Appendix E.07 – Geologic Resources

APPENDIX E.07

GEOLOGIC RESOURCES – ERRATA SHEET

	Incorrect Tier 1 Draft EIS Text/Table		Tier 1 Final EIS Text/Table (Volume 2) Page
	Page	Description	
1.	1-5	Landslide Susceptibility data was updated for Environmental Consequences, Affected Environment, and Stations to reflect moderate, high, and combination-high landslide susceptibility. In the previous analysis, data on landslide incidence was erroneously represented as data on landslide susceptibility. However, the data was similar in extent and this update does not affect the outcome of the analysis.	Data Matrices

NEC FUTURE
A Rail Investment Plan for the Northeast Corridor

Geologic Resources Effects Assessment Methodology

January 30, 2014
FINAL

Submitted by:

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1. Geologic Resources Effects Assessment Methodology

1.1 INTRODUCTION

This methodology explains how the NEC FUTURE program will address the potential effects of the Tier 1 EIS Alternatives on geologic resources and geologic hazards (geologic resources) in the Tier 1 EIS. It will also consider how geologic resources could affect implementation of the Tier 1 EIS Alternatives (see also Construction Effects Assessment Approach document).

This methodology presents the regulatory framework, involved government agencies, expected regulatory and other outcomes of the Tier 1 EIS process and relevance to Tier 2, project-level assessments. It also identifies data sources, metrics and methods to be used to document existing conditions and analyze environmental consequences. This methodology may be revised as the NEC FUTURE program advances and new information is available.

1.2 DEFINITIONS

Geologic resources include soil resources, subsurface geologic conditions, groundwater resources, and mineral deposits that can provide value, or are useful to society. Geologic hazards associated with these and other geologic resources could pose potential danger to the built and natural environment. Geologic hazards include soils containing naturally occurring asbestos (NOA), acid producing soils, soils with steep slopes and high landslide susceptibility, karst terrain, abandoned mines, and seismic conditions.

Specific geologic resources covered in this methodology include:

- *Topography:* The shape and relief of the land surface. The relief of an area is defined as the difference in elevation resulting from natural or human-made conditions. Steep slopes, or areas of high relief, are a geologic hazard that results from an area's topographic position.
- *Soils:* Geologic materials that are influenced by the organic matter, minerals, water, and atmospheric gases of the earth's surface. Soil scientists' record characteristics of how soils have formed and describe their chemical and physical properties based on their parent geologic material. The following chemical and physical properties may influence the project as they are geologic hazards involving soils: NOA, acid producing soils, and soils whose physical properties or topographic position (i.e., steep slopes) is susceptible to landslides.
- *Karst terrain:* Characterized by sinkholes and caves generally underlain by soluble rocks such as lime stone and dolomite. Karst terrain is considered a geologic hazard.
- *Seismic faults:* Active geologic faults or fracture along which the blocks of crust on either side have moved relative to one another along the fracture. Seismic faults are considered a geologic hazard.
- *Seismicity:* The frequency or magnitude of earthquake activity in a given area.

- *Groundwater:* A geologic resource that includes all water that occurs below the land surface. Aquifers are a type of groundwater resource in which water is stored in water-bearing rocks or unconsolidated material (gravel, sand, or silt).
- *Sole source aquifer (SSA):* Aquifer that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. These areas may have no alternative drinking water source(s) that could physically, legally and economically supply all those who depend on the aquifer for drinking water. SSA designation is one tool to protect drinking water supplies in areas where there are few or no alternative sources to the groundwater resource and where, if contamination occurs, using an alternative source would be extremely expensive.
- *Minerals:* Natural substances found in rocks and in the ground that are mined or extracted from the ground.
- *Active/Inactive Mines:* Mines are excavated areas from which minerals are extracted. An "active" mine is one where minerals are currently being extracted. An "inactive" mine is one where the extraction of minerals is no longer occurring.

The definitions listed above are based on data from the U.S. Geological Survey (USGS), U.S. U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), and the U.S. Environmental Protection Agency (USEPA).

1.3 RELATED RESOURCES

The effects assessments from other resources evaluated as part of the Tier 1 EIS will contribute to the assessment of effects on geologic resources. These related resources are identified in Table 1. Note that the effects assessments for those related resources will be documented within their respective Tier 1 EIS sections.

Table 1 – Related Resource Inputs to Geologic Resource Assessment

Resource	Input to Geologic Assessment
Land Cover	▪ Identification of potential land cover conversions
Hazardous Materials	▪ Location of hazardous materials and contaminated waste sites

Source: NEC FUTURE JV Team, 2013

1.4 AGENCY AND REGULATORY FRAMEWORK

Geologic resources are subject to regulation by the USEPA and Occupational Safety and Health Administration. Applicable legislation and regulations, listed in Table 2 will be considered, consistent with a Tier 1 level of assessment, in the evaluation of geologic resources for the NEC FUTURE program.

Table 2 – Management and Regulation of Geologic Resources

Federal Agency	Regulatory Oversight	Description of Regulation	Regulated Resource
United States Department of Environmental Protection (USEPA)	▪ Safe Drinking Water Act of 1974	▪ Regulates the nation's public drinking water supply	▪ Sole Source Aquifers ▪ Mining Activities
Occupational Safety and Health Administration (OSHA)	▪ Asbestos Standard for Construction 29 CFR 1926.1101	▪ Defines the proper procedures for handing asbestos and regulates exposure	▪ Asbestos

Source: NEC FUTURE JV Team, 2013

The United States Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) identifies, maintains inventories and monitors the use and development of soil. The NRCS does not have regulatory authority to approve or deny development affecting soil.

The United States Geological Survey (USGS) is a non-regulatory agency under the U.S. Department of Interior responsible for providing information pertaining to groundwater resources, topographic, and seismic data.

1.4.1 Regulatory Compliance

No formal agency approvals would be requested for the Tier 1 EIS. However, the FRA will engage in dialogue with the USEPA on methodologies, assumptions, and findings of the Tier 1 EIS. The requirements for subsequent Tier 2 evaluations, including compliance with the Safe Water Drinking Act will be described in the Tier 1 EIS. During the Tier 1 EIS process, the FRA will identify potential opportunities to streamline subsequent Tier 2 environmental reviews (see Section 1.7). Coordination with USEPA will be consistent with the NEC FUTURE's Agency Coordination Plan and support the Statement of Principles (SOP) established between the FRA and federal regulatory agencies as part of the Council on Environmental Quality (CEQ) Pilot program.

1.5 METHODOLOGY TO Assess Effects

This effects assessment methodology identifies the approach and assumptions for describing existing conditions of geologic resources and environmental consequences of the Tier 1 EIS Alternatives on those resources. It identifies data sources, defines the Affected Environment and Context Area considered for geologic resources, and the approach for evaluating potential direct effects.[1] Direct effects include encroachment or alteration of geologic resources. Indirect effects,[2] such as those induced by growth will be addressed in a separate methodology (see Indirect Effects Assessment Methodology).

[1] Direct Effects are caused by the action and occur at the same time and place (40 CFR § 1508.8)
[2] Indirect Effects are those effects that occur later in time or are further removed in distance (40 CFR § 1508.8)

1.5.1 Existing Conditions

The data sources listed in Table 3 will be used to establish the existing conditions for geologic resources.

Table 3 – Data Sources for the Evaluation of Geologic Resources

Geologic Resource	Data Source	Data Application
Seismic Hazards	▪ National Atlas of the United States, 2012, Seismic Hazard Map for the United States: National Atlas of the United States, Reston, VA. ▪ National Earthquake Information Center	▪ Mapping of seismic conditions that can be affected by an earthquake or vibration of the earth
Sole Source Aquifers	▪ USEPA, 2012 Drinking Water GIS Data, Sole Source Aquifers ▪ U.S. Geological Survey, Johnston, P.M., Geology and Ground Water Resources of Washington, D.C., and Vicinity, 1964. ▪ U.S. Geological Survey, Meng, Andrew A., John F. Harsh, Hydrogeologic Framework of the Virginia Coastal Plain: Regional Aquifer Systems Analysis, Professional Paper 1404-C, 1988.	▪ Mapping of SSAs within the Study Area
Karst Terrain	▪ National Atlas of the United States, 2005, Engineering Aspects of Karst: National Atlas of the United States, Reston, VA. ▪ USGS, Regional Aquifer Systems Analysis, Professional Paper 1404-C	▪ Mapping of underground karst topography
Naturally Occurring Asbestos	▪ Mineral Resources On-Line Spatial Data, 2005, Asbestos mines, prospects, and occurrences in the US: USGS, Reston, VA. ▪ USGS, Natural Asbestos Occurrences in the Eastern United States: U.S. Geological Survey Open-File Report	▪ Mapping of NOA within the Study Area
Acid Producing Soils	▪ GIS Data is not available for this particular resource. The general assumption is that areas that fall within the coastal plain of the eastern US are more susceptible to the presence of Acid Producing Soils	▪ Generally discussion of an area to have the potential for acid producing soils.
Landslide Susceptibility	▪ National Atlas of the United States, 2012, Landslide Incidence and Susceptibility in the Conterminous United States: National Atlas of the United States, Reston, VA. ▪ USGS, Topographic Maps ▪ USDA, NRCS, On-line soil survey data (SSURGO)	▪ Mapping of soils that have physical properties or topographic position susceptible to landslides.
Minerals	▪ USGS Central Region Mineral Resources Center, Denver, CO	▪ Mapping of minerals
Mines	▪ USGS, Mineral Resources Program, Mineral Resources On-Line Spatial Data	▪ Mapping of active/inactive mines

Source: NEC FUTURE JV, 2013

Existing conditions for geologic resources will be documented in the Tier 1 EIS for an established Affected Environment and Context Area. The Affected Environment is a 3,000-foot swath centered on the Representative Route[3] for each of the Tier 1 EIS Alternatives. The 3,000-foot swath is sufficiently wide to:

- Encompass and account for the improvements associated with a Representative Route including infrastructure improvements (such as embankments, aerial structures, track improvements), ancillary facilities (such as stations, yards and parking structures), or service changes.
- Account for contiguous geologic resources that extend beyond representative routes of the Alternatives Considered.

Existing geologic resources within the Affected Environments will be mapped using GIS and discussed qualitatively for each state on a county-by-county basis. The "presence and absence" of geologic resources within the Affected Environments will be reported in tabular format.

The Context Area is five miles wide, centered on the Representative Route for each of the Tier 1 EIS Alternatives. Within the Context Area, geologic resources will be mapped but not be quantified in order to qualitatively characterize the resources that could be affected should the Representative Route shift. For resources within the Context Area, general characteristics of, and relative size and location of, geologic resources will be presented; this information will be used to supplement the quantitative assessment of effects within the Affected Environment.

1.5.2 Environmental Consequences

Within the Affected Environment, environmental consequences will be determined for those areas where a Representative Route of a Tier 1 EIS Alternative overlaps with geologic resources. A qualitative assessment of resources present in the Context Area will be used to supplement the effects assessment.

For the Affected Environment, potential effects of Tier 1 EIS Alternatives on geologic resources will include 1) a review of GIS data to determine the "presence or absence" of geologic resources within the Affected Environment; 2) the potential for the Tier 1 EIS Alternatives to disturb these geologic resources and 3) the environmental consequences that may occur as a result of the disturbance to each resource.

The following steps will be undertaken to evaluate the environmental consequences:

1. Using GIS, the Representative Routes of each Tier 1 EIS Alternatives will be mapped to identify where the routes intersect with geologic resources. Locations where a Representative Route intersects with a geologic resource will be documented as a potential effect on the identified geologic resource. Effects will be discussed qualitatively.

[3] Representative Route refers to a proposed route or potential alignment for a Tier 1 EIS Alternative. The Representative Route includes the physical footprint of the improvements associated with the Tier 1 EIS Alternatives. The horizontal and vertical dimensions of the footprint of the Representative Route are based on prototypical cross-sections for these improvements. The Representative Route is used as a proxy for estimating the potential effects of a route whose location could shift during subsequent project-level reviews.

2. Geologic resources potentially affected by a Representative Route will be further reviewed and compared with the proposed construction type of the Tier 1 EIS Alternatives and resources identified in Table 1. Potential effects on the geologic resources resulting from the proposed construction type will be qualitatively described and mapped.

For the Context Area, the potential for geologic resources to be impacted should there be a shift in a Representative Route will be qualitatively discussed.

Temporary construction-related effects to geologic resources will be described as to the location, duration and type of activity. The NEC FUTURE program overall approach to assessing construction-related effects at the Tier 1 EIS level is further described in a separate Construction Effects Assessment Approach document. Construction methods and activities for the Tier 1 EIS Alternatives will be the basis of this assessment and will be described in Chapter 2.

1.5.3 Mitigation Strategies

A menu of potential mitigation measures will be developed on a programmatic scale for further consideration in Tier 2. An example of a programmatic mitigation measures would include design considerations, alternative construction methods, and slope/soil stabilization measures.

1.6 TIER 1 EIS OUTCOMES

The Tier 1 EIS geologic resource assessment will:

- Map the presence of geologic resources in the Affected Environment and Context Area.
- Identify potential effects on the geologic resources resulting from construction activities.
- Overlay potential areas of land cover conversions and hazardous waste and contaminated waste sites that may affect geologic resources as described in Table 1.
- Identify a menu of potential mitigation measures.
- Describe regulatory compliance requirements for subsequent Tier 2 evaluations.

1.7 APPLICABILITY TO TIER 2 ASSESSMENTS

The Tier 1 EIS analysis will identify the presence of geologic resources that could be affected by the Tier 1 EIS Alternatives. Tier 2 analyses would further determine the presence of geologic resources, as well as identify mitigation measures and design and construction methods that would avoid or minimize effects.

Additionally, the FRA will identify ways in which agency coordination during the Tier 1 EIS process could create efficiencies and help streamline subsequent Tier 2 reviews and approvals. For example, if a particular portion or element of a Tier 1 EIS Alternative avoids direct effects on geologic resources, the FRA may coordinate with the USEPA to determine whether or not those portions need further evaluation during the Tier 2 environmental review process.

Application of Effects-Assessment Methodology

7.1 GEOLOGIC RESOURCES: APPLICATION OF EFFECTS-ASSESSMENT METHODOLOGY

7.1.1 Variations to Effects-Assessment Methodology

The following variations from the Effects-Assessment Methodology occurred during the process of developing the Tier 1 Draft EIS analysis:

- Seismic hazards at a level of 3–4%g or 4–5%g were analyzed as an effect. The unit "%g" is the force caused by the shaking during an earthquake measured as a percentage of gravity. Seismic hazards at a level of 3–4%g or 4–5%g were included because they represent the upper range of total seismic hazards along the East Coast, which are minor relative to other regions of North America.
- A clarified definition of plant and producer includes the following: A plant is a facility that processes raw minerals. A producer, either past or present, is a location where a raw mineral is/was produced from (e.g., mine, ore bank, pit).
- Data are compiled for each county using either presence/absence delineation or identification of the number of resources as described below.
  - Presence/Absence: seismic hazards; sole source aquifers; karst terrain; naturally occurring asbestos; acid producing soils; landslide susceptibility
  - Number of Resources: mineral resources: producer, occurrence, plant, inactive producer; active mines

7.1.2 Data Variations

The following variations from the identified data sources in the Effects-Assessment Methodology occurred during the process of developing the Tier 1 Draft EIS analysis:

- Inactive mines were removed from the effects assessment. The methodology previously included inactive mines in the effects assessment. Multiple issues arose during the data compilation for inactive mines. Datasets were unavailable, incomplete, and inconsistent throughout the study area. Given the state of data on inactive mines, field verification would be required to confirm their presence, and as such, consideration of their effects should occur during Tier 2 analyses.

7.1.3 Criteria for Analysis

Existing Conditions

- Sole source aquifers and asbestos occurrences were identified as noteworthy and were highlighted at any occurrence within the footprint of the Affected Environment and Context Area. These resources were identified as noteworthy because they may represent significant regulatory challenges. In addition, karst terrain and soils associated with moderate or high incidence of landslide occurrences were identified as noteworthy when assessing impacts within the Affected Environment due to the potential associated safety issues and engineering costs related to constructing on top of these types or geological resources.

Environmental Consequences

- Sole source aquifers, asbestos occurrences, karst terrain, and soils associated with moderate or high incidence of landslide occurrences were identified as noteworthy when assessing impacts within the Representative Route. These resources were identified as noteworthy because they may represent significant regulatory challenges or due to the potential associated safety issues and engineering costs related to constructing on top of these types or geological resources.

Environmental Consequences – Stations

- When assessing impacts due to the construction of new or modified stations, the following resources were identified as noteworthy: sole source aquifers; asbestos occurrences; karst terrain; soils associated with moderate or high incidence of landslide occurrences; and mineral resources – any. Similar to assessing construction type impacts within the Representative Route, the first four resources listed were identified as noteworthy because they may represent significant regulatory challenges or may pose potential associated safety issues and engineering costs related to constructing on top of these types or geological resources. Mineral resources were also identified as noteworthy when assessing impacts caused by the construction of new or modified stations due to potential geographic conflicts that would need to be assessed.

Data Matrices

Geography		Existing NEC Environmental Consequences												Alternative 1 Environmental Consequences											
		Presence or Absence						Quantity						Presence or Absence						Quantity					
State	County	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*		Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*	
DC	District of Columbia					X	~~X~~											X	~~X~~						
MD	Prince George's					X	~~X~~											X	~~X~~						
MD	Anne Arundel					X	~~X~~											X	~~X~~						
MD	Howard																								
MD	Baltimore County					X	X											X	X						
MD	Baltimore City					X	X			1								X	X			1			
MD	Harford					X	X											X	X						
MD	Cecil					X	X											X	X						
DE	New Castle		X			X	X			1					X			X	X			1			
PA	Delaware		X			X									X			X	X						
PA	Philadelphia	X	X			X								X	X			X	X						
PA	Bucks	X	X			X	X							X	X			X	X						
NJ	Mercer	X	X			X								X	X			X	X						
NJ	Middlesex	X	X			X								X	X			X	X				1		
NJ	Union	X												X											
NJ	Essex	X												X											
NJ	Hudson	X												X											
NY	New York	X												X											
NY	Queens	X	X			X								X	X			X							
NY	Kings													X	X										
NY	Bronx	X												X											
NY	Westchester	X												X											
NY	Putnam																								
NY	Nassau																								
NY	Suffolk																								
CT	Fairfield	X												X											
CT	New Haven	X								1				X								1			
CT	Middlesex																								
CT	New London		X							1					X							1			
CT	Hartford																		X			1	2		
CT	Tolland																								
CT	Windham																								
RI	Washington		X												X										
RI	Kent		X												X										
RI	Providence																								
MA	Worcester																								
MA	Middlesex																								
MA	Bristol																								
MA	Norfolk	X	X											X	X										
MA	Suffolk	X					X							X					X						
Total number of counties with presence of resource		15	11	0	0	14	10							15	11	0	0	14	10						
Total number of mineral occurrences								0	0	2	2	0								0	0	2	2	0	

Geography		Alternative 2 Environmental Consequences												Alternative 3 via CC and PVD (3.1) Environmental Consequences											
		Presence or Absence						Quantity						Presence or Absence						Quantity					
State	County	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*		Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*	
DC	District of Columbia					X	~~X~~											X	~~X~~						
MD	Prince George's					X	~~X~~											X	~~X~~						
MD	Anne Arundel					X	~~X~~											X	~~X~~				1		
MD	Howard																								
MD	Baltimore County					X	X											X	X						
MD	Baltimore City					X	X			1								X	X	1	1	6			
MD	Harford					X	X									X		X	X						
MD	Cecil					X	X											X	X						
DE	New Castle		X			X	X			1					X			X	X			2			
PA	Delaware		X			X	X								X			X	X						
PA	Philadelphia	X	X			X	X							X	X			X	X						
PA	Bucks	X	X			X	X							X	X			X	X						
NJ	Mercer	X	X			X								X	X			X							
NJ	Middlesex	X	X			X						1		X	X			X					1		
NJ	Union	X												X											
NJ	Essex	X												X											
NJ	Hudson	X												X											
NY	New York	X												X											
NY	Queens	X	X			X								X	X			X							
NY	Kings		X	X										X	X										
NY	Bronx	X												X											
NY	Westchester	X												X											
NY	Putnam													X											
NY	Nassau																								
NY	Suffolk																								
CT	Fairfield	X												X											
CT	New Haven	X									1			X						1			2		
CT	Middlesex																								
CT	New London		X								1				X								1		
CT	Hartford																		X			1	1		
CT	Tolland																								
CT	Windham																								
RI	Washington		X												X										
RI	Kent		X												X										
RI	Providence																								
MA	Worcester																								
MA	Middlesex																								
MA	Bristol																								
MA	Norfolk	X	X											X	X										
MA	Suffolk	X					X							X					X						
Total number of counties with presence of resource		16	12	0	0	14	13							17	12	1	0	14	13						
Total number of mineral occurrences								0	0	3	5	0								2	1	9	6	0	

Geography		Alternative 3 via LI and PVD (3.2) Environmental Consequences												Alternative 3 via LI and WOR (3.3) Environmental Consequences											
		Presence or Absence						Quantity						Presence or Absence						Quantity					
State	County	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*		Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*	
DC	District of Columbia					X	~~X~~											X	~~X~~						
MD	Prince George's					X	~~X~~											X	~~X~~						
MD	Anne Arundel					X	~~X~~											X	~~X~~				1		
MD	Howard																								
MD	Baltimore County					X	X											X	X						
MD	Baltimore City					X	X	1	1	6								X	X	1	1	6			
MD	Harford			X		X	X									X		X	X						
MD	Cecil					X	X											X	X						
DE	New Castle		X			X	X			2					X			X	X			2			
PA	Delaware		X			X	X								X			X	X						
PA	Philadelphia	X	X			X	X							X	X			X	X						
PA	Bucks	X	X			X	X							X	X			X	X						
NJ	Mercer	X	X			X								X	X			X							
NJ	Middlesex	X	X			X						1		X	X			X					1		
NJ	Union	X												X											
NJ	Essex	X												X											
NJ	Hudson	X												X											
NY	New York	X												X											
NY	Queens	X	X			X								X	X			X							
NY	Kings	X	X			X								X	X			X							
NY	Bronx	X												X											
NY	Westchester	X												X											
NY	Putnam	X																							
NY	Nassau	X	X			X								X	X			X							
NY	Suffolk	X	X			X	X							X	X			X	X						
CT	Fairfield	X												X											
CT	New Haven	X									1			X								1			
CT	Middlesex																								
CT	New London		X								1				X								1		
CT	Hartford																		X			1	1		
CT	Tolland																								
CT	Windham																								
RI	Washington		X												X										
RI	Kent		X												X										
RI	Providence																								
MA	Worcester													X											
MA	Middlesex													X											
MA	Bristol																								
MA	Norfolk	X	X											X	X				X						
MA	Suffolk	X					X							X					X						
Total number of counties with presence of resource		18	14	1	0	17	14							20	14	1	0	17	15						
Total number of mineral occurrences								1	1	9	5	0								1	1	9	5	0	

Geography		Alternative 3 via CC and WOR (3.4) Environmental Consequences											
		Presence or Absence						Quantity					
State	County	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*	
DC	District of Columbia					X	~~X~~						
MD	Prince George's					X	~~X~~						
MD	Anne Arundel					X	~~X~~					1	
MD	Howard												
MD	Baltimore County					X	X						
MD	Baltimore City					X	X	1	1	6			
MD	Harford			X		X	X						
MD	Cecil					X	X						
DE	New Castle		X			X	X			2			
PA	Delaware		X			X	X						
PA	Philadelphia	X	X			X	X						
PA	Bucks	X	X			X	X						
NJ	Mercer	X	X			X							
NJ	Middlesex	X	X			X						1	
NJ	Union	X											
NJ	Essex	X											
NJ	Hudson	X											
NY	New York	X											
NY	Queens	X	X			X							
NY	Kings	X	X										
NY	Bronx	X											
NY	Westchester	X											
NY	Putnam	X											
NY	Nassau												
NY	Suffolk												
CT	Fairfield	X											
CT	New Haven	X								1			
CT	Middlesex												
CT	New London		X							1			
CT	Hartford									1	1		
CT	Tolland												
CT	Windham												
RI	Washington		X										
RI	Kent		X										
RI	Providence												
MA	Worcester	X											
MA	Middlesex	X											
MA	Bristol												
MA	Norfolk	X	X				X						
MA	Suffolk	X					X						
Total number of counties with presence of resource		19	12	1	0	14	14						
Total number of mineral occurrences								1	1	9	4	0	

*Inactive Mines are not included in the existing conditions analysis due to unavailability of data.

Existing NEC – Affected Environment

Geography		Presence or Absence						Quantity				
State	County	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*
DC	District of Columbia					X	~~X~~				2	
MD	Prince George's					X	~~X~~				4	
MD	Anne Arundel					X	~~X~~				4	
MD	Howard					X	~~X~~					
MD	Baltimore County					X	X				5	
MD	Baltimore City				X	X	X		1	1	1	
MD	Harford					X	X	1				
MD	Cecil					X	X	1			2	
DE	New Castle		X			X	X			1		
PA	Delaware		X			X	X					
PA	Philadelphia	X	X			X	X					
PA	Bucks	X	X			X	X	1			1	
NJ	Mercer	X	X			X				1		
NJ	Middlesex	X	X			X		1			6	
NJ	Union	X						1				
NJ	Essex	X									1	
NJ	Hudson	X			X			2				
NY	New York	X	X									
NY	Queens	X	X			X						
NY	Kings	X	X									
NY	Bronx	X										
NY	Westchester	X										
NY	Putnam											
NY	Nassau											
NY	Suffolk											
CT	Fairfield	X								1	6	
CT	New Haven	X								1	6	
CT	Middlesex											
CT	New London		X								7	
CT	Hartford											
CT	Tolland											
CT	Windham											
RI	Washington		X					1			4	
RI	Kent		X									
RI	Providence											
MA	Worcester											
MA	Middlesex											
MA	Bristol		X					1			2	
MA	Norfolk	X	X						1		1	
MA	Suffolk	X					X					
Total number of counties with presence of resource		16	14	0	2	15	13					
Total number of mineral occurrences								9	2	5	52	0

Alternative 1 – Affected Environment

Geography		Presence or Absence						Quantity				
State	County	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*
DC	District of Columbia					X	~~X~~				2	
MD	Prince George's					X	~~X~~				4	
MD	Anne Arundel					X	~~X~~				4	
MD	Howard					X	~~X~~					
MD	Baltimore County					X	X				5	
MD	Baltimore City				X	X	X		2	1	1	
MD	Harford					X	X	1				
MD	Cecil					X	X	1			2	
DE	New Castle		X			X	X			1		
PA	Delaware		X			X	X					
PA	Philadelphia	X	X			X	X					
PA	Bucks	X	X			X	X	1			1	
NJ	Mercer	X	X			X				1		
NJ	Middlesex	X	X			X		1			6	
NJ	Union	X						1				
NJ	Essex	X									1	
NJ	Hudson	X			X			2				
NY	New York	X	X									
NY	Queens	X	X			X						
NY	Kings	X	X									
NY	Bronx	X										
NY	Westchester	X										
NY	Putnam											
NY	Nassau											
NY	Suffolk											
CT	Fairfield	X								1	6	
CT	New Haven	X								1	6	
CT	Middlesex											
CT	New London		X					1			15	
CT	Hartford											
CT	Tolland											
CT	Windham											
RI	Washington		X					2			4	
RI	Kent		X									
RI	Providence											
MA	Worcester											
MA	Middlesex											
MA	Bristol		X					1			2	
MA	Norfolk	X	X						1		1	
MA	Suffolk	X					X					
Total number of counties with presence of resource		16	14	0	2	15	13					
Total number of mineral occurrences								11	3	5	60	0

Alternative 2 – Affected Environment

Geography		Presence or Absence						Quantity				
State	County	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*
DC	District of Columbia					X	~~X~~				2	
MD	Prince George's					X	~~X~~				4	
MD	Anne Arundel					X	~~X~~				4	
MD	Howard					X	~~X~~					
MD	Baltimore County					X	X				5	
MD	Baltimore City				X	X	X		2	1	1	
MD	Harford					X	X	1				
MD	Cecil					X	X	5			4	2
DE	New Castle		X			X	X			1		
PA	Delaware		X			X	X					
PA	Philadelphia	X	X			X	X				1	
PA	Bucks	X	X			X	X	1			1	
NJ	Mercer	X	X			X				1		
NJ	Middlesex	X	X			X		1			6	
NJ	Union	X						1				
NJ	Essex	X									1	
NJ	Hudson	X			X			2				
NY	New York	X	X									
NY	Queens	X	X			X						
NY	Kings	X	X			X						
NY	Bronx	X										
NY	Westchester	X										
NY	Putnam											
NY	Nassau											
NY	Suffolk											
CT	Fairfield	X								1	7	
CT	New Haven	X								1	6	
CT	Middlesex											
CT	New London		X								7	
CT	Hartford						X	1		1	8	
CT	Tolland							2				
CT	Windham											
RI	Washington		X					1			4	
RI	Kent		X									
RI	Providence							1			3	
MA	Worcester											
MA	Middlesex											
MA	Bristol		X					1			2	
MA	Norfolk	X	X						1		1	
MA	Suffolk	X					X					
Total number of counties with presence of resource		16	14	0	2	16	14					
Total number of mineral occurrences								17	3	6	67	2

Alternative 3 via CC and PVD (3.1) – Affected Environment

Geography		Presence or Absence						Quantity				
State	County	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*
DC	District of Columbia					X	~~X~~				2	
MD	Prince George's					X	~~X~~				4	
MD	Anne Arundel					X	~~X~~				4	
MD	Howard					X	~~X~~					
MD	Baltimore County			X		X	X	1			10	
MD	Baltimore City				X	X	X	1	2	13	1	
MD	Harford			X		X	X	1			4	
MD	Cecil					X	X	5			4	2
DE	New Castle		X			X	X			2		
PA	Delaware		X			X	X					
PA	Philadelphia	X	X			X	X					
PA	Bucks	X	X			X	X	1			1	
NJ	Mercer	X	X			X				1		
NJ	Middlesex	X	X			X		1			6	
NJ	Union	X						1				
NJ	Essex	X									1	
NJ	Hudson	X			X			2				
NY	New York	X	X						5			
NY	Queens	X	X			X						
NY	Kings	X	X			X						
NY	Bronx	X										
NY	Westchester	X						1			2	
NY	Putnam	X										
NY	Nassau											
NY	Suffolk											
CT	Fairfield	X						1		1	9	
CT	New Haven	X						2		1	9	
CT	Middlesex											
CT	New London		X								7	
CT	Hartford						X	1		1	4	
CT	Tolland							2				
CT	Windham											
RI	Washington		X					1			4	
RI	Kent		X									
RI	Providence							1			3	
MA	Worcester											
MA	Middlesex											
MA	Bristol		X					1			2	
MA	Norfolk	X	X						1		1	
MA	Suffolk	X					X					
Total number of counties with presence of resource		17	14	2	2	16	14					
Total number of mineral occurrences								23	8	19	78	2

Alternative 3 via LI and PVD (3.2) – Affected Environment

Geography		Presence or Absence						Quantity				
State	County	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*
DC	District of Columbia					X	~~X~~				2	
MD	Prince George's					X	~~X~~				4	
MD	Anne Arundel					X	~~X~~				4	
MD	Howard					X	~~X~~					
MD	Baltimore County			X		X	X	1			10	
MD	Baltimore City				X	X	X	1	2	13	1	
MD	Harford			X		X	X	1			4	
MD	Cecil					X	X	5			4	2
DE	New Castle		X			X	X			2	1	
PA	Delaware		X			X	X					
PA	Philadelphia	X	X			X	X					
PA	Bucks	X	X			X	X	1				
NJ	Mercer	X	X			X				1		
NJ	Middlesex	X	X			X		1			7	
NJ	Union	X						1				
NJ	Essex	X										
NJ	Hudson	X			X			2				
NY	New York	X	X									
NY	Queens	X	X			X						
NY	Kings	X	X			X						
NY	Bronx	X										
NY	Westchester	X										
NY	Putnam											
NY	Nassau	X	X			X						
NY	Suffolk	X	X			X	X			1		
CT	Fairfield	X								1	6	
CT	New Haven	X								1	6	
CT	Middlesex											
CT	New London		X								7	
CT	Hartford						X	1		1	3	
CT	Tolland							2				
CT	Windham											
RI	Washington		X					1			4	
RI	Kent		X									
RI	Providence							1			3	
MA	Worcester											
MA	Middlesex											
MA	Bristol		X					1			2	
MA	Norfolk	X	X						1		1	
MA	Suffolk	X					X					
Total number of counties with presence of resource		18	16	2	2	18	15					
Total number of mineral occurrences								19	3	20	69	2

Alternative 3 via LI and WOR (3.3) – Affected Environment

Geography		Presence or Absence						Quantity				
State	County	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*
DC	District of Columbia					X	~~X~~				2	
MD	Prince George's					X	~~X~~				4	
MD	Anne Arundel					X	~~X~~				4	
MD	Howard					X	~~X~~					
MD	Baltimore County			X		X	X	1			10	
MD	Baltimore City				X	X	X	1	2	13	1	
MD	Harford			X		X	X	1			4	
MD	Cecil					X	X	5			4	2
DE	New Castle		X			X	X			2	1	
PA	Delaware		X			X	X					
PA	Philadelphia	X	X			X	X					
PA	Bucks	X	X			X	X	1				
NJ	Mercer	X	X			X				1		
NJ	Middlesex	X	X			X		1			7	
NJ	Union	X						1				
NJ	Essex	X										
NJ	Hudson	X			X			2				
NY	New York	X	X									
NY	Queens	X	X			X						
NY	Kings	X	X			X						
NY	Bronx	X										
NY	Westchester	X										
NY	Putnam											
NY	Nassau	X	X			X						
NY	Suffolk	X	X			X	X			1		
CT	Fairfield	X								1	6	
CT	New Haven	X								1	6	
CT	Middlesex											
CT	New London		X								7	
CT	Hartford						X	1		1	5	
CT	Tolland							2				
CT	Windham											
RI	Washington		X					1			4	
RI	Kent		X									
RI	Providence							1			3	
MA	Worcester	X									2	
MA	Middlesex	X					X					
MA	Bristol		X					1			2	
MA	Norfolk	X	X				X		1		1	
MA	Suffolk	X					X					
Total number of counties with presence of resource		20	16	2	2	18	17					
Total number of mineral occurrences								19	3	20	73	2

Alternative 3 via CC and WOR (3.4) – Affected Environment

Geography		Presence or Absence						Quantity				
State	County	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*
DC	District of Columbia					X	~~X~~				2	
MD	Prince George's					X	~~X~~				4	
MD	Anne Arundel					X	~~X~~				4	
MD	Howard					X	~~X~~					
MD	Baltimore County			X		X	X	1			10	
MD	Baltimore City				X	X	X	1	2	13	1	
MD	Harford			X		X	X	1			4	
MD	Cecil					X	X	5			4	2
DE	New Castle		X			X	X			2		
PA	Delaware		X			X	X					
PA	Philadelphia	X	X			X	X					
PA	Bucks	X	X			X	X	1			1	
NJ	Mercer	X	X			X				1		
NJ	Middlesex	X	X			X		1			6	
NJ	Union	X						1				
NJ	Essex	X									1	
NJ	Hudson	X			X			2				
NY	New York	X	X						5			
NY	Queens	X	X			X						
NY	Kings	X	X			X						
NY	Bronx	X										
NY	Westchester	X						1			2	
NY	Putnam	X										
NY	Nassau											
NY	Suffolk											
CT	Fairfield	X						1		1	9	
CT	New Haven	X						2		1	9	
CT	Middlesex											
CT	New London		X								7	
CT	Hartford						X	1		5	4	
CT	Tolland							2				
CT	Windham											
RI	Washington		X					1			4	
RI	Kent		X									
RI	Providence							1			3	
MA	Worcester	X								2		
MA	Middlesex	X					X					
MA	Bristol		X					1			2	
MA	Norfolk	X	X				X		1		1	
MA	Suffolk	X					X					
Total number of counties with presence of resource		19	14	2	2	16	16					
Total number of mineral occurrences								23	8	25	78	2

*Inactive Mines are not included in the existing conditions analysis due to unavailability of data.

Geography		Station ID	Station Type	Alternative 1 Stations											Alternative 2 Stations											Alternative 3 via CC and PVD (3.1) Stations											Alternative 3 via LI and PVD (3.2) Stations											Alternative 3 via LI and WOR (3.3) Stations											Alternative 3 via CC and WOR (3.4) Stations										
				Presence or Absence						Quantity					Presence or Absence						Quantity					Presence or Absence						Quantity					Presence or Absence						Quantity					Presence or Absence						Quantity					Presence or Absence						Quantity				
State	County			Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*
DC	District of Columbia	1	Existing																																																																		
MD	Prince George's	2	Existing																																																																		
MD	Prince George's	3	Existing																																																																		
MD	Prince George's	4	Existing																																																																		
MD	Anne Arundel	5	Existing					X	X										X	X										X	X										X	X										X	X										X	X					
MD	Anne Arundel	6	Existing																												X										X	X				1						X					1												
MD	Anne Arundel	6	New																	X										X					1																		X										X					1	
MD	Baltimore County	7	Existing																																																																		
MD	Baltimore County	15	Existing						X											X											X											X											X											X					
MD	Baltimore City	8	Existing																																																																		
MD	Baltimore City	9	New																																																																		
MD	Baltimore City	10	Existing																																																																		
MD	Baltimore City	11	New					X																						X		1		5							X		1		5							X		1		5							X		1		5		
MD	Baltimore City	12	New						X										X	X										X	X										X	X										X	X										X	X					
MD	Baltimore City	13	New					X	X											X										X	X										X	X										X	X										X	X					
MD	Baltimore City	14	New																											X	X										X	X										X	X										X	X					
MD	Harford	16	Existing																																																																		
MD	Harford	17	Existing					X											X											X											X											X											X						
MD	Cecil	22	Existing						X											X											X											X											X											X					
MD	Cecil	23	New					X	X										X	X										X	X										X	X										X	X										X	X					
DE	New Castle	24	Existing					X	X										X	X										X	X										X	X										X	X										X	X					
DE	New Castle	25	Existing						X											X											X											X											X											X					
DE	New Castle	26	New					X	X										X	X										X	X										X	X										X	X										X	X					
DE	New Castle	27	Existing						X											X											X											X											X											X					
DE	New Castle	28	New	X	X			X	X						X	X			X	X						X	X			X	X						X	X			X	X						X	X			X	X						X	X			X	X					
DE	New Castle	29	Existing						X											X											X											X											X											X					
PA	Delaware	30	Existing																																																																		
PA	Delaware	31	Existing																																																																		
PA	Delaware	32	Existing	X	X			X							X	X			X							X	X			X							X	X			X							X	X			X							X	X			X						
PA	Delaware	33	Existing																																																																		
PA	Delaware	34	New	X	X			X							X	X			X							X	X			X							X	X			X							X	X			X							X	X			X						
PA	Delaware	35	Existing																																																																		
PA	Delaware	36	Existing																																																																		
PA	Delaware	37	Existing																																																																		
PA	Delaware	38	Existing																																																																		
PA	Delaware	39	Existing																																																																		
PA	Delaware	40	Existing																																																																		
PA	Delaware	41	Existing																																																																		
PA	Delaware	42	Existing																																																																		
PA	Delaware	43	Existing																																																																		
PA	Philadelphia	44	Existing												X	X			X	X						X	X			X	X						X	X			X	X						X	X			X	X						X	X			X	X					
PA	Philadelphia	45	Existing												X	X			X																						X											X																	
PA	Philadelphia	46	Existing																							X	X			X							X	X			X							X	X			X							X	X			X						
PA	Philadelphia	47	Existing					X											X											X											X											X											X						
PA	Philadelphia	48	Existing																																																																		
PA	Philadelphia	49	Existing																																																																		
PA	Philadelphia	50	Existing																																																																		
PA	Philadelphia	51	Existing																																																																		
PA	Philadelphia	52	Existing																																																																		
PA	Bucks	53	Existing	X	X			X	X						X	X			X	X						X	X			X	X						X	X			X	X						X	X			X	X						X	X			X	X					
PA	Bucks	54	Existing																																																																		
PA	Bucks	55	Existing						X											X											X											X											X											X					
PA	Bucks	56	Existing						X											X											X											X											X											X					
PA	Bucks	57	Existing						X											X											X											X											X											X					

*Inactive Mines are not included in the existing conditions analysis due to unavailability of data.

Geography				Alternative 1 Stations											Alternative 2 Stations											Alternative 3 via CC and PVD (3.1) Stations											Alternative 3 via LI and PVD (3.2) Stations											Alternative 3 via LI and WOR (3.3) Stations											Alternative 3 via CC and WOR (3.4) Stations										
				Presence or Absence						Quantity					Presence or Absence						Quantity					Presence or Absence						Quantity					Presence or Absence						Quantity					Presence or Absence						Quantity					Presence or Absence						Quantity				
State	County	Station ID	Station Type	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*	Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*
NJ	Mercer	58	Existing																																																														
NJ	Mercer	60	Existing																																																														
NJ	Mercer	61	Existing	X	X			X							X	X			X							X	X			X							X	X			X							X	X			X							X	X			X						
NJ	Middlesex	62	New					X											X											X											X											X											X						
NJ	Middlesex	63	Existing																																																														
NJ	Middlesex	64	Existing					X											X											X											X											X											X						
NJ	Middlesex	65	Existing																																																														
NJ	Middlesex	66	Existing																																																														
NJ	Middlesex	67	Existing																																																														
NJ	Middlesex	68	New																																																														
NJ	Union	69	Existing																																																														
NJ	Union	70	Existing																																																														
NJ	Union	71	Existing																																																														
NJ	Union	72	Existing																																																														
NJ	Essex	73	Existing																																																														
NJ	Essex	74	Existing																																																														
NJ	Essex	75	Existing																																																														
NJ	Hudson	76	Existing																																																														
NY	New York	77	Existing																																																														
NY	New York	9993	Existing																																																														
NY	Queens	144	Existing																																		X	X			X							X	X			X																	
NY	Queens	145	New																																		X	X			X							X	X			X																	
NY	Bronx	78	New																																																														
NY	Bronx	79	New																																																														
NY	Bronx	80	New																																																														
NY	Bronx	81	New																																																														
NY	Westchester	82	Existing																																																														
NY	Westchester	83	Existing																																																														
NY	Westchester	84	Existing																																																														
NY	Westchester	85	Existing																																																														
NY	Westchester	86	Existing																																																														
NY	Westchester	87	New																																																														
NY	Westchester	88	Existing																																																														
NY	Westchester	151	New																																																														
NY	Putnam	153	Existing																																																														
NY	Nassau	146	New																																		X	X			X							X	X			X																	
NY	Suffolk	148	New																																		X	X			X							X	X			X																	
NY	Suffolk	149	Existing																																		X	X			X							X	X			X																	
CT	Fairfield	89	Existing																																																														
CT	Fairfield	90	Existing																																																														
CT	Fairfield	91	Existing																																																														
CT	Fairfield	92	Existing																																																														
CT	Fairfield	93	Existing																																																														
CT	Fairfield	94	New																																																														
CT	Fairfield	95	Existing																																																														
CT	Fairfield	96	Existing																																																														
CT	Fairfield	97	Existing																																																														
CT	Fairfield	98	Existing																																																														
CT	Fairfield	99	Existing																																																														
CT	Fairfield	100	Existing																																																														
CT	Fairfield	101	Existing																																																														
CT	Fairfield	102	Existing																																																														
CT	Fairfield	103	Existing																																																														
CT	Fairfield	104	Existing																																																														
CT	Fairfield	105	Existing																																																														
CT	Fairfield	107	New																																																														
CT	Fairfield	108	Existing																																																														
CT	Fairfield	154	New																																																														

*Inactive Mines are not included in the existing conditions analysis due to unavailability of data.

Alternative 1 Stations

Geography		Station ID	Station Type	Presence or Absence						Quantity				
State	County			Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*
CT	New Haven	109	Existing											
CT	New Haven	110	Existing											
CT	New Haven	111	Existing											
CT	New Haven	112	New											
CT	New Haven	113	Existing											
CT	New Haven	156	New											
CT	New Haven	114	Existing											
CT	New Haven	115	Existing											
CT	New Haven	116	Existing											
CT	New Haven	155	New											
CT	Middlesex	117	Existing											
CT	Middlesex	118	Existing											
CT	Middlesex	119	Existing											
CT	Middlesex	120	New											
CT	New London	121	Existing											
CT	New London	124	New											
CT	New London	122	Existing											
CT	Hartford	160	New											
CT	Hartford	160	Existing											
CT	Hartford	161	New											
CT	Hartford	164	New											
CT	Tolland	165	New											
CT	Tolland	166	New											
RI	Washington	123	Existing	X	X									
RI	Washington	125	Existing											
RI	Washington	126	Existing											
RI	Kent	127	Existing											
RI	Providence	128	Existing											
RI	Providence	129	New											
RI	Providence	130	New											
MA	Bristol	131	Existing											
MA	Bristol	132	Existing											
MA	Bristol	133	Existing											
MA	Worcester	172	Existing											
MA	Worcester	173	New											
MA	Worcester	174	New											
MA	Worcester	175	New											
MA	Middlesex	176	New											
MA	Middlesex	178	New											
MA	Middlesex	181	New											
MA	Suffolk	182	New											
MA	Norfolk	134	Existing											
MA	Norfolk	135	Existing											
MA	Norfolk	136	Existing											
MA	Suffolk	137	Existing											
MA	Suffolk	138	Existing											
MA	Suffolk	139	Existing						X					
MA	Suffolk	140	Existing						X					
MA	Suffolk	141	Existing						X					
MA	Suffolk	142	New											
MA	Suffolk	143	Existing						X					
Total number of counties with presence of resource				5	5	0	0	15	20					
Total number of mineral occurrences										0	0	0	0	0

Alternative 2 Stations

Geography		Station ID	Station Type	Presence or Absence						Quantity				
State	County			Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*
CT	New Haven	109	Existing											
CT	New Haven	110	Existing											
CT	New Haven	111	Existing											
CT	New Haven	112	New											
CT	New Haven	113	Existing											
CT	New Haven	156	New											
CT	New Haven	114	Existing											
CT	New Haven	115	Existing											
CT	New Haven	116	Existing											
CT	New Haven	155	New											
CT	Middlesex	117	Existing											
CT	Middlesex	118	Existing											
CT	Middlesex	119	Existing											
CT	Middlesex	120	New											
CT	New London	121	Existing											
CT	New London	124	New											
CT	New London	122	Existing											
CT	Hartford	160	New						X					
CT	Hartford	160	Existing											
CT	Hartford	161	New											
CT	Hartford	164	New						X					
CT	Tolland	165	New											
CT	Tolland	166	New											
RI	Washington	123	Existing	X	X									
RI	Washington	125	Existing											
RI	Washington	126	Existing											
RI	Kent	127	Existing											
RI	Providence	128	Existing											
RI	Providence	129	New											
RI	Providence	130	New											
MA	Bristol	131	Existing											
MA	Bristol	132	Existing											
MA	Bristol	133	Existing											
MA	Worcester	172	Existing											
MA	Worcester	173	New											
MA	Worcester	174	New											
MA	Worcester	175	New											
MA	Middlesex	176	New											
MA	Middlesex	178	New											
MA	Middlesex	181	New											
MA	Suffolk	182	New											
MA	Norfolk	134	Existing											
MA	Norfolk	135	Existing											
MA	Norfolk	136	Existing											
MA	Suffolk	137	Existing											
MA	Suffolk	138	Existing											
MA	Suffolk	139	Existing						X					
MA	Suffolk	140	Existing						X					
MA	Suffolk	141	Existing						X					
MA	Suffolk	142	New											
MA	Suffolk	143	Existing						X					
Total number of counties with presence of resource				7	7	0	0	16	24					
Total number of mineral occurrences										0	0	0	0	0

Alternative 3 via CC and PVD (3.1) Stations

Geography		Station ID	Station Type	Presence or Absence						Quantity				
State	County			Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*
CT	New Haven	109	Existing											
CT	New Haven	110	Existing											
CT	New Haven	111	Existing											
CT	New Haven	112	New											
CT	New Haven	113	Existing											
CT	New Haven	156	New											
CT	New Haven	114	Existing											
CT	New Haven	115	Existing											
CT	New Haven	116	Existing											
CT	New Haven	155	New											
CT	Middlesex	117	Existing											
CT	Middlesex	118	Existing											
CT	Middlesex	119	Existing											
CT	Middlesex	120	New											
CT	New London	121	Existing											
CT	New London	124	New											
CT	New London	122	Existing											
CT	Hartford	160	New											
CT	Hartford	160	Existing											
CT	Hartford	161	New											
CT	Hartford	164	New						X					
CT	Tolland	165	New											
CT	Tolland	166	New											
RI	Washington	123	Existing	X	X									
RI	Washington	125	Existing											
RI	Washington	126	Existing											
RI	Kent	127	Existing											
RI	Providence	128	Existing											
RI	Providence	129	New											
RI	Providence	130	New											
MA	Bristol	131	Existing											
MA	Bristol	132	Existing											
MA	Bristol	133	Existing											
MA	Worcester	172	Existing											
MA	Worcester	173	New											
MA	Worcester	174	New											
MA	Worcester	175	New											
MA	Middlesex	176	New											
MA	Middlesex	178	New											
MA	Middlesex	181	New											
MA	Suffolk	182	New											
MA	Norfolk	134	Existing											
MA	Norfolk	135	Existing											
MA	Norfolk	136	Existing											
MA	Suffolk	137	Existing											
MA	Suffolk	138	Existing											
MA	Suffolk	139	Existing						X					
MA	Suffolk	140	Existing						X					
MA	Suffolk	141	Existing						X					
MA	Suffolk	142	New						X					
MA	Suffolk	143	Existing						X					
Total number of counties with presence of resource				7	7	0	0	20	25					
Total number of mineral occurrences										1	0	5	1	0

Alternative 3 via LI and PVD (3.2) Stations

Geography		Station ID	Station Type	Presence or Absence						Quantity				
State	County			Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*
CT	New Haven	109	Existing											
CT	New Haven	110	Existing											
CT	New Haven	111	Existing											
CT	New Haven	112	New											
CT	New Haven	113	Existing											
CT	New Haven	156	New											
CT	New Haven	114	Existing											
CT	New Haven	115	Existing											
CT	New Haven	116	Existing											
CT	New Haven	155	New											
CT	Middlesex	117	Existing											
CT	Middlesex	118	Existing											
CT	Middlesex	119	Existing											
CT	Middlesex	120	New											
CT	New London	121	Existing											
CT	New London	124	New											
CT	New London	122	Existing											
CT	Hartford	160	New											
CT	Hartford	160	Existing											
CT	Hartford	161	New											
CT	Hartford	164	New						X					
CT	Tolland	165	New											
CT	Tolland	166	New											
RI	Washington	123	Existing	X	X									
RI	Washington	125	Existing											
RI	Washington	126	Existing											
RI	Kent	127	Existing											
RI	Providence	128	Existing											
RI	Providence	129	New											
RI	Providence	130	New											
MA	Bristol	131	Existing											
MA	Bristol	132	Existing											
MA	Bristol	133	Existing											
MA	Worcester	172	Existing											
MA	Worcester	173	New											
MA	Worcester	174	New											
MA	Worcester	175	New											
MA	Middlesex	176	New											
MA	Middlesex	178	New											
MA	Middlesex	181	New											
MA	Suffolk	182	New											
MA	Norfolk	134	Existing											
MA	Norfolk	135	Existing											
MA	Norfolk	136	Existing											
MA	Suffolk	137	Existing											
MA	Suffolk	138	Existing											
MA	Suffolk	139	Existing						X					
MA	Suffolk	140	Existing						X					
MA	Suffolk	141	Existing						X					
MA	Suffolk	142	New						X					
MA	Suffolk	143	Existing						X					
Total number of counties with presence of resource				12	12	0	0	26	25					
Total number of mineral occurrences										1	0	5	1	0

Alternative 3 via LI and WOR (3.3) Stations

Geography		Station ID	Station Type	Presence or Absence						Quantity				
State	County			Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*
CT	New Haven	109	Existing											
CT	New Haven	110	Existing											
CT	New Haven	111	Existing											
CT	New Haven	112	New											
CT	New Haven	113	Existing											
CT	New Haven	156	New											
CT	New Haven	114	Existing											
CT	New Haven	115	Existing											
CT	New Haven	116	Existing											
CT	New Haven	155	New											
CT	Middlesex	117	Existing											
CT	Middlesex	118	Existing											
CT	Middlesex	119	Existing											
CT	Middlesex	120	New											
CT	New London	121	Existing											
CT	New London	124	New											
CT	New London	122	Existing											
CT	Hartford	160	New											
CT	Hartford	160	Existing											
CT	Hartford	161	New											
CT	Hartford	164	New						X					
CT	Tolland	165	New											
CT	Tolland	166	New											
RI	Washington	123	Existing	X	X									
RI	Washington	125	Existing											
RI	Washington	126	Existing											
RI	Kent	127	Existing											
RI	Providence	128	Existing											
RI	Providence	129	New											
RI	Providence	130	New											
MA	Bristol	131	Existing											
MA	Bristol	132	Existing											
MA	Bristol	133	Existing											
MA	Worcester	172	Existing	X										
MA	Worcester	173	New	X										
MA	Worcester	174	New	X										
MA	Worcester	175	New	X										
MA	Middlesex	176	New	X										
MA	Middlesex	178	New	X										
MA	Middlesex	181	New	X										
MA	Suffolk	182	New	X										
MA	Norfolk	134	Existing											
MA	Norfolk	135	Existing											
MA	Norfolk	136	Existing											
MA	Suffolk	137	Existing											
MA	Suffolk	138	Existing											
MA	Suffolk	139	Existing						X					
MA	Suffolk	140	Existing						X					
MA	Suffolk	141	Existing	X					X					
MA	Suffolk	142	New	X					X					
MA	Suffolk	143	Existing	X					X					
Total number of counties with presence of resource				23	12	0	0	26	25					
Total number of mineral occurrences										1	0	5	1	0

Alternative 3 via CC and WOR (3.4) Stations

Geography		Station ID	Station Type	Presence or Absence						Quantity				
State	County			Seismic Hazards	Sole Source Aquifers	Karst Terrain	Naturally Occurring Asbestos	Acid Producing Soils	Landslide Susceptibility	Mineral Resources - Producer	Mineral Resources - Occurrence	Mineral Resources - Plant	Mineral Resources - Inactive Producer	Active Mines*
CT	New Haven	109	Existing											
CT	New Haven	110	Existing											
CT	New Haven	111	Existing											
CT	New Haven	112	New											
CT	New Haven	113	Existing											
CT	New Haven	156	New											
CT	New Haven	114	Existing											
CT	New Haven	115	Existing											
CT	New Haven	116	Existing											
CT	New Haven	155	New											
CT	Middlesex	117	Existing											
CT	Middlesex	118	Existing											
CT	Middlesex	119	Existing											
CT	Middlesex	120	New											
CT	New London	121	Existing											
CT	New London	124	New											
CT	New London	122	Existing											
CT	Hartford	160	New											
CT	Hartford	160	Existing											
CT	Hartford	161	New											
CT	Hartford	164	New						X					
CT	Tolland	165	New											
CT	Tolland	166	New											
RI	Washington	123	Existing	X	X									
RI	Washington	125	Existing											
RI	Washington	126	Existing											
RI	Kent	127	Existing											
RI	Providence	128	Existing											
RI	Providence	129	New											
RI	Providence	130	New											
MA	Bristol	131	Existing											
MA	Bristol	132	Existing											
MA	Bristol	133	Existing											
MA	Worcester	172	Existing	X										
MA	Worcester	173	New	X										
MA	Worcester	174	New	X										
MA	Worcester	175	New	X										
MA	Middlesex	176	New	X										
MA	Middlesex	178	New	X										
MA	Middlesex	181	New	X										
MA	Suffolk	182	New	X										
MA	Norfolk	134	Existing											
MA	Norfolk	135	Existing											
MA	Norfolk	136	Existing											
MA	Suffolk	137	Existing											
MA	Suffolk	138	Existing											
MA	Suffolk	139	Existing						X					
MA	Suffolk	140	Existing						X					
MA	Suffolk	141	Existing	X					X					
MA	Suffolk	142	New	X					X					
MA	Suffolk	143	Existing	X					X					
Total number of counties with presence of resource				18	7	0	0	20	24					
Total number of mineral occurrences										1	0	5	1	0

*Inactive Mines are not included in the existing conditions analysis due to unavailability of data.