# 2. Environmental Compliance

***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, none of which had environmental or health consequences, all the ORR sites were in compliance with all applicable environmental regulations in 1998.

At the end of CY 1998, 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 1998.

In 1998, all three ORR facilities operated in compliance with the regulatory dose limits, and met the emission and test procedures, of 40 CFR 61, subpart H (National 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.

## 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 Industrialization 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 discussed with the regulatory agencies in an effort to ensure that compliance with environmental regulations will be sustained. In the following sections, compliance status for the ORR sites with regard to major environmental statutes and DOE orders is summarized by statute.

## 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 underground storage tanks (USTs) used for the storage of petroleum and hazardous substances; recycla-

ble used oil; and batteries, mercury thermostats, and selected pesticides or 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 wastes.

The Y-12 Plant, ORNL, and the ETTP are 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 1998, the Y-12 Plant had about 151 generator accumulation areas for hazardous or mixed waste. ORNL had about 345 generator accumulation areas, and the ETTP maintained about 89.

The Union Valley Sample Preparation Facility managed by the LMES Analytical Chemistry Organization is also a large-quantity generator. At the end of 1998, this facility had ten satellite accumulation areas and two 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, and ORNL's Walker Branch Watershed Laboratory are also classified as conditionally exempt small-quantity generators.

The Y-12 Plant is registered as a large-quantity generator and a TSD facility under EPA Identification (ID) Number TN3890090001. RCRA requires that owners and operators of hazardous waste management facilities have operating and/or postclosure care permits. 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. Amended Part A permit applications were submitted to TDEC in December 1991, August 1993, July 1994, September 1995, and March 1998 but have not yet been acted on. 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 closed 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. Three Class 1 permit modifications were submitted to the TDEC in 1998 for Permit TNHW-032. These modifications included changing the co-operator from LMES to LMES and Bechtel Jacobs Company LLC and then to just Bechtel Jacobs Company LLC, updating the contingency plan, updating the closure plan, and removing the requirement to hydrostatically test the tank dikes.

Permit TNHW-083 was issued by TDEC on September 28, 1995, for container storage units. Three Class 1 permit modifications were submitted to TDEC in 1998 for Permit TNHW-083. These modifications included changing the co-operator from LMES to LMES and Bechtel Jacobs Company LLC and then to just Bechtel Jacobs Company LLC, updating the contingency plan, and updating the closure plan.

Permit TNHW-084 was also issued by TDEC on September 28, 1995, for production-associated units. Three Class 1 permit modifications were submitted to TDEC in 1998 for Permit TNHW-084. These modifications included updating the contingency plan, removing the requirement to have shelf rings on the storage shelves, modifying the physical boundaries of permitted areas in Building 9212, updating the professional engineer-stamped drawing for the C-1 wing storage area in Building 9212, and making minor language changes.

Permit TNHW-092 was issued by TDEC on September 3, 1996 for the production and storage of classified waste. Four Class 1 permit modifications were submitted to TDEC in 1998 for Permit TNHW-092. This modification included changing the co-operator from LMES to LMES and Bechtel Jacobs Company LLC and then to just Bechtel Jacobs Company LLC, and updating the contingency plan.

ORNL is registered as a large-quantity generator and a TSD facility under EPA Identification

**Table 2.1. RCRA operating permits**

| Permit Number | Building/description |
|---|---|
| | *Y-12 Plant* |
| 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 9201-4 Container Storage Unit |
| | 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 |
| | Containerized Waste Storage Area (CWSA) |
| 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 |
| | *ORNL* |
| 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[a] |
| | Building 7653 Container Storage Unit |
| | Building 7654 Container Storage Unit |
| | Building 7668 Container Storage Unit[b] |
| | 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 |
| | *ETTP* |
| 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 |

[a]Incorporated May 1997; was originally TN1890090003 (TNHW-010) up to May 1997.
[b]Closure initiated late 1998; closure approval pending.

Number TN1890090003. ORNL's most recent Part A revision on November 4, 1998, included 33 units. During 1998, 26 units operated as interim-status or permitted units; another 7 units were proposed (new construction). ORNL has been issued four operating permits (see Table 2.1). A revised permit application for the Chemical Detonation Facility was submitted in 1998; state action on that permit application is still pending. Three new storage units (Buildings 7668, 7883, and 7572) were opened for waste storage during 1998. Three Class 1[1] permit modifications and seven Class 1 permit modifications were submitted to TDEC in 1998: (1) changing co-operators; updating the Waste Analysis Plan, Contingency Plan, operational information, and maps; and implementing safe-standby (interim shutdowns) (TNHW-027, TNHW-10A, and TNHW-097); (2) adding newly listed waste codes (TNHW-097 and TNHW-10A); and (3) revising security information (TNHW-097).

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 1997 to all four ETTP RCRA permits included changes in the facility name, changes in perimeter fencing, and an update of contingency plan information. Modifications to TNHW-015 and TNHW-015A allowed for the storage and treatment of F007 waste (cyanide salts present in electroplating solutions). 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, investigate, 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 solid waste management units (SWMUs) and also from RCRA Areas of Concern (AOCs). 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 1999.

At the Y-12 Plant, 27 RCRA units have been certified closed by TDEC since the mid-1980s. Closure of the Building 9201-4 Container Storage Unit at the Y-12 Plant was completed in 1998, and acceptance of the closure certification by TDEC is expected in early 1999.

ORNL's Solid Waste Storage Area (SWSA) 6 is an interim-status disposal site (landfill) that underwent partial closure that included construction of eight interim-measure caps. A revised Closure Plan for SWSA 6 (which included the

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

| Appendix A section | Title | Number of sites proposed |
|---|---|---|
| 1a | List of SWMUs and AOCs requiring further investigation under the Federal Facility Agreement | 257 |
| 1b | List of SWMUs and AOCs requiring further investigation | 0 |
| 2 | List of SWMUs and AOCs requiring no further action/ investigation at this time. | 277 |
| 3 | List of SWMUs and AOCs requiring confirmatory sampling | 0 |

eight caps, the Hillcut Test Facility, and the Former Explosives Detonation Trench) was resubmitted in July 1995 to TDEC. The revised Closure Plan defers final closure to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remediation process, which is expected to integrate 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 1999.

Closure of ORNL's Building 7555 was completed on December 16, 1997, and closure was approved by TDEC on December 31, 1997. Closure of Building 7668 was completed in late 1998 with final closure approval expected in 1999.

At the ETTP, closure of the K-1417-B unit is ongoing, and certification of closure must be submitted to TDEC by May 1999.

### 2.2.1.2 Land Disposal Restrictions

The 1984 RCRA amendments established land disposal restrictions (LDRs), which prohibit 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.

Currently, with the exception of a few organic mixed wastes, the same restrictions apply to mixed wastes, which are composed of a mixture of radioactive and hazardous wastes.

In September 1992, the Federal Facility Compliance Act was passed by Congress to address the extended storage of mixed waste by DOE through agreement with host states. DOE negotiated a Federal Facility Compliance Agreement with EPA in June 1992 and established the initial requirements for treating wastes stored on the reservation. This 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 to address treatment and disposal of DOE's mixed waste at Oak Ridge facilities (discussed in Sect. 2.2.4). As of the end of CY 1998, all but one milestone under the Site Treatment Plan have been met. The Site Treatment Plan is updated annually to reflect the most current treatment objectives (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 Oak Ridge Reservation. 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.

## 2.2.2 RCRA-CERCLA Integration

The CERCLA response action and RCRA corrective action processes are similar and include four steps with similar purposes (Table 2.4).

EPA, DOE, and TDEC entered into an interagency agreement known as the ORR Federal Facility Agreement (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. This agreement established a procedural framework and schedule for developing, implementing, and monitoring response actions on the ORR in accordance with CERCLA. The ORR FFA is also intended to integrate 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 2.5. 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.

## 2.2.3 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). Unlike the other regulatory programs summarized in this chapter, such as RCRA or the Clean Water Act (CWA), which address ongoing waste generation, storage, disposal, or discharge of waste or wastewaters, CERCLA is a process to address abandoned or uncontrolled hazardous substance sites where a release has or may have occurred. 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

**Table 2.3. RCRA Subtitle D landfills**

| 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. RCRA and CERCLA corrective action processes**

| 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 2.5. 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)<br>2. Oil Landfarm<br>3. S-3 Pond Site (west) | TNHW-087 |
| Chestnut Ridge | 1. Chestnut Ridge Sediment Disposal Basin<br>2. Chestnut Ridge Security Pits<br>3. Kerr Hollow Quarry | TNHW-088 |
| Upper East Fork Poplar Creek | 1. New Hope Pond<br>2. S-3 Pond site (east) | TNHW-089 |

CERCLA was signed in January 1991 between EPA, TDEC, and DOE known as the ORR FFA (see Sect. 2.2.2). 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.

It is important to note that environmental restoration activities on the ORR are in transition. 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 1997 document *Oak Ridge Operations Office Environmental Management, Accelerating Clean-Up: Focus on 2006.* Key assumptions for the accomplishment of these goals are:

- reindustrialization will be the primary method of accomplishment for D&D of the ETTP;
- an on-site waste management facility will be operational on the ORR in fiscal year 2000 for wastes resulting from the CERCLA actions;
- the watershed approach will be implemented for assessment and cleanup of the ORR; and
- aggressive, enhanced performance (greater efficiency) will be attained by transition to a management and integration (M&I) contract with full projectization of work scope and extensive utilization of subcontractors.

### 2.2.4 Federal Facility Compliance Agreement

The Federal Facility Compliance Act was signed 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 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.

Site Treatment Plans are required for facilities at which DOE generates or stores mixed waste. The purpose of the Site Treatment Plan is to identify to TDEC the proposed options (treatment method, facility, and schedule) for treating mixed waste at the ORR. For some waste types, these options include continued waste characterization for use, development, and/or modification of treatment technologies.

The ORR Site Treatment Plan 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 Site Treatment Plan was issued to TDEC on April 4, 1995. TDEC has reviewed and modified the plan in accordance with Section 3021(b)2 of RCRA. TDEC has issued a commissioner's order (Sect. 2.2.1.2), effective October 1, 1995, that requires compliance with the approved plan.

The Site Treatment Plan provides overall schedules, milestones, and target dates for achieving compliance with land disposal restrictions (LDRs); a general framework for the establishment and review of milestones; and other provisions for implementing the Site Treatment Plan 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. Except for one, all milestones and commitments under the Site Treatment Plan have been met for CY 1998. The annual update of the Site Treatment Plan for CY 1997 was approved by TDEC , and the annual update, to be in effect in FY 1999, was issued in October 1998 (*Site Treatment Plan for Mixed Wastes on the U.S. Department of Energy Oak Ridge Reservation*, October 1998).

The Site Treatment Plan will terminate when there is no longer any LDR mixed waste being stored on the ORR, regardless of when it was generated. In the absence of a compliant Site Treatment Plan, LDR mixed-waste storage would be in violation of RCRA Section 3004(j).

## 2.2.5 Underground Storage Tanks

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 2.6 summarizes the status of USTs on the ORR.

ORNL has responsibility for 54 USTs registered with the TDEC under Facility ID #0-730089; all 54 USTs are in compliance with the applicable portions of 40 CFR 280 and Rule 1200-1-15. These 54 UST systems can be categorized as follows.

**Table 2.6. ORR UST status, 1998**

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

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

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

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

[d]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.

Three tanks remain in service and are relatively new UST systems that meet the 1998 final standards for new tank installations. One UST site is in a groundwater monitoring program, anticipated to be completed in August 1999. Six other UST case closures are pending at TDEC.

Thirteen USTs are deferred or exempt from regulation under RCRA Subtitle I, all solid waste management units (SWMU), and can be categorized as follows: two radioactive waste oil tanks closed under RCRA Subtitle C; one radioactive waste oil tank permitted under RCRA Subtitle C; two radioactive waste tanks closed under the FFA; two exempt heating oil tanks, which were closed as a best management practice (BMP); one wastewater tank regulated under the CWA; other RCRA SWMU and four USTs with volumes of 110 gal or less, which were closed as a best management practice (BMP).

Case closure letters covering 26 USTs have been received from TDEC. Documentation of two HS UST closures was submitted to EPA in 1992; however, no response has ever been received from EPA. Two tanks were closed before the effective date of 40 CFR 280 (December 22, 1988) but after the UST registration date (January 1, 1974). All USTs not meeting the 1998 standards have been closed, the last of which was closed in November 1997.

The ORNL UST Program was also given responsibility for, and completed the closure of, three additional USTs, each of which was registered to DOE at a non-ORNL location. Case closure letters have also been received for these three non-ORNL USTs. Another four USTs never required registration because they were closed prior to January 1, 1974; however, these USTs are still potentially regulated if evidence of a release is discovered.

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, 2000.

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 East End Fuel Facility has been permanently closed, and an alternative to active remediation was pursued. A Site-Specific Standard Request (SSSR) for the unit had been submitted to TDEC in April 1994. The unit meets the specific requirements set forth within the rules by TDEC Department of Underground Storage Tanks (DUST) for approval into a monitoring-only program, but a denial by TDEC for the SSSR was received in December 1996. DOE filed an appeal of this determination seeking review before the Petroleum Underground Storage Tank Board. The appeal was withdrawn in 1999, and the TDEC Division of Underground Storage Tanks agreed to defer further remedial actions for the East End Fuel Facility to the CERCLA process.

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.

One methanol/gasoline hazardous substance UST was removed in May 1997. A "case closed" status was granted by EPA-Region IV regulators. Four methyl mercaptan hazardous substance USTs were removed in July 1996. One other hazardous substance UST designed as a spill overflow tank was never activated.

Sixteen known and/or suspected historical USTs are also included in the ETTP UST Program as a BMP. These exempted historical USTs are those UST systems that were out of service before January 1, 1974. There is a potential that historical UST sites would have to adhere 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 E.

## 2.2.6 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 1998.

During 1998, 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 three divisional (Chemical Technology, Metals and Ceramics, and Environmental Sciences divisions) "generic" categorical exclusions (CXs) that would cover proposed bench-scale and pilot-scale research activities. In addition, a generic CX was approved for ORNL involvement in cooperative research and development agreements (CRADAs) 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.

DOE has proposed development at ORNL of a high-energy linear accelerator facility, now called the Spallation Neutron Source (SNS), 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

**Table 2.7. NEPA activities during 1998**

| Types of NEPA documentation | Y-12 Plant | ORNL | ETTP |
|---|---|---|---|
| Categorical exclusion (CX) recommendation | 7 | 11 | 6 |
| Specific CX granted | 7 | 11 | 5 |
| Approved under general CX documents | 89 | 73 | 47 |
| Environmental assessment | 0 | 0 | 0 |
| Special environmental analysis | 0 | 0 | 0 |
| Programmatic environmental assessment | 0 | 0 | 0 |
| Supplemental analysis | 0 | 0 | 0 |
| Environmental impact statement | 0 | 1[a] | 0 |
| Supplemental environmental impact statement | 0 | 0 | 0 |
| Programmatic environmental impact statement | 0 | 0 | 0 |

[a]EIS for Spallation Neutron Source has been finalized. Record of Decision (ROD) was signed in June 1999.

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 the these surveys have been incorporated into the final EIS for the proposed project. A Record of Decision (ROD) on the EIS is planned to be issued in 1999. A companion project to the SNS is the DOE and The University of Tennessee proposed user facility, the Joint Institute for Neutron Sciences (JINS). The JINS would be constructed in an area northeast of the main ORNL facility complex in Bethel Valley. It is anticipated that this project would require an environmental assessment, which is expected to be completed by late summer of 1999.

Much of the NEPA activity at the ETTP during 1998 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*, 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 1998, NEPA reviews supported 19 potential lease actions. Reviews of NEPA values were conducted for two major decontamination and decommissioning (D&D) projects and eight CERCLA investigation or early action projects. Other NEPA reviews covered more routine maintenance actions, such as reroofing, parking lot repairs, asbestos removal, installation of fencing, and decontamination of facilities.

At the Y-12 Plant, job-specific CX documents were prepared and approved in 1998 for a number of projects involving demolition and disposition of several structures, including three small buildings previously supporting the z-oil distribution system. Other NEPA reviews covered routine actions, such as office renovations, repairs to storm and sewer systems, security upgrades, and infrastructure improvements

During the last quarter of 1998, activities were initiated toward the preparation of a Y-12 Site Wide Environmental Impact Statement (SWEIS). The Notice of Intent (NOI) is to be published in the early spring of 1999, and the SWEIS is scheduled for completion in the fall of 2000. The Y-12 SWEIS will analyze the impacts of current operations and foreseeable new operations and facilities for approximately the next 10 years. Alternatives to be analyzed include an extensive upgrade/retrofit of existing processes and facilities, construction of new facilities to replace existing processes and facilities, a combination of upgrades of existing processes and facilities and new construction, and the No Action alternative.

## 2.2.7 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 1999.

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. Eleven reviews were prepared for submittal in 1998 from the ETTP. The submittals dealt with leasing portions of property and/or land on the ORR.

The Y-12 Plant prepared and submitted five Project Summaries to the Tennessee SHPO. Four of the Project Summaries involved the demolition of historical properties eligible for inclusion in the *National Register of Historic Places* (*National Register*). Memoranda of Agreement were prepared and submitted to the SHPO and the Advisory Council on Historic Preservation for approval for the demolition of Buildings 9418-1, 9418-4, 9418-5, and 9419-1.

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 Freels 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.

## 2.2.8 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 best management practices (BMPs) are required for activities on the ORR. Coordination with TDEC, the U.S. Army Corps of Engineers (COE), and Tennessee Valley Authority (TVA) is necessary for activities involving waters of the United States, which include wetlands and floodplains. This is also true for the state and waters of the state. Generally, this coordination results in permits from the COE, TVA, and/or the state (see Sect. 2.2.13.3 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 newly constructed wetlands or enhancement of previously impacted areas.

The ORR implements protection of wetlands through each site NEPA program in accordance with 10 CFR 1022, "Floodplain/Wetlands Environmental Review Requirements." The Y-12 Plant, ORNL, and the ETTP practice wetlands protection by establishing buffer zones and other BMPs whenever activities are proposed that may introduce a potential environmental impact. Wetlands protection, documentation, and reporting requirements are administered through the NEPA review and documentation process. 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 34,500 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 1997a), surveys additional areas for which restoration activities are planned.

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-enhancement zone. This protection and maintenance continued through 1998. A wetlands survey of ORNL areas, *Wetland Survey of the X-10 Bethel Valley and Melton Valley Groundwater Operable Units at ORNL* (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 Spallation Neutron Source project. The survey, *Ecological Resource Surveys for the Proposed National Spallation Neutron Source Site on the Oak Ridge Reservation Jurisdictional Wetlands* was completed and published in April 1997.

In 1998, a partial survey of the ETTP wetlands was conducted. Approximately 75% of the ETTP area was surveyed and the wetland areas mapped. The survey will be completed in 1999. The map will then be used to provide guidance on wetlands protection to construction crews, remediation projects, and other ETTP operations.

## 2.2.9 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.

## 2.2.10 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.

### 2.2.10.1 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 (the gray bat, bald eagle, and peregrine falcon) are represented by one to several

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

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

[a]Land and surface waters of the ORR exclusive of the Clinch River, which borders the ORR.

[b]E = endangered, T = threatened, C = species of concern, NM = in need of management.

migratory or transient individuals rather than by permanent residents, although this situation may change as these species continue to recover. A few individual bald eagles, for example, have become winter resident rather than transient. 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.

#### 2.2.10.2 Threatened and Endangered Plants

Twenty-four plant species, currently known to occur on the ORR, are listed by the state of Tennessee, including the purple fringeless orchid, pink lady's-slipper, and Canada lily (Table 2.9). 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.

Two additional species listed by the state, Michigan 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 lands may be present on the ORR as well, although they have not been located (Table 2.10).

## 2.2.11 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 demographic impacts of the planned action on surrounding minority and low-income communities that could be affected by the action.

## 2.2.12 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 DOE. Both ORNL and the Y-12 Plant are designated as nontransient, noncommunity 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

**Table 2.9. Vascular plant species on the Oak Ridge Reservation that are listed by state or federal agencies (1998)**

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

[a]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.

[b]*Carex oxylepis var. pubescens* has not been re-located during recent surveys.

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

**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[a] |
|---|---|---|---|
| *Agalinis auriculata* | Earleaf false-foxglove | Calcareous barren | (C2), E |
| *Berberis canadensis* | American barberry | Rocky bluff, creek bank | S |
| *Gnaphalium helleri* | Catfoot | Dry woodland edge | S |
| *Liatris cylindracea* | Slender blazing star | Calcareous barren | E |
| *Lonicera dioica* | Mountain honeysuckle | Rocky river bluff | S |
| *Meehania cordata* | Heartleaf meehania | Moist calcareous woods | T |
| *Pedicularis lanceolata* | Swamp lousewort | Calcareous wet meadow | T |
| *Solidago ptarmicoides* | Prairie goldenrod | Calcareous barren | E |
| *Pycnanthemum torrei*[b] | Torrey's mountain-mint | Calcareous barren edge | *c* |
| *Allium burdickii* or *A. tricoccom*[c] | Ramps | Moist woods | S-CE |

[a]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.

[b]Carl Nordman, state botantist (personal communication) plans to list *P. torrei* with status S until it can be considered by the scientific advisory committee.

[c]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.

can use the records sent to the state by the water treatment facility from which water is received to meet applicable compliance requirements. In 1998, the DOE water treatment plant met all of the Tennessee radiological and nonradiological standards and scored well on the annual TDEC review.

Both ORNL's and the Y-12 Plant'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 1998. The next sampling for lead and copper at the Y-12 Plant is to be completed by September 30, 1999. All ORNL and Y-12 drinking water distribution system bacteriological sample analyses were satisfactory in 1998.

In June 1997, ORNL received two Class V underground injection control (UIC) permits 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 2000.

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 nontransient, 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 Community Reuse Organization of East Tennessee (CROET).

A cross-contamination control program implemented at the Y-12 Plant, ORNL, and the ETTP prevents and eliminates cross-connects 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.

## 2.2.13 Clean Water Act

The Clean Water Act (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.

### 2.2.13.1 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 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 9300 laboratory analyses in 1998, in addition to numerous field observations. Monitoring of discharges demonstrates that the Y-12 Plant has achieved an NPDES permit compliance rate of 99.9%; biological monitoring programs conducted on nearby surface streams provide evidence of the continued ecological recovery of the streams. At the Y-12 Plant, there were nine NPDES noncompliances in 1998, compared with seven in 1997 (Fig. 2.1). All nine noncompliances resulted from permit exceedences for chlorine, and seven of the nine exceedences were associated with a single event.

In May 1995, the Y-12 Plant appealed two provisions of the permit: the biomonitoring limitations placed on East Fork Poplar Creek (EFPC) Outfall Point 201 and the mercury limitations at Monitoring Station 17. These limits are stayed while resolution of both issues is being sought by personnel from the Y-12 Plant and TDEC. 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.

ORNL is currently operating under NPDES Permit TN 0002941, which was renewed by TDEC on December 6, 1996, and went into effect

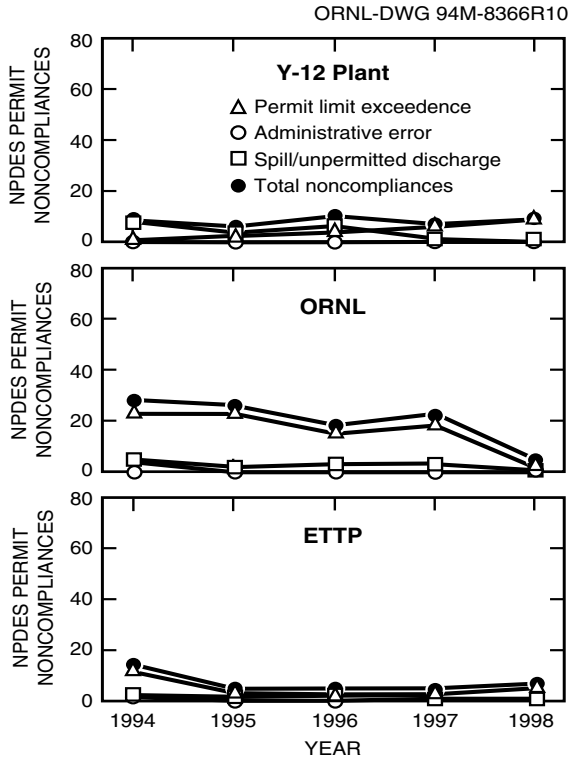


**Fig. 2.1. Five-year summary of NPDES noncompliances.**

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 6500 laboratory analyses and measurements in 1998, in addition to numerous field observations by ORNL field technicians. The NPDES permit limit compliance rate for all discharge points for 1998 was nearly 100%, with three permit-limit exceedences from approximately 6500 limit-comparison measurements (Fig. 2.1).

Compared with the previous permit, the new ORNL permit includes more stringent limits, based on compliance with water quality criteria, at a number of outfalls. The new permit also 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 includes 3 major outfalls, 2 minor outfalls, and 136 storm drain outfalls. From about 35,000 NPDES laboratory and field measurements completed in 1998, only 7 noncompliances occurred, indicating a compliance rate of more than 99% (Fig. 2.1).

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.

### 2.2.13.2 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 11 and September 10, 1998. No deficiencies of the Y-12 Plant Sanitary Sewer Compliance Program were noted during the inspections.

The current discharge permit was issued on August 25, 1997, by the city of Oak Ridge and will expire on December 31, 1999. This 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. A resolution of the appeal is expected in early 1999. All other provisions of the permit that were not appealed are in effect.

During 1998, the Y-12 Plant experienced three exceedences of the Industrial User Discharge permit, one for cadmium and two for arsenic. On May 21, the cadmium default limit of 0.0045 mg/L was exceeded. The result obtained was 0.0049 mg/L. The arsenic default limit of 0.0045 mg/L was exceeded on June 16 (0.0077 mg/L) and November 11 (0.0095 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 for (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.

Lockheed Martin Energy Systems received a pump and haul permit, State Permit No. 97-010, for operation of a pump and haul system for disposal of sanitary wastewater to an off-site municipal sewage facility on September 30, 1997. This permit became effective on October 1, 1997. Beginning in December 1998, Bechtel Jacobs Company accepted responsibility for this permit and for submittal of monthly discharge reports to TDEC.

At ORNL, sanitary wastewater is collected, treated, and discharged separately from other liquid wastewater streams through an on-site sewage treatment plant. Wastewater discharged into 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 sewage treatment plant is ultimately discharged into White Oak Creek (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. As a result, the sludge is treated as solid LLW. ORNL has completed a line-item project for comprehensive upgrades of its sanitary sewage system. Upgrades include 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 Sewage Treatment Plant sludge continues to decline. During 1998, ORNL submitted a wastewater treatment questionnaire to the city of Oak Ridge to allow ORNL's sewage sludge to be transported to the Oak Ridge Sewage Treatment Plant and to be included in the city's Land Application Program. Analytical data for lead indicated that some lead contamination exists within the system and caused the first shipment to be delayed until 1999.

ETTP domestic wastewater is treated at the on-site K-1203 Sewage Treatment Plant 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 Sewage Treatment Plant and also to ensure that effluent from the facility continues to meet all NPDES permit limits. The K-1250-4 Bridge Replacement Project at ETTP was initiated under an Aquatic Resources Alteration Permit (ARAP) and Corps of Engineers (COE) permit issued on August 22, 1997. Work continued on the bridge project through 1998. In January 1998 during a compliance inspection by ETTP Environmental Compliance personnel, it was identified that gravel and debris removal from the old bridge structure had been placed in the creek bed of Poplar Creek. This was determined by site personnel to be a violation of the terms and conditions of the permits and was appropriately reported to the regulatory agencies. In accordance with recommendations from TDEC, the debris was removed from the creek bed and appropriately dispositioned. No adverse impact to the stream and aquatic life were observed as a result of these activities. Work on the project was completed in August 1998.

### 2.2.13.3 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 ARAPs, and TVA 26A approvals. See Sect. 2.5, Environmental Permits, for ARAP permits issued or expected in 1998.

One new ARAP (permit number 98-318) was issued to the Y-12 Plant in1998 for removal of debris in EFPC at the Oil/Water Separator. In addition, one permit previously issued during remedial actions in Bear Creek Burial Grounds remains in force.

No new ARAP, COE, or TVA permits were issued to either the ETTP or ORNL in 1998.

### 2.2.13.4 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 of 1990, which has as its primary objective the improvement of responses to oil spills.

The Oil Pollution Act requires certain facilities to prepare and implement a Facility Response Plan for responding to a worst-case discharge of oil. The ETTP was the only DOE site in Oak Ridge that required such a Facility Response Plan. However, because of operational changes resulting from recent reindustrialization activities at ETTP, this plan is no longer required, and in a letter dated January 29, 1999, EPA Region IV reclassified the ETTP as a "non-regulated" facility for purposes of Facility Response Plan requirements.

### 2.2.13.5 Clean Water Action Plan

To commemorate the 25th anniversary of the Clean Water Act, Vice President Gore asked the federal agencies to develop and implement a comprehensive plan that would help revitalize the nation's commitment to our valuable water resources. The result was the Clean Water Action Plan (CWAP), which was announced by the president and the vice president on February 19, 1998, and charts a new course for protecting and restoring the nation's waterways.

In September 1998, Secretary of Energy Richardson issued a memorandum supporting the CWAP and directed DOE staff to develop plans for integrating Action Plan goals into DOE activities. The 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 response to the secretary's memorandum, a draft implementation plan was developed by DOE in October 1998, and work began in DOE field offices to focus on associated actions of potential interest to the DOE complex.

In November 1998, DOE ORO designated a staff point of contact to serve as a coordinator for ORO in the refinement of the implementation plan, and to interact with DOE Headquarters staff on Action Plan initiatives for federal agencies that may affect DOE. In January 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. These discussions will continue in 1999 as communications are established with state and other federal agencies that will be involved in implementing the Action Plan; these are expected to include TDEC, EPA, the U.S. Department of Agriculture, the U.S. Department of the Interior, and the U.S. Bureau of Land Management.

## 2.2.14 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.

### 2.2.14.1 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; however, additional regulations outside the permit program also regulate emissions to the atmosphere. All three ORR facilities are subject to these rules and are meeting the compliance requirements.

CAA compliance program staff participate in regulatory inspections and internal audits to verify and improve compliance with applicable regulations or permit conditions. Sources subject to the permitting requirements are permitted, and rele-

vant 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.

### 2.2.14.2 Compliance with 1990 CAA Amendments

Implementation of additional requirements resulting from the 1990 CAA Amendments is nearly complete. All three sites are subject to the Title V Operating Permit Program. Permit applications have been submitted and were determined to be complete by TDEC. The sites will operate under existing permits until the Title V permits are issued. Other regulatory requirements under Title III, Hazardous Air Pollutants (HAPs), and Title VI, Stratospheric Ozone Protection have been implemented

### 2.2.14.3 National Emission Standards for Hazardous Air Pollutants for Radionuclides

Under Section 112 of the Clean Air Act, 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), which was used to bring the ORO into full compliance with 40 CFR 61, Subpart H. As required by the FFCA, the *Compliance Plan: National Emission Standards for Hazardous Air Pollutants for Airborne Radionuclides on the Oak Ridge Reservation, Oak Ridge, Tennessee* (*Compliance Plan*), was submitted to EPA Region 4 in December 1991. ORO completed all other obligations under the compliance schedule of the FFCA by 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 ORO 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. This is accomplished through primary oversight by the TDEC– Division of Radiological Health, which also issues licenses to 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 1998. 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 0.73 mrem/year in 1998.

Continuous sampling for radionuclide emissions is conducted at the ETTP TSCA Incinerator, 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. 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. The EPA and DOE Oversight Division (TDEC/DOE-O) also conduct independent ambient air monitoring programs.

### 2.2.14.4 NESHAP for Asbestos

The ORR facilities have numerous buildings and equipment that contain asbestos materials. The compliance program for management of

asbestos 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) were reported at the ETTP, ORNL, or the Y-12 Plant in 1998.

### 2.2.14.5 State-Issued Air Permits

The Y-12 Plant has 40 active air permits covering 147 air emission points. There are 174 documented exempt minor sources and 416 exempt minor emission points. During 1998, one new construction permit was issued. TDEC was notified that Bechtel Jacobs LLC has assumed operation of certain waste management air emission sources at the Y-12 Plant.

ORNL has 21 active operating permits covering 201 emission sources. The remaining emission sources are exempt from permitting requirements. During CY 1998, ORNL submitted permit applications for the construction of two additional emission sources. One construction permit was received authorizing the construction of a new 125 million Btu boiler subject to New Source Performance Standards.

At the end of CY 1998, there were 92 active air emission sources under DOE control at the ETTP. The total includes 30 sources covered by eight TDEC air operating permits and one new source that operated under a permit 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.

## 2.2.15 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.

### 2.2.15.1 Polychlorinated Biphenyls

TSCA specifically bans the manufacture, processing, and distribution in commerce of polychlorinated biphenyls (PCBs) but authorizes the continued use of some existing PCBs and PCB equipment. TSCA also imposes marking, storage, and disposal requirements for PCBs. The codified regulation governing PCBs mandated by TSCA is found at 40 CFR 761 and is administered by EPA. EPA extensively revised 40 CFR 761 during 1998. Some of the new revisions include new decontamination methods, less expensive disposal options for certain types of PCB waste, storage for reuse, storage of PCB/radioactive waste beyond 1 year, continued use of PCB contaminated surfaces, PCB remediation wastes, PCB bulk product waste, analytical waste, and disposal of analytical waste. Most of the requirements of 40 CFR 761 are matrix and concentration dependent. For example, the ban on manufacturing, processing, use, and distribution in commerce applies to PCBs at any concentration. Storage and disposal requirements generally apply to PCBs at 50 parts per million (ppm) or greater; however, these requirements may apply at lower concentrations in some instances. TDEC restricts PCBs from disposal in landfills and classifies PCBs as special wastes under Tennessee solid waste regulations. A special waste exemption is required from the state of Tennessee to dispose of PCBs at concentrations up to 49 ppm in landfills. Additionally, PCB discharges into waterways are restricted by the state-regulated CWA and NPDES programs. New amendments to the TSCA/PCB regulations effective in August 1998 have broadened use and disposal options for a variety of materials.

### 2.2.15.2 Authorized and Unauthorized Uses of PCBs

EPA promulgated regulations in 1979 implementing the TSCA ban on the manufacture, use, processing, and distribution in commerce of PCBs; however, specific applications of PCBs were authorized for continued use under restricted conditions. A variety of PCB systems and equip-

ment 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. Some small pole-mounted transformers remaining in service at the ETTP and Y-12 Plant electrical systems are scheduled to be tested for PCBs during normal maintenance. It is unlikely that any of these small transformers contain PCBs at concentrations regulated for disposal; however, they are assumed to contain PCBs until verified otherwise. Prior to August 1998, all untested pole-mounted transformers were assumed to contain PCB concentrations greater than or equal to 500 ppm. Assumption provisions included in the amendments to 40 CFR 761, effective August 28, 1998, allow the presumption that "in use" pole-mounted transformers contain PCB concentrations between 50 ppm and 500 ppm, alleviating cumbersome inspection and reporting requirements. In addition to the 90 pole-mounted transformers removed from the Y-12 Plant 1998 PCB Annual Inventory per analytical verification, this provision allowed for the reclassification and removal of 8 additional transformers, leaving only 13 transformers requiring inspection and reporting. In 1998, all remaining pole-mounted transformers located at the ETTP and the Y-12 Plant were removed from the PCB Annual Inventory after theTSCA/PCB amendments reclassified untested pole-mounted transformers from PCB to PCB-contaminated electrical equipment.

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 decontamination and decommissioning (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 most recent 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. In 1998, ORNL discovered and reported finding PCBs at regulated levels in roofing paint used on Buildings 2000 and 2001. Per EPA request, an annual sampling and monitoring plan was prepared and submitted for the site. The intent is to evaluate the level of releases of PCBs to the environs. At the end of 1998, EPA approval of the sampling and monitoring plan is still pending. Sampling would begin in CY 1999. In 1998, PCBs were found in interior and exterior wall paints as well as equipment paint. EPA was notified of this discovery and the intent to leave the material in place for the duration of its useful life was added to the PCB FFCA (see Sect. 2.2.15.3).

### 2.2.15.3 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 research and development (R&D), and records and reporting requirements for the ORR.

During 1998, ORNL reported on (1) mischaracterization of the PCB levels in waste stored in Tank 7830A and (2) failure to dispose of six PCB waste containers within 1 year of generation. During 1998, two variances were granted by EPA: one for a water-based drum washing facility and another for an alternative for decontaminating PCB containers. Also 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 1 year and alternative safe secondary containment system requirements for radioactive waste. DOE is awaiting EPA concurrence on the requested changes.

#### 2.2.15.4 ETTP TSCA Incinerator PCB Disposal Approval

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

#### 2.2.15.5 PCB Research and Development Approvals

EPA Region 4 had previously granted ORNL authorization to conduct R&D for development of alternative disposal techniques for PCBs. The approvals authorized PCB R&D using stabilization/solidification techniques, base-catalyzed destruction processes, a chemically enhanced oxidation/reduction process, and a microbial degradation procedure. During 1998, ORNL researchers continued investigations of alternative disposal methods for PCBs under the approval of EPA Region 4.

### 2.2.16 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. The regulations for the application, storage, and disposal of pesticides are presented in 40 CFR 150–189.

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. 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.

No restricted-use pesticide products are used at the Y-12 Plant, the ETTP, or ORNL. Safrotin®, used for control of cockroaches, is the only restricted-use pesticide stored at the Y-12 Plant. No purchases of this restricted-use material have been made since August 1993, and it was last used in 1995. Ficam-W, a general-use pesticide, has been substituted for Safrotin, and efforts for proper disposal of the remaining Safrotin are under way. An inventory of pesticide products is maintained for use at each facility. It is site policy to store, apply, and dispose of these products in a manner that ensures full compliance with FIFRA requirements.

## 2.2.17 Emergency Planning and Community Right-To-Know Act

The Emergency Planning and Community Right-To-Know Act (EPCRA), also referred to as Superfund Amendments and Reauthorization Act (SARA) Title III, requires reporting of emergency planning information, hazardous chemical inventories, and environmental releases to federal, state, and local authorities. The ongoing requirements of EPCRA are contained in Sections 302, 303, 304, 311, 312, and 313 of SARA Title III and are given in the notes to Table 2.11.

The ORR had no releases subject to Section 304 notification requirements during 1998. The Section 311 lists are updated frequently and are provided to the appropriate officials. The Section 312 inventories for 1998 identified hazardous chemicals, documented their locations, and summarized the hazards associated with them. Of these Section 312 chemicals, 73 were located at the Y-12 Plant, 27 at ORNL, and 19 at the ETTP.

The annual Toxic Release Inventory (TRI) report is a requirement of Section 313. The report is due to the EPA and TDEC by July 1 of each year for the previous calendar year and addresses releases of regulated chemicals into the environment, waste management activities, and pollution prevention activities associated with those chemicals. Chemicals that exceed the reporting threshold, based on quantities processed, manufactured, or otherwise used are identified and included in the report. The TRI report covering CY 1998 has been submitted for the ORR for eight chemicals given in Table 2.12. Only those chemicals that exceed the reporting threshold must be reported.

Because of new EPA instructions regarding Section 313 reporting, one new chemical (nitrate compounds) was added to the CY 1998 report. Nitrate compounds are commonly found in sanitary sewer discharges and, to a lesser extent are found in ORR process wastewater discharges. Addition of nitrate compounds resulted in a significant increase in reportable amounts of chemicals for the CY 1998 report compared with the previous year.

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

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

[a]Requires that Local Emergency Planning Committee and State Emergency Response Commission be notified of EPCRA-related planning.

[b]Addresses reporting to state and local authorities of off-site releases.

[c]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.

[d]Requires that releases of toxic chemicals be reported annually to EPA and the state.

The Y-12 Plant triggered the reporting threshold for ozone as a result of its manufacture for cooling tower water microbial control. The ETTP also created manufactured ozone as a by-product of the ultraviolet sterilization system at the Sewage Treatment Plant. In both cases, the ozone is immediately dissolved in water and results in a release measuring zero.

The reporting of copper compounds and manganese compounds in the CY 1997 report was triggered by the combustion of coal at the Y-12 Plant and at ORNL. Copper and manganese compounds exceeded the reporting threshold based on conservative EPA air emission factors for coal-fired external combustion sources. Empirical data obtained after the CY 1997 report showed that actual amounts of copper and manganese manufactured as a by-product of coal

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

| Chemical | Year | Quantity (lb)[a] | | | |
|---|---|---|---|---|---|
| | | Y-12 Plant | ORNL | ETTP | Total |
| Methanol | 1997 | 32,405 | 436 | 0 | 32,841 |
| | 1998 | 43,730 | 906 | 0 | 44,636 |
| Hydrochloric acid[b] | 1997 | 98,100 | 46,508 | 37 | 144,645 |
| | 1998 | 96,101 | 49,123 | 18 | 145,242 |
| Lead | 1997 | 1,392 | 6,598 | 15,554 | 23,544 |
| | 1998 | 10,379 | 5,346 | 5,801 | 21,526 |
| Nitric acid | 1997 | 545 | 129 | 0 | 674 |
| | 1998 | 469 | 1,204 | 0 | 1,673 |
| Ozone | 1997 | 0 | 0 | 0 | 0 |
| | 1998 | 0 | 0 | 0 | 0 |
| Nitrate compounds | 1997 | *c* | *c* | *c* | *c* |
| | 1998 | 202,870 | 64,405 | 6,857 | 274,132 |
| Zinc dust | 1997 | *c* | *c* | *c* | *c* |
| | 1998 | 0 | 0 | 111 | 111 |
| Chlorine | 1997 | 0 | 0 | 0 | 0 |
| | 1998 | 0 | 0 | 0 | 0 |
| Total | 1997 | 132,442 | 53,671 | 15,591 | 201,704 |
| | 1998 | 353,549 | 120,984 | 12,787 | 487,320 |

[a]Represents total releases to air, land, and water, and includes off-site transfer.
[b]EPA published AP-42 emission factors during 1996 for hydrochloric acid emissions from coal combustion. Prior to that time, hydrochloric acid emissions were not included.
[c]Not reported.

and combustion on the ORR are less than the reporting thresholds for each. Therefore, copper and manganese compounds are not reported in the CY 1998 report.

## 2.2.18 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 radio-nuclides) 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 1998, 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 two incidents that involved oil sheens observed on East Fork Poplar Creek (EFPC).

During 1998, ORNL and the ETTP reported no CERCLA RQ releases to federal and state agencies.

## 2.3 DOE ORDERS AND STANDARDS DEVELOPMENT

Until recently, DOE directed the environmental, safety, and health (ES&H) aspects of all work through rules and directives such as orders, notices, and manuals. However, this approach suffers from several disadvantages. Most notably, it has been difficult to develop orders that recognize and deal with the wide diversity of the work. This can lead to inappropriate application of high-hazard requirements to low-hazard activities. Also, because the order-based approach does not easily incorporate the benefits of experience, safety practices can rapidly become obsolete or ineffective. In many cases, order requirements duplicate what is already required by law or regulation. In the past, DOE orders were not always clear about DOE's expectations for contractors. To compensate for this uncertainty, contractors took conservative steps to ensure that their operations would meet DOE orders.

Recognizing the disadvantages of that approach, DOE has developed and implemented a policy for an integrated standards program. This policy addresses evolving obligations with regard to federal, state, and local laws and regulations; use of technical standards; and development of new standards for programs, processes, and products unique to the department's operations, consistent with statutes and procedures for involvement of the public and other stakeholders. The current process has evolved over the past few years.

### 2.3.1 Standards/Requirements Identification Documents

In 1995, DOE implemented the Standards/ Requirements Identification Documents (S/RIDs) concept in response to a recommendation from the Defense Nuclear Facilities Safety Board (DNFSB). The recommendation was that DOE should develop mechanisms for identifying which standards are applicable to the specific work being performed, determining whether those standards are fully implemented, and determining whether the standards are appropriate and adequate to ensure protection to workers, the public, and the environment. The S/RIDs covering all environment-, safety-, and health-(ES&H) related activities were included in the DOE contracts for LMES and LMER in October 1995 and January 1996, respectively. This change established the S/RIDs as the contractual set of ES&H requirements rather than DOE orders at that time.

### 2.3.2 Work Smart Standards

In 1996, LMER and LMES implemented the "Necessary and Sufficient" process to identify standards for ES&H activities as part of a pilot project sanctioned by the DOE Department Standards Committee. This process was subsequently renamed by DOE as "work smart standards" (WSS). WSS are sets of environment, safety, and health laws, regulations, and other standards that have been chosen for applicability and appropriateness for a particular scope of work. Although S/RIDs are generally limited to activities conducted under the offices of Defense Programs (DP) and Environmental Restoration and Waste Management (EM), WSS are intended to apply to all departmental activities. The WSS process allows adoption of consensus standards, developed and used by others in industry, and all applicable requirements from laws and regulations are automatically included. The WSS sets of standards are designed to provide adequate protection (when properly implemented) against the hazards associated with a particular scope of work.

#### 2.3.2.1 Status of WSS Development and Implementation

For the ORR EMEF activities, headquartered at the ETTP site, WSS have been established and are the contractual set of ES&H requirements (with the exception of Occurrence Reporting and Emergency Management S/RIDs, which are still applicable to EMEF) rather than DOE orders.

Implementation of WSS for Defense and Manufacturing Programs (Y-12 Plant) has been completed for the Y-12 General Manufacturing Organization (GMO), which provides manufacturing and support services to the Y-12 Plant and its customers, including the Y-12 nuclear facilities and the U.S. Navy, in the areas of

machining, forming, rolling, heat treating, welding, and laser cutting on a wide variety of metals and nonmetals. These operations are equivalent to those found in private industry general machine shops. The remaining Y-12 site activities are subject to standards and requirements as defined in the S/RIDs.

At LMER, WSS have been approved for all R&D activities and on a facility-specific basis for the Radiochemical Research Facilities, the five Accelerator Facilities, the Radiochemical Technology Facilities, the Radiochemical Engineering Development Center, the Radiochemical Development Facility, the Irradiated Materials Examination and Testing Facility, the Irradiated Fuels Examination Laboratory, the Hazardous Waste Operations Facilities, the Waste Management and Remedial Action Division (WMRAD) Radiological and Industrial Facilities, and the WMRAD Nuclear Category 2 and 3 facilities. Exceptions to the WSS include the emergency management require-ments and occurrence reporting requirements.

A stand-alone set of WSS for construction and construction-like activities have also been approved for ORNL.

### 2.3.3 Integrated Safety Management Systems

DOE has established Integrated Safety Management (ISM) as the framework for managing environment, safety, and health at their sites. ISM was initially developed in response to a recommendation from the DNFSB, and DOE decided to establish it as a policy for all DOE facilities, not just defense nuclear facilities. ISM integrates environment, safety, and health into work planning and execution and includes pollution prevention and waste minimization.

The department's ISM Program is based on seven guiding principals and five core functions that provide the necessary structure for any work activity that could potentially affect the public, the workers, and the environment (Fig. 2.2).

The Y-12 Plant philosophy is to achieve ES&H excellence by properly planning and performing work activities so that ES&H considerations are integrally a part of these activities from conceptualization to completion. Involvement of workers in a team environment to ensure adequate input for work planning, hazard recognition and minimization, development of clear lines of ownership and responsibility, and establishment of a balanced understanding of goals and requirements is the mechanism by which ES&H excellence is to be achieved at the Y-12 Plant. This management system fully embodies the basic concepts of ISM contained in the DOE Safety Management System Policy (DOE P 450.4) and is fully documented in the Y-12 Plant ISM Systems Program Description (Y15635PD).

In July 1998, DOE-DP (Defense Programs) completed a Phase I verification of ISM implementation at the Y-12 Plant. Later in the year (October through December), a team from the DOE-EH (Office of Environment, Safety, and Health) evaluated the Y-12 Plant ISM program. As of December 1998, the Y-12 Plant ISM program was found to be performing effectively in operating nuclear facilities, while opportunities for improvement were identified in nonnuclear facilities and sitewide programs

. The Environmental Management and Enrichment Facilities (EMEF) DOE Prime Contractors are implementing Integrated Safety Management System (ISMS) programs in accordance with DOE policies. The Bechtel Jacobs Company issued an updated ISMS Description Document and supplement in September 1998 to reflect the company's approach for integrating safety into all aspects of work planning and execution.

During 1998, ORNL established the organizational framework for effective implementation of the DOE Integrated Safety Management Program. This program is designed to ensure that environmental, safety and health concerns are incorporated into the planning and execution of all work activities throughout the Laboratory. Following upon the documentation of a Laboratory ISMS policy, the ORNL ISMS Steering Committee coordinated the preparation of an ISMS Plan by each of the 37 divisions and offices at the Laboratory. These plans are tailored to the unique types of work performed by each of the 37 organizations at ORNL and draws upon the insights of those performing the work to ensure that there are processes to incorporate environmental, safety, and health concerns into the day-to-day activities of each of these organizations.

When completed, these plans were reviewed and approved by the Laboratory managers respon

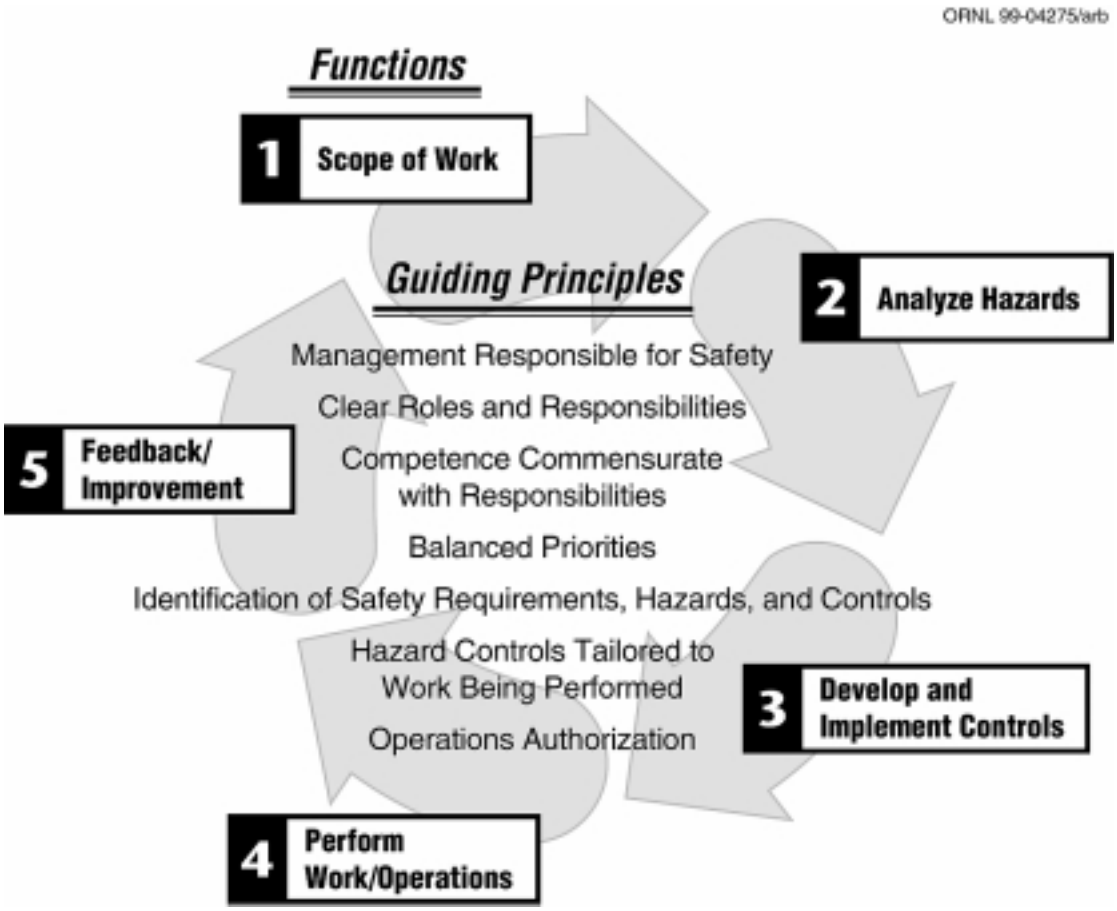


**Fig. 2.2. Guiding principles and core functions of Integrated Safety Management.**

sible for the performance of the work. The set of 37 plans were then reviewed by the ISMS Steering Committee as a set to identify any areas for improvement in the coverage of environmental, safety, and health topics addressed in the plans. A formal review of the ORNL ISMS Program by a team drawn from throughout the DOE complex is scheduled for April 1999.

The efforts carried out in 1998 have provided a strong foundation for the program and the basis for a successful outcome to the April Review.

### 2.3.4 DOE Order 5400.1, "General Environmental Protection Program," and DOE Order 231.1, "Environment, Safety and Health Reporting"

Through DOE's Accelerated Orders Reduction effort, certain requirements in DOE Order 5400.1, "General Environmental Protection Program," have been modified. Therefore, only part of these orders are in the Work Smart Standards (WSS) for ORNL and Bechtel Jacobs LLC. Some requirements from DOE Order 5400.1 have been transferred to DOE Order 231.1, "Environment, Safety and Health Reporting," and others have been canceled. For example, the requirement to produce the *Oak Ridge Reservation Annual Site Environmental Report* documenting the site's environmental performance has been transferred to DOE Order 231.1.

DOE Order 5400.1 establishes environmental protection program requirements, authorities, and responsibilities for DOE operations to ensure compliance with applicable federal, state, and local environmental protection laws and regulations, executive orders, and internal DOE policies. The order specifically defines the mandatory environmental protection standards (including those imposed by federal and state statutes), establishes reporting of environmental occurrences and periodic routine significant environmental protection information, and provides requirements and guidance for environmental monitoring programs.

An environmental monitoring plan (EMP) is to be prepared, reviewed annually, and updated every 3 years or as needed. Revision 3 of *The Environmental Monitoring Plan for the ORR* (DOE 1998a) was reissued by DOE in September 1998. The EMP provides a single point of reference for the effluent monitoring and environmental surveillance programs of the Y-12 Plant, ORNL, the ETTP, and ORR areas outside specific facility boundaries.

### 2.3.5 DOE Order 5400.5, "Radiation Protection of the Public and the Environment"

DOE Order 5400.5 provides guidance and establishes radiation protection standards and central practices designed to protect the public and the environment against undue risk from DOE operations. This order requires that no member of the public receive an effective dose equivalent (EDE) in a year greater than 100 mrem via all pathways, that no member of the public receive a radiation dose equivalent greater than 10 mrem in a year from airborne emissions, and no more than 4 mrem from the drinking water pathway. Effluent monitoring results are a major component in the determination of compliance with these dose standards.

DOE Order 5400.5 also established derived concentration guides (DCGs) for radionuclides in water. (See Appendix A for a list of radionuclides and their half-lives.) The DCG is the concentration of a given radionuclide for one exposure pathway (e.g., drinking water) that would result in an EDE of 100 mrem (1 mSv) per year to a reference man, as defined by the International Commission on Radiological Protection (ICRP) publication 23 (ICRP 1975). The consumption of water is assumed to be 730 L/year at the DCG level. DCGs were calculated using methodologies consistent with recommendations found in ICRP publications 26 (ICRP 1977) and 30 (ICRP 1978). DCGs are used as reference concentrations for conducting environmental protection programs at DOE sites, as screening values for considering best available technology for treatment of liquid effluents, and for making dose comparisons. Using radiological data, percentages of the DCG for a given isotope are calculated. In the event that a sum of the percentages of the DCGs for each location ever exceeds 100%, an analysis of the best available technology to reduce the sum of the percentages of the DCGs to less than 100% would be required as specified in DOE Order 5400.5.

In addition, dose limits imposed by other federal regulations (40 CFR Parts 61, 191, and 192 and 10 CFR Parts 60 and 72) must be met. The primary dose limit is expressed as an EDE, which requires the weighted summation of doses to specified organs of the body. Monitoring of effluents released to the environment is required to ensure that radiation doses to the public are as low as reasonably achievable (ALARA) and are consistent with prescribed dose standards.

## 2.4 APPRAISALS AND SURVEILLANCES OF ENVIRONMENTAL PROGRAMS

Numerous appraisals, surveillances, and audits of the ORR environmental activities were conducted during 1998 (see Tables 2.13, 2.14, and 2.15). These tables do not include internal LMER, LMES, or Lockheed Martin corporate assessments for 1998.

**Table 2.13. Summary of environmental audits and assessments conducted at the Y-12 Plant, 1998**

| Date | Reviewer | Subject | Issues |
|---|---|---|---|
| 2/6 | TDEC | Landfills IV, V, VI, and VII | 0 |
| 2/11 | City of Oak Ridge | Sanitary Sewer | 0 |
| 2/23–24 | TDEC | RCRA | 0 |
| 2/25–3/11 | TDEC | TDEC Annual Air Inspection | 0 |
| 3/25 | TDEC-DSWM TSD Land Section | CY 1998 RCRA Compliance Evaluation Inspection–Groundwater | 0 |
| 4/2 | TDEC | Opacity Monitoring System | 0 |
| 4/3 | TDEC | Quality Assurance Audit Evaluation–Air | 0 |
| 5/22 | TDEC | Landfills IV, V, VI, and VII | 0 |
| 6/9–10 | TDEC | NPDES CEI | 0 |
| 9/9 | City of Oak Ridge | Pretreatment Inspection | 0 |
| 9/11 | TDEC | Landfills IV, V, VI, VII, and II | 0 |
| 10/22 | TDEC | TDEC Annual Clean Air Compliance Inspection | 0 |
| 12/8 | TDEC-DUST | UST Facility Compliance Inspection | 1[a] |

[a]Failure to conduct successful tank leak tests at Service Station and TSD.

**Table 2.14. Summary of environmental audits and assessments conducted at ORNL, 1998**

| Date | Reviewer | Subject | Issues |
|---|---|---|---|
| 1/28-7/22 | TDEC/DOE-O[a] | Inspection of CAA Permitted Sources and Visible Emission Evaluations | 0 |
| 3/10-3/11 | EPA, TDEC/DOE-O | NPDES Compliance Sampling Inspection | 0 |
| 5/4-5/5 | TDEC | Inspection of RCRA generator areas and treatment, storage, and disposal operations | 0 |
| 9/21-10/1 | Lockheed Martin Corporation | ESH Audit/CAA | 0 |
| 9/23 | TDEC | Inspection of RCRA groundwater wells and operations | 0 |
| 11/24 | TDEC/UST Division | Operational USTs | 1[b] |

[a]Tennessee Department of Environment and Conservation/DOE Oversight Division.
[b]Failure to conduct annual line tightness testing at ORNL Gas Station. This testing was conducted on 12/16/98.

**Table 2.15. Summary of environmental audits and assessments conducted at the ETTP, 1998**

| Date | Reviewer | Subject | Issues |
|---|---|---|---|
| 2/23 | TDEC | RCRA Inspection | 0 |
| 3/26 | TDEC, TDEC/DOE-O[a] | CAA Inspection | 0 |
| 3/30 | TDEC | RCRA Inspection | 0 |
| 5/19 | TDEC | CWA Inspection | 0 |
| 5/26 | EPA; TDEC; TDEC/DOE-O | RCRA Inspection | 0 |
| 6/2 | Tennessee Historic Commission Advisory Council on Historic Preservation | Historic Properties Review | 0 |
| 8/11 | TDEC; TDEC/DOE-O | RCRA Inspection | 0 |
| 8/31 | TDEC | RCRA Inspection | 0 |
| 9/14 | TDEC; TDEC/DOE-O | RCRA Inspection | 0 |
| 9/17 | EPA | TSCA/PCB Visit | 0 |
| 9/23 | TDEC | RCRA Inspection | 0 |
| 9/28 | Tennessee Department of Health | TSCA Incinerator Visit | 0 |
| 10/23 | TDEC; TDEC/DOE-O | Solid Waste Inspection | 0 |
| 11/16 | EPA | CWA Inspection | 0 |
| 11/24 | TDEC; TDEC/DOE-O | UST Inspection | 0 |
| 12/7 | TDEC Heritage Office | Natural Heritage Area Inspection | 0 |

[a]Tennessee Department of Environment and Conservation/DOE Oversight Division.

### 2.4.1 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 Department of Energy 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 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.

## 2.5 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,

**Table 2.16. Summary of permits as of December 1998**

| | Y-12 Plant | ORNL | ETTP |
|---|---|---|---|
| *Resource Conservation and Recovery Act* | | | |
| RCRA operating (Part A and Part B) | 4[a] | 4[b] | 4 |
| Part B applications in process | 1[c] | 1 | 0 |
| Postclosure | 3[d] | 0 | 0 |
| Permit-by-rule units | 13[e] | 170[f] | 9[e] |
| Solid waste landfills | 6[g] | 0 | 0 |
| Annual petroleum UST facility certificate | 2 | 1 | 1 |
| Transporter permit | 1 | 2[h] | 1 |
| *Clean Water Act* | | | |
| NPDES | 1[i] | 1 | 1 |
| Storm water | 1[j] | 1[j] | 1[j] |
| Aquatic resource alteration/U.S. Army | 2 | 2 | 0 |
| Corps of Engineers 404 permits | 0 | 0 | 1 |
| General storm water construction | 2[k] | 0 | 0 |
| *Clean Air Act* | | | |
| Operating air | 40 | 21 | 12 |
| Construction | 0 | 1 | 2 |
| Prevention of significant deterioration | 0 | 0 | 0 |
| *Sanitary Sewer* | | | |
| Sanitary sewer | 1 | 0 | 0 |
| Pump-and-haul permit | 1 | 0 | 0 |
| *Toxic Substances Control Act* | | | |
| TSCA Incinerator | 0 | 0 | 1 |
| R&D for alternative disposal methods | 0 | 2 | 0 |
| *Safe Drinking Water Act* | | | |
| Water Treatment Plant and distribution | 2 | 1 | 1 |
| Class V underground injection control permits | 0 | 1 | 0 |

[a]Four permits have been issued, representing 17 active units.

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

[c]One application is under review by TDEC, representing three active units.

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

[e]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.

[f]Three tanks have been grouted in place since the last reporting cycle.

[g]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.

[h]One permit for solid waste and one for hazardous waste.

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

[j]TDEC has incorporated into individual NPDES permits.

[k]Notice of intent that accesses a general NPDES permit. Two notices of intent remain on file for construction at Landfill V, VII, and for tree maintenance on tributary 7 at the Walk-In Pits closure.

are RCRA operating permits, NPDES permits, and air operating permits.

## 2.6 NOTICES OF VIOLATIONS AND PENALTIES

Two Commissioner's Orders were received in 1998 related to previously issued Notices of Violation (NOVs) for the disposal of radioactive and mixed waste in Industrial Landfill V at the Y-12 Plant in 1996 and 1997. LMES and DOE settled these issues in February 1999 with the issuance of a Consent Order. LMES agreed to make monetary payments of $202,287.50 to various state and local agencies, DOE agreed to a management plan for uranium hexafluoride cylinders stored at the ETTP, and DOE agreed to a remediation plan for Landfill V.

Resolution has been readied in regard to a Commissioner's Order and Assessment of Civil Penalty that was received from TDEC on November 14, 1997, for failure to meet Tennessee State Water Quality Criteria, resulting in a significant fish kill(~24,000) that occurred at the Y-12 Plant on July 24, 1997. Raw water discharge to Upper East Fork Poplar Creek (UEFPC) had been stopped after a major flooding event (>100-year flood) that occurred on July 22, 1997. A slug of sodium bisulfite, a chemical used to reduce levels of instream residual chlorine, had accumulated in the raw water weir basin and was released when the raw water discharge was returned to UEFPC. The sodium bisulfite caused the dissolved oxygen concentrations in UEFPC to drop (<5 ppm), resulting in a fish kill. In June 1999, the Tennessee Water Quality Control Board approved an Agreed Order between LMES, DOE and TDEC to resolve the issue and a penalty of $5,755.02 was paid.

The Y-12 Plant also received an NOV in 1998 for two NPDES mercury permit limit excursions related to the July 1997 flood. Actions were taken at the time of the excursions to correct the problem. No fines or penalties were assessed by TDEC in connection with this NOV.

ORNL received two TDEC NOVs in 1998 for NPDES permit limit excursions; NOVs were received in January and July 1998. ORNL provided responses to TDEC as to corrective actions for excursions cited in the NOVs. No fines or penalties were assessed by TDEC in connection with the ORNL NOVs.

## 2.7 CURRENT ISSUES

### 2.7.1 Actions Filed by Friends of the Earth, Inc.

On January 17, 1992, Friends of the Earth, Inc., a nonprofit corporation, filed a lawsuit against Admiral James D. Watkins (then Secretary of Energy) and DOE in the U.S. District Court for the Eastern District of Tennessee, Northern Division. The suit alleges that DOE is violating the terms and conditions of its NPDES permits for the Y-12 Plant, ORNL, and the ETTP. Specifically, the complaint alleges that discharges of certain quantities of various pollutants into tributaries of the Clinch River that have their sources at the Y-12 Plant, ORNL, and the ETTP have exceeded (and are exceeding) the allowable discharge limits established by the NPDES permits. The suit seeks to force DOE to comply in all respects with its NPDES permits, declaratory judgment, and the award of various other costs.

On September 26, 1996, U.S. District Judge Leon Jordan issued an order requiring DOE to install tablet dechlorinator units at the Y-12 Plant at sources of chlorinated water to ensure compliance with the requirements of the facility's NPDES permit and to eliminate all unpermitted outfalls at the Y-12 Plant. The order also required DOE to conduct a comprehensive survey of all pipes, sinks, and other connections to the storm drain systems at the Y-12 Plant, ORNL, and the ETTP by September 26, 1997. A copy of the report summarizing the survey was provided to Friends of the Earth by October 25, 1997, in accordance with the order.

Friends of the Earth have asked the court to award attorney fees. DOE has opposed the request for attorney fees. The parties are waiting for the court's decision.

## 2.7.2 Hazardous/Toxic Waste Off-Site Shipment Moratorium

In May 1991, a moratorium on the off-site shipment (to non-DOE sites) of PCB and RCRA hazardous waste was implemented throughout the DOE complex, including the DOE sites located on the ORR. The purpose of the moratorium was twofold: (1) to ensure that hazardous/toxic wastes shipped from DOE facilities to commercial TSD facilities do not have bulk (volume) radioactive contamination as a result of DOE operations and (2) to ensure that the wastes do not have surface contamination exceeding DOE Order 5400.5 criteria unless the receiving facility is specifically licensed to manage radioactive waste.

In October 1993, the ETTP received a partial lifting of the moratorium for wastes composed of solid materials that do not have the potential for bulk contamination. The ETTP moratorium continues to remain in effect for hazardous/toxic wastes that are not solid materials (because of the potential for bulk contamination) until such time as DOE develops generic criteria for bulk contamination release. Off-site shipments of solid, hazardous/toxic wastes resumed at the ETTP following DOE's issuance of the partial lifting.

The moratorium at the Y-12 Plant was fully lifted by DOE in January 1994. The Y-12 Plant resumed off-site shipment activities for hazardous/toxic wastes following the lifting of the site moratorium.

In November 1994, ORNL received a partial lifting of the moratorium for wastes composed of solid materials that do not have the potential for bulk contamination. The ban on shipping wastes to off-site commercial facilities was partially lifted in 1996 following DOE approval of ORNL's program to make "no-rad added" determinations using generator process knowledge. During 1997, wastes with suitable generator process knowledge for no-rad added were shipped to commercial vendors, while mixed wastes were shipped to the ETTP. In 1998, ORNL implemented a no-rad added sampling and analysis protocol for wastes that are not solid materials and for which process knowledge is not sufficient to evaluate the presence of bulk contamination. ORNL subsequently received acknowledgment from Bechtel Jacobs Company (the management and integration contractor for DOE Environmental Management) to use that protocol for wastes requiring no-rad added sampling and analysis. Bechtel Jacobs Company will be responsible for initiating shipments of these no-rad added wastes (for which sampling and analysis was conducted) to appropriate off-site vendors.

## 2.7.3 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 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 Tennessee Wildlife Resources Agency (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 1999)