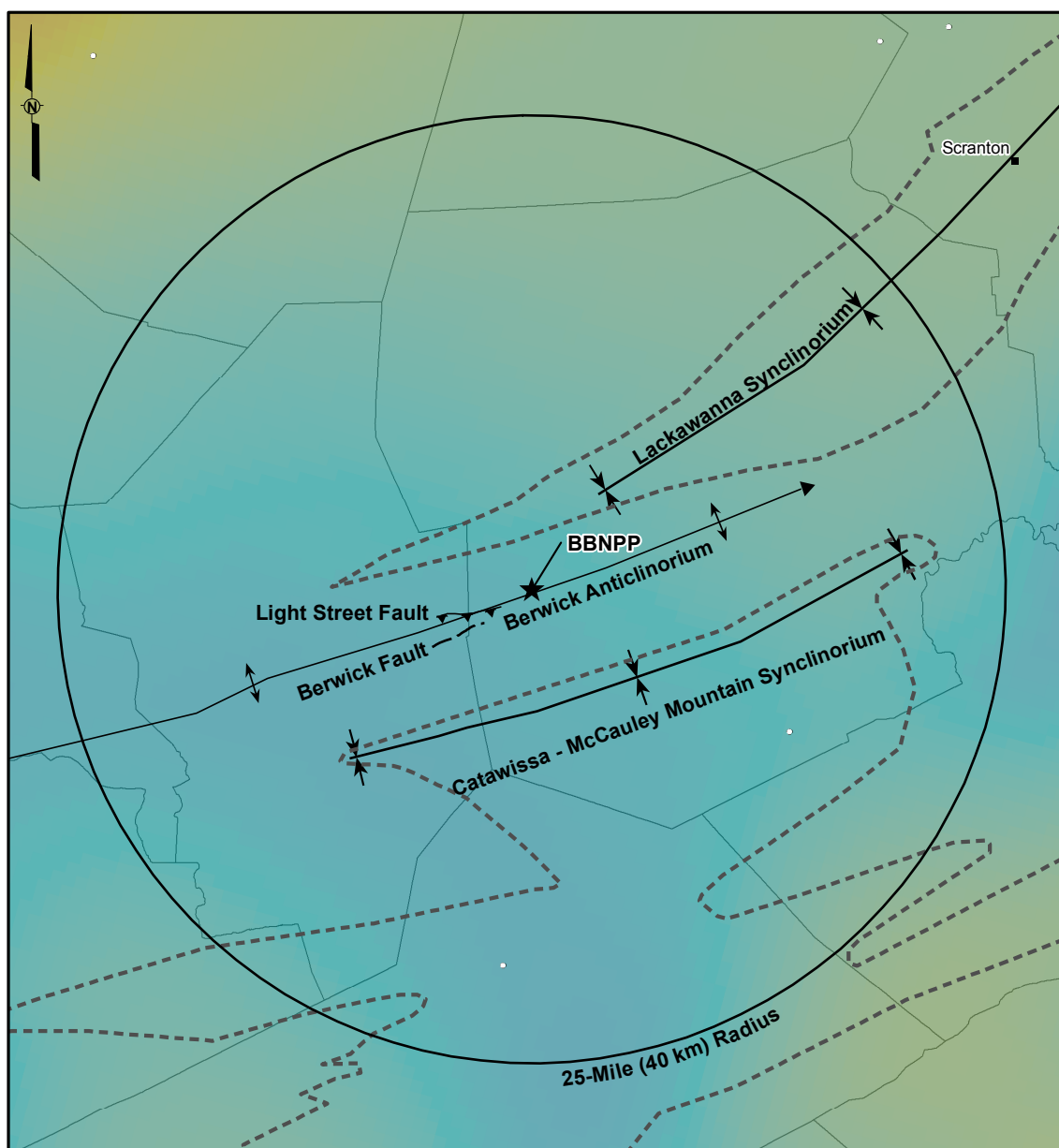


Figure 2.5-26— {Site Vicinity Magnetic Anomaly Map}**LEGEND**

★ Center Point of Proposed Bell Bend NPP (BBNPP)

○ NPP Reactor 25-Mile (40 km) Radius

----- Anthracite Region

↕↕ Syncline

↕↕ Anticline

Earthquakes by Magnitude, m_b

○ 3.0 - 3.9

○ 4.0 - 4.9

○ 5.0 - 5.9

— Inferred Fault

▲▲▲ Thrust Fault

Aeromagnetics

8215 nanoteslas
0
-1730 nanoteslas

0 2.5 5 10 miles

0 2.5 5 10 kilometers

REFERENCE:
• Bankey, 2002.
• Harrison, 2004.

Figure 2.5-27— {Site Specific Stratigraphic Column}

Era	Period	Epoch	Age (Ma)	Unit		Thickness (ft)
Cenozoic	Quaternary	Holocene	0.01	Stratified Drift		38.5
		Pleistocene	1.8			
Paleozoic	Devonian	Upper	360	Hamilton Group	Harrell Formation	150
		Middle	370		Mahantango Formation	1,500
					Marcellus Formation	350
					Onondaga Formation	175
		Lower	391		Old Port Formation	100-150
	Silurian	Upper	417	Keyser Formation	125	
				Tonoloway Formation	100	
				Wills Creek Formation	750	
		Lower	423	Bloomsburg Formation	464	
				Mifflintown Formation	336	
				Keefer Formation	670-1,070	
				Rose Hill Formation		
				Tuscarora Formation	400-700	
		Ordovician	Upper	443	Juniata Formation	600-1,125
					Bald Eagle Formation	700-1,313
	Reedsville Formation				600-1,800	
	Middle		458	Trenton Group Antes Shale Coburn Limestone Salona Limestone	842	
				Black River Group	632	
				Loysburg Formation	263-475	
	Lower		470	Beekmantown Group Bellefonte Dolomite Axemann Limestone Nittany Dolomite Stonehenge Formation	3,159-4,200	
	Cambrian		Upper	490	Gatesburg Formation	1,211
			Middle	510	Warrior Formation	400-1,340
		Pleasant Hill Formation			NOT REPORTED	
Lower		520	Waynesboro Formation	1,000+		
Neo-Proterozoic	Ediacaran		543	Metamorphic/Igneous		

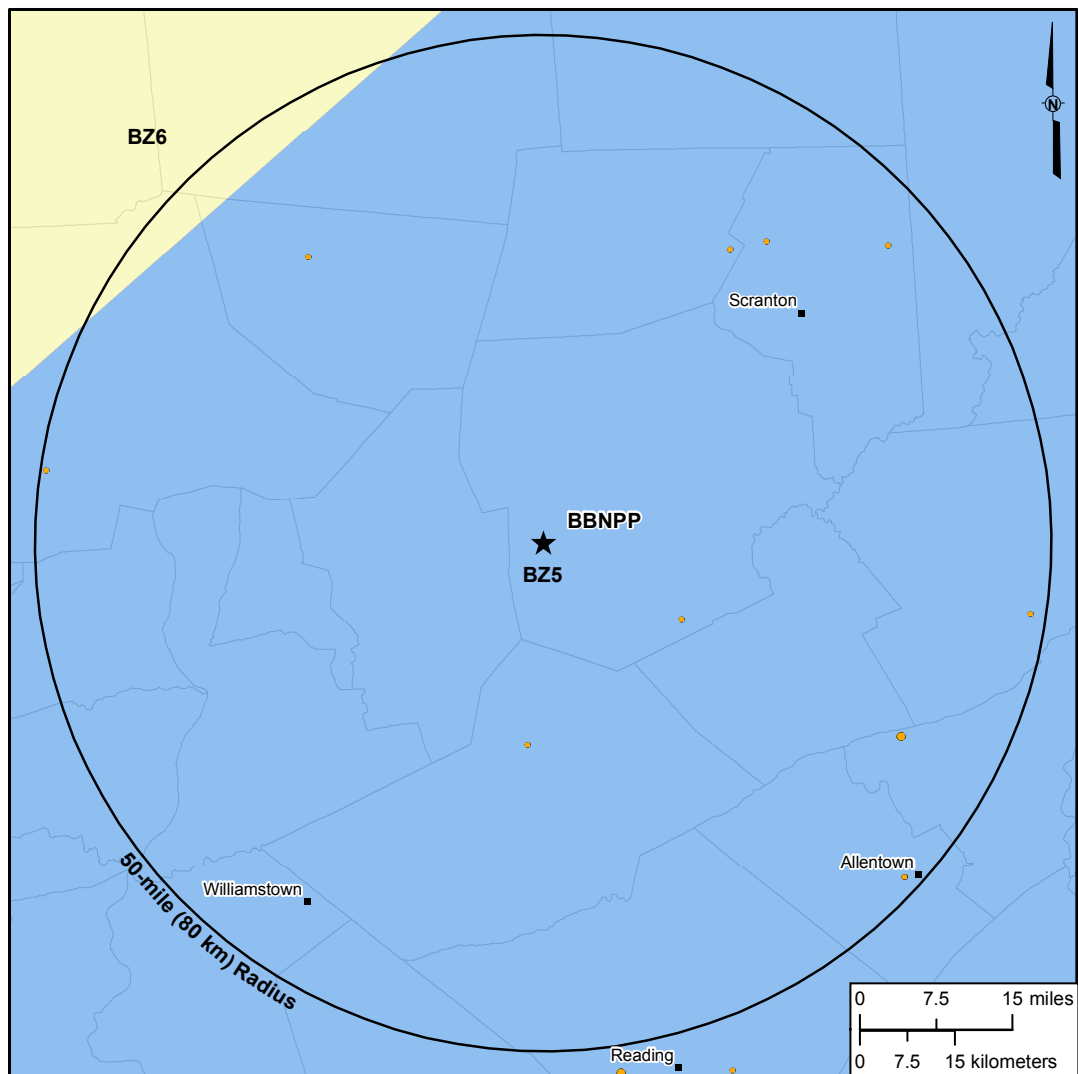
REFERENCES:
•Crangle, 2002
•Gold, 2003
•Inners, 1978
•Kauffman, 1999
•Laughrey, 1999
•McElroy, 2007
•Thompson, 1999

10-4310-GIS-A133.

Figure 2.5-28— {Ten-Foot Solid Core of Mahantango Shale with No Open Fractures}

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Figure 2.5-29— {Bechtel Group EPRI Source Zones 50-mile Radius}



LEGEND

-  Center Point of Proposed Bell Bend NPP (BBNPP)
 City
 NPP Reactor 50-mile (80 km) Radius

Earthquake Epicenters (by Magnitude, mb)

USGS 2008 Catalog
(1534-2006)

2007 to April 2010

-  3.0 - 3.9  3.0 - 3.9
 4.0 - 4.9  4.0 - 4.9
 5.0 - 5.9  5.0 - 5.9
 6.0 - 6.9  6.0 - 6.9
 7.0 - 7.9  7.0 - 7.9

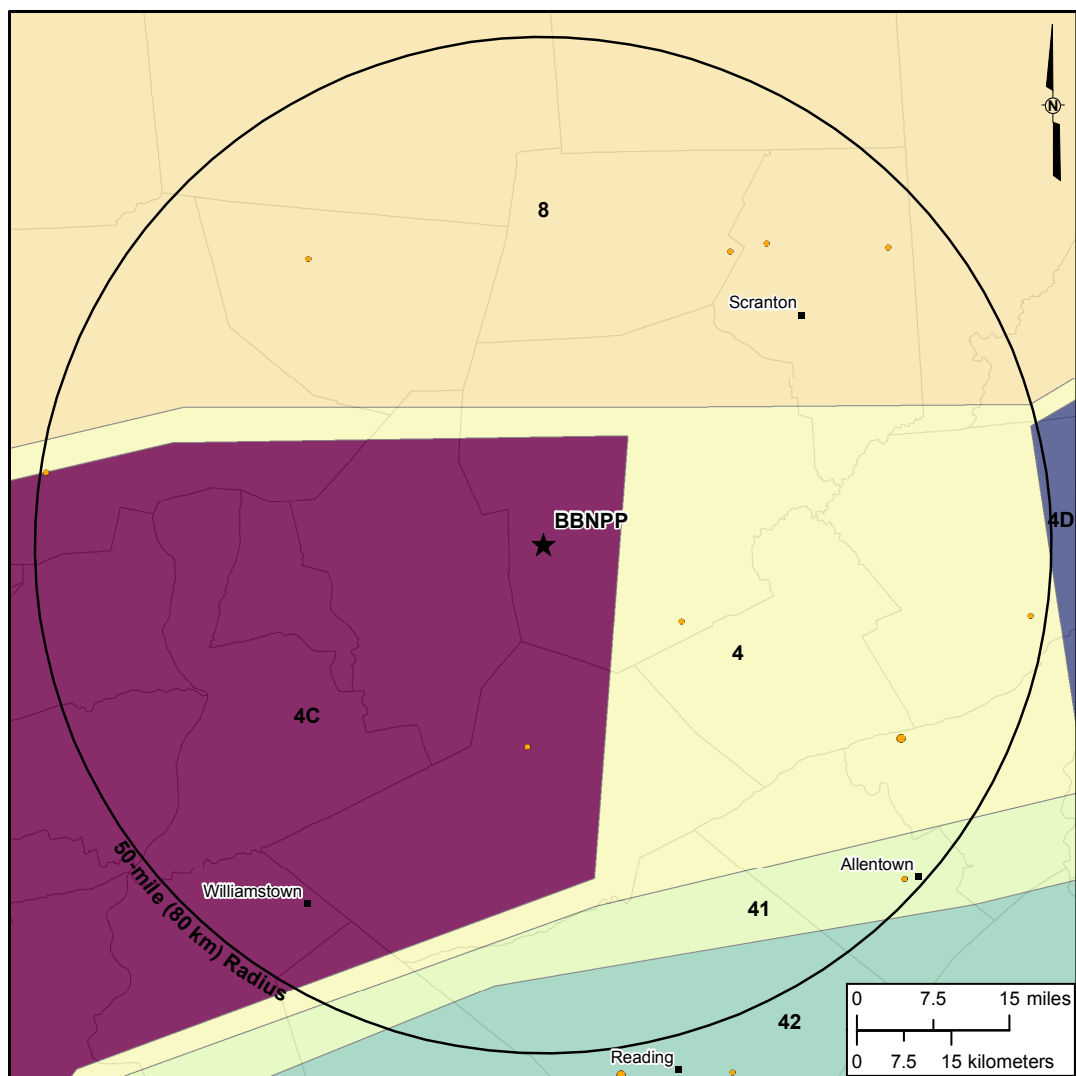
Bechtel Group Sources contributing to 99% of BBNPP Site Hazard

- 3 La Malbaie/Charlevoix
- 11 Clarendon-Linden
- 24 Bristol Block
- 25 NY-AL Lineament
- B24 Atlantic Coastal Region Background
- B25 Southern Appalachians Background
- B26 Southern Eastern Craton Background
- B27 Northern Eastern Craton Background
- B28 Northern Appalachians Background
- D Niagara Area

REFERENCES:

- ESRI, 2007.
- USGS 2008.
- USGS, PDE, 2010.
- ANSS, 2010.
- EC, 2010.
- EPRI Volume IX: Bechtel Group, 1986.

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Figure 2.5-30— {Dames & Moore EPRI Source Zones 50-mile Radius}**LEGEND**

- ★ Center Point of Proposed Bell Bend NPP (BBNPP)
- City
- NPP Reactor 50-mile (80 km) Radius
- Earthquake Epicenters (by Magnitude, mb)

USGS 2008 Catalog (1534-2006)

- 3.0 - 3.9
- 4.0 - 4.9
- 5.0 - 5.9
- 6.0 - 6.9
- 7.0 - 7.9

2007 to April 2010

- 3.0 - 3.9
- 4.0 - 4.9
- 5.0 - 5.9

NOTE: The 2007 to 2010 seismicity shown in 500-mile (800 km) radius.

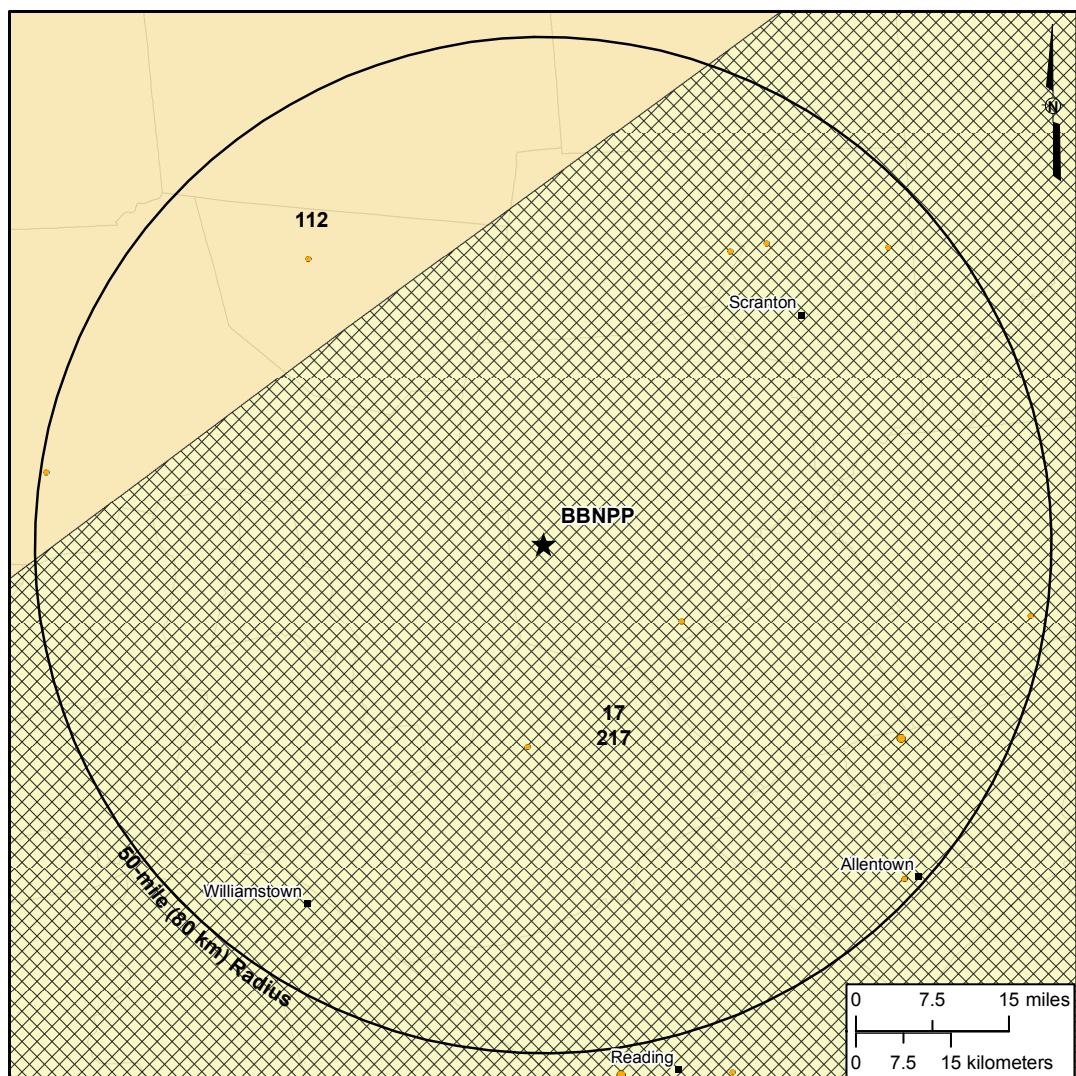
Dames and Moore Sources contributing to 99% of BBNPP Site Hazard

- 3 Adirondacks Zone
- 4 Appalachian Fold Belts
- 4C Kink in Fold Belt
- 4D Kink in Fold Belt
- 8 Eastern Marginal Basin
- 40 Clarendon-Linden Zone
- 41 Central Virginia Seismic Zone
- 42 Southern Cratonic Margin (default)
- 47 Newark-Gettysburg Basin
- 59 Connecticut Basin
- 59 La Malbaie/Charlevoix Zone

REFERENCES:

- ESRI, 2007.
- USGS 2008.
- USGS, PDE, 2010.
- ANSS, 2010.
- EC, 2010.
- EPRI Volume VI: Dames and Moore, 1986.

10-4310-GIS-A053

Figure 2.5-31 — {Law Engineering EPRI Source Zones 50-mile Radius}**LEGEND**

- ★ Center Point of Proposed Bell Bend NPP (BBNPP)
- City
- NPP Reactor 200-mile (322 km) Radius
- Earthquake Epicenters (by Magnitude, mb)

USGS 2008 Catalog (1534-2006)

- 3.0 - 3.9
- 4.0 - 4.9
- 5.0 - 5.9
- 6.0 - 6.9
- 7.0 - 7.9

2007 to April 2010

- 3.0 - 3.9
- 4.0 - 4.9
- 5.0 - 5.9

NOTE: The 2007 to 2010 seismicity shown in 500-mile (800 km) radius.

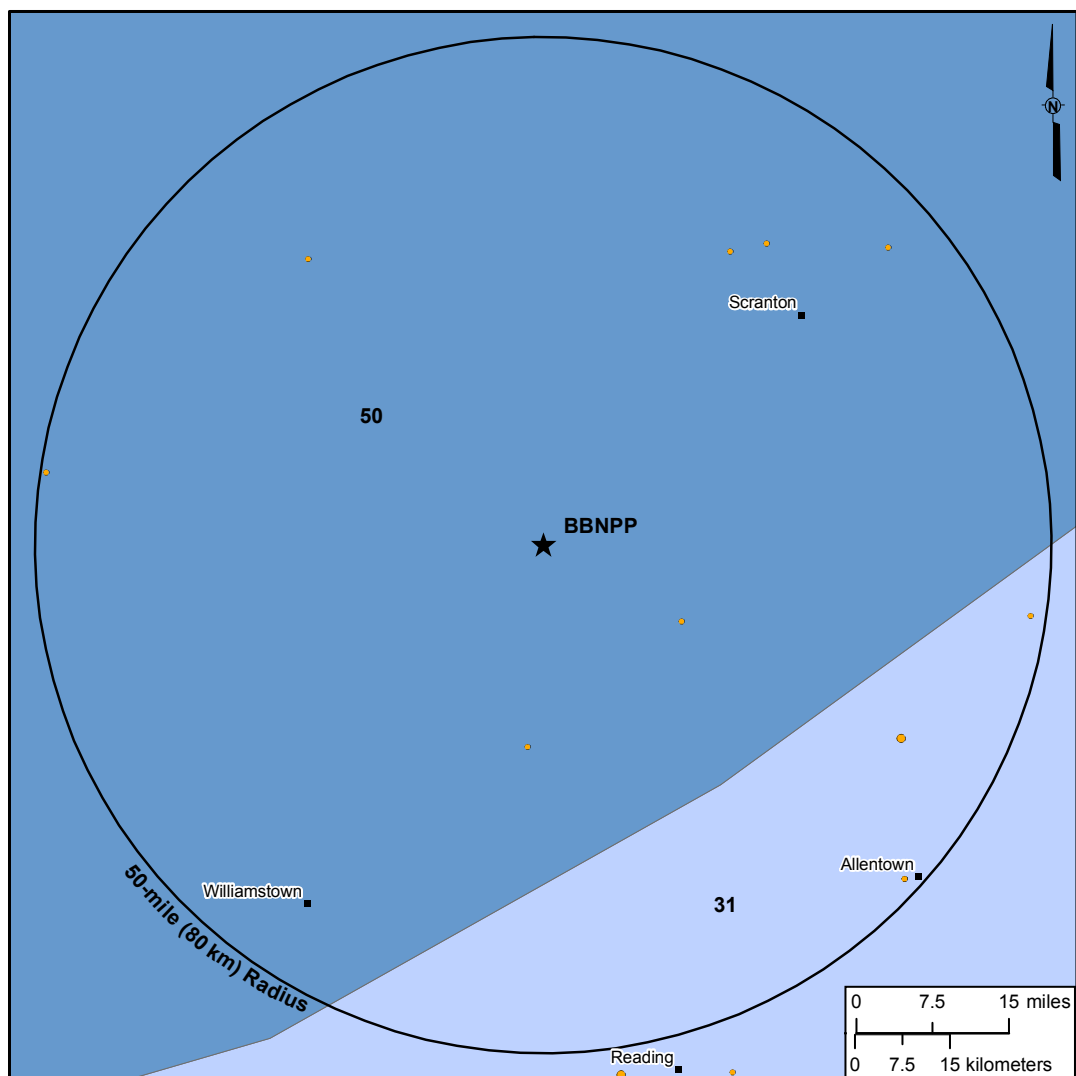
Law Engineering Sources contributing to 99% of BBNPP Site Hazard

- M15** Mafic Pluton
- C11** Combination (22-35)
- 217** Eastern Basement Background
- 12** La Malbaie/Charlevoix
- 17** Eastern Basement
- 20** Clarendon-Linden
- 22** Reactivated Eastern Seaboard Normal
- 101** Western New England Background
- 107** Eastern Piedmont Background
- 110** Adirondacks Background
- 111** Laurentian Block
- 112** Ohio-pennsylvania Block

REFERENCES:

- ESRI, 2007.
- USGS 2008.
- USGS, PDE, 2010.
- ANSS, 2010.
- EC, 2010.
- EPRI Volume IX: Bechtel Group, 1986.

10-4310-GIS-A055

Figure 2.5-32— {Rondout Associates EPRI Source Zones 50-mile Radius}**LEGEND**

- ★ Center Point of Proposed Bell Bend NPP (BBNPP)
- City
- NPP Reactor 50-mile (80 km) Radius
- Earthquake Epicenters (by Magnitude, mb)

USGS 2008 Catalog (1534-2006)

- 3.0 - 3.9
- 4.0 - 4.9
- 5.0 - 5.9
- 6.0 - 6.9
- 7.0 - 7.9

2007 to April 2010

- 3.0 - 3.9
- 4.0 - 4.9
- 5.0 - 5.9

NOTE: The 2007 to 2010 seismicity shown in 500-mile (800 km) radius.

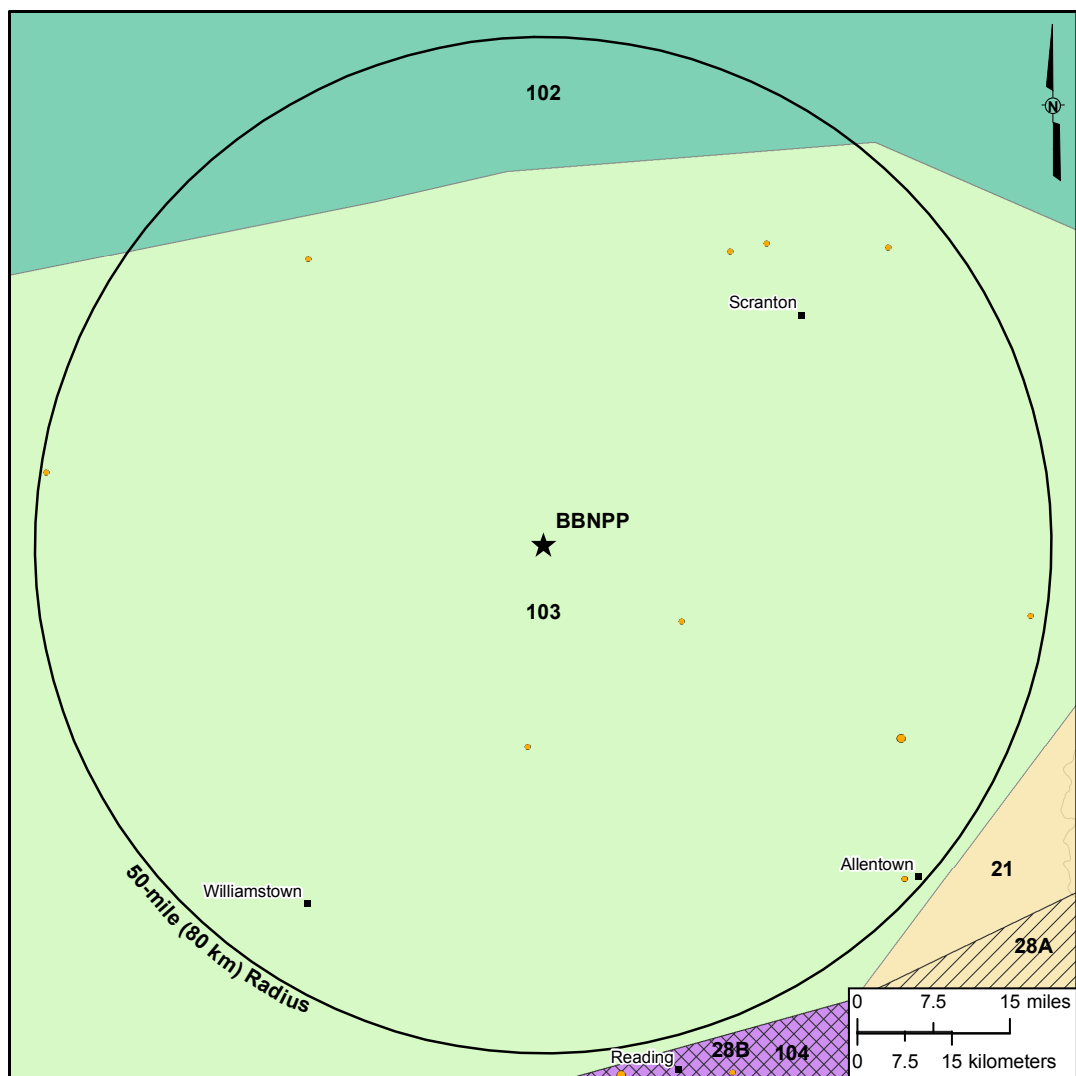
Rondout Associates Sources contributing to 99% of BBNPP Site Hazard

- 30 Shenandoah
- 31 Quakers
- 33 Niagara
- 34 Nessmuk
- 37 La Malbaie (Charlevoix) Seismic Zone
- 50 Grenville Province (Background)

REFERENCES:

- ESRI, 2007.
- USGS 2008.
- USGS, PDE, 2010.
- ANSS, 2010.
- EC, 2010.
- EPRI Volume X: Rondout Associates, 1986.

10-4310-GIS-A057

Figure 2.5-33— {Weston Geophysical EPRI Source Zones 50-mile Radius}**LEGEND**

- ★ Center Point of Proposed Bell Bend NPP (BBNPP)
- City
- NPP Reactor 50-mile (80 km) Radius

Earthquake Epicenters
(by Magnitude, mb)

USGS 2008 Catalog
(1534-2006)

- 3.0 - 3.9
- 4.0 - 4.9
- 5.0 - 5.9
- 6.0 - 6.9
- 7.0 - 7.9

2007 to April 2010

- 3.0 - 3.9
- 4.0 - 4.9
- 5.0 - 5.9

NOTE: The 2007 to 2010 seismicity shown in 500-mile (800 km) radius.

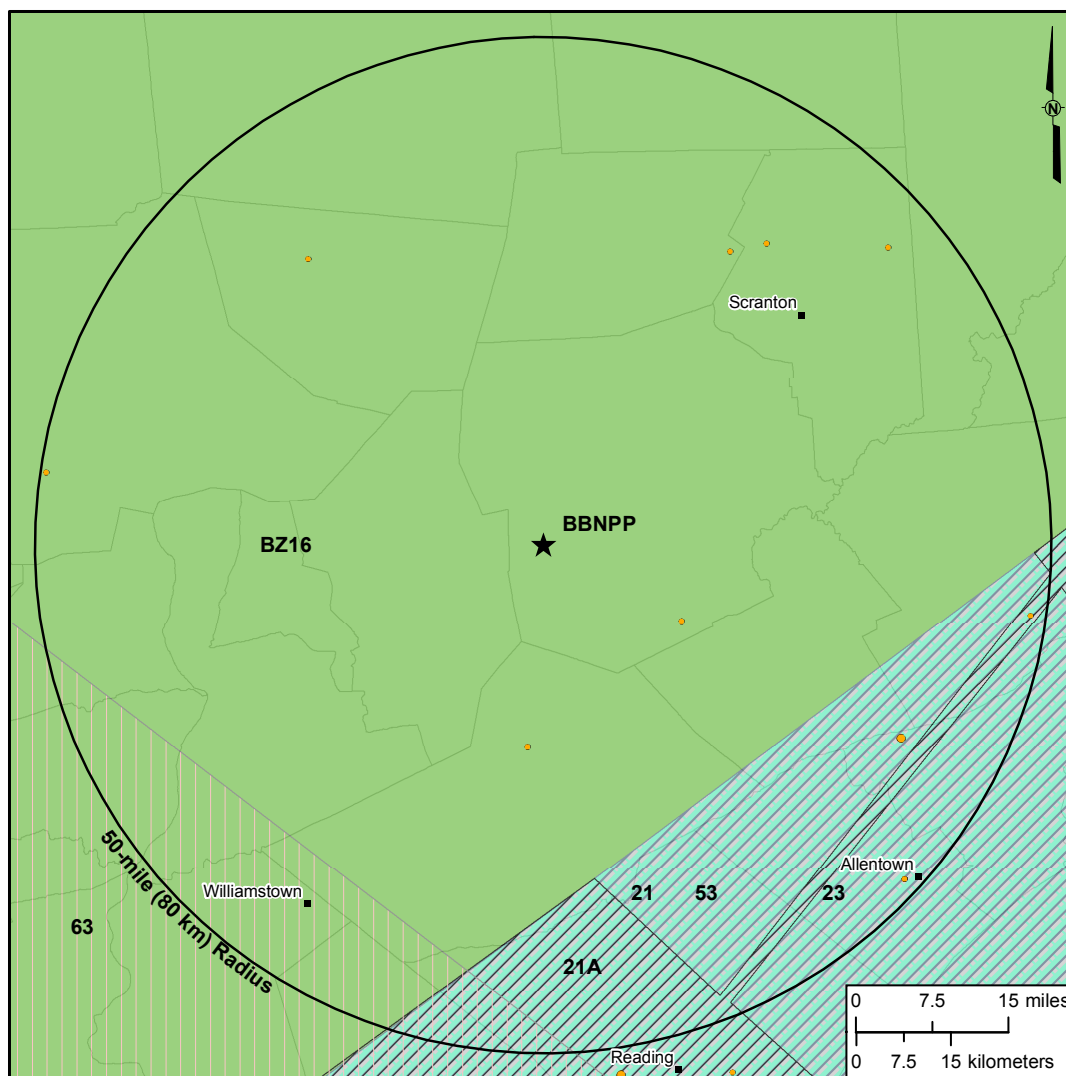
Weston Geophysical Sources contributing to 99% of BBNPP Site Hazard

- 1 Charlevoix - La Malbaie Seismic Zone
- 6 Adirondack Mountains
- 8 Clarendon-Linden Faults
- 21 New York Nexus
- 28A Zone of Mesozoic Basin
- 28B Zone of Mesozoic Basin
- 101 South Ontario-Ohio-Indiana Background
- 102 Appalachian Plateau Background
- 103 Southern Appalachian Background
- 104 Southern Coastal Plain Background

REFERENCES:

- ESRI, 2007.
- USGS 2008.
- USGS, PDE, 2010.
- ANSS, 2010.
- EC, 2010.
- EPRI Volume V: Weston Geophysical, 1986.

10-4310-GIS-A059

Figure 2.5-34— {Woodward-Clyde Consultants EPRI Source Zones 50-mile Radius}**LEGEND**

- ★ Center Point of Proposed Bell Bend NPP (BBNPP)
- City
- NPP Reactor 50-mile (80 km) Radius

Earthquake Epicenters
(by Magnitude, mb)

USGS 2008 Catalog
(1534-2006)

- 3.0 - 3.9
- 4.0 - 4.9
- 5.0 - 5.9
- 6.0 - 6.9
- 7.0 - 7.9

2007 to April 2010

- 3.0 - 3.9
- 4.0 - 4.9
- 5.0 - 5.9

NOTE: The 2007 to 2010 seismicity shown in 500-mile (800 km) radius.

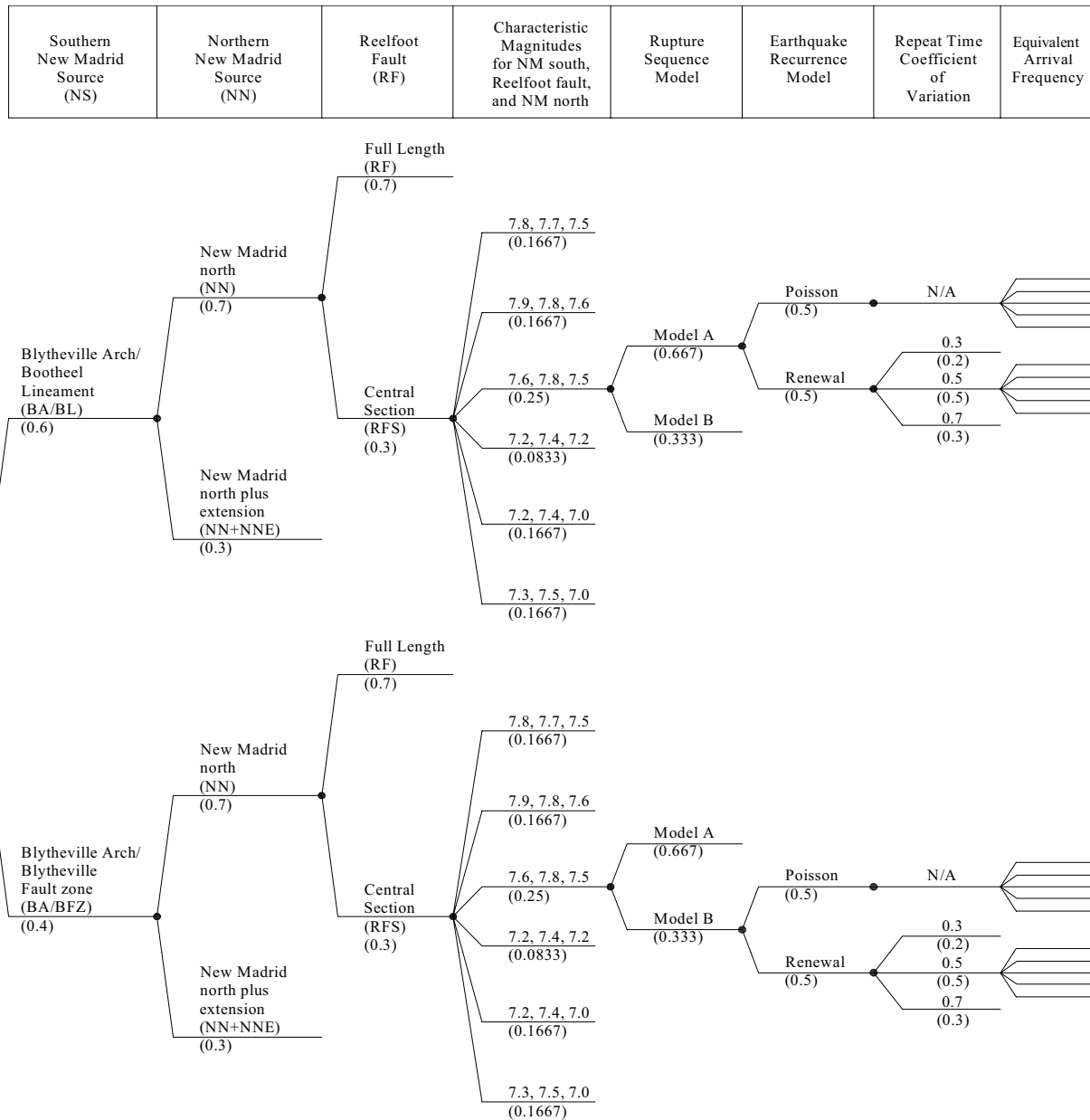
Woodward-Clyde Sources contributing to 99% of BBNPP Site Hazard

- 18 Adirondack Uplift
- 20A Mohawk River Trend
- 21 NJ Isostatic Gravity Saddle
- 21A NJ Isostatic Gravity Saddle
- 22 Newark Basin
- 23 Newark Basin Perimeter
- 24 Ramapo Fault Zone
- 25 Hudson River Valley Trend
- 33 W. NY-S Ontario Trend
- 34 Attica, NY Intersection
- 63 Tyron-Mt. Union Lineament
- BZ16 Susquehanna Background
- 12 Charlevoix Seismic Zone
- 61 Pittsburgh-Washington Lineament
- 10 Moodus Seismic Zone
- 53 New York-New Jersey-E. Pennsylvania Default

REFERENCES:

- ESRI, 2007.
- USGS 2008.
- USGS, PDE, 2010.
- ANSS, 2010.
- EC, 2010.
- EPRI Volume VIII: Woodward-Clyde Consultants, 1986.

10-4310-GIS-A061

Figure 2.5-35— {Logic Tree of New Madrid Fault System}

Adapted from the Seismic Hazards Report for the Clinton ESP Site .
See Figure 4.1-1 of Appendix B (EGC 2006)

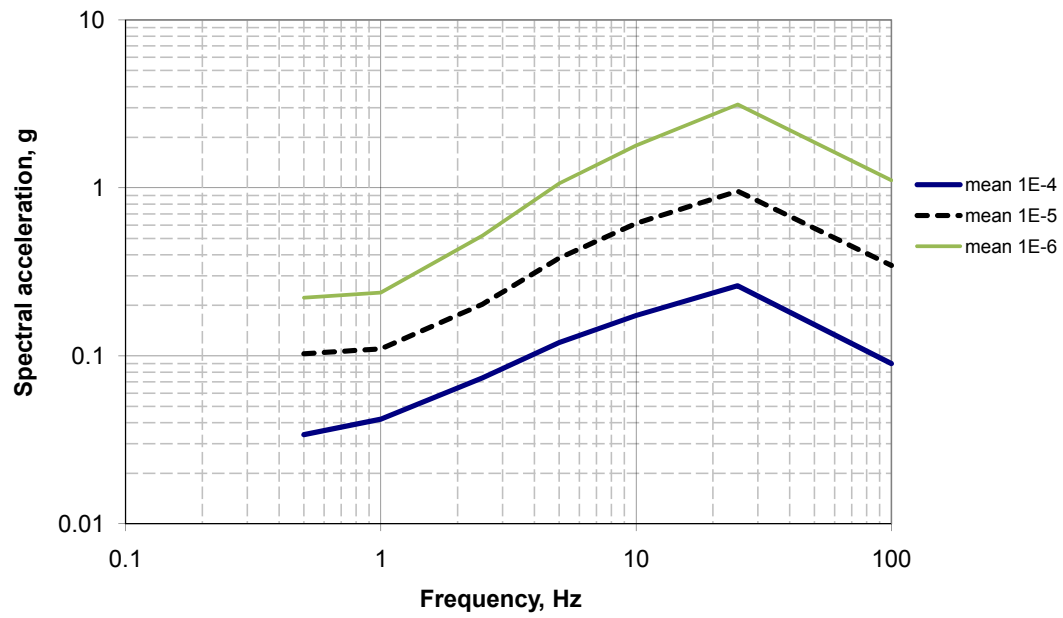
Figure 2.5-36— {Uniform Hazard Spectra for Hard Rock at 7 Structural Frequencies}

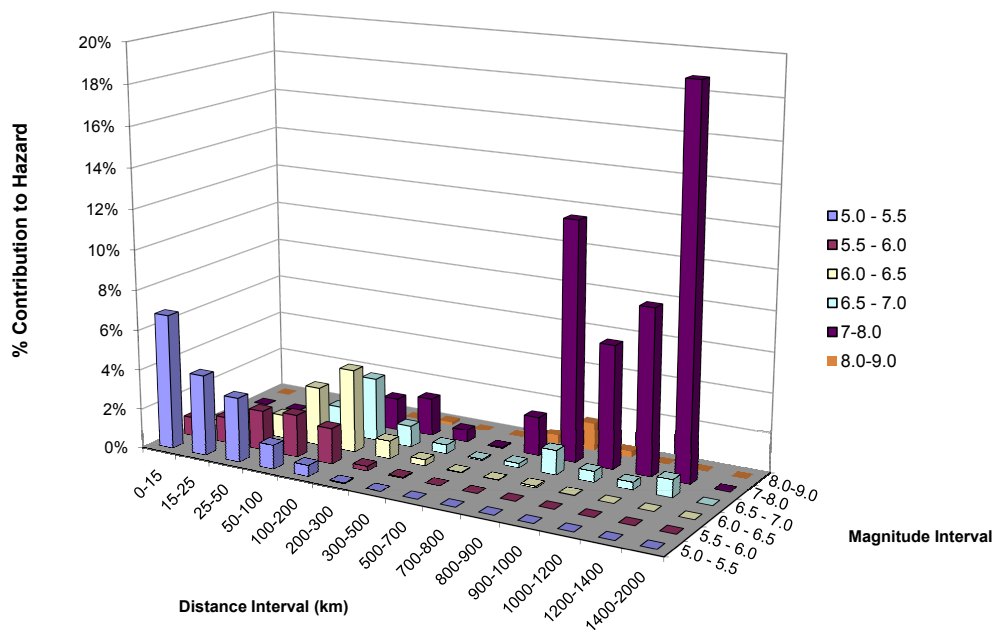
Figure 2.5-37— {Mean 1E-4 Rock Deaggregation for 1 and 2.5 Hz}

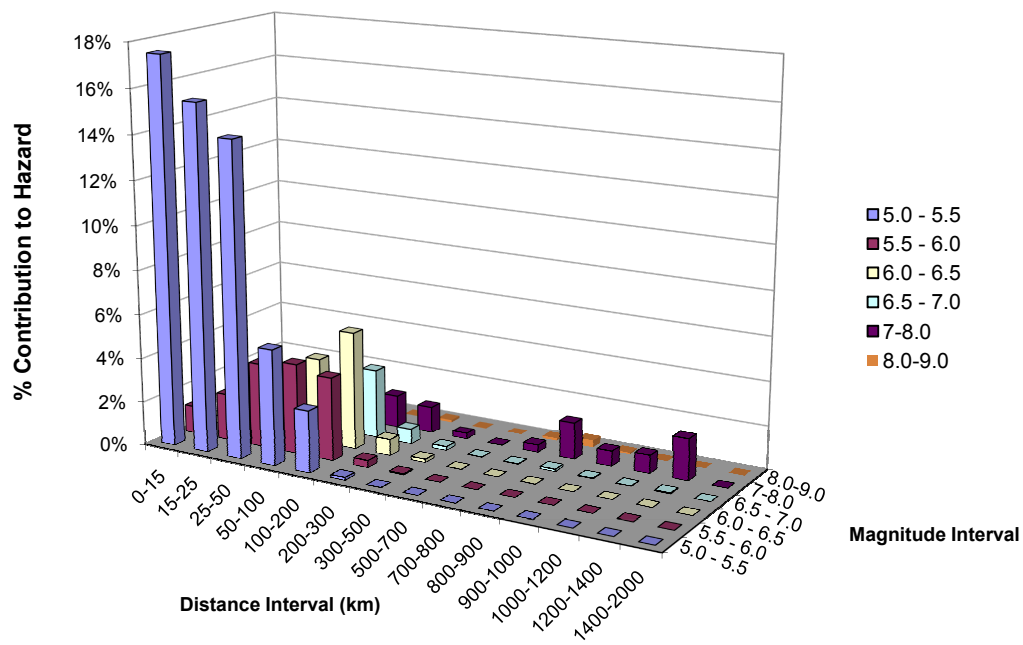
Figure 2.5-38— {Mean 1E-4 Rock Deaggregation for 5 and 10 Hz}

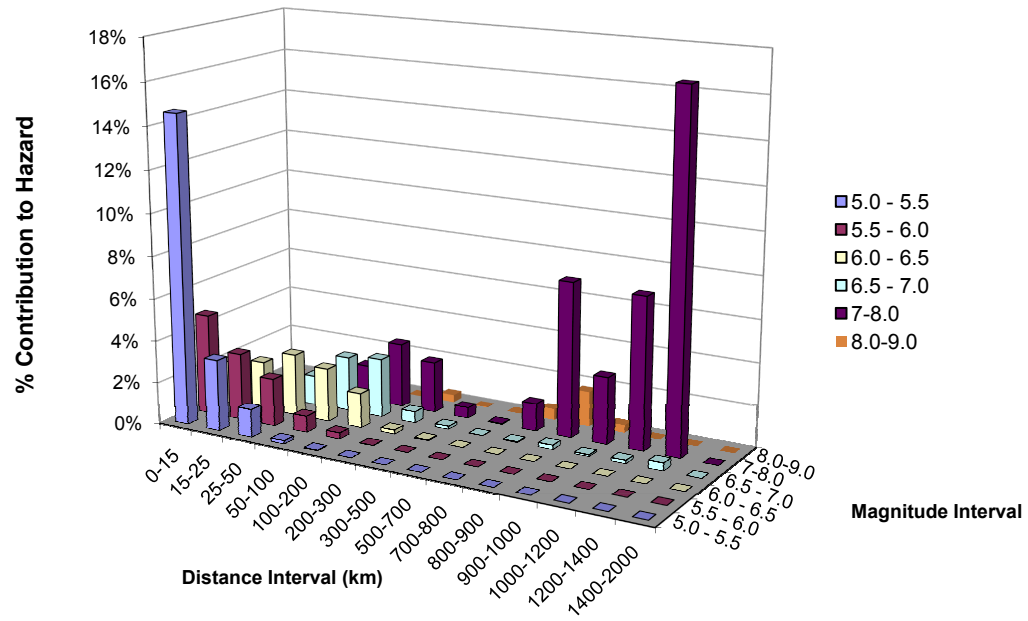
Figure 2.5-39— {Mean 1E-5 Rock Deaggregation for 1 and 2.5 Hz}

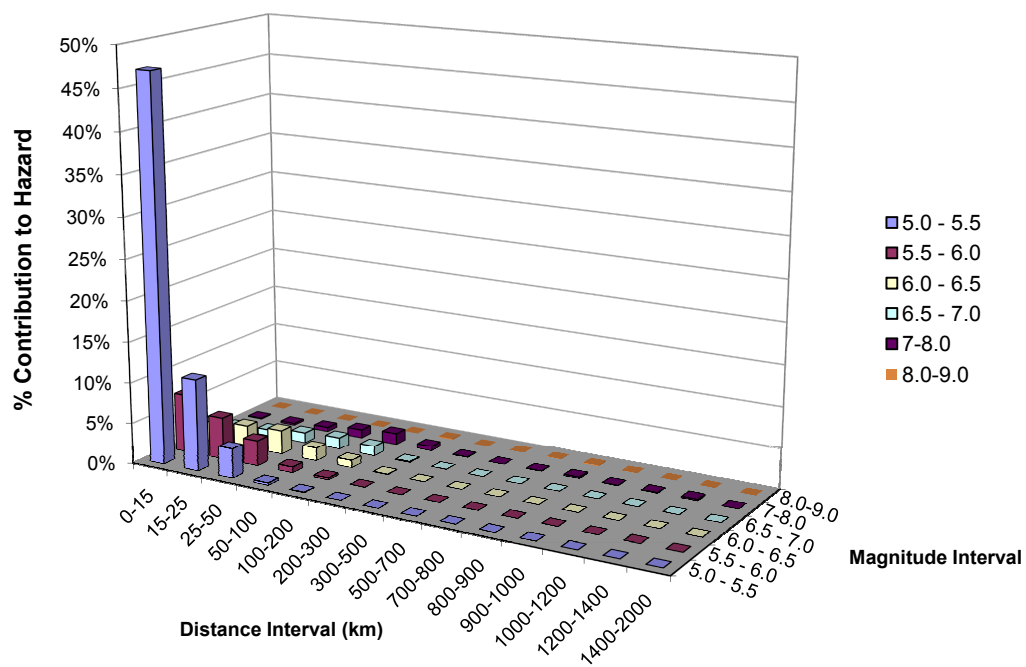
Figure 2.5-40— {Mean 1E-5 Rock Deaggregation for 5 and 10 Hz}

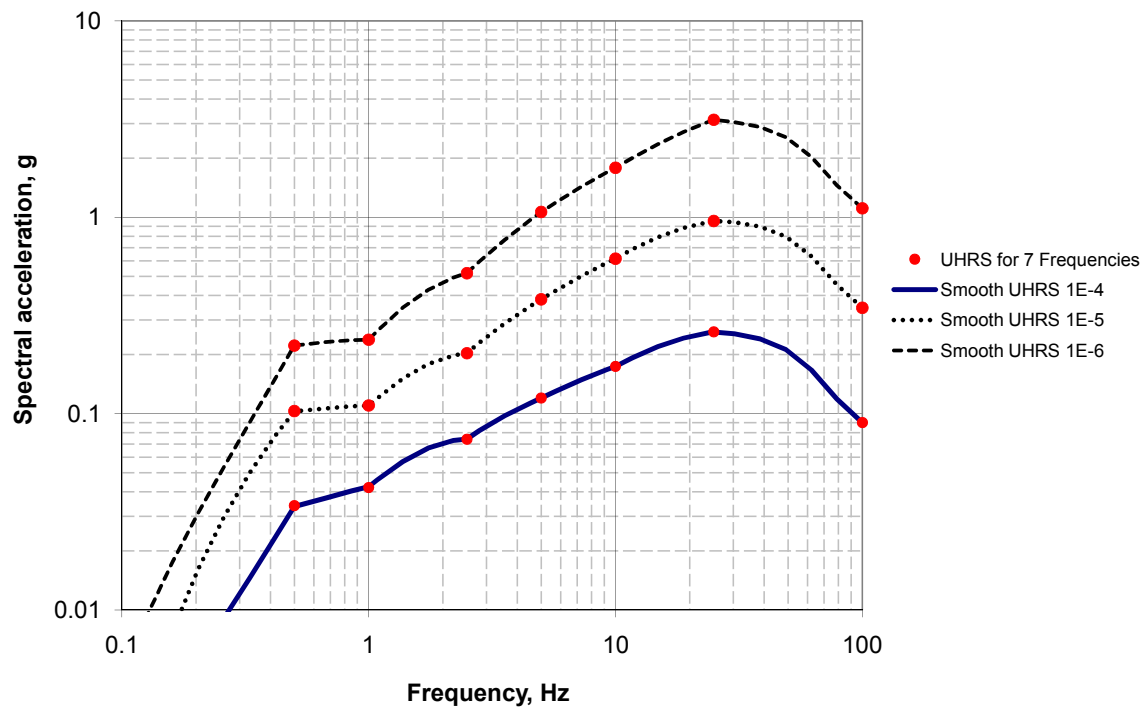
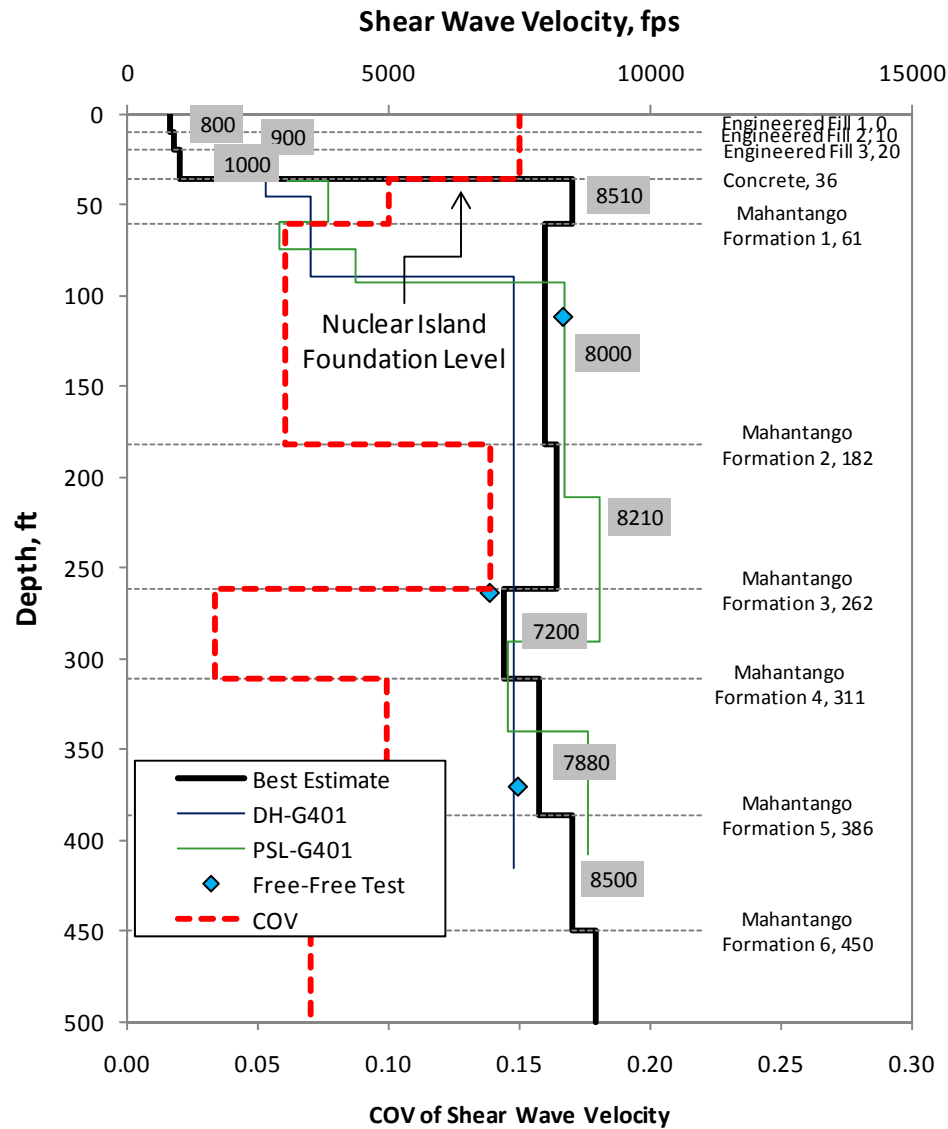
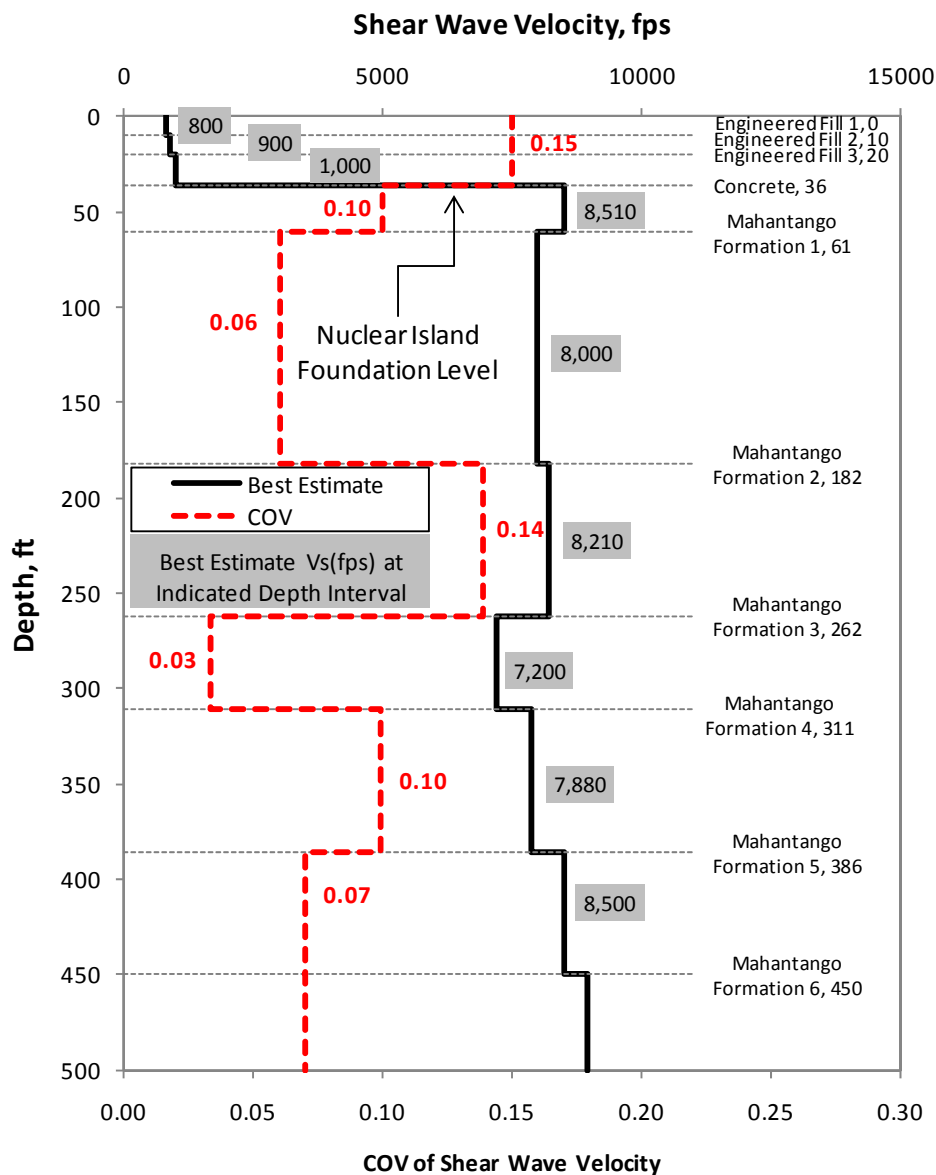
Figure 2.5-41— {Smooth Hard Rock UHRS Spectra}

Figure 2.5-42— {Shear-Wave Velocity and its Coefficient of Variation for Depth up to 500 ft (152.4 m)}

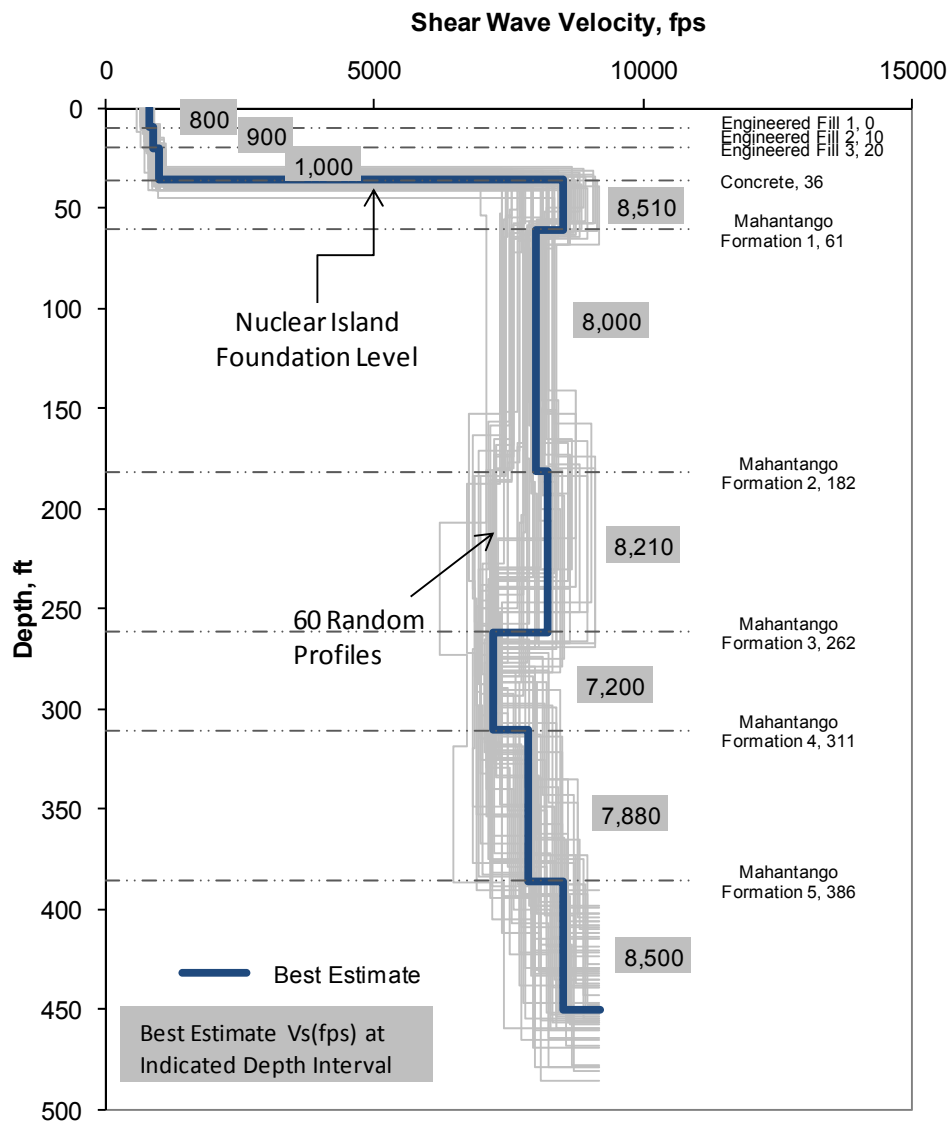


10-4310-GIS-A239

Figure 2.5-43— {Best Estimate Shear-Wave Velocity V_s and its Coefficient of Variation for Depth up to 500 ft (152.4 m)}

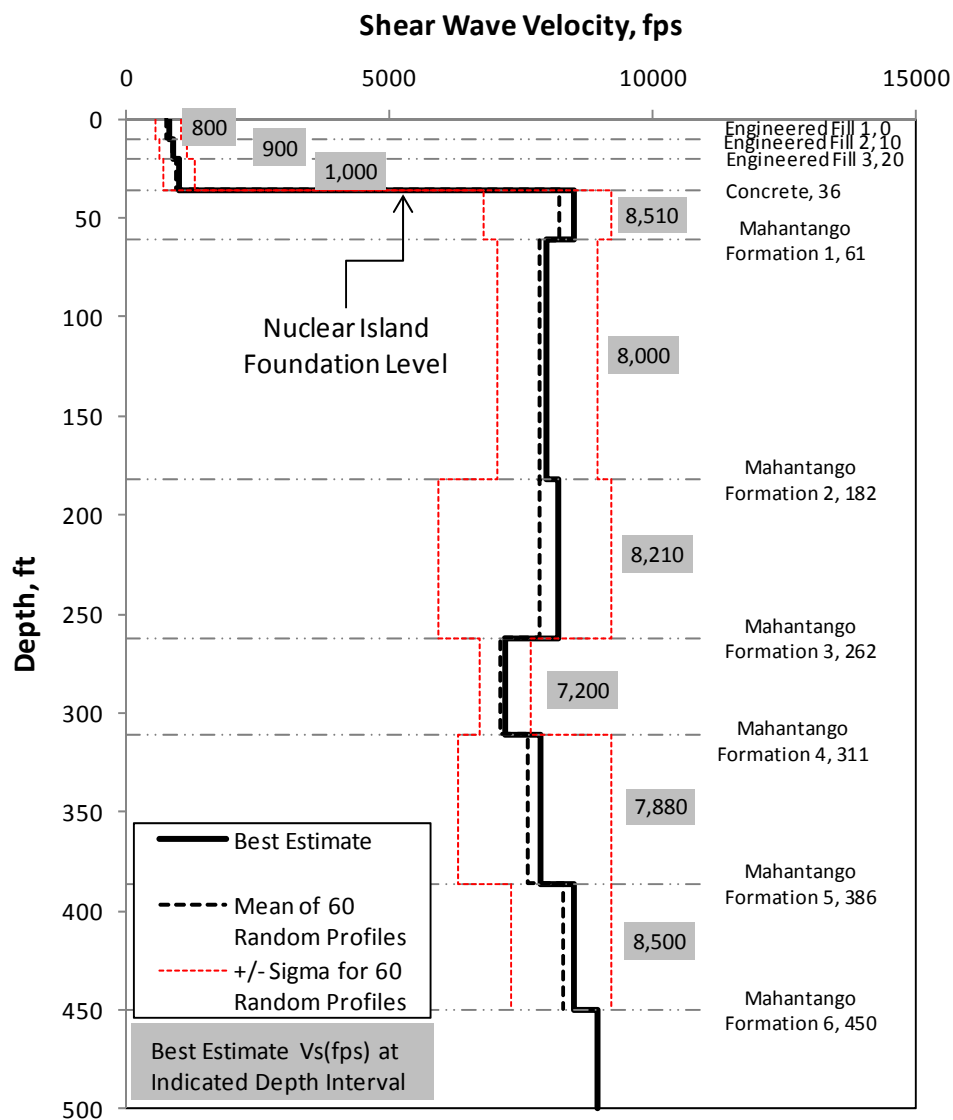


10-4310-GIS-A240

Figure 2.5-44— {60 Randomized Shear-Wave Velocity Profiles for Depth up to 500 ft (152.4 m)}

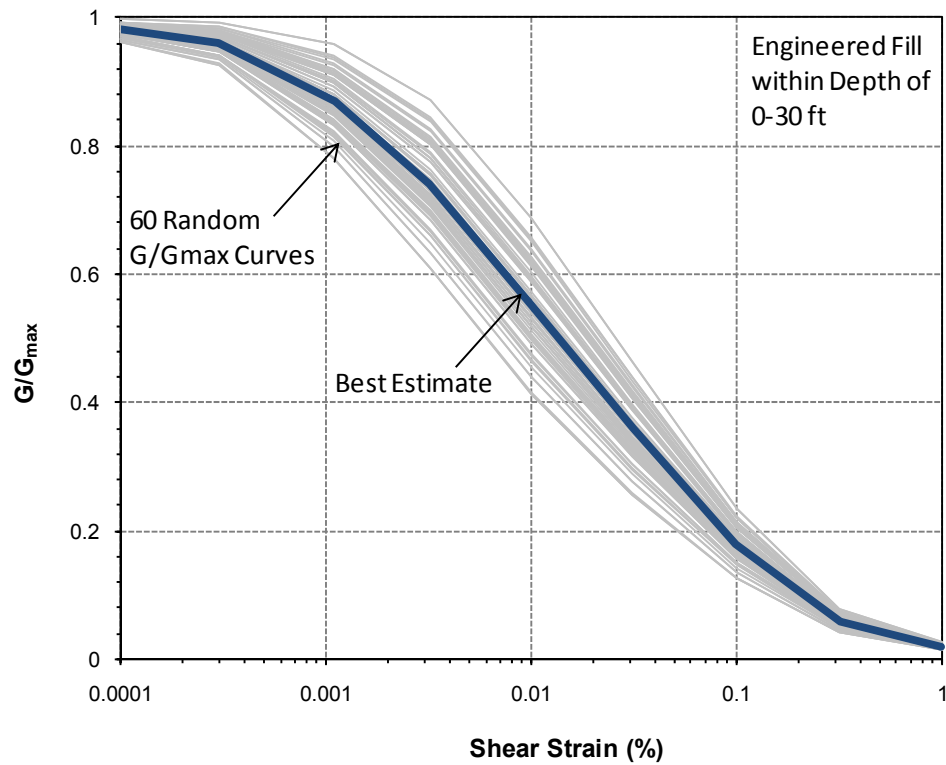
10-4310-GIS-A241

Figure 2.5-45— {Mean and Standard Deviation of 60 Randomized Shear-Wave Velocity Profiles Compared with Best Estimate}



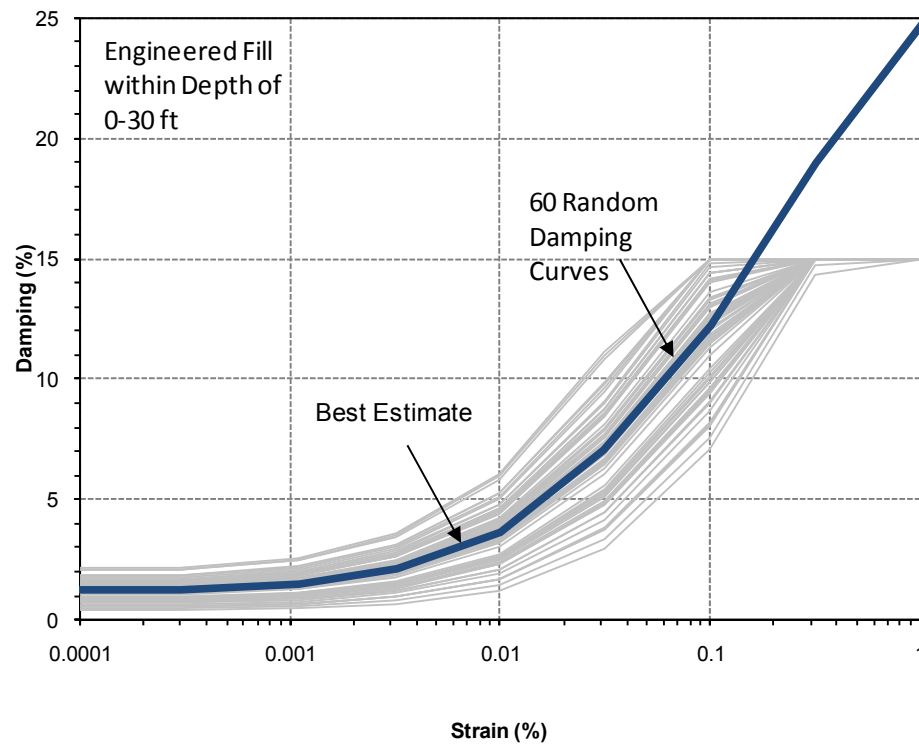
10-4310-GIS-A242

Figure 2.5-46— {G/Gmax Curves Representing Uncertainty in Shear Modulus for Engineered Fill within Depth 0-30 ft}



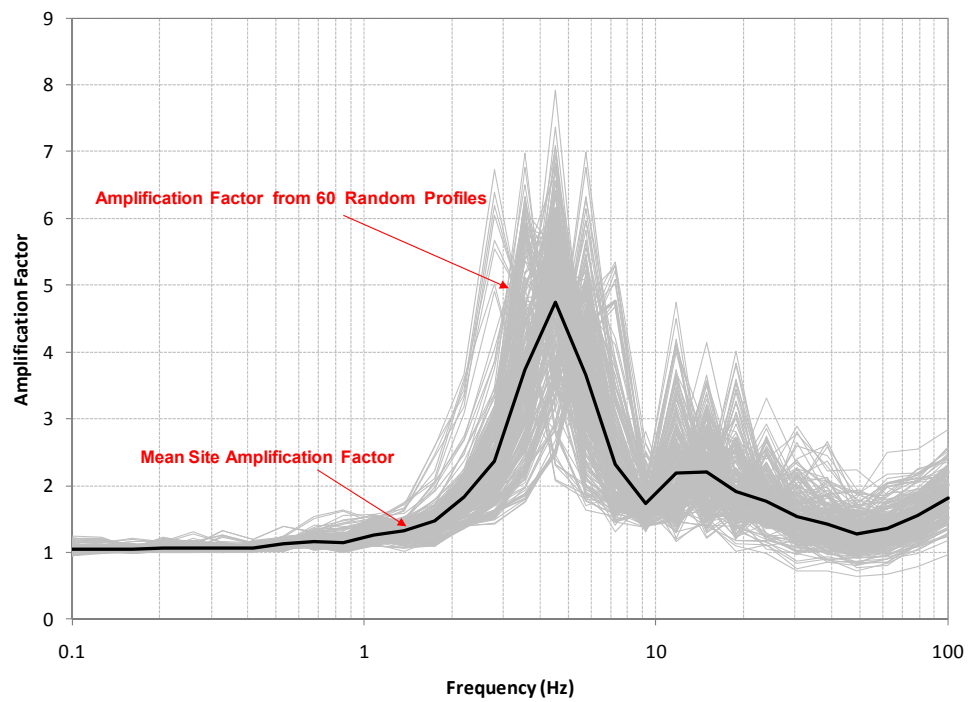
10-4310-GIS-A243

Figure 2.5-47— {Damping Curves Representing Uncertainty in Damping for Engineered Fill within Depth 0-30 ft}

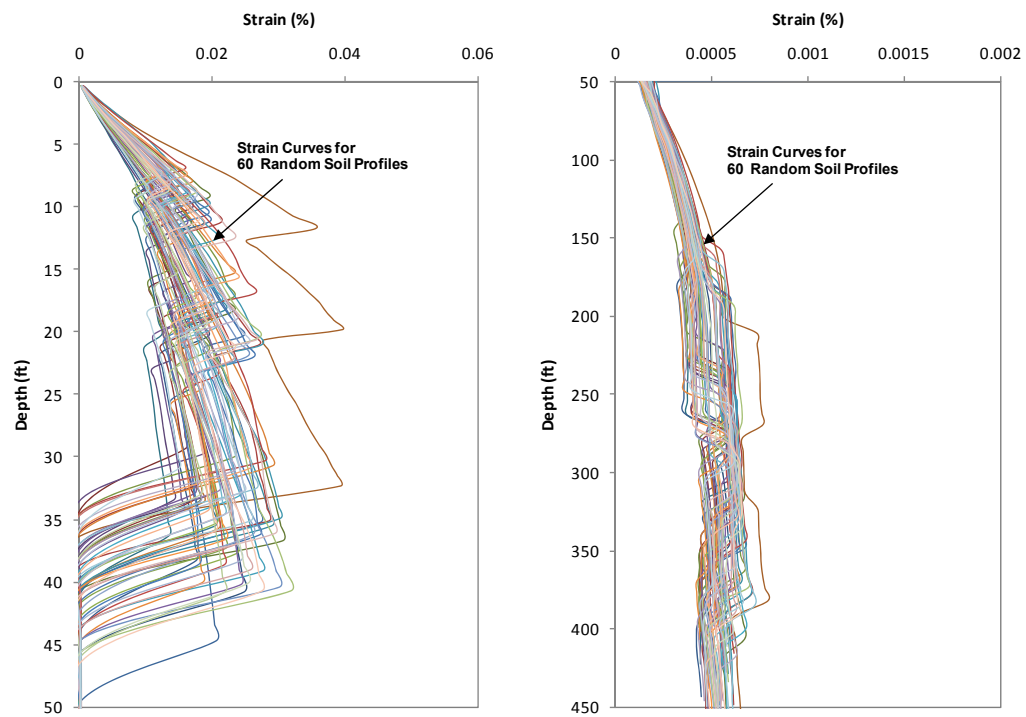


10-4310-GIS-A244

Figure 2.5-48— {Mean Site Amplification Factor at the Ground Surface for 1E-4 HF DEM Input Motion}

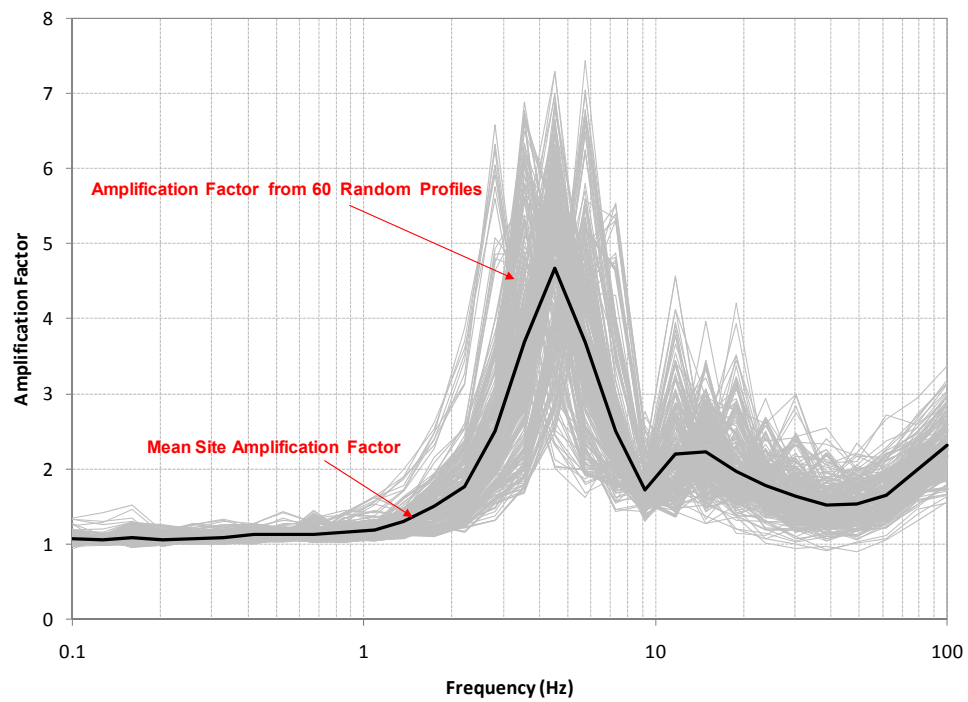


10-4310-GIS-A245

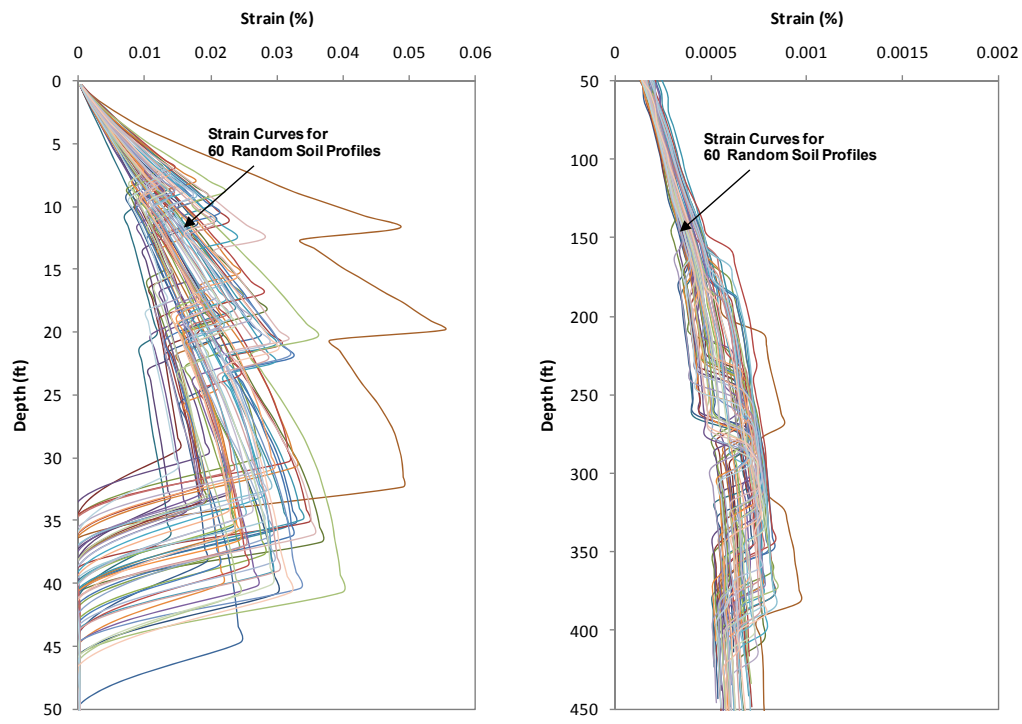
Figure 2.5-49— {Maximum Strains Vs. Depth for 1E-4 HF DEM Input Motion}

10-4310-GIS-A246

Figure 2.5-50— {Mean Site Amplification Factor at the Ground Surface for 1E-4 LF DEM Input Motion}

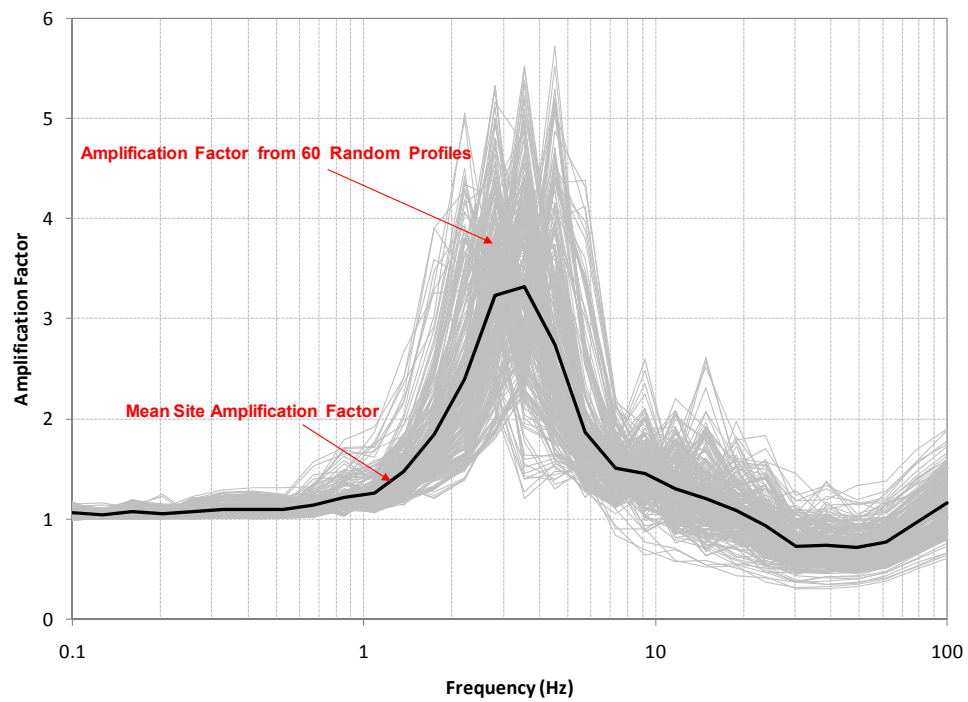


10-4310-GIS-A247

Figure 2.5-51— {Maximum Strains Vs, Depth for 1E-4 LF DEM Input Motion}

10-4310-GIS-A248

Figure 2.5-52— {Mean Site Amplification Factor at the Ground Surface for 1E-5 HF DEM Input Motion}



10-4310-GIS-A249

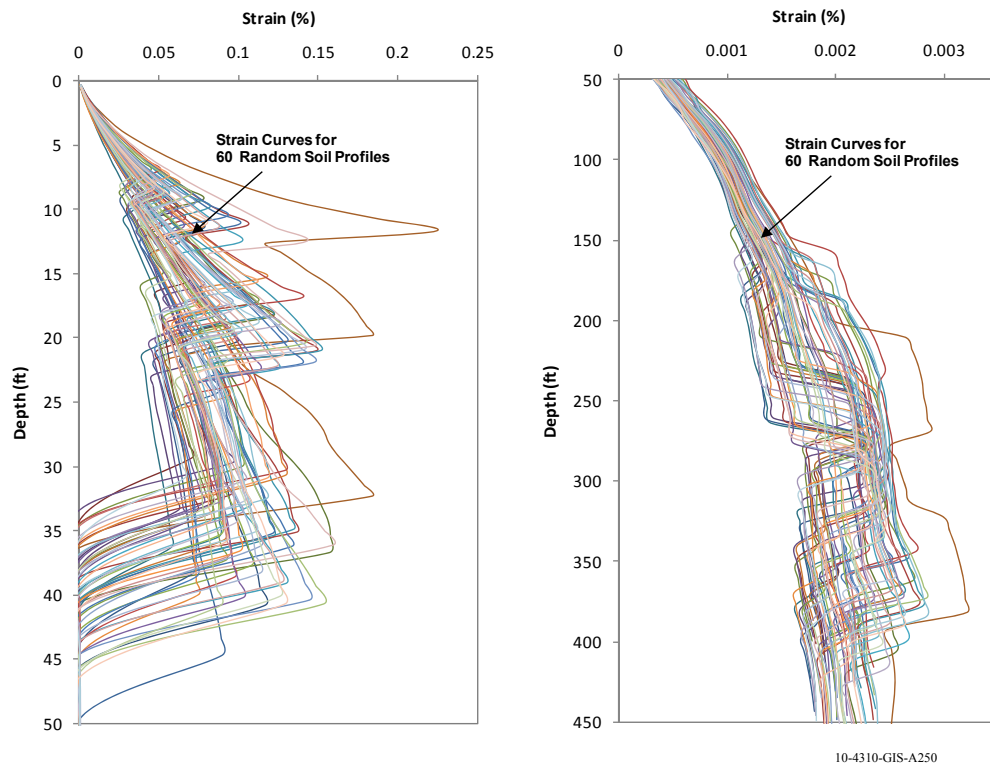
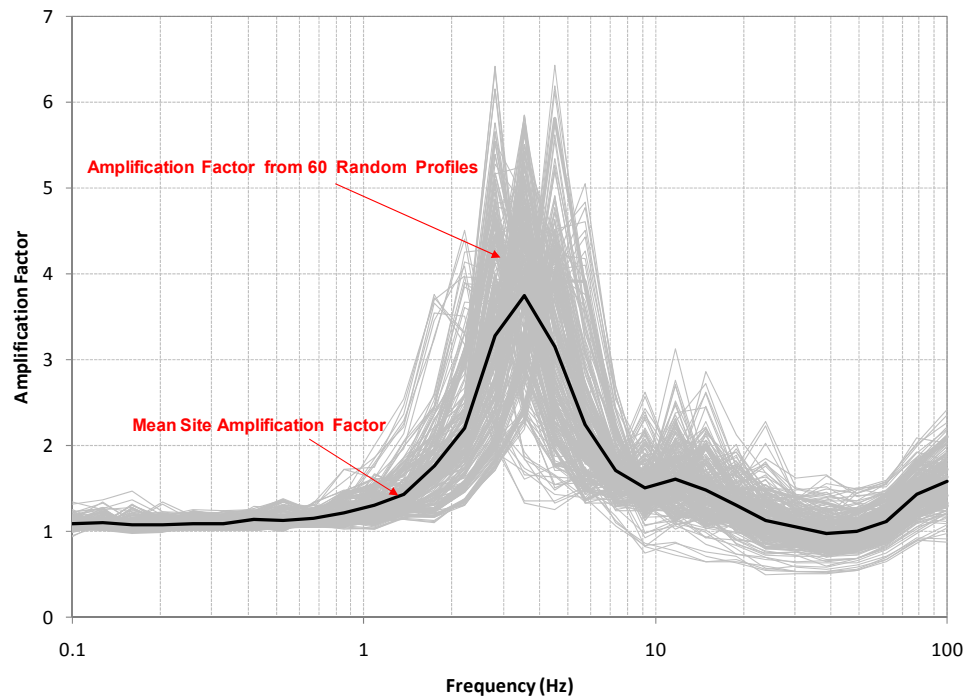
Figure 2.5-53— {Maximum Strains Vs. Depth for 1E-5 HF DEM Input Motion}

Figure 2.5-54— {Mean Site Amplification Factor at the Ground Service for 1E-5 LF DEM Input Motion}



10-4310-GIS-A251

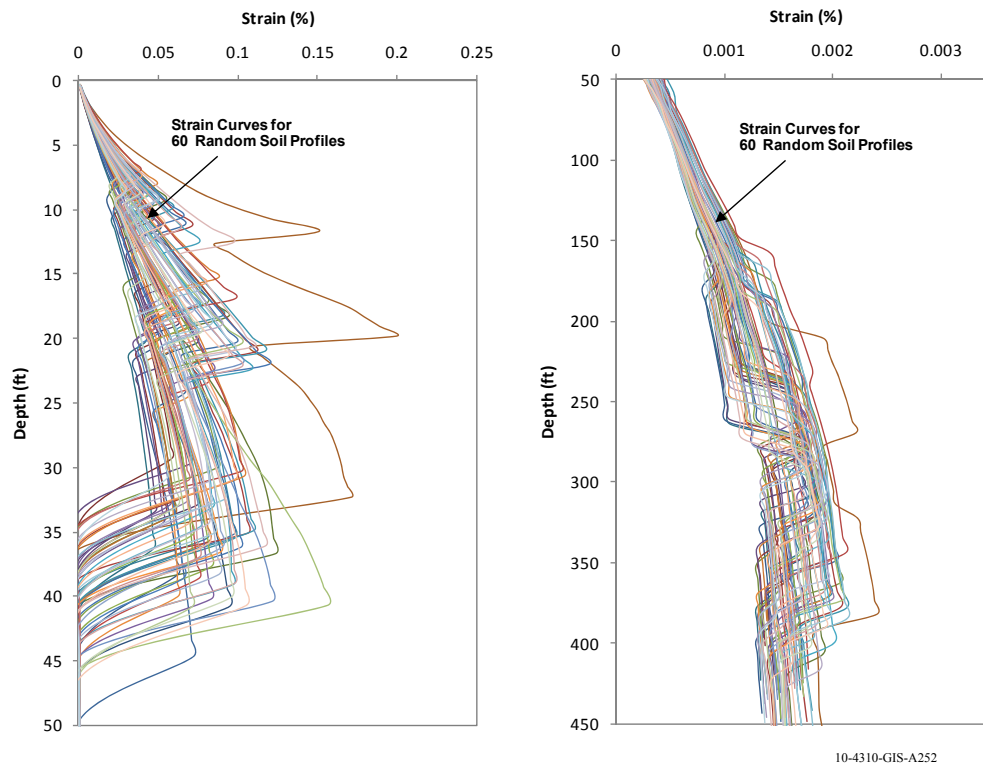
Figure 2.5-55— {Maximum Strains Vs. Depth for 1E-5 LF DEM Input Motion}

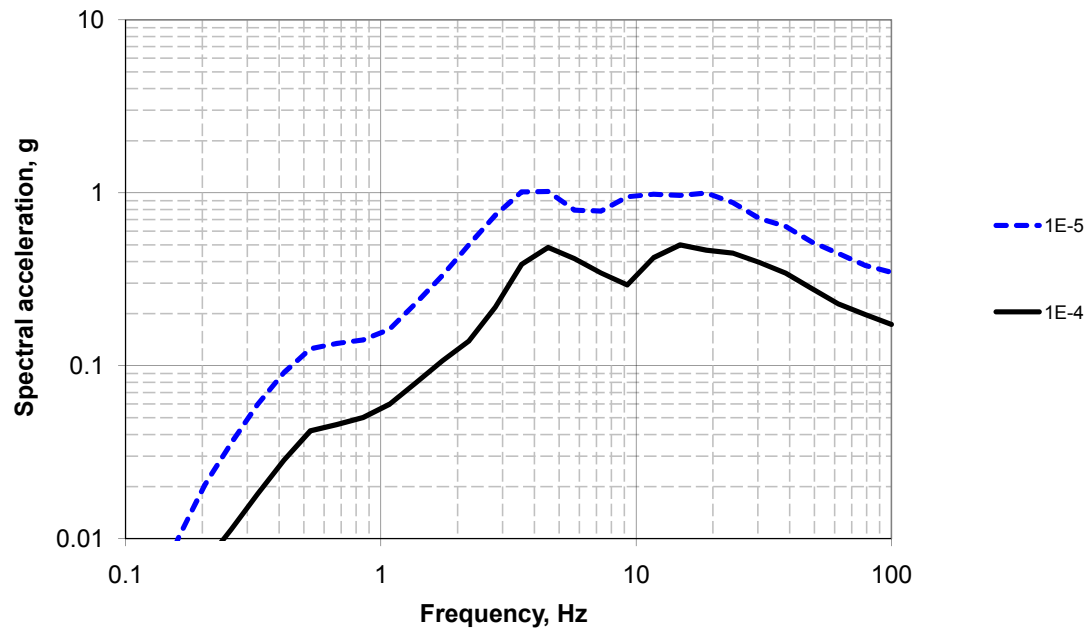
Figure 2.5-56— {Site Spectra for 1E-4 and 1E-5}

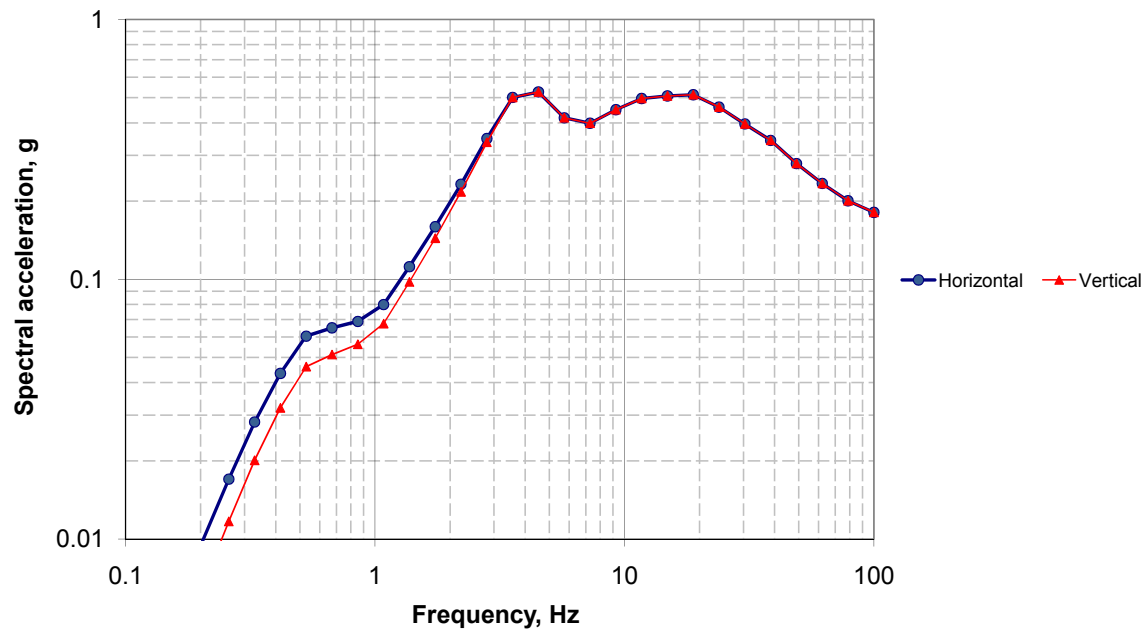
Figure 2.5-57— {Recommended Horizontal and Vertical Spectra}

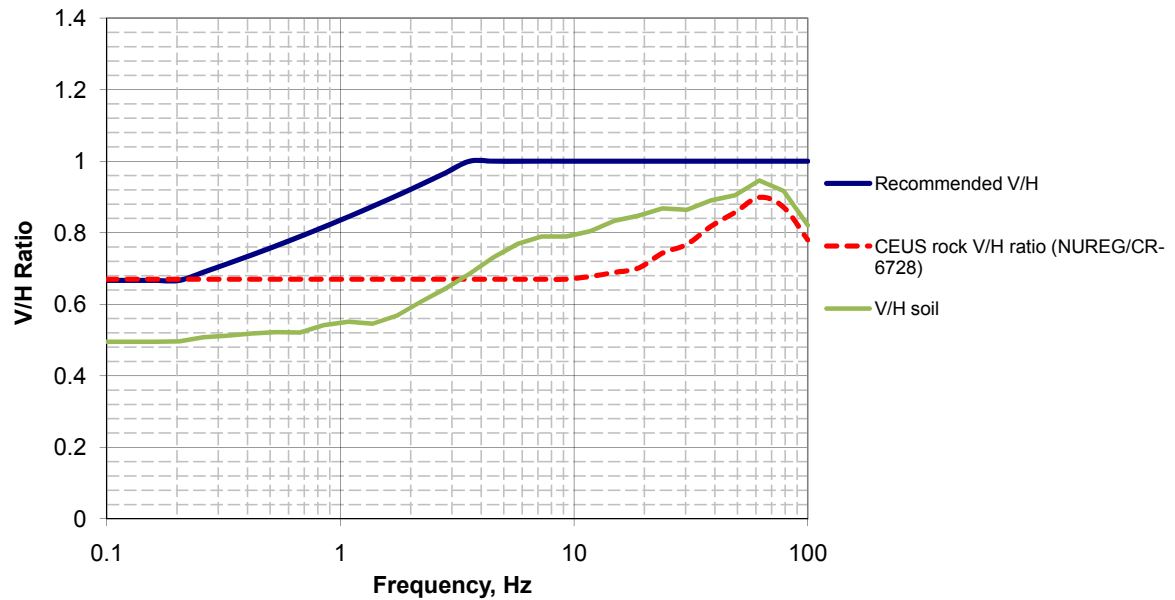
Figure 2.5-58— {VH Ratios from Several Publications and Recommended VH Ratios}

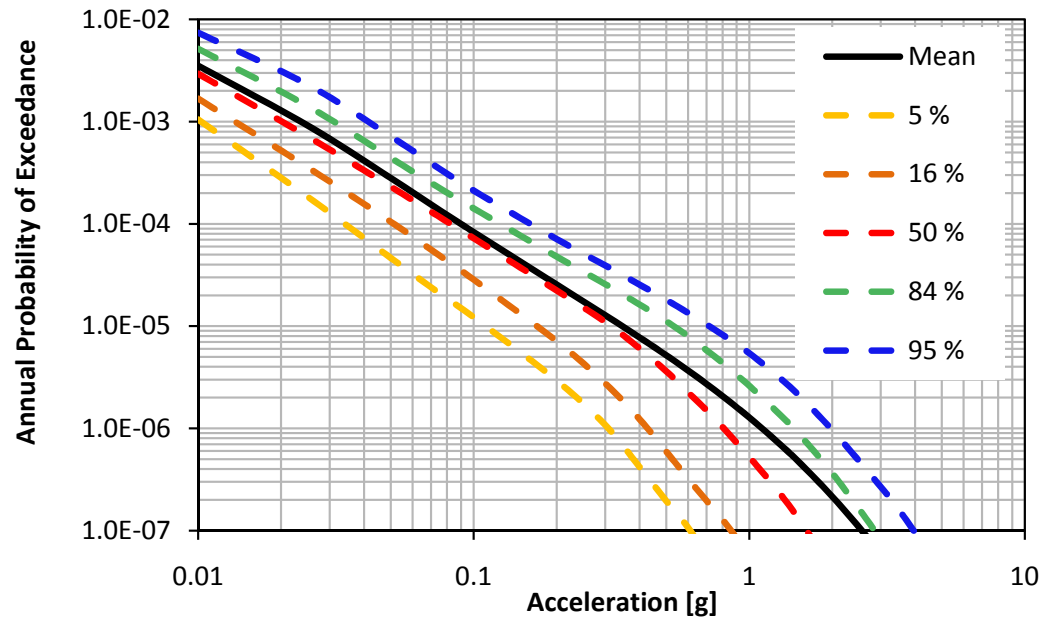
Figure 2.5-59— {Mean and Fractile Rock Hazard Curves for PGA}

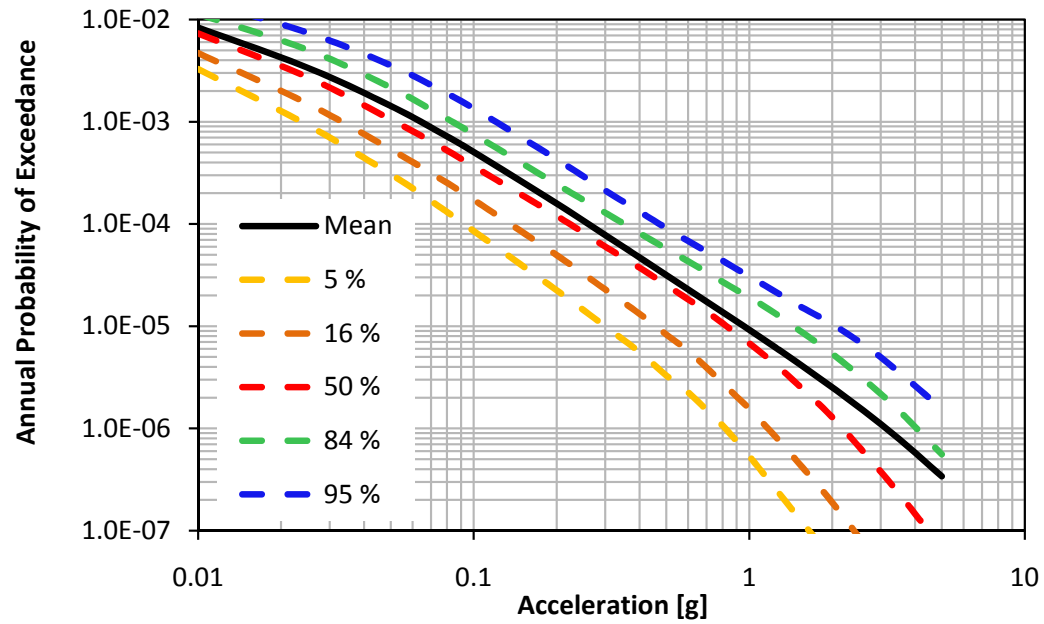
Figure 2.5-60— {Mean and Fractile Rock Hazard Curves for 25Hz}

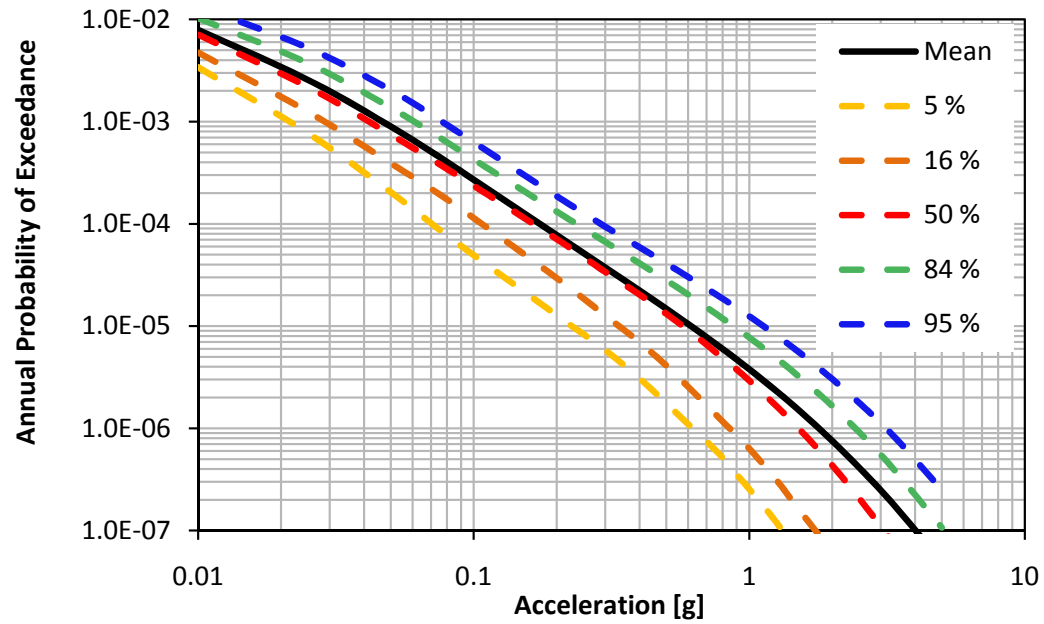
Figure 2.5-61— {Mean and Fractile Rock Hazard Curves for 10 Hz}

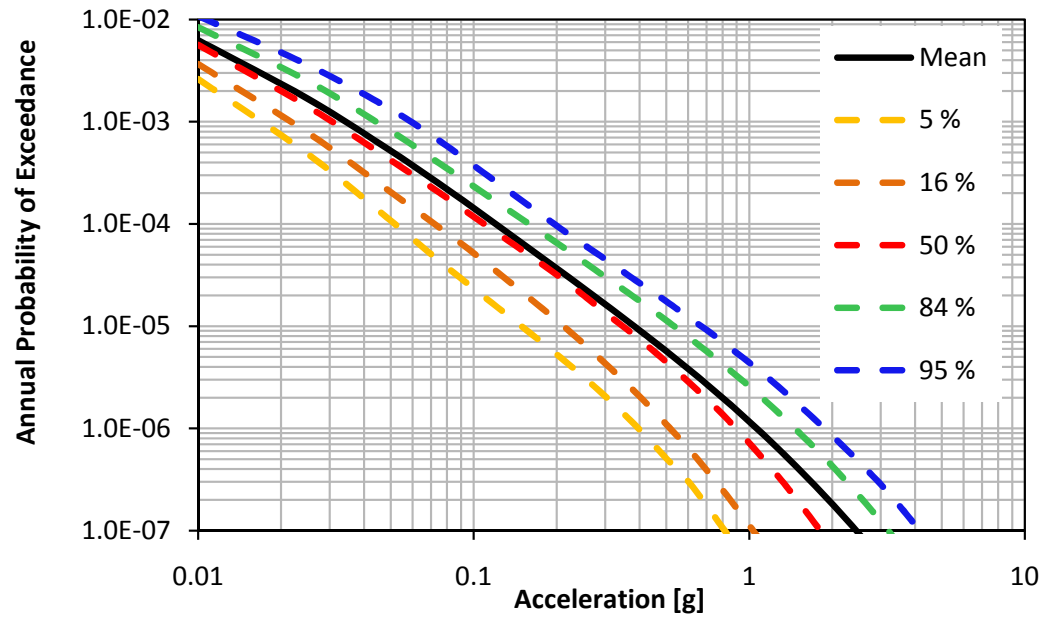
Figure 2.5-62— {Mean and Fractile Rock Hazard Curves for 5.0 Hz}

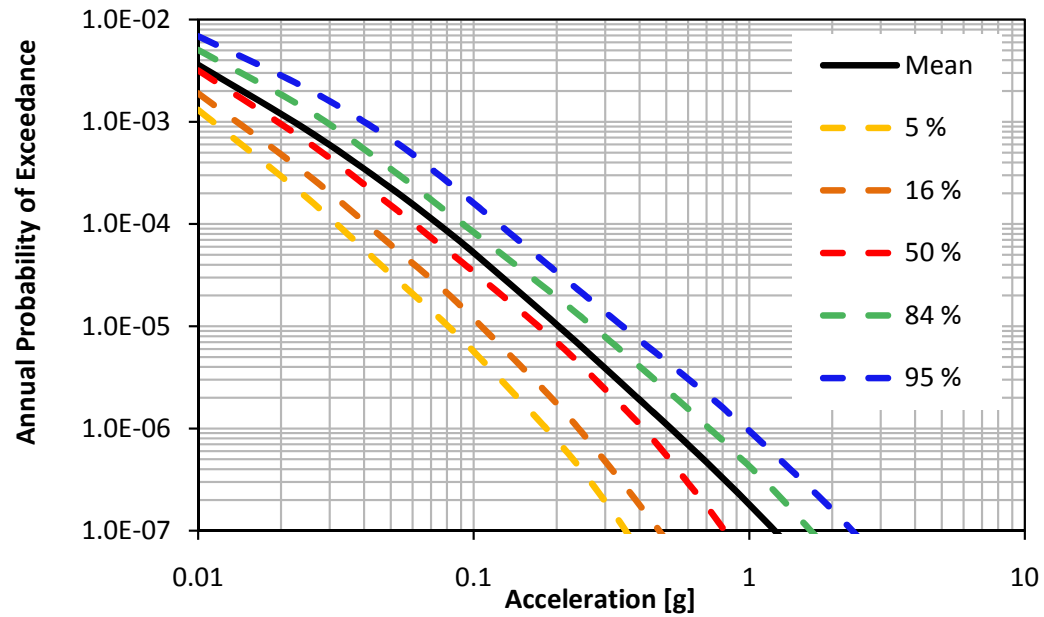
Figure 2.5-63— {Mean and Fractile Rock Hazard Curves for 2.5 Hz}

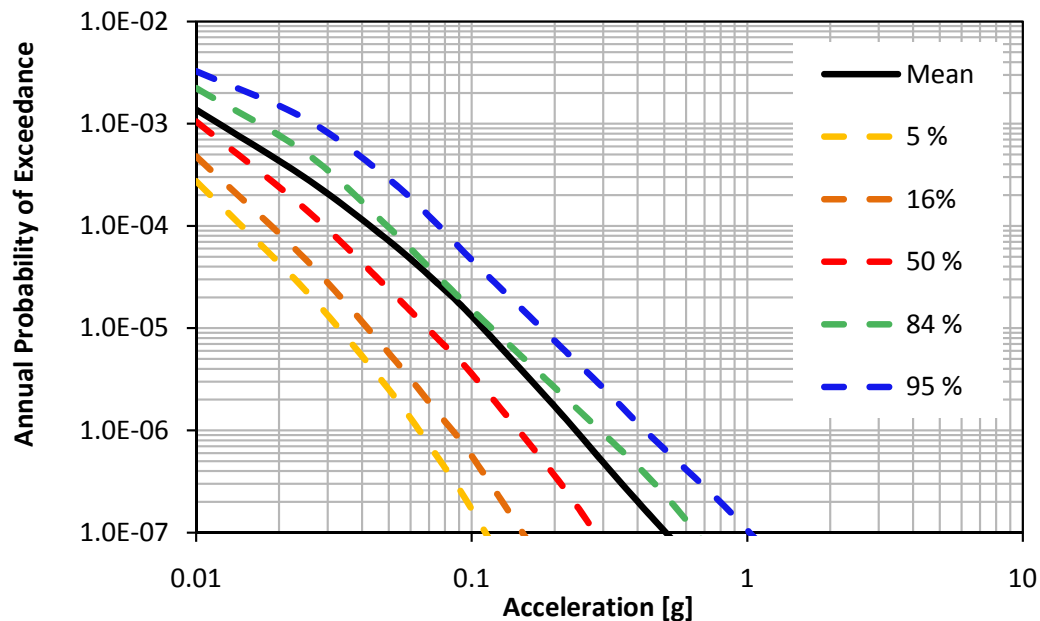
Figure 2.5-64— {Mean and Fractile Rock Hazard Curves for 1.0 Hz}

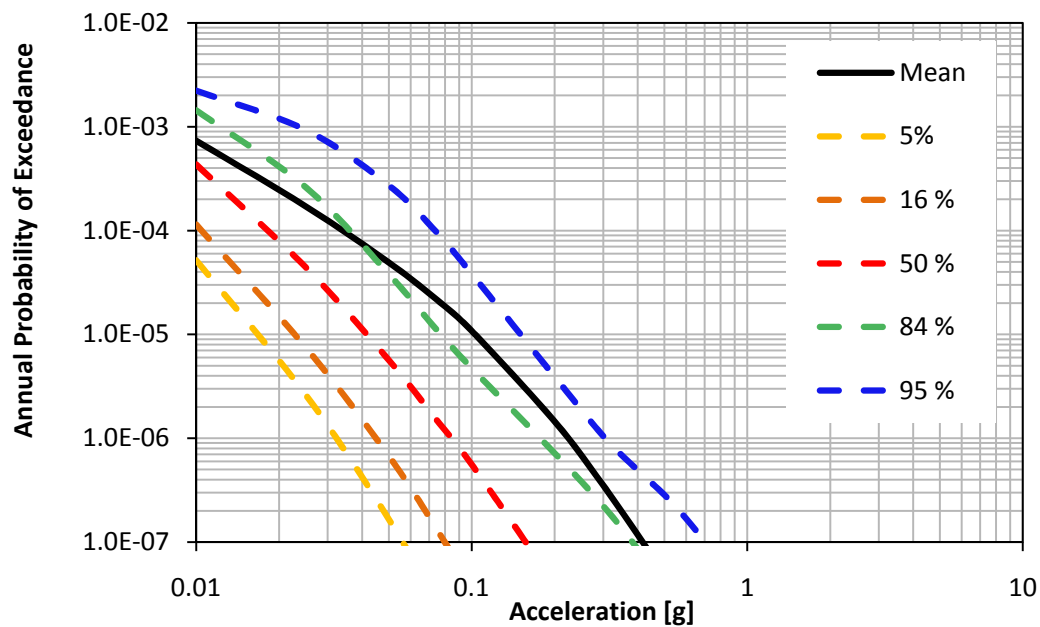
Figure 2.5-65— {Mean and Fractile Rock Hazard Curves for 0.5 Hz}

Figure 2.5-66— {Location of the Arms of the New Madrid Fault System}

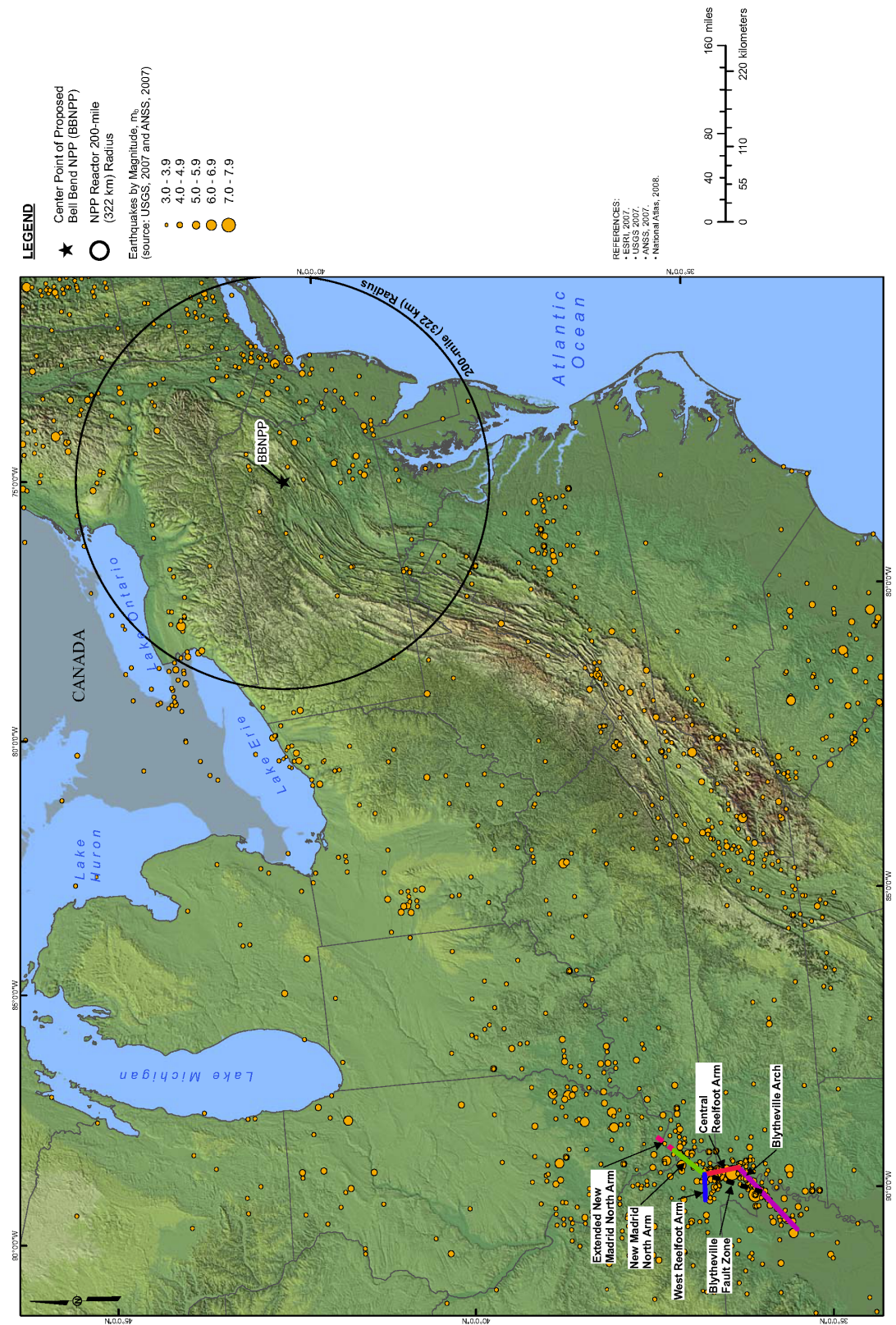
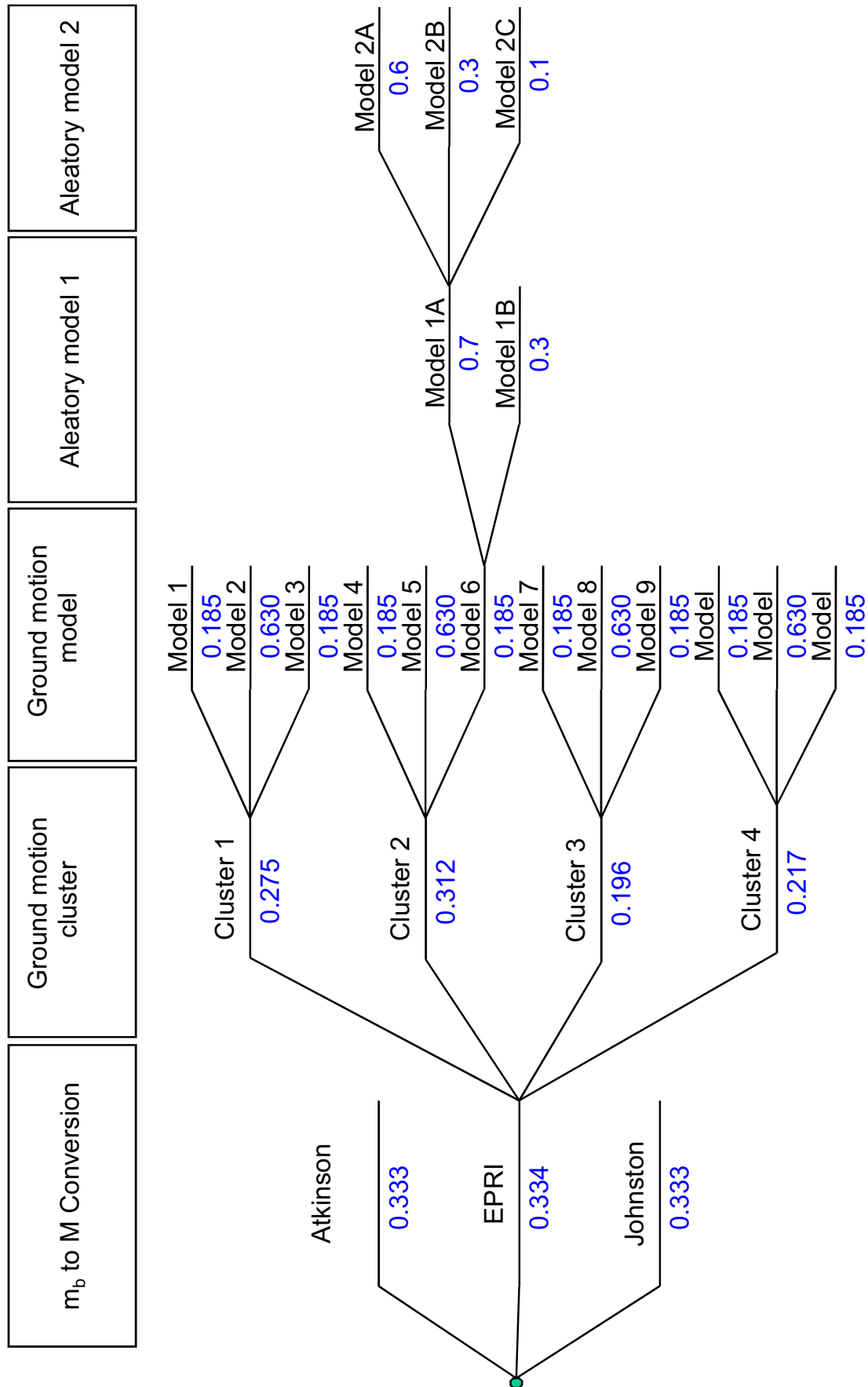


Figure 2.5-67—{Logic Tree of Ground Motion Models for Non-General Sources}



Note: Non-rift cluster 4 for Wabash Valley and Rift cluster 4 for New Madrid

Figure 2.5-68—{Logic Tree of Ground Motion Models for General Area Sources}

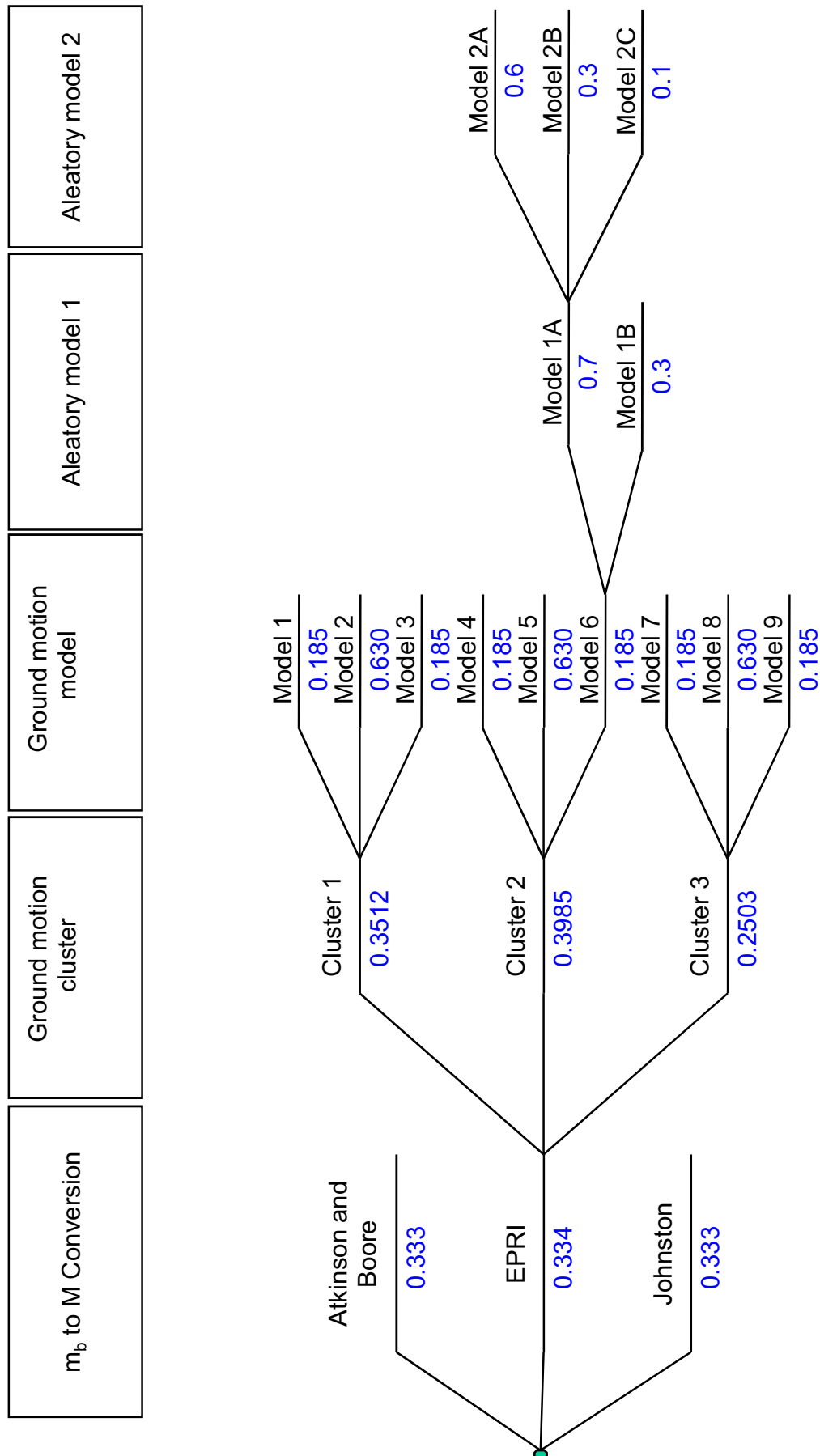


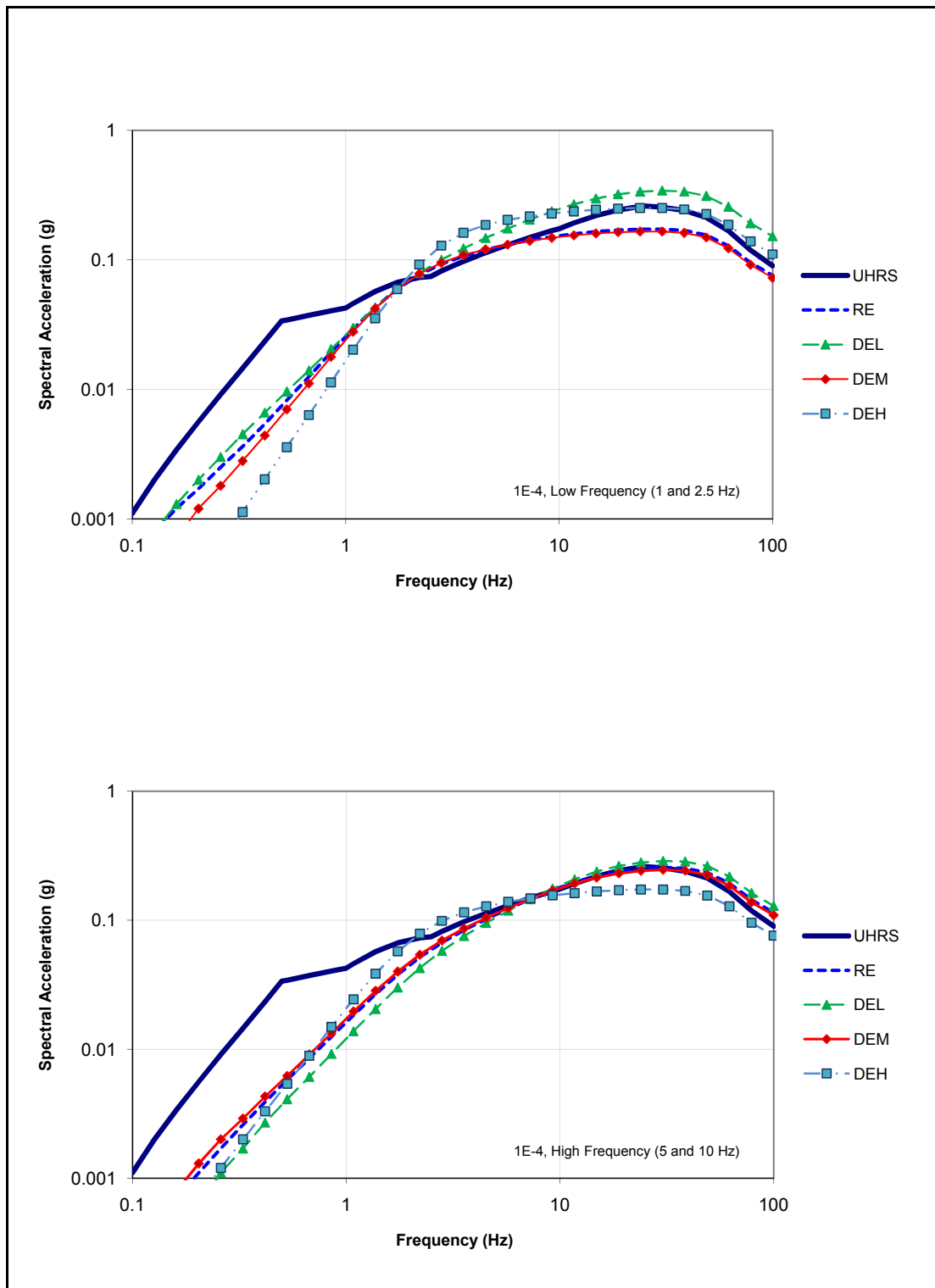
Figure 2.5-69— {1E-4 Response Spectra of Controlling Events at BBNPP}

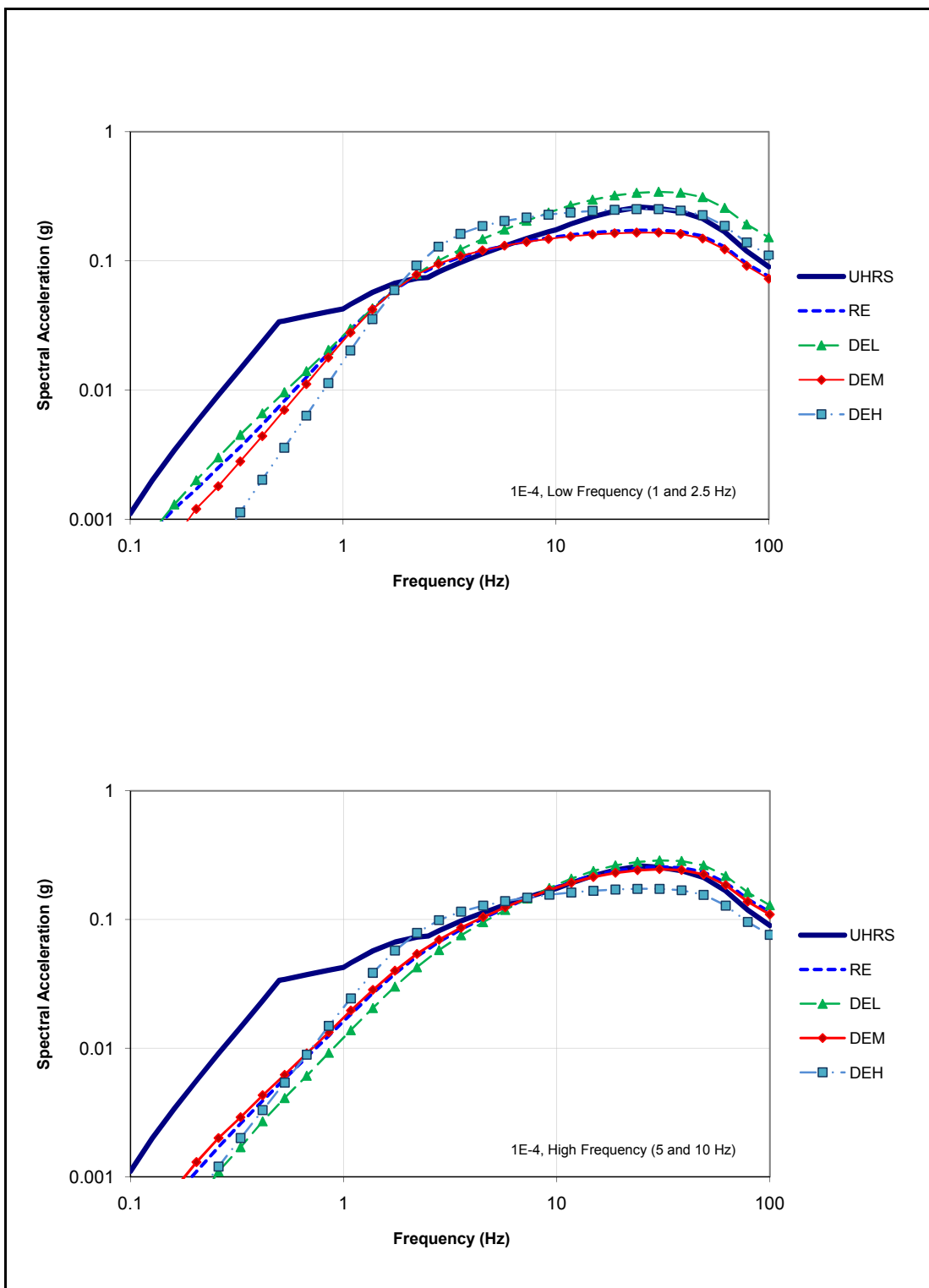
Figure 2.5-70— {1E-5 Response Spectra of Controlling Events at BBNPP}

Figure 2.5-71— {Response Spectra of Selected Time Histories for 1E-4 Controlling Events LF, DEL and DEH after Spectral Matching}

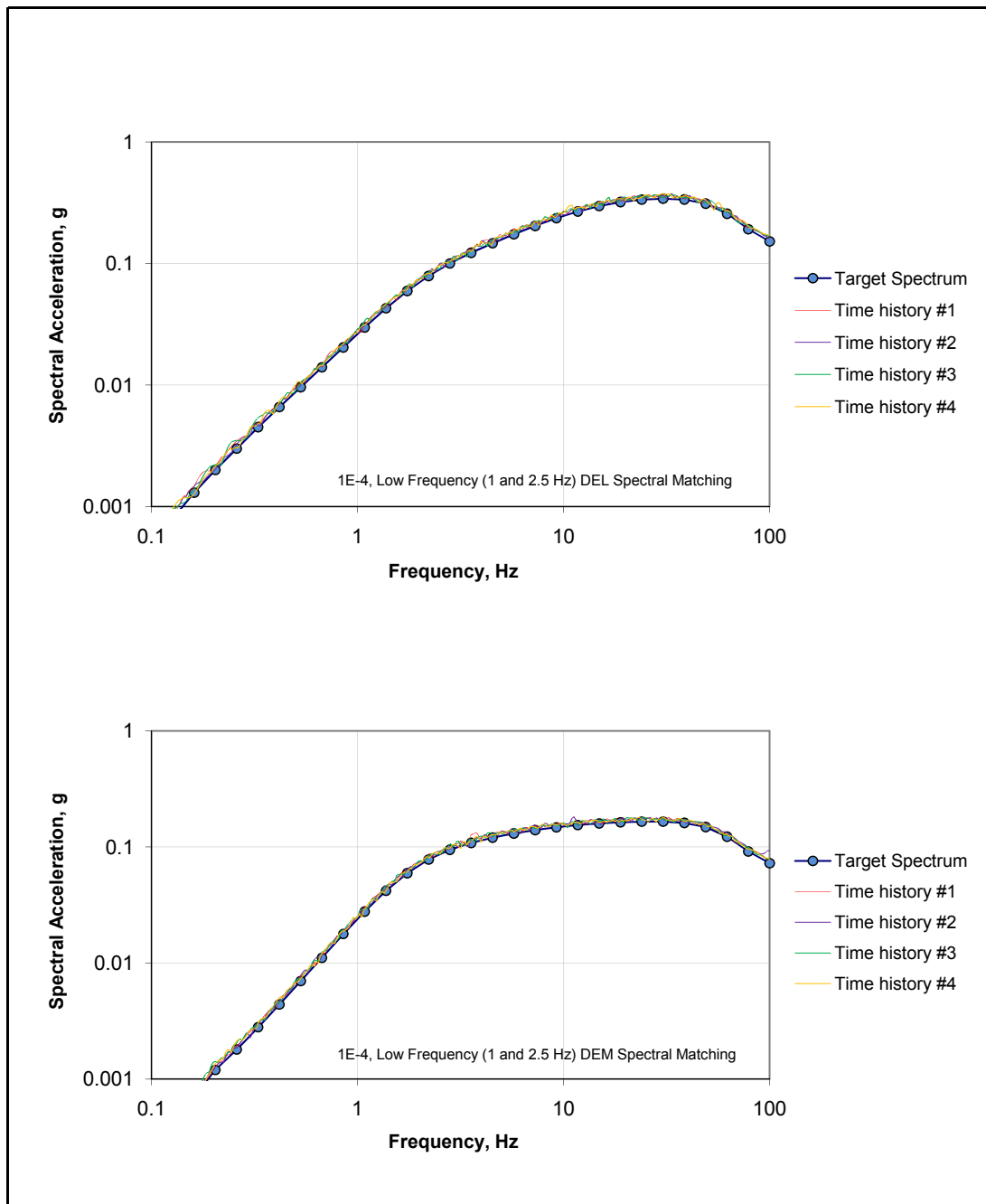


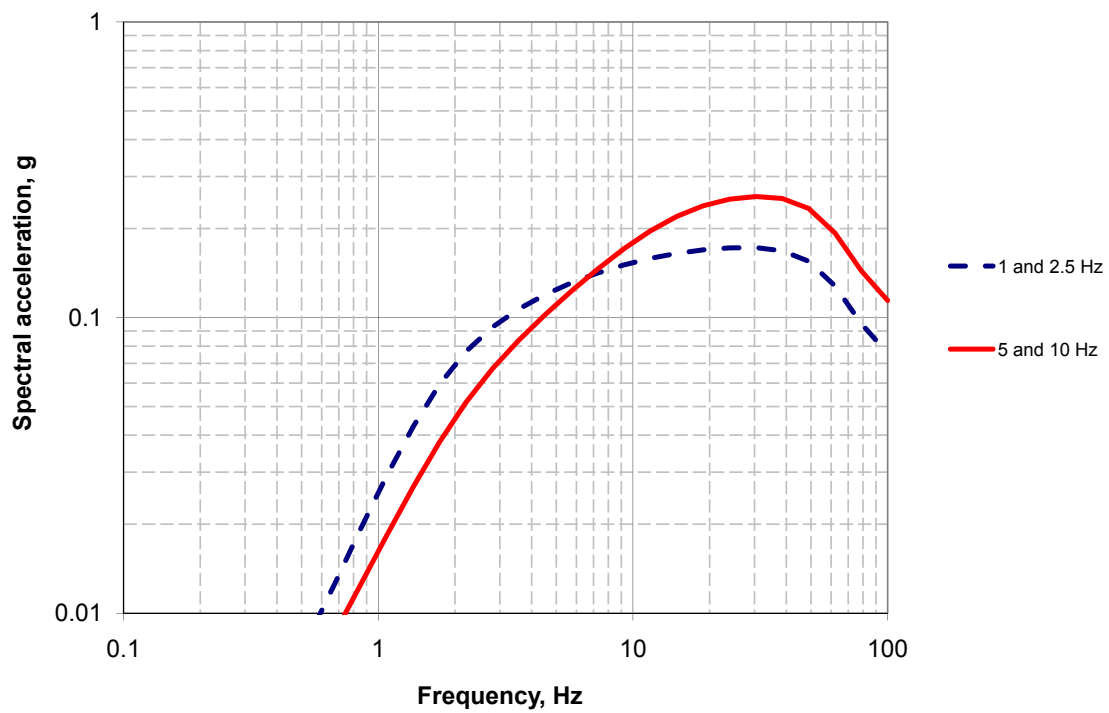
Figure 2.5-72— {1E-4 Smooth Hard Rock Spectra Controlling Earthquakes}

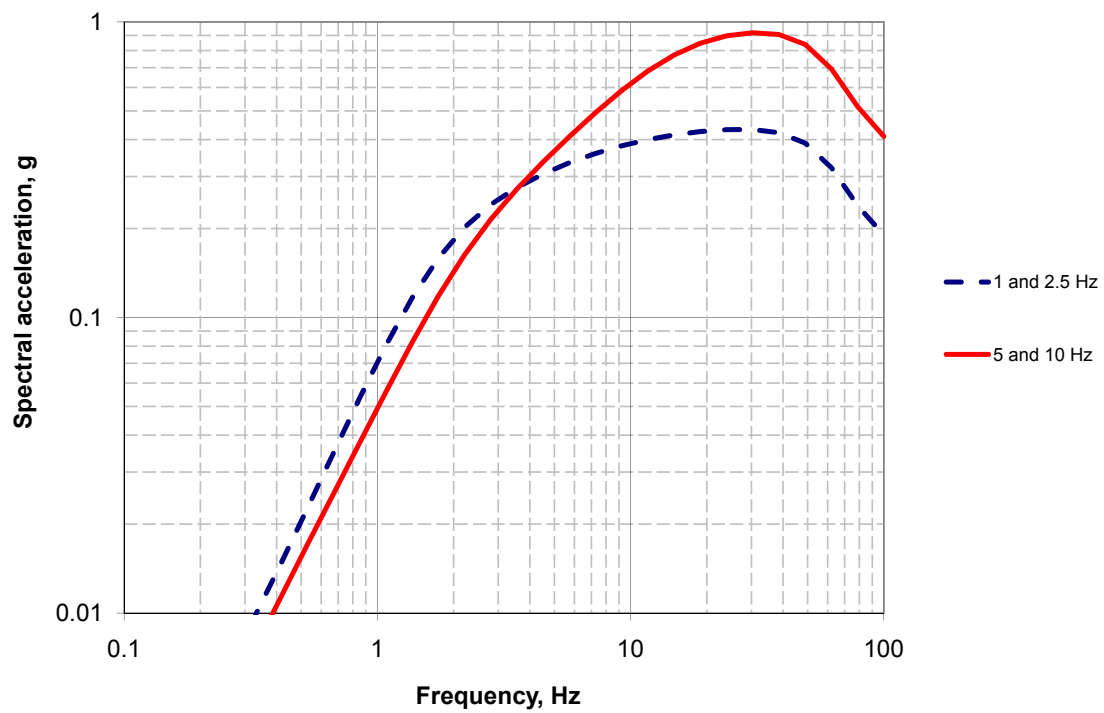
Figure 2.5-73— {1E-5 Smooth Hard Rock Spectra Controlling Earthquakes}

Figure 2.5-74— {UCSS Map}

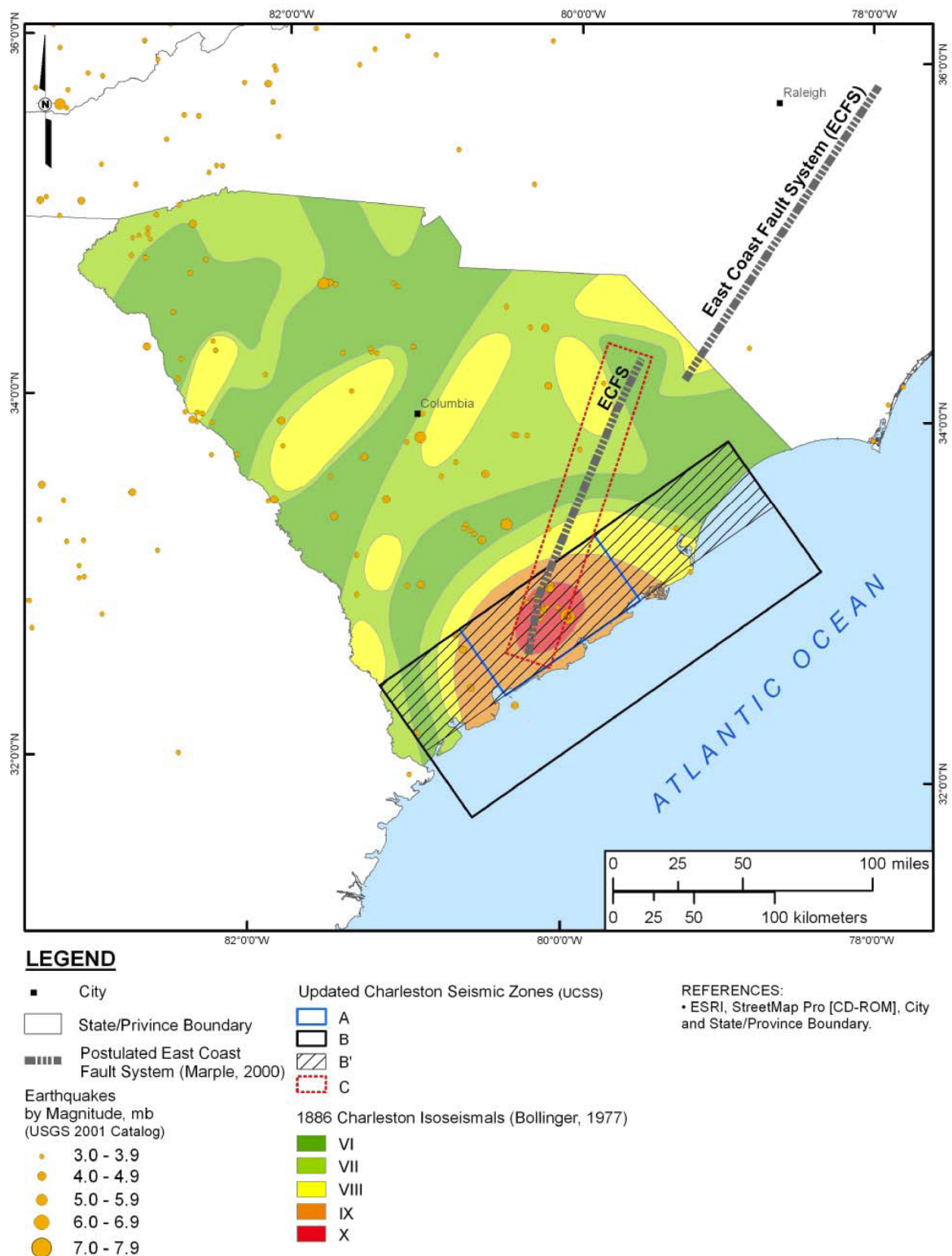


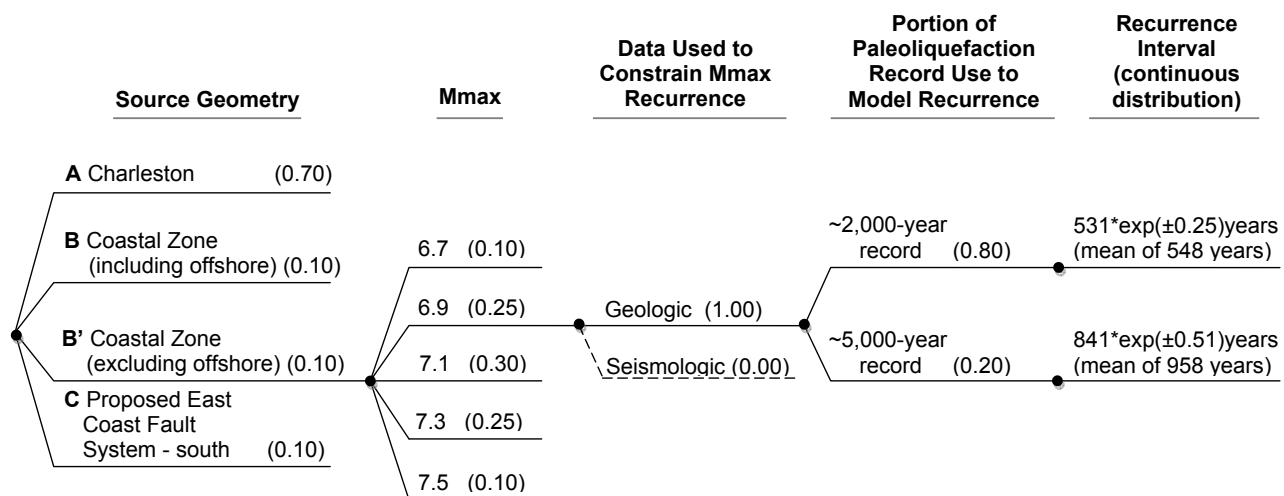
Figure 2.5-75— {Updated Charleston Seismic Sources (UCSS) Logic Tree}

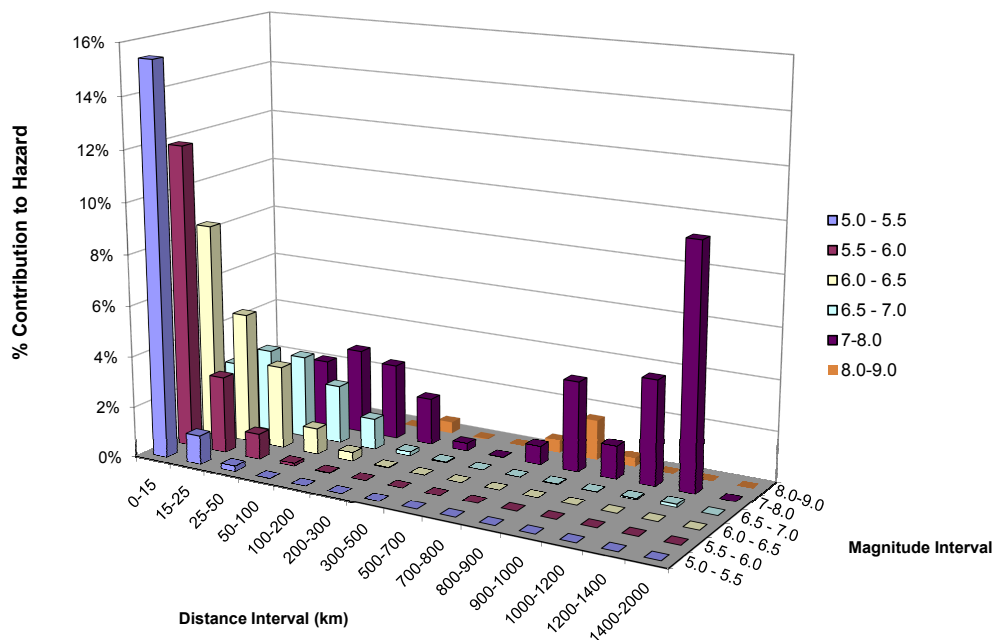
Figure 2.5-76— {Mean 1E-6 Rock Deaggregation for 1 and 2.5 Hz}

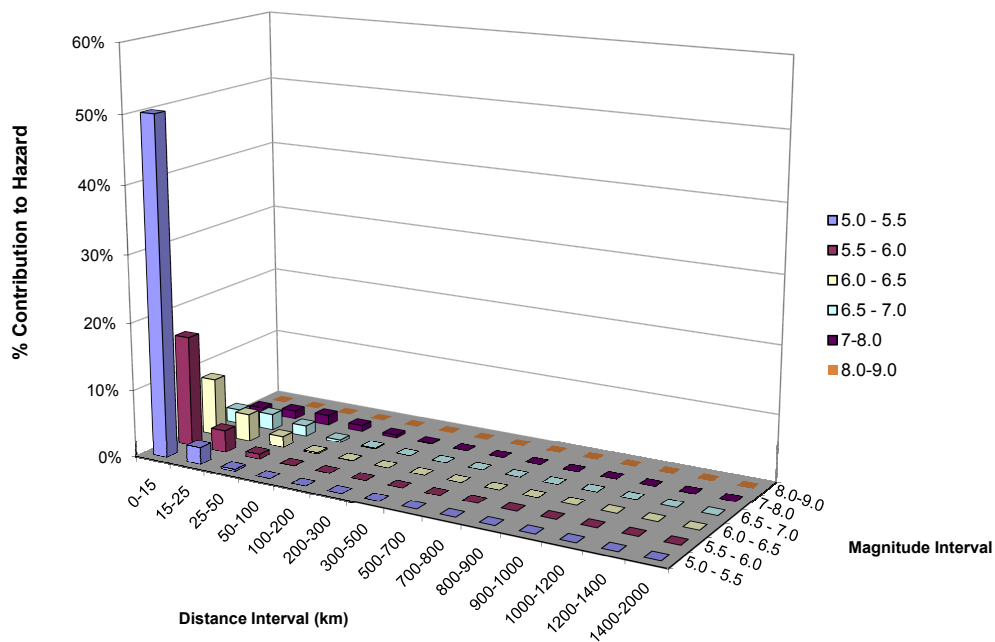
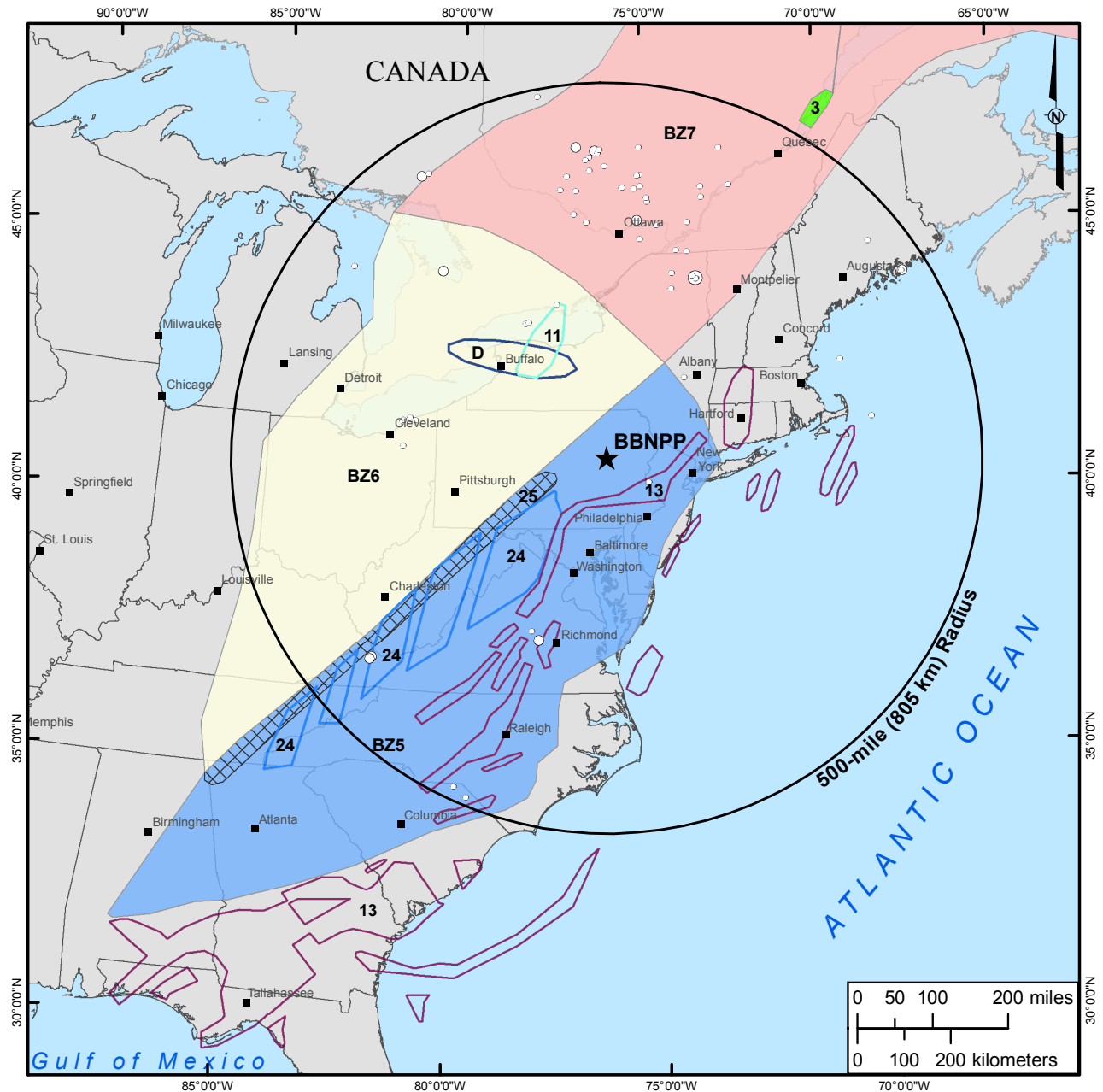
Figure 2.5-77— {Mean 1E-6 Rock Deaggregation for 5 and 10 Hz}

Figure 2.5-78— {Bechtel EPRI Source Zones and 2002-2007 Events in 500-Mile Radius}**LEGEND**

★ Center Point of Proposed Bell Bend NPP (BBNPP)

■ City

○ NPP Reactor 500-mile (805 km) Radius

Earthquakes by Magnitude, mb (SEE NOTE)

USGS 2002 to 2007

- 3.0 - 3.9
- 4.0 - 4.9
- 5.0 - 5.9

NOTE: The 2002 to 2007 seismicity shown in 500-mile (805 km) radius.

Bechtel Group Sources contributing to 99% of BBNPP Site Hazard

3 La Malbaie/Charlevoix

11 Clarendon-Linden

13 Mesozoic Basins

24 Bristol Block

25 NY-AL Lineament

BZ5 Southern Appalachians Background

BZ6 Southern Eastern Craton Background

BZ7 Northern Eastern Craton Background

D Niagara Area

REFERENCES:

- ESRI, 2007.
- USGS 2007.
- ANSS, 2007.
- EPRI Volume IX: Bechtel Group, 1986.

Figure 2.5-79— {Dames and Moore EPRI Source Zones and 2002-2007 Events in 500-mile Radius}**LEGEND**

★ Center Point of Proposed Bell Bend NPP (BBNPP)

■ City

○ NPP Reactor 500-mile (805 km) Radius

Earthquakes by Magnitude, mb (SEE NOTE)

USGS 2002 to 2007

- 3.0 - 3.9
- 4.0 - 4.9
- 5.0 - 5.9

NOTE: The 2002 to 2007 seismicity shown in 500-mile (805 km) radius.

Dames and Moore Sources contributing to 99% of BBNPP Site Hazard

- 3 Adirondacks Zone
- 4 Paleozoic Fold Belts
- 8 Eastern Marginal Basin
- 9 Clarendon-Linden Zone
- 41 Southern Cratonic Margin (default)
- 42 Newark-Gettysburg Basin
- 53 Southern Appalachian Mobile Belt (default)
- 59 La Malbaie/Charlevoix Zone

REFERENCES:

- ESRI, 2007.
- USGS, 2007.
- ANSS, 2007.
- EPRI Volume VI: Dames and Moore, 1986.

Figure 2.5-80— {Law Engineering EPRI Source Zones and 2002-2007 Events in 500-Mile Radius}**LEGEND**

- ★ Center Point of Proposed Bell Bend NPP (BBNPP)
- City
- NPP Reactor 500-mile (805 km) Radius

Earthquakes by Magnitude, mb (SEE NOTE)

USGS 2002 to 2007

- 3.0 - 3.9
- 4.0 - 4.9
- 5.0 - 5.9

NOTE: The 2002 to 2007 seismicity shown in 500-mile (805 km) radius.

Law Engineering Sources contributing to 99% of BBNPP Site Hazard

- 8-17 Buried East Coast Mesozoic Basins
- 17 Eastern Basements
- 22 Reactivated Eastern Seaboard Normal Faults
- 12 Charlevoix Seismic Zone

REFERENCES:

- ESRI, 2007.
- USGS 2007.
- ANSS, 2007.
- EPRI Volume VII: Law Engineering, 1986.

Figure 2.5-81— {Rondout Associates EPRI Source Zones and 2002-2007 Events in 500-Mile Radius}**LEGEND**

★ Center Point of Proposed Bell Bend NPP (BBNPP)

■ City

○ NPP Reactor 500-mile (805 km) Radius

Earthquakes by Magnitude, mb (SEE NOTE)

USGS 2002 to 2007

○ 3.0 - 3.9

○ 4.0 - 4.9

○ 5.0 - 5.9

NOTE: The 2002 to 2007 seismicity shown in 500-mile (805 km) radius.

Rondout Associates Sources contributing to 99% of BBNPP Site Hazard

30 Shenandoah

31 Quakers

33 Niagara

34 Nessmuk

37 La Malbaie (Charlevoix) Seismic Zone

41 Vermont

50 Grenville (Background)

REFERENCES:

• ESRI, 2007.

• USGS 2007.

• ANSS, 2007.

• EPRI Volume X: Rondout Associates, 1986.

Figure 2.5-82— {Weston Geophysical EPRI Source Zones and 2002-2007 Events in 500-Mile Radius}**LEGEND**

★ Center Point of Proposed Bell Bend NPP (BBNPP)

■ City

○ NPP Reactor 500-mile (805 km) Radius

Earthquakes by Magnitude, mb (SEE NOTE)

USGS 2002 to 2007

○ 3.0 - 3.9

○ 4.0 - 4.9

○ 5.0 - 5.9

NOTE: The 2002 to 2007 seismicity shown in 500-mile (805 km) radius.

Weston Geophysical Sources contributing to 99% of BBNPP Site Hazard

1 Charlevoix - La Malbaie Seismic Zone

6 Adirondack Mountains

8 Clarendon-Linden

21 New York Nexus

28B Zone of Mesozoic Basin

28E Zone of Mesozoic Basin

102 Appalachian Plateau Background

103 Southern Appalachian Background

104 Southern Coastal Plain Background

REFERENCES:

• ESRI, 2007.

• USGS 2007.

• ANSS, 2007.

• EPRI Volume V: Weston Geophysical, 1986.

Figure 2.5-83— {Woodward-Clyde EPRI Source Zones and 2002-2007 Events in 500-Mile Radius}

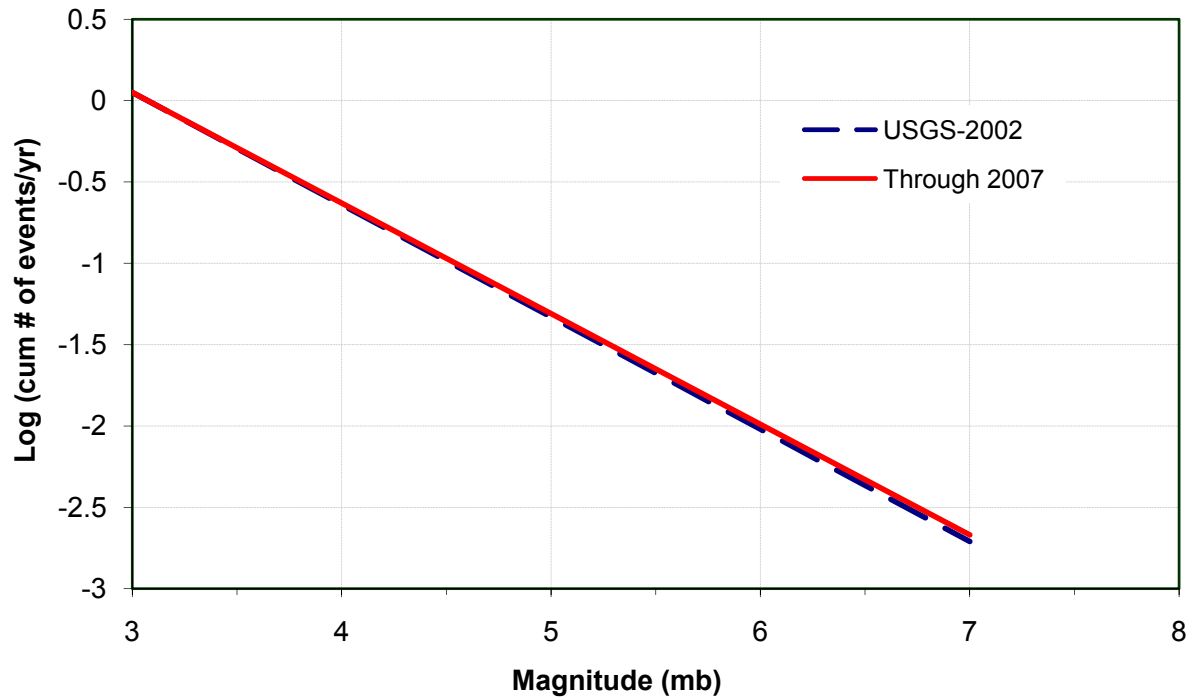
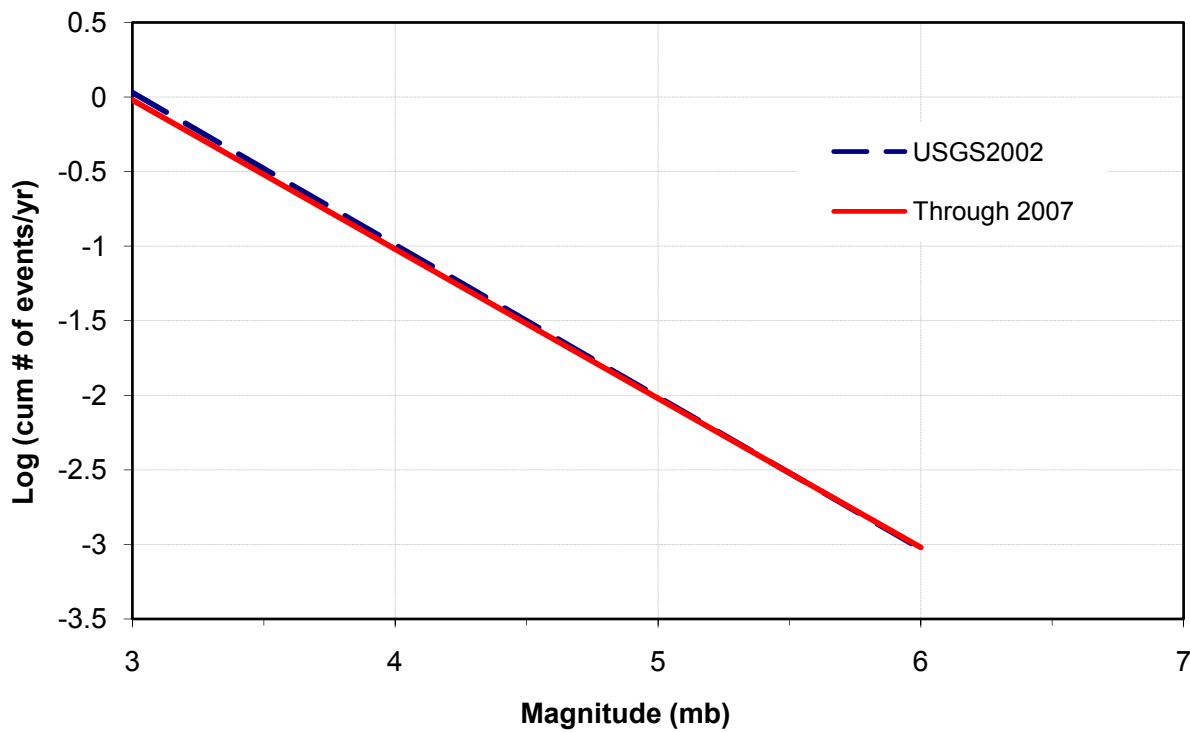
Figure 2.5-84— {Comparison of Seismicity Rates}**Bechtel Zone # 3-Charlevoix****Background Zone**

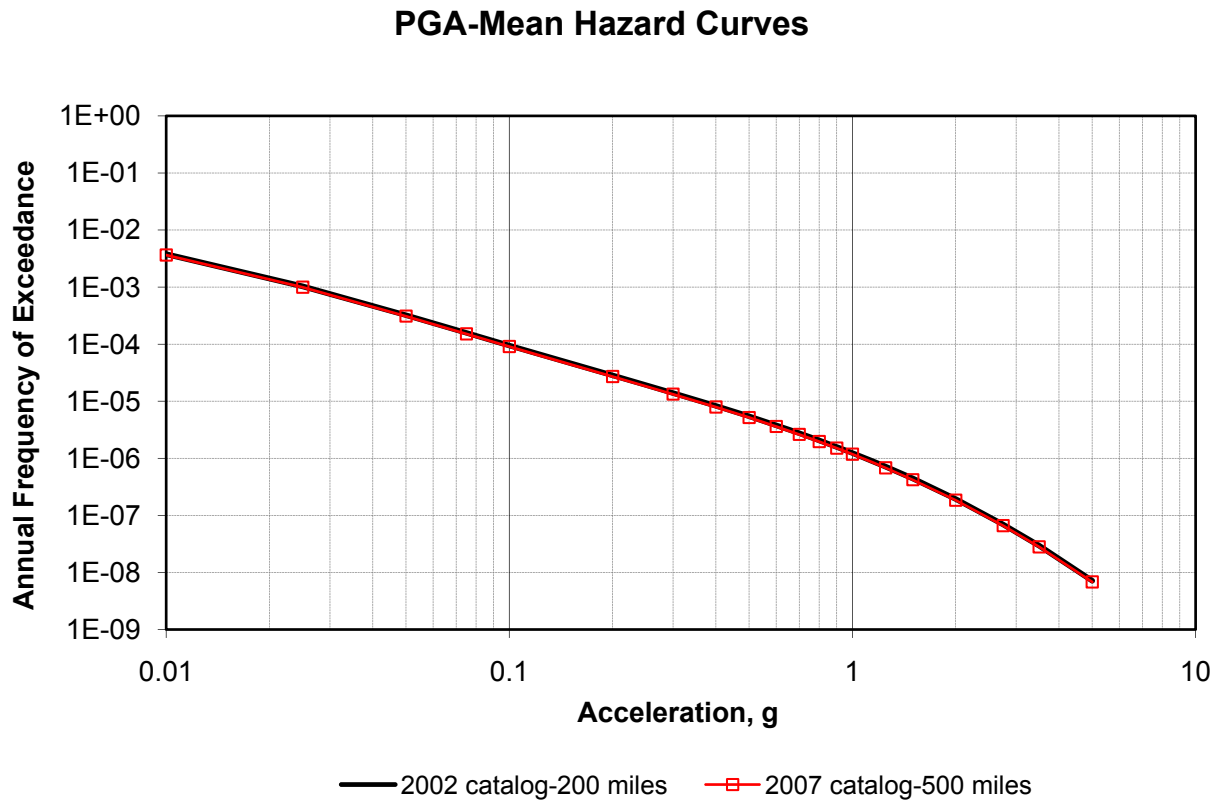
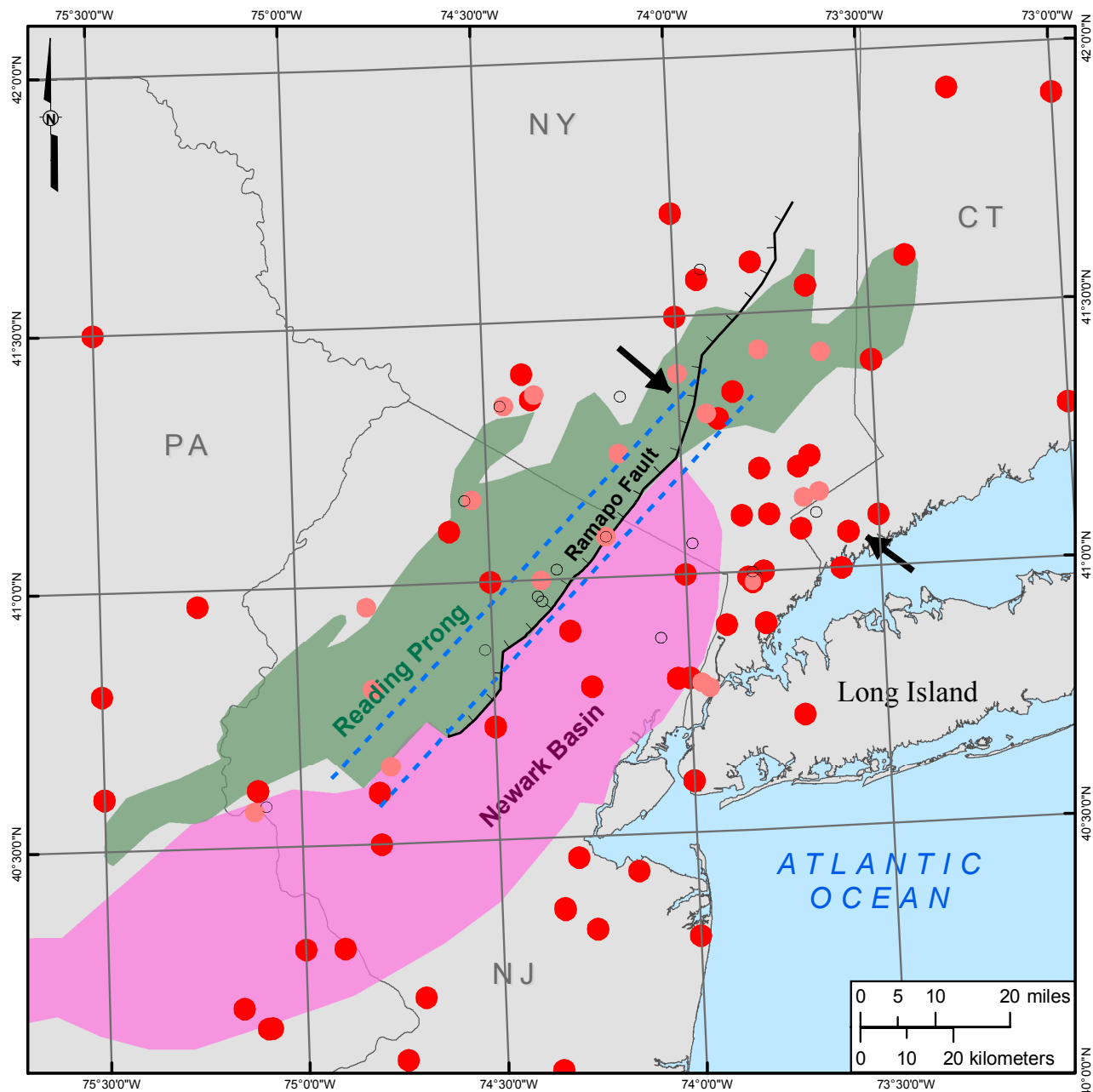
Figure 2.5-85— {Comparison of PGA-Mean Hazard Curves}

Figure 2.5-86— {Seismicity of New York-Philadelphia Area}**LEGEND**

Earthquakes by Magnitude, mb

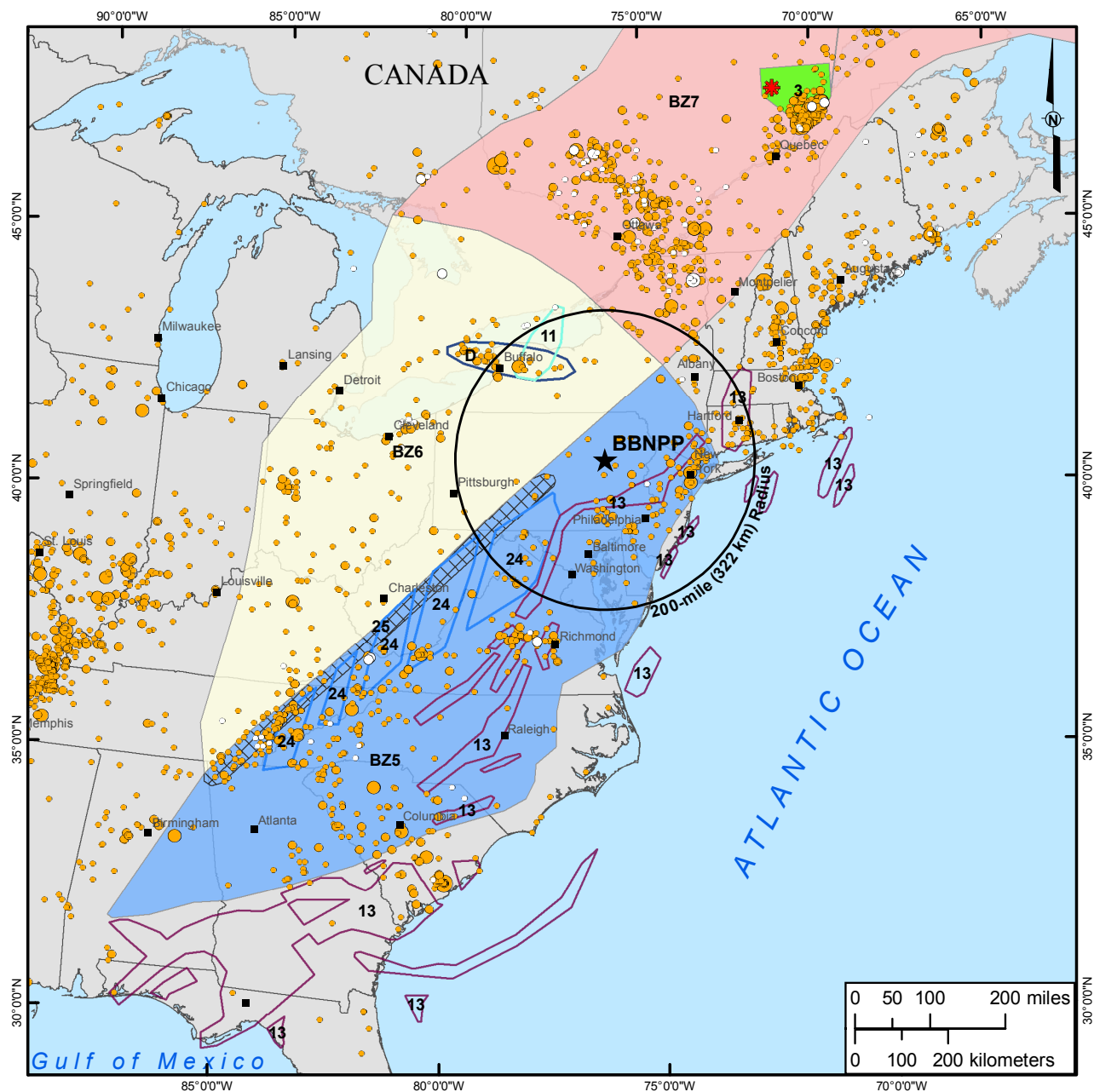
USGS 2007

- M < 2.25
- 2.25 < M < 3.0
- M ≥ 3.0

- Ramapo Fault
- Reading Prong
- Newark Basin
- RSZ

REFERENCES:

- ESRI, 2007.
- USGS 2007.
- ANSS, 2007.
- Sykes et al, 2008.

Figure 2.5-87— {Bechtel EPRI Source Zones for Charlevoix Sensitivity Analysis Case 1}**LEGEND**

★ Center Point of Proposed
Bell Bend NPP (BBNPP)

■ City

○ NPP Reactor 200-mile
(322 km) Radius

Earthquakes by Magnitude, mb (SEE NOTE)
USGS 2001 USGS 2002 to 2007

• 3.0 - 3.9
• 4.0 - 4.9
• 5.0 - 5.9
• 6.0 - 6.9
• 7.0 - 7.9

○ 3.0 - 3.9
○ 4.0 - 4.9
○ 5.0 - 5.9

★ Saguenay Earthquake

NOTE: The 2002 to 2007 seismicity
shown in 625-mile (1000 km) radius.

Bechtel Group Sources contributing
to 99% of BBNPP Site Hazard

3 La Malbaie/Charlevoix

11 Clarendon-Linden

13 Mesozoic Basins

24 Bristol Block

25 NY-AL Lineament

BZ5 Southern Appalachians Background

BZ6 Southern Eastern Craton Background

BZ7 Northern Eastern Craton Background

D Niagara Area

REFERENCES:

- ESRI, 2007.
- USGS, 2007.
- ANSS, 2007.
- EPRI Volume IX: Bechtel Group, 1986.

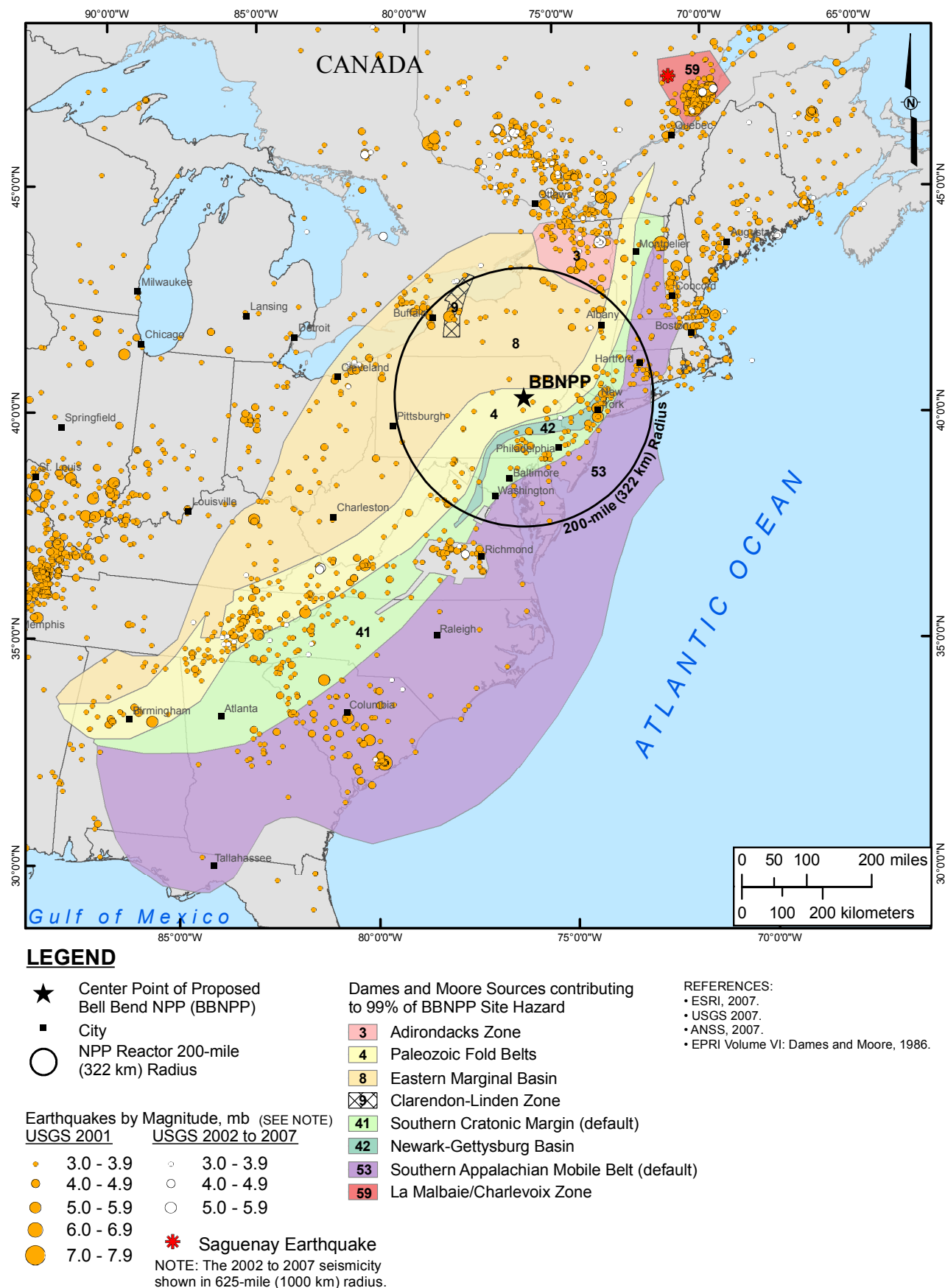
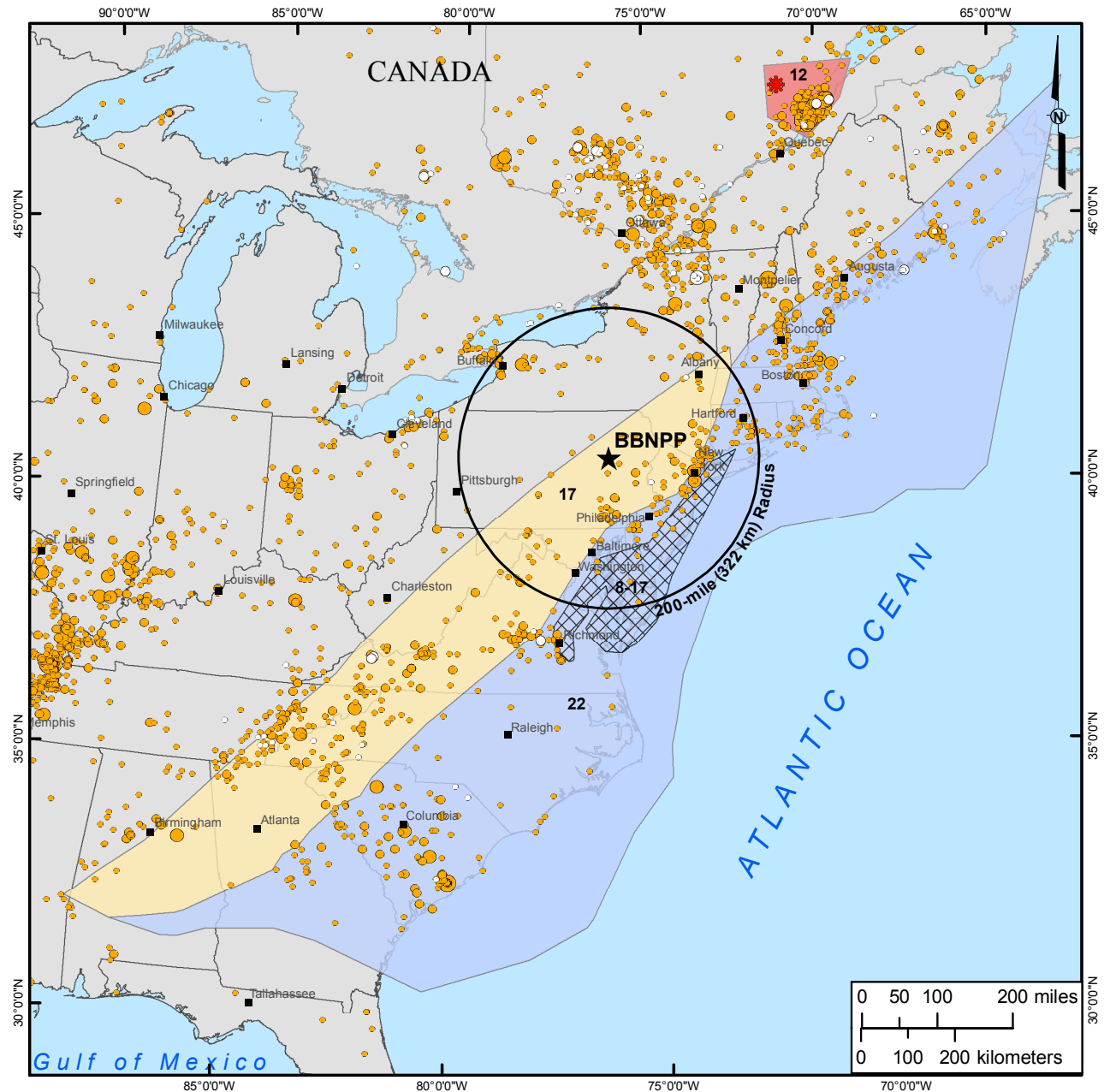
Figure 2.5-88— {Dames and Moore EPRI Source Zones for Charlevoix Sensitivity Analysis Case 1}

Figure 2.5-89— {Law Engineering EPRI Source Zones for Charlevoix Sensitivity Analysis Case 1}**LEGEND**

★ Center Point of Proposed Bell Bend NPP (BBNPP)

■ City

○ NPP Reactor 200-mile (322 km) Radius

Law Engineering Sources contributing to 99% of BBNPP Site Hazard

8-17 Buried East Coast Mesozoic Basins

17 Eastern Basements

22 Reactivated Eastern Seaboard Normal Faults

12 Charlevoix Seismic Zone

REFERENCES:

- ESRI, 2007.
- USGS 2007.
- ANSS, 2007.
- EPRI Volume VII: Law Engineering, 1986.

Earthquakes by Magnitude, mb (SEE NOTE)

USGS 2001

USGS 2002 to 2007

• 3.0 - 3.9

○ 3.0 - 3.9

• 4.0 - 4.9

○ 4.0 - 4.9

• 5.0 - 5.9

○ 5.0 - 5.9

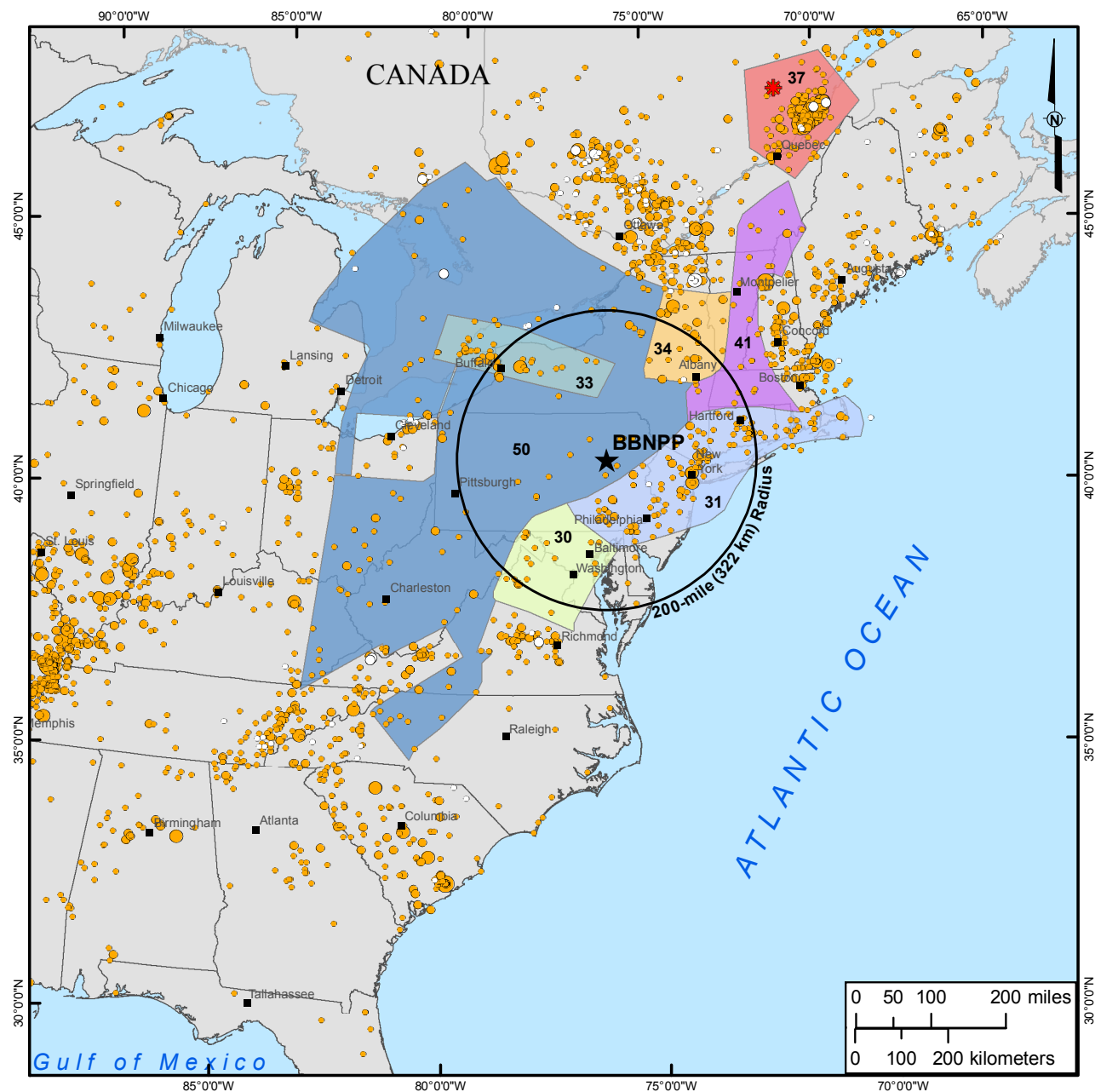
• 6.0 - 6.9

○

• 7.0 - 7.9

* Saguenay Earthquake

NOTE: The 2002 to 2007 seismicity shown in 625-mile (1000 km) radius.

Figure 2.5-90— {Rondout Associates EPRI Source Zones for Charlevoix Sensitivity Analysis Case 1}**LEGEND**

★ Center Point of Proposed Bell Bend NPP (BBNPP)

■ City

○ NPP Reactor 200-mile (322 km) Radius

Earthquakes by Magnitude, mb (SEE NOTE)
USGS 2001 USGS 2002 to 2007

• 3.0 - 3.9 ○ 3.0 - 3.9

• 4.0 - 4.9 ○ 4.0 - 4.9

• 5.0 - 5.9 ○ 5.0 - 5.9

• 6.0 - 6.9 ○ 6.0 - 6.9

• 7.0 - 7.9 ○ 7.0 - 7.9

★ Saguenay Earthquake

NOTE: The 2002 to 2007 seismicity shown in 625-mile (1000 km) radius.

Rondout Associates Sources contributing to 99% of BBNPP Site Hazard

30 Shenandoah

31 Quakers

33 Niagara

34 Nessmuk

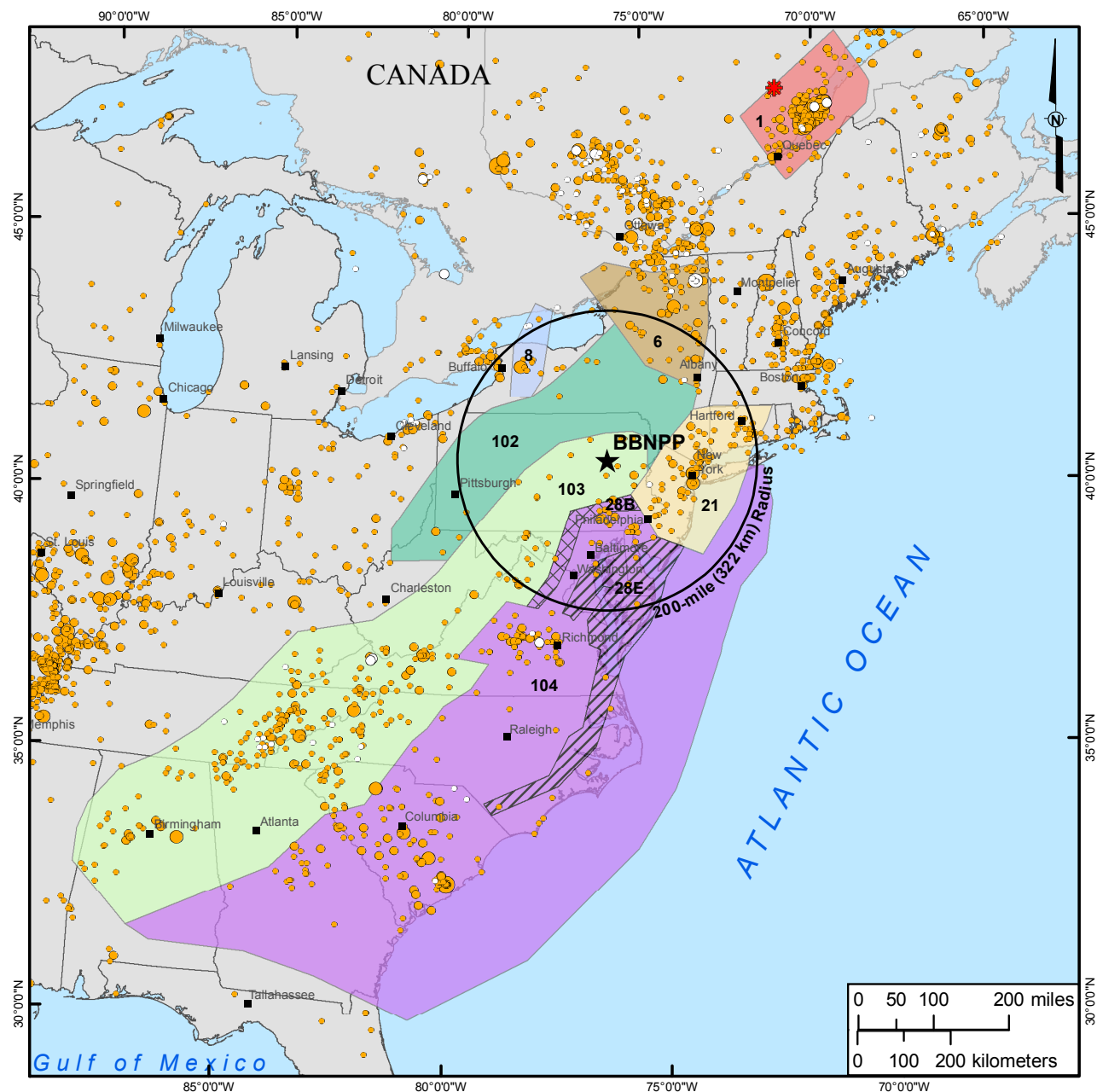
37 La Malbaie (Charlevoix) Seismic Zone

41 Vermont

50 Grenville (Background)

REFERENCES:

- ESRI, 2007.
- USGS 2007.
- ANSS, 2007.
- EPRI Volume X: Rondout Associates, 1986.

Figure 2.5-91— {Weston Geophysical EPRI Source Zones for Charlevoix Sensitivity Analysis Case 1}**LEGEND**

★ Center Point of Proposed
Bell Bend NPP (BBNPP)

■ City

○ NPP Reactor 200-mile
(322 km) Radius

Earthquakes by Magnitude, mb (SEE NOTE)
USGS 2001 USGS 2002 to 2007

- | | |
|-------------|-------------|
| • 3.0 - 3.9 | ○ 3.0 - 3.9 |
| • 4.0 - 4.9 | ○ 4.0 - 4.9 |
| • 5.0 - 5.9 | ○ 5.0 - 5.9 |
| • 6.0 - 6.9 | |
| • 7.0 - 7.9 | |

NOTE: The 2002 to 2007 seismicity
shown in 625-mile (1000 km) radius.

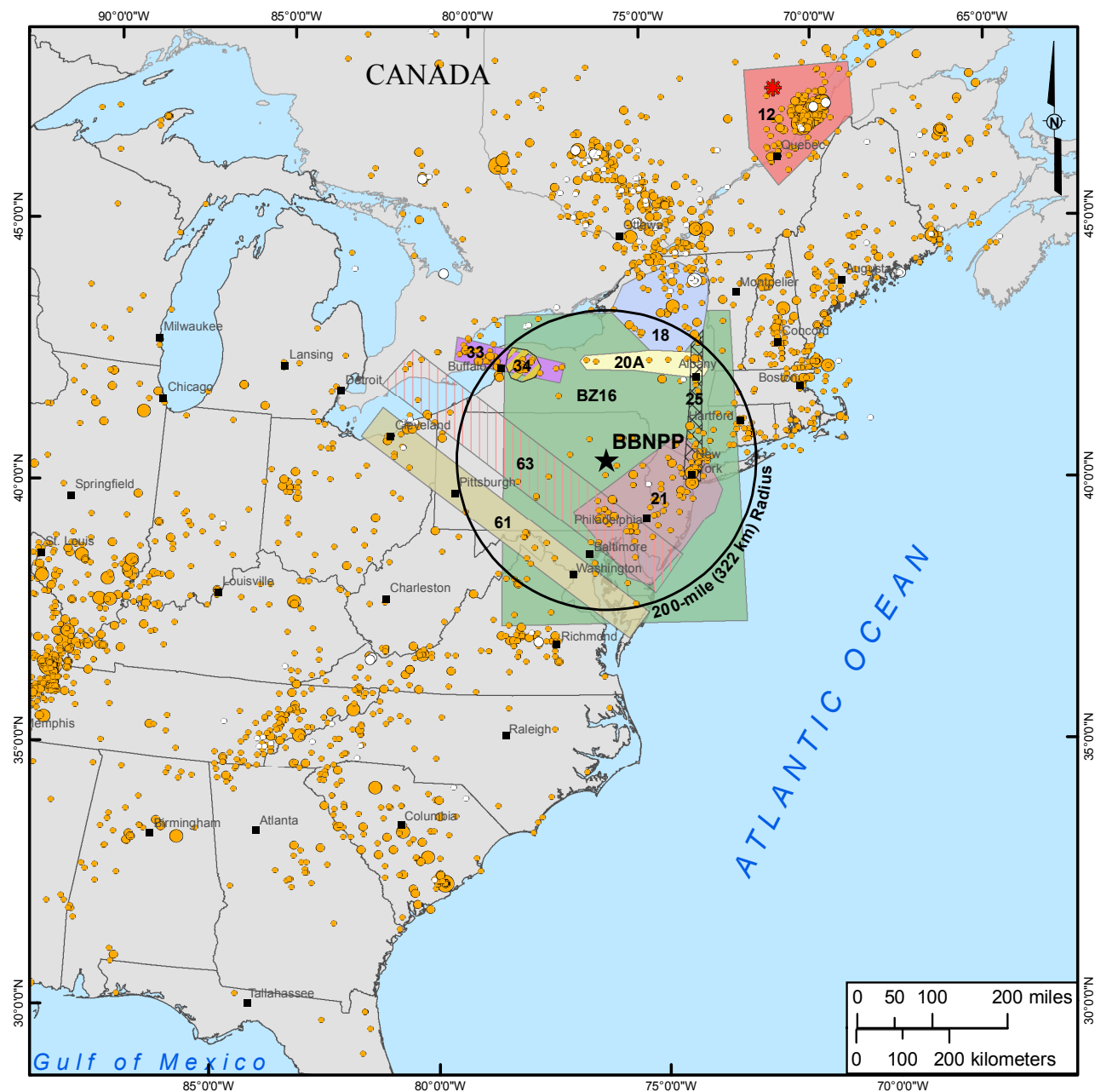
★ Saguenay Earthquake

Weston Geophysical Sources contributing
to 99% of BBNPP Site Hazard

- 1 Charlevoix - La Malbaie Seismic Zone
- 6 Adirondack Mountains
- 8 Clarendon-Linden
- 21 New York Nexus
- ~~28B~~ Zone of Mesozoic Basin
- ~~28E~~ Zone of Mesozoic Basin
- 102 Appalachian Plateau Background
- 103 Southern Appalachian Background
- 104 Southern Coastal Plain Background

REFERENCES:

- ESRI, 2007.
- USGS 2007.
- ANSS, 2007.
- EPRI Volume V: Weston Geophysical, 1986.

Figure 2.5-92— {Woodward-Clyde EPRI Source Zones for Charlevoix Sensitivity Analysis Case 1}**LEGEND**

★ Center Point of Proposed
Bell Bend NPP (BBNPP)

■ City

○ NPP Reactor 200-mile
(322 km) Radius

Earthquakes by Magnitude, mb (SEE NOTE)
USGS 2001 USGS 2002 to 2007

- | | |
|-------------|-------------|
| • 3.0 - 3.9 | ○ 3.0 - 3.9 |
| • 4.0 - 4.9 | ○ 4.0 - 4.9 |
| • 5.0 - 5.9 | ○ 5.0 - 5.9 |
| • 6.0 - 6.9 | |
| • 7.0 - 7.9 | |

* Saguenay Earthquake

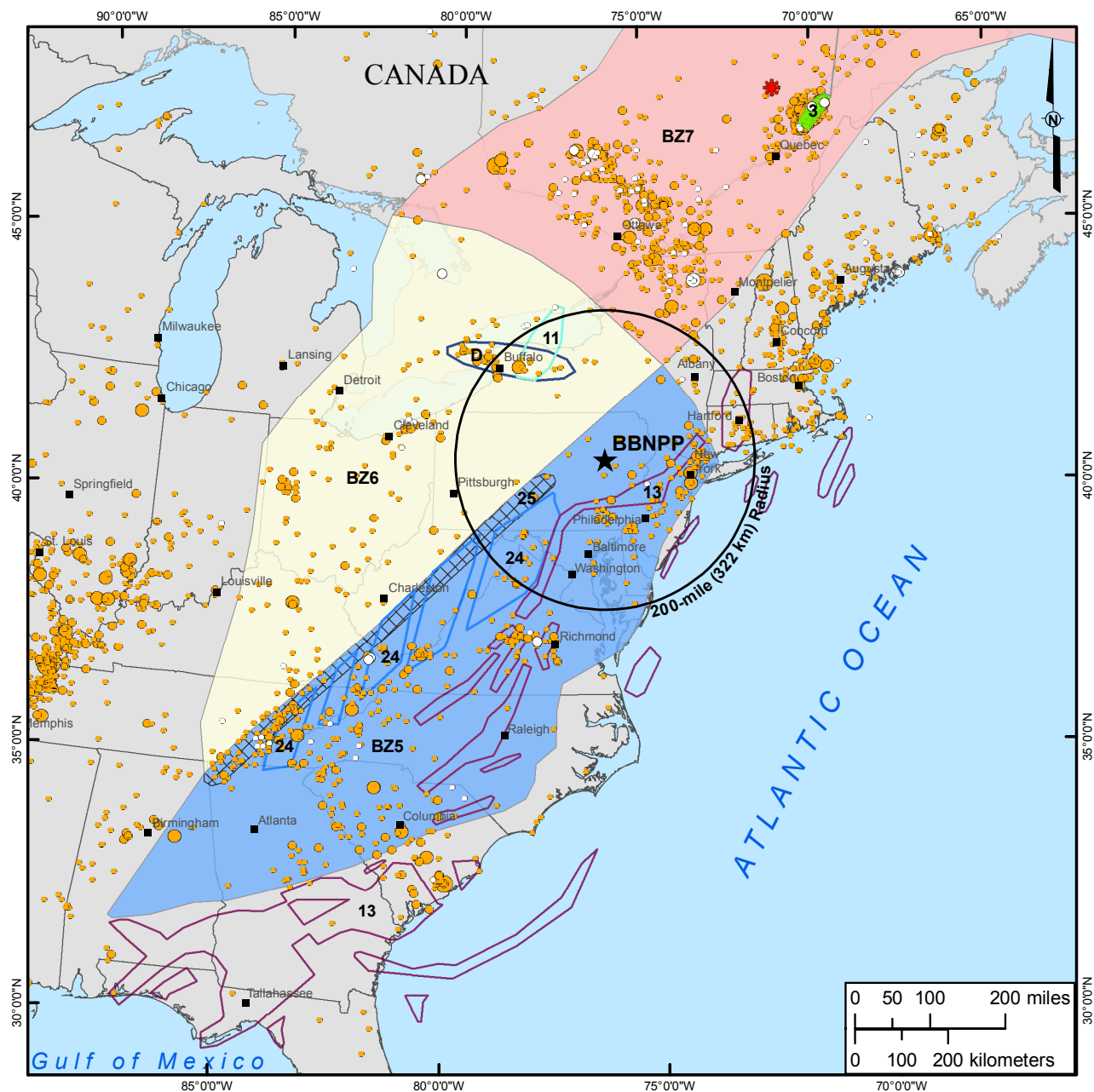
NOTE: The 2002 to 2007 seismicity
shown in 625-mile (1000 km) radius.

Woodward-Clyde Sources contributing
to 99% of BBNPP Site Hazard

- | | |
|------|---------------------------------|
| 18 | Adirondack Uplift |
| 20A | Mohawk River Trend |
| 21 | NJ Isostatic Gravity Saddle |
| 25 | Hudson River Valley Trend |
| 33 | W. NY-S Ontario Trend |
| 34 | Attica, NY Intersection |
| 63 | Tyron-Mt. Union Lineament |
| BZ16 | Susquehanna Background |
| 12 | Charlevoix Seismic Zone |
| 61 | Pittsburgh-Washington Lineament |

REFERENCES:

- ESRI, 2007.
- USGS 2007.
- ANSS, 2007.
- EPRI Volume VIII: Woodward-Clyde Consultants, 1986.

Figure 2.5-93— {Bechtel EPRI Source Zones for Charlevoix Sensitivity Analysis Case 2}**LEGEND**

★ Center Point of Proposed
Bell Bend NPP (BBNPP)

■ City

○ NPP Reactor 200-mile
(322 km) Radius

Earthquakes by Magnitude, mb (SEE NOTE)
USGS 2001 USGS 2002 to 2007

• 3.0 - 3.9
• 4.0 - 4.9
• 5.0 - 5.9
• 6.0 - 6.9
• 7.0 - 7.9

○ 3.0 - 3.9
○ 4.0 - 4.9
○ 5.0 - 5.9

★ Saguenay Earthquake

NOTE: The 2002 to 2007 seismicity
shown in 625-mile (1000 km) radius.

Bechtel Group Sources contributing
to 99% of BBNPP Site Hazard

3 La Malbaie/Charlevoix

11 Clarendon-Linden

13 Mesozoic Basins

24 Bristol Block

25 NY-AL Lineament

BZ5 Southern Appalachians Background

BZ6 Southern Eastern Craton Background

BZ7 Northern Eastern Craton Background

D Niagara Area

REFERENCES:

- ESRI, 2007.
- USGS 2007.
- ANSS, 2007.
- EPRI Volume IX: Bechtel Group, 1986.

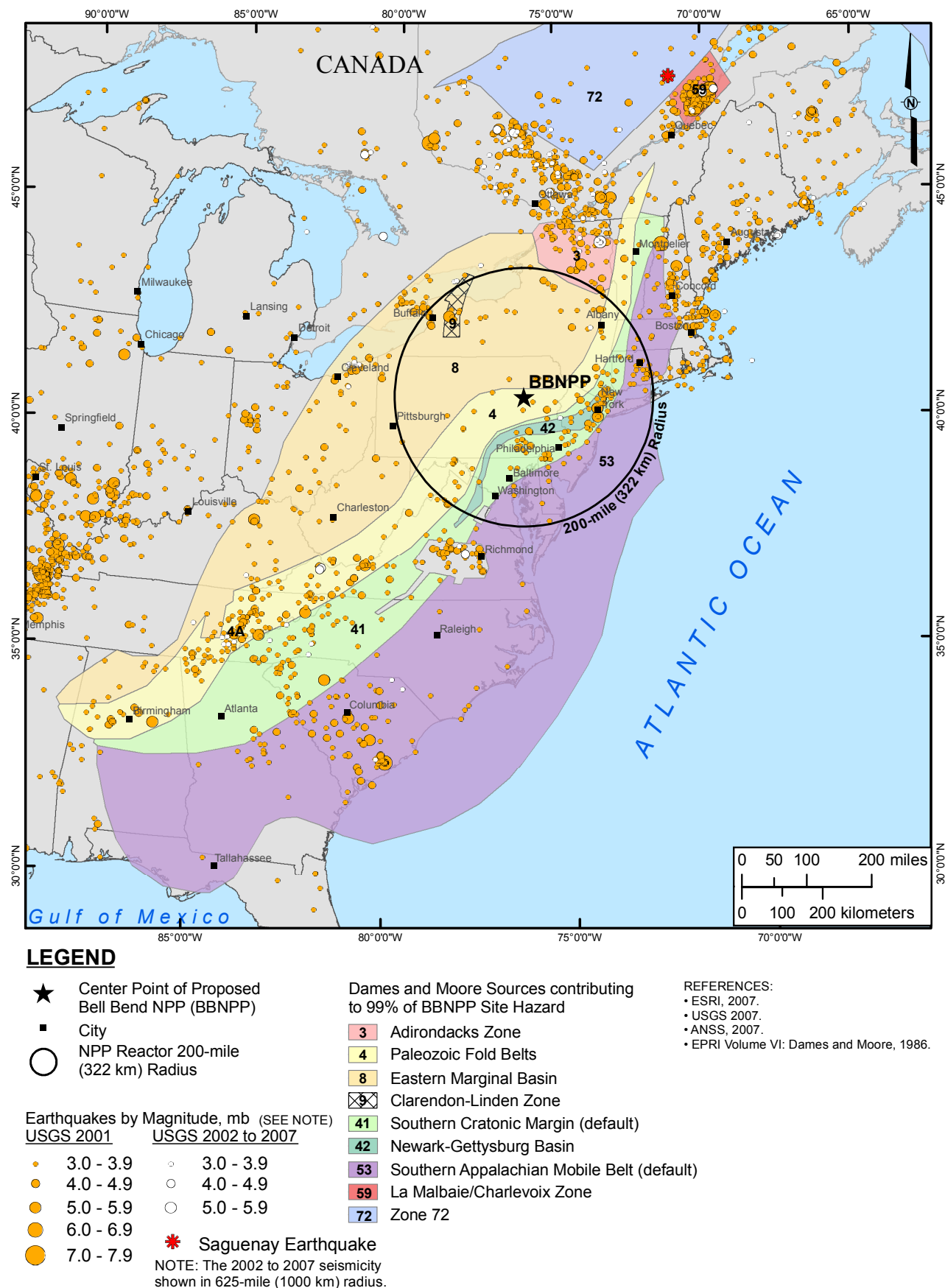
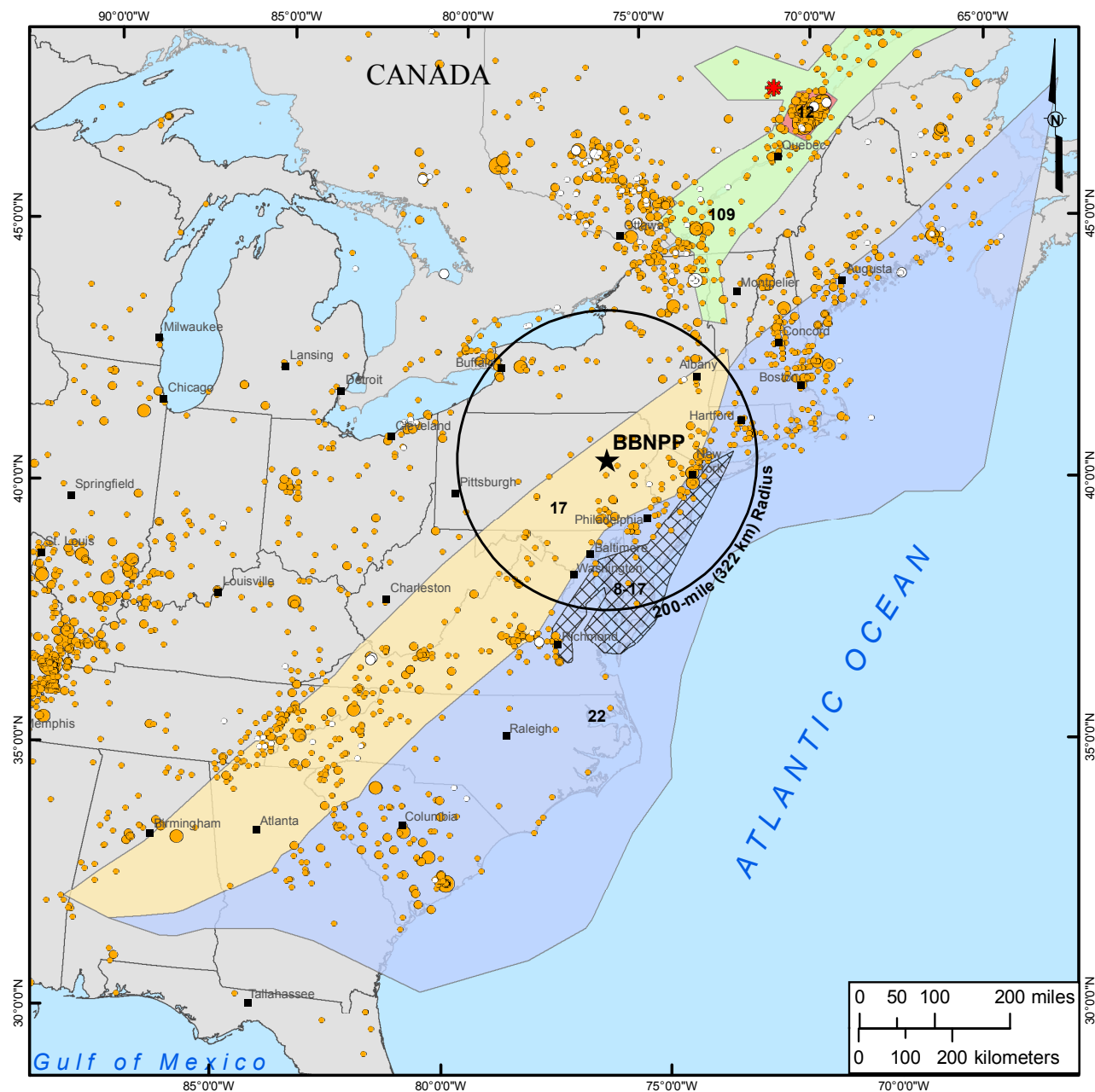
Figure 2.5-94— {Dames and Moore EPRI Source Zones for Charlevoix Sensitivity Analysis Case 2}

Figure 2.5-95— {Law Engineering EPRI Source Zones for Charlevoix Sensitivity Analysis Case 2}**LEGEND**

★ Center Point of Proposed Bell Bend NPP (BBNPP)

■ City

○ NPP Reactor 200-mile (322 km) Radius

Law Engineering Sources contributing to 99% of BBNPP Site Hazard

8-17 Buried East Coast Mesozoic Basins

17 Eastern Basements

22 Reactivated Eastern Seaboard Normal Faults

12 Charlevoix Seismic Zone

109 Zone 109

REFERENCES:

- ESRI, 2007.
- USGS 2007.
- ANSS, 2007.
- EPRI Volume VII: Law Engineering, 1986.

Earthquakes by Magnitude, mb (SEE NOTE)
USGS 2001 USGS 2002 to 2007

3.0 - 3.9

4.0 - 4.9

5.0 - 5.9

6.0 - 6.9

7.0 - 7.9

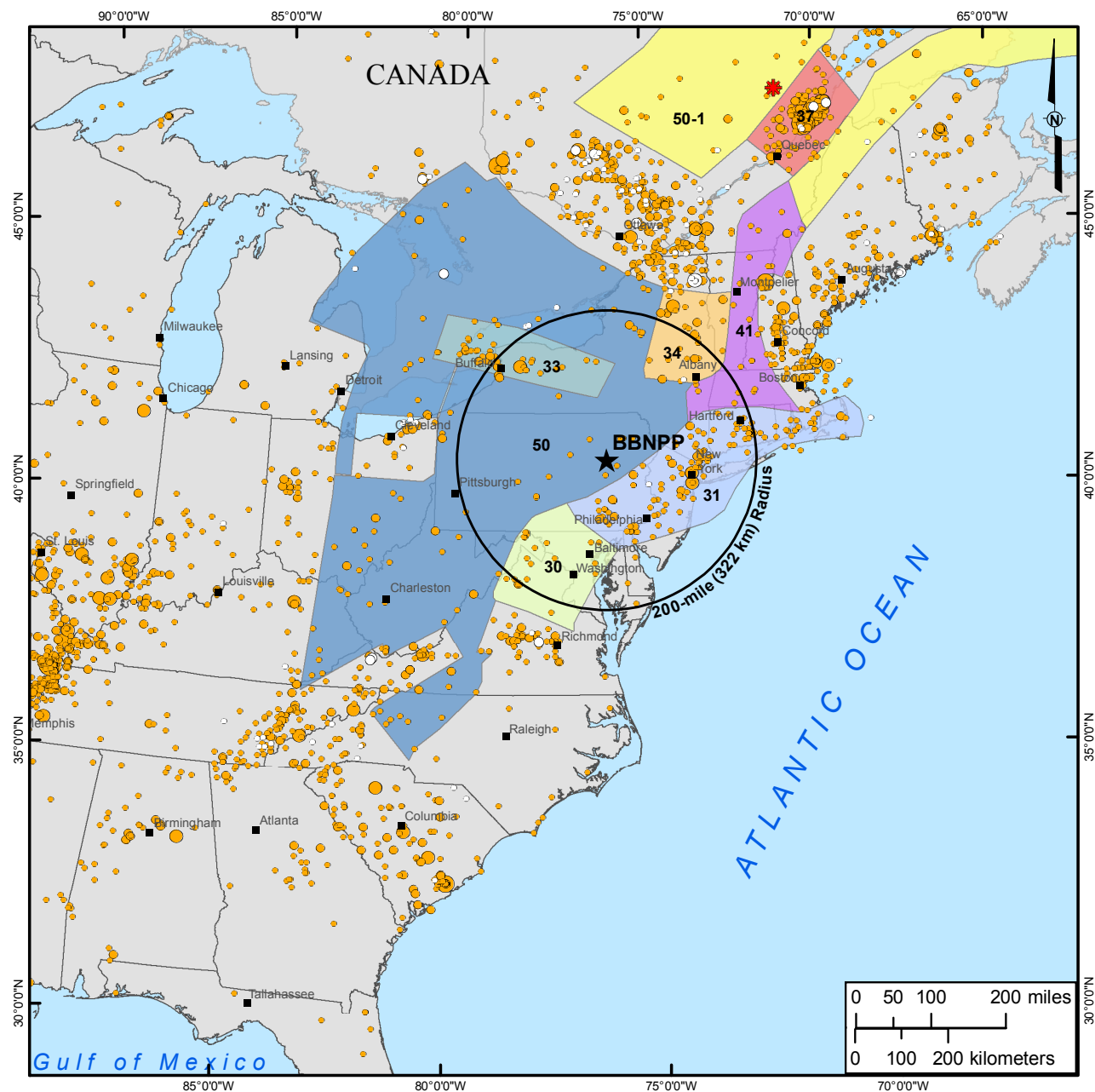
3.0 - 3.9

4.0 - 4.9

5.0 - 5.9

* Saguenay Earthquake

NOTE: The 2002 to 2007 seismicity shown in 625-mile (1000 km) radius.

Figure 2.5-96— {Rondout Associates EPRI Source Zones for Charlevoix Sensitivity Analysis Case 2}**LEGEND**

★ Center Point of Proposed
Bell Bend NPP (BBNPP)

■ City

○ NPP Reactor 200-mile
(322 km) Radius

Earthquakes by Magnitude, mb (SEE NOTE)
USGS 2001 USGS 2002 to 2007

• 3.0 - 3.9 ○ 3.0 - 3.9

• 4.0 - 4.9 ○ 4.0 - 4.9

• 5.0 - 5.9 ○ 5.0 - 5.9

• 6.0 - 6.9 ○ 5.0 - 5.9

• 7.0 - 7.9

★ Saguenay Earthquake

NOTE: The 2002 to 2007 seismicity
shown in 625-mile (1000 km) radius.

Rondout Associates Sources contributing
to 99% of BBNPP Site Hazard

30 Shenandoah

31 Quakers

33 Niagara

34 Nessmuk

37 La Malbaie (Charlevoix) Seismic Zone

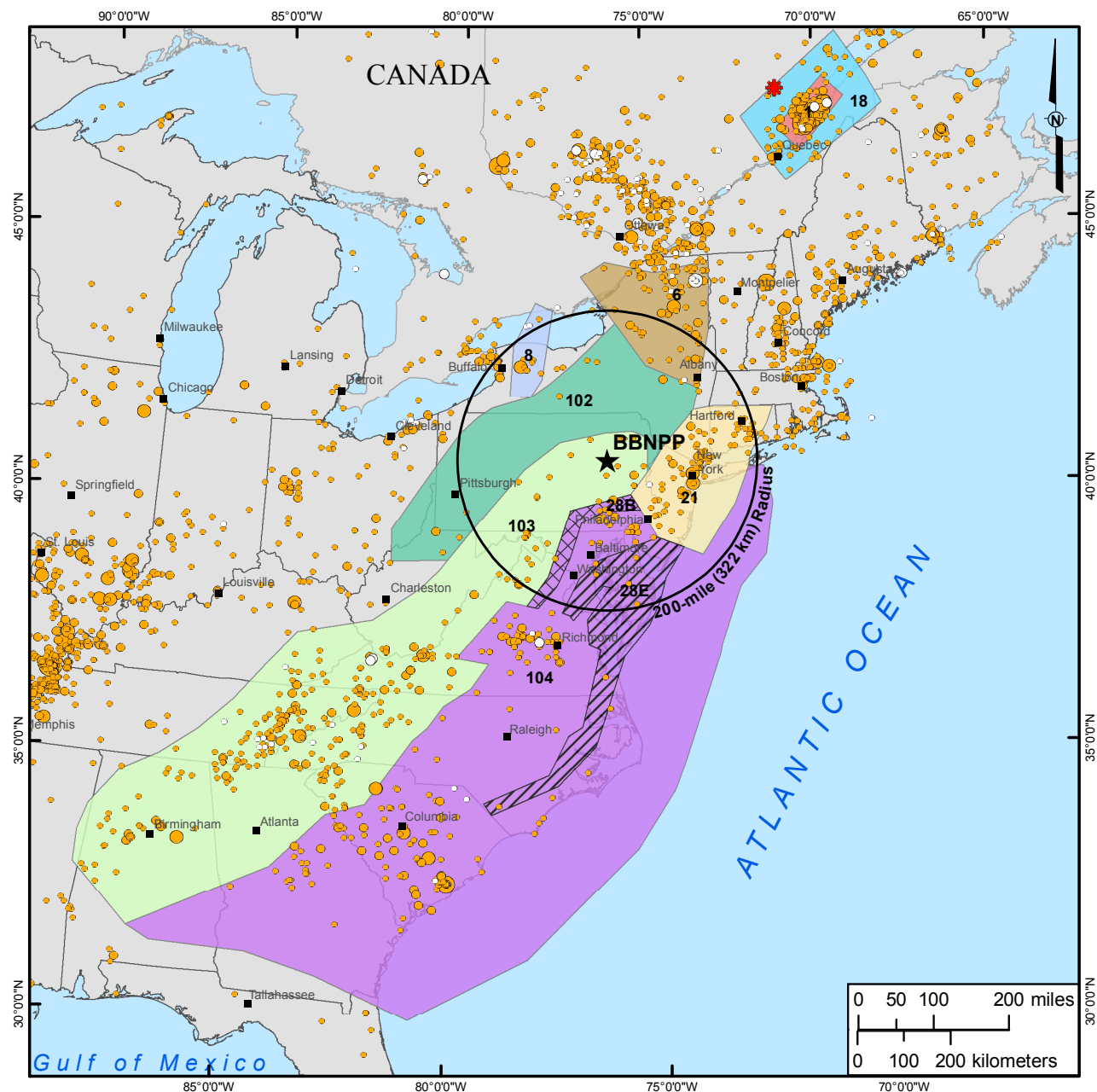
41 Vermont

50 Grenville (Background)

50-1 Zone 50-1

REFERENCES:

- ESRI, 2007.
- USGS 2007.
- ANSS, 2007.
- EPRI Volume X: Rondout Associates, 1986.

Figure 2.5-97— {Weston Geophysical EPRI Source Zones for Charlevoix Sensitivity Analysis Case 2}**LEGEND**

★ Center Point of Proposed Bell Bend NPP (BBNPP)

■ City

○ NPP Reactor 200-mile (322 km) Radius

Earthquakes by Magnitude, mb (SEE NOTE)
USGS 2001 USGS 2002 to 2007

- | | |
|-------------|-------------|
| • 3.0 - 3.9 | ○ 3.0 - 3.9 |
| • 4.0 - 4.9 | ○ 4.0 - 4.9 |
| • 5.0 - 5.9 | ○ 5.0 - 5.9 |
| • 6.0 - 6.9 | |
| • 7.0 - 7.9 | |

NOTE: The 2002 to 2007 seismicity shown in 625-mile (1000 km) radius.

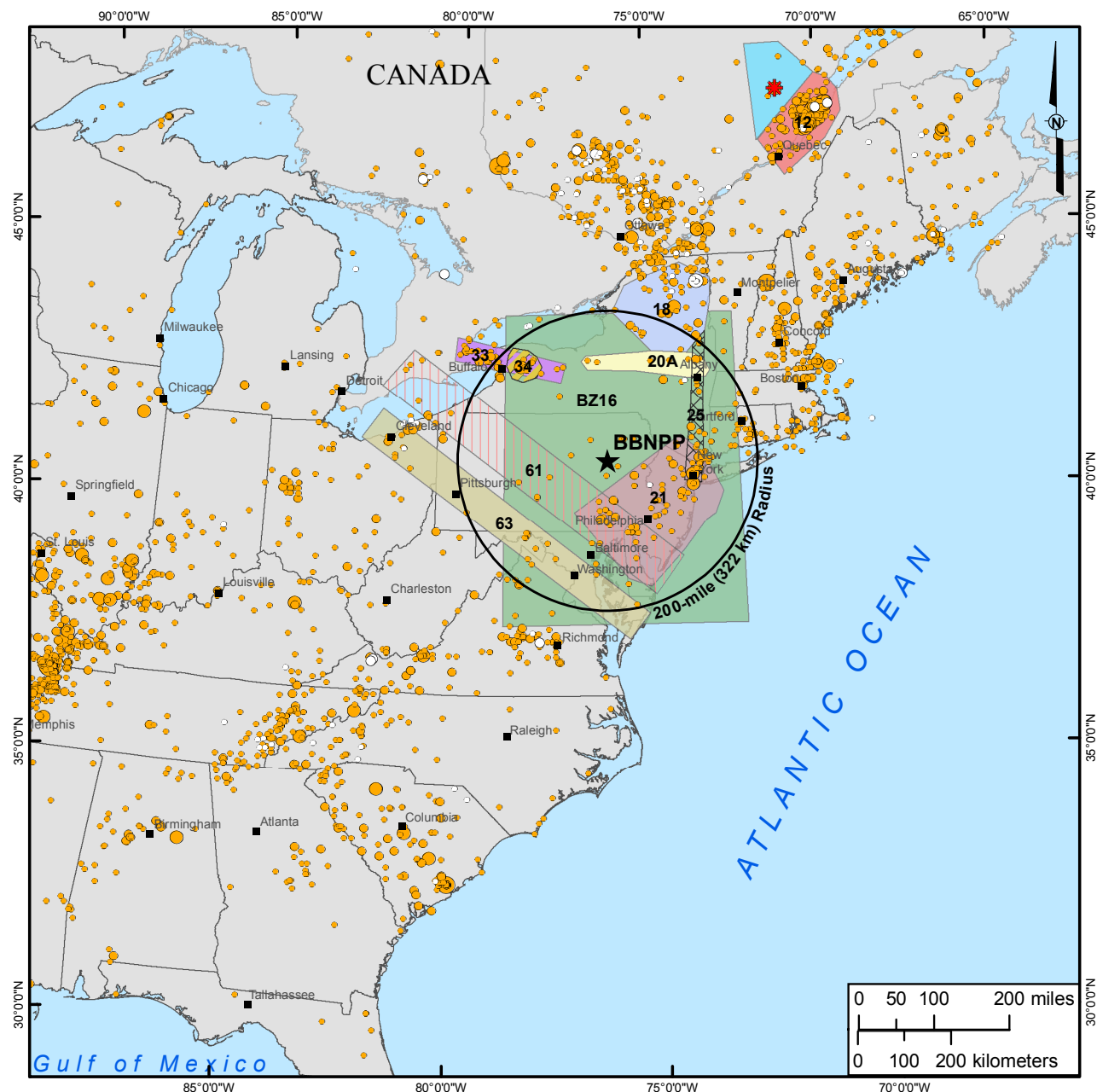
Weston Geophysical Sources contributing to 99% of BBNPP Site Hazard

- 1 Charlevoix - La Malbaie Seismic Zone
- 6 Adirondack Mountains
- 8 Clarendon-Linden
- 21 New York Nexus
- ~~28B~~ Zone of Mesozoic Basin
- ~~28E~~ Zone of Mesozoic Basin
- 102 Appalachian Plateau Background
- 103 Southern Appalachian Background
- 104 Southern Coastal Plain Background
- 18 Zone 18

* Saguenay Earthquake

REFERENCES:

- ESRI, 2007.
- USGS 2007.
- ANSS, 2007.
- EPRI Volume V: Weston Geophysical, 1986.

Figure 2.5-98— {Woodward-Clyde EPRI Source Zones for Charlevoix Sensitivity Analysis Case 2}**LEGEND**

★ Center Point of Proposed
Bell Bend NPP (BBNPP)

■ City

○ NPP Reactor 200-mile
(322 km) Radius

Earthquakes by Magnitude, mb (SEE NOTE)
USGS 2001 USGS 2002 to 2007

- | | |
|-------------|-------------|
| • 3.0 - 3.9 | ○ 3.0 - 3.9 |
| • 4.0 - 4.9 | ○ 4.0 - 4.9 |
| • 5.0 - 5.9 | ○ 5.0 - 5.9 |
| • 6.0 - 6.9 | |
| • 7.0 - 7.9 | |

* Saguenay Earthquake

NOTE: The 2002 to 2007 seismicity
shown in 625-mile (1000 km) radius.

Woodward-Clyde Sources contributing
to 99% of BBNPP Site Hazard

- | | |
|------|---------------------------------|
| 18 | Adirondack Uplift |
| 20A | Mohawk River Trend |
| 21 | NJ Isostatic Gravity Saddle |
| 25 | Hudson River Valley Trend |
| 33 | W. NY-S Ontario Trend |
| 34 | Attica, NY Intersection |
| 61 | Tyron-Mt. Union Lineament |
| BZ16 | Susquehanna Background |
| 12 | Charlevoix Seismic Zone |
| 63 | Pittsburgh-Washington Lineament |
| | New Source Zone |

REFERENCES:

- ESRI, 2007.
- USGS 2007.
- ANSS, 2007.
- EPRI Volume VIII: Woodward-Clyde Consultants, 1986.

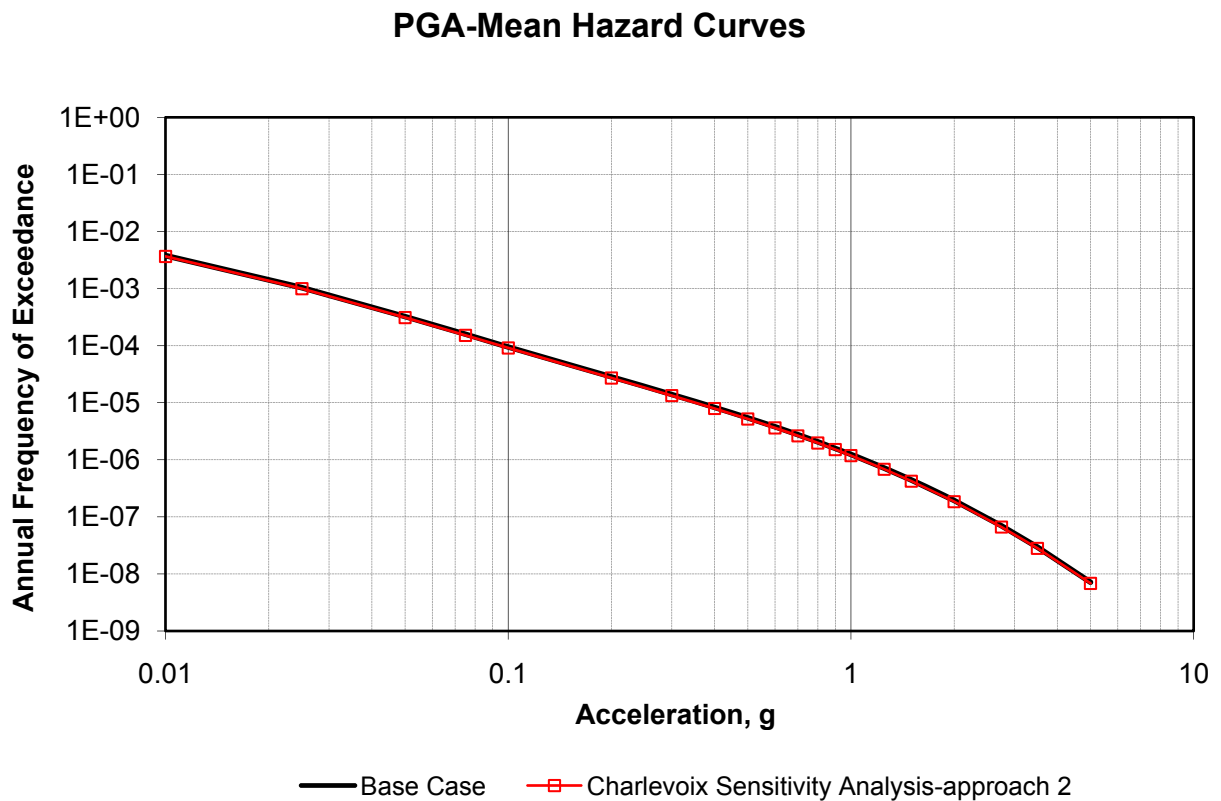
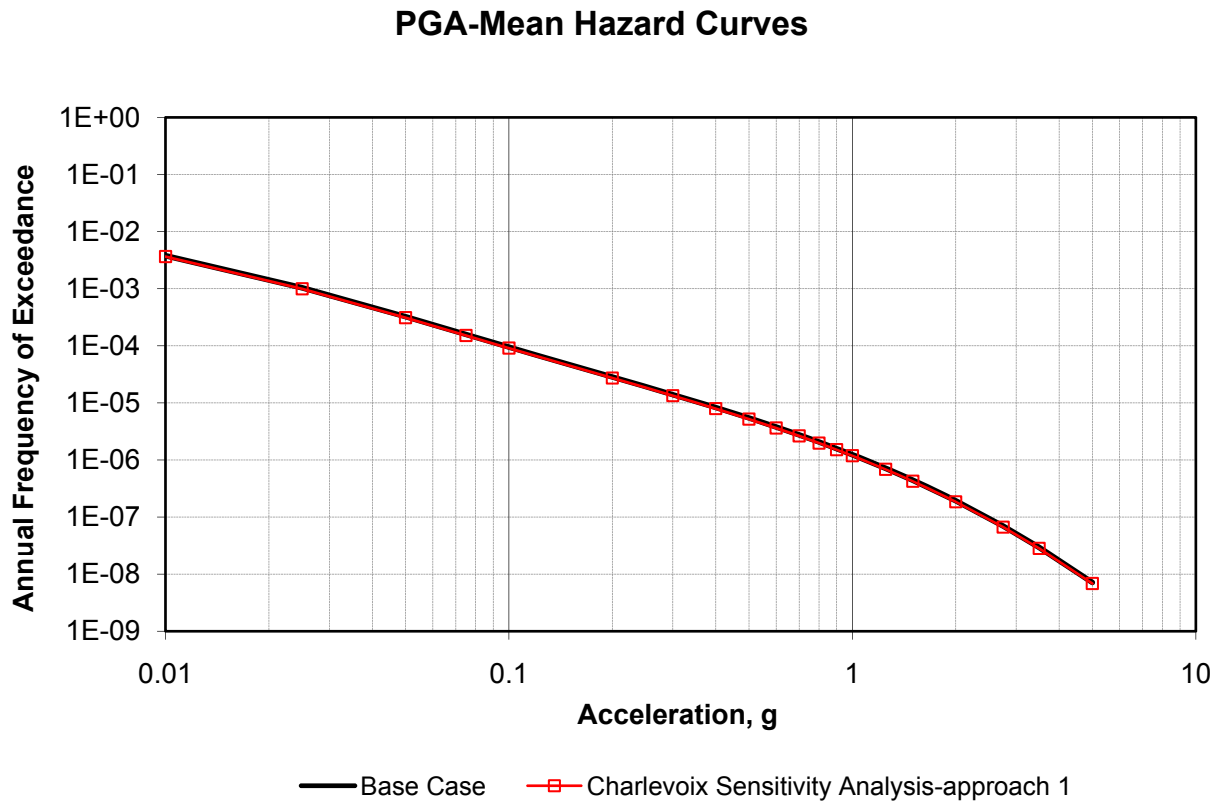
Figure 2.5-99— {Comparison of PGA Mean Hazard Curves for Charlevoix Sensitivity Analysis}

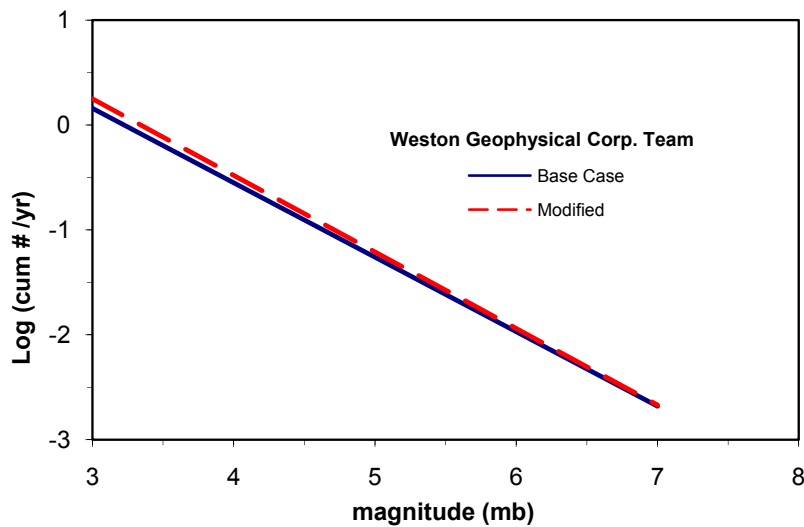
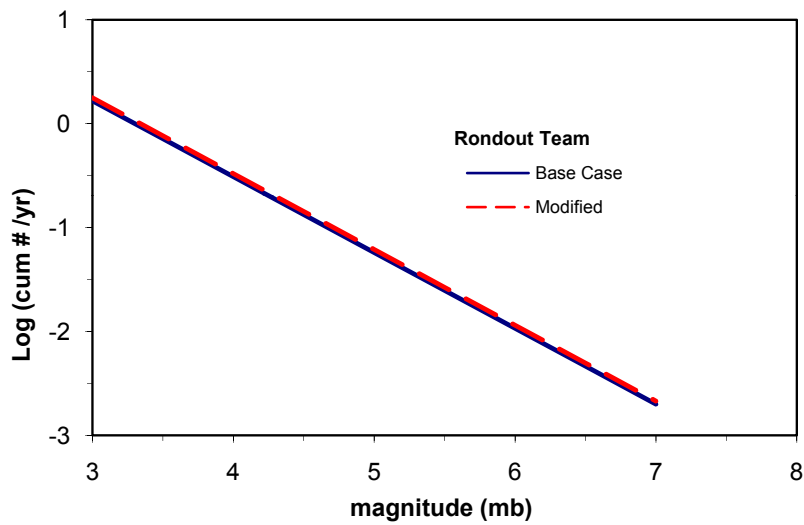
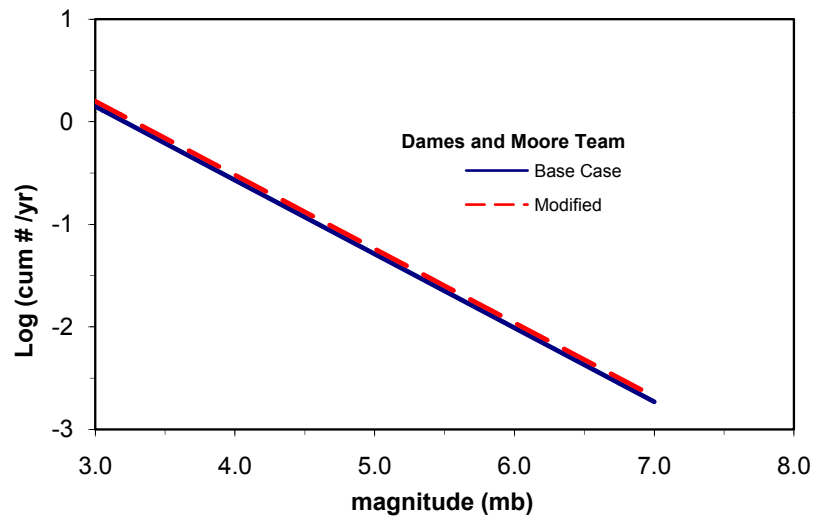
Figure 2.5-100— {Seismicity Rates Charlevoix Sensitivity Analysis}

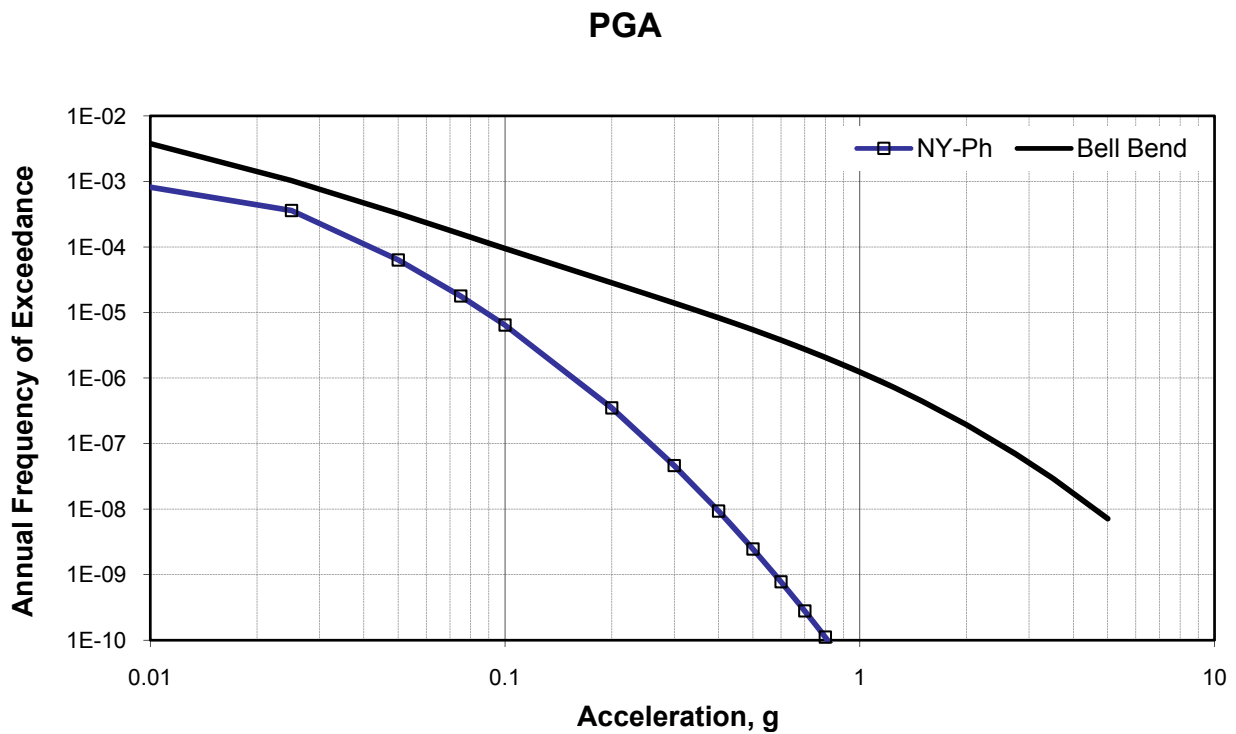
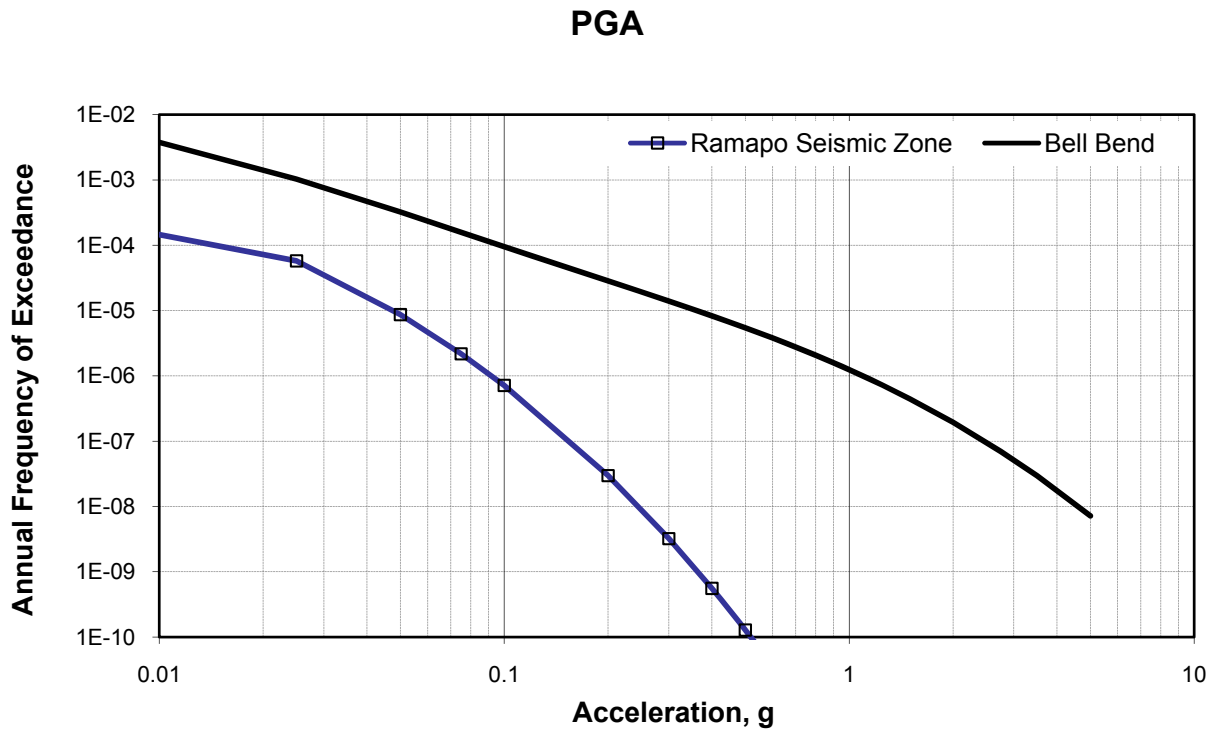
Figure 2.5-101— {Hazard Curves Sensitivity Study of the Ramapo Fault System}

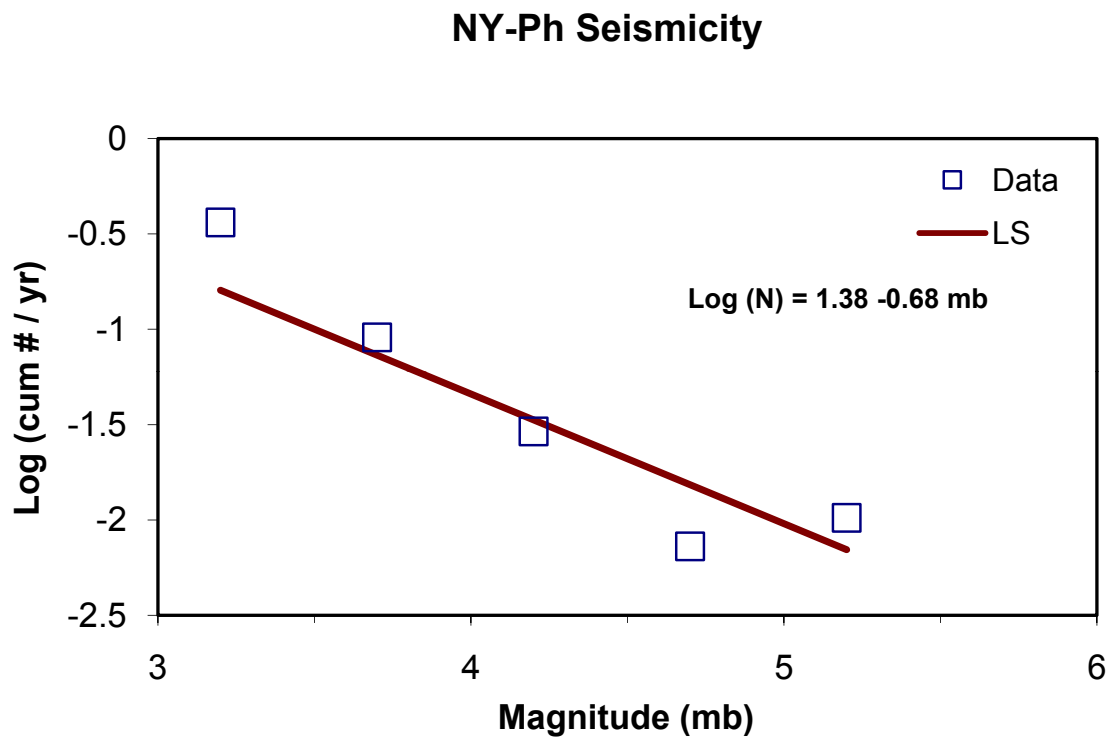
Figure 2.5-102— {Seismicity Rates of the Ramapo Fault System}

Figure 2.5-103—{Earthquake Epicenters Map 25-mile (40 km) radius}

