

LIST OF TABLES

Table 2.2-1 Technical Meetings Conducted as Part of the CEUS SSC Project.....	2-29
Table 2.2-2 Contributors to the CEUS SSC Project.....	2-30
Table 3.2-1 Summary of Earthquakes Added—USGS Earthquake Catalog by Time Period.....	3-44
Table 3.2-2 Summary of Earthquakes Added—USGS Earthquake Catalog by Source.....	3-45
Table 3.3-1 Conversion Relationships Used—Develop Uniform Moment Magnitudes E[M]	3-46
Table 3.4-1 Comparison of CEUS SSC Catalog Declustering Results Obtained Using the EPRI (1988) Approach with the Gardner Knopoff (1974) Approach	3-47
Table 3.5-1 Probability of Detection and Equivalent Periods of Completeness for the CEUS for Magnitude Weighting Case A	3-48
Table 3.5-2 Probability of Detection and Equivalent Periods of Completeness for the CEUS for Magnitude Weighting Case B	3-51
Table 3.5-3 Probability of Detection and Equivalent Periods of Completeness for the CEUS for Magnitude Weighting Case E	3-54
Table 4.1.2-1 Sample table indicating particular types of data that can be considered in the identification and characterization of seismic sources (Table 2, ANSI/ANS-2.27-2008).....	4-26
Table 4.1.2-2 Sample table identifying the types of data that can be considered for characterizing different types of seismic sources, and an evaluation of the relative usefulness or credibility of the various data types (Budnitz et al., 1997).....	4-27
Table 4.1.2-3 Table showing the “generic” (not source-specific) evaluation of data to address indicators of a unique seismic source. The table indicates the TI Team’s assessment of the types of data that can be used to address the indicators and their relative usefulness.....	4-28
Table 4.1.2-4 Example of Data Evaluation Table for the Illinois Basin–Extended Basement Zone (IBEB)	4-34
Table 4.1.2-5 Example of Data Summary Table for the Extended Continental Crust–Atlantic Margin (ECC-AM) and Atlantic Highly Extended Crust (AHEX) Zones	4-35
Table 4.1.3-1 Criteria Used to Define the Seismotectonic Zones and Mmax Zones	4-37
Table 4.2.2-1 RLME Sources.....	4-38
Table 4.2.4-1 Seismotectonic Zones	4-39
Table 5.2.1-1 Mesozoic-and-Younger Extended Superdomains (MESE).....	5-60
Table 5.2.1-2 Older Extended and Non-Extended Superdomains (NMESE)	5-61
Table 5.2.1-3 Composite SCR Superdomains (COMP).....	5-62
Table 5.2.1-4 Results of Analyses of Updated SCR Superdomains	5-63

Table 5.2.1-5 Source Zones, $P(m^u > 8\%)$ Values, and Weights on Kijko (2004) K-S-B Estimates	5-64
Table 5.2.1-6 Mmax Distributions for the Two Example Seismic Sources.....	5-65
Table 5.3.2-1 Alternative Cases Considered for the Magnitude-Dependent Weights.....	5-65
Table 5.3.3-1 Miller and Rice (1983) Discrete 5-Point Approximation to a Continuous Probability Distribution and the Modified Form Used in This Study	5-65
Table 5.4-1 Assessment of Default Characteristics of Future Earthquakes in the CEUS.....	5-66
Table 5.4-2 Characteristics of Future Earthquakes for Individual Seismic Sources	5-68
Table 5.4-3 Estimates of D_{90} for Individual Seismic Source Zones.....	5-71
Table 6.1-1 Summary of Data Used to Assess RLME Recurrence Frequencies.....	6-80
Table 6.1.1-1 Charlevoix RLME Recurrence Frequency	6-83
Table 6.1.2-1 Summary of Interpreted Charleston Earthquake Ages and Sizes from “Contemporary Ages Only” Scenario	6-84
Table 6.1.2-2 Summary of Interpreted Charleston Earthquake Ages and Sizes from “All Ages” Scenario.....	6-84
Table 6.1.2-3 Charleston Liquefaction Feature Ages Used to Assess Ages of Prehistoric Earthquakes	6-85
Table 6.1.2-4 Charleston RLME Recurrence Frequency for Poisson Model	6-86
Table 6.1.2-5 Charleston RLME Recurrence Frequency for Renewal Model	6-87
Table 6.1.3-1 Range of Cheraw Fault Estimated Magnitudes (M)	6-88
Table 6.1.3-2 Cheraw RLME In-Cluster Recurrence Frequency	6-89
Table 6.1.3-3 Cheraw RLME In-Cluster Slip Rates	6-89
Table 6.1.3-4 Cheraw RLME Out-of-Cluster Recurrence Frequency	6-90
Table 6.1.3-5 Cheraw RLME Out-of-Cluster Slip Rates	6-90
Table 6.1.4-1 Range of Estimated Meers Fault Earthquake Magnitudes (M)	6-91
Table 6.1.4-2 Meers RLME In-Cluster Recurrence Frequency.....	6-91
Table 6.1.4-3 Meers RLME Out-of-Cluster Recurrence Frequency.....	6-91
Table 6.1.5-1 Preferred Ages for Paleoearthquakes in the New Madrid Region ¹	6-92
Table 6.1.5-2 Magnitude Comparisons for New Madrid 1811-1812 Earthquake Sequence	6-93
Table 6.1.5-3 Liquefaction Constraints on Age of AD 1450 NMFS RLME.....	6-94
Table 6.1.5-4 Liquefaction Constraints on Age of AD 900 NMFS RLME.....	6-95
Table 6.1.5-5 NMFS In-Cluster RLME Recurrence Frequency—Poisson Model	6-96
Table 6.1.5-6 NMFS In-Cluster RLME Recurrence Frequency—Renewal Model	6-96
Table 6.1.5-7 NMFS Out-of-Cluster RLME Recurrence Frequency—Poisson Model	6-96
Table 6.1.6-1 Range of ERM-S Estimated Magnitudes (M).....	6-97
Table 6.1.6-2 Range of ERM-N Estimated Magnitudes (M)	6-98
Table 6.1.6-3 ERM-S RLME Recurrence Frequency.....	6-98
Table 6.1.6-4 ERM-N RLME Recurrence Frequency	6-99
Table 6.1.7-1 Marianna RLME Recurrence Frequency	6-99

Table 6.1.8-1 Range of Commerce Fault Zone RLME Estimated Magnitudes (M).....	6-100
Table 6.1.8-2 Commerce Fault Zone RLME Recurrence Frequency.....	6-101
Table 6.1.9-1 Liquefaction Evidence for Prehistoric Earthquakes in the Southern Illinois Basin	6-102
Table 6.1.9-2 Wabash RLME Recurrence Frequency	6-109
Table 6.2-1 Alternative Mmax Zonation Models	6-109
Table 6.3.2-1 Maximum Magnitude Distributions for Mmax Distributed Seismicity Sources	6-110
Table 7.1-1 Data Summary and Data Evaluation Tables for Seismotectonic Zones in Appendices C and D	7-81
Table 7.4.2-1 Maximum Magnitude Distributions for Seismotectonic Distributed Seismicity Sources	7-82
Table 8.1-1 Description of Seven Test Sites.....	8-13
Table 8.2.1-1 Mean and Select Fractiles for Rock Hazard at Central Illinois: Digital Data for Figures 8.2-1a through 8.2-1c.....	8-14
Table 8.2.2-1 Mean and Select Fractiles for Rock Hazard at Chattanooga: Digital Data for Figures 8.2-2a through 8.2-2c.....	8-16
Table 8.2.3-1 Mean and Select Fractiles for Rock Hazard at Houston: Digital Data for Figures 8.2-3a through 8.2-3c.....	8-18
Table 8.2.4-1 Mean and Select Fractiles for Rock Hazard at Jackson: Digital Data for Figures 8.2-4a through 8.2-4c.....	8-20
Table 8.2.5-1 Mean and Select Fractiles for Rock Hazard at Manchester: Digital Data for Figures 8.2-5a through 8.2-5c.....	8-22
Table 8.2.6-1 Mean and Select Fractiles for Rock Hazard at Savannah: Digital Data for Figures 8.2-6a through 8.2-6c.....	8-24
Table 8.2.7-1 Mean and Select Fractiles for Rock Hazard at Topeka: Digital Data for Figures 8.2-7a through 8.2-7c.....	8-26
Table 9.4-1 Available Information for Determining the Precision of Mean Hazard	9-21
Table 9.4-2 Summary of an Example Logic Tree Representing Uncertainties for the Charleston Seismic Zone	9-21
Table 9.4-3 Basic Weights Given in EPRI (2004) for Ground Motion Equations	9-22
Table 9.4-4 Ground Motion Equations and Weights Used in USGS 2008 National Hazard Map for CEUS	9-23
Table 9.4-5 Minimum COV _{MH} Values Observed in Seismic Hazard	9-23
Table A-1 CEUS SSC GIS Database	A-7
Table B-1 Earthquake Catalog.....	B-6
Table B-2 Moment Magnitude Data	B-312
Table B-3 Approximate Moment Magnitude Data.....	B-324
Table C-5.4 Data Evaluation Future Earthquake Characteristics	C-3
Table C-6.1.1 Data Evaluation Charlevoix RLME	C-9
Table C-6.1.2 Data Evaluation Charleston RLME	C-14
Table C-6.1.3 Data Evaluation Cheraw Fault RLME	C-30

Table C-6.1.4 Data Evaluation Oklahoma Aulacogen RLME	C-36
Table C-6.1.5 Data Evaluation Reelfoot Rift–New Madrid Fault System RLMEs	C-42
Table C-6.1.6 Data Evaluation Reelfoot Rift–Eastern Margin Fault(s) RLMEs.....	C-51
Table C-6.1.7 Data Evaluation Reelfoot Rift–Marianna RLME	C-62
Table C-6.1.8 Data Evaluation Reelfoot Rift–Commerce Fault Zone RLME	C-67
Table C-6.1.9 Data Evaluation Wabash Valley RLME.....	C-75
Table C-7.3.1 Data Evaluation St. Lawrence Rift Zone	C-83
Table C-7.3.2 Data Evaluation Great Meteor Hotspot Zone	C-92
Table C-7.3.3 Data Evaluation Northern Appalachian Zone	C-99
Table C-7.3.4 Data Evaluation Paleozoic Extended Crust Zone	C-105
Table C-7.3.5 Data Evaluation Illinois Basin-Extended Basement Zone	C-112
Table C-7.3.6 Data Evaluation Reelfoot Rift Zone	C-124
Tables C-7.3.7/7.3.8 Data Evaluation Extended Continental Crust—Atlantic.....	C-131
Tables C-7.3.9/7.3.10 Data Evaluation Extended Continental Crust—Gulf Coast	C-138
Table C-7.3.12 Data Evaluation Midcontinent-Craton Zone	C-146
Table D-5.4 Data Summary Future Earthquake Characteristics.....	D-3
Table D-6.1.1 Data Summary Charlevoix RLME	D-10
Table D-6.1.2 Data Summary Charleston RLME.....	D-17
Table D-6.1.3 Data Summary Cheraw Fault RLME	D-35
Table D-6.1.4 Data Summary Oklahoma Aulacogen RLME	D-38
Table D-6.1.5 Data Summary Reelfoot Rift–New Madrid Seismic Zone (NMSZ) Region.....	D-44
Table D-6.1.9 Data Summary Wabash Valley RLME	D-92
Table D-7.3.1 Data Summary St. Lawrence Rift Zone (SLR)	D-121
Table D-7.3.2 Data Summary Great Meteor Hotspot Zone (GMH).....	D-141
Table D-7.3.3 Data Summary Northern Appalachian Zone (NAP)	D-151
Table D-7.3.4 Data Summary Paleozoic Extended Crust Zone.....	D-163
Table D-7.3.7 Data Summary Extended Continental Crust Zone—Atlantic Margin (ECC- AM).....	D-191
Table D-7.3.9 Data Summary Extended Continental Crust Zone—Gulf Coast (ECC-GC)....	D-225
Table D-7.3.12 Data Summary Midcontinent-Craton Zone (MidC)	D-240
Table E-1.2-1. Summary of Information on Liquefaction Features in Regional Data Sets.....	E-5
Table E-1.2-2 Summary of Type and Prevalence of Paleoliquefaction Features	E-7
Table E-2.1.3. Summary of Dating Techniques Used in Paleoliquefaction Studies.....	E-30
Table E-2.2. Uncertainties Related to Interpretation of Paleoearthquake Parameters	E-36
Table 1: Key Questions and Topics That Workshop 2 Presenters Were Asked to Address	F-35
Table H-3-1 Weighted Alternative Seismogenic Crustal Thickness Values for Mmax Zones	H-20
Table H-3-2 Aleatory Distributions for Characterization of Future Earthquake Ruptures for Mmax Zones	H-20

Table H-3-3 Maximum Magnitude Distributions for Mmax Distributed Seismicity Sources	H-20
Table H-4-1 Seismotectonic Source Zones	H-21
Table H-4-2 Weighted Alternative Seismogenic Crustal Thickness Values for Seismotectonic Zones.....	H-21
Table H-4-3 Aleatory Distributions for Characterization of Future Earthquake Ruptures for Seismotectonic Zones.....	H-22
Table H-4-4 Maximum Magnitude Distributions for Seismotectonic Distributed Seismicity Sources	H-24
Table H-5.1-1 Charlevoix RLME Magnitude Distribution	H-25
Table H-5.1-2 Annual Frequencies for Charlevoix RLME Events Data Set 1: 1870 and 1663	H-25
Table H-5.1-3 Annual Frequencies for Charlevoix RLME Events Data Set 2: 3 Earthquakes in 6–7 kyr BP.....	H-25
Table H-5.1-4 Annual Frequencies for Charlevoix RLME Events Data Set 3: 4 Earthquakes in 9.5–10.2 kyr BP.....	H-26
Table H-5.2-1 Charleston RLME Magnitude Distribution	H-26
Table H-5.2-2 Annual Frequencies for Charleston RLME Events Poisson Model, 2,000- Year Time Period Earthquakes 1886, A, B, and C.....	H-26
Table H-5.2-3 Annual Frequencies for Charleston RLME Events Poisson Model, 5,500- Year Time Period Earthquakes 1886, A, B, and C.....	H-27
Table H-5.2-4 Annual Frequencies for Charleston RLME Events Poisson Model, 5,500- Year Time Period Earthquakes 1886, A, B, C, and D	H-27
Table H-5.2-5 Annual Frequencies for Charleston RLME Events Poisson Model, 5,500- Year Time Period Earthquakes 1886, A, B, C, and E	H-27
Table H-5.2-6 Annual Frequencies for Charleston RLME Events Poisson Model, 5,500- Year Time Period Earthquakes 1886, A, B, C, D, and E.....	H-28
Table H-5.2-7 Annual Frequencies for Charleston RLME Events BPT Renewal Model, α = 0.3, 2,000-Year Time Period Earthquakes 1886, A, B, and C	H-28
Table H-5.2-8 Annual Frequencies for Charleston RLME Events BPT Renewal Model, α = 0.5, 2,000-Year Time Period Earthquakes 1886, A, B, and C	H-28
Table H-5.2-9 Annual Frequencies for Charleston RLME Events BPT Renewal Model, α = 0.7, 2,000-Year Time Period Earthquakes 1886, A, B, and C	H-29
Table H-5.2-10 Annual Frequencies for Charleston RLME Events BPT Renewal Model, α = 0.3, 5,500-Year Time Period Earthquakes 1886, A, B, and C	H-29
Table H-5.2-11 Annual Frequencies for Charleston RLME Events BPT Renewal Model, α = 0.5, 5,500-Year Time Period Earthquakes 1886, A, B, and C	H-29
Table H-5.2-12 Annual Frequencies for Charleston RLME Events BPT Renewal Model, α = 0.7, 5,500-Year Time Period Earthquakes 1886, A, B, and C	H-30
Table H-5.2-13 Annual Frequencies for Charleston RLME Events BPT Renewal Model, α = 0.3, 5,500-Year Time Period Earthquakes 1886, A, B, C, and D	H-30
Table H-5.2-14 Annual Frequencies for Charleston RLME Events BPT Renewal Model, α = 0.5, 5,500-Year Time Period Earthquakes 1886, A, B, C, and D	H-30

Table H-5.2-15 Annual Frequencies for Charleston RLME Events BPT Renewal Model, α = 0.7, 5,500-Year Time Period Earthquakes 1886, A, B, C, and D	H-31
Table H-5.2-16 Annual Frequencies for Charleston RLME Events BPT Renewal Model, α = 0.3, 5,500-Year Time Period Earthquakes 1886, A, B, C, and E	H-31
Table H-5.2-17 Annual Frequencies for Charleston RLME Events BPT Renewal Model, α = 0.5, 5,500-Year Time Period Earthquakes 1886, A, B, C, and E	H-31
Table H-5.2-18 Annual Frequencies for Charleston RLME Events BPT Renewal Model, α = 0.7, 5,500-Year Time Period Earthquakes 1886, A, B, C, and E	H-32
Table H-5.2-19 Annual Frequencies for Charleston RLME Events BPT Renewal Model, α = 0.3, 5,500-Year Time Period Earthquakes 1886, A, B, C, D, and E	H-32
Table H-5.2-20 Annual Frequencies for Charleston RLME Events BPT Renewal Model, α = 0.5, 5,500-Year Time Period Earthquakes 1886, A, B, C, D, and E	H-32
Table H-5.2-21 Annual Frequencies for Charleston RLME Events BPT Renewal Model, α = 0.7, 5,500-Year Time Period Earthquakes 1886, A, B, C, D, and E	H-33
Table H-5.3-1 Cheraw RLME Magnitude Distribution	H-33
Table H-5.3-2 Annual Frequencies for Cheraw RLME Events In-Cluster Case, Data Set: 2 Earthquakes in 20–25 kyr	H-33
Table H-5.3-3 Annual Frequencies for Cheraw RLME Events In-Cluster Case, Data Set: 3 Earthquakes in 20–25 kyr	H-34
Table H-5.3-4 Slip Rates for Cheraw Fault In-Cluster Case, Data Set: 3.2–4.1 m in 20–25 kyr	H-34
Table H-5.3-5 Annual Frequencies for Cheraw RLME Events Out-of-Cluster Case, Time Between Clusters	H-34
Table H-5.3-6 Slip Rates for Cheraw Fault Out-of-Cluster Case, Data Set: 7–8 m in 0.4–2.0 myr	H-35
Table H-5.4-1 Meers RLME Magnitude Distribution	H-35
Table H-5.4-2 Annual Frequencies for Meers RLME Events In-Cluster Case	H-35
Table H-5.4-3 Annual Frequencies for Meers RLME Events Out-of-Cluster Case	H-36
Table H-5.5-1 NMFS RLME Magnitude Distribution	H-36
Table H-5.5-2 Annual Frequencies for NMFS RLME Events In-Cluster Case, Poisson Model	H-36
Table H-5.5-3 Annual Frequencies for NMFS RLME Events In-Cluster Case, BPT Model, α = 0.3	H-37
Table H-5.5-4 Annual Frequencies for NMFS RLME Events In-Cluster Case, BPT Model, α = 0.5	H-37
Table H-5.5-5 Annual Frequencies for NMFS RLME Events In-Cluster Case, BPT Model, α = 0.7	H-37
Table H-5.5-6 Annual Frequencies for NMFS RLME Events Out-of-Cluster Case, Poisson Model	H-38
Table H-5.6-1 ERM-S RLME Magnitude Distribution	H-38
Table H-5.6-2 ERM-N RLME Magnitude Distribution	H-38
Table H-5.6-3 Annual Frequencies for ERM-S RLME Events Data Set: 2 Earthquakes in 17.7–21.7 kyr	H-39

Table H-5.6-4 Annual Frequencies for ERM-S RLME Events Data Set: 3 Earthquakes in 17.7–21.7 kyr	H-39
Table H-5.6-5 Annual Frequencies for ERM-S RLME Events Data Set: 4 Earthquakes in 17.7–21.7 kyr	H-39
Table H-5.6-6 Annual Frequencies for ERM-N RLME Events Data Set: 1 Earthquake in 12–35 kyr	H-40
Table H-5.6-7 Annual Frequencies for ERM-N RLME Events Data Set: 2 Earthquakes in 12–35 kyr	H-40
Table H-5.7-1 Marianna RLME Magnitude Distribution	H-40
Table H-5.7-2 Annual Frequencies for Marianna RLME Events Data Set: 3 Earthquakes in 9.6–10.2 kyr.....	H-41
Table H-5.7-3 Annual Frequencies for Marianna RLME Events Data Set: 4 Earthquakes in 9.6–10.2 kyr.....	H-41
Table H-5.8-1 Commerce RLME Magnitude Distribution.....	H-41
Table H-5.8-2 Annual Frequencies for Commerce RLME Events Data Set: 2 Earthquakes in 18.9–23.6 kyr	H-42
Table H-5.8-3 Annual Frequencies for Commerce RLME Events Data Set: 3 Earthquakes in 18.9–23.6 kyr	H-42
Table H-5.9-1 Wabash RLME Magnitude Distribution	H-42
Table H-5.9-2 Annual Frequencies for Wabash RLME Events Data Set: 2 Earthquakes in 11–13 kyr.....	H-43
PPRP Comment Response Table	(Appendix I)
Table K-1 SCR Earthquake Catalog	K-5
Table K-2 SCR Domains Updated from Johnston et al. (1994)	K-34