

ANNUAL SITE ENVIRONMENTAL REPORT 2008

THE OAK RIDGE RESERVATION





Annual Site
ENVIRONMENTAL 2008
Report

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the Oak Ridge Reservation

**Oak Ridge Reservation Annual Site
Environmental Report for 2008**

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Acronyms and Abbreviations

AAS	ambient air station
ACGIH	American Conference of Governmental Industrial Hygienists
ALARA	as low as reasonably achievable
AM	action memorandum
AMO	Atlantic Multidecadal Oscillation
AMSE	American Museum of Science and Energy
ANSI	American National Standards Institute, Inc.
AOC	area of concern
ARAP	aquatic resource alteration permit
ASER	annual site environmental report
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASTM	American Society for Testing and Materials
B&W Y-12	B&W Technical Services Y-12
BCG	biota concentration guide
BCK	Bear Creek kilometer
BESC	BioEnergy Science Center
BFK	Brushy Fork kilometer
BJC	Bechtel Jacobs Company LLC
BMAP	Biological Monitoring and Abatement Program, Plan
BSTS	Big Spring Treatment System
CAA	Clean Air Act
CAP-88	Clean Air Assessment software
CBMH	catch basin manhole
CCC	Complex Command Center
CEMS	continuous emission monitoring system
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	<i>Code of Federal Regulations</i>
CH	contact-handled
CMTS	Central Mercury Treatment System
CNF	Central Neutralization Facility
CNMS	Center for Nanophase Materials Sciences
CRK	Clinch River kilometer
CROET	Community Reuse Organization of East Tennessee
CRT	cathode ray tube
CWA	Clean Water Act
CX	categorical exclusion
CY	calendar year
CYRTF	Coal Yard Runoff Treatment Facility
D&D	decontamination and decommissioning
DAC	derived air concentration
DCG	derived concentration guide
DES	detailed energy survey
DOE	U.S. Department of Energy

Oak Ridge Reservation

DOE-EM	DOE Office of Environmental Management
DOE-ORO	DOE Oak Ridge Operations Office
dps	disintegrations per second
DWI	David Witherspoon, Inc.
EC&P	Environmental Compliance and Protection
ECD	Environmental Compliance Department
ECM	energy conservation measures
ECR	environmental compliance representative
ED	effective dose
EDE	effective dose equivalent
EFD	east foundation drain
EFK	East Fork Poplar Creek kilometer
EM	(DOE Office of) Environmental Management
EMC	event mean concentration
EMEF	Environmental Management and Enrichment Facilities
EMMIS	Environmental Monitoring Management Information System
EMS	environmental management system
EMWMF	Environmental Monitoring Waste Management Facility
ENSO	El Niño Southern Oscillation
EO	environmental officer
EP&WSD	Environmental Protection and Waste Services Division
EPA	U.S. Environmental Protection Agency
EPACT	Energy Policy Act
EPCRA	Emergency Planning and Community Right-to-Know Act
EPO	environmental protection officer
EPT	Ephemeroptera, Plecoptera, and Trichoptera (taxa)
ER	Environmental Restoration
ES&H	Environment, Safety, and Health
ESCO	energy savings contractor
ESPC	energy savings performance contract
ESS	Environmental Surveillance System
ETCFC	East Tennessee Clean Fuel Coalition
ETTP	East Tennessee Technology Park
FCK	First Creek kilometer
FEC	Federal Electronics Challenge
FFA	Federal Facility Agreement
FFK	Fifth Creek kilometer
FGR	federal guidance report
FONSI	finding of no significant impact
FS	feasibility study
FY	fiscal year
GCK	Grass Creek kilometer
GET	General Employee Training
gsf	gross square feet
GWQAR	Groundwater Quality Assurance Report
HCK	Hinds Creek kilometer
HEPA	high-efficiency particulate air

HEUMF	Highly Enriched Uranium Materials Facility
HFIR	High Flux Isotope Reactor
HQ	hazard quotient
HSWA	Hazardous Solid Waste Amendment
IC ₂₅	inhibition concentration (percentage that caused 25% reduction in survival, reproduction, or growth of the test organisms)
ICK	Ish Creek kilometer
ICP	inductively coupled plasma
ICP-MS	inductively coupled plasma mass spectrometry
ID	identification (number)
IDMS	Integrated Document Management System
IFDP	Integrated Facility Disposition Project
IP	initial proposal
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
ISO	International Organization for Standardization
ITER	International Thermonuclear Experimental Reactor
JIBS	Joint Institute for Biological Sciences
JTU	Jackson turbidity unit
LANL	Los Alamos National Laboratory
LC ₅₀	concentration of aqueous sample lethal to 50% of test organisms in a given time span
LCD	liquid crystal display
LEED®	Leadership in Energy and Environmental Design
LIMS	Laboratory Information Management System
LLW	low-level radioactive waste
LOC	Local Oversight Committee
MACT	Maximum Achievable Control Technology
MBK	Mill Branch kilometer
MCCBK	McCoy Branch kilometer
MCL	maximum contaminant level
MDA	minimum detectable activity
MEK	Melton Branch kilometer
MIK	Mitchell Branch kilometer
MLF	Modernization of Laboratory Facilities
MOA	memorandum of agreement
MRF	Multiprogram Research Facility
MSDS	material safety data sheet
MSRE	Molten Salt Reactor Experiment
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NIOSH	National Institute for Occupational Safety and Health
NNSA	National Nuclear Security Administration
NOAA	National Oceanic and Atmospheric Administration
NOEC	no-observed-effect concentration
NOV	notice of violation

Oak Ridge Reservation

NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NSF-ISR	NSF International Registrations, Inc.
NSPS	New Source Performance Standard
NTRC	National Transportation Research Center
NTS	Nevada Test Site
NTU	nephelometric turbidity unit
NWTK	Northwest Tributary kilometer
ODS	ozone-depleting substance
OHS	Occupational Health Services
ORAU	Oak Ridge Associated Universities
OREIS	Oak Ridge Environmental Information System
ORGDP	Oak Ridge Gaseous Diffusion Plant
ORISE	Oak Ridge Institute for Science and Education
ORNL	Oak Ridge National Laboratory
ORO	DOE Oak Ridge Operations Office
ORR PCB FFCA	Oak Ridge Reservation Polychlorinated Biphenyl Federal Facilities Compliance Agreement
ORR	Oak Ridge Reservation
ORSSAB	Oak Ridge Site Specific Advisory Board
ORSTP	Oak Ridge Science and Technology Park
OS	DOE Office of Science
OST	Office of Secure Transportation
OSTI	Office of Scientific and Technical Information
P2	pollution prevention
PAM	perimeter air monitoring
PCB	polychlorinated biphenyl
PCCR	phased construction completion report
PCPA	postclosure permit application
PDO	Pacific Decadal Oscillation
PIDAS	Perimeter Intrusion Detection Assessment System
PM ₁₀	particulate matter with an aerodynamic diameter less than or equal to 10 micrometers
PM _{2.5}	particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers
PPE	personal protection equipment
PWD	process waste drain
PWTC	Process Waste Treatment Complex
QA	quality assurance
QC	quality control
QE	quality evaluation
R&D	research and development
RAC	Radiological Assessment Corporation
Rad NESHAP	National Emission Standards for Hazardous Air Pollutants for Radionuclides
RATA	Relative Accuracy Test Audit
RCK	Raccoon Creek kilometer
RCRA	Resource Conservation and Recovery Act
RfC	reference concentration
RfD	reference dose

RH	remote-handled
RI	species of regional importance
ROD	record of decision
RQ	reportable quantity
RRD	Research Reactors Division
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SBMS	Standards-Based Management System
SDWA	Safe Drinking Water Act
SE	standard error
SF	slope factor
SHPO	state historic preservation officer
SIP	State Implementation Plan
SMS	Safety Management System
SNS	Spallation Neutron Source
SPCC	Spill Prevention, Control, and Countermeasures Plan
SPEIS	Supplemental Programmatic Environmental Impact Statement
SPWTF	Steam Plant Wastewater Treatment Facility
STP	Sewage Treatment Plant
SWEIS	sitewide environmental impact statement
SWHIS	Surface Water Hydrological Information Support System
SWMU	solid waste management unit
SWP3	Storm Water Pollution Prevention Program
SWSA	solid waste storage area
TCE	trichloroethene
TDEC	Tennessee Department of Environment and Conservation
TEAM	Transformational Energy Action Management
TOA	Tennessee Oversight Agreement
TRC	total residual chlorine
TRU	transuranic
TSCA	Toxic Substances Control Act
TSS	total suspended solids
TVA	Tennessee Valley Authority
TWA	time-weighted average
TWPC	Transuranic Waste-Processing Center
TWRA	Tennessee Wildlife Resources Agency
USDA	U.S. Department of Agriculture
UST	underground storage tank
UT	University of Tennessee
VOC	volatile organic compound
WAG	waste area grouping
WBK	Walker Branch kilometer
WCK	White Oak Creek kilometer
WOC	White Oak Creek
WOD	White Oak Dam
WOL	White Oak Lake

Oak Ridge Reservation

WQC	Water quality criteria
WQPP	water quality protection plan
WRRP	Water Resources Restoration Program
WSR	Waste Services Representative
WWTS	Waste Water Treatment System
Y-12 Complex	Y-12 National Security Complex
YSO	Y-12 Site Office

Units of Measure and Conversion Factors

Units of measure and their abbreviations

acre	acre	milliliter	mL
becquerel	Bq	millimeter	mm
centimeter	cm	million	M
curie	Ci	millirad	mrad
day	day	millirem	mrem
degrees Celsius	°C	millisievert	mSv
degrees Fahrenheit	°F	minute	min
foot	ft	nephelometric turbidity unit	NTU
gallon	gal	parts per billion	ppb
gallons per minute	gal/min	parts per million	ppm
gram	g	parts per trillion	ppt
hectare	ha	picocurie	pCi
hour	h	pound	lb
kilogram	kg	pounds per square inch	psi
kilometer	km	quart	qt
kilowatt	kW	rad	rad
liter	L	roentgen	R
megawatt	MW	roentgen equivalent man	rem
meter	m	second	s
metricton	MT	sievert	Sv
microcurie	μCi	standard unit (pH)	SU
microgram	μg	ton, short (2000 lb)	ton
micrometer	μm	yard	yd
millicurie	mCi	year	year
milligram	mg		

Quantitative prefixes

tera	$\times 10^{12}$	pico	$\times 10^{-12}$
giga	$\times 10^9$	nano	$\times 10^{-9}$
mega	$\times 10^6$	micro	$\times 10^{-6}$
kilo	$\times 10^3$	milli	$\times 10^{-3}$
hecto	$\times 10^2$	centi	$\times 10^{-2}$
deka	$\times 10^1$	deci	$\times 10^{-1}$

Unit conversions

Unit	Conversion	Equivalent	Unit	Conversion	Equivalent
Length					
in.	× 2.54	cm	cm	× 0.394	in.
ft	× 0.305	m	m	× 3.28	ft
mile	× 1.61	km	km	× 0.621	mile
Area					
acre	× 0.405	ha	ha	× 2.47	acre
ft ²	× 0.093	m ²	m ²	× 10.764	ft ²
mile ²	× 2.59	km ²	km ²	× 0.386	mile ²
Volume					
ft ³	× 0.028	m ³	m ³	× 35.31	ft ³
qt (U.S. liquid)	× 0.946	L	L	× 1.057	qt (U.S. liquid)
gal	× 3.7854118	L	L	× 0.264172051	gal
Concentration					
ppm	× 1	mg/L	mg/L	× 1	ppm
Weight					
lb	× 0.4536	kg	kg	× 2.205	lb
ton	× 907.1847	kg	kg	× 0.00110231131	ton
Temperature					
°C	°F = (9/5) °C + 32	°F	°F	°C = (5/9) (F - 32)	°C
Activity					
Bq	× 2.7 × 10 ⁻¹¹	Ci	Ci	× 3.7 × 10 ¹⁰	Bq
Bq	× 27	pCi	pCi	× 0.037	Bq
mSv	× 100	mrem	mrem	× 0.01	mSv
Sv	× 100	rem	rem	× 0.01	Sv
nCi	× 1000	pCi	pCi	× 0.001	nCi
mCi/km ²	× 1	nCi/m ²	nCi/m ²	× 1	mCi/km ²
dpm/L	× 0.45 × 10 ⁹	μCi/cm ³	μCi/cm ³	× 2.22 × 10 ⁹	dpm/L
pCi/L	× 10 ⁻⁹	μCi/mL	μCi/mL	× 10 ⁹	pCi/L
pCi/m ³	× 10 ⁻¹²	μCi/cm ³	μCi/cm ³	× 10 ¹²	pCi/m ³

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