

Appendix E.05 Hydrologic/Water Resources (Floodplains)



Floodplains Effects Assessment Methodology

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FINAL

Submitted by:



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1. Floodplains

1.1 INTRODUCTION

This methodology explains how the NEC FUTURE program will address the potential effects of the Tier 1 EIS Alternatives on floodplains in the Tier 1 EIS.

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

A floodplain is an area susceptible to flooding. The Federal Emergency Management Agency (FEMA) defines the geographic area of floodplains according to varying levels of flood risk by designating special flood hazard areas (SFHA) on a Flood Insurance Rate Map (FIRM). SFHAs are those areas that are susceptible to being inundated by a flood event having a one percent chance (base flood or 100-year flood) of being equaled or exceeded each year, and are regulated by FEMA. This Tier 1 EIS will focus on the SFHAs (regulated floodplains). The definitions below relate to floodplains and the SFHAs that will be included in the analysis for the NEC FUTURE program.

- ▶ *Base Flood*: A flood having a one percent chance of being equaled or exceeded in any given year. This is also referred to as the 100-year floodplain.
- ▶ *Base Flood Elevations (BFE)*: The elevation of surface water resulting from a flood that has a 1 percent chance of equaling or exceeding that level in any given year. The BFE is shown on the FIRM for zones AE, AH, A1–A30, AR, AR/A, AR/AE, AR/A1– A30, AR/AH, AR/AO, V1–V30, and VE (see definitions of flood zones below).
- ▶ *Advisory Base Flood Elevations (ABFE)*: The elevation of surface water resulting from a flood from in-progress or approximate studies that are intended to offer guidance on elevating new and reconstructed buildings. ABFE maps provide interim information for reconstruction efforts and can be used until new Flood Insurance Surveys (FISs) and FIRMs, if under development, become effective.
- ▶ *Floodway*: A regulatory floodway is defined by FEMA as “...the channel of a watercourse and the adjacent land that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.”
- ▶ *Flood Zones*: Flood zones are geographic areas that the FEMA has defined according to varying levels of flood risk. These zones are depicted on a community's FIRM or Flood Hazard Boundary Map. Each zone reflects the severity or type of flooding in the area.
 - *Flood Zone A*: This category and its multiple subcategories, indicate high risk flooding areas. Within the Zone A, these areas have been calculated as having a 1 percent annual chance of

flooding and there are mandatory requirements for flood insurance for those communities that participate in the National Flood Insurance Program (NFIP). The subcategories within Zone A include: AO, AH, A1-A30, AE, A99, and AR. These subcategories are variations on the types of waterways with which flooding may be associated or those that have BFEs calculated and shown on the FIRMs. For purposes of this Tier 1 EIS analysis, anything within a Zone A category is included in the definition of a floodplain.

- *Flood Zone V*: This category and its subcategories (VE, V1-30), indicate high risk flooding areas within coastal areas. The Zone V designation includes coastal areas with a 1 percent or greater chance of flooding and an additional hazard associated with storm waves. For those communities that participate in the NFIP, mandatory insurance is required within Zone V. For purposes of this Tier 1 EIS analysis, anything within a Zone V category is included in the definition of a floodplain.

1.3 RELATED RESOURCES

The effects assessments from other resources evaluated as part of the Tier 1 EIS will be used to assess the effects on floodplains. 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 Floodplains Assessment

Resource	Input to Floodplains Assessment
Land Cover	<ul style="list-style-type: none"> ▪ Land cover assessment for areas where a “conversion” of land use may occur ▪ Land cover assessment to determine existing land cover types, such as residential areas, to identify potential flooding risk
Water Resources	<ul style="list-style-type: none"> ▪ Effects of water resources that overlap with floodplains and thus aggravate flooding conditions/risks
Coastal Zones & Saltwater Wetlands	<ul style="list-style-type: none"> ▪ Effects of coastal zones & saltwater wetlands that overlap with floodplains and thus aggravate flooding conditions/risks
Climate Change	<ul style="list-style-type: none"> ▪ Vulnerability assessment associated with flooding risks; qualitative evaluation of the potential impact climate change may have on changing flood zones

Source: NEC FUTURE JV Team, 2013

1.4 AGENCY AND REGULATORY FRAMEWORK

Floodplains are subject to regulation by FEMA. Approvals or permits are issued by at the state or local level. Applicable legislation and regulations, listed in Table 2 will be considered, consistent with a Tier 1 level of assessment, in the evaluation of floodplains for the NEC FUTURE Program.

Table 2 –Management and Regulation of Floodplains

Federal Agency	Regulatory Oversight	Description of Regulation	Regulated Resource
FEMA	<ul style="list-style-type: none"> Nation Flood Insurance Program (NFIP) 	<ul style="list-style-type: none"> Identifies flood hazard areas throughout the U.S. and its territories and produces Flood Hazard Boundary Maps and FIRMs. These maps are used for floodplain management and to determine risk-based flood insurance premiums for the NFIP. 	<ul style="list-style-type: none"> Floodplain mapping/floodplain management regulations

Source: NEC FUTURE JV Team, 2013

Additionally, the following Executive Orders pertain to floodplains:

- ▶ *Executive Order (EO) 11988: Floodplain Management*: EO 11988 requires federal agencies to avoid, to the extent possible, the short-and long-term adverse impacts associated with the occupancy and modification of floodplains. Federal agencies are to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.
- ▶ *Floodplain Management Department of Transportation Order (DOT) 5650.2 "Floodplain Management and Protection"*: The purpose of DOT Order 5650.2 is to ensure that proper consideration is given to the avoidance and mitigation of adverse floodplain impacts by DOT actions, planning programs and budget requests.

1.4.1 Regulatory Compliance

No formal agency approvals would be requested for the Tier 1 EIS. The requirements for subsequent Tier 2 evaluations, including compliance with EO 11988 as well as state and local regulations, will be described in the Tier 1 EIS. During the Tier 1 EIS process, the FRA will engage in dialogue with FEMA to discuss methodologies, assumptions and findings and how Tier 1 EIS Alternatives avoid or consider floodplains as well as identify potential opportunities to streamline subsequent Tier 2 environmental reviews (see Section 1.7). Coordination with FEMA 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 floodplains 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 floodplains, and the approach for evaluating potential direct effects¹. Direct effects

¹ Direct Effects are caused by the action and occur at the same time and place (40 CFR § 1508.8)

include encroachment or fill within a floodplain. Indirect effects², those related to induced growth, will be addressed in a separate methodology (see Indirect Effects Assessment Methodology).

1.5.1 Existing Conditions

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

Table 3 – Data Sources for the Evaluation of Floodplains

Resource	Data Source	Data Application
Floodplains	<ul style="list-style-type: none"> ▪ Digital Geospatial Version of Flood Hazard Information published on Flood Insurance Rate Maps (FIRMs) ▪ Advisory Base Flood Elevation and preliminary data where available 	<ul style="list-style-type: none"> ▪ Data will be mapped in GIS and overlain on the Affected Environment

Source: NEC FUTURE JV, 2013

The existing conditions for floodplains will be documented in the Tier 1 EIS for an established Affected Environment and Context Area. The Affected Environment is a 2,000-foot-wide swath centered on the Representative Route³ for each of the Tier 1 EIS Alternatives. This 2,000-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 floodplains and affiliated water features that may extend beyond the Representative Route

Within the Affected Environment, the total area (acres) of SFHAs, as defined in Section 1.2, will be estimated within each state on a county-by-county basis.

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

² Indirect Effects are those effects that occur later in time or are further removed in distance (40 CFR § 1508.8)

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.

1.5.2 Environmental Consequences

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

Environmental consequences on floodplains within the Affected Environment will be identified as follows:

1. Overlay available floodplain data for the Affected Environment with the Representative Route associated with the Tier 1 EIS Alternatives to identify portions of the floodplain that could be directly impacted by the alternatives. The area (in acres) of potentially directly-impacted floodplain will be mapped and presented for each Tier 1 EIS Alternative by county and state.
2. To assess potential alterations to floodplains associated with the Tier 1 EIS Alternatives, floodplains affected by a Tier 1 EIS Alternative will be further reviewed and compared to the proposed prototypical cross sections of the Representative Route for that portion of the Tier 1 EIS Alternative. Areas where earth moving activities, such as tunneling, structures and excavation, are proposed will be noted and the potential effects related to typical construction methods on the floodplain will be qualitatively described and mapped.
3. Where the analysis indicates that alterations to the floodplain may occur, a review of the existing and contiguous land cover will be undertaken to qualitatively assess the flooding risks. For example, alterations to floodplains adjacent to developed areas may result in an increased risk to humans whereas alterations to floodplains adjacent to undeveloped areas may not.
4. Overlay identified effects on freshwater water resources, coastal zones and saltwater wetlands with floodplain data to qualitatively discuss areas where flooding conditions/risks may be aggravated.
5. Flooding risks and resulting vulnerabilities are subject to increase due to climate change and sea level rise and are analyzed in the Climate Change and Sea Level Rise Methodology. Drawing on the climate change vulnerability analysis, any proposed infrastructure or NEC reconstruction associated with the Tier 1 EIS Alternatives located within a floodplain or an area that has been identified as being susceptible to an increase in flooding or expanded floodplain will be qualitatively discussed and mapped.

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

Temporary construction-related effects to floodplains 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 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 measure would be to incorporate the use of pervious materials for proposed rail infrastructure within floodplains.

1.6 TIER 1 EIS OUTCOMES

The Tier 1 EIS floodplain assessment will:

- ▶ Quantify acres of floodplains within the Affected Environment to establish the existing conditions
- ▶ Map the distribution of floodplains within the Affected Environment and Context Area
- ▶ Identify portions of the Representative Route of the Tier 1 EIS Alternatives that lie within the floodplains and calculate potential acreages of floodplain encroachment (fill within a floodplain) and potential alterations to floodplains
- ▶ Qualitatively assess and map further potential alterations to floodplains associated with proposed prototypical cross sections
- ▶ Qualitatively assess potential flooding risks on existing and contiguous land use cover as identified in Table 1
- ▶ Qualitatively assess and map areas where flooding conditions may be aggravated due to identified effects on freshwater resources, coastal areas and saltwater wetlands
- ▶ Qualitatively assess and map infrastructure vulnerabilities within identified floodplains as they relate to the climate change vulnerability analysis
- ▶ Identify if the Tier 1 EIS Alternatives avoid direct effects on floodplains
- ▶ Identify a menu of potential mitigation measures to be applied at Tier 2
- ▶ Describe regulatory compliance requirements for subsequent Tier 2 evaluations

1.7 APPLICABILITY TO TIER 2 ASSESSMENTS

The Tier 1 analysis will identify areas where there is potential for encroachment and fill of floodplains. Tier 2 analysis would further define the effects on floodplains and determine the actual results of encroaching/filling identified floodplains at specific locations, as well as include the development of mitigation measures and designs that would avoid or minimize the effects on floodplains.

Additionally, 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 floodplains, FRA would coordinate with FEMA to determine whether or not those portions need further evaluation of floodplains during the Tier 2 environmental review process.

Application of Effects-Assessment Methodology

5.2 FLOODPLAINS: APPLICATION OF EFFECTS-ASSESSMENT METHODOLOGY

5.2.1 Variations to Effects-Assessment Methodology

There were no variations to the Effects-Assessment Methodology during the Tier 1 Draft EIS analysis.

5.2.2 Data Variations

There were no variations from the identified data sources in the Effects-Assessment Methodology during the development of the Tier 1 Draft EIS analysis.

5.2.3 Criteria for Analysis

Existing Conditions

- ▶ The FRA calculated the total number of acres of Special Flood Hazard Area (SFHA) within the Affected Environment by overlaying the Affected Environment of each Action Alternative with the National Flood Hazard Layer (NFHL) for each county and state.
- ▶ The FRA calculated the average total number of acres of SFHA within the Affected Environment by county. All counties encompassing the average of 700 or more acres of SFHA within the Affected Environment of each Action Alternative and the existing NEC were further identified as having the most potential impacts to floodplains. Waterbodies within those counties and the Affected Environment of each Action Alternative were also identified.
- ▶ The FRA calculated the total number of acres of SFHA present within each county and separately for each state as a percentage of the total area of the Affected Environment of each Action Alternative within that same county or state.

Environmental Consequences

- ▶ The FRA calculated the total number of acres of SFHA within the Representative Route by overlaying the Representative Route of each Action Alternative with the NFHL for each county and state.
- ▶ The FRA calculated the average total number of acres of SFHA within the Affected Environment by county. All counties encompassing the average 50 or more acres of SFHA within the Representative Route were further identified as having the most potential impacts to floodplains. Waterbodies within those counties and the Representative Route of each Alternative were also identified.
- ▶ For each Action Alternative and the existing NEC, the FRA calculated the total number of acres of SFHA present within the Representative Route for each county and separately for each state as a percentage of the total area of the Representative Route within that same county or state.

Environmental Consequences – Stations

- ▶ The FRA calculated the number of acres of SFHA present within station areas for each county and state using the same GIS data layers and processes as described earlier in this section for the Environmental Consequences analysis.

Data Matrices

Geography		Floodplains Environmental Consequences (Acres)							Floodplains Affected Environment (Acres)						
State	County	Existing NEC	Alternative 1	Alternative 2	Alternative 3				Existing NEC	Alternative 1	Alternative 2	Alternative 3			
					via CC and PVD (3.1)	via LI and PVD (3.2)	via LI and WOR (3.3)	via CC and WOR (3.4)				via CC and PVD (3.1)	via LI and PVD (3.2)	via LI and WOR (3.3)	via CC and WOR (3.4)
DC	District of Columbia	7	7	7	23	23	23	23	121	121	121	127	127	127	127
MD	Prince George's	32	32	32	98	98	98	98	547	547	547	561	561	561	561
MD	Anne Arundel	49	49	49	159	159	159	159	745	745	745	774	774	774	774
MD	Howard	0	0	0	0	0	0	0	7	7	7	8	8	8	8
MD	Baltimore County	12	12	12	68	68	68	68	374	374	374	695	695	695	695
MD	Baltimore City	14	14	14	19	19	19	19	83	88	88	204	204	204	204
MD	Harford	61	61	61	179	179	179	179	948	948	946	1498	1498	1498	1498
MD	Cecil	34	34	66	109	109	109	109	606	606	860	862	862	862	862
DE	New Castle	51	51	109	201	201	201	201	1643	1643	2339	2368	2368	2368	2368
PA	Delaware	7	7	40	30	30	30	30	291	291	487	589	589	589	589
PA	Montgomery	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PA	Philadelphia	21	21	91	30	30	30	30	478	478	1411	1057	1057	1057	1057
PA	Bucks	21	21	21	71	71	71	71	535	535	534	555	555	555	555
NJ	Salem	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NJ	Gloucester	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NJ	Camden	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NJ	Burlington	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NJ	Mercer	33	33	33	93	93	93	93	440	440	440	459	459	459	459
NJ	Middlesex	43	43	45	155	155	155	155	994	994	1037	1063	1063	1063	1063
NJ	Somerset	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NJ	Union	5	5	10	18	18	18	18	158	158	161	161	161	161	161
NJ	Essex	23	23	45	63	63	63	63	366	366	377	379	379	379	379
NJ	Bergen	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NJ	Hudson	37	43	43	106	106	106	106	1188	1219	1232	1656	1656	1656	1656
NY	New York	7	7	7	7	7	7	7	264	282	299	490	490	490	490
NY	Richmond	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NY	Queens	5	5	5	5	5	5	5	161	161	247	247	305	305	247
NY	Kings	0	0	0	0	0	0	0	11	11	63	63	147	147	63
NY	Bronx	50	50	57	110	50	50	110	497	497	502	519	497	497	519
NY	Westchester	2	2	4	24	2	2	24	232	232	252	870	232	232	870
NY	Putnam	0	0	0	0	0	0	0	0	0	0	86	0	0	86
NY	Nassau	0	0	0	0	0	0	0	0	0	0	0	4	4	0
NY	Suffolk	0	0	0	0	5	5	0	0	0	0	0	222	222	0
CT	Fairfield	63	70	84	78	70	70	79	1288	1397	1549	1788	1397	1397	1788
CT	Litchfield	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CT	New Haven	104	104	176	108	169	169	108	2015	2015	2578	2393	2805	2805	2393
CT	Hartford	0	0	110	25	40	56	41	0	0	882	596	538	681	739
CT	Tolland	0	0	1	1	1	27	27	0	0	237	237	237	391	391
CT	Windham	0	0	0	0	0	0	0	0	0	0	0	0	2	2
CT	Middlesex	46	58	46	46	46	46	46	820	859	820	820	820	820	820
CT	New London	235	266	235	235	235	235	235	3332	3754	3332	3332	3332	3332	3332
RI	Washington	48	69	48	48	48	48	48	1479	1712	1479	1479	1479	1479	1479
RI	Kent	15	15	15	15	15	15	15	488	488	488	488	488	488	488
RI	Providence	14	14	22	25	25	14	14	217	217	560	557	557	217	217
MA	Hampden	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MA	Worcester	0	0	0	0	0	55	55	0	0	0	0	0	977	977
MA	Middlesex	0	0	0	0	0	17	17	0	0	0	0	0	349	349
MA	Bristol	9	9	10	33	33	9	9	464	464	501	513	513	513	513
MA	Norfolk	12	12	21	52	52	12	12	393	393	386	399	399	399	399
MA	Suffolk	2	2	1	3	3	3	3	84	84	84	89	89	181	181
DC	Total	7	7	7	23	23	23	23	121	121	121	127	127	127	127
MD	Total	202	202	234	631	631	631	631	3308	3313	3566	4601	4601	4601	4601
DE	Total	51	51	109	201	201	201	201	1643	1643	2339	2368	2368	2368	2368
PA	Total	49	49	152	131	131	131	131	1304	1304	2432	2201	2201	2201	2201
NJ	Total	141	147	177	435	435	435	435	3146	3177	3248	3717	3717	3717	3717
NY	Total	64	64	73	145	69	69	145	1165	1183	1363	2275	1896	1896	2275
CT	Total	448	498	652	493	560	602	535	7454	8025	9397	9166	9129	9428	9465
RI	Total	77	98	84	88	88	77	77	2185	2417	2527	2525	2525	2185	2185
MA	Total	22	22	32	88	88	95	95	941	941	972	1000	1001	2418	2418
Grand Total		1060	1137	1521	2234	2225	2262	2272	21268	22124	25966	27980	27564	28939	29355

Geography		Station ID	Station Type	Floodplains					
State	County			Stations (Acres)				Alternative 3	
				Alternative 1	Alternative 2	via CC and PVD (3.1)	via LI and PVD (3.2)	via LI and WOR (3.3)	via CC and WOR (3.4)
DC	District of Columbia	1	Existing	0	0	0	0	0	0
MD	Prince George's	2	Existing	2	2	2	2	2	2
MD	Prince George's	3	Existing	0	0	0	0	0	0
MD	Prince George's	4	Existing	0	0	0	0	0	0
MD	Anne Arundel	5	Existing	0	0	0	0	0	0
MD	Anne Arundel	6	Existing	0	11	11	11	11	11
MD	Anne Arundel	6	New	11	0	11	11	11	11
MD	Baltimore County	7	Existing	4	4	4	4	4	4
MD	Baltimore County	15	Existing	0	0	0	0	0	0
MD	Baltimore City	8	Existing	0	0	0	0	0	0
MD	Baltimore City	9	New	0	0	0	0	0	0
MD	Baltimore City	10	Existing	14	14	14	14	14	14
MD	Baltimore City	11	New	0	0	0	0	0	0
MD	Baltimore City	12	New	0	0	0	0	0	0
MD	Baltimore City	13	New	0	0	0	0	0	0
MD	Baltimore City	14	New	0	0	*	*	*	*
MD	Harford	16	Existing	0	0	0	0	0	0
MD	Harford	17	Existing	0	0	0	0	0	0
MD	Cecil	22	Existing	0	0	0	0	0	0
MD	Cecil	23	New	0	0	0	0	0	0
DE	New Castle	24	Existing	0	0	0	0	0	0
DE	New Castle	25	Existing	0	0	0	0	0	0
DE	New Castle	26	New	1	1	1	1	1	1
DE	New Castle	27	Existing	12	12	12	12	12	12
DE	New Castle	28	New	0	0	0	0	0	0
DE	New Castle	29	Existing	1	1	1	1	1	1
PA	Delaware	30	Existing	0	0	0	0	0	0
PA	Delaware	31	Existing	0	0	0	0	0	0
PA	Delaware	32	Existing	7	7	7	7	7	7
PA	Delaware	33	Existing	5	5	5	5	5	5
PA	Delaware	34	New	3	3	3	3	3	3
PA	Delaware	35	Existing	4	4	4	4	4	4
PA	Delaware	36	Existing	0	0	0	0	0	0
PA	Delaware	37	Existing	0	0	0	0	0	0
PA	Delaware	38	Existing	0	0	0	0	0	0
PA	Delaware	39	Existing	0	0	0	0	0	0
PA	Delaware	40	Existing	0	0	0	0	0	0
PA	Delaware	41	Existing	1	1	1	1	1	1
PA	Delaware	42	Existing	0	0	0	0	0	0
PA	Delaware	43	Existing	0	0	0	0	0	0
PA	Philadelphia	44	Existing	0	6	5	5	5	5
PA	Philadelphia	45	Existing	44	44	44	44	44	44
PA	Philadelphia	46	Existing	0	0	0	0	0	0
PA	Philadelphia	47	Existing	0	0	0	0	0	0
PA	Philadelphia	48	Existing	0	0	0	0	0	0
PA	Philadelphia	49	Existing	0	0	0	0	0	0
PA	Philadelphia	50	Existing	0	0	0	0	0	0
PA	Philadelphia	51	Existing	0	0	0	0	0	0
PA	Philadelphia	52	Existing	2	2	2	2	2	2
PA	Bucks	53	Existing	0	0	0	0	0	0
PA	Bucks	54	Existing	0	0	0	0	0	0
PA	Bucks	55	Existing	3	3	3	3	3	3
PA	Bucks	56	Existing	0	0	0	0	0	0
PA	Bucks	57	Existing	0	0	0	0	0	0
NJ	Mercer	58	Existing	12	12	12	12	12	12
NJ	Mercer	60	Existing	0	0	0	0	0	0
NJ	Mercer	61	Existing	0	0	0	0	0	0

*Potential impacts of less than 0.5 acres.

Geography		Station ID	Station Type	Floodplains							
State	County			Stations (Acres)				Alternative 3			
				Alternative 1	Alternative 2	via CC and PVD (3.1)	via LI and PVD (3.2)	via LI and WOR (3.3)	via CC and WOR (3.4)		
NJ	Middlesex	62	New	0	0	0	0	0	0		
NJ	Middlesex	63	Existing	1	1	1	1	1	1		
NJ	Middlesex	64	Existing	0	0	0	0	0	0		
NJ	Middlesex	65	Existing	0	0	0	0	0	0		
NJ	Middlesex	66	Existing	0	0	0	0	0	0		
NJ	Middlesex	67	Existing	*	*	*	*	*	*		
NJ	Middlesex	68	New	0	0	2	2	2	2		
NJ	Union	69	Existing	1	1	1	1	1	1		
NJ	Union	70	Existing	0	0	0	0	0	0		
NJ	Union	71	Existing	0	0	0	0	0	0		
NJ	Union	72	Existing	0	0	0	0	0	0		
NJ	Essex	73	Existing	26	0	26	26	26	26		
NJ	Essex	74	Existing	5	5	5	5	5	5		
NJ	Essex	75	Existing	0	0	5	5	5	5		
NJ	Hudson	76	Existing	22	22	22	22	22	22		
NY	New York	77	Existing	0	0	0	0	0	0		
NY	New York	9993	Existing	0	0	0	0	0	0		
NY	Queens	144	Existing	0	0	0	0	0	0		
NY	Queens	145	New	0	0	0	0	0	0		
NY	Bronx	78	New	2	2	2	2	2	2		
NY	Bronx	79	New	0	0	0	0	0	0		
NY	Bronx	80	New	3	3	3	3	3	3		
NY	Bronx	81	New	13	13	13	13	13	13		
NY	Westchester	82	Existing	0	0	0	0	0	0		
NY	Westchester	83	Existing	0	0	0	0	0	0		
NY	Westchester	84	Existing	6	6	6	6	6	6		
NY	Westchester	85	Existing	0	0	0	0	0	0		
NY	Westchester	86	Existing	1	1	1	1	1	1		
NY	Westchester	87	New	0	0	0	0	0	0		
NY	Westchester	88	Existing	3	3	3	3	3	3		
NY	Westchester	151	New	0	0	0	0	0	0		
NY	Putnam	153	Existing	0	0	0	0	0	0		
NY	Nassau	146	New	0	0	0	0	0	0		
NY	Suffolk	148	New	0	0	0	0	0	0		
NY	Suffolk	149	Existing	0	0	0	0	0	0		
CT	Fairfield	89	Existing	5	5	5	5	5	5		
CT	Fairfield	90	Existing	0	0	0	0	0	0		
CT	Fairfield	91	Existing	0	0	0	0	0	0		
CT	Fairfield	92	Existing	0	0	0	0	0	0		
CT	Fairfield	93	Existing	0	0	0	0	0	0		
CT	Fairfield	94	New	0	0	0	0	0	0		
CT	Fairfield	95	Existing	0	0	0	0	0	0		
CT	Fairfield	96	Existing	0	0	0	0	0	0		
CT	Fairfield	97	Existing	3	3	3	3	3	3		
CT	Fairfield	98	Existing	0	0	0	0	0	0		
CT	Fairfield	99	Existing	0	0	0	0	0	0		
CT	Fairfield	100	Existing	5	5	5	5	5	5		
CT	Fairfield	101	Existing	8	8	8	8	8	8		
CT	Fairfield	102	Existing	1	1	1	1	1	1		
CT	Fairfield	103	Existing	0	0	0	0	0	0		
CT	Fairfield	104	Existing	0	0	0	0	0	0		
CT	Fairfield	105	Existing	24	24	24	24	24	24		
CT	Fairfield	107	New	0	0	0	0	0	0		
CT	Fairfield	108	Existing	3	3	3	3	3	3		
CT	Fairfield	154	New	0	0	0	0	0	0		
CT	New Haven	109	Existing	0	0	0	0	0	0		
CT	New Haven	110	Existing	2	2	2	2	2	2		

*Potential impacts of less than 0.5 acres.

Geography		Station ID	Station Type	Floodplains Stations (Acres)					
State	County			Alternative 1	Alternative 2	Alternative 3			
						via CC and PVD (3.1)	via LI and PVD (3.2)	via LI and WOR (3.3)	via CC and WOR (3.4)
CT	New Haven	111	Existing	15	15	15	15	15	15
CT	New Haven	112	New	0	18	0	18	18	0
CT	New Haven	113	Existing	2	2	2	2	2	2
CT	New Haven	156	New	0	6	0	6	6	0
CT	New Haven	114	Existing	6	6	6	6	6	6
CT	New Haven	115	Existing	15	15	15	15	15	15
CT	New Haven	116	Existing	0	0	0	0	0	0
CT	New Haven	155	New	0	0	1	0	0	1
CT	Middlesex	117	Existing	0	0	0	0	0	0
CT	Middlesex	118	Existing	3	3	3	3	3	3
CT	Middlesex	119	Existing	0	0	0	0	0	0
CT	Middlesex	120	New	0	0	0	0	0	0
CT	New London	121	Existing	18	18	18	18	18	18
CT	New London	124	New	0	0	0	0	0	0
CT	New London	122	Existing	38	38	38	38	38	38
CT	Hartford	160	New	0	0	0	0	0	0
CT	Hartford	160	Existing	0	0	0	0	0	0
CT	Hartford	161	New	0	3	3	3	3	3
CT	Hartford	164	New	0	0	0	0	0	0
CT	Tolland	165	New	0	0	0	0	0	0
CT	Tolland	166	New	0	0	0	0	0	0
RI	Washington	123	Existing	4	4	4	4	4	4
RI	Washington	125	Existing	0	0	0	0	0	0
RI	Washington	126	Existing	5	5	5	5	5	5
RI	Kent	127	Existing	0	0	0	0	0	0
RI	Providence	128	Existing	1	1	1	1	1	1
RI	Providence	129	New	0	1	1	1	1	1
RI	Providence	130	New	0	0	0	0	0	0
MA	Bristol	131	Existing	0	0	0	0	0	0
MA	Bristol	132	Existing	0	0	0	0	0	0
MA	Bristol	133	Existing	1	1	1	1	1	1
MA	Worcester	172	Existing	0	0	0	0	0	0
MA	Worcester	173	New	0	0	0	0	0	0
MA	Worcester	174	New	0	0	0	0	0	0
MA	Worcester	175	New	0	0	0	0	17	17
MA	Middlesex	176	New	0	0	0	0	0	0
MA	Middlesex	178	New	0	0	0	0	0	0
MA	Middlesex	181	New	0	0	0	0	0	0
MA	Suffolk	182	New	0	0	0	0	0	0
MA	Norfolk	134	Existing	6	6	6	6	6	6
MA	Norfolk	135	Existing	0	0	0	0	0	0
MA	Norfolk	136	Existing	9	9	9	9	9	9
MA	Suffolk	137	Existing	0	0	0	0	0	0
MA	Suffolk	138	Existing	0	0	0	0	0	0
MA	Suffolk	139	Existing	0	0	0	0	0	0
MA	Suffolk	140	Existing	0	0	0	0	0	0
MA	Suffolk	141	Existing	0	0	0	0	0	0
MA	Suffolk	142	New	0	0	0	0	0	0
MA	Suffolk	143	Existing	1	1	1	1	1	1
Grand Total				386	394	415	439	456	432

*Potential impacts of less than 0.5 acres.