safety and health, including pollution prevention, waste minimization, and resource conservation. Therefore, the guiding principles and core functions in ISMS are as applicable to the protection of the environment as they are to safety. Figure 2.2 depicts the relationship between EMS and ISMS.

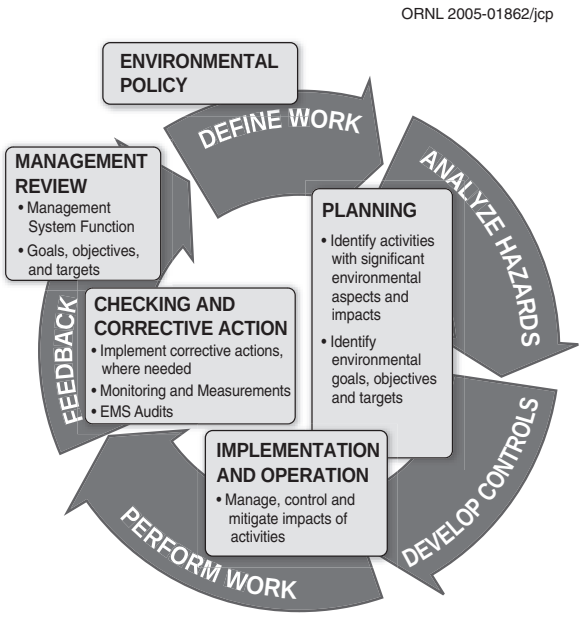

Fig. 2.2. The relationship between EMS and ISMS.

UT-Battelle and BWXT Y-12 have both chosen to implement EMSs that are modeled after the international standard established by ISO 14001. The purpose of this system is to achieve, maintain, and demonstrate continuing environmental improvement by assessing and controlling the impact of activities and facilities on the environment. The system is designed to ensure that activities are in compliance with environmental laws and regulations, and it provides a framework for integrating compliance, pollution prevention, and other environmental considerations into the planning and implementation phases of site activities. The ISO 14001 EMS is consistent with ISMS core functions and guiding principles and includes the following features:

- policy,
- identified significant environmental aspects and controls,
- applicable legal requirements,
- objectives and targets,
- training requirements,
- communication with stakeholders,
- records and document control requirements,
- monitoring and measurement requirements,
- an emergency preparedness and response program, and
- provisions for handling nonconformances and corrective/preventive actions.

Environmental aspects are elements of an organization's activities, products, or services that can interact with the environment. In the ISMS, these may be thought of as environmental hazards associated with a facility operation or work activity.

UT-Battelle EMS Implementation Status

The UT-Battelle EMS is integrated into ISMS through the work control process. All significant environmental aspects are incorporated into work control to ensure that appropriate controls are in place.

In 2004, UT-Battelle's EMS was registered to the ISO 14001 Standard by a third-party registrar. Several minor deficiencies were noted during the registration audit. Corrective action plans have been developed and are being implemented.

ISO 14001 encourages organizations to make their environmental policy and significant environmental aspects of their activities available to the public.

The *UT-Battelle Policy for ORNL* is a high-level document that contains both scientific/technical and environment, safety, and health commitments. As required by ISO 14001, the policy contains commitments to (1) comply with applicable requirements, (2) prevent pollution, and (3) continually improve. The environmental policy statements in the UT-Battelle Policy for ORNL are available on the external web site at http://train.ornl.gov/wbt/EnvPolicy.cfm.

UT-Battelle has identified the following aspects as potentially having significant environmental impacts:

- industrial waste requiring special approval for disposal;
- hazardous waste;
- radioactive waste;
- PCB waste;
- mixed waste;
- medical waste;
- recyclable materials;
- air emissions;
- liquid discharges;
- storage or use of chemicals or radioactive materials;
- use/storage of PCB-contaminated equipment;
- transuranic or Class III/IV waste;
- historic/cultural resources;
- sensitive/endangered species;
- quarantined soils or plants;
- hold-for-decay wastes;
- universal waste;
- RCRA, PCB, and CERCLA treatability studies;
- excavated soils;
- physical disturbance of aquatic environs; and
- legacy contamination.

Activities containing these aspects are carefully controlled to minimize or eliminate impacts to the environment. Monitoring activities associated with these aspects are described in Chapters 3, 5, and 7.

BWXT Y-12 EMS Implementation Status

BWXT Y-12 completed the ISO 14001 planning phase during 2004 and initiated the management assessment to verify and validate implementation. The goal is to self-verify integration of the EMS with the Y-12 ISMS.

BWXT Y-12 Policy Y72-001, "Environment, Safety, and Health," is the top-level guiding principle for protecting the workers, the public, the environment and for preventing pollution whenever activities are planned and performed. In addition, Policy Y72-006, "Y-12 Pollution Prevention and Sustainability Policy," affirms the commitment of BWXT Y-12 to continually integrate sustainability principles into its activities in a safe, compliant, and cost-effective manner. These policies commitments and top management's commitment to environmental

stewardship may be viewed on the BWXT Y-12 public web page (http://www.y12.doe.gov/public/about/esh.php).

In addition to established policy, BWXT Y-12 has identified legal and other requirements, evaluated activities for significant environmental aspects, and incorporated them into the ISMS process. The ISMS process includes hazard analysis of work activities (operations, maintenance, and construction) and the appropriate involvement of subject-matter experts, including environment, safety, and health professionals.

BWXT Y-12 EMS criteria for defining significant aspects are based on actual and perceived impacts and on regulatory requirements. The following aspects have been identified as potentially having significant environmental impact:

- **Waste generation**—excess materials and chemicals, low-level radiological, hazardous, mixed, PCB waste, universal, special industrial, medical, and sanitary
- **Air emissions**—criteria pollutants, hazardous air pollutants and other non-radiological air contaminants, ozone, and radiological emissions
- **Liquid discharges**—process wastewater, cooling water, sanitary wastewater, flow management, chlorinated water discharges
- **Potential releases from spill, leaks, runoff**—storage of radiological and nonradiological materials, oil and gas, waste, storm water runoff
- **Spread of legacy contamination**—historical waste management units, legacy mercury and PCB spills, demolition of excess and surplus facilities, groundwater contamination
- **Interactions with historical and cultural resources and wildlife habitat**
- **Natural resource consumption**—power and energy use
- **Natural resource conservation**—purchasing materials with recycled content, recycling, and preventing pollution.

Activities involving these aspects are evaluated and controlled to minimize potential impacts to the environment. Monitoring activities associated with these aspects are described in Sects. 6 and 7.

As part of the ongoing activities to integrate the principles of the ISO 14001 EMS with the Y-12 ISMS, a number of environmental objectives and targets have been established.

Monitoring our progress in achieving the environmental objectives and targets is a way to measure our improvement. Table 2.12 lists environmental objectives and associated targets for 2005 at the Y-12 Complex.

BJC EMS Implementation Status

BJC uses ISMS core functions and guiding principles to integrate EMS considerations into work activities. By integrating EMS considerations within the elements of ISMS, the BJC Environment, Safety, and Health Organization provides procedures and processes for identifying environmental protection controls and compliance impacts and concerns prior to performing a scope of work, during work activities, and after the work is completed. Issued in September 2000, the BJC environmental management policy is a key attribute of the EMS. The policy reflects the mission, goals, and responsibilities of the company with respect to environmental aspects and impacts, including pollution prevention. At the beginning of each project, subject-matter experts, called "environmental compliance and protection leads," are assigned to each subcontractor's work activity to support the formation of project and subproject teams in identifying and analyzing environmental hazards and in implementing controls that comply with DOE Work Smart Standards and applicable laws and regulations. The EMS is supported by communication between BJC and its subcontractors through the project's environmental compliance and protection lead. The EMS ensures that periodic assessments against the EMS attributes are conducted to evaluate the ISMS performance of each project and the subcontractor in charge of managing the project.

During CY 2004 BJC updated the company's ISMS description document to incorporate EMS, finalized the Awareness Training on the EMS, and updated the self-performed EMS implementation gap analysis. Also in CY 2004, BJC addressed the gaps identified by the analysis. During CY 2005 BJC will identify significant environmental aspects, targets, and objectives for the EMS. Modifications to enhance the EMS will be made to meet the

Table 2.12. Environmental objective and associated targets for 2005 at the Y-12 Complex

Objective	Target
Production Support Programs, Operations of Facilities, and Projects (construction, deactivation, and demolition) will be conducted in compliance with applicable environmental laws, regulations, standards/requirements identification documents, and Y71-series procedures.	Zero notices of violations received from regulatory agencies; Zero environmental permit noncompliances; Zero open environmental compliance Issues.
Eliminate legacy low-level radioactive waste (LLW) inventory at Y-12.	Zero legacy LLW containers in inventory.
Reduce low-level radioactive waste generation from routine operations.	Achieve 80% reduction using a 1993 baseline.
Limit radiological and non-radiological emissions to the ambient air.	Maintain dose to maximally exposed off-site individual for Oak Ridge Reservation < 10 mrem/year. Maintain Y-12 Steam Plant NO_x emissions to < 232 tons/year during ozone season.
Improve water quality of East Fork Poplar Creek.	Eliminate NPDES non-compliances due to chlorine.
Reduce potential for spills or leaks of hazardous materials to the environment.	Zero recordable releases to the environment. Zero facilities rated red from good housekeeping inspection.
Reduce the quantity of hazardous materials on site.	Achieve progress in reducing quantity of hazardous materials on site. 100% on-time update of quarterly Hazardous Material Information System inventory. Replace hazardous materials with safe alternatives where feasible.
Support achievement of Pollution Prevention (P2) Program goals.	Achieve progress on P2 Program waste reduction and recycling.
Increase purchases of EPA-designated items with recycled content when these items are competitively priced and meet performance standards.	100% use of affirmative procurement (considering price, availability, and performance).
Reduce potential for spread of legacy contamination.	Eliminate visible mercury from catch basins.
Preserve historical/cultural resources.	Conduct Y-12 operations in accordance with programmatic agreement for compliance with National Historic Preservation Act.
Continue to foster strong relationships with regulatory agencies, community, and interested stakeholders.	Zero impacts to planned Y-12 remedial action or historic/cultural resources. Maintain open and effective communication paths to stakeholders.
Improve the Environmental Management System.	Zero open issues from assessments.

Executive Order 13148 requirement that a fully implemented EMS be in place by December 31, 2005.

2.2.18.2 Pollution Prevention

During 2004, the ORR continued to implement a substantial number of pollution prevention projects, which were reported to DOE. Reported results are summarized by program secretarial office in Table 2.13. Pollution-prevention-specific information is also available on the DOE pollution prevention homepage at http://www.eh.doe.gov/p2/.

The ORR Sites' pollution prevention programs are driven by federal and state laws and regulations, executive orders, and DOE policies, notices, and orders. During 2004, in addition to supporting the implementation of pollution prevention projects, the ORR facilities performed activities to ensure the requirements established by DOE Order 450.1 as well as all other existing requirements were addressed. The ORR facilities must complete pollution-prevention-related

Table 2.13. 2004 ORR pollution prevention project implementation results summary

Program secretarial office	Total projects reported in FY 2004	Total quantity of waste reduced in FY 2004 (MT or m^3)	Total cost avoidance in FY 2004 (Millions of $)
NNSA/DP[a]	72	20,769	6.4
EM[b]	8[c]	*c*	*c*
SC[d]/Other R&D	14	6,574	3.0

[a]National Nuclear Security Administration/Defense Program.

[b]Environmental Management.

[c]The EM Program at the ETTP site is using Six Sigma projects as a means of capturing P2 project-related data. The project –specific waste volume reduction and cost avoidance data is not as yet being reported as it is confidential information proprietary to BJC and is currently undergoing a review prior to public release.

[d]Office of Science.

requirements such as planning and reporting to comply with many regulatory requirements, including RCRA, the Tennessee Hazardous Waste Reduction Act, and the EPCRA/Pollution Prevention Act. The ORR facilities must also comply with DOE requirements, including reporting of pollution prevention project and program activities. The *Annual Report on Waste Generation and Pollution Prevention Progress*, the annual *Affirmative Procurement Report*, and reports on pollution prevention projects completed by each site are designed to provide data used to measure progress toward DOE's FY 2005 and 2010 pollution prevention goals. Reported reduction results for FY 2004 (percentages based on a 1993 baseline) are summarized by program secretarial office or by the site as appropriate in Table 2.14.

The ORR also supports DOE's goal of reducing off-site releases and transfers of toxic chemicals by assessing operations associated with these releases and transfers. However, because of substantial changes since 1993 in the operations included in the EPCRA-related reporting from which these values are obtained, the ORR does not anticipate an overall reduction when compared with the 1993 baseline. Information on program secretarial office-specific and site-specific waste generation, recycling, and affirmative procurement is also available on the DOE pollution prevention homepage at http://www.eh.doe.gov/p2/.

Additionally, each site's data are included in DOE's complex-wide reports. Elements of DOE's annual reports are extracted and included in DOE's central internet database, which provides national-level DOE waste management and cleanup data to the public, as required by the December 1998 settlement agreement between DOE and the Natural Resources Defense Council, Inc.

In FY 2004, ORR-related activities received the following pollution-prevention awards in recognition of specific 2003 pollution-prevention accomplishments.

- The Battelle Memorial Institute received the 2004 White House Closing-the-Circle Award and the 2004 DOE Office of Science Award for Best in Class for its leadership and management in the development and integration of EMSs into the operations and business systems of Brookhaven National Laboratory, ORNL, and Pacific Northwest National Laboratory. This integration resulted in hazard and waste reduction, significant cost savings, improved environmental accountability, and enhanced compliance with environmental requirements and standards (UT-Battelle at ORNL part of team).
- UT-Battelle at ORNL received the 2004 DOE Office of Science Accomplishment Award for integration of environmental sustainability principles in operations and design and waste water reduction activities. Environmental sustainability principles include new facility design using the U.S. Green Building Council rating system, use of bio-based-fueled vehicles, energy management, and pollution prevention. The award recognizes the team's efforts and outstanding commitment to pollution prevention and environmental stewardship through

Table 2.14. 2004 ORR affirmative procurement and waste reduction progress summary

Program secretarial office	Waste reduction by office (%)				Site	Sanitary waste reduction by site (%)	
	Transuranic	Mixed low-level and RCRA	Low-level waste	Affirmative procurement		Landfill	Recycling
NNSA /DP[a]	N/A	98	65	92	Y-12	85	63
EM[b]	N/A	*c*	*c*	100	ETTP	90	*d*
SC[e]/Other R&D	88	94	61	78	ORNL	41	48

[a]National Nuclear Security Administration/Defense Program.

[b]Environmental Management.

[c]The facilities at ETTP are undergoing D&D to support privatization and reindustrialization of ETTP or for demolition as part of site closure activities. In addition, the accelerated closure contract was established in FY 2004. As a result, waste generation from on-site DOE activities is expected to fluctuate significantly from year to year. Also, normal fluctuations could be expected from year to year when generating small volumes of a given waste stream.

[d]As a result of ongoing decontamination and decommissioning activities at the ETTP site as well as those activities associated with the accelerated closure contract, on-site recycling activities can be expected to fluctuate significantly from year to year.

[e]Office of Science.

integration of environmental sustainability principles into laboratory operations.

- UT-Battelle at ORNL received the FY 2004 EPA Energy Star award for ORNL's Mammalian Genetics Office Building (Building 1059). The building ranked in the top 10% in energy efficiency for similar buildings across the country.
- UT-Battelle at ORNL received the Tennessee Chamber of Commerce and Industry 2003 Environmental Excellence Certificate (awarded in FY 2004).
- UT-Battelle at ORNL received the 2003 Excellence in Construction Award (awarded in FY 2004).
- BWXT Y-12 was awarded the FY 2004 National Nuclear Security Administration Pollution Prevention Award for FY 2003 Best in Class in Education and Outreach and Information Sharing—Impact of Y-12 Pollution Prevention Awareness and Outreach Initiatives Team.
- BWXT Y-12 was awarded the FY 2004 National Nuclear Security Administration Pollution Prevention Award for FY 2003 Best in Class in Recycling—Y-12 Infrastructure Reduction—Maximizing Recycling Team.
- BWXT Y-12 was awarded the Tennessee Chamber of Commerce and Industry 2003 Solid Waste Management Award—Creative Partnership to Reduce Industrial Waste Generation and Avoid Costs at the Y-12 National Security Complex (awarded in FY 2004).

To support future pollution prevention implementation, compliance, and goal achievement, the ORR sites' pollution prevention programs continue to pursue site projects, perform required activities, and complete required reporting.

2.2.18.3 Ozone-Depleting Substances Phase-Out Efforts

Significant progress has been made in eliminating use of Class I and Class II ozone-depleting substances at the Y-12 Complex, and a number of projects have been identified to further reduce ozone-depleting substance uses. The *Y-12 Complex Ozone Depleting Substances (ODS) Phase-Out and Management Plan* (Y-12 2003), was issued in 2003 and provides a complete discussion of requirements and compliance activities at the Y-12 Complex.

One of the pollution prevention goals involving ozone-depleting substances is to retrofit or replace by 2005 100% of chillers using Class 1 refrigerants that have a cooling capacity of greater than 150 tons and that were manufactured before 1984. In December 1998, a $12.8 M line item project, "Retrofit Heating Ventilation and Air Conditioning (HVAC) and Chillers for

Ozone Protection" was completed at the Y-12 Complex. A significant number of chillers were retrofitted, replaced, or taken out of service. The last remaining chiller at the Y-12 Complex included under this retrofit or replacement goal was taken out of service and the freon removed in March 2004.

The second pollution prevention goal involving ozone-depleting substances is to eliminate Class I ozone-depleting substances by 2010 to the extent economically practicable and to the extent that safe alternative chemicals are available for DOE Class I applications. The Y-12 Complex has accomplished this goal to the extent economically practicable and to the extent that safe alternative chemicals are available for Y-12-specific applications. A number of actions have been initiated to achieve this goal, including product substitutions for solvent uses, retrofits or replacements for chiller systems, and product substitutions for fire-protection systems. For example, the use of Halon in fire-protection systems has been eliminated. Where availability of safe alternatives or economic factors prevent elimination of ozone-depleting substances use, the Y-12 Complex continues to pursue viable options (e.g., elimination of Freon 12 and Freon 113 solvent usage in some of Y-12's major production facilities). Four remaining chillers with Class I ozone-depleting substances are being assessed to determine the long-term need for these systems while taking into account economic considerations.

ORNL has implemented a plan to eliminate the use of Class I ozone-depleting substances. This plan included the replacement, retrofit, or decommissioning of all chillers that require Class I substances, the gradual phase out of smaller refrigeration systems that require Class I substances, the elimination of all fire-protection systems that use Class I substances, and the elimination of all other systems or processes that require Class I substances. Currently, Class I substances are used in small refrigeration systems such as refrigerators and window air conditioners. As these units fail, they are replaced with new units that use Class II or unregulated refrigerants.

DOE guidance dated October 1999, requires that all DOE facilities retrofit or replace by 2005 all chillers using Class I refrigerants that are greater than 150 tons of cooling capacity and that were manufactured prior to 1984. ORNL operated a number of chillers that were impacted by this requirement. All of these impacted chillers have been retrofitted, replaced, or decommissioned, except one chiller located in Building 3525. That chiller was to be decommissioned; however, plans for the 3525 facility were changed in 2003, requiring that the chiller be replaced in accordance with the DOE requirement. Plans are being developed to replace this chiller.

ETTP completed the phaseout of Class 1 ozone-depleting substances equipment in the mid-90s. At that time, ETTP surplused and moved all Class 1 ozone-depleting substances to other DOE sites so they are no longer part of the ETTP ozone-depleting substances inventory. One exception exists, a small amount—270 lb of Class 1 R-12 refrigerant—was maintained in the ETTP inventory in CY 2004 for servicing older, small units/appliances (i.e., freezers and refrigerators) for the duration of their expected service life.

2.2.18.4 Energy Management (Including Fleet Management)

BWXT Y-12 prepared a multiyear Energy Management Plan that defines the general energy requirements of the Y-12 Complex and provides a brief history of energy-reduction efforts and a timetable for further energy-saving measures. The primary focus for energy conservation is on electricity, with secondary concentrations on reducing the use of natural gas, fuel (gasoline and diesel), coal, and water.

Over the past 15 years, the energy consumption at the Y-12 Complex has been reduced by more than 40%. Much of this reduction came as a result of reduced production activities and energy savings measures, such as replacing chillers, eliminating cooling towers, and regularly overhauling steam plant boilers.

ORNL's Energy Management and Implementation Plan outlines the strategy for managing and implementing short- and long-range energy-related activities. As a result of ORNL's emphasis on energy and utilities management and projects, standard building energy intensity has been reduced by approximately 20% compared with FY 1985 usage (based on British thermal units per gross square foot). Also, the energy intensity for high-energy-use facilities

has been reduced by 65%. Specific activities include the following.

- **Energy Star.** In FY 2000 ORNL was awarded the EPA's Energy Star Award for a building, the first DOE building to achieve this rating and only the second building in the state of Tennessee to do so. A second building at ORNL received the Energy Star Award in FY 2004. Additional reviews are ongoing.
- **Leadership in Energy and Environmental Design (LEED) and Sustainability.** The newly constructed East Campus Modernization project at ORNL used third-party financing to add over 300,000 ft^2 of energy-efficient office, laboratory, and computer space and achieve a savings of $0.5 million in annual energy costs (30% savings compared with the baseline conventional design). This project was recently certified by the U.S. Green Building Council as a LEED-certified project.
- **Chlorinated fluorocarbon (CFC) reductions.** As part an aggressive chiller replacement program, ORNL has replaced 16 chillers totaling 8,200 tons in cooling capacity, well ahead of legislated requirements. As a result, chiller energy use has dropped an average of 21% for an annual savings of $280 thousand, and CFC emissions have been cut by 5000 lb/year. ORNL continues to replace smaller CFC chillers and has transferred all R-113 and most of the R-11 stored refrigerant to a refrigerant recycler.
- **Water savings.** Water-related projects and management efforts have resulted in water usage being reduced by 955 million gal, over 15%, since FY 2000.
- **Green power.** ORNL participates in TVA's "Green Power Switch" program. ORNL was TVA's first industrial green power participant and purchases 675 MWh in green power annually.
- **Distributed energy resource.** Combining solar power with natural-gas-fired turbine technology, ORNL's 30-kW distributed energy resource research project won a Federal Energy Saver Showcase Award in FY 2002.
- **Greenhouse gas emission reductions.** Even though the gross square footage at ORNL has increased almost 20% since FY 1995, the relatively recent conversion from coal to natural gas as the primary fuel at the central steam plant has reduced CO_2-equivalent greenhouse gas emissions by 29% over the same time period.
- **Vehicle fleet management.** ORNL is working to minimize the use of petroleum-based fuels in the vehicle fleet. To minimize gasoline consumption, 81 ethanol-burning vehicles are in service (14 purchased in FY 2004 and 6 in FY 2005). Additional alternative fuel vehicles are being added to the fleet as funding allows.

2.2.18.5 Beneficial Landscaping Practices

DOE Order 450.1 incorporates Executive Order 13148, "Guidance for Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds." The guidance applicable to DOE-site landscaping includes

- use of regionally native plants for landscaping;
- design, use, or promotion of construction practices that minimize adverse effects on the natural habitat;
- seeking to prevent pollution;
- implementing water and energy efficient practices;
- creating outdoor demonstration projects; and
- other initiatives.

Y-12/NNSA partners with ORNL regarding stewardship responsibilities for lands on the ORR. Y-12 requires extensive use of erosion controls in construction projects (e.g., use of settling ponds and storm water detention areas), minimal use of water for irrigation, and use of trees where possible to provide shade for energy conservation. Active environmental compliance and preservation programs, such as an ongoing sitewide Pollution Prevention Program, Storm Water Pollution Prevention Plan activities, and policies requiring minimal use of pesticides and fertilizers also minimize environmental impacts. Additionally, Y-12 has limited its modernization construction to brownfield sites, thereby preserving ORR greenfield space.

ORNL has various ongoing programs and initiatives that involve or facilitate environmentally and economically beneficial landscaping practices. These include

- incorporation of native plants into planning for restoration or landscaping in areas across ORNL;
- development of the ORNL Conceptual Landscape Plan and Design Guidelines, which calls for use of native plant species;
- use of an internal stream corridor protection effort to encourage the growth of native plants in the riparian zone surrounding ORNL creeks;
- the formation of an interagency Native Grass Working Group;
- integration of native-plant requirements into facilities-development projects;
- evaluation of upcoming projects by the ORNL Land and Facilities Use Committee on potential impacts, including impact on natural habitat;
- creation of an ongoing sitewide Pollution Prevention Program and a Storm Water Pollution Prevention Plan and Program;
- minimal use of pesticides and fertilizers, and use of organic fertilizers;
- extensive use of erosion controls in construction projects (e.g., settling ponds and bioretention areas);
- minimal use of water for irrigation;
- incorporation of plants into project designs for energy conservation by providing shade and cooling to paved surfaces;
- provision of public-awareness interaction on invasive plants, nuisance wildlife, and restoration of native grasses;
- use of brownfield areas for siting new ORNL developments, when practicable; and
- implementation of an interagency cooperative agreement on conversion of TVA power-line rights-of-way from fescue grass to native grasses and shrubs.

2.2.19 Release of Property

DOE Order 5400.5 establishes standards and requirements for operations of DOE and its contractors with respect to protection of members of the public and the environment against undue risk from radiation. In addition to discharges to the environment, the release of property containing residual radioactive material is a potential contributor to the dose received by the public, and DOE Order 5400.5 specifies limits for unrestricted release of property to the public.

BWXT-Y-12, UT Battelle, and Bechtel Jacobs Company each utilize a graded approach for release of material and equipment for unrestricted use by the public. Material has been categorized so that in some cases an administrative release can be accomplished without a radiological survey. Such material originates from nonradiological areas and includes the following:

- documents, mail, diskettes, compact disks, and other office media;
- nonradioactive items or materials received which are immediately (within the same shift) determined to have been misdelivered or damaged;
- personal items or materials;
- paper, plastic products, aluminum beverage cans, toner cartridges, and other items released for recycling;
- office trash;
- nonradiological area housekeeping materials and associated waste;
- break-room, cafeteria, and medical wastes;
- medical and bioassay samples; and
- other items with an approved release plan.

Items originating from nonradiological areas within the sites' controlled areas not in the listed categories are surveyed prior to release to the public, or a process knowledge evaluation is conducted to ensure that material has not been exposed to radioactive material or beams of radiation capable of creating radioactive material. In some cases both a radiological survey and a process knowledge evaluation are performed (e.g., a radiological survey is conducted on the outside of the item, and a process knowledge form is signed by the custodian for inaccessible surfaces.) When the process knowledge approach is employed, the item's custodian is required to sign a statement that specifies the history of the material and that confirms that no radioactive material has passed through or contacted the item. Items advertised for public sale via an auction are also surveyed on a random basis by state of Tennessee personnel, giving further assurance that material and equipment are not being released with inadvertent contamination.

A similar approach is used for material released to state-permitted landfills on the ORR. The only exception is for items that could be

contaminated in depth; items contaminated in depth are also sampled by laboratory analysis to ensure that landfill permit criteria are met.

ORR contractors continue to follow the requirements of the scrap metal moratorium. No scrap metal originating from radiological areas is being released for recycle.

2.3 Appraisals and Surveillances of Environmental Programs

Numerous appraisals, surveillances, and audits of ORR environmental activities were conducted during 2004 (see Tables 2.15, 2.16, and 2.17). These tables do not include internal DOE prime contractor assessments for 2004.

2.4 Environmental Permits

Table 2.18 contains a summary of environmental permits for the three ORR sites. Continuing permits, required at each of the ORR facilities, are RCRA operating permits, NPDES permits, and air operating permits.

2.5 Notices of Violations and Penalties

ORNL received one NOV from TDEC in 2004 for a RCRA nonconformance, two NOVs for NPDES permit nonconformances, and one NOV for CAA nonconformance. The RCRA issue was for failure to make a waste determination on five drums of waste. ORNL provided response correspondence to TDEC stating that a waste determination had been made and addressing corrective measures taken for the five drums of confirmed radioactive waste. The NPDES NOVs were for permit nonconformance that occurred at the ORNL Sewage Treatment Plant and the ORNL Coal Yard Runoff Treatment Facility. The Sewage Treatment Plant NOV was for exceedance of an effluent total suspended solids limit, and the Coal Yard Runoff Treatment Facility NOV was for exceedance of effluent iron and copper limits. Both situations were investigated, corrective actions were taken, and there was no recurrence of either condition. The CAA NOV was for a construction project air emissions permitting administrative error. The situation has been corrected.

One NOV was issued by TDEC in 2004 for ETTP RCRA operations. This NOV covered five items of noncompliance:

- one instance of poor container condition at Building K-1065-A;
- one drum with improper labeling in Building 1423-A dike;
- seven containers that were stored in excess of one year and were not included in the ETTP Site Treatment Plan;
- 128 containers of filter press sludge generated at the TSCA Incinerator, were not characterized in a timely manner and 71 of those drums were stored in excess of one year; and
- cracks/bare concrete in the floor at Buildings K-1435-B, K-1435-C, and K-1425 were not repaired despite having been identified in the February 2003 TDEC inspection.

BWXT Y-12 received one NOV in 2004. An NOV was issued by TDEC against the Y-12 potable water distribution system for failure to have an adequate working cross connection control program and failure to maintain adequate records regarding the testing, repairs, and retesting of backflow prevention devices. Corrective actions have been implemented and reinspection by TDEC is pending.

2.6 Tennessee Oversight Agreement

The Tennessee Oversight Agreement is a voluntary agreement entered into between DOE and the state of Tennessee. This agreement reflects an extension through June 30, 2006, of the agreement between the DOE and the state executed on May 13, 1991, and continues to reflect the obligations and agreements regarding DOE's technical and financial support.

The agreement is designed to assure the citizens of Tennessee that their health, safety, and environment are being protected through existing programs and through substantial new commitments by DOE. Through a program of independent monitoring and oversight, the state will advise and assist in verifying that DOE's activities do not adversely impact the public health, public safety, or the environment. DOE and the state, in a spirit of partnership and cooperation, agree to find ways to achieve clean air,

Table 2.15. Summary of environmental audits and assessments conducted at the Y-12 Complex, 2004[a]

Date	Reviewer	Subject	Issues
		BWXT Y-12	
3/10/2004	City of Oak Ridge	Sanitary Sewer pretreatment inspection	0
3/10–11/2004	TDEC—Knoxville Office	TDEC Annual Clean Air compliance inspection	0
3/16/2004	TDEC—Nashville Office	TDEC relative accuracy test audit inspection of the NO_x monitors at the Y-12 Steam Plant	0
6/15–16/2004	TDEC	NPDES compliance evaluation inspection	0
9/8/2004	City of Oak Ridge	Sanitary Sewer pretreatment inspection	0
11/16–18/2004	TDEC	TDEC annual RCRA audit	0
		Bechtel Jacobs Company	
11/30/2004	TDEC	Title V annual inspection	0

[a]Abbreviations

NPDES	National Pollutant Discharge Elimination System
RCRA	Resource Conservation and Recovery Act
TDEC	Tennessee Department of Environment and Conservation

Table 2.16. Summary of environmental audits and assessments conducted at ORNL, 2004[a]

Date	Reviewer	Subject	Issues
		UT-Battelle	
5/18-21/2004	TDEC	Generator and Technical Services Division	1
7/19/2004	TDEC	NOV resolution	0
11/4/2004	TDEC	ORNL NPDES permit renewal inspection	0
11/9/2004	TDEC	ORNL NPDES permit renewal inspection	0
11/12/2004	TDEC DOE-O	ORNL NPDES storm outfalls inspection	1
11/30–12/1/2004	TDEC	TDEC air permit	0
		Bechtel Jacobs Company	
11/30/04	TDEC	Title V annual inspection	0

[a]Abbreviations

NOV	notice of violation
NPDES	National Pollutant Discharge Elimination System
ORNL	Oak Ridge National Laboratory
TDEC	Tennessee Department of Environment and Conservation
TDEC/DOE-O	TDEC/DOE-Oversight Division

Table 2.17. Summary of environmental audits and assessments conducted at the ETTP, 2004[a]

Date	Reviewer	Subject	Issues
1/5/2004	TDEC	Title V annual air inspection	0
3/29/2004	TDEC	RCRA inspection (permitted storage areas)	5

[a]Abbreviations

RCRA	Resource Conservation and Recovery Act
TDEC	Tennessee Department of Environment and Conservation

Table 2.18. Summary of permits as of December 2004

	Y-12 Complex	ORNL	ETTP
Resource Conservation and Recovery Act (RCRA)			
RCRA operating (Parts A and B)	3[a]	2[b]	3
Part B applications in process	2[c]	1	0
Postclosure	3[d]	0	0
Solid waste landfills	6[e]	0	0
Annual petroleum underground storage tank facility certificate	2	1	1
Transporter permit	1	1	1
Hazardous and Solid Waste Amendments (HSWA) Permit	1[f]	1[f]	1[f]
Clean Water Act			
National Pollutant Discharge Elimination System (NPDES)	1[g]	2	4[h]
Storm water	1[i]	1[i]	1[i]
Aquatic resource alteration	1	1	1
U.S. Army Corps of Engineers 404 permits	0	0	1
General storm water construction	1[j]	6	0
Clean Air Act			
Operating Title V Major Source Permit	2	2	8
Construction	1	2	2
Prevention of significant deterioration	0	0	0
Sanitary Sewer			
Sanitary sewer	1	0	0
Pump-and-haul permit	2[k]	2[k]	2
Toxic Substances Control Act (TSCA)			
TSCA Incinerator	0	0	1
Research and development for alternative disposal methods	0	0	0
Safe Drinking Water Act			
Class V underground injection control permits	0	0	0

[a]Three permits have been issued, and one of the three was terminated in 2004.

[b]Two permits have been issued, representing 16 active units and 5 proposed units.. One additional permit covers corrective action (HSWA) only.

[c]Two Part B permit renewal applications for TNHW-083 and TNHW-084 are under review by Tennessee Department of Environment and Conservation (TDEC) personnel.

[d]Three permits have been issued, representing units closed under RCRA in Bear Creek Hydrogeologic Regime, Chestnut Ridge Hydrogeologic Regime, and Upper East Fork Poplar Creek Regime.

[e]Three landfills are operational; one is inactive and has a record of decision under the Comprehensive Environmental Response, Compensation, and Liability Act; one is closed pending certification; and one is in postclosure care and maintenance.

[f]Oak Ridge Reservation (ORR) permit (TNHW-121). Requirements for corrective action have been integrated into the ORR Federal Facility Agreement.

[g]Issued 4/28/95 and effective 7/1/95. TDEC has incorporated requirements for storm water into individual NPDES permits.

[h]Only two NPDES permits are directly administered by DOE contractor. Two permits are administered through CROET.

[i]TDEC has incorporated into individual NPDES permits.

[j]Notice of intent that accesses a general NPDES permit. A notice of intent remains on file for construction of Building 9720-82 and hollow-fill.

[k]This includes one pump-and-haul permit for Y-12 and two for office trailers at ORNL, as well as one at Clark Center Park which is operated by East Tennessee Mechanical Contractors.

water, and land in concert with sustainable economic growth.

To date, a variety of activities have been conducted under the agreement. DOE has provided security clearances and training necessary for state employees to gain access to the sites. Environmental data and documents pertaining to the environmental management, restoration, and emergency management programs are provided or are made available to the state for its review. The TDEC/DOE Oversight Division routinely visits the three DOE sites to attend formal meetings and briefings, conduct walk-throughs of buildings operations to assess compliance with environmental regulations. The TDEC/DOE Oversight Division also collects air samples, water samples, and soil samples and occasionally does radiological surveys. Also, prior to surplus sales the TDEC/DOE Oversight Division routinely does a radiological survey of all equipment and material to be auctioned off.

The TDEC/DOE Oversight Division also prepares an annual environmental monitoring report of its activities (TDEC 2004a) and is available on the web at http://www.state.tn.us/environment/doeo/.