

CONTENTS

COVER SHEET iii

NOTATION xxv

ENGLISH/METRIC AND METRIC/ENGLISH EQUIVALENTS xxx

SUMMARY S-1

 S.1 Introduction..... S-1

 S.1.1 Background Information..... S-1

 S.1.1.1 Creation of USEC..... S-5

 S.1.1.2 Growing Concern over the DUF₆ Inventory S-6

 S.1.1.3 Programmatic NEPA Review and Congressional Interest..... S-7

 S.1.1.4 DOE Request for Contractor Proposals and Site-Specific
 NEPA Review S-8

 S.1.1.5 Public Law 107-206 Passed by Congress..... S-9

 S.1.1.6 Characteristics of DUF₆ S-10

 S.1.2 Purpose and Need S-11

 S.1.3 Proposed Action..... S-11

 S.1.4 Scope..... S-12

 S.1.5 Public Review of the Draft EIS S-12

 S.1.6 Relationship to Other NEPA Reviews..... S-13

 S.1.7 Organization of This Environmental Impact Statement S-13

 S.2 Alternatives..... S-14

 S.2.1 No Action Alternative..... S-14

 S.2.2 Proposed Action Alternatives S-16

 S.2.2.1 Alternative Location A (Preferred Alternative) S-17

 S.2.2.2 Alternative Location B S-17

 S.2.2.3 Alternative Location C S-17

 S.2.2.4 Conversion Process Description..... S-17

 S.2.2.5 Option of Shipping ETTP Cylinders to Paducah S-19

 S.2.2.6 Option of Expanding Conversion Facility Operations S-23

 S.2.3 Alternatives Considered but Not Analyzed in Detail S-25

 S.2.3.1 Use of Commercial Conversion Capacity S-25

 S.2.3.2 Sites Other Than Paducah S-25

 S.2.3.3 Alternative Conversion Processes S-25

 S.2.3.4 Long-Term Storage and Disposal Alternatives S-25

 S.2.3.5 Other Transportation Modes S-26

 S.2.3.6 One Conversion Plant for Two Sites S-26

 S.3 Affected Environment S-26

 S.4 Environmental Impact Assessment Approach, Assumptions,
 and Methodology S-27

CONTENTS (Cont.)

S.5	Consequences and Comparison of Alternatives	S-30
S.5.1	Human Health and Safety — Construction and Normal Facility Operations	S-30
S.5.2	Human Health and Safety — Facility Accidents	S-31
S.5.2.1	Physical Hazards.....	S-31
S.5.2.2	Facility Accidents Involving Radiation or Chemical Releases.....	S-31
S.5.3	Human Health and Safety — Transportation.....	S-35
S.5.4	Air Quality and Noise	S-38
S.5.5	Water and Soil.....	S-39
S.5.6	Socioeconomics.....	S-40
S.5.7	Ecology.....	S-41
S.5.8	Waste Management.....	S-41
S.5.9	Resource Requirements.....	S-43
S.5.10	Land Use	S-43
S.5.11	Cultural Resources	S-43
S.5.12	Environmental Justice	S-43
S.5.13	Option of Shipping ETTP Cylinders to Paducah	S-43
S.5.14	Impacts Associated with Conversion Product Sale and Use.....	S-44
S.5.15	Impacts from D&D Activities	S-45
S.5.16	Cumulative Impacts.....	S-45
S.5.17	Mitigation.....	S-47
S.5.18	Unavoidable Adverse Impacts	S-49
S.5.19	Irreversible and Irrecoverable Commitment of Resources	S-49
S.5.20	Relationship between Short-Term Use of the Environment and Long-Term Productivity.....	S-49
S.5.21	Pollution Prevention and Waste Minimization	S-50
S.5.22	Potential Impacts Associated with the Option of Expanding Conversion Facility Operations	S-50
S.6	Environmental and Occupational Safety and Health Permits and Compliance Requirements	S-51
S.7	Preferred Alternative	S-51
1	INTRODUCTION	1-1
1.1	Background Information.....	1-2
1.1.1	Creation of USEC.....	1-3
1.1.2	Growing Concern over the DUF ₆ Inventory.....	1-4
1.1.3	Programmatic NEPA Review and Congressional Interest.....	1-6
1.1.4	DOE Request for Contractor Proposals and Site-Specific NEPA Review	1-7
1.1.5	Public Law 107-206 Passed by Congress	1-8

CONTENTS (Cont.)

1.2	Characteristics of DUF ₆	1-9
1.2.1	Cylinder Inventory	1-10
1.2.2	Cylinder Condition and Potential Contamination	1-12
1.3	Purpose and Need	1-13
1.4	Proposed Action.....	1-13
1.5	DOE DUF ₆ Management Program.....	1-14
1.6	Scope.....	1-15
1.6.1	Public Scoping Process for This Environmental Impact Statement.....	1-15
1.6.2	Scope of This Environmental Impact Statement.....	1-17
1.6.2.1	Alternatives.....	1-18
1.6.2.2	Depleted Uranium Conversion Technologies and Products.....	1-18
1.6.2.3	Transportation Modes.....	1-19
1.6.2.4	Conversion Product Disposition.....	1-19
1.6.2.5	Human Health and Environmental Issues	1-21
1.6.3	Public Review of the Draft EIS.....	1-21
1.7	Relationship to Other NEPA Reviews.....	1-24
1.8	Other Documents and Studies Related to DUF ₆ Management and Conversion Activities.....	1-27
1.9	Organization of This Environmental Impact Statement	1-30
2	DESCRIPTION AND COMPARISON OF ALTERNATIVES	2-1
2.1	No Action Alternative.....	2-1
2.2	Proposed Action.....	2-4
2.2.1	Action Alternatives	2-5
2.2.1.1	Alternative Location A (Preferred Alternative).....	2-6
2.2.1.2	Alternative Location B.....	2-6
2.2.1.3	Alternative Location C.....	2-6
2.2.2	Conversion Process Description.....	2-8
2.2.2.1	Cylinder Transfer System	2-12
2.2.2.2	Vaporization System.....	2-12
2.2.2.3	Conversion System	2-13
2.2.2.4	Depleted Uranium Conversion Product Handling System	2-13
2.2.2.5	HF Recovery System	2-14
2.2.2.6	Emptied Cylinder Processing.....	2-14
2.2.2.7	Management of Potential Transuranic and PCB Contamination.....	2-15
2.2.3	Conversion Product Disposition	2-16
2.2.4	Option of Shipping ETTP Cylinders to Paducah	2-18
2.2.5	Option of Expanding Conversion Facility Operations.....	2-20
2.3	Alternatives Considered but Not Analyzed in Detail	2-23
2.3.1	Utilization of Commercial Conversion Capacity.....	2-23
2.3.2	Other Sites	2-23

CONTENTS (Cont.)

2.3.3	Other Conversion Technologies.....	2-24
2.3.4	Long-Term Storage and Disposal Alternatives.....	2-24
2.3.5	Other Transportation Modes.....	2-25
2.3.6	One Conversion Plant Alternative.....	2-25
2.4	Comparison of Alternatives.....	2-26
2.4.1	General.....	2-26
2.4.2	Summary and Comparison of Potential Environmental Impacts.....	2-27
2.4.2.1	Human Health and Safety — Construction and Normal Facility Operations.....	2-28
2.4.2.2	Human Health and Safety — Facility Accidents.....	2-28
2.4.2.3	Human Health and Safety — Transportation.....	2-32
2.4.2.4	Air Quality and Noise.....	2-35
2.4.2.5	Water and Soil.....	2-36
2.4.2.6	Socioeconomics.....	2-37
2.4.2.7	Ecology.....	2-37
2.4.2.8	Waste Management.....	2-38
2.4.2.9	Resource Requirements.....	2-39
2.4.2.10	Land Use.....	2-40
2.4.2.11	Cultural Resources.....	2-40
2.4.2.12	Environmental Justice.....	2-40
2.4.2.13	Option of Shipping ETTP Cylinders to Paducah.....	2-40
2.4.2.14	Impacts Associated with Conversion Product Sale and Use.....	2-41
2.4.2.15	Impacts from D&D Activities.....	2-42
2.4.2.16	Cumulative Impacts.....	2-42
2.4.2.17	Potential Impacts Associated with the Option of Expanding Conversion Facility Operaitons.....	2-43
2.5	Preferred Alternative.....	2-44
3	AFFECTED ENVIRONMENT.....	3-1
3.1	Paducah Site.....	3-1
3.1.1	Cylinder Yards.....	3-2
3.1.2	Site Infrastructure.....	3-2
3.1.3	Climate, Air Quality, and Noise.....	3-5
3.1.3.1	Climate.....	3-5
3.1.3.2	Existing Air Emissions.....	3-5
3.1.3.3	Air Quality.....	3-7
3.1.3.4	Existing Noise Environment.....	3-11
3.1.4	Geology and Soil.....	3-11
3.1.4.1	Topography, Structure, and Seismic Risk.....	3-11
3.1.4.2	Soils.....	3-14
3.1.5	Water Resources.....	3-15

CONTENTS (Cont.)

3.1.5.1	Surface Water	3-15
3.1.5.2	Groundwater	3-16
3.1.6	Biotic Resources.....	3-17
3.1.6.1	Vegetation	3-17
3.1.6.2	Wildlife.....	3-18
3.1.6.3	Wetlands.....	3-19
3.1.6.4	Threatened and Endangered Species	3-22
3.1.7	Public and Occupational Safety and Health.....	3-24
3.1.7.1	Radiation Environment.....	3-24
3.1.7.2	Chemical Environment.....	3-26
3.1.8	Socioeconomics.....	3-26
3.1.8.1	Population.....	3-28
3.1.8.2	Employment	3-28
3.1.8.3	Personal Income	3-29
3.1.8.4	Housing	3-30
3.1.8.5	Community Resources	3-31
3.1.9	Waste Management	3-32
3.1.9.1	Wastewater	3-34
3.1.9.2	Solid Nonhazardous, Nonradioactive Waste.....	3-34
3.1.9.3	Nonradioactive Hazardous and Toxic Waste	3-35
3.1.9.4	Low-Level Radioactive Waste	3-35
3.1.9.5	Low-Level Radioactive Mixed Waste.....	3-35
3.1.10	Land Use	3-35
3.1.11	Cultural Resources	3-37
3.1.12	Environmental Justice	3-38
3.1.12.1	Minority Populations	3-38
3.1.12.2	Low-Income Populations	3-39
3.2	East Tennessee Technology Park	3-39
3.2.1	Cylinder Yards	3-42
3.2.2	Site Infrastructure.....	3-44
3.2.3	Climate, Air Quality, and Noise.....	3-44
3.2.3.1	Climate	3-44
3.2.3.2	Existing Air Emissions.....	3-45
3.2.3.3	Air Quality.....	3-47
3.2.3.4	Existing Noise Environment	3-50
3.2.4	Geology and Soil.....	3-52
3.2.4.1	Topography, Structure, and Seismic Risk.....	3-52
3.2.4.2	Soils	3-52
3.2.5	Water Resources.....	3-53
3.2.5.1	Surface Water	3-53
3.2.5.2	Groundwater	3-55
3.2.6	Biotic Resources.....	3-57
3.2.6.1	Vegetation	3-57

CONTENTS (Cont.)

3.2.6.2	Wildlife.....	3-57
3.2.6.3	Wetlands.....	3-58
3.2.6.4	Threatened and Endangered Species.....	3-58
3.2.7	Public and Occupational Safety and Health.....	3-58
3.2.7.1	Radiation Environment.....	3-58
3.2.7.2	Chemical Environment.....	3-61
3.2.8	Socioeconomics.....	3-61
3.2.8.1	Population.....	3-61
3.2.8.2	Employment.....	3-63
3.2.8.3	Personal Income.....	3-64
3.2.8.4	Housing.....	3-67
3.2.8.5	Community Resources.....	3-68
3.2.9	Waste Management.....	3-68
3.2.9.1	Wastewater.....	3-68
3.2.9.2	Solid Nonhazardous, Nonradioactive Waste.....	3-71
3.2.9.3	Nonradioactive Hazardous and Toxic Waste.....	3-71
3.2.9.4	Low-Level Radioactive Waste.....	3-71
3.2.9.5	Low-Level Radioactive Mixed Waste.....	3-71
3.2.10	Land Use.....	3-72
3.2.11	Cultural Resources.....	3-72
3.2.12	Environmental Justice.....	3-74
3.2.12.1	Minority Populations.....	3-74
3.2.12.2	Low-Income Populations.....	3-75
4	ENVIRONMENTAL IMPACT ASSESSMENT APPROACH, ASSUMPTIONS, AND METHODOLOGY.....	4-1
4.1	General Approach.....	4-1
4.2	Major Assumptions and Parameters.....	4-2
4.3	Methodology.....	4-2
4.3.1	Overview of the Human Health Assessment.....	4-5
4.3.2	Radiation.....	4-5
4.3.2.1	Background Radiation.....	4-5
4.3.2.2	Radiation Doses and Health Effects.....	4-7
4.3.3	Chemicals.....	4-9
4.3.4	Accidents.....	4-10
4.3.4.1	Accident Consequences.....	4-10
4.3.4.2	Accident Frequencies.....	4-12
4.3.4.3	Accident Risk.....	4-12
4.3.4.4	Physical Hazard Accidents.....	4-13
4.4	Uncertainty in Estimated Impacts.....	4-13

CONTENTS (Cont.)

5	ENVIRONMENTAL IMPACTS OF ALTERNATIVES	5-1
5.1	No Action Alternative.....	5-1
5.1.1	Introduction	5-1
5.1.1.1	Cylinder Maintenance Activities.....	5-2
5.1.1.2	Assumptions and Methods Used to Assess Impacts Associated with Cylinder Breaches.....	5-5
5.1.2	Impacts of No Action at the Paducah Site.....	5-6
5.1.2.1	Human Health and Safety.....	5-7
5.1.2.2	Transportation	5-15
5.1.2.3	Air Quality and Noise.....	5-15
5.1.2.4	Water and Soil	5-17
5.1.2.5	Socioeconomics.....	5-19
5.1.2.6	Ecology.....	5-19
5.1.2.7	Waste Management	5-20
5.1.2.8	Resource Requirements	5-20
5.1.2.9	Land Use.....	5-20
5.1.2.10	Cultural Resources	5-20
5.1.2.11	Environmental Justice	5-20
5.2	Proposed Action Alternatives	5-21
5.2.1	Conversion Facility Construction Impacts.....	5-21
5.2.1.1	Human Health and Safety — Normal Construction Activities.....	5-22
5.2.1.2	Human Health and Safety — Accidents.....	5-22
5.2.1.3	Air Quality and Noise.....	5-23
5.2.1.4	Water and Soil	5-27
5.2.1.5	Socioeconomics.....	5-29
5.2.1.6	Ecology.....	5-30
5.2.1.7	Waste Management	5-37
5.2.1.8	Resource Requirements	5-39
5.2.1.9	Land Use.....	5-39
5.2.1.10	Cultural Resources	5-40
5.2.1.11	Environmental Justice	5-41
5.2.2	Operational Impacts	5-42
5.2.2.1	Human Health and Safety — Normal Facility Operations.....	5-42
5.2.2.2	Human Health and Safety — Facility Accidents	5-47
5.2.2.3	Air Quality and Noise.....	5-59
5.2.2.4	Water and Soil	5-65
5.2.2.5	Socioeconomics.....	5-66
5.2.2.6	Ecology.....	5-67
5.2.2.7	Waste Management	5-69
5.2.2.8	Resource Requirements	5-70
5.2.2.9	Land Use.....	5-71

CONTENTS (Cont.)

5.2.2.10	Cultural Resources	5-71
5.2.2.11	Environmental Justice	5-72
5.2.3	Transportation	5-73
5.2.3.1	Collective Population Risk.....	5-73
5.2.3.2	Maximally Exposed Individuals during Routine Conditions.....	5-82
5.2.3.3	Accident Consequence Assessment	5-82
5.2.3.4	Historical Safety Record of Anhydrous NH ₃ and HF Transportation in the United States.....	5-87
5.2.4	Impacts Associated with HF and CaF ₂ Conversion Product Sale and Use.....	5-90
5.2.5	Impacts If ETTP Cylinders Are Shipped to Paducah Rather Than to Portsmouth	5-91
5.2.5.1	Construction and Operation Impacts.....	5-91
5.2.5.2	Cylinder Preparation Impacts at ETTP	5-93
5.2.5.3	Transportation of Cylinders from ETTP to Paducah.....	5-96
5.2.6	Potential Impacts Associated with the Option of Expanding Conversion Facility Operations.....	5-103
5.2.6.1	Potential Impacts Associated with Increasing Plant Throughput.....	5-104
5.2.6.2	Potential Impacts Associated with Extending the Plant Operational Period.....	5-104
5.2.6.3	Potential Impacts Associated with Possible Future Paducah-to-Portsmouth Cylinder Shipments	5-105
5.3	Cumulative Impacts.....	5-106
5.3.1	Issues and Assumptions	5-106
5.3.2	Paducah Site.....	5-109
5.3.3	Results	5-110
5.3.3.1	Radiological Releases — Normal Operations.....	5-110
5.3.3.2	Accidental Releases — Radiological and Chemical Materials.....	5-110
5.3.3.3	Transportation	5-110
5.3.3.4	Chemical Exposure — Normal Operations.....	5-111
5.3.3.5	Air Quality.....	5-111
5.3.3.6	Noise.....	5-111
5.3.3.7	Water and Soil.....	5-111
5.3.3.8	Ecology.....	5-112
5.3.3.9	Land Use.....	5-112
5.3.3.10	Cultural Resources	5-112
5.3.3.11	Environmental Justice	5-112
5.3.3.12	Socioeconomics.....	5-113
5.4	Mitigation	5-113
5.5	Unavoidable Adverse Impacts.....	5-116

CONTENTS (Cont.)

5.6	Irreversible and Irretrievable Commitment of Resources	5-116
5.6.1	Land.....	5-117
5.6.2	Materials.....	5-117
5.6.3	Energy	5-118
5.7	Relationship between Short-Term Use of the Environment and Long-Term Productivity	5-119
5.8	Pollution Prevention and Waste Minimization.....	5-120
5.9	Decontamination and Decommissioning of the Conversion Facility	5-120
5.9.1	Human Health and Safety — Off-Site Public	5-121
5.9.2	Human Health and Safety — On-Site Workforce.....	5-122
5.9.3	Air Quality.....	5-123
5.9.4	Socioeconomics.....	5-123
5.9.5	Waste Management.....	5-123
6	ENVIRONMENTAL AND OCCUPATIONAL SAFETY AND HEALTH PERMITS AND COMPLIANCE REQUIREMENTS	6-1
6.1	DUF ₆ Cylinder Management and Construction and Operation of a DUF ₆ Conversion Facility.....	6-1
6.2	Transportation of UF ₆	6-1
6.3	Worker Safety and Health	6-3
7	REFERENCES	7-1
8	LIST OF PREPARERS	8-1
9	GLOSSARY	9-1
10	INDEX.....	10-1
APPENDIX A:	Text of Public Law 107-206 Pertinent to the Management of DUF ₆	A-1
APPENDIX B:	Issues Associated with DUF ₆ Cylinder Contamination.....	B-1
APPENDIX C:	Scoping Summary Report for Depleted Uranium Hexafluoride Conversion Facilities Environmental Impact Statement Scoping Process	C-1
APPENDIX D:	Environmental Synopsis for the Depleted UF ₆ Conversion Project.....	D-1
APPENDIX E:	Impacts Associated with HF and CAF ₂ Conversion Product Sale and Use.....	E-1

CONTENTS (Cont.)

APPENDIX F: Assessment Methodologies..... F-1

APPENDIX G: Consultation Letters G-1

APPENDIX H: Contractor Disclosure Statement H-1

FIGURES

S-1 Regional Map of the Paducah, Kentucky, Site Vicinity S-2

S-2 Storage of DUF₆ Cylinders S-4

S-3 Three Alternative Conversion Facility Locations within the Paducah Site,
with Location A Being the Preferred Alternative S-18

S-4 Conceptual Overall Material Flow Diagram for the Paducah
Conversion Facility S-20

S-5 Conceptual Conversion Facility Site Layout for Paducah S-21

S-6 Areas of Potential Impact Evaluated for Each Alternative S-28

1-1 DUF₆ Storage Locations 1-2

1.1-1 Storage of DUF₆ Cylinders..... 1-4

2.2-1 Three Alternative Conversion Facility Locations within the Paducah Site,
with Location A Being the Preferred Alternative 2-7

2.2-2 Conceptual Overall Material Flow Diagram for the Paducah
Conversion Facility 2-9

2.2-3 Conceptual Conversion Facility Site Layout for Paducah 2-10

3.1-1 Regional Map of the Paducah Site Vicinity..... 3-3

3.1-2 Locations of Cylinder Yards at the Paducah Site That Are Used
to Store DOE-Managed Cylinders 3-4

3.1-3 Wind Rose for the Barkley Regional Airport, 1990–1994..... 3-6

FIGURES (Cont.)

3.1-4	Wetlands in the Vicinity of the Three Candidate Locations for the Paducah Conversion Facility.....	3-20
3.1-5	Areas of Potential Indiana Bat Habitat at the Paducah Site	3-23
3.1-6	Land Cover in McCracken County, Kentucky.....	3-36
3.1-7	Census Tracts within 50 mi of the Conversion Facility at the Paducah Site with Minority Populations in Excess of State-Specific Thresholds.....	3-40
3.1-8	Census Tracts within 50 mi of the Conversion Facility at the Paducah Site with Low-Income Populations in Excess of State-Specific Thresholds	3-41
3.2-1	Regional Map of the ETTP Vicinity	3-42
3.2-2	Locations of Storage Yards at ETTP That Are Used to Store DOE-Managed Cylinders.....	3-43
3.2-3	Wind Rose for the ETTP K1209 Meteorological Tower, 2001	3-46
3.2-4	Surface Water Features in the Vicinity of ETTP	3-54
3.2-5	Land Cover in Roane County, Tennessee	3-73
3.2-6	Census Tracts within 50 mi of the Storage Facility at ETTP with Minority Populations in Excess of State-Specific Thresholds.....	3-76
3.2-7	Census Tracts within 50 mi of the Storage Facility at ETTP with Low-Income Populations in Excess of State-Specific Thresholds.....	3-77
4.3-1	Areas of Potential Impact Evaluated for Each Alternative	4-4
5.2-1	Wetlands within Location A at the Paducah Site.....	5-34
5.2-2	Wetlands along the Proposed Rail Line at the Paducah Site.....	5-36
5.2-3	Areas of Potential Indiana Bat Habitat at the Paducah Site	5-38

TABLES

S-1	Inventory of DOE UF ₆ Cylinders Considered in This EIS	S-4
S-2	Summary of Alternatives Considered for the Paducah Conversion Facility EIS	S-15
S-3	Summary of Paducah Conversion Facility Parameters	S-22
S-4	Summary of Proposed Conversion Product Treatment and Disposition	S-22
S-5	Summary of Major EIS Data and Assumptions	S-29
S-6	Summary Comparison of Potential Environmental Consequences of the Alternatives	S-52
1.1-1	Inventory of DOE UF ₆ Cylinders Considered in This EIS	1-11
2.1-1	Summary of Alternatives Considered	2-2
2.2-1	Summary of Paducah Conversion Facility Parameters	2-11
2.2-2	Summary of Proposed Conversion Product Treatment and Disposition.....	2-17
2.4-1	Summary Comparison of Potential Environmental Consequences of the Alternatives	2-45
3.1-1	DOE-Managed DUF ₆ Cylinders at the Paducah Site.....	3-2
3.1-2	Annual Criteria Pollutant and Volatile Organic Compound Emissions from Selected Major Point Sources around the Paducah Site in 1999.....	3-7
3.1-3	National Ambient Air Quality Standards, Kentucky State Ambient Air Quality Standards, Maximum Allowable Increments for Prevention of Significant Deterioration, and Highest Background Levels Representative of the Paducah Gaseous Diffusion Plant	3-8
3.1-4	Additional Commonwealth of Kentucky Ambient Air Quality Standards	3-10
3.1-5	Federal- and State-Listed Endangered, Threatened, and Special Concern Species near the Paducah Site	3-22
3.1-6	Estimated Radiation Doses to Members of the General Public and Cylinder Yard Workers at the Paducah Gaseous Diffusion Plant.....	3-25

TABLES (Cont.)

3.1-7 Estimated Hazard Quotients for Members of the General Public near the Paducah Site under Existing Environmental Conditions 3-27

3.1-8 Population in the Paducah Region of Influence, Kentucky, and Illinois in 1990, 2000, and 2003 3-28

3.1-9 Employment in McCracken County by Industry in 1990 and 2000 3-29

3.1-10 Employment in the Paducah Region of Influence by Industry in 1990 and 2000 3-30

3.1-11 Unemployment Rates in McCracken County, the Paducah Region of Influence, and Kentucky 3-31

3.1-12 Personal Income in McCracken County and the Paducah Region of Influence in 1990, 2000, and 2003..... 3-31

3.1-13 Housing Characteristics in the City of Paducah, McCracken County, and the Paducah Region of Influence in 1990 and 2000..... 3-32

3.1-14 Public Service Employment in the City of Paducah, McCracken County, and Kentucky in 2002 3-33

3.1-15 Number of Physicians in McCracken County and Kentucky in 1997 3-33

3.1-16 School District Data for McCracken County and Kentucky in 2001..... 3-33

3.1-17 Medical Facility Data for McCracken County in 1998..... 3-34

3.1-18 Projected Waste Generation Volumes for the Paducah Site 3-34

3.2-1 DOE-Managed DUF₆ Cylinders at the ETTP Site..... 3-42

3.2-2 Annual Criteria Pollutant and Volatile Organic Compound Emissions from Selected Major Point Sources around the ETTP Site in 1999..... 3-47

3.2-3 National Ambient Air Quality Standards, Tennessee State Ambient Air Quality Standards, Maximum Allowable Increments for Prevention of Significant Deterioration, and Highest Background Levels Representative of the ETTP Site 3-48

3.2-4 Additional Tennessee Ambient Air Quality Standards 3-50

TABLES (Cont.)

3.2-5 Allowable Noise Level by Zoning District in Anderson County, Tennessee 3-51

3.2-6 Federal- and State-Listed Endangered, Threatened,
and Special Concern Species on ORR 3-59

3.2-7 Estimated Radiation Doses to Members of the General Public
and Cylinder Yard Workers at ETP 3-60

3.2-8 Estimated Hazard Quotients for Members of the Public near ETP
under Existing Environmental Conditions 3-62

3.2-9 Population in the ETP Region of Influence and Tennessee
in 1990, 2000, and 2003 3-63

3.2-10 Employment in Knox County by Industry in 1990 and 2000 3-64

3.2-11 Employment in Anderson County by Industry in 1990 and 2000..... 3-65

3.2-12 Employment in the ETP Region of Influence by Industry in 1990 and 2000 3-65

3.2-13 Unemployment Rates in the Knoxville Metropolitan Statistical Area
and Tennessee 3-66

3.2-14 Personal Income in Knox and Anderson Counties and the ETP Region
of Influence in 1990, 2000, and 2003..... 3-66

3.2-15 Housing Characteristics in the City of Knoxville, Knox and Anderson
Counties, and the ETP Region of Influence in 1990 and 2000..... 3-67

3.2-16 Public Service Employment in the City of Knoxville, ETP
Region-of-Influence Counties, and Tennessee in 2001 3-69

3.2-17 Number of Physicians in Knox and Anderson Counties and Tennessee
in 1997..... 3-69

3.2-18 School District Data for Knox and Anderson Counties and Tennessee
in 2001 3-70

3.2-19 Medical Facility Data for Knox and Anderson Counties in 1998..... 3-70

3.2-20 Projected Waste Generation Volumes for ETP 3-71

4.2-1 Summary of Major EIS Data and Assumptions 4-3

TABLES (Cont.)

4.3-1	Key Features of Potential Human Exposures to Radiological, Chemical, and Physical Hazards	4-6
4.3-2	Comparison of Radiation Doses from Various Sources.....	4-8
5.1-1	No Action Alternative: Comparison of Frequencies Assumed in the PEIS with Planned Frequencies for Activities at the Paducah Site.....	5-3
5.1-2	No Action Alternative: Estimated Consequences of Chemical Exposures for Cylinder Accidents at the Paducah Site.....	5-11
5.1-3	No Action Alternative: Estimated Consequences from Radiation Exposures for Cylinder Accidents at the Paducah Site.....	5-13
5.2-1	Potential Impacts to Human Health from Physical Hazards during Conversion Facility Construction and Operations at the Paducah Site.....	5-23
5.2-2	Annual Criteria Pollutant and Volatile Organic Compound Emissions from Construction of the Conversion Facility at the Paducah Site	5-24
5.2-3	Maximum Air Quality Impacts at the Construction Site Boundary Due to Emissions from Activities Associated with Construction of the Conversion Facility at the Paducah Site.....	5-25
5.2-4	Socioeconomic Impacts from Construction of the Conversion Facility at the Paducah Site	5-29
5.2-5	Wastes Generated from Construction Activities for the Conversion Facility at the Paducah Site	5-39
5.2-6	Materials/Resources Consumed during Construction of the Conversion Facility at the Paducah Site	5-40
5.2-7	Estimated Radiological Doses and Cancer Risks under Normal Conversion Facility Operations at the Paducah Site.....	5-45
5.2-8	Bounding Radiological Accidents Considered for Conversion Operations at the Paducah Site	5-48
5.2-9	Estimated Radiological Doses per Accident Occurrence during Conversion at the Paducah Site	5-49

TABLES (Cont.)

5.2-10	Estimated Radiological Health Risks per Accident Occurrence during Conversion at the Paducah Site.....	5-50
5.2-11	Bounding Chemical Accidents during Conversion Operations at the Paducah Site	5-53
5.2-12	Consequences of Chemical Accidents during Conversion at the Paducah Site: Number of Persons with the Potential for Adverse Effects	5-54
5.2-13	Consequences of Chemical Accidents during Conversion at the Paducah Site: Number of Persons with the Potential for Irreversible Adverse Effects.....	5-55
5.2-14	Annual Point Source Emissions of Criteria Pollutants, Volatile Organic Compounds, Uranium, and Fluoride from Operation of the Conversion Facility at the Paducah Site	5-60
5.2-15	Maximum Air Quality Impacts Due to Emissions from Activities Associated with Operation of the Conversion Facility at the Paducah Site	5-61
5.2-16	Socioeconomic Impacts from Operation of the Conversion Facility at the Paducah Site	5-67
5.2-17	Wastes Generated from Operation of the Conversion Facility at the Paducah Site	5-69
5.2-18	Materials Consumed Annually during Normal Conversion Facility Operations at the Paducah Site.....	5-71
5.2-19	Utilities Consumed during Conversion Facility Operations at the Paducah Site.....	5-72
5.2-20	Collective Population Transportation Risks for Shipment of Anhydrous NH ₃ to the Paducah Conversion Facility	5-74
5.2-21	Collective Population Transportation Risks for Shipment of Conversion Products to Envirocare as the Primary Disposal Site, Assuming the U ₃ O ₈ Is Disposed of in Bulk Bags.....	5-76

TABLES (Cont.)

5.2-22 Collective Population Transportation Risks for Shipment of Conversion Products to NTS as an Optional Disposal Site, Assuming the U₃O₈ Is Disposed of in Bulk Bags..... 5-78

5.2-23 Collective Population Transportation Risks for Shipment of U₃O₈ Conversion Products in Emptied Cylinders 5-80

5.2-24 Collective Population Transportation Risks for Shipment of the HF Conversion Co-Product from the Paducah Site to Commercial Users 5-81

5.2-25 Collective Population Transportation Risks for Shipment of CaF₂ for the Neutralization Option..... 5-81

5.2-26 Estimated Radiological Impacts to the MEI from Routine Shipment of Radioactive Materials from the Paducah Conversion Facility 5-83

5.2-27 Potential Radiological Consequences to the Population from Severe Transportation Accidents 5-84

5.2-28 Potential Chemical Consequences to the Population from Severe Transportation Accidents 5-85

5.2-29 Potential Radiological Consequences to the MEI from Severe Transportation Accidents Involving Shipment of Radioactive Materials..... 5-88

5.2-30 Products from DUF₆ Conversion..... 5-90

5.2-31 Summary of Environmental Parameters for a Cylinder Transfer Facility 5-95

5.2-32 ETTP UF₆ Cylinder Shipments to Paducah..... 5-97

5.2-33 Estimated Radiological Impacts to the MEI from Routine Shipment of DUF₆ Cylinders 5-98

5.2-34 Potential Radiological Consequences to the Population from Severe Transportation Accidents Involving Shipment of DUF₆ Cylinders..... 5-99

5.2-35 Potential Chemical Consequences to the Population from Severe Transportation Accidents Involving Shipment of DUF₆ Cylinders..... 5-100

5.2-36 Potential Radiological Consequences to the MEI from Severe Transportation Accidents Involving Shipment of DUF₆ Cylinders..... 5-101

TABLES (Cont.)

5.2-37 Potential Chemical Consequences to the MEI from Severe Transportation Accidents Involving Shipment of DUF₆ Cylinders 5-101

5.2-38 Estimated Radiological Impacts to the MEI from Routine Shipment of Non-DUF₆ Cylinders 5-102

5.2-39 Annual Transportation Impacts for the Shipment of DUF₆ Cylinders from Paducah to Portsmouth, Assuming 1,000 DUF₆ Cylinders Shipped per Year 5-106

5.3-1 Cumulative Impacts of DUF₆ Activities and Other Past, Present, or Reasonably Foreseeable Future Actions at the Paducah Site 5-107

5.6-1 Materials/Resources Consumed during Conversion Facility Construction at the Paducah Site 5-118

5.6-2 Materials Consumed Annually during Conversion Facility Operations at the Paducah Site 5-118

5.6-3 Utilities Consumed during Conversion Facility Operations at the Paducah Site 5-119

5.9-1 Estimated Latent Cancer Fatalities from Radiation Exposure Resulting from Conversion Facility D&D Activities at the Paducah Site 5-122

5.9-2 Annual and Total Waste Volume Estimates from Conversion Facility D&D Activities at the Paducah Site 5-125

6.1 Potentially Applicable Consents for the Construction and Operation of a DUF₆ Conversion Facility 6-4

B-1 Bounding Concentrations of Dispersed Transuranic and Tc-99 Contamination in the DUF₆ Full and Heels Cylinders B-5

B-2 Maximum Total Quantities of Transuranics and Technetium in the DUF₆ Inventory B-6

B-3 Concentrations of Transuranic Constituents and Tc-99 in Depleted Uranium That Would Result in 10% Contribution to Dose B-8

B-4 Radiological Parameters for Uranium, Transuranic, and Technetium Isotopes B-10

TABLES (Cont.)

B-5	Relative Contributions of Transuranic and Technetium Isotopes to Dose.....	B-10
B-6	Estimated Maximum Transuranic Radioactivity Concentration in Heels.....	B-13
B-7	Estimated Maximum Transuranic Activity Concentration in Converted Heels Material	B-13
B-8	Estimated Maximum Number of Drums Containing Potential Transuranic Waste.....	B-13
E-1	Products from DUF ₆ Conversion Assuming HF Acid Is Sold.....	E-4
E-2	Aqueous HF Levels for Sale	E-4
E-3	Activity Levels for Aqueous HF	E-5
E-4	Activity Levels for CaF ₂	E-5
E-5	Process Control Specifications for HF.....	E-6
E-6	Process Control Specifications for Acid-Grade CaF ₂	E-6
F-1	Bounding Aqueous HF Spill Source Term	F-15
F-2	Anhydrous NH ₃ Tank Rupture Spill Parameters	F-16
F-3	Potential Shipments of Material Analyzed for the DUF ₆ Conversion EIS.....	F-22
F-4	Environmental Management Waste Generation Forecast for Fiscal Years 2002 through 2025	F-41

