Table of Contents

EXECUTIVE SUMMARY _____ EXE-1

The West Valley Demonstration Project was established to demonstrate that technologies could be developed to safely clean up and solidify radioactive waste.

INTRODUCTION _____ INT-1

An environmental surveillance and monitoring program was developed and implemented to ensure that operations at the Project would not adversely affect public health and safety or the environment.

ENVIRONMENTAL COMPLIANCE SUMMARY: CALENDAR YEAR 1999 _____ ECS-1

Project activities are governed by federal and state regulations, Department of Energy Orders, and regulatory compliance agreements.

CHAPTER 1. ENVIRONMENTAL MONITORING PROGRAM INFORMATION

The radionuclides monitored at the Project are those that have the potential to contribute a dose above background or that are most abundant in air and water effluents discharged from the site.

Introduction _____ 1-1
- Radiation and Radioactivity _____ 1-1
- Measurement of Radioactivity _____ 1-2
- Measurement of Dose _____ 1-2

Environmental Monitoring Program Overview _____ 1-4
- Data Reporting _____ 1-4
- Changes in the 1999 Monitoring Program _____ 1-6
- Vitrification Overview _____ 1-6

1999 Activities at the WVDP _____ 1-7
- Vitrification _____ 1-7
- Environmental Management of Aqueous Radioactive Waste _____ 1-8
- Environmental Management of Airborne Radioactive Emissions _____ 1-8
- Environmental Management of Radiological Exposure _____ 1-9
- Unplanned Radiological Releases _____ 1-9
- NRC-licensed Disposal Area (NDA) Interceptor Trench and Pretreatment System _____ 1-9
- Waste Minimization Program _____ 1-10
- Pollution Prevention Awareness Program _____ 1-10
- Waste Management _____ 1-10
- National Environmental Policy Act Activities _____ 1-11

Table of Contents

Chapter 1 (continued)

Self-Assessments ____ 1-13
Occupational Safety and Environmental Training ____ 1-13
Voluntary Protection Program STAR Status ____ 1-14
ISMS Implementation ____ 1-14
EMS Implementation ____ 1-14
Performance Measures ____ 1-14
Radiation Doses to the Maximally Exposed Off-site Individual ____ 1-14
SPDES Permit Limit Exceptions ____ 1-15
Waste Minimization and Pollution Prevention ____ 1-16
Spills and Releases ____ 1-17
Vitrification ____ 1-18

CHAPTER 2. ENVIRONMENTAL MONITORING

The West Valley Demonstration Project's environmental monitoring program includes monitoring and sampling of liquid and air effluents both on- and off-site. Deer, fish, milk, hay, and various fruits and vegetables also are sampled.

Routine Monitoring Program ____ 2-1
Sampling Program Overview ____ 2-1
Water Sampling Locations ____ 2-2
Air Sampling Locations ____ 2-2
Radiological Monitoring: Surface Water ____ 2-2
Low-level Waste Treatment Facility Sampling Location ____ 2-2
Northeast Swamp and North Swamp Sampling Locations ____ 2-3
Other Surface Water Sampling Locations ____ 2-4
SDA and NDA Sampling Locations ____ 2-6
Standing Pond Water Sampling Locations ____ 2-8
Off-site Surface Water Sampling Locations ____ 2-9
Drinking Water Sampling Locations ____ 2-11
Radiological Monitoring: Sediments ____ 2-11
Radiological Monitoring: Air ____ 2-13
On-site Ventilation Systems ____ 2-13
Perimeter and Remote Air Sampling ____ 2-16
Fallout Pot Sampling ____ 2-17
Off-site Surface Soil Sampling ____ 2-17
Radiological Monitoring: Food Chain ____ 2-19

Table of Contents

Chapter 2 (continued)

Direct Environmental Radiation Monitoring ____ 2-21
Meteorological Monitoring ____ 2-23
Special Monitoring ____ 2-24
Nonradiological Monitoring: Surface Water ____ 2-25
Nonradiological Monitoring: Drinking Water ____ 2-26
Nonradiological Monitoring: Air ____ 2-26

CHAPTER 3. GROUNDWATER MONITORING

Groundwater is routinely sampled for radiological and chemical parameters both inside the Project site security fence and outside the site to determine and document any effect of site activities on groundwater quality.

Groundwater Monitoring Program Overview ____ 3-1
Geologic History of the West Valley Site ____ 3-1
Surface Water Hydrology of the West Valley Site ____ 3-2
Hydrogeology of the West Valley Site ____ 3-2
Routine Groundwater Monitoring Program ____ 3-4
Monitoring Well Network ____ 3-5
Groundwater Monitoring Program Highlights 1982 to 1999 ____ 3-5
Annual Analytical Trigger Limit Review ____ 3-8
Results of Routine Groundwater Monitoring ____ 3-8
Long-term Trends of Gross Beta and Tritium at Selected Groundwater Monitoring Locations ____ 3-10
North Plateau Seeps ____ 3-12
North Plateau Well Points ____ 3-13
Results of Radioisotopic Sampling ____ 3-13
Results of Monitoring at the NDA ____ 3-13
Volatile and Semivolatile Organic Compounds Sampling ____ 3-14
Special Groundwater Monitoring ____ 3-15
Gross Beta Plume on the North Plateau ____ 3-15
Northeast Swamp Drainage Monitoring ____ 3-15
1998 Geoprobe® Investigation in the Core Area of the North Plateau Plume ____ 3-15
Permeable Treatment Wall ____ 3-16
North Plateau Groundwater Quality Early Warning Sampling ____ 3-16
Evaluation of Groundwater Monitoring Well Corrosion ____ 3-17

Table of Contents

CHAPTER 4: RADIOLOGICAL DOSE ASSESSMENT

Because of the difficulty of directly measuring any dose contributed by the Project to the off-site environment and the public, computer models are used to calculate dose estimates. Estimates are based on concentrations of radionuclides measured in air and water collected from on-site effluent points.

Introduction ____ 4-1
Radioactivity ____ 4-1
Radiation Dose ____ 4-2
Units of Measurement ____ 4-2
Sources of Radiation ____ 4-3
Health Effects of Low-level Radiation ____ 4-4
Exposure Pathways ____ 4-4
Land Use Survey ____ 4-4
Radioactive Vitrification Operations ____ 4-4
Dose Assessment Methodology ____ 4-5
Comparison of Near-site and Background Environmental Media Concentrations ____ 4-6
Predicted Dose from Airborne Emissions ____ 4-8
Predicted Dose from Waterborne Releases ____ 4-10
Predicted Dose from All Pathways ____ 4-11
Unplanned Releases ____ 4-12
Risk Assessment ____ 4-12
Summary ____ 4-13

CHAPTER 5. QUALITY ASSURANCE

The West Valley Demonstration Project's quality assurance program certifies that sample collection and analyses are consistent, precise, and accurate.

Organizational Responsibilities ____ 5-1
Program Design ____ 5-1
Procedures ____ 5-2
Quality Control in the Field ____ 5-2
Quality Control in the Laboratory ____ 5-3
Personnel Training ____ 5-5
Record Keeping ____ 5-5
Chain-of-Custody Procedures ____ 5-5
Audits and Appraisals ____ 5-6
Self-Assessments ____ 5-6
Lessons Learned Program ____ 5-6

Table of Contents

Chapter 5 (continued)

Data Management and Data Validation _____ 5-7
Data Assessment and Reporting _____ 5-7
Summary _____ 5-7

APPENDIX A *Maps*
APPENDIX B *1999 Environmental Monitoring Program*
APPENDIX C *Summary of Water, Sediment, and Soil Monitoring Data*
APPENDIX D *Summary of Air Monitoring Data*
APPENDIX E *Summary of Groundwater Monitoring Data*
APPENDIX F *Summary of Biological Data*
APPENDIX G *Summary of Nonradiological Monitoring Data*
APPENDIX H *Summary of Direct Radiation Monitoring Data*
APPENDIX I *Summary of Meteorological Data*
APPENDIX J *Summary of Quality Assurance Crosscheck Analyses*
APPENDIX K *Environmental Regulations, Orders, Standards, and Permits*
APPENDIX L *Summary of NYSERDA Groundwater Monitoring Data*

REFERENCES and BIBLIOGRAPHY
GLOSSARY
ACRONYMS and ABBREVIATIONS
UNITS OF MEASURE
SCIENTIFIC NOTATION and CONVERSION CHART
DISTRIBUTION
ACKNOWLEDGMENTS

Table of Contents

Summary List of Maps

Location of the Western New York Nuclear Service Center ____ INT-3
North Plateau Gross Beta Plume Area: Fourth-Quarter 1999 Results ____ 3-11
Project Base Map ____ A-3
On-site Surface Water and Soil Sampling Locations ____ A-4
Off-site Surface Water, Soil, and Sediment Sampling Locations ____ A-5
On-site Air Monitoring and Sampling Points ____ A-6
Off-site Air and Fallout Sampling Points ____ A-7
Active WVDP Groundwater Monitoring Points ____ A-8
North Plateau On-site Groundwater Monitoring Network ____ A-9
South Plateau On-site Groundwater Monitoring Network ____ A-10
Near-site Drinking Water and Biological Sampling Points ____ A-11
Location of On-site Thermoluminescent Dosimeters (TLDs) ____ A-12
Location of Off-site Thermoluminescent Dosimeters (TLDs) ____ A-13
Environmental Sample Points more than 5 Kilometers from the WVDP Site ____ A-14

Figures

1. Location of the Western New York Nuclear Service Center ____ INT-3

1-1. Average Annual Exposure at DNTLD 24 ____ 1-9
1-2. Average Annual Exposure at DNTLD 36 ____ 1-10
1-3. Annual Effective Dose Equivalent to the Maximally Exposed Off-site Individual ____ 1-15
1-4. Yearly SPDES Permit Exceptions ____ 1-16
1-5. Percentage of Waste Reduction Exceeding Annual Goals ____ 1-17
1-6. Number of Immediately Reportable Spills or Releases ____ 1-18
1-7. Number of Curies Transferred to the Vitrification Facility in 1999 ____ 1-18

2-1. Thirteen-year Trends of Gross Alpha, Gross Beta, and Tritium Concentrations at Sampling Location WNSP006 ____ 2-6

2-2. Thirteen-year Trends of Gross Alpha, Gross Beta, and Tritium Concentrations at Sampling Location WNNDADR ____ 2-8

2-3. Thirteen-year Trends of Gross Alpha, Gross Beta, and Tritium Concentrations at Sampling Location WFFELBR ____ 2-10

2-4. Fourteen-year Trends of Cesium-137 in Stream Sediments at Two Locations Upstream and Three Locations Downstream of the WVDP ____ 2-12

Table of Contents

List of Figures (continued)

2-5. Comparison of Cesium-137 with Naturally Occurring Potassium-40 Concentrations in 1999 at Downstream Sampling Location SFTCSED ____ 2-12

2-6. Thirteen-year Trends of Gross Alpha and Gross Beta Activity at the Main Stack Sampling Location (ANSTACK) ____ 2-14

2-7. Thirteen-year Trends of Gross Alpha and Gross Beta Concentrations at the Rock Springs Road Sampling Location (AFRSPRD) ____ 2-16

2-8. Sixteen-year Trend of Environmental Radiation Levels at Perimeter TLDs ____ 2-22

3-1. Geologic Cross Section through the North Plateau ____ 3-3

3-2. Geologic Cross Section through the South Plateau ____ 3-3

3-3. North Plateau Gross Beta Plume Area: Fourth-Quarter 1999 Results ____ 3-11

3-4. Annualized Average Strontium-90 Concentrations at WNSWAMP ____ 3-16

3-5. Nine-year Trends of Averaged Gross Beta Activity at Selected Locations in the Sand and Gravel Unit ____ 3-18

3-6. Nine-year Trends of Gross Beta and Tritium at Well 105 ____ 3-18

3-7. Fourteen-year Trends of Averaged Gross Beta Activity at Selected Locations in the Sand and Gravel Unit ____ 3-19

3-8. Nine-year Trends of Averaged Tritium Activity at Selected Locations in the Sand and Gravel Unit ____ 3-19

3-9. Fourteen-year Trends of Averaged Tritium Activity at Selected Locations in the Sand and Gravel Unit ____ 3-20

3-10. Nine-year Trends of 1,1-DCA at Selected Monitoring Locations ____ 3-20

3-11. Nine-year Trends of Dichlorodifluoromethane (DCDFMeth) at Selected Monitoring Locations ____ 3-21

3-12. Nine-year Trends of 1,2-DCE and 1,1,1-TCA at Well 8612 ____ 3-21

Table of Contents

List of Figures (continued)

4-1. Comparison of Annual Background Radiation Dose to the Dose from 1999 WVDP Effluents ____ 4-3

4-2. Effective Dose Equivalent from Liquid and Airborne Effluents to a Maximally Exposed Individual Residing near the WVDP ____ 4-12

4-3. Collective Effective Dose Equivalent from Liquid and Airborne Effluents to the Population Residing within 80 Kilometers of the WVDP ____ 4-12

A-1. Project Base Map ____ A-3
A-2. On-site Surface Water and Soil Sampling Locations ____ A-4
A-3. Off-site Surface Water, Soil, and Sediment Sampling Locations ____ A-5
A-4. On-site Air Monitoring and Sampling Points ____ A-6
A-5. Off-site Air and Fallout Sampling Points ____ A-7
A-6. Active WVDP Groundwater Monitoring Points ____ A-8
A-7. North Plateau On-site Groundwater Monitoring Network ____ A-9
A-8. South Plateau On-site Groundwater Monitoring Network ____ A-10
A-9. Near-site Drinking Water and Biological Sampling Points ____ A-11
A-10. Location of On-site Thermoluminescent Dosimeters (TLDs) ____ A-12
A-11. Location of Off-site Thermoluminescent Dosimeters (TLDs) ____ A-13
A-12. Environmental Sample Points more than 5 Kilometers from the WVDP Site ____ A-14
A-13. Projected 2000 Census Population by Sector within 80 Kilometers of the Site ____ A-15

E-1. pH - Sand and Gravel Unit ____ E-25
E-2. Conductivity - Sand and Gravel Unit ____ E-25
E-3. Gross Alpha - Sand and Gravel Unit ____ E-26
E-4. Gross Beta - Sand and Gravel Unit ____ E-26
E-4a. Gross Beta (magnified scale of Fig. E-4) - Sand and Gravel Unit ____ E-27
E-4b. Gross Beta (magnified scale of Fig. E-4a) - Sand and Gravel Unit ____ E-27
E-5. Tritium Activity - Sand and Gravel Unit ____ E-28
E-5a. Tritium Activity (magnified scale of Fig. E-5) - Sand and Gravel Unit ____ E-28
E-6. pH - Till-sand Unit ____ E-29
E-7. Conductivity - Till-Sand Unit ____ E-29
E-8. Gross Alpha - Till-Sand Unit ____ E-29
E-9. Gross Beta - Till-Sand Unit ____ E-29
E-10. Tritium Activity - Till-Sand Unit ____ E-30
E-11. pH - Weathered Lavery Till Unit ____ E-30

Table of Contents

List of Figures (concluded)

E-12. Conductivity - Weathered Lavery Till Unit _____ E-30
E-13. Gross Alpha - Weathered Lavery Till Unit _____ E-30
E-14. Gross Beta - Weathered Lavery Till Unit _____ E-31
E-14a. Gross Beta (magnified scale of Fig. E-14) - Weathered Lavery Till Unit _____ E-31
E-15. Tritium Activity - Weathered Lavery Till Unit _____ E-31
E-16. pH - Unweathered Lavery Till Unit _____ E-31
E-17. Conductivity - Unweathered Lavery Till Unit _____ E-32
E-18. Gross Alpha - Unweathered Lavery Till Unit _____ E-32
E-19. Gross Beta - Unweathered Lavery Till Unit _____ E-32
E-19a. Gross Beta (magnified scale of Fig. E-19) - Unweathered Lavery Till Unit _____ E-32
E-20. Tritium Activity - Unweathered Lavery Till Unit _____ E-33
E-21. pH - Kent Recessional Sequence _____ E-33
E-22. Conductivity - Kent Recessional Sequence _____ E-33
E-23. Gross Alpha - Kent Recessional Sequence _____ E-33
E-24. Gross Beta - Kent Recessional Sequence _____ E-34
E-25. Tritium Activity - Kent Recessional Sequence _____ E-34

H-1. 1999 Average Yearly Gamma Exposure Rates around the West Valley Demonstration Project Site _____ H-6

H-2. 1999 Average Yearly Gamma Exposure Rates on the West Valley Demonstration Project Site _____ H-6

I-1. Wind Frequency Rose: 10-meter at the Regional Monitoring Station _____ I-3
I-2. Wind Frequency Rose: 10-meter at the Primary Monitoring Station _____ I-4
I-3. Wind Frequency Rose: 60-meter at the Primary Monitoring Station _____ I-5
I-4. 1999 Weekly Precipitation _____ I-6
I-5. 1999 Cumulative Precipitation _____ I-6

Table of Contents

Tables

2-1. 1999 Gross Alpha Concentrations at Surface Water Sampling Locations ____ 2-5

2-2. 1999 Gross Beta Concentrations at Surface Water Sampling Locations ____ 2-5

2-3. 1999 Gross Alpha Concentrations at Off-site, Perimeter, and On-site Ambient Air Sampling Locations ____ 2-18

2-4. 1999 Gross Beta Concentrations at Off-site, Perimeter, and On-site Ambient Air Sampling Locations ____ 2-18

3-1. 1999 Groundwater Sampling and Analysis Agenda ____ 3-6

4-1. Potential Local Off-site Exposure Pathways Under Existing WVDP Conditions ____ 4-5

4-2. Summary of Annual Effective Dose Equivalents to an Individual and Population from WVDP Releases in 1999 ____ 4-7

C-1. Total Radioactivity of Liquid Effluents Released from Lagoon 3 (WNSP001) in 1999 ____ C-3

C-2. Comparison of 1999 Lagoon 3 (WNSP001) Liquid Effluent Radioactivity Concentrations with Department of Energy Guidelines ____ C-4

C-3. Radioactivity Concentrations and pH in Surface Water: Facility Yard Drainage (WNSP005) ____ C-5

C-4. Radioactivity Concentrations in Surface Water Downstream of the WVDP at Frank's Creek (WNSP006) ____ C-6

C-5. Radioactivity Concentrations in Surface Water: Sewage Treatment Facility (WNSP007) ____ C-7

C-6. Radioactivity Concentrations in Surface Water: French Drain (WNSP008) ____ C-8

C-7. Radioactivity Concentrations and pH in Surface Water: Northeast Swamp (WNSWAMP) ____ C-9

C-8. Radioactivity Concentrations in Surface Water: North Swamp (WNSW74A) ____ C-10

C-9. Radioactivity Concentrations and pH in Surface Water: Frank's Creek East of the SDA (WNFRC67) ____ C-11

C-10. Radioactivity Concentrations and pH in Surface Water: Erdman Brook (WNERB53) ____ C-12

Table of Contents

List of Tables (continued)

C-11. Radioactivity Concentrations and pH in Surface Water: Cooling Tower Basin (WNCOOLW) ____ C-13

C-12. Radioactivity Concentrations and pH in Surface Water: SDA Drainage (WNSDADR) ____ C-14

C-13. Radioactivity Concentrations and pH in Surface Water: Waste Tank Farm Underdrain (WN8D1DR) ____ C-15

C-14. Radioactivity Concentrations in Surface Water: Drum Cell Drainage (WNDCELD) ____ C-16

C-15. Radioactivity Concentrations, pH, and Conductivity: Environmental Laboratory Potable Water Sampling Location (WNDNKEL) ____ C-17

C-16. Radioactivity Concentrations, pH, and Conductivity: Maintenance Shop Potable Water (WNDNKMS) ____ C-18

C-17. Radioactivity Concentrations, pH, and Conductivity: Main Plant Potable Water (WNDNKMP) ____ C-19

C-18. Radioactivity Concentrations and Water Quality Parameters: Utility Room Potable Water (WNDNKUR) ____ C-20

C-19. Radioactivity Concentrations and Water Quality Parameters: Storage and Disposal Area Drainage (WNNDADR) ____ C-21

C-20. Radioactivity Concentrations, NPOC, and TOX in Groundwater at the NDA Interceptor Trench (WNNDATR) ____ C-22

C-21. Radioactivity Concentrations and Water Quality Parameters in Surface Water at the Standing Water (WNSTAW-series) Sampling Locations ____ C-23

C-22. Radioactivity Concentrations, pH, and Conductivity in Surface Water Upstream of the WVDP in Buttermilk Creek at Fox Valley (WFBCBKG) ____ C-24

C-23. Radioactivity Concentrations, pH, and Conductivity in Surface Water Downstream of the WVDP in Buttermilk Creek at Thomas Corners Road Bridge (WFBCTCB) ____ C-25

C-24. Radioactivity Concentrations and pH in Surface Water Downstream of the WVDP in Cattaraugus Creek at Felton Bridge (WFFELBR) ____ C-26

C-25. Radioactivity Concentrations in Surface Water Upstream of the WVDP in Cattaraugus Creek at Bigelow Bridge (WFBIGBR) ____ C-26

C-26. Radioactivity Concentrations, pH, and Conductivity in Potable Well Water around the WVDP ____ C-27

Table of Contents

List of Tables (continued)

C-27. Surface Water Quality at Locations WFBCBKG, WNSP006, WNSWAMP, and WNSW74A ____ C-28

C-28. Radioactivity Concentrations and Metals Concentrations in On-site Soils/Sediments ____ C-29

C-29. Radioactivity Concentrations in Surface Soil Collected at Air Sampling Stations around the WVDP ____ C-30

C-30. Radioactivity Concentrations in Stream Sediments around the WVDP ____ C-31

D-1. Airborne Radioactive Effluent Totals Released from the Main Ventilation Stack (ANSTACK) ____ D-3

D-2. Comparison of 1999 Main Stack Exhaust Radioactivity Concentrations with Department of Energy Guidelines ____ D-4

D-3. Airborne Radioactive Effluent Totals from the Vitrification System (HVAC) Ventilation Stack (ANVITSK) ____ D-5

D-4. Airborne Radioactive Effluent Totals from the Seismic Sampler (ANSEISK) for the Vitrification System (HVAC) Ventilation Stack ____ D-6

D-5. Airborne Radioactive Effluent Totals from the 01-14 Building Ventilation Exhaust (ANCSSTK) ____ D-7

D-6. Airborne Radioactive Effluent Totals from the Contact Size-reduction Facility Ventilation Stack (ANCSRFK) ____ D-8

D-7. Airborne Radioactive Effluent Totals from the Supernatant Treatment System Ventilation Stack (ANSTSTK) ____ D-9

D-8. Airborne Radioactive Effluent Totals from the Container Sorting and Packaging Facility (ANCSPFK) ____ D-10

D-9. Airborne Radioactive Effluent Totals from the Former Low-level Waste Treatment Facility Hot Side Ventilation (ANLLWTVH) ____ D-11

D-10. Airborne Radioactive Effluent Totals from the New Low-level Waste Treatment Facility Ventilation (ANLLW2V) ____ D-11

D-11. Airborne Radioactive Effluent Totals from the Laundry Change Room (ANLAUNV) ____ D-12

D-12. Radioactivity Concentrations in Airborne Particulates at the Lag Storage Area Air Sampler (ANLAGAM) ____ D-13

Table of Contents

List of Tables (continued)

D-13. Radioactivity Concentrations in Airborne Particulates at the NDA Air Sampler (ANNDAAM) ____ D-14

D-14. Airborne Radioactivity Concentrations at the SDA Trench 9 Air Sampler (ANSDAT9) ____ D-15

D-15. Airborne Radioactive Effluent Totals from Outdoor Ventilation Enclosures/Portable Ventilation Units ____ D-16

D-16. Airborne Radioactivity Concentrations at the Rock Springs Road Air Sampler (AFRSPRD) ____ D-17

D-17. Radioactivity Concentrations in Airborne Particulates at the Dutch Hill Air Sampler (AFBOEHN) ____ D-18

D-18. Radioactivity Concentrations in Airborne Particulates at the Fox Valley Air Sampler (AFFXVRD) ____ D-19

D-19. Radioactivity Concentrations in Airborne Particulates at the Bulk Storage Warehouse Air Sampler (AFBLKST) ____ D-20

D-20. Radioactivity Concentrations in Airborne Particulates at the Route 240 Air Sampler (AFRT240) ____ D-21

D-21. Radioactivity Concentrations in Airborne Particulates at the Thomas Corners Road Air Sampler (AFTCORD) ____ D-22

D-22. Radioactivity Concentrations in Airborne Particulates at the West Valley Air Sampler (AFWEVAL) ____ D-23

D-23. Radioactivity Concentrations in Airborne Particulates at the Springville Air Sampler (AFSPRVL) ____ D-24

D-24. Airborne Radioactivity Concentrations at the Great Valley Background Air Sampler (AFGRVAL) ____ D-25

D-25. Radioactivity Concentrations in Airborne Particulates at the Nashville Background Air Sampler (AFNASHV) ____ D-26

D-26. Radioactivity and pH in Fallout: Dutch Hill (AFDHFOP) ____ D-27

D-27. Radioactivity and pH in Fallout: Rain Gauge (ANRGFOP) ____ D-27

D-28. Radioactivity and pH in Fallout: Route 240 (AF24FOP) ____ D-28

D-29. Radioactivity and pH in Fallout: Thomas Corners Road (AFTCFOP) ____ D-28

D-30. Radioactivity and pH in Fallout: Fox Valley Road (AFFXFOP) ____ D-29

Table of Contents

List of Tables (continued)

E-1. Groundwater Monitoring Network: Super Solid Waste Management Units ____ E-3

E-2. Contamination Indicator and Radiological Indicator Results: Sand and Gravel Unit ____ E-7

E-3. Contamination Indicator and Radiological Indicator Results: Lavery Till-Sand Unit ____ E-11

E-4. Contamination Indicator and Radiological Indicator Results: Weathered Lavery Till Unit ____ E-12

E-5. Contamination Indicator and Radiological Indicator Results: Unweathered Lavery Till Unit ____ E-13

E-6. Contamination Indicator and Radiological Indicator Results: Kent Recessional Sequence ____ E-14

E-7. Contamination Indicator and Radiological Indicator Results: North Plateau Seep Monitoring Locations ____ E-15

E-8. Contamination Indicator and Radiological Indicator Results: North Plateau Well Points ____ E-16

E-9. Detections of Volatile Organic Compounds at Selected Groundwater Monitoring Locations ____ E-16

E-10. Tributyl Phosphate Sampling Results at Selected Groundwater Monitoring Locations ____ E-17

E-11. Metals Sampling Results ____ E-17

E-12. Sampling Parameters at Early Warning Monitoring Wells ____ E-19

E-13. Alpha-, Beta-, and Gamma-emitting Radioisotopic Results ____ E-19

E-14. Practical Quantitation Limits ____ E-22

F-1. Radioactivity Concentrations in Milk ____ F-3

F-2. Radioactivity Concentrations in Meat ____ F-4

F-3. Radioactivity Concentrations in Food Crops ____ F-5

F-4. Radioactivity Concentrations in Fish Flesh from Cattaraugus Creek ____ F-6

G-1. West Valley Demonstration Project State Pollutant Discharge Elimination System (SPDES) Sampling Program ____ G-3

G-2. West Valley Demonstration Project 1999 SPDES Noncompliance Episodes ____ G-4

Table of Contents

List of Tables (concluded)

G-3A. SPDES Results for Outfall 001 (WNSP001): Water Quality ____ G-5
G-3B. SPDES Results for Outfall 001 (WNSP001): Metals ____ G-7
G-3C. SPDES Results for Outfall 007 (WNSP007): Organics ____ G-9
G-4. SPDES Results for Outfall 007 (WNSP007): Water Quality and Iron ____ G-11
G-5. SPDES Results for Outfall 008 (WNSP008): Water Quality ____ G-12
G-6. SPDES Results for Sums of Outfalls 001, 007, 008, and 116: Water Quality ____ G-13
G-7. Annual/Semiannual SPDES Results for Outfall 001 ____ G-14
G-8. Annual SPDES Results for Outfalls 007 and 008 ____ G-15

H-1. Summary of 1999 Quarterly Averages of Off-site TLD Measurements ____ H-3
H-2. Summary of 1999 Quarterly Averages of On-site TLD Measurements ____ H-4
H-3. 3rd-Quarter 1999 TLD Results and Instantaneous Dose Readings with a High-pressure Ion Chamber (HPIC) at Each Monitoring Location ____ H-5

I-1. Site Precipitation Collection Data ____ I-7
I-2. Annual Temperature Summary at the 10-meter Primary Meteorological Tower ____ I-8
I-3. Annual Barometric Pressure Summary ____ I-8

J-1. Comparison of Radiological Results with Known Results of Crosscheck Samples from the DOE Environmental Measurements Laboratory Quality Assessment Program 50 ____ J-3

J-2. Comparison of Radiological Results with Known Results of Crosscheck Samples from the DOE Environmental Measurements Laboratory Quality Assessment Program 51 ____ J-5

K-1. Department of Energy Radiation Protection Standards and Derived Concentration Guides ____ K-3

K-2. Environmental Regulations, Orders, and Standards ____ K-4

K-3. West Valley Demonstration Project Environmental Permits ____ K-5

L-1. Contamination Indicator Results at SDA Monitoring Wells ____ L-3
L-2. Radiological Indicator Results at SDA Monitoring Wells ____ L-4
L-3. Radioisotopic Results at SDA Monitoring Wells ____ L-5