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List of Acronyms and Abbreviations

°C	degree(s) Celsius
°F	degree(s) Fahrenheit
AB	nuclear safety Authorization Basis
ACGIH	American Conference of Governmental Industrial Hygienists
ACS	American Community Survey
ADD	average daily dose
ADE	advection-dispersion equation
AEGL	Acute Exposure Guideline Level
AERMET	American Meteorological Society/U.S. Environmental Protection Agency Regulatory Meteorological Preprocessor
AERMOD	American Meteorological Society/U.S. Environmental Protection Agency Regulatory Model
AMS	articulated-mast system
amsl	above mean sea level
APL	accelerated process line
ARAR	applicable or relevant and appropriate requirement
ARF	airborne release fraction
AS/RS	Automated Stacker/Retrieval System
AVA	American Viticultural Area
BAF	bioaccumulation factor
BBI	Best-Basis Inventory
BCF	bioconcentration factor
BEIR	Biological Effects of Ionizing Radiation
BOF	balance of facilities
BOR	U.S. Bureau of Reclamation
BRC	Blue Ribbon Commission on America's Nuclear Future
BRR	Black Rock Reservoir
BTU	British thermal unit
BUSS	Beneficial Uses Shipping System
C3T	Cleanup Challenge and Constraints Team
CAIRS	Computerized Accident/Incident Reporting System
Census Bureau	U.S. Census Bureau
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	<i>Code of Federal Regulations</i>
CH	contact-handled
COPC	constituent of potential concern
CPI	Consumer Price Index

List of Acronyms and Abbreviations

CRCIA	<i>Screening Assessment and Requirements for a Comprehensive Assessment, Columbia River Comprehensive Impact Assessment</i>
CSB	Canister Storage Building
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
CWC	Central Waste Complex
CY	calendar year
D&D	decontamination and decommissioning
dB	decibels
dBA	decibels A-weighted
DBVS	Demonstration Bulk Vitrification System
DCF	dose conversion factor
DHS	U.S. Department of Homeland Security
DNAPL	dense, nonaqueous-phase liquid
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy Richland Operations Office
DOT	U.S. Department of Transportation
DR	damage ratio
DSASW	documented safety analysis for solid waste operations
DST	double-shell tank
EA	environmental assessment
EBR-II	Experimental Breeder Reactor II
ECEM	Ecological Contaminant Exposure Model
ECF	elevation correction factor
Ecology	Washington State Department of Ecology
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
EPIcode	Emergency Prediction Information Code
ERDF	Environmental Restoration Disposal Facility
ERPG	Emergency Response Planning Guideline
ETF	Effluent Treatment Facility
FAST Facility	Fluorinel Dissolution Process and Fuel Storage Facility
FBSR	fluidized-bed steam reforming
FDP	Fluorinel Dissolution Process
Fermi	Enrico Fermi Nuclear Generating Station
FFTF	Fast Flux Test Facility
“FFTF Decommissioning EIS”	“Environmental Impact Statement for the Decommissioning of the Fast Flux Test Facility at the Hanford Site, Richland, Washington”
FGR	Federal Guidance Report

FIR	field investigation report
FONSI	Finding of No Significant Impact
FRAMES	Framework for Risk Analysis in Multimedia Environmental Systems
FTE	full-time equivalent
FY	fiscal year
Gable Gap	Gable Mountain–Gable Butte Gap
GAP	Government Accountability Project
GENII	Hanford Environmental Radiation Dosimetry Software System, Generation II
GENII-2	Hanford Environmental Radiation Dosimetry Software System, Generation II, Version 2
GHB	Generalized Head Boundary
GIS	geographic information system
<i>Green Book</i>	<i>Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements</i>
GTCC	greater-than-Class C
<i>GTCC EIS</i>	<i>Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste</i>
HAB	Hanford Advisory Board
Hanford	Hanford Site
<i>Hanford Comprehensive Land-Use Plan EIS</i>	<i>Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement</i>
HDW	Hanford Defined Waste
HEAST	Health Effects Assessment Summary Table
HEPA	high-efficiency particulate air
HFEF	Hot Fuel Examination Facility
HIHTL	hose-in-hose transfer line
HLW	high-level radioactive waste
HMS	Hanford Meteorological Station
HSGS	headspace gas sampling
<i>HSRAM</i>	<i>Hanford Site Risk Assessment Methodology</i>
<i>HSSWAC</i>	<i>Hanford Site Solid Waste Acceptance Criteria</i>
<i>HSW EIS</i>	<i>Final Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement, Richland, Washington</i>
HTWOS	Hanford Tank Waste Operation Simulator
ICRP	International Commission on Radiological Protection
ICV™	In-Container Vitrification™
IDA	intentional destructive act
IDF	Integrated Disposal Facility

IDF-East	200-East Area Integrated Disposal Facility
IDF-West	200-West Area Integrated Disposal Facility
IEM	Interim Examination and Maintenance
IHLW	immobilized high-level radioactive waste
ILAW	immobilized low-activity waste
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
IRIS	Integrated Risk Information System
ISCORS	Interagency Steering Committee on Radiation Standards
ISO	International Organization for Standardization
ITV	in-tank vehicle
K_d	standard distribution coefficient
LAW	low-activity waste
LCF	latent cancer fatality
LDC	large-diameter container
LERF	Liquid Effluent Retention Facility
LIGO	Laser Interferometer Gravitational-Wave Observatory
LLBG	low-level radioactive waste burial ground
LLW	low-level radioactive waste
LOAEL	lowest-observed adverse effect level
LPF	leak path factor
LWPF	Liquid Waste Processing Facility
MACCS	MELCOR Accident Consequence Code System
MAI	Mission Acceleration Initiative
MAR	material at risk
MCL	maximum contaminant level
MEDE	melt-drain-evaporate
MEI	maximally exposed individual
MFC	Materials and Fuels Complex
MLLW	mixed low-level radioactive waste
<i>Modal Study</i>	<i>Shipping Container Response to Severe Highway and Railway Accident Conditions</i>
MODFLOW	modular three-dimensional finite-difference groundwater flow model
MODPATH	MODFLOW particle-tracking postprocessing package
MRS	mobile retrieval system
MSL	mean sea level
MUST	miscellaneous underground storage tank

	NAAQS	National Ambient Air Quality Standards
	NASA	National Aeronautics and Space Administration
	NDA	nondestructive assay
	NDE	nondestructive examination
	NEHRP	National Earthquake Hazards Reduction Program
	NEPA	National Environmental Policy Act
	NFPA	National Fire Protection Association
	<i>NI PEIS</i>	<i>Final Programmatic Environmental Impact Statement for Accomplishing Expanded Civilian Nuclear Energy Research and Development and Isotope Production Missions in the United States, Including the Role of the Fast Flux Test Facility</i>
	NNSS	Nevada National Security Site
	NPL	National Priorities List
	NRC	U.S. Nuclear Regulatory Commission
	NRDWL	Nonradioactive Dangerous Waste Landfill
	<i>NRF</i>	<i>National Response Framework</i>
	<i>NRIA</i>	<i>Nuclear/Radiological Incident Annex</i>
	NWCF	New Waste Calcining Facility
	OA	Office of Independent Oversight and Performance Assurance
	ORIGEN2	Oak Ridge Isotope Generation and Depletion Code
	ORNL	Oak Ridge National Laboratory
	ORP	Office of River Protection
	OSHA	Occupational Safety and Health Administration
	PCB	polychlorinated biphenyl
	PPF	Plutonium Finishing Plant
	PHREEQC	Ph, REDOX, and Equilibrium – C Language
	PM _n	particulate matter with an aerodynamic diameter less than or equal to <i>n</i> micrometers
	PNNL	Pacific Northwest National Laboratory
	PPA	Property Protected Area
	PPF	Preprocessing Facility
	ppm	part(s) per million
	Pu-239 DE-curies	plutonium-239 dose-equivalent curies
	PUREX	Plutonium-Uranium Extraction
	PVC	polyvinyl chloride
	<i>R</i>	Retardation coefficient
	R&D	research and development

List of Acronyms and Abbreviations

<i>Radioactive Material Transport Study</i>	<i>Final Environmental Impact Statement on the Transportation of Radioactive Material by Air and Other Modes</i>	
RAO	remedial action objective	
RCA	radiologically controlled area	
RCB	Reactor Containment Building	
RCRA	Resource Conservation and Recovery Act	
RD/RA	remedial design/remedial action	
REDOX	Reduction-Oxidation	
<i>Reexamination Study</i>	<i>Reexamination of Spent Fuel Shipment Risk Estimates</i>	
rem	roentgen equivalent man	
RESRAD	RESidual RADioactivity	
RF	respirable fraction	
RH	remote-handled	
RH-SC	remote-handled special component	
RI/FS	remedial investigation/feasibility study	
RL	Richland Operations Office	
RMS	root mean square	
ROD	Record of Decision	
ROI	region of influence	
RPP	River Protection Project	
RPPDF	River Protection Project Disposal Facility	
RSD	relative standard deviation	
RSE	rubble, soil, and equipment	
RSWF	Radioactive Scrap and Waste Facility	
RTP	Remote Treatment Project	
RWM	restricted-waste management	
S&M	surveillance and maintenance	
SAIC	Science Applications International Corporation	
SALDS	State-Approved Land Disposal Site	
SC	special component	
SCBA	self-contained breathing apparatus	
SIM	Soil Inventory Model	
SNF	spent nuclear fuel	
SPF	Sodium Processing Facility	
SRE	Sodium Reactor Experiment	
SRF	Sodium Reaction Facility	
SRS	Savannah River Site	

SSF	Sodium Storage Facility
SST	single-shell tank
STAR	Science and Technology Applications Research
STOMP	Subsurface Transport Over Multiple Phases
STORM	Subsurface Transport Over Reactive Multiphases
STP	supplemental treatment process
STTS-East	200-East Area Supplemental Treatment Technology Site
STTS-West	200-West Area Supplemental Treatment Technology Site
SWB	solid-waste box
<i>SWIFT Report</i>	<i>Solid Waste Integrated Forecast Technical (SWIFT) Report, FY2006–FY2035</i>
SWOC	Solid Waste Operations Complex
“Tank Closure EIS”	“Environmental Impact Statement for Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single-Shell Tanks at the Hanford Site, Richland, Washington”
TBR	technical baseline review
<i>TC & WM EIS</i>	<i>Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington</i>
<i>Technical Guidance Document</i>	<i>Technical Guidance Document for Tank Closure Environmental Impact Statement Vadose Zone and Groundwater Revised Analyses</i>
TEDF	Treated Effluent Disposal Facility
TEEL	Temporary Emergency Exposure Limit
TMC	theoretical maximum capacity
TOB	top of basalt
TOE	total operating efficiency
TPA	Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement)
TPQ	threshold planning quantity
TQ	threshold quantity
TRA	Technology Readiness Assessment
TRAGIS	Transportation Routing Analysis Geographic Information System
TRC	total recordable cases
TRG	Technical Review Group
TRU	transuranic
TRUPACT-II	Transuranic Waste Package Transporter II
TRV	toxicity reference value
<i>TWRS EIS</i>	<i>Tank Waste Remediation System, Hanford Site, Richland, Washington, Final Environmental Impact Statement</i>
UGA	urban growth area
UMADRA	Umatilla Army Depot Reuse Authority
US Ecology	US Ecology Commercial Low-Level Radioactive Waste Disposal Site

List of Acronyms and Abbreviations

USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VBR	vacuum-based retrieval
VOC	volatile organic compound
WESF	Waste Encapsulation and Storage Facility
WIDS	Waste Information Data System
WIPP	Waste Isolation Pilot Plant
<i>WIPP SEIS-II</i>	<i>Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement</i>
<i>WM PEIS</i>	<i>Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste</i>
WRAP	Waste Receiving and Processing Facility
WRF	waste receiver facility
WSU-TC	Washington State University Tri-Cities
WTP	Waste Treatment Plant
Yakama Nation	Confederated Tribes and Bands of the Yakama Nation
<i>Yucca Mountain EIS</i>	<i>Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada</i>

Measurement Units

The principal measurement units used in this *Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington (TC & WM EIS)* are SI units (the abbreviation for the *Système international d'unités*). The SI system is an expanded version of the metric system that was accepted as the legal standard by the International Organization for Standardization. In this system, most units are made up of combinations of seven basic units, of which length in meters, mass in kilograms, and volume in liters are of most importance in this *TC & WM EIS*. Exceptions are radiological units that use the English system (e.g., rem, millirem).

Scientific (Exponential) Notation

Numbers that are very small or very large are often expressed in scientific, or exponential, notation as a matter of convenience. For example, the number 0.000034 may be expressed as 3.4×10^{-5} or 3.4E-05, and 65,000 may be expressed as 6.5×10^4 or 6.5E+04. In this *TC & WM EIS*, numerical values that are less than 0.001 or greater than 9,999 are generally expressed in scientific notation, i.e., 1.0×10^{-3} and 9.9×10^3 , respectively.

Multiples or submultiples of the basic units are also used. A partial list of prefixes that denote multiples and submultiples follows, with the equivalent multiplier values expressed in scientific notation.

Prefix	Symbol	Multiplier	
atto	a	0.000 000 000 000 000 001	1×10^{-18}
femto	f	0.000 000 000 000 001	1×10^{-15}
pico	p	0.000 000 000 001	1×10^{-12}
nano	n	0.000 000 001	1×10^{-9}
micro	μ	0.000 001	1×10^{-6}
milli	m	0.001	1×10^{-3}
centi	c	0.01	1×10^{-2}
deci	d	0.1	1×10^{-1}
deca	da	10	1×10^1
hecto	h	100	1×10^2
kilo	k	1,000	1×10^3
mega	M	1,000,000	1×10^6
giga	G	1,000,000,000	1×10^9
tera	T	1,000,000,000,000	1×10^{12}
peta	P	1,000,000,000,000,000	1×10^{15}
exa	E	1,000,000,000,000,000,000	1×10^{18}

The following symbols are occasionally used in conjunction with numerical expressions:

- < less than
- ≤ less than or equal to
- > greater than
- ≥ greater than or equal to

Conversions

English to Metric			Metric to English		
Multiply	by	To get	Multiply	by	To get
Area			Area		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092903	square meters	square meters	10.7639	square feet
square yards	0.8361	square meters	square meters	1.196	square yards
acres	0.40469	hectares	hectares	2.471	acres
square miles	2.58999	square kilometers	square kilometers	0.3861	square miles
Length			Length		
inches	2.54	centimeters	centimeters	0.3937	inches
feet	30.48	centimeters	centimeters	0.0328	feet
feet	0.3048	meters	meters	3.281	feet
yards	0.9144	meters	meters	1.0936	yards
miles	1.60934	kilometers	kilometers	0.6214	miles
Temperature			Temperature		
degrees Fahrenheit	Subtract 32, then multiply by 0.55556	degrees Celsius	degrees Celsius	Multiply by 1.8, then add 32	degrees Fahrenheit
Volume			Volume		
fluid ounces	29.574	milliliters	milliliters	0.0338	fluid ounces
gallons	3.7854	liters	liters	0.26417	gallons
cubic feet	0.028317	cubic meters	cubic meters	35.315	cubic feet
cubic yards	0.76455	cubic meters	cubic meters	1.308	cubic yards
Weight			Weight		
ounces	28.3495	grams	grams	0.03527	ounces
pounds	0.4536	kilograms	kilograms	2.2046	pounds
short tons	0.90718	metric tons	metric tons	1.1023	short tons

Note: The use of the SI system of units as the principal system of measurement in this *TC & WM EIS*, combined with the use of significant figures or rounding when presenting numerical data, may cause some conversions to appear to be incorrect throughout this environmental impact statement (EIS). This is generally more common when the original value was in English units and was subsequently converted to the SI system for presentation in this EIS. The rounding error may be more noticeable when the corresponding measurement units in the English and SI systems are not relatively comparable in magnitude (e.g., feet and meters). For example, for the “2.9-million-liter (758,000-gallon) capacity” values presented in Chapter 2, Section 2.2.1.1, the original value of 758,000 gallons was converted to 2,869,000 liters (rounded to 2.9 million liters). However, converting 2.9 million liters to gallons yields 766,000 gallons, which is different from the original value. In another example, for the values “22 by 29 meters (72 by 94 feet)” presented in Section 2.3.3.2.2, the original value of 94 feet was converted to 28.6 meters (rounded to 29 meters). Converting 29 meters to feet yields 95 feet, which is slightly different from the original value of 94 feet. In this *TC & WM EIS*, the original value in English units is preserved, whereas, in many instances, the SI unit is actually the converted number.

