



Migratory birds known to nest on the Oak Ridge Reservation, such as this summer tanager, are covered by the Migratory Bird Treaty Act. DOE and its partners follow a wildlife management plan to protect migratory birds and their habitats.

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Compliance Summary and Community Involvement

Activities conducted on ORR must conform to environmental standards established by federal and state statutes and regulations, DOE orders, contract-based standards, and compliance and settlement agreements where applicable. The US Environmental Protection Agency (EPA) and the Tennessee Department of Environment and Conservation (TDEC) are the principal regulating agencies that issue permits, review compliance reports, participate in joint monitoring programs, inspect facilities and operations, and enforce compliance with applicable regulations.

The following sections summarize the major environmental statutes and their 2021 status for DOE operations on ORR. Note that the DOE Reindustrialization Program, typically in coordination with the Community Reuse Organization of East Tennessee, has leased several facilities at ETTP and the Oak Ridge Science and Technology Park to private entities at ORNL over the past several years. This report does not discuss the compliance status of these lessee operations.

2.1. Laws and Regulations

Table 2.1, which begins on page 2-4, is a summary of the principal environmental standards applicable to DOE activities on ORR, their 2021 status, and the sections in this report that provide more detailed information.

2.2. External Oversight and Assessments

Table 2.2 (see page 2-9) lists the inspections of ORR environmental activities conducted by regulatory agencies for each of the major ORR sites (ETTP, Y-12, and ORNL) during 2021. This table does not include internal DOE or DOE contractor assessments, audits, or evaluations.

2.3. Reporting of Oak Ridge Reservation Spills and Releases

Substances defined as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) are considered to be harmful to human health and the environment. Because many are commonly used substances that are harmless in normal uses but can be dangerous when released, CERCLA establishes reportable quantities for hazardous substance releases.

Certain releases of oil must be reported if they “cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines” (40 *Code of Federal Regulations* 110.3[b]).

On March 1, 2021, a hydraulic oil spill originating from demolition of the Biology Complex at Y-12 resulted in a sheen observed on East Fork Poplar Creek at Outfall 21. Oil-absorbent pads and booms were used to capture the sheen on site. Notifications were made to TDEC, EPA, and the US Nuclear Regulatory Commission.

Neither ETTP, Y-12, nor ORNL had any reportable releases of extremely hazardous substances, as defined by the Emergency Planning and Community Right-to-Know Act, in 2021. See Sections 3.3.11, 4.3.10, and 5.3.10 of this report for more information.

2.4. Notices of Violations and Penalties

ETTP had no notices of environmental violations or penalties in 2021.

In 2021, compliance with the Y-12 National Pollutant Discharge Elimination System (NPDES) water discharge permit limits was 100 percent. However, Y-12 was issued a Notice a Violation for three fish kills caused by chlorinated water discharges, two oily sheens caused by construction activities and CERCLA remediation

activities, and a cloudy discharge that was also caused by CERCLA remediation activities.

In March 2021, a satellite container was found open at ORNL by the TDEC Division of Solid Waste Management during a Hazardous Waste Compliance Evaluation inspection, resulting in a violation. The container was immediately secured, returning the facility to compliance, so no follow-up inspections were conducted.

In 2021, compliance with the ORNL NPDES permit was calculated based on the total 1,736 required laboratory analyses and field measurements. Two numeric NPDES permit noncompliances were reported for ORNL treatment facilities. Also, in 2021, a water line break at ORNL caused aquatic species mortality (total of five crayfish) at White Oak Creek. This incident was reported as a noncompliance with narrative criteria in the permit.

2.5. Community Involvement and Resources

Public activities were severely curtailed in 2021 due to COVID-19 and its applicable restrictions. In previous years, DOE and its contractors have provided or supported numerous community involvement activities on a range of subjects including ETTP historic interpretation efforts, Manhattan Project National Historical Park public meetings and public engagement efforts, Historic American Engineering Record activities, American Museum of Science and Energy community meetings hosted by the City of Oak Ridge, ETTP airport public meetings, public bus tours of ORR, public comment periods for draft environmental assessments, and Community Relations Council meetings. Public collaboration will resume when COVID-19 safety restrictions are lifted.

During 2021, organizations such as Big Brothers Big Sisters, the Boys & Girls Club, Discover Life in America, Dolly Parton’s Imagination Library, East Tennessee Foundation, Foothills Land Conservancy, Friends of the Smokies, the United Way, and many other local charities benefited

from DOE and its contractors' involvement in the community.

2.5.1. Public Comments Solicited

To keep the public informed of comment periods and other matters related to cleanup activities on ORR, DOE publishes online notices at <https://www.energy.gov/orem/services/community-engagement>, conducts public meetings, and issues notices in local newspapers as appropriate. Information on environmental policy and DOE's commitment to providing sound environmental stewardship practices and keeping the public informed is available to the public through sponsored forums and public documents such as this report.

2.5.2. Oak Ridge Site Specific Advisory Board

The Oak Ridge Site Specific Advisory Board (ORSSAB) is a federally appointed citizens' panel that provides independent advice and recommendations to the DOE Oak Ridge Environmental Management Program. The board was formed in 1995 and is composed of up to 22 members chosen to reflect the diversity of genders, races, occupations, views, and interests of persons living near ORR. Members are appointed by DOE and serve on a voluntary basis without compensation.

Information on recommendations the board has made since its establishment, minutes of board and committee meetings, and other information are available on the ORSSAB website at <http://www.energy.gov/ORSSAB>. Videos of the first hour of recent board meetings are posted at <https://www.energy.gov/orem/listings/oak-ridge-site-specific-advisory-board-meetings>. Additional information may be obtained by calling 865-241-4583 or 865-241-4584.

2.5.3. DOE Information Center

The DOE Information Center, located at 1 Science.Gov Way, Oak Ridge, Tennessee, is a one-stop information facility that maintains a collection of more than 45,000 documents describing environmental activities in Oak Ridge.

The center is open Monday through Friday from 8 a.m. to 5 p.m. and can be reached by phone at 865-241-4780, or toll-free at 1-800-382-6938 (option 6). An online catalog that can be used to search for DOE documents by author, title, date, and other fields is available at <https://www.energy.gov/orem/services/community-engagement/doe-information-center>.

2.5.4. Other Resources

- Agency for Toxic Substances and Disease Registry: 1-800-232-4636, <http://www.atsdr.cdc.gov>
- DOE main website: <http://www.energy.gov>
- DOE Oak Ridge Public Affairs Office: 865-576-0885
- EPA Region 4: 1-800-241-1754, <https://www.epa.gov/aboutepa/about-epa-region-4-southeast>
- TDEC, DOE Oversight Division: 865-481-0995, <https://www.tn.gov/environment/program-areas/rem-remediation/rem-oak-ridge-reservation-clean-up.html>
- ETPP: <https://www.energy.gov/orem/cleanup-sites/east-tennessee-technology-park>
- Y-12 National Security Complex: <http://www.y12.doe.gov/>
- ORNL: <https://www.ornl.gov/>

Table 2.1. Applicable environmental laws and regulations and 2021 status

Regulatory program description	2021 status	Report sections
<p>The Clean Air Act and state of Tennessee rules regulate the release of air pollutants through permits and quality limits. Emissions of radionuclides are regulated by EPA via National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities. Greenhouse gas emissions inventory tracking and reporting are regulated by EPA and by DOE.</p>	<p>In 2021 all activities on ORR were conducted in accordance with Clean Air Act requirements.</p>	<p>3.3.3 4.3.4 5.3.3</p>
<p>The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) provides a regulatory framework for remediation of the release or threat of release of hazardous substances from past practices on ORR.</p>	<p>ORR was placed on the EPA National Priorities List in 1989. The ORR Federal Facility Agreement, initiated in 1992 between EPA, TDEC, and DOE, established the framework and schedule for developing, implementing, and monitoring remedial actions on ORR. The on-site CERCLA Environmental Management Waste Management Facility (EMWMF) is operated by UCOR for DOE. Located in Bear Creek Valley, EMWMF is used for disposal of waste resulting from CERCLA cleanup actions on ORR. EMWMF is an engineered landfill that accepts low-level radioactive, hazardous, asbestos, and polychlorinated biphenyl (PCB) wastes, and combinations of these wastes, in accordance with specific waste acceptance criteria under an agreement with state and federal regulators. No CERCLA notices of violations were issued for ORR actions during 2021.</p>	<p>3.3.8 4.3.8, 4.3.12 5.3.8</p>
<p>The Clean Water Act seeks to protect and improve surface water quality by establishing surface water standards enabled by a system of permits. Wastewater discharges are regulated by National Pollutant Discharge Elimination System (NPDES) permits issued by TDEC.</p>	<p>Discharges to surface water at each of the three major ORR sites are governed by NPDES permits. In 2021, ETPP achieved a compliance rate of 100% with NPDES permit limits. In 2021, Y-12 achieved a compliance rate of 100% with NPDES permit limits. Y-12 was issued a Notice a Violation for three fish kills caused by chlorinated water discharges, two oily sheens caused by construction activities and CERCLA remediation activities, and a cloudy discharge also caused by CERCLA remediation activities. The ORNL NPDES permit compliance rate was greater than 99%. ORNL had two numeric permit noncompliances. ORNL also had a water line break that caused aquatic species mortality at White Oak Creek (total of five crayfish). This incident was reported as a noncompliance with narrative criteria in the permit. See Appendix D.</p>	<p>3.3.4, 3.3.5 4.3.5 5.3.4</p>
<p>The Energy Independence and Security Act (EISA) Section 438 establishes requirements for federal agencies to reduce storm water runoff from development projects to protect water resources.</p>	<p>A variety of storm water management techniques, referred to as green infrastructure or low impact design practices, have been implemented on ORR to comply with EISA. The site sustainability plans and associated reporting provide data on sustainability projects and support EISA Section 438 compliance.</p>	<p>3.6.2 4.2.6.3, 4.2.6.9 5.2.1.5</p>

Table 2.1. Applicable environmental laws and regulations and 2021 status (continued)

Regulatory program description	2021 status	Report sections
The Emergency Planning and Community Right-to-Know Act (EPCRA) , also referred to as the Superfund Amendments and Reauthorization Act Title III, requires reporting of emergency planning information, hazardous chemical inventories, and environmental releases of certain toxic chemicals to federal, state, and local authorities.	In 2021, DOE facilities on ORR operated in accordance with emergency planning and reporting requirements as defined by EPCRA. ETPP had no reportable releases of hazardous or extremely hazardous substances. Y-12 and ORNL had no reportable releases of extremely hazardous substances. ORNL exceeded the reporting threshold and reported on the manufacture of nitrate compounds as by-products of on-site sewage treatment. At Y-12, LSC Environmental Edge Earth Guard Pellets, a substance reported by UCOR, exceeded the reporting threshold and was added to the 2021 inventory.	3.3.11
		4.3.10
		5.3.10
The National Environmental Policy Act (NEPA) requires consideration of how federal actions may impact the environment and an examination of alternatives to the actions. NEPA also requires that decisions include public input and involvement through scoping and review of certain NEPA documents.	During 2021, DOE planning and decision-making activities at ETPP, Y-12, and ORNL were conducted via site-level procedures that provide requirements for project reviews and NEPA compliance. In 2021, 39 NEPA reviews were completed at Y-12, three reviews and one categorical exclusion were completed at ETPP, 108 reviews were completed by UT-Battelle, LLC at ORNL, and two reviews were completed by North Wind Solutions, LLC.	3.3.2 4.3.2 5.3.2
The National Historic Preservation Act (NHPA) provides protection for the nation's historic resources by establishing a comprehensive national historic preservation policy.	ORR has several facilities eligible for inclusion in the National Register of Historic Places. Proposed activities are reviewed to determine potential adverse effects on these properties, and identify methods to avoid, mitigate, or minimize adverse effects or harm. During 2021, activities on ORR were conducted in compliance with NHPA requirements.	3.3.2 4.3.3 5.3.2
ORR Protection of Wetlands Programs are implemented to minimize the destruction, loss, or degradation of ORR wetlands and to preserve and enhance their beneficial value.	Surveys to determine the presence of wetlands are conducted as needed for projects or programs through NEPA and other reviews to facilitate compliance with TDEC and US Army Corps of Engineers requirements. Wetland protection on ORR is conducted according to 10 Code of Federal Regulations 1022 and Executive Order (EO) 11990, <i>Protection of Wetlands</i> . No new wetlands were delineated at ETPP or Y-12 in 2021. At ORNL, seven wetlands were delineated in 2021.	1.3.6.1 5.3.12
The Resource Conservation and Recovery Act (RCRA) governs the generation, storage, handling, and disposal of hazardous wastes. RCRA also regulates underground storage tanks containing petroleum and hazardous substances, universal waste, and recyclable used oil.	Y-12, ORNL, and ETPP are defined as large-quantity generators of hazardous waste because each generates more than 1,000 kg of hazardous waste per month. Each site is also regulated as a handler of universal waste. In addition, several permits have been issued for hazardous waste management units on ORR. No notices of violation were issued for ETPP or Y-12 in 2021. At ORNL, one violation was identified and corrected when identified, returning the facility to compliance. An unplanned episodic event occurred at the Hardin Valley Campus, managed by UT-Battelle, when 188 kg of filters and personal protective equipment were generated. Hazardous waste generator regulations allow very small-quantity generators to conduct one planned or unplanned episodic event per year.	3.3.7 4.3.7 5.3.6

Table 2.1. Applicable environmental laws and regulations and 2021 status (continued)

Regulatory program description	2021 status	Report sections
The Safe Drinking Water Act establishes minimum drinking water standards and monitoring requirements.	The City of Oak Ridge supplies potable water to the facilities on ORR and is responsible for meeting all regulatory requirements for drinking water. Sampling results in 2021 for residual chlorine levels, bacterial constituents, and disinfectant by-products in ORR's water system were all within acceptable limits.	3.3.6 4.3.6 5.3.5
The Toxic Substances Control Act regulates the manufacture, use, and distribution of a number of toxic chemicals.	PCB waste generation, transportation, disposal, and storage at ORR are regulated under EPA identification numbers TN1890090003 and TN0890090004. ETPP operated one PCB waste storage area in 2021 where nonradioactive PCB waste was stored in a facility that was not a RCRA-permitted storage facility. In 2021, UT-Battelle, LLC operated six PCB storage areas. Five were located at ORNL, and one was located at the Y-12 Complex. There were no other PCB storage areas at the Y-12 Complex. The ORR PCB Federal Facilities Compliance Agreement between EPA and DOE continues to provide a mechanism to address legacy PCB-use issues across ORR. The agreement specifically addresses the unauthorized use of PCBs, storage and disposal of PCB waste, PCB spill cleanup and decontamination, PCBs mixed with radioactive materials, PCB research and development, and ORR records and reporting requirements. EPA is updated annually on the status of DOE actions regarding management and disposition of legacy PCBs covered by the ORR PCB Federal Facilities Compliance Agreement.	3.3.10 4.3.9 5.3.9
The Bald and Golden Eagle Protection Act protects bald and golden eagles by prohibiting, except under specified conditions, the taking or possession of and commerce in such birds. The act imposes criminal and civil penalties for any such actions.	Bald eagles are known to frequent ORR year-round. Three active bald eagle nests on ORR are protected in accordance with this act. Eaglets have been successfully fledged from the Poplar Creek nesting location in the past.	1.3.6.2
The Endangered Species Act prohibits activities that would jeopardize the continued existence of an endangered or threatened species or cause adverse modification to a critical habitat.	ORR is host to several plant and animal species categorized as endangered, threatened, or of special concern, and these species are protected in accordance with this act.	1.3.6.2, 1.3.6.3
The Migratory Bird Treaty Act protects migratory birds by governing the taking, killing, possession, transportation, and importation of such birds, including their eggs, parts, and nests and any product, manufactured or not, from such items.	ORR hosts numerous migratory birds that are protected under this act.	1.3.6.2

Table 2.1. Applicable environmental laws and regulations and 2021 status (continued)

Regulatory program description	2021 status	Report sections
DOE Order 231.1B, Environment, Safety, and Health Reporting , ensures timely collection, reporting, analysis, and dissemination of information on environment, safety, and health issues.	The 2021 Oak Ridge Reservation Annual Site Environmental Report summarizes ORR environmental activities during 2021 and characterizes environmental performance.	All chapters
DOE Order 435.1, Change 1, Radioactive Waste Management , is implemented to ensure that all DOE radioactive waste is managed in a manner that protects workers, public health and safety, and the environment.	Waste certification programs that are protective of workers, the public, and the environment have been implemented for all activities on ORR to ensure compliance with this DOE order.	3.3 4.3.14, 4.8.2 5.3
DOE Order 436.1, Department Sustainability , provides requirements and responsibilities for managing sustainability within DOE to ensure the department carries out its missions in a sustainable manner that addresses national energy security and global environmental challenges and advances sustainable, efficient, and reliable energy for the future.	DOE contractors on ORR have developed site sustainability plans and have implemented environmental management systems that are incorporated with the contractors' integrated safety management systems to promote sound stewardship practices and ensure compliance with this DOE order.	3.2 4.2 5.2
DOE Order 458.1, Radiation Protection of the Public and the Environment , issued in June 2011, canceled DOE Order 5400.5 and was established to protect members of the public and the environment from undue risk from radiation. This order established standards and requirements for operations of DOE and DOE contractors.	In 2021, DOE Order 458.1 was the primary contractual obligation for radiation protection programs for UT-Battelle, LLC and Consolidated Nuclear Security LLC, and for all UCOR work scope areas where existing CERCLA decision documents do not specifically identify DOE Order 5400.5 requirements. A dose assessment was performed to ensure that the total dose to members of the public from all DOE ORR pathways did not exceed the 100 mrem annual limit established by this order. The assessment estimated the maximum 2021 dose to a hypothetically exposed member of the public from all ORR potential exposure pathways combined would be about 8 mrem. Therefore, the 2021 maximum effective dose was about 8% of the 100 mrem annual limit given in DOE Order 458.1. Clearance of property from ORNL, ETPP, and the Y-12 Complex was conducted in accordance with approved procedures that comply with DOE Order 458.1. There were no unplanned radiological air emission releases from the three major ORR sites in 2021. No limits were exceeded in 2021.	Chapter 7

Table 2.1. Applicable environmental laws and regulations and 2021 status (continued)

Regulatory program description	2021 status	Report sections
DOE Order 5400.5, Radiation Protection , was established to protect members of the public and the environment against undue risk from radiation. This order established standards and requirements for operations of DOE and DOE contractors.	DOE Order 5400.5 is the primary environmental surveillance radiological applicable, relevant, and appropriate requirement for most CERCLA activities across ORR. It will remain in force until the individual CERCLA decision documents are reissued or revised to incorporate DOE Order 458.1. A dose assessment, performed to ensure the total dose to members of the public from all ORR pathways did not exceed the 100 mrem annual limit established by this order, estimated the maximum 2021 dose to a hypothetical exposed member of the public from all ORR potential exposure pathways combined would be about 8 mrem.	Chapter 7
Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds , identifies the responsibilities of federal agencies to promote the conservation of migratory bird populations.	A memorandum of understanding entered into by DOE and the US Fish and Wildlife Service meets the requirements under Section 3 of EO 13186. ORR hosts numerous migratory birds that are present either seasonally or year-round. This memorandum, which was updated in September 2013, strengthens migratory bird conservation on ORR through enhanced collaboration between DOE and the US Fish and Wildlife Service.	1.3.6.2
Executive Order 13834, Efficient Federal Operations , directs federal agencies to manage their buildings, vehicles, and overall operations to optimize energy and environmental performance, reduce waste, and cut costs.	EO 13834, <i>Efficient Federal Operations</i> , superseded EO 13693. Progress toward meeting the requirements of the EO and achieving DOE sustainability goals is summarized in this report. ORNL, Y-12, and ETPP all have sustainability processes and management systems to comply with the EO and subsequent federal instructions for implementing the EO.	3.2.1 4.2.6.3 5.2.1.4

Acronyms:

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
 DOE = US Department of Energy
 EISA = Energy Independence and Security Act
 EMWMF = Environmental Management Waste Management Facility
 EO = Executive Order
 EPA = US Environmental Protection Agency
 EPCRA = Emergency Planning and Community Right-to-Know Act
 ETPP = East Tennessee Technology Park

NEPA = National Environmental Policy Act
 NPDES = National Pollutant Discharge Elimination System
 ORNL = Oak Ridge National Laboratory
 ORR = Oak Ridge Reservation
 PCB = polychlorinated biphenyl
 RCRA = Resource Conservation and Recovery Act
 TDEC = Tennessee Department of Environment and Conservation
 Y-12 or Y-12 Complex = Y-12 National Security Complex

Table 2.2. Summary of external regulatory environmental audits, inspections, and assessments at ORR, 2021

Date	Reviewer	Subject	Issues
East Tennessee Technology Park			
August 20	TDEC	ETTP CWA/NPDES Inspection	0
Y-12 National Security Complex			
February 25	TDEC	Landfill CDL-VII, Area 6, Phase II Final Inspection	0
March 3	TDEC	Annual RCRA Hazardous Waste Compliance Inspection	0
March 8–9	TDEC	Comprehensive Environmental NPDES Compliance Inspections	0
March 11	TDEC	Quarterly ORR Landfill inspection	0
March 23	City of Oak Ridge	Industrial and Commercial User Wastewater Discharge Permit Inspection	0
May 20	TDEC	Quarterly ORR Landfill Inspection	0
July 13	TDEC	Annual Air Quality Compliance Inspection	0
July 21	City of Oak Ridge	Industrial and Commercial User Wastewater Discharge Permit Inspection	0
August 20	TDEC	Quarterly ORR Landfill Inspection	0
September 9	TDEC	Quarterly Inspection of ILF-IV and Semi-annual Inspection of Closed ILF-II	0
September 20–23	UTCIS	Triannual Environmental Management System External Audit	0
October 19	TDEC	Quarterly Inspection of ILF-V and CDL-VII	0
December 9	TDEC	Quarterly Inspection of ILF-IV and a second Semiannual inspection of Closed ILF-II	0
Oak Ridge National Laboratory (including UT-Battelle, LLC; UCOR; Isotek Systems, LLC; and North Wind Solutions, LLC activities)			
March 10–11	TDEC	Hazardous Waste Compliance Evaluation Inspection (including UT-Battelle, Transuranic Waste Processing Center, and UCOR)	1
March 16–17	TDEC	National Pollutant Discharge Elimination System Permit TN0002941 Compliance Inspection	0
March 9	City of Oak Ridge	CFTF Wastewater Inspection	0
July 21	KCDAQM	National Transportation Research Center Clean Air Act Inspection	0
July 22	City of Oak Ridge	CFTF Wastewater Inspection	0
Acronyms:			
CFTF = Carbon Fiber Technology Facility		ORR = Oak Ridge Reservation	
CWA = Clean Water Act		RCRA = Resource Conservation and Recovery Act	
ETTP = East Tennessee Technology Park		TDEC = Tennessee Department of Environment and Conservation	
KCDAQM = Knox County Department of Air Quality Management		UCOR = UCOR, an Amentum-led partnership with Jacobs	
NPDES = National Pollutant Discharge Elimination System		UTCIS = University of Tennessee Center for Industrial Services	

2.6. References

DOE 2020. *2020 Remediation Effectiveness Report for the US Department of Energy Oak Ridge Reservation, Oak Ridge, Tennessee, Data and Evaluations*. DOE/OR/01-2844&D1, US Department of Energy, Oak Ridge, Tennessee, March.

UCOR 2021. *2021 Cleanup Progress: Annual Report to the Oak Ridge Regional Community, Oak Ridge, Tennessee*. OREM-20-7603, UCOR, Oak Ridge, Tennessee.