

## 2. Environmental Compliance

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### **Setting**

It is the policy of the U.S. Department of Energy Oak Ridge Operations Office 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), work smart standards, 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.

### **Update**

Except for a few minor instances, all the ORR sites were in compliance with all applicable environmental regulations in 1999.

At the end of CY 1999, all milestones, except for one under the Site Treatment Plan, had been met.

Each of the plants achieved a National Pollution Discharge Elimination System permit compliance rate of 99.9 % or better in 1999.

In 1999, all three ORR facilities operated in compliance with the regulatory dose limits, and met the emission and test procedures, of Tennessee Rule 1200-3-11-.08 (Emission Standards for Hazardous Air Pollutants for Radionuclides).

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

There are several private businesses operating under leasing arrangements at the ETTP under the DOE reindustrialization initiative. Lessees are accountable to comply with all applicable standards and regulations and to obtain permits and licenses with local, state, and federal agencies as appropriate. Unless specified, lessee operations are not discussed in this report.

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### 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, work smart standards (WSS), 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. The lessees obtain their own permits separate and distinct from DOE. The lessees' compliance activities are not reflected 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.

During routine operations or when ongoing self-assessments of compliance status identify environmental issues, the issues are typically discussed with the regulatory agencies. In the following sections, major environmental statutes and DOE orders 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, batteries, and many other substances deemed potentially harmful to human health and to the environment. RCRA also regulates under-

ground storage tanks (USTs) used for the storage of petroleum and hazardous substances; recyclable used oil; and batteries, mercury thermostats, selected pesticides, and fluorescent/hazardous light bulbs as universal wastes.

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

The Y-12 Plant, ORNL, and the ETPP are considered RCRA large-quantity generators. 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 a TSD facility or shipped directly off-site for treatment, storage, or disposal. At the end of 1999, the Y-12 Plant had about 146 generator accumulation areas for hazardous or mixed waste. ORNL had about 305 generator accumulation areas, and the ETPP maintained about 45.

The Union Valley Sample Preparation Facility is also a large-quantity generator. At the end of 1999, this facility had nine satellite accumulation areas and one 90-day accumulation areas.

ORISE is classified under RCRA as a conditionally exempt small-quantity generator. Its site accumulation area is located in the Chemical Safety Building on the Scarboro Operations Site.

The Central Training Facility on Bear Creek Road, the Transportation Safeguards Division Garage, ORNL's Walker Branch Watershed Laboratory, and the Freil's Bend area are also classified as conditionally exempt small-quantity generators.

The Y-12 Plant is also registered as a large-quantity generator and a TSD facility under EPA Identification (ID) Number TN3890090001. Most of the units at the Y-12 Plant are being operated under operating permits; however, several units still operate under interim status in accordance with a Part A permit application. Six RCRA Part B permit applications have been submitted for

storage and treatment units at the Y-12 Plant. Four Part B applications have been approved and issued as RCRA operating permits (Table 2.1). One application has been withdrawn because the unit (Interim Reactive Waste Treatment Unit) was closed in 1997. One application has not been acted on.

The first Y-12 Plant permit (TNHW-032) was issued by the TDEC on September 30, 1994, for tank and container storage units.

Permit TNHW-083 was issued by TDEC on September 28, 1995, for container storage units. Permit TNHW-084 was also issued by TDEC on September 28, 1995, for production-associated units.

Permit TNHW-092 was issued by TDEC on September 3, 1996, for the production and storage of classified waste.

Several permit modifications, involving all these permits, were submitted in 1999. The modifications predominately dealt with administrative changes (i.e., updating Plant Shift Superintendent list) and physical modification of the permitted areas.

ORNL is registered as a large-quantity generator and a TSD facility under EPA ID Number TN1890090003. ORNL's most recent Part A revision on July 14, 1999, included 33 units. During 1999, 26 units operated as interim-status or permitted units; another 7 units were proposed (new construction). A revised permit application for the Chemical Detonation Facility was submitted in 1998; state action on that permit application was still pending at the writing of this report. ORNL has been issued four operating permits (see Table 2.1). Seventeen permit modifications of the Part B (operating) permits were submitted during 1999. Class <sup>1</sup>1 permit modifications were submitted to and approved by TDEC in 1999 that removed LMER as co-operators on all three RCRA permits. Late in 1999, three Class <sup>1</sup>1 permit modifications requested the addition of WESKEM as co-operator; approval is expected in early 2000. Two Class 2 modifications (for the TNHW-097 and TNHW-10A permits) were requested to add newly listed waste codes; that request was later rescinded because those waste codes were vacated by EPA. Nine Class <sup>1</sup>1 modifications were implemented: (1) making minor changes in the job descriptions (for all three ORNL permits: TNHW-027, TNHW-010A, and TNHW-097); (2) revising

Table 2.1. RCRA operating permits, 1999

Permit Number	Building/description
<i>Y-12 Plant</i>	
TNHW-032	Building 9811-1 Tank Storage Unit (OD-7) Waste Oil/Solvent Storage Unit (OD-9) Liquid Organic Solvent Unit (OD-10)
TNHW-083	Building 9720-9 Container Storage Unit Building 9720-25 Container Storage Unit Building 9720-31 Container Storage Unit Building 9720-58 Container Storage Unit Building 9811-1 Container Storage Unit
TNHW-084	Building 9206 Building 9212 Building 9720-12 Cyanide Treatment and Storage Unit Organic Handling Unit
TNHW-092	Building 9720-32 Building 9720-59
<i>ORNL</i>	
TNHW-010	HSWA Only
TNHW-010A	Building 7507 Container Storage Unit Building 7507W Container Storage Unit Building 7651 Container Storage Unit Building 7652 Container Storage Unit <sup>a</sup> Building 7653 Container Storage Unit Building 7654 Container Storage Unit Building 7668 Container Storage Unit <sup>b</sup> Building 7669 Container Storage Unit Building 7934 Container Storage Unit Portable Buildings 1 & 2 Container Storage Unit
TNHW-027	Tank 7830A Storage Unit
TNHW-097	Building 7855 Container Storage Unit Building 7883 Container Storage Unit Building 7884 Container Storage Unit Building 7578 Container Storage Unit Building 7579 Container Storage Unit 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 7842 Container Storage Unit Building 7878 Container Storage Unit Building 7879 Container Storage Unit Building 7824 Container Storage Unit
<i>ETTP</i>	
TNHW-015	K-1435 Toxic Substances Control Act Incinerator
TNHW-015A	K-1425 and K-1435 Container and Tank Storage Units
TNHW-056	Container Storage Units and Waste Pile Units
TNHW-057	K-1202 and K-1420-A Tank Storage Units

<sup>a</sup>Incorporated May 1997; was originally TN1890090003 (TNHW-010) up to May 1997.

<sup>b</sup>Closure completed December 21, 1998; TDEC approval received April 14, 1999.

the emergency coordinator lists (all three permits); and (3) relocating emergency response equipment (all three permits) and to allow venting of containers of highly radioactive wastes (TNHW-097 permit only). However, TDEC requested the container-venting modification be resubmitted as a Class <sup>1</sup> modification. Final approval of the container-venting modification should be in early 2000.

The ETTP is registered as a large-quantity generator and a TSD facility under EPA ID Number TN0890090004. The ETTP has received four 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 this permit was submitted to TDEC in March 1997. A second permit (TNHW-015A) is for storage of waste at the incinerator. Two other permits (TNHW-056 and TNHW-057) cover container and tank storage at various locations throughout the plant.

Modifications in 1999 to all four ETTP RCRA permits included changes in perimeter fencing and an update of contingency plan information. Modifications to TNHW-015 included equipment changes and modifications. Additional minor permit modifications provided clarification and updated information regarding the individual RCRA units.

**2.2.1.1 RCRA Assessments, Closures, and Corrective Measures**

The Hazardous and Solid Waste Amendments (HSWA) to RCRA, passed in 1984, require any facility seeking a RCRA permit to identify, inves-

tigate, and (if necessary) clean up all former and current solid waste management units (SWMUs). The original HSWA permit (HSWA 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 (FFA) (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 post-closure permit. DOE submitted comments on the draft permits; however, comment resolution is still pending.

The renewed permit will address contaminant releases from SWMUs and also from RCRA Areas of Concern (AOCs), but will also integrate RCRA requirements with cleanups conducted under the FFA and CERCLA programs (see Sect. 2.2.3). AOCs are areas contaminated by a release of hazardous constituents that originated from something other than a SWMU. Under the existing HSWA permit, DOE must notify EPA within 30 days of identification of a new SWMU, or of planned significant changes to SWMUs that could alter further investigation or corrective action. DOE has provided to EPA a proposed Appendix A to the permit that identifies existing SWMUs and AOCs for action or no action (see Table 2.2). The renewed permits (TDEC and EPA versions) are expected to be issued in 2000.

At the Y-12 Plant, 28 RCRA units have been closed since the mid-1980s. Closure of the Containerized Waste Storage Area at the Y-12 Plant was completed in 1999, and acceptance of the

**Table 2.2. Summary of proposed Appendix A to HSWA permit, 1999**

Appendix A section	Title	Number of sites proposed
1a	List of SWMUs and AOCs requiring further investigation under the Federal Facility Agreement	256
1b	List of SWMUs and AOCs requiring further investigation	0
2	List of SWMUs and AOCs requiring no further action/ investigation at this time.	294
3	List of SWMUs and AOCs requiring confirmatory sampling	0

closure certification by TDEC is expected in early 2000.

Since the mid-1980s, ORNL has closed a total of 8 RCRA units. Although closure of ORNL's Building 7668 was completed in late 1998, final closure approval was received on April 14, 1999. ORNL's Solid Waste Storage Area (SWSA) 6 is an interim-status disposal site (landfill) that underwent partial closure beginning in late 1988. A revised Closure Plan for SWSA 6 (which included the eight interim-measure caps, the Hill-cut Test Facility, and the Former Explosives Detonation Trench) was resubmitted in July 1995 to TDEC. The revised Closure Plan defers final closure to the CERCLA remediation process, which is expected to incorporate the RCRA closure requirements. On November 26, 1996, TDEC approved one portion of the SWSA 6 Closure Plan revision: the request to discontinue the maintenance and repair of the eight interim caps. TDEC action is still pending on the balance of the Closure Plan and on the DOE submittal of the associated Environmental Monitoring Plan and Post-Closure Permit Application. The remedy selection under CERCLA is expected to be completed in 2000.

At the ETPP, the RCRA closure of the K-1417-B Drum Storage Yard was completed in 1999. All other clean-up actions at ETPP are being conducted under CERCLA.

### **2.2.1.2 Land Disposal Restrictions**

The 1984 RCRA amendments established land disposal restrictions (LDRs), 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 not available for many years, DOE's storage of those mixed wastes over a year constituted RCRA LDR violations. In order to become compliant with RCRA, DOE entered into agreements with EPA and later TDEC (see Sect. 2.2.4).

### **2.2.1.3 RCRA Subtitle D Solid Waste**

Located within the boundary of the Y-12 Plant are two Class II operating industrial solid waste disposal landfills and two operating Class IV construction demolition landfills. These facilities are permitted by TDEC and accept solid waste from DOE operations on the ORR. In addition, one Class IV facility (Spoil Area 1) is overfilled by 11,700 yards and has been the subject of a CERCLA Remedial Investigation/Feasibility Study. A CERCLA Record of Decision (ROD) 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 (HS) 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, HS USTs are still regulated by EPA. Table 2.4 summarizes the status of USTs on the ORR. (See Appendix C for a summary of UST data.)

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 which meet the 1998 standards for new UST installations; 2 USTs still in service which are deferred or exempt from Subtitle I because they are regulated by other statutes [1 RCRA Subtitle C and 1 Clean Water Act (CWA)]. Of the 49 closed USTs, 24 were replaced by double-walled, concrete-encased aboveground storage tanks; 3 were replaced by the new state-of-the-art USTs; and 22 USTs were not replaced. Groundwater monitoring of closed USTs was completed in August 1999, and the last UST monitoring wells were plugged and abandoned in November 1999. Four case closure approval letters were received during 1999. Case closure letters for the last three USTs are expected in 2000, thus completing the ORNL UST closure and replacement program.

**Table 2.3. RCRA Subtitle D landfills, 1999**

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 (Spoil Area 1)	DML-01-103-0012	Overfilled, Class IV Subject of CERCLA ROD
Construction and Demolition Landfill VI	DML-01-103-0036	Operating, Class IV
Construction and Demolition Landfill VII	DML-01-103-0045	Operating, Class IV
Construction and Demolition Landfill II	IDL-01-103-0189	Postclosure care and maintenance

**Table 2.4. ORR UST status, 1999**

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

<sup>a</sup>The 51 “closed” USTs include deferred or excluded tanks of various categories, as detailed in the text.

<sup>b</sup>Two USTs are deferred because they are regulated by the Atomic Energy Act of 1954. The third is a permanently closed methanol UST.

<sup>c</sup>Closed tanks include two hazardous substance tanks, both of which were excavated, removed, and dismantled.

<sup>d</sup>Four USTs were permanently closed that were 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 was permanently closed that stored a methanol/gasoline mixture.

The Y-12 Plant UST Program includes four active petroleum USTs that meet all current regulatory compliance requirements. The UST registration certificates for these tanks are current, and certificates are posted at the UST locations, enabling fuel delivery until March 31, 2001.

All legacy petroleum UST sites at the Y-12 Plant 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 (BMP). 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 the ETTP.

A detailed description of all ORNL, Y-12 Plant, and ETTP USTs and their current status is included in Appendix C.

## 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 ORR was placed on the EPA National Priorities List (NPL) in December 1989. The NPL is a comprehensive list of sites/facilities that have been found to pose a sufficient threat to human health and/or the environment to warrant cleanup under CERCLA. An interagency agreement under Section 120(c) of CERCLA was signed in January 1991 between EPA, TDEC, and DOE known as the ORR FFA. The FFA ensures 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. This agreement established the procedural framework and schedule for developing, implementing, and monitoring response actions on the ORR in accordance with CERCLA. The FFA Appendix C lists all of the inactive sites/areas that will be investigated, and possibly remediated, under CERCLA. Milestones for completion of CERCLA documents are available in Appendix E of the FFA.

DOE-ORO has incorporated aggressive management and productivity goals into its planning for the accelerated completion of the DOE Environmental Management mission as detailed in the initial *Accelerating Clean-Up: Paths to Closure, Oak Ridge Operations Office* (DOE 1999b), published in February 1999. Key assumptions for the accomplishment of these goals are:

- reindustrialization is a method of accomplishment for decontamination and decommissioning. The value of assets in the form of idle equipment, facilities, land, etc., is provided to the private sector to offset some of the costs;
- the use of innovative technologies is incorporated into planning for the Environmental Management (EM) Program;

- current environmental standards are met unless there is a reasonable assurance that the dialogue with the stakeholders/regulators will result in an acceptable alternate standard;
- waste are disposed of as follows:
  - waste generated by CERCLA actions are disposed of in an onsite waste management facility, which is operational by fiscal year (FY) 2001;
  - low-level waste is disposed of at the Nevada Test Site or commercial disposal sites;
  - transuranic waste is disposed of at the Waste Isolation Pilot Plant;
  - mixed low-level waste is disposed of at commercial disposal sites or Hanford;
  - hazardous waste is disposed of at various commercial facilities;
  - sanitary/industrial waste is disposed of onsite.

## 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).

EPA, DOE, and TDEC entered into an interagency agreement known as the ORR FFA to ensure 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. The ORR FFA is also intended to coordinate the corrective action processes of RCRA required under the HSWA permit with CERCLA.

As a further example, three RCRA postclosure permits, one for each of the three hydrogeologic regimes at the Y-12 Plant, have been issued and incorporate the seven major closed waste disposal areas at the Y-12 Plant. These are noted in Table 2.6. Groundwater corrective actions have been deferred to CERCLA. Reporting of groundwater-monitoring data will comply with RCRA postclosure permit conditions as well as CERCLA requirements.

**Table 2.5. RCRA and CERCLA corrective action processes, 1999**

RCRA	CERCLA	Purpose
RCRA facility assessment	Preliminary assessment/site investigation	Identify releases needing further investigations
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. Postclosure permits for Y-12 Plant hydrogeologic regimes**

Hydrogeologic regime	Waste area	Postclosure permit
Bear Creek Valley	1. Bear Creek Burial Grounds (including the walk-in pits) 2. Oil Landfarm 3. S-3 Pond Site (west)	TNHW-087
Chestnut Ridge	1. Chestnut Ridge Sediment Disposal Basin 2. Chestnut Ridge Security Pits 3. Kerr Hollow Quarry	TNHW-088
Upper East Fork Poplar Creek	1. New Hope Pond 2. S-3 Pond site (east)	TNHW-089

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 treatment plans for each site. The Act 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 1992 agreement was replaced in 1995 with a state commissioner’s order. The Tennessee commissioner’s order signed on September 26, 1995, culminated negotiations between DOE and the state and established a Site Treatment Plan (STP) to address treatment and disposal of DOE’s mixed waste from Oak Ridge facilities.

The ORR STP calls for mixed low-level (radioactive) waste (LLW) 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 proposed Transuranic Processing Facility (TPF) only as necessary to meet the waste acceptance criteria for disposal at the Waste Isolation Pilot Plant (WIPP).

The STP provides overall schedules, milestones, and target dates for achieving compliance with LDRs; a general framework for the establishment and review of milestones; and other provisions for implementing the STP that are enforceable under the commissioner’s order.

Semiannual progress reports document the quantity of LDR mixed waste in storage at the end of the previous 6-month period and the estimated quantity to be placed in storage for the next five fiscal years. All milestones and commitments for

### **2.2.4 Federal Facility Compliance Agreement**

In June 1992, DOE negotiated a Federal Facility Compliance Agreement with EPA and established the initial requirements for treating mixed wastes stored on the reservation. Later, the Federal Facility Compliance Act was signed by Congress on October 6, 1992, to bring federal facilities (including those under DOE) into full compliance with RCRA. The act waives the government’s sovereign immunity, allowing fines and penalties to be imposed for RCRA violations at



the STP were met for CY 1999. The annual update of the STP for CY 1998 has been approved and issued.

The STP will terminate when there is no LDR mixed waste in noncompliant storage (i.e., in storage for more than one year). In the absence of the STP, LDR mixed waste in storage for more than one year 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. These procedures 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 1999.

During 1999, 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 a “generic” categorical exclusion (CX) for ORNL Energy Division that would cover proposed bench-scale and pilot-scale research activities. A CX is one of a category of actions defined in 40 CFR 1508.4 that do not individually or cumulatively have a significant effect on the human environment and for which neither an environmental assessment (EA) nor an environmental impact statement (EIS) is normally required. Generic CXs expedite the NEPA process by allowing ORNL to group activities and proceed with a proposed action after completion of internal screening and documentation. In addition to NEPA compliance reviews for a variety of projects that were not covered by generic CXs (Table 2.7), other NEPA reviews covered routine maintenance actions, laboratory and office renovation and upgrades, reroofing of ORNL facilities, and site characterization activities.

**Table 2.7. NEPA activities during 1999**

Types of NEPA documentation	Y-12 Plant	ORNL	ETTP
Categorical exclusion (CX) recommendation	5	10	4
Specific CX granted	4	10	4
Approved under general CX documents	50	35	91
Environmental assessment	1	0	0
Special environmental analysis	0	0	0
Programmatic environmental assessment	0	0	0
Supplemental analysis	0	0	0
Environmental impact statement	1 <sup>a</sup>	1 <sup>b</sup>	0
Supplemental environmental impact statement	0	0	0
Programmatic environmental impact statement	0	0	0

<sup>a</sup>Site Wide Environmental Impact Statement (SWEIS) is in progress for operations of the Y-12 Plant.

<sup>b</sup>EIS for Spallation Neutron Source (SNS) has been finalized. Record of Decision (ROD) was signed in June 1999.

The DOE Office of Biological and Environmental Research proposes to add a Field Research Center (FRC) component to the existing Natural and Accelerated Bioremediation Research (NABIR) Program. The NABIR Program is a ten-year fundamental research program designed to increase the understanding of fundamental biogeochemical processes that would allow the use of bioremediation approaches for cleaning up DOE's contaminated legacy waste sites. An EA has been drafted (December 22, 1999) and the proposed action is to select and operate a field research component of the NABIR Program through the use of an FRC. The proposed FRC would consist of contaminated and uncontaminated (i.e., background) areas on DOE lands, and the EA analyzes two alternative sites: (1) ORNL/Y-12 Site and (2) Pacific Northwest National Laboratory/DOE Hanford 100-H Area. The ORNL/Y-12 Site FRC would include a previously disturbed 243-acre (98-hectares) contaminated area and a 404-acre (163-hectares) uncontaminated background area on the Y-12 Site. Within these areas would be small (less than one acre) test plots where field research would take place.

Funding has been provided to initiate the construction phase of DOE's proposed Spallation Neutron Source (SNS) project that would serve as a cornerstone for advanced research in neutron scattering into the next century. The proposed site for the SNS facility is on the ORR, on Chestnut Ridge approximately 2 miles northeast of ORNL. A site characterization survey, ecological resource surveys (potential habitat for federal- and state-listed animal and plant species and jurisdictional wetlands), and an archaeological survey have been completed, and findings from these surveys have been incorporated into the final EIS for the proposed project. A ROD on the EIS was issued on June 18, 1999.

Much of the NEPA activity at the ETPP during 1999 involved review of potential leases of the land and facilities. The *Final Environmental Assessment, Lease of Land and Facilities Within the East Tennessee Technology Park, Oak Ridge, Tennessee* (ORO 1997) was completed and approved in 1997 and was issued in December with a finding of no significant impact (FONSI). The EA was written to describe the baseline environmental conditions at the site, to analyze potential generic impacts to the baseline environment from

future tenant operations based on defined bounding scenarios, and to identify and characterize cumulative impacts of future industrial uses of the site. In addition, the EA provides DOE with environmental information for developing lease restrictions. In 1999, NEPA reviews supported 39 potential lease actions. An EA determination was prepared and approved in December 1999 for LLW Storage at the ETPP. Other NEPA reviews covered more routine maintenance actions, such as upgrade of sprinkler systems, roof repairs, transfer of properties, fencing projects, and Cooperative Research and Development Agreement (CRADA) activities.

At the Y-12 Plant, job-specific CX documents were prepared and approved in 1999 for two projects involving demolition and disposal of small support structures: one project for construction of a new changehouse, and one for a CERCLA early-action cleanup project. A job-specific CX request was not approved for a significant process upgrade project; the project has since been canceled. Other general CX NEPA reviews covered routine actions, such as office renovations, improvements to communications and security systems, equipment replacements, and infrastructure improvements.

The DOE prepared an Environmental Assessment for the Receipt and Storage of Uranium Materials from the Fernald Environmental Management Project Site, issuing a finding of no significant impact in April of 1999. The Y-12 Plant was one of four sites selected to receive and store uranium materials from the cleanup of the DOE Fernald site, until such time when its market potential can be realized.

The DOE also prepared an Environmental Analysis of a Proposed NABIR Field Research Center on the Oak Ridge Reservation that included some property in Bear Creek Valley that falls under the management of the Y-12 Site. This project is discussed further in Sect. 5.

In March 1999, DOE published the Notice of Intent to prepare a Site-Wide Environmental Impact Statement (SWEIS) for the Y-12 Plant. Public Scoping Meetings were held in April, and Public Workshops were held in September. The SWEIS will analyze current and ongoing operations at the Y-12 Plant as projected for the next 5 to 10 years. In addition, specific analysis will be presented for two proposals for new facilities and

alternatives for the highly enriched uranium (HEU) Storage and the Special Materials Missions at Y-12. Alternatives considered for the HEU Storage Mission include No Action (continue to use existing Y-12 storage facilities), construct a new HEU Materials Facility at one of two proposed sites, or construct a new addition to an existing building. Alternatives considered for the Special Materials Mission include No Action (continue to use existing special materials operations facilities), or construct a new Special Materials Complex at one of three proposed sites. The Draft SWEIS will be available for public review in the Summer of 2000. Public meetings will be scheduled to receive comments on the Draft document. Comments will be addressed and the Final SWEIS is scheduled for publication in December 2000, with a ROD to follow in late January 2001.

### 2.2.6 National Historic Preservation Act

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*. 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 (SHPO), 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. It stipulates that DOE-ORO will prepare a cultural resource management plan (CRMP) for the ORR and will provide a draft of the CRMP to the Tennessee SHPO and Advisory Council on Historic Preservation within 24 months of the ratification of the agreement. The agreement also stipulates that DOE-ORO will conduct surveys to identify significant historical properties on the ORR. A draft CRMP has been completed and reviewed by the SHPO and the Advisory Council. Comments from the SHPO, the Advisory Council, and the public have been incorporated into the CRMP, which is expected to be issued in 2000.

Compliance with NHPA at ORNL, the Y-12 Plant, and the ETTP is achieved and maintained in conjunction with NEPA compliance. The scope of proposed actions is reviewed in accordance with the programmatic agreement, and, if warranted, consultation is initiated with the SHPO and the Advisory Council on Historic Preservation, and the appropriate level of documentation is prepared and submitted. ORNL submitted one historical review in 1998 for installing siding on Building 3550. Additional supplemental information to justify the installation of siding on Building 3550 was submitted to the SHPO and the Advisory Council in 1999. A historical review was completed for reroofing Freel's Cabin, a two room, one-story saddlebag log house that was constructed in the 19<sup>th</sup> century. Six reviews were prepared for submittal in 1999 from the ETTP. Most of the submittals dealt with leasing portions of property and/or land on the ORR.

The Y-12 Plant did not prepare or submit any Project Summaries to the Tennessee SHPO in 1999.

The ETTP and Y-12 Plant have been surveyed to identify sites eligible for inclusion in the *National Register*, and an archaeological survey has been completed. ORR-wide surveys to identify and evaluate pre-World War II structures and known archaeological sites for eligibility in the *National Register* were completed in 1995. Survey results were incorporated into the CRMP.

A survey of all ORISE structures was conducted to comply with the NHPA. Two properties, the Freel's Cabin and the Atmospheric Turbulence Diffusion Laboratory, were identified as previously included in the *National Register*. Management responsibilities for the Freels Cabin have since been transferred to ORNL. Section 106 of the NHPA requires federal agencies to coordinate with the state and allow the SHPO to review proposed demolition projects and other activities adversely affecting existing structures. During the past 3 years, ORISE removed 40 surplus structures (some requiring decontamination) from the ORR.

### 2.2.7 Protection of Wetlands

Executive Order 11990 (issued in 1977) was established to mitigate adverse effects to wetlands caused by destruction or modification of wetlands

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 BMPs are required for activities on the ORR. Coordination with TDEC, the U.S. Army Corps of Engineers (COE), and 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 COE, TVA, and/or the state (see Sect. 2.2.12.4 for permitting details). In addition, TDEC has developed a regulatory position on impacted wetlands that includes mitigation; any affected wetlands must be replaced in area and function by restoration of disturbed wetlands, construction of wetlands, or enhancement of previously impacted area.

The ORR implements protection of wetlands through each site NEPA program in accordance with 10 CFR 1022, "Floodplain/Wetlands Environmental Review Requirements." Each of the sites also has conducted surveys for the presence of wetlands, and conducts surveys on a project or program as-needed basis. Wetland surveys and delineations have been conducted on about 14,000 acres (5668 ha) of the 34,424 acres (13,968 ha) that make up the reservation. About 800 acres (324 ha) of wetlands have been identified in the areas in which surveys have been conducted. Surveys for the remaining 20,500 acres (8300 ha) will be conducted only as needed.

The Y-12 Plant has conducted two surveys of its wetlands resources. *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 Plant area of responsibility was completed in October 1994. The first report surveys the Y-12 Plant and surrounding areas; the second report, *Wetland Survey of Selected Areas in the Oak Ridge Y-12 Plant Area of Responsibility, Oak Ridge, Tennessee, Y/ER-279*, January 1997 (LMES 1997c), surveys additional areas for which restoration activities are planned.

A wetlands mitigation project is planned to offset wetlands that will be impacted by CERCLA activities in Bear Creek Valley. The project is discussed in Sect. 3.5.1.

In 1995, TDEC approved a wetlands mitigation plan for First Creek at ORNL in conjunction with a sediment-removal project on Melton Branch. Implementation of the plan was completed on schedule in March 1996 with annual reports submitted to TDEC as required. The plan required that a 1000-linear-foot reach of First Creek be planted in specific trees and shrubs and that it be protected and maintained as a stream-buffer zone. This protection and maintenance continued through 1999. 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), was completed and published in 1996 and serves as a reference document to support wetlands assessments for upcoming ORNL projects and activities. In addition, a wetlands survey of a selected area on the ORR was conducted for the proposed SNS project. The survey, *Ecological Resource Surveys for the Proposed National Spallation Neutron Source Site on the Oak Ridge Reservation: 1. Potential Habitat for Federal and State Listed Animal and Plant Species. 2. Jurisdictional Wetlands* (Rosensteel et al. 1997) was completed and published in April 1997. A Floodplain/Wetland Assessment was prepared for the proposed Fire Protection Systems Upgrade Line-Item project. This project, which would involve the installation of underground waterlines, would include disturbances of two small wetland areas and the floodplains of WOC in the 6000 area of ORNL. The Notice of Floodplain and Wetlands Involvement and the Floodplain Statement of Findings were published in the Federal Register on September 16, 1999, and October 29, 1999, respectively. A Corps of Engineers Permit and an Aquatic Resource Alteration Permit would be obtained from the U.S. COE and from the state of Tennessee, respectively, prior to disturbance of WOC and its tributaries.

In 1999, a partial survey of the ETPP wetlands was conducted. Approximately 75% of the ETPP area was surveyed and the wetland areas mapped. The map will be used to provide guidance on wetlands protection to construction crews, remediation projects, and other ETPP operations. The *East Tennessee Technology Park Blair Road Wetland Monitoring Report* (BJC 1999) was prepared and issued in June 1999.

## 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 floodplains 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 statement 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, species are considered endangered, threatened, or of special concern (plants) or in need of management (animals). All such species are termed threatened and endangered (T&E) species in this report.

### 2.2.9.1 Threatened and Endangered Animals

Listed animal species known to be currently 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 riversnail), amphibians (such as the hellbender), birds (such as Bachman’s sparrow), and mammals (such as the smoky shrew). Birds are one of the most thoroughly surveyed animal groups (along with fish and aquatic invertebrates) on the ORR. The only federally listed animal species that have been recently observed (e.g., the gray bat) are represented by one to several migratory or transient individuals rather than by permanent residents, although this situation may change as these species continue to recover. Similarly, several state-listed bird species, such as the anhinga, olive-sided flycatcher, sandhill crane, double-crested cormorant, and little blue heron are currently uncommon migrants or visitors to the reservation; however, the double-crested cormorant and little blue heron are increasing or will probably increase in numbers. Others, such as the cerulean warbler, northern harrier, great egret, and yellow-bellied sapsucker, are common migrants or winter residents that do not nest on the reservation.

### 2.2.9.2 Threatened and Endangered Plants

Twenty-one plant species that are threatened and endangered, currently known to occur on the ORR, are listed by the state of Tennessee, including the pink lady’s-slipper, and Canada lily (Table 2.9). Two species occurring on the ORR, Carey’s saxifrage (*Saxifraga careyana*) and purple fringeless orchid (*Platanthera permoena*), have been removed from the state list as of Nov. 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 former C2 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, Michigan lily and hairy sharp-scaled sedge, were identified in the past on the ORR; however, they have not been found in recent years. Several state-listed plant species currently found on adjacent

Table 2.8. Animal species of concern reported from the Oak Ridge Reservation<sup>a</sup>

Species	Legal status <sup>b</sup>		
	Federal	State	
<b>Fish</b>			
<i>Phoxinus tennesseensis</i>	Tennessee dace	NM	
<b>Amphibians and reptiles</b>			
<i>Hemidactylium scutatum</i>	Four-toed salamander	NM	
<b>Birds</b>			
<i>Haliaeetus leucocephalus</i> <sup>c</sup>	Bald eagle	T	T
<i>Falco peregrinus</i> <sup>d</sup>	Peregrine falcon		E
<i>Dendroica cerulea</i>	Cerulean warbler	C	
<i>Pandion haliaetus</i>	Oprey		T
<i>Ammodramus savannarum</i>	Grasshopper sparrow		NM
<i>Accipiter striatus</i>	Sharp-shinned hawk		NM
<i>Accipiter cooperii</i>	Cooper's hawk		NM
<i>Circus cyaneus</i>	Northern harrier		NM
<i>Anhinga anhinga</i>	Anhinga		NM
<i>Casmerodius alba</i>	Great egret		NM
<i>Egretta thula</i>	Snowy egret		NM
<i>Contopus borealis</i>	Olive-sided flycatcher		NM
<i>Grus canadensis</i>	Sandhill crane		NM
<i>Lanius ludovicianus</i>	Loggerhead shrike		
<i>Phalacrocorax auritus</i>	Double-crested cormorant		NM
<i>Sphyrapicus varius</i>	Yellow-bellied sapsucker		NM
<i>Egretta caerulea</i>	Little blue heron		NM
<b>Mammals</b>			
<i>Myotis grisescens</i>	Gray bat	E	E
<i>Sorex longirostris</i>	Southeastern shrew		NM

<sup>a</sup>Land and surface waters of the ORR exclusive of the Clinch River, which borders the ORR.

<sup>b</sup>E = endangered, T = threatened, C = species of concern, NM = in need of management.

<sup>c</sup>The bald eagle was proposed for federal delisting on July 6, 1999.

<sup>d</sup>The peregrine falcon was federally delisted on August 25, 1999.

lands may be present on the ORR as well, although they have not been located (Table 2.10).

## 2.2.10 Environmental Justice

On February 11, 1994, President Clinton promulgated Executive Order 12898, "Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations." 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 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 effectively communicate DOE activities to minority communities. Efforts are under way to ensure that DOE activities are presented to the public in a manner that does not require stakeholders to possess a technical background in order for them to effectively participate in the decision-making process.

In addition, each DOE planned action that is addressed under NEPA must include an analysis of the health, environmental, economic, and

**Table 2.9. Vascular plant species reported from the Oak Ridge Reservation which are listed by state or federal agencies, 1999**

Species	Common name	Habitat on ORR	Status code <sup>a</sup>
<i>Aureolaria patula</i>	Spreading false-foxglove	River bluff	(C2), T
<i>Carex gravida</i>	Heavy sedge	Varied	S
<i>Carex oxylepis</i> var. <i>pubescense</i> <sup>b</sup>	Hairy sharp-scaled sedge	Shaded wetlands	S
<i>Cimicifuga rubifolia</i>	Appalachian bugbane	River slope	(C2), T
<i>Cypripedium acaule</i>	Pink lady's-slipper	Dry to rich woods	E-CE
<i>Delphinium exaltatum</i>	Tall larkspur	Barrens and woods	(C2), E
<i>Diervilla lonicera</i>	Northern bush-honeysuckle	River bluff	T
<i>Draba ramosissima</i>	Branching whitlow-grass	Limestone cliff	S
<i>Elodea nuttallii</i>	Nuttall waterweed	Pond, embayment	S
<i>Fothergilla major</i>	Mountain witch-alder	Woods	T
<i>Hydrastis canadensis</i>	Golden seal	Rich woods	S-CE
<i>Juglans cinerea</i>	Butternut	Slope near stream	(C2), T
<i>Juncus brachycephalus</i>	Small-head rush	Open wetland	S
<i>Lilium canadense</i>	Canada lily	Moist woods	T
<i>Lilium michiganense</i> <sup>c</sup>	Michigan lily	Moist woods	T
<i>Liparis loeselii</i>	Fen orchid	Forested wetland	E
<i>Panax quinquefolius</i>	Ginseng	Rich woods	S-CE
<i>Platanthera flava</i> var. <i>herbiola</i>	Tuberculed rein-orchid	Forested wetland	T
<i>Ruellia purshiana</i>	Push's wild-petunia	Dry, open woods	S
<i>Scirpus fluviatilis</i>	River bulrush	Wetland	S
<i>Spiranthes lucida</i>	Shining ladies-tresses	Boggy wetland	T
<i>Thuja occidentalis</i>	Northern white cedar	Rocky river bluffs	S
<i>Viola tripartita</i> var. <i>tripartita</i>	Three-parted violet	Rocky woods	S

<sup>a</sup>Status codes:

(C2) Special Concern, under review for federal listing; was 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.

<sup>b</sup>*Carex oxylepis* var. *pubescens* has not been re-located during recent surveys.

<sup>c</sup>*Lilium michiganense* is believed to have been extirpated from the ORR by the impoundment at Melton Hill.

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 sources. The act requires 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. Because the systems that supply drinking water to the ORR are DOE-owned, the requirements of Section 1447 apply. The Underground Injection Control (UIC) program, adopted pursuant to the SDWA, regulates the emplacement of fluids into the subsurface by means of injection wells.

Potable water for the city of Oak Ridge, the Y-12 Plant, and ORNL is received from a DOE-owned water-treatment facility located northeast of the Y-12 Plant and currently managed by East Tennessee Mechanical Contractors in partnership with Johnson Controls World Services, Inc., for

Table 2.10. Additional rare plants that occur near the ORR and might be present on the ORR

Species	Common name	Habitat on ORR	Status code <sup>a</sup>
<i>Agalinis auriculata</i>	Earleaf false-foxglove	Calcareous barren	(C2), E
<i>Berberis canadensis</i>	American barberry	Rocky bluff, creek bank	S
<i>Gnaphalium helleri</i>	Catfoot	Dry woodland edge	S
<i>Lathyrus palustris</i>	A vetch	Moist meadows	S
<i>Liatris cylindracea</i>	Slender blazing star	Calcareous barren	E
<i>Lonicera dioica</i>	Mountain honeysuckle	Rocky river bluff	S
<i>Meehania cordata</i>	Heartleaf meehania	Moist calcareous woods	T
<i>Pedicularis lanceolata</i>	Swamp lousewort	Calcareous wet meadow	T
<i>Solidago ptarmicoides</i>	Prairie goldenrod	Calcareous barren	E
<i>Pycnanthemum torrei</i> <sup>b</sup>	Torrey's mountain-mint	Calcareous barren edge	
<i>Allium burdickii</i> or <i>A. tricoccom</i> <sup>c</sup>	Ramps	Moist woods	S-CE

<sup>a</sup>Status codes:

(C2) Special Concern, under review for federal listing; was 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.

<sup>b</sup>The scientific advisory committee on listing plants in Tennessee decided (12/17/99) not to list this species until a specimen is placed in the University of Tennessee Herbarium .

<sup>c</sup>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.

DOE. Both ORNL and the Y-12 Plant are designated as nontransient, non-community water-distribution systems by the TDEC Division of Water Supply and are subject to the Tennessee Regulations for Public Water Systems and Drinking Water Quality, Chapter 1200-5-1. Under the TDEC regulations, distribution systems that do not perform water treatment can use the records sent to the state by the water treatment facility from which water is received to meet applicable compliance requirements.

Both ORNL's and the Y-12 Site's water distribution systems have qualified for triennial lead and copper sampling. In 1997, the ORNL system was sampled; none of the samples exceeded the Tennessee lead or copper action levels. Therefore, no lead or copper sampling was required in 1999, but sampling will be conducted again in 2000. In 1999, the Y-12 Site was sampled. Twenty predetermined Tier I and Tier II samples were taken as "first draw" one-liter samples having at least a six-hour standing time in the pipe prior to sampling, as required by 40 CFR 141.86(b). The

results of the first set of samples indicated the lead action level of 0.015 mg/L was exceeded, but the copper level of 1.3 mg/L was not, based on the 90<sup>th</sup> percentile calculation requirements of 40 CFR 141,80(c). A resample was conducted. The results of the second set of samples indicate that the Y-12 Site is in compliance with both the lead and copper action levels. (The routine triennial monitoring was done at the approved sampling sites, which were locked-out by tagging and valving off the faucets to prevent their use for the required six-hour standing time for first-draw samples. When the valves were turned on and the samples taken and analyzed, four exceeded the action level. The sites were resampled after another six-hour lock-out that did not involve turning the valves, and the samples were within the action level. The sampling should represent a typical drinking water situation. Turning the cutoff valves off and on, as opposed to the faucet itself, is not typical. Based on this the first set of samples were invalidated based on the fact that the sampling did not represent a true, typical drinking water sce-



nario.) All ORNL and Y-12 drinking water distribution system bacteriological sample analyses were satisfactory in 1999.

In June 1997, ORNL received two Class V UIC approvals from the TDEC Division of Water Supply for two separate Environmental Sciences Division (ESD) research projects at Waste Area Grouping (WAG) 5. Work on one of these projects was completed in May 1998, and a report was submitted to TDEC in June 1998. Work on the second project is continuing and is anticipated to be completed in January 2003.

The K-1515 Sanitary Water Plant provides drinking water for the ETTP and for an industrial park located on Bear Creek Road south of the site. The DOE-owned facility is classified as a non-transient, noncommunity water-supply system by TDEC and is subject to state regulations. On April 1, 1998, operation of the facility became the responsibility of Operations Management International, Inc. (OMI, Inc.) under contract with the CROET.

A cross-contamination control program implemented at the Y-12 Plant, ORNL, and the ETTP prevents and eliminates cross-connections of sanitary water with process water and uses backflow-prevention devices and an engineering review and permitting process. As part of the program, an inventory of installed backflow-prevention devices is maintained, and inspection and maintenance of the devices are conducted in accordance with regulatory requirements.

### 2.2.12 Clean Water Act

The CWA was originally enacted as the Water Pollution Control Act in 1948, then later established as the Federal Water Pollution Control Act in 1972. Since that time, the CWA received two major amendments. 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 has established a comprehensive federal and state program to protect the nation's waters from pollutants. Congress continues to work on amendments to and reauthorization of the CWA. (See Appendix D for reference standards and data for water.)

### 2.2.12.1 National Pollutant Discharge Elimination System

One of the strategies developed to achieve the goals of the CWA was the establishment by the EPA 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.

The current Y-12 Plant NPDES permit (TN0002968) became effective on July 1, 1995, and encompasses approximately 100 active point-source discharges or storm water monitoring locations requiring compliance monitoring. The monitoring resulted in approximately 11,000 laboratory analyses in 1999, in addition to numerous field observations. Monitoring of discharges demonstrates that the Y-12 Plant has achieved an NPDES permit compliance rate of nearly 100%. At the Y-12 Plant, there were four NPDES noncompliances in 1999, compared with nine in 1998 (Fig. 2.1). Information on these noncompliances is provided in Appendix E, Table E.1, "Summary of Y-12 Plant NPDES Excursions for 1999." Personnel from TDEC conducted a com-

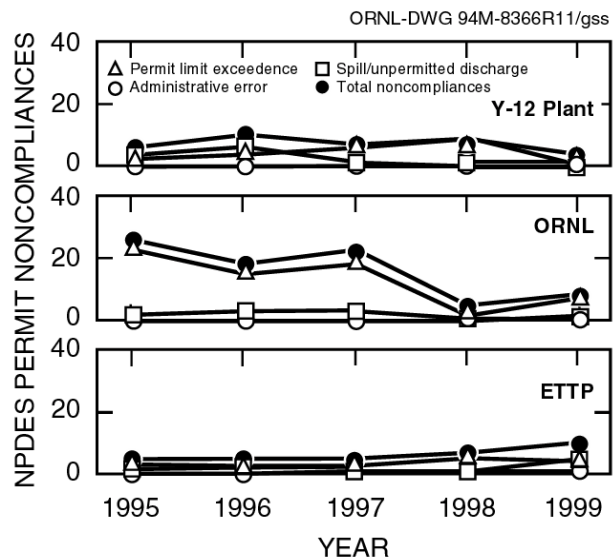


Fig. 2.1. Five-year summary of NPDES noncompliances.

pliance evaluation inspection of the Y-12 Plant NPDES program on May 10-11, 1999. There were no deficiencies noted during the inspection.

In September 1999, a Consent Order agreed to by the DOE and Tennessee Water Quality Board resolved the outstanding permit appeals regarding biotoxicity and mercury limitations in East Fork Poplar Creek (EFPC). The requirements for instream mercury monitoring and limits were deleted from the NPDES permit and placed under the CERCLA program. The current permit requires storm water characterizations at selected monitoring locations in accordance with the Y-12 Plant Storm Water Pollution Prevention Plan. Other documents submitted to TDEC in accordance with the NPDES permit include the Radiological Monitoring Plan (revised in 1997) and the Biological Monitoring and Abatement Program (BMAP) Plan (revised in 1998). A report on the analysis of fecal coliform bacteria levels at selected storm water monitoring points has been previously submitted. In October 1999, an application for renewal of the Y-12 NPDES permit was submitted to the TDEC.

ORNL is currently operating under NPDES Permit TN 0002941, which was renewed by TDEC on December 6, 1996, and went into effect February 3, 1997. 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 6,500 laboratory analyses and measurements in 1999, in addition to numerous field observations by ORNL field technicians. The NPDES permit limit compliance rate for all discharge points for 1999 was nearly 100%, with only seven out of about 6,500 individual measurements exceeding their respective permit limits (Fig. 2.1). (See Appendix E, Table E.2.)

The current permit requires ORNL to conduct detailed characterization of numerous storm water outfalls, conduct an assessment and evaluation to modify the Radiological Monitoring Plan, develop and implement a Storm Water Pollution Prevention Plan, implement a revised BMAP plan, and develop and implement a Chlorine Control Strategy. DOE appealed certain limits and conditions of the renewed ORNL permit, including numeric limits on effluent mercury, arsenic, and selenium.

The ETTP NPDES permit included three major outfalls, one minor outfall, and 136 storm-drain outfalls. From about 35,000 NPDES laboratory and field measurements completed in 1999, only 10 noncompliances occurred, indicating a compliance rate of more than 99% (Fig. 2.1). (See Appendix E, Table E.3.)

The ETTP is operating under NPDES Permit TN0002950, issued with an effective date of October 1, 1992. A major permit modification became effective June 1, 1995, and the permit expired on September 29, 1997. In anticipation of reindustrialization activities at ETTP and to facilitate the transfer of ownership/operation of ETTP facilities to other parties, the NPDES permit application submitted in March 1997 included a request to TDEC to issue four separate NPDES permits for wastewater treatment facilities, the sanitary water treatment facility, and the storm-water drainage system. The site continues to operate under the terms and conditions of the expired permit until new permits are issued.

In addition to the outfall monitoring requirements, the current ETTP NPDES permit includes requirements to develop and implement a Storm Water Pollution Prevention Plan, a BMAP plan, a Wastewater Control and Surveillance Plan for wastewater treatment facilities, and monitoring of the TSCA Incinerator Scrubber Effluent. Additionally, four compliance schedules were included in the permit when it was issued in October 1992. These compliance schedules required termination of discharges at three major outfalls and compliance with chlorine limitations at seven outfalls. All requirements specified by the compliance schedules were met by the required deadlines.

### 2.2.12.2 Sanitary Wastewater

The CWA includes pretreatment regulations for publicly owned treatment works (POTW). Sanitary wastewater from the Y-12 Plant is discharged to the city of Oak Ridge POTW under an industrial and commercial wastewater discharge permit. City personnel performed semiannual inspections on February 10 and August 18, 1999. No deficiencies of the Y-12 Plant Sanitary Sewer Compliance Program were noted during the inspections.

The Industrial User discharge permit in effect at Y-12 during 1999 was issued on August 25,

1997, by the city of Oak Ridge and expired on December 31, 1999. A new permit was issued January 1, 2000. The 1997 discharge permit established discharge limits for radionuclides, and these limitations were appealed by DOE, based on the right of sovereign immunity as stated in the Atomic Energy Act of 1954. Resolution of the appeal occurred when the city of Oak Ridge and DOE agreed that the requirements of DOE Order 5400.5 "Radiation Protection of the Public and Environment" are adequate to protect the Oak Ridge POTW and workers. Although the city of Oak Ridge agreed not to set discharge limits for radionuclides, the DOE is required to submit radiological monitoring data on a quarterly basis.

During 1999, the Y-12 Plant experienced one exceedence of the Industrial User Discharge permit. On December 16, the copper limit of 0.092 mg/L was exceeded. The result obtained was 0.093 mg/L.

Sanitary sewer radiological sample results at the Y-12 Plant 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. Typically, sample results indicate that the Y-12 Plant radiological discharges are three orders of magnitude below their respective DCG.

LMES submitted two applications for pump and haul permits to the TDEC in 1999. Both of these applications are expected to be approved in the year 2000. The requests are for the removal of sanitary wastes from the Clark Center Park restroom facilities and for the removal of similar wastes from a Y-12 Plant office trailer designated as Building 9983-AZ.

At ORNL, sanitary wastewater is collected, treated, and discharged separately from other liquid wastewater streams through an on-site STP. Wastewater discharged into this 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 STP is ultimately discharged into WOC 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, and as a result, the sludge is then managed as solid LLW. ORNL has completed a line-item project for comprehensive upgrades of its sanitary sewage system. Upgrades included sealing the collection system to reduce infiltration of contaminated groundwater and surface water and redirecting discharges from the laundry to appropriate alternative treatment facilities. The radioactivity level of ORNL STP sludge continues to decline. In 1998, ORNL's sewage sludge was accepted into the city of Oak Ridge's Biosolids Land Application Program. During 1999, ORNL transported seven tanker loads of sewage sludge to the Oak Ridge STP. Each tanker load was sampled and analyzed, and the resulting data/transfer approved by the city of Oak Ridge prior to delivery.

ETTP domestic wastewater is treated at the on-site K-1203 STP and discharged pursuant to the NPDES permit. Beginning April 1, 1998, operation of the facility became the responsibility of OMI, Inc. under contract with CROET. A sewer-use ordinance and a wastewater control and surveillance program are in effect to ensure adequate treatment of wastewater at the K-1203 STP and also to ensure that effluent from the facility continues to meet all NPDES permit limits. Bechtel Jacobs Company LLC submitted an application in 1999 for a sanitary sewage pump and haul permit for the K-1350-DF Facility at ETTP. Excess property sales are conducted in this area.

### 2.2.12.3 Storm Water Protection Permits

Storm water discharges associated with construction activities that disturb more than five acres of land must be NPDES permitted. Coverage under a general permit is typically available to a construction project if the proper Notice of Intent (NOI) is filed. In October 1999, ORNL submitted an NOI for storm water discharges associated with the construction of the SNS and construction

activities were initiated based on the NOI, in cooperation with TDEC regulatory personnel.

### 2.2.12.4 Aquatic Resources Protection

The COE, TVA, and TDEC conduct permitting programs for projects and activities with the potential to affect aquatic resources, including navigable waters, surface waters (including tributaries), and wetlands. These are the COE Section 404 dredge-and-fill permits, TDEC applicable or relevant and appropriate requirements (ARARs), and TVA 26A approvals.

An Aquatic Resources Alteration Permit (ARAP) (permit number 98-318) was issued to the Y-12 Plant in 1998 for removal of debris in EFPC at the Oil/Water Separator. This permit remains valid for this location until September 2003. In addition, one permit previously issued during remedial actions in Bear Creek Burial Grounds remains in force. No TVA or COE permits were issued to Y-12 in 1999.

Four new ARAPs were issued to ORNL in 1999. Two general ARAPs were issued for five stream crossings associated with the construction of a road between the TRU Waste Remediation Facility in Melton Valley and Highway 95 (permit numbers KFO 99-022 and 99-023). A general permit for debris removal (KFO 99-070) was issued to ORNL for the removal of an accumulation of unconsolidated gravel, which was interfering with flow measurement at the WOC Headwaters monitoring station. An ARAP was also issued for bank stabilization at the eastern security fence intersection with WOC (KFO 99-093). No TVA or COE permits were issued to ORNL or ETTP in 1999.

### 2.2.12.5 Oil Pollution Prevention

Section 311 of the CWA regulates the discharges of oils or petroleum products to waters of the United States and requires the development and implementation of a Spill Prevention Control and Countermeasures (SPCC) Plan to minimize the potential for oil discharges. Currently, each facility implements a site-specific SPCC Plan. This section of the CWA was significantly

amended by the Oil Pollution Act (OPA) of 1990, which has as its primary objective the improvement of responses to oil spills.

### 2.2.12.6 Clean Water Action Plan

The Clean Water Action Plan essentially reflects a commitment by federal agencies to work cooperatively to improve water quality in the United States and 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.

In 1999, planning discussions were initiated by the DOE-ORO Clean Water Implementation Plan coordinator for the Oak Ridge area that involved personnel from various ORNL research and support organizations. The initial focus was to identify potential EPA and Tennessee needs under the federal Action Plan where DOE and ORNL could provide service. On a national level, the Departments of Agriculture and Interior are developing a 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 multi-agency policy are to use a consistent and scientific approach to managing lands and resources and for assessing, protecting, and restoring watersheds; to identify specific watersheds in which to focus budgetary and other resources and accelerate improvements in water quality and watershed condition; to use the results of watershed assessments to guide planning and management activities; to work closely with States, Tribes, local governments, and stakeholders to implement this policy; to meet CWA responsibilities to adhere to Federal, State, Tribal, interstate, and local water quality requirements to the same extent as nongovernmental entities; and to 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 Tennessee by the EPA as described in the State Implementation Plan. Air pollution control rules are developed and administered by the TDEC.

### 2.2.13.1 General CAA Compliance

The TDEC air pollution control rules ensure compliance with the federal 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 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 Title V Operating Permit Program. Permit applications were submitted and determined to be complete by the TDEC. However, no Title V permits have been issued for DOE operations on the ORR to date. All sites continue to be covered under the application shield provision of the Tennessee Title V permitting rule which covers permitted air emission sources under existing air permits until issuance of the site level Title V air permits.

### 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 this rule, the entire DOE facility at Oak Ridge, Tennessee, must meet this emission standard.

During 1991 and 1992, DOE and EPA Region 4 negotiated a Federal Facilities Compliance Agreement (FFCA) for the purpose of bringing the ORR into full compliance with 40 CFR 61, Subpart H. As required by the FFCA, the *Compliance Plan: National Standards for Hazardous Air Pollutants for Airborne Radionuclides on the Oak Ridge Reservation, Oak Ridge Tennessee (Compliance Plan)*, was submitted to EPA Region 4 on December 15, 1992. In September 1993, EPA Region 4 conducted an inspection of the ORR to verify that all requirements of the FFCA were completed. All requirements were found to have been satisfactorily completed, and no deficiencies were noted. In May 1994, the *Compliance Plan* was updated to reflect additional agreements between EPA Region 4 and ORR since the original *Compliance Plan* was submitted in 1991.

On June 10, 1996, EPA delegated authority for regulation of airborne radionuclide emissions from DOE facilities in Tennessee to the Tennessee Department of Environment and Conservation (TDEC) Division of Air Pollution Control (DAPC). TDEC adopted the federal rule verbatim as Tennessee Rule 1200-3-11-.08 *Emission Standards for Emissions Other Than Radon from Department of Energy Facilities*. In addition, TDEC codified that all past formal agreements between DOE and EPA would be recognized provided these are current, valid, and supported by appropriate documentation. The TDEC-DAPC has given primary administrative authority of the radionuclide emission standard to the TDEC-Division of Radiological Health (DRH), which also licenses non-DOE nuclear facilities in the state.

The ORR facilities operated in compliance with the Radionuclide National Emission Standards for Hazardous Air Pollutants (Rad-NESHAP) dose limit of 10 mrem/year to the most exposed member of the public during 1999. Based

on modeling of radionuclide emissions from all major and minor point sources, the effective dose equivalent (EDE) to the most exposed member of the public was 0.69 mrem/year in 1999.

Beginning in 1999, the TDEC-DRH required DOE to assess the dose from airborne radionuclide emissions to members of the public located on the DOE ORR. Specifically, dose to lessees located in areas of the ORR where access to the public is not restricted was determined.

Continuous sampling for radionuclide emissions is conducted at the ETTP TSCA Incinerator and K-33 Decontamination Room, major sources at ORNL, and exhaust stacks serving uranium-processing areas at the Y-12 Plant. Grab samples and other EPA-approved estimation techniques are used on remaining minor emission points and grouped area sources to estimate emissions confirmatory measurements demonstrating compliance with the off-site dose limit. Fugitive emissions continue to be monitored by the ORR Perimeter Air Monitoring (PAM) System. In addition to this, ETTP continued to operate a site-specific ambient air monitoring system for surveillance of TSCA Incinerator uranium emissions. In addition to the ORR regulatory compliance program mentioned above, the EPA and DOE Oversight Division (TDEC/DOE-O) 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 (ACM). The compliance program for management of ACM removal and disposal includes demolition and renovation notifications to TDEC, inspections, monitoring, and prescribed work practices for abatement and disposal of asbestos materials. No releases of reportable quantities (RQs) of asbestos were reported at the ETTP, ORNL, or the Y-12 Plant in 1999.

### 2.2.13.5 State-Issued Air Permits

The Y-12 Plant has 36 active air permits covering 138 air emission points. There are 175 documented exempt minor sources and 414 exempt minor emission points. During 1999, one new construction permit was issued.

ORNL has 22 active operating permits covering 201 emission sources. The remaining emission sources are exempt from permitting requirements. During CY 1999, ORNL submitted a permit application for the construction of one additional emission source.

At the end of CY 1999, there were 88 active air emission sources under DOE control at the ETTP. The total includes 30 sources covered by eight TDEC air operating permits to construct. All remaining active air emission sources are exempt from permitting requirements. Permitted sources under DOE's Reindustrialization Initiative are no longer reported in this annual report, except for the portion of the year the source was under DOE control.

Air permit data are summarized in Appendix F.

### 2.2.13.6 NESHAP for Source Categories

There are only two sources on the ORR subject to Maximum Achievable Control Technology (MACT) standards. One 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 MACT. The other source is the TSCA Incinerator.

### 2.2.13.7 Stratospheric Ozone Protection

DOE remains committed to continued reductions in usage of regulated ozone-depleting substances (ODSs) and substituting, where possible, ODS with materials reported to have less ozone depleting potential. For example, DOE has committed to replacing Class I ODS-containing refrigeration appliances with cooling capacities at 150 tons or greater located at all DOE installations. This has been accomplished at ETTP and Y-12. This program of replacing large refrigeration appliances continues at ORNL.

### 2.2.13.8 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 disposal 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 PCBs at concentrations up to 49 ppm in landfills.

### **2.2.14.2 PCB Compliance Agreements**

The Oak Ridge Reservation PCB Federal Facilities Compliance Agreement (ORR-PCB-FFCA) between EPA Region 4 and DOE became effective on December 16, 1996. The agreement

addresses PCB compliance issues at the ETTP, ORNL, the Y-12 Plant, and ORISE. For the ETTP, the agreement supersedes a previous agreement known as the Uranium Enrichment Toxic Substances Control Act Federal Facilities Compliance Agreement (UE-TSCA-FFCA). The UE-TSCA-FFCA continues in force for the Portsmouth and Paducah gaseous diffusion plants.

The ORR-PCB-FFCA 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. In 1998, changes to the ORR-PCB-FFCA were proposed by DOE to reflect the TSCA/PCB amendments, specifically storage of PCB/radioactive waste beyond one year and alternative safe secondary containment system requirements for radioactive waste. DOE is awaiting EPA concurrence on the requested changes.

### **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 50-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 at 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. Unfortunately, the proposals to the new amendments that would have addressed these 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, and nonelectrical systems. More such unauthorized uses are likely to be found during the course of D&D activities. The most widespread of these unauthorized uses of PCBs are PCB-impregnated gaskets in the gaseous diffusion process motor ventilation systems at the ETTP. The discoveries of such uses include rubber gasket components used to seal glove-box units and paint coatings used on hydraulic equipment at the Y-12 Plant 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 submitted for the site. EPA approval of the sampling and monitoring plan was verbally issued on February 11, 1999. The first annual monitoring was initiated in March 1999. Those sample results showed low levels of PCBs in two catch basin sediments and, as a result, additional sampling was conducted in August 1999. A summary of the latest results of the sampling and recommendations for corrective action were prepared in late 1999 for submittal to EPA (expected early CY 2000). In 1999, ORNL reported finding PCBs at regulated levels in grease in a reactor positioning device and in a rolling mill. EPA approved ORNL's proposal for continued use of the rolling mill on November 17, 1999.

#### **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.

#### **2.2.14.5 PCB Research and Development Approvals**

During 1999, ORNL researchers continued investigations of alternative disposal methods for PCBs (enzymatic solution) under the approval of EPA Region 4.

#### **2.2.15 Federal Insecticide, Fungicide, and Rodenticide Act**

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) governs the sale and use of pesticides and requires that all pesticide products be registered by EPA before they may 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 Plant, the ETTP, and ORNL maintain procedures for the storage, application, and disposition of pesticides. Individuals responsible for application of FIFRA materials are certified by the Tennessee Department of Agriculture.

No restricted-use pesticide products are used at the Y-12 Plant, the ETTP, or ORNL. An inventory of pesticide products is maintained for use 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 the SARA Title III, requires reporting to federal, state, and local authorities of emergency planning information, hazardous chemical inventories, and releases of listed toxic chemicals to the environment. The ongoing requirements of EPCRA are contained in Sections 302, 303, 304, 311, 312, and 313 of EPCRA and are briefly described in Table 2.11. Executive Order (E.O.) 12856 *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements* requires all federal facilities to comply with provisions of EPCRA and the Pollution Prevention Act.

The ORR had no releases subject to Section 304 notification requirements during 1999. Sections 311 and 312 inventories of hazardous and

extremely hazardous chemicals, their locations and associated hazards, were submitted as required. Of the reportable Section 312 chemicals identified for CY 1999 on the ORR, 66 were located at the Y-12 Plant, 27 at ORNL, and 11 at the ETTP.

Hazardous chemicals reported in past DOE reports, now under the control of organizations under the DOE Reindustrialization Initiative were not reported in the CY 1999 submittal for the ETTP. Lessees must evaluate their own inventories of hazardous and extremely hazardous chemicals and submit information as required by both Sections 311 and 312.

DOE is required by Section 313 and the EO to participate in annual Toxic Release Inventory (TRI) reporting. The report is due to the EPA and TDEC on or before July 1 of each year covering the previous calendar year and addresses releases of reportable toxic chemicals to the air, water, and to land, as well as waste management activities and pollution prevention activities where reportable chemicals are involved. Amounts of toxic chemicals “processed,” “manufactured,” or “otherwise used” as defined under the Section 313 rule are aggregated for all DOE operations on the ORR and compared against activity thresholds for purposes of determining reportable chemicals. The TRI report covering reporting year (RY) 1999 was submitted for the ORR which included the ten toxic chemicals in Table 2.12.

Because of recent guidance issued by EPA, sulfuric acid (aerosol form only) manufactured in excess of the activity threshold as a by-product of combustion of coal at the Y-12 and ORNL steam plants and of wastes and fuel at the TSCA Incinerator was added for the reporting year. Copper (metal) was added because of the processing of copper for subsequent sale in excess of the activity threshold at the ETTP. Mercury (metal) was also added because of “otherwise use” of this material at the ORNL.

Reporting for chlorine was triggered because of use in potable water processing at the city of Oak Ridge Water Treatment Plant at Y-12. Reporting for ozone was required because of manufacture for microbial control in Y-12 cooling tower water. Releases of chlorine and ozone were low only requiring submittal of an EPA Form A for these.

**Table 2.11. EPCRA (SARA Title III) compliance information for the ORR**

Y-12 Plant	ORNL	ETTP
<i>302–303, Planning notification<sup>a</sup></i>		
In compliance	In compliance	In compliance
<i>304, Extremely hazardous substance release notification<sup>b</sup></i>		
In compliance	In compliance	In compliance
<i>311–312, Material safety data sheet/chemical inventory<sup>c</sup></i>		
In compliance	In compliance	In compliance
<i>313, Toxic chemical release reporting<sup>d</sup></i>		
In compliance	In compliance	In compliance

<sup>a</sup>Requires that Local Emergency Planning Committee and State Emergency Response Commission be notified of EPCRA-related planning.

<sup>b</sup>Addresses reporting to state and local authorities of off-site releases.

<sup>c</sup>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.

<sup>d</sup>Requires that releases of toxic chemicals be reported annually to EPA and the state.

**Table 2.12. EPCRA Section 313 toxic chemical release and off-site transfer summary for the ORR, 1999**

Chemical	Year	Quantity (lb) <sup>a</sup>			
		Y-12 Plant	ORNL	ETTP	Total
Chlorine	1998	0	0	0	0
	1999	0	0	0	0
Methanol	1998	43,730	906	0	44,636
	1999	30,597	517	0	31,114
Hydrochloric acid (aerosol)	1998	96,101	49,123	18	145,242
	1999	138,595	52,603	16	191,214
Sulfuric acid (aerosol)	1998	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
	1999	53,283	29,015	221	82,519
Lead	1998	10,379	5,346	5,801	21,526
	1999	4,923	11,723	1,895	18,541
Nitric acid	1998	469	1,204	0	1,673
	1999	296	81	1	378
Ozone	1998	0	0	0	0
	1999	0	0	0	0
Nitrate compounds	1998	202,870	64,161	6,857	273,888
	1999	5,641	62,091	2,057	69,789
Mercury	1998	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
	1999	141	712	23	876
Copper	1998	<i>b</i>	<i>b</i>	<i>b</i>	<i>b</i>
	1999	165	1,602	100,138	101,905
Total	1998	353,549	120,740	12,676	486,965
	1999	233,641	158,344	104,351	496,336

<sup>a</sup>Represents total releases to air, land, and water, and includes off-site waste transfers.

<sup>b</sup>No reportable releases in RY 1998.

Form R TRI forms were required for the following toxic chemicals. Hydrochloric acid (aerosol form only) manufactured as a by-product of combustion of coal at Y-12 and ORNL and of wastes at the TSCA Incinerator was reported. Lead (metal) was reported on because of use at the ORNL Lead Shop where lead is formed for purposes of radiological shielding. Methanol was reported on because of use in chiller systems at Y-12. Nitric acid was reported on because of use in process and waste treatment operations at ORNL and Y-12. Nitrate compounds were reported on because of manufacture of these in the STP at ORNL and waste management operations at all sites.

As for Sections 311 and 312, no reporting of TRI chemical releases or waste management activities from ETTP lessees were included in the DOE TRI report for RY 1999.

Total reportable ORR TRI chemical releases to the air, water, land, and through waste transferred off-site for treatment, disposal, and recycling increased slightly, by approximately two percent, over RY 1998 amounts. This was mainly due to the addition in RY 1999 of copper sent off-site in waste from the metals mining project at ETTP, first-time reporting of sulfuric acid aerosol releases from combustion of coal at Y-12 and ORNL, and use of a higher emission factor for hydrochloric acid aerosols from coal combustion as specified by EPCRA guidance. Nitrate compound release amounts significantly decreased because of additional information learned relative to the Y-12 sanitary sewer discharge to the city of Oak Ridge, which showed that this release is actually much lower than reported previously.

Reportable release to the air, water, and land, from each ORR site, can be reviewed in the EPA database at <http://www.epa.gov/triexplorer/reports.htm>.

Figure 2.2 shows total reportable ORR TRI chemical releases for each reporting year beginning with RY 1993.

### 2.2.17 Environmental Occurrences

CERCLA requires that the National Response Center be notified if a nonpermitted release of a RQ or more of a hazardous substance (including radionuclides) is released to the environment within a 24-hour 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 they can determine whether government response is appropriate.

During 1999, Y-12 Plant staff reported no CERCLA RQ releases to federal and state agencies.

The National Response Center and Tennessee Emergency Management Agency (TEMA) were notified of one incident that involved an oil sheen observed on EFPC.

During 1999, ORNL and the ETTP reported no CERCLA RQ releases or oil sheens to federal and state agencies.

## 2.3 APPRAISALS AND SURVEILLANCES OF ENVIRONMENTAL PROGRAMS

Numerous appraisals, surveillances, and audits of the ORR environmental activities were conducted during 1999 (see Tables 2.13, 2.14, and 2.15). These tables do not include internal DOE prime contractor assessments for 1999.

### 2.3.1 Defense Nuclear Facilities Safety Board

Under its enabling statute (Public Law 100-456), the Defense Nuclear Facilities Safety Board (DNFSB) is responsible for independent, external oversight of all activities in DOE's nuclear weapons complex affecting nuclear health and safety. The board reviews operations, practices, and occurrences at DOE's defense nuclear facilities and makes recommendations to the Secretary of Energy to protect public health and safety. The board has made 38 formal sets of recommendations including 175 specific recommendations on health and safety issues for DOE defense nuclear facilities.

In September 1994, during a DNFSB tour of a storage building in 9204-2E, a discrepancy with specific stipulations of the criticality safety approval for storage of fissile material in that area

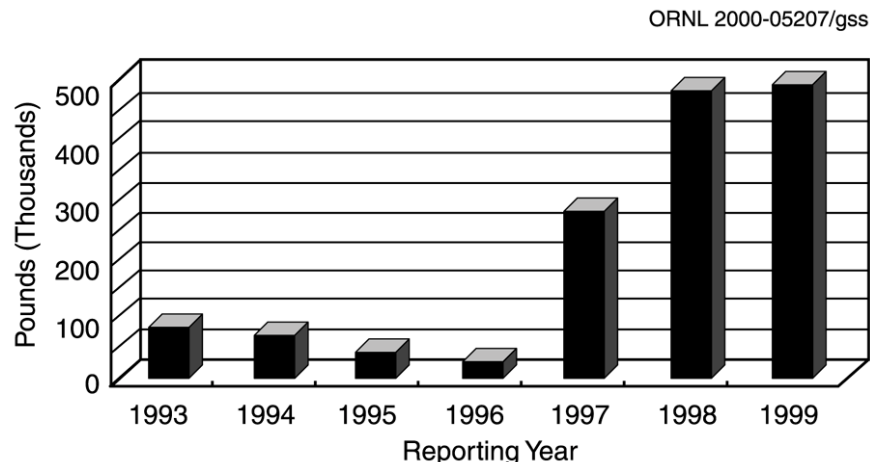


Fig. 2.2. Total reportable TRI chemical releases, 1993–1999.

**Table 2.13. Summary of environmental audits and assessments conducted at the Y-12 Plant, 1999**

Date	Reviewer	Subject	Issues
<b>Lockheed Martin Energy Systems, Inc.</b>			
1/7	TDEC	Opacity Compliance Monitoring	0
1/20–21	TDEC	RCRA	0
2/10	City of Oak Ridge	Pretreatment Inspection	0
3/9–10	TDEC	TDEC Rad Review	0
5/10–11	TDEC	NPDES CEI	0
6/4	TDEC	Opacity Compliance Monitoring	0
8/16	TDEC	Opacity Compliance Monitoring	0
8/18	City of Oak Ridge	Pretreatment Inspection	0
8/23	TDEC	Quality Assurance Audit Evaluation-Air	0
<b>Bechtel Jacobs Company</b>			
3/12, 6/10, 8/19, 11/22	TDEC	(Solid Waste Inspection) Quarterly inspections of Y-12 active landfills	0
6/17	TDEC	(Solid Waste Inspection) Biannual post closure inspection of the Y-12 Centralized Sanitary Landfill II facility	0

**Table 2.14. Summary of environmental audits and assessments conducted at ORNL, 1999**

Date	Reviewer	Subject	Issues
4/5–4/6 <sup>a</sup>	TDEC	Inspection of RCRA generator areas and treatment, storage, and disposal operations	0
4/21 <sup>b</sup>	TDOT	(Safe Dams Inspection) Inspection of White Oak Dam Spillway	0
5/12–13 <sup>a,b</sup>	TDEC, TDEC/DOE-O	(CWA Inspection) Annual Compliance Evaluation Inspection of ORNL NPDES Program (included Bechtel Jacobs Company and LMER facilities)	0

<sup>a</sup>LMER.<sup>b</sup>Bechtel Jacobs Company.

**Table 2.15. Summary of environmental audits and assessments conducted at the ETTP, 1999**

Date	Reviewer	Subject	Issues
3/2	EPA, TDEC/DOE-O	(Reindustrialization visit) Tour/site orientation of Reindustrialization Program	0
3/17	TDEC, EPA	(RCRA Inspection) Semiannual inspection of TSCA incinerator and discussion of human health and ecological risk assessment issues	0
4/26	TDEC	(RCRA Inspection) Semiannual RCRA inspection at ETTP	0
5/5	TDEC, TDEC/DOE-O	(CWA Inspection) Annual compliance evaluation inspection of ETTP NPDES program	0
6/17	EPA	(Reindustrialization visit) Discussion concerning categorization of facilities at ETTP (Reindustrialization)	0
9/20	TDEC	(RCRA Inspection) Semiannual ETTP RCRA inspection of permitted units, 90-day storage areas, and satellite accumulation areas	0

was identified. As a result, a number of operations at the Y-12 Plant were curtailed, and the DNFSB ultimately issued Recommendation 94-4, "Deficiencies in Criticality Safety at the Oak Ridge Y-12 Plant." However, environmental operations (compliance monitoring, reporting, and oversight) continued uninterrupted, and there were no environmental impacts as a result of the stand-down.

Since that time, operations in Y-12 facilities have been resumed in phases, and Phase A restart of Enriched Uranium Operations was completed in 1998. In March 1999, the DNFSB accepted the DOE proposal to close DNFSB Recommendation 94-4. The proposal cites improvements in the Y-12 Plant's overall conduct of operations, criticality safety, training, and qualification resulting from upgrade efforts in Recommendation 94-4.

## 2.4 ENVIRONMENTAL PERMITS

Table 2.16 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

The Y-12 Plant received two Notice of Violations (NOVs) in 1999 for NPDES chlorine permit limit excursions in October and December of 1998 and inability to meet minimum flow requirements in EFPC in October of 1998. Actions were taken at the time of the excursions to correct the problem. No fines or penalties were assessed by TDEC in connection with these NOVs.

ORNL received an NOV in 1999 for two NPDES permit limit excursions. ORNL provided a response to TDEC describing corrective actions for the excursions cited in the NOV. No fines or penalties were assessed by TDEC in connection with the ORNL NOV.

## 2.6 CURRENT ISSUES

### 2.6.1 Tennessee Oversight Agreement

On May 13, 1991, the state of Tennessee and DOE entered into a 5-year monitoring and oversight agreement in which DOE agreed to provide

Table 2.16. Summary of permits as of December 1999

	Y-12 Plant	ORNL	ETTP
<i>Resource Conservation and Recovery Act</i>			
RCRA operating (Part A and Part B)	4 <sup>a</sup>	4 <sup>b</sup>	4
Part B applications in process	0 <sup>c</sup>	1	0
Postclosure	3 <sup>d</sup>	0	0
Permit-by-rule units	13 <sup>e</sup>	125 <sup>e</sup>	9 <sup>e</sup>
Solid waste landfills	6 <sup>f</sup>	0	0
Annual petroleum UST facility certificate	2	1	1
Transporter permit	1	2 <sup>g</sup>	1
<i>Clean Water Act</i>			
NPDES	1 <sup>h</sup>	1	1
Storm water	1 <sup>i</sup>	1 <sup>i</sup>	1 <sup>i</sup>
Aquatic resource alteration	2	2	0
U.S. Army Corps of Engineers 404 permits	0	0	1
General storm water construction	1 <sup>j</sup>	0	0
<i>Clean Air Act</i>			
Operating air	36	21	8
Construction	1	1	2
Prevention of significant deterioration	0	0	0
<i>Sanitary Sewer</i>			
Sanitary sewer	1	0	0
Pump-and-haul permit	2	0	0
<i>Toxic Substances Control Act</i>			
TSCA Incinerator	0	0	1
R&D for alternative disposal methods	0	2	0
<i>Safe Drinking Water Act</i>			
Water Treatment Plant and distribution	2	1	1
Class V underground injection control permits	0	1	0

<sup>a</sup>Four permits have been issued, representing 15 active units.

<sup>b</sup>Four permits have been issued, representing 20 active units and 7 proposed units. One permit covers corrective action (HSWA) only.

<sup>c</sup>A Part B permit application for three waste piles was previously submitted to TDEC, but a permit is no longer being pursued because the waste piles are scheduled to be closed.

<sup>d</sup>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 (UEFPC) Regime.

<sup>e</sup>Number of units reported in 3016 Report/Inventory of Federal Hazardous Waste Activities. This report/inventory includes each tank unit (i.e., facility) and does not count individual tanks as a separate unit.

<sup>f</sup>Four landfills are operational: one (Spoil Area 1) is inactive and has an ROD under CERCLA, and one (Landfill II) is in postclosure care and maintenance.

<sup>g</sup>One permit for solid waste and one for hazardous waste.

<sup>h</sup>Issued 4/28/95 and effective 7/1/95. TDEC has incorporated requirements for storm water into individual NPDES permits.

<sup>i</sup>TDEC has incorporated into individual NPDES permits.

<sup>j</sup>Notice of intent that accesses a general NPDES permit. A notice of intent remains on file for construction at Landfill V, VII.

the state with financial and technical support for “independent monitoring and oversight” of DOE activities on the ORR. In June 1996, the state and DOE signed a 5-year extension of the agreement that will expire in June 2001. The agreement provides the state of Tennessee \$26.15 million over the 5-year period. Activities that are conducted under the agreement include oversight of DOE’s environmental monitoring, waste management, environmental restoration, and emergency management programs. The agreement is intended to assure Tennessee citizens that their health, safety, and environment are being protected by DOE through existing programs and substantial new commitments.

TDEC is the lead Tennessee state agency for implementation of the agreement. TDEC has established the Tennessee Department of Environment and Conservation/DOE Oversight Division (TDEC/DOE-O), located in the city of Oak Ridge. TDEC has entered into contracts with various state and local agencies to support oversight activities. Contracts have been signed with the TWRA for fish and wildlife monitoring activities, TEMA for emergency management support, and the ORR Local Oversight Committee for assistance in achieving a better public understanding of the issues and activities on the ORR.

A DOE-Tennessee Oversight Agreement (TOA) steering committee composed of site and major program representatives has been established to coordinate implementation of the TOA and to promote consistency in its implementation across the ORR. Bechtel Jacobs LLC, LMES, LMER, and other selected DOE prime contractors have established internal organizations, including the designation of TOA coordinators, to facilitate implementation of the agreement.

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 made available to the state for its review. TDEC/DOE-O routinely visits the three DOE sites to attend formal meetings and briefings, conduct walk-throughs of buildings and grounds, and conduct observations of site operations to assess compliance with environmental regulations. The TDEC/DOE-O also prepares an annual environmental monitoring report of its activities (TDEC 1999a). The report covering CY 1999 was issued in December 1999.