DOE/EIS-0387

Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex

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Abstract: NNSA, a separately organized agency within DOE, is responsible for maintaining the safety, reliability, and security of the U.S. nuclear weapons stockpile to meet national security requirements. NNSA manages nuclear weapons programs and facilities, including those at the Y-12 National Security Complex (Y-12) at Oak Ridge, Tennessee. This Final Y-12 SWEIS analyzes the potential environmental impacts of the reasonable alternatives for ongoing and foreseeable future operations and activities at Y-12, including alternatives for changes to site infrastructure and levels of operation (using production capacity as the key metric for comparison).

Five alternatives are analyzed in this Y-12 SWEIS: (1) No Action Alternative (maintain the status quo); (2) Uranium Processing Facility (UPF) Alternative; (3) Upgrade-in-Place Alternative; (4) Capability-sized UPF Alternative; and (5) No Net Production/Capability-sized UPF Alternative. This document assesses the potential environmental impacts of operations and applicable plans on land uses, socioeconomic characteristics and environmental justice, prehistoric and historic cultural resources, visual resources, geology and soils, biological resources, wetlands, water, air quality, noise, traffic and transportation, utilities and energy, waste management, human health and safety, intentional destructive acts, and accidents. The Capability-sized UPF Alternative is NNSA's preferred alternative.

Public Involvement: NNSA distributed the Draft Y-12 SWEIS in October 2009. The public comment period for the Draft Y-12 SWEIS began on October 30, 2009, with publication of the Environmental Protection Agency's Notice of Availability in the *Federal Register* (74 FR 56189). That notice invited public comment on the Draft Y-12 SWEIS through January 4, 2010, and provided for two public hearings to receive comments on the Draft Y-12 SWEIS. During the comment period, two public hearings were held in Oak Ridge, Tennessee, on November 17 and

18, 2009. At the first hearing, NNSA announced an extension of the comment period until January 29, 2010. That announcement was formalized with a notice in the *Federal Register* on December 28, 2009 (74 FR 68599).

All comments received during the comment period were considered during the preparation of the Final Y-12 SWEIS. All late comments were also considered. The Final SWEIS contains revisions and new information based in part on comments received on the Draft SWEIS. Following issuance of the Draft SWEIS, NNSA determined that a Haul Road was needed to support UPF construction. The Final SWEIS also includes information and analysis of a Haul Road extension corridor for the UPF, including a detailed Wetlands Assessment that was prepared in accordance with 10 Code of Federal Regulations (CFR) 1022, "Compliance with Floodplain and Wetlands Environmental Review Requirements" for the purpose of fulfilling NNSA's responsibilities under Executive Order 11990, "Protection of Wetlands." The Wetlands Assessment is contained in Appendix G. The comments received on that assessment, and NNSA's responses to those comments, are contained in Volume II of the Final SWEIS. In accordance with 40 CFR 1502.9(c)(1), NNSA determined, with respect to the Haul Road, that there were no substantial changes in the proposed action that are relevant to environmental concerns, nor significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. Consequently, NNSA determined that a Supplemental Draft Y-12 SWEIS was not required.

Vertical change bars in the margins of the Final SWEIS indicate the locations of revisions and new information (in the Summary, small changes are indicated by a double underline). Volume II contains the comments received on the Draft SWEIS and NNSA's responses to the comments. NNSA will use the analysis presented in this Final SWEIS, as well as other information, in preparing the Record(s) of Decision (RODs) regarding Y-12. NNSA will issue one or more RODs no sooner than 30 days after the U.S. Environmental Protection Agency publishes a Notice of Availability of this Final SWEIS in the *Federal Register*. This document and related information are available on the Internet at www.y12sweis.com and DOE's NEPA website at www.nepa.energy.gov/DOE_NEPA_documents.htm.

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ACRONYMS AND ABBREVIATIONS

AAQS	Ambient Air Quality Standards
AAS2	Ambient Air Station No. 2
AAS8	Ambient Air Station No. 8
ACGIH	American Conference of Governmental Industrial Hygienists
ACHP	Advisory Council on Historic Preservation
ACO	Analytical Chemistry Organization
AD/HE	assembly/disassembly and high explosives
ALARA	as low as reasonably achievable
AMSL	above mean sea level
AQCR	Air Quality Control Region
ARRA	American Recovery and Reinvestment Act
ASER	Annual Site Environmental Report
ASTM	American Society for Testing and Materials
ATSDR	Agency for Toxic Substances and Disease Registry
BA	Biological Assessment
BCG	biota concentration guides
BEA	Bureau of Economic Analysis
BEIR	Biological Effects of Ionizing Radiation
BFK	Bushy Fork Kilometer
BJC	Bechtel Jacobs Company
BLM	Bureau of Land Management
BLS	Bureau of Labor Statistics
BMAP	Biological Monitoring and Abatement Program
BMP	Best Management Practice
BO	Biological Opinion
Bq	Becquerel
BSWTS	Big Spring Wastewater Treatment System
B&W	Babcock & Wilcox Technical Services Y-12, LLC, the management and operating contractor at Y-12
CAA	*Clean Air Act*
CAP88-PC	Clean Air Assessment Package 1988
Cat I/II	Category I and II
CATV	Cable Television Network
CAUP	Compressed Air Upgrades Project
CCC	Complex Command Center
CD	Critical Decision
CED	collective committed effective dose
CEDR	Comprehensive Epidemiologic Data Resource
CEQ	Council on Environmental Quality
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act*
CFR	Code of Federal Regulations
Ci	Curies
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora

CMC	Consolidated Manufacturing Complex
CMTS	Central Mercury Treatment System
CO	Carbon monoxide
CO_2	Carbon dioxide
CRMP	Cultural Resource Management Plan
CRT	cathode ray tube
CSA	Canned subassemblies
CSF	Cancer Slope Factors
CSMO	Central Scrap Management Office
CTBT	Comprehensive Test Ban Treaty
CWA	*Clean Water Act*
CX	categorical exclusion
CY	calendar year
D&D	decontamination and decommissioning
DARA	disposal area remedial action
DART	Days Away, Restricted or on Job Transfer
DBA	design-basis accident
DBT	Design Basis Threat
DCG	Derived concentration guide
DHS	Department of Homeland Security
DLA	Defense Logistics Agency
DNFSB	Defense Nuclear Facilities Safety Board
DNL	Day-Night Average Sound Level
DOC	Department of Commerce
DoD	Department of Defense
DOE	Department of Energy
DOE-NE	Department of Energy Office of Nuclear Energy
DOE-SC	Department of Energy Office of Science
DOI	Department of Interior
DOJ	Department of Justice
DOT	Department of Transportation
DP	Defense Programs
DPNet	Defense Programs Network
DSWM	Division of Solid Waste Management
DU	depleted uranium
EA	Environmental Assessment
EAC	early action compact
ED	effective dose
EFPC	East Fork Poplar Creek
EIS	Environmental Impact Statement
EM	Environmental Management
EMS	Environmental Management System
EMWMF	Environmental Management Waste Management Facility
EO	Executive Order
EOC	Emergency Operations Center
EOL	end-of-life

EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning & Community Right-to-Know Act
EPHA	Emergency Planning Hazards Assessment
ERB	emergency response boundary
ERPG	Emergency Response Planning Guideline
ERO	Emergency Response Organization
ESCO	Emergency Savings Contractor
ES&H	environment, safety and health
ESPCs	Energy savings performance contracts
ESRI	Environmental Systems Research Institute
ETTP	East Tennessee Technology Park
EU	enriched uranium
FAA	Federal Aviation Administration
FFA	*Federal Facilities Agreement*
FFCA	*Federal Facilities Compliance Act*
FIRP	Facilities and Infrastructure Recapitalization Program
FONSI	Finding of No Significant Impact
FR	*Federal Register*
FRR	foreign research reactor
FTE	Full Time Employment
FY	Fiscal Year
GIS	Geographic Information Systems
GSA	General Services Administration
GSMNP	Great Smoky Mountain National Park
GTRI	Global Threat Reduction Initiative
HAP	hazardous air pollutant
HEPA	high-efficiency particulate air
HEU	highly enriched uranium
HEUMF	Highly Enriched Uranium Materials Facility
HF	hydrogen fluoride
Hg	mercury
HFIR	high flux isotope reactor
HI	hazard index
HPP	*National Historic Preservation Act* Historic Preservation Plan
HQ	hazard quotient
HVAC	heating, ventilation, and air conditioning
IAEA	International Atomic Energy Agency
ICRP	International Commission on Radiological Protection
IFDP	Integrated Facility Disposition Program
IR	Infrastructure Reduction
ISC3	Industrial Source Complex
ISSM	Integrated Safeguards and Security Management
LANL	Los Alamos National Laboratory
LCD	liquid crystal display
LCF	latent cancer fatality
LDR	Land Disposal Restrictions

LEED	Leadership in Energy and Environmental Design
LEP	Life Extension Program
LEU	low-enriched uranium
LiCl	Lithium chloride
LiH/LiD	lithium hydride/lithium deuteride
LLW	low-level waste
LMER	Lockheed Martin Energy Research Corporation
LMES	Lockheed Martin Energy Systems, Inc.
LOS	Level-of-Service
LWD	lost workdays
MAA	material access area
MACCS	MELCOR Accident Consequence Code System
MCL	Maximum Concentration Limits
MEI	maximally exposed individual
MLLW	mixed low-level waste
M&O	Management and operating
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standard
NCI	National Cancer Institute
NBB	National Biodiesel Board
NCRP	National Council on Radiation Protection and Measurements
NDA	nondestructive assay
NDT	nondestructive testing
NEIC	National Earthquake Institute Center
NEPA	*National Environmental Policy Act*
NERP	National Environmental Research Park
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFRR	Nuclear Facility Risk Reduction
NHPA	*National Historical Preservation Act*
NIOSH	National Institute for Occupational Safety and Health
NMFS	National Marine Fisheries Service
NN	Office of Nuclear Nonproliferation
NNSA	National Nuclear Security Administration
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOX	nitrogen oxides
NO_2	nitrogen dioxide
NP	Natural Phenomena
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPR	Nuclear Posture Review
NPT	Nuclear Nonproliferation Treaty
NRC	Nuclear Regulatory Commission
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NSDWS	National Secondary Drinking Water Standard

NSP	National Security Program
NTN	Nuclear Technology & Nonproliferation
NTS	Nevada Test Site
NWC	Nuclear Weapons Council
ODS	Ozone Depleting Substances
O&M	operation and maintenance
OMB	Office of Management and Budget
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
ORO	Oak Ridge Office
OSHA	Occupational Safety and Health Administration
OST	Office of Secure Transportation
PAGs	protective action guides
Pb	lead
PEL	permissible exposure limits
P&PDs	Production and Planning Directives
PC	performance categories
PCB	polychlorinated biphenyl
PEIS	Programmatic Environmental Impact Statement
PIDAS	Perimeter Intrusion Detection and Assessment System
POTW	Oak Ridge Publicly Owned Treatment Works
PRG	Preliminary Remediation Goals
PSS	Plant Shift Superintendent
PVC	Polyvinyl Chloride
RADTRAN	Radioactive Material Transportation risk assessment computer code
RCRA	*Resource Conservation and Recovery Act*
REIS	Regional Economic Information System
REM	roentgen equivalent man
REMS	Radiation Exposure and Monitoring System
RERTR	Reduced Enrichment Research and Test Reactor
RfD	Reference Dose
R&D	research and development
RI	species of regional importance
RMP	resource management planning
ROD	Record of Decision
ROI	region of influence
ROW	Right-of-Way
SA	Supplement Analysis
SARA	*Superfund Amendments and Reauthorization Act*
S&D	Storage and Disposition
SC	Office of Science
SGT	Safeguard Transporters
S&M	service and maintenance
SEAB	Secretary of Energy Advisory Board
SEER	Surveillance, Epidemiology and End Results
SHPO	State Historic Preservation Officer

SIP	Security Improvement Project
SLEP	Stockpile Life Extension Programs
SMC	Special Materials Complex
SMR	Standard Mortality Ratio
SNL	Sandia National Laboratories
SNM	special nuclear material
SNS	Spallation Neutron Source
SO_2	Sulfur dioxide
SOx	Sulfur Oxides
SPEIS	Supplemental Programmatic Environmental Impact Statement
SR	State Route
SRS	Savannah River Site
SSM	Stockpile Stewardship and Management
SSM PEIS	*Programmatic Environmental Impact Statement for Stockpile Stewardship and Management*
SST	safe secure trailer
START	Strategic Arms Reduction Talks
SWEIS	Site-Wide Environmental Impact Statement
SWMU	solid waste management unit
TCA	Tennessee Code Annotated
TDEC	Tennessee Department of Environment and Conservation
TDOT	Tennessee Department of Transportation
T&E	threatened and endangered
TECC	Transportation and Emergency Control Center
TED	Total Effective Dose
TEV	Threshold Emission Value
TLD	Thermoluminescent Dosimeter
TLV	Threshold Limit Value
TN	Tennessee
TP3	Tennessee Pollution Prevention Partnership
TRAGIS	Transportation Routing Analysis Geographic Information System
TRC	Total Recordable Cases
TRCR	Total Recordable Case Rate
TRU	transuranics
TSCA	*Toxic Substances Control Act*
TSD	treatment, storage, and disposal
TSHPO	Tennessee State Historic Preservation Officer
TSR	Tennessee State Route
TSWMA	*Tennessee Solid Waste Management Act*
TVA	Tennessee Valley Authority
TWA	time-weighted average
TWRA	Tennessee Wildlife Resources Agency
TYCSP	Ten-Year Comprehensive Site Plan
TYSP	Ten Year Site Plan
UCNI	Unclassified Controlled Nuclear Information
UEFPC	Upper East Fork Poplar Creek

UF_4	Uranium tetraflouride
UPF	Uranium Processing Facility
U.S.	United States
U.S.C.	United States Code
USEC	United States Enrichment Corporation
USFWS	U.S. Fish and Wildlife Service
USACE	U.S. Army Corps of Engineers
USCB	United States Census Bureau
UST	Underground Storage Tank
UTenn	University of Tennessee
VOCs	volatile organic compounds
VRM	Visual Resource Management
WAC	waste acceptance criteria
WETF	West End Treatment Facility
WIPP	Waste Isolation Pilot Plant
WMA	Wildlife Management Area
WVDP WM	West Valley Demonstration Project Waste Management
Y-12	Y-12 National Security Complex
YSO	Y-12 Site Office

UNIT OF MEASURE AND ABBREVIATIONS

A-weighted decibel	dBA
British thermal unit per hour	Btu/hr
cubic meters	m^3
cubic meters per year	m^3/yr
cubic yards	yd^3
decibel	dB
degrees Fahrenheit	^oF
gallons per day	gal/day
gallons per year	gal/yr
kilogram	kg
kilovolt	kV
kilowatt hour	kWh
kilowatt hours per year	kWh/yr
megavolt ampere	MVA
megawatt	MW
Megawatt electrical	MWe
megawatt hours	MWh
microcurie	µCi
micrograms per cubic meter	µg/m^3
millicurie	mCi
milligram per cubic meter	mg/m3
milligram per liter	mg/L
million	M
1 million British thermal unit	MM Btu
million gallons per day	M gal/day
million gallons per year	M gal/yr
millirem	mrem
millirem per year	mrem/yr
millisievert	mSv
particulate matter of aerodynamic diameter less than 2.5 micrometers	$PM_{2.5}$

particulate matter of aerodynamic diameter less than 10 micrometers	PM_{10}
parts per billion	ppb
parts per million	ppm
picocurie	pCi
pound	lb
pounds per square inch gauge	psig
rem per year	rem/yr
square feet	ft^2
standard cubic feet	scf
tons per year	tons/yr, tpy

CONVERSION CHART

TO CONVERT FROM U.S. CUSTOMARY INTO METRIC			TO CONVERT FROM METRIC INTO U.S. CUSTOMARY		
If you know	**Multiply by**	**To get**	**If you know**	**Multiply by**	**To get**
		Length			
inches	2.540	centimeters	centimeters	0.3937	inches
feet	30.48	centimeters	centimeters	0.03281	feet
feet	0.3048	meters	meters	3.281	feet
yards	0.9144	meters	meters	1.094	yards
miles	1.609	kilometers	kilometers	0.6214	miles
		Area			
square inches	6.452	square centimeters	square centimeters	0.1550	square inches
square feet	0.09290	square meters	square meters	10.76	square feet
square yards	0.8361	square meters	square meters	1.196	square yards
acres	0.4047	hectares	hectares	2.471	acres
square miles	2.590	square kilometers	square kilometers	0.3861	square miles
		Volume			
fluid ounces	29.57	milliliters	milliliters	0.03381	fluid ounces
gallons	3.785	liters	liters	0.2642	gallons
cubic feet	0.02832	cubic meters	cubic meters	35.31	cubic feet
cubic yards	0.7646	cubic meters	cubic meters	1.308	cubic yards
		Weight			
ounces	28.35	grams	grams	0.03527	ounces
pounds	0.4536	kilograms	kilograms	2.205	pounds
short tons	0.9072	metric tons	metric tons	1.102	short tons
		Temperature			
Fahrenheit (^{o}F)	subtract 32, then multiply by 5/9	Celsius (^{o}C)	Celsius (^{o}C)	multiply by 9/5, then add 32	Fahrenheit (^{o}F)
Kelvin (K)	subtract 273.15	Celsius (^{o}C)	Celsius (^{o}C)	add 273.15	Kelvin (K)

Note: 1 sievert = 100 rem