APPENDIX K

Supplemental Information on Alternatives Development

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Introduction

The Bureau of Ocean Energy Management (BOEM) considered alternatives to the Proposed Action that were identified through coordination with cooperating and participating agencies and through public comments received during the public scoping period for the environmental impact statement (EIS). BOEM evaluated the alternatives and excluded from further consideration alternatives that did not meet the purpose and need, did not meet the screening criteria, or both. The screening criteria are presented below. Alternatives that were considered and carried forward for detailed analysis are presented in Section 2.1 of the EIS, Alternatives, and alternatives excluded from further consideration, are presented in Section 2.1.8, Alternatives Considered but Dismissed from Detailed Analysis.

The sections below provide more detail on BOEM's screening criteria followed by additional background on the evolution of the layouts carried forward for Alternatives C1, C2, E1, and E2.

Alternatives Screening Criteria

An alternative would be considered but not analyzed in detail if it meets any of the following criteria (BOEM 2022)[1]:

- It does not respond to BOEM's purpose and need:
    - It results in activities that are prohibited under the lease, e.g., requiring locating part, or all, of the wind energy facility outside of the Lease Area, or constructing and operating a facility for another form of energy.
    - It is inconsistent with the following federal and state policy goals:
        - The United States' policy under the Outer Continental Shelf Lands Act to make Outer Continental Shelf (OCS) energy resources available for the expeditious and orderly development, subject to environmental safeguards
        - Executive Order 14008 (Tackling the Climate Crisis at Home and Abroad) issued on January 27, 2021
        - The shared goal of the U.S. Departments of Interior, Energy, and Commerce to deploy 30 gigawatts (GW) of offshore wind in the United States by 2030, while protecting biodiversity and promoting ocean co-use
        - The goals of affected states, including state laws that establish renewable energy goals and mandates, where applicable
    - It is inconsistent with existing law, regulation, or policy; a state or federal agency would be prohibited from permitting activities required by the alternative.
- It does not meet most of the applicant's goals:
    - It proposes relocating most of the Project outside of the area proposed by the applicant.

[1] BOEM's Process for Identifying Alternatives for Environmental Reviews of Offshore Wind Construction and Operations Plans pursuant to the National Environmental Policy Act (NEPA) published June 22, 2022, is available at this link: https://www.boem.gov/sites/default/files/documents/renewable-energy/BOEM%20COP%20EIS%20Alternatives-2022-06-22.pdf

    - It results in the development of a project that would not allow the developer to satisfy contractual offtake obligations.

- There is no scientific evidence that the alternative would avoid or substantially lessen one or more significant socioeconomic or environmental effects of the Project.
- It is technically infeasible or impractical, meaning implementation of the alternative is unlikely given past and current practice, technology, and/or site conditions as determined by BOEM's technical experts.
- It is economically infeasible or impractical, meaning implementation of the alternative is unlikely due to unreasonable costs as determined by BOEM's technical and economic experts.
- It is environmentally infeasible, meaning implementation of the alternative would not be allowed by another agency from which a permit or approval is required, or implementation results in an obvious and substantial increase in impacts on the human environment that outweighs potential benefits.
- The implementation of the alternative is remote or speculative, or it is too conceptual in that it lacks sufficient detail to meaningfully analyze impacts; or there is insufficient available information to determine whether the alternative is technically feasible.
- It has a substantially similar design to another alternative that is being analyzed in detail.
- It would have a substantially similar effect as an alternative that is analyzed in detail.

Alternative C: Habitat Impact Minimization Alternative (Habitat Alternative)

The Revolution Wind Renewable Energy Lease OCS-A 0486 (Lease Area), partially located on Cox Ledge, is dominated by complex benthic habitats, with large contiguous areas of complex habitats located centrally and throughout the entire southern portion of the Lease Area. Smaller, patchy areas of complex habitats also occur throughout the northern portion of the Lease Area (see Appendix X2 [Inspire Environmental 2023] in the *Construction & Operations Plan Revolution Wind Farm* [COP] [VHB 2023] for the benthic habitat mapping report).

BOEM received scoping comments from the U.S. Environmental Protection Agency (EPA), the New England and Mid-Atlantic Fisheries Management Councils, the Defenders of Wildlife, the Nature Conservancy, and National Marine Fisheries Service (NMFS) that supported the creation of an EIS alternative focused on reducing impacts to complex benthic habitat that may support important commercial and recreational fisheries species in the Lease Area (SWCA Environmental Consultants 2022). Some of these comments specifically cited the importance of Cox Ledge and surrounding complex habitat areas for Atlantic cod (*Gadus morhua*) spawning and survival of juvenile cod. The extensive boulders and cobbles in the area also provide habitat for other structure-oriented fish species, such as black sea bass (*Centropristis striata*).

Micrositing,[2] in which the installation location of a wind turbine generator (WTG) foundation is altered slightly from the proposed location to avoid sensitive habitat or seabed hazards, allows for the reduction of impacts to complex habitats at some WTG locations. However, given the density of complex habitats throughout the Lease Area, it would not be feasible to fully avoid impacts to these habitats and meet the existing power purchase agreements (PPAs) with the largest turbine size considered in the project design envelope (PDE). Therefore, Alternative C considers and prioritizes contiguous areas of complex habitat that should be excluded from development to avoid and minimize impacts to complex habitats to the greatest extent possible while meeting BOEM's purpose and need. Alternative C seeks to reduce impacts to sensitive benthic habitats within the Lease Area that are most vulnerable to permanent and long-term impacts from the Proposed Action. The number of WTGs that could be removed in Alternative C is based on the minimum power output for Revolution Wind, LLC (Revolution Wind) (704 megawatts [MW]) using the largest-capacity WTG in the PDE (12 MW). BOEM determined a maximum of 36 WTG locations could be eliminated from the proposed 100 locations, which include a minimum of five "spare" WTG positions to allow for installation and engineering flexibility.

Preliminary Screening and Rationale

BOEM sought NMFS's Greater Atlantic Regional Fisheries Office (GARFO) input on determining which WTG positions should be removed to most effectively reduce impacts to complex benthic habitats in the Lease Area. GARFO provided BOEM with four priority areas for potential avoidance (Figure K-1). In order of descending priority, GARFO identified Area 1 (eight WTG positions), Area 2 (38 WTG positions), Area 3a (six WTG positions), and Area 3b (nine WTG positions). The identification and ranking of these priority areas were based on multibeam backscatter data and the presence of identified large boulders (i.e., > 0.5–1.0 meters [m] in diameter) within the Lease Area; their proximity to Cox Ledge; and the importance of these habitats as EFH, particularly for spawning Atlantic cod. The estimated importance of these areas to Atlantic cod is supported by recent acoustic, telemetry, and fisheries-dependent biological sample data (Van Hoeck et al. 2022; Van Parijs 2022). Based on the COP and additional feedback from the applicant, BOEM continues to assume no change to the offshore substation locations due to feasibility constraints that would delay the Project to the extent that it would no longer meet the PPA obligations or BOEM's purpose and need as described in Section 1.2 of the EIS. The scientific rationale for the prioritization of the four priority areas is provided in the following paragraphs.

[2] In accordance with 30 Code of Federal Regulations 585.634(C)(6), micrositing of WTG foundations may occur within a 500-foot (152-meter [m]) radius around each proposed WTG location. The micrositing allowance for the Project is a diamond-shaped area within the 500-foot (152-m) radius circle surrounding foundation locations, ensuring 1.15-mile (1-nautical mile [nm]) spacing on the cardinal directions and no less than 0.7 mile (0.6 nm) on the inter-cardinal directions.

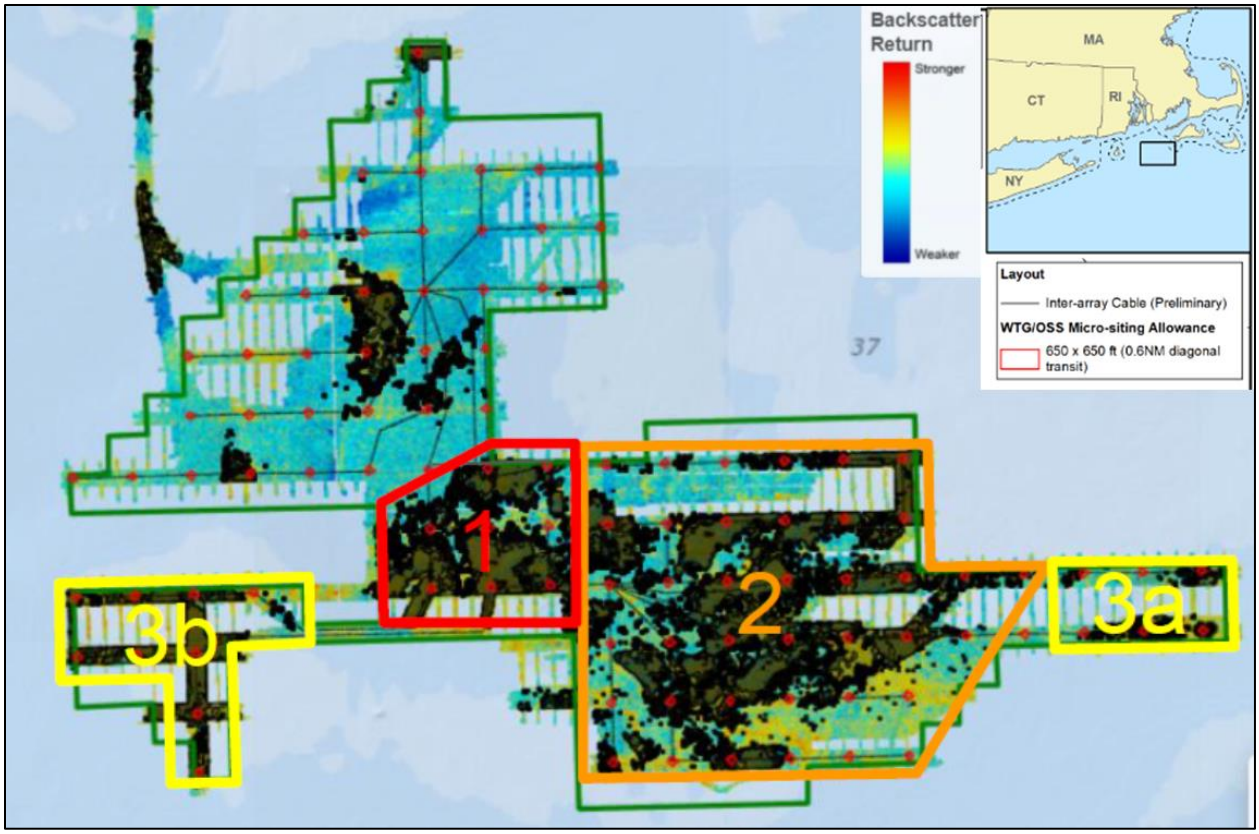

Figure K-1. Alternative C development. Revolution Wind Lease Area with multi-beam backscatter and boulder presence (dark green with black outlines; data from construction and operations plan Appendix X2) shown in relation to the four priority areas identified for avoidance by the Greater Atlantic Regional Fisheries Office on November 5, 2021.

Area 1 contains contiguous complex habitat illustrated by high multibeam backscatter return and a high density of large boulders (> 0.5–1.0 m in diameter). This area overlaps documented cod spawning activity based on recent acoustic, telemetry, and fisheries-dependent biological sample data (Van Hoeck et al. 2022; Van Parijs 2022). GARFO requested no modification in the shape of this area targeted for removal.

Area 2 contains large areas of contiguous complex habitat illustrated by high multibeam backscatter return and a high density of large boulders (> 0.5–1.0 m in diameter). Acoustic and telemetry data for Atlantic cod in this area are limited (Van Parijs 2022). Ongoing research and emerging data will assist in evaluating the importance of this area for cod spawning. GARFO requested that any modification of this area be limited to modifying the boundaries of the area rather than selection of particular turbine locations within the area and should prioritize maintaining the largest contiguous complex habitat area feasible.

Areas 3a and 3b are areas of complex habitat illustrated by high multibeam backscatter return and identified large boulders (> 0.5–1.0 m in diameter). Data for Atlantic cod in this area are limited (Inspire Environmental 2019, 2020). Ongoing research and emerging data will assist in evaluating the importance of this area for cod spawning. GARFO requested that any development of these areas be considered only if it would allow for the protection and conservation of higher priority areas.

If BOEM omitted all turbines within the identified priority areas (a total of 61 WTGs) from Alternative C, then Alternative C would not meet the purpose and need. A discussion of the further reduction of impacts to these habitats through the selection of Alternative C in conjunction with Alternative F is provided in EIS Section 3.13.2. BOEM developed the layouts for Alternative C based on the following criteria:

- GARFO's identified priority areas (see Figure K-1)
- Maintaining continuity of complex habitat
- Boulder density (higher density areas were avoided over lower density areas.)
- Multibeam backscatter data (high backscatter areas were avoided over lower backscatter areas.)
- Engineering considerations such as maintaining linearity of inter-array cable (IAC) layouts and maintaining offshore substation locations

BOEM identified two layouts for Alternative C that aim to address these criteria. Alternative C1 removes all WTG positions from Area 1 and 27 WTG positions from Area 2 leaving 65 WTG positions remaining (Figure K-2). Alternative C2 removes all WTG positions from Area 1 and 28 WTG positions from Area 2 leaving 64 WTG positions remaining (Figure K-3). Alternative C1 reduces development in areas of contiguous complex habitat slightly more than Alternative C2. Alternative C2 shifts exclusion of three WTG positions from the southeastern portion to areas further north to reduce development in or adjacent to known cod spawning areas, however, resulting in slightly less complex habitat avoided when compared to Alternative C1. See EIS Section 3.6.2.4 for more information on differences in impacts to complex habitats.

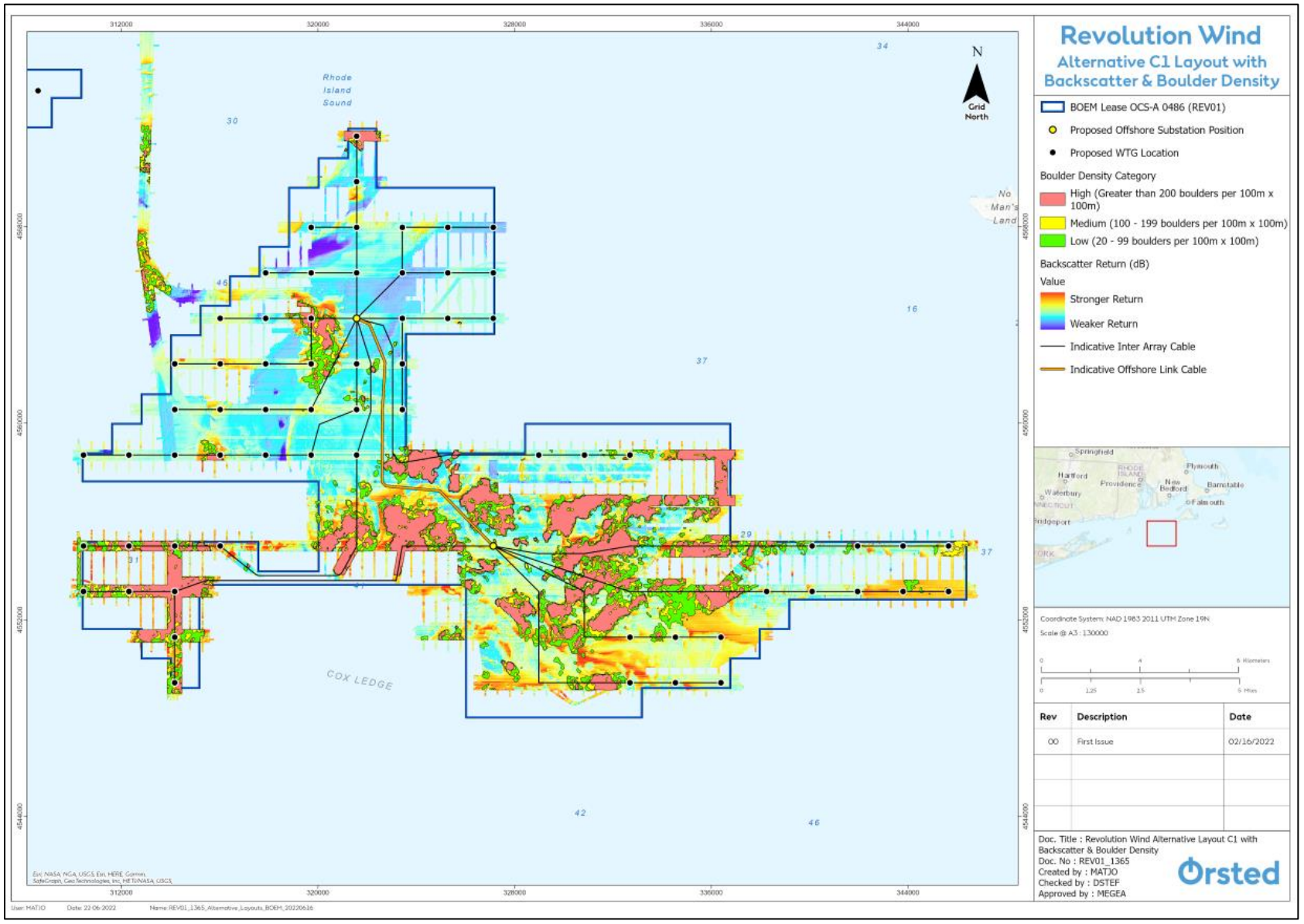

Figure K-2. Alternative C1 layout overlaid with backscatter and boulder density data. Image courtesy of Orsted.

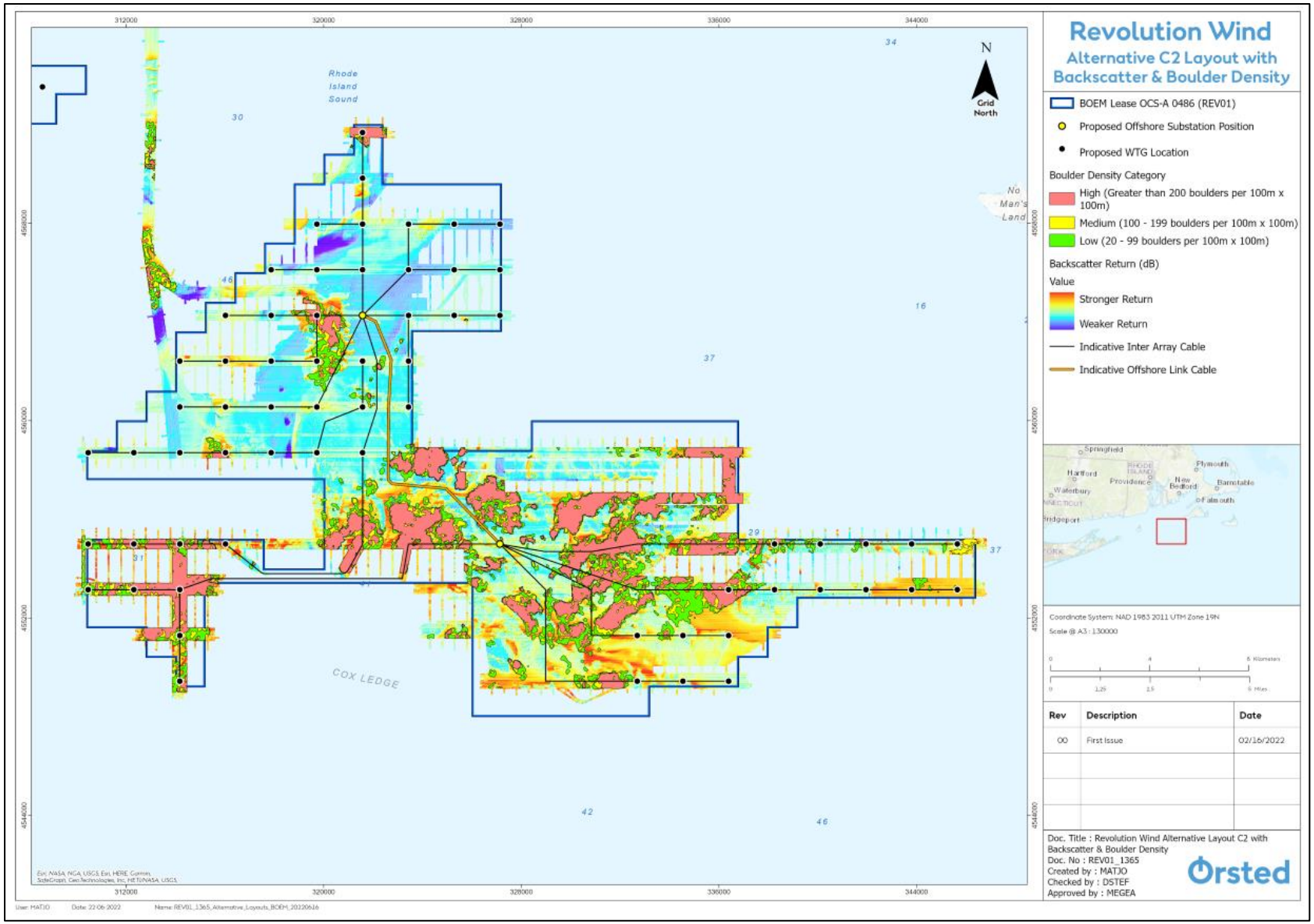

Figure K-3. Alternative C2 layout overlaid with backscatter and boulder density data. Image courtesy of Orsted.

Alternative E: Reduction of Surface Occupancy to Reduce Impacts to Culturally Significant Resources Alternative (Viewshed Alternative)

The federally recognized Wampanoag Tribe of Gay Head (Aquinnah) has identified certain unencumbered views from the Gay Head Cliffs (i.e., Aquinnah Cliffs) on Martha's Vineyard as important to their oral history, traditions, cultural practices, and as a traditional cultural place (TCP) associated with the Wampanoag cultural hero Moshup. Through scoping and ongoing government-to-government consultation, the northernmost WTGs nearest to the Gay Head Cliffs were identified of the highest concern to the Wampanoag Tribe of Gay Head (Aquinnah), especially at sunset when these WTGs would be backlit and silhouetted. In a letter to BOEM on July 12, 2021, the tribe's historic preservation office noted the importance of the tribe's ancestral lands on the west side of Martha's Vineyard that include Gay Head Cliffs, designated as a national natural landmark by the National Park Service (Washington 2021). The letter also provided a map of the wind development area with an east to west line in which the Wampanoag Tribe of Gay Head (Aquinnah) opposes any development north thereof (Figure K-4). The tribe has expressed concerns that the introduction of offshore wind infrastructure will adversely affect the recently identified Vineyard Sound and Moshup's Bridge TCP and the Gay Head Cliffs National Natural Landmark (which is also part of the TCP). Factoring in the information and concerns of the Wampanoag Tribe of Gay Head (Aquinnah) and other stakeholders, along with balancing the purpose and need in EIS Section 1.2, BOEM considered a suite of options for removing WTG positions aimed at reducing impacts to viewsheds on and surrounding Martha's Vineyard.

Given the proximity of the Project to Martha's Vineyard, visibility of the offshore components cannot be completely eliminated under any action alternative or layout alternatives, while maintaining the minimum positions needed to fulfill the PPA obligations (i.e. 704 MW). To determine which WTG positions could be removed to reduce visual impacts most effectively to these cultural resources, while still meeting the purpose and need, BOEM developed multiple layout alternatives for Alternatives E1 and E2 and directed the Project applicant, Revolution Wind, to produce visual simulations of these layouts. BOEM shared these simulations with the Wampanoag Tribe of Gay Head (Aquinnah) and requested feedback on these potential layouts on September 10, 2021, and again on October 12, 2021, after an additional layout alternative was simulated.

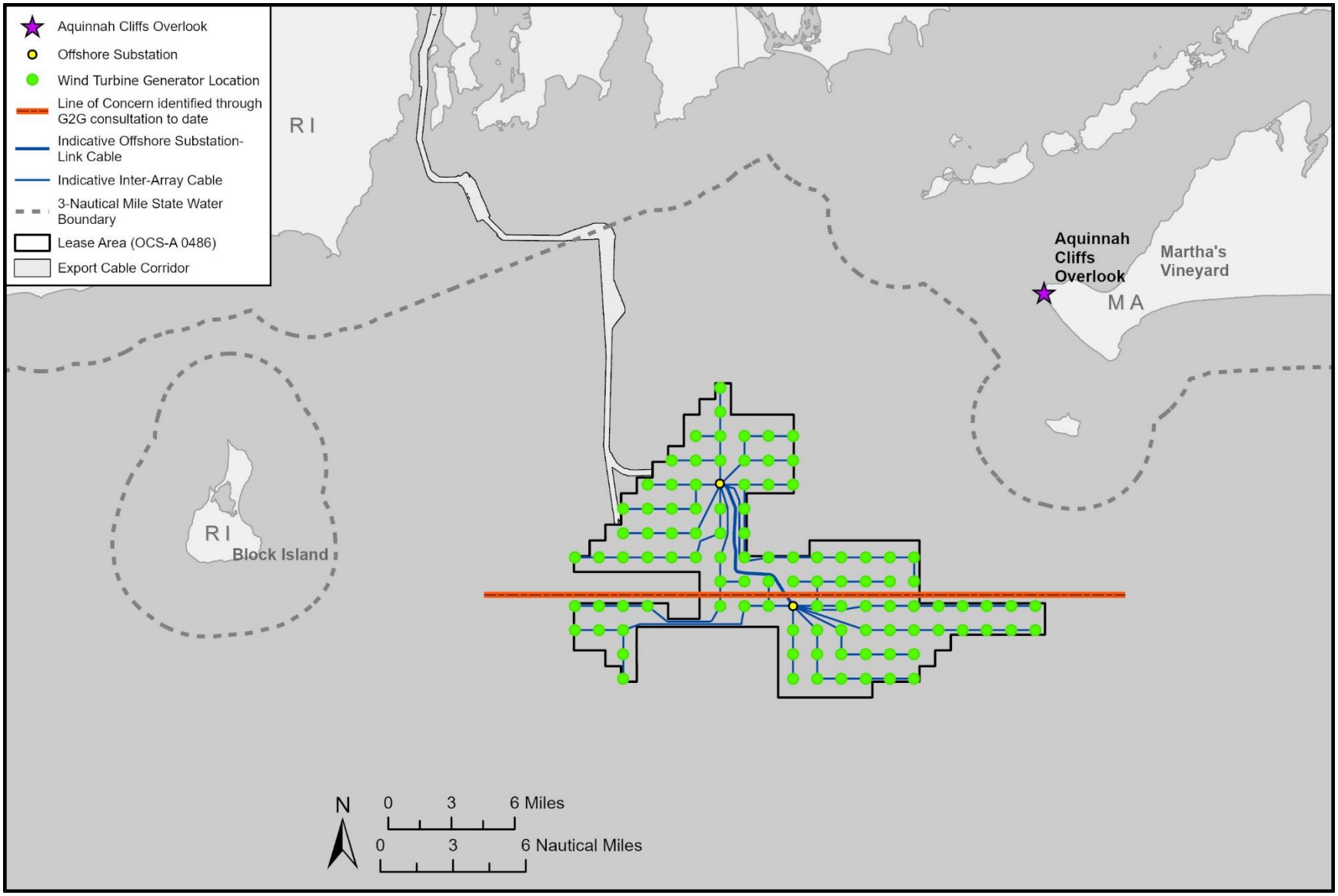

Figure K-4. The line of concern provided by the Wampanoag Tribe of Gay Head (Aquinnah) overlaid with the Lease Area as proposed in Revolution Wind's construction and operations plan.

Preliminary Screening and Rationale

BOEM directed Revolution Wind to simulate eight potential WTG layouts for Alternative E (four for Alternative E1 and four for Viewshed Alternative E2). Figures K-5 through K-12 outline the layouts that were simulated and reviewed by BOEM's subject-matter experts and shared with the Wampanoag Tribe of Gay Head (Aquinnah) for input. No specific responses were received from the tribe; however, applying best professional judgement and input previously received by the tribe and other stakeholders, BOEM's subject-matter experts concluded that Alternatives E1-3 (see Figure K-7) and E2-4 (see Figure K-12) were most effective at reducing the visual impacts of concern at or near the Gay Head Cliffs, as well as other national historic landmarks and culturally important resources in Rhode Island and Massachusetts. Therefore, Alternatives E1-3 and E2-4 were carried forward for detailed analysis as Alternatives E1 and E2 in the EIS, acknowledging that neither alternative completely eliminates the visual impacts of concern for the reasons outlined above but offer a reasonable range of alternatives for consideration by stakeholders and the decisionmaker.

Layout Alternative E1-3 (see Figure K-7) was carried forward because the WTGs on the northwest end appear further apart, reducing the visual clutter and "curtain effect" from the visual overlapping of WTG towers and blades. The horizontal field-of-view of the Project is also less in layout Alternative E1-3 than in all other layouts simulated except for layout Alternative E2-4, with enough positions remaining to fulfill the PPA agreements (i.e. 704 MW).

Layout Alternative E2-4 (see Figure K-12) was carried forward because it reduces the number of WTGs that occupy the northwest end of the field-of-view within the sunset views from the Gay Head Cliffs overlook. Although this layout does not decrease visual prominence of WTGs further east in the Lease Area, it allows for a larger unobstructed sunset view within the northwestern portion of the Lease Area with enough positions remaining to fulfill the PPA agreements (i.e. 704 MW) up to the maximum potential output of the Project (880 MW). Figure K-13 provides a sunset simulation overlaid with the WTG positions that would be removed north-northwest of the northernmost offshore substation under layout Alternative E2-4.

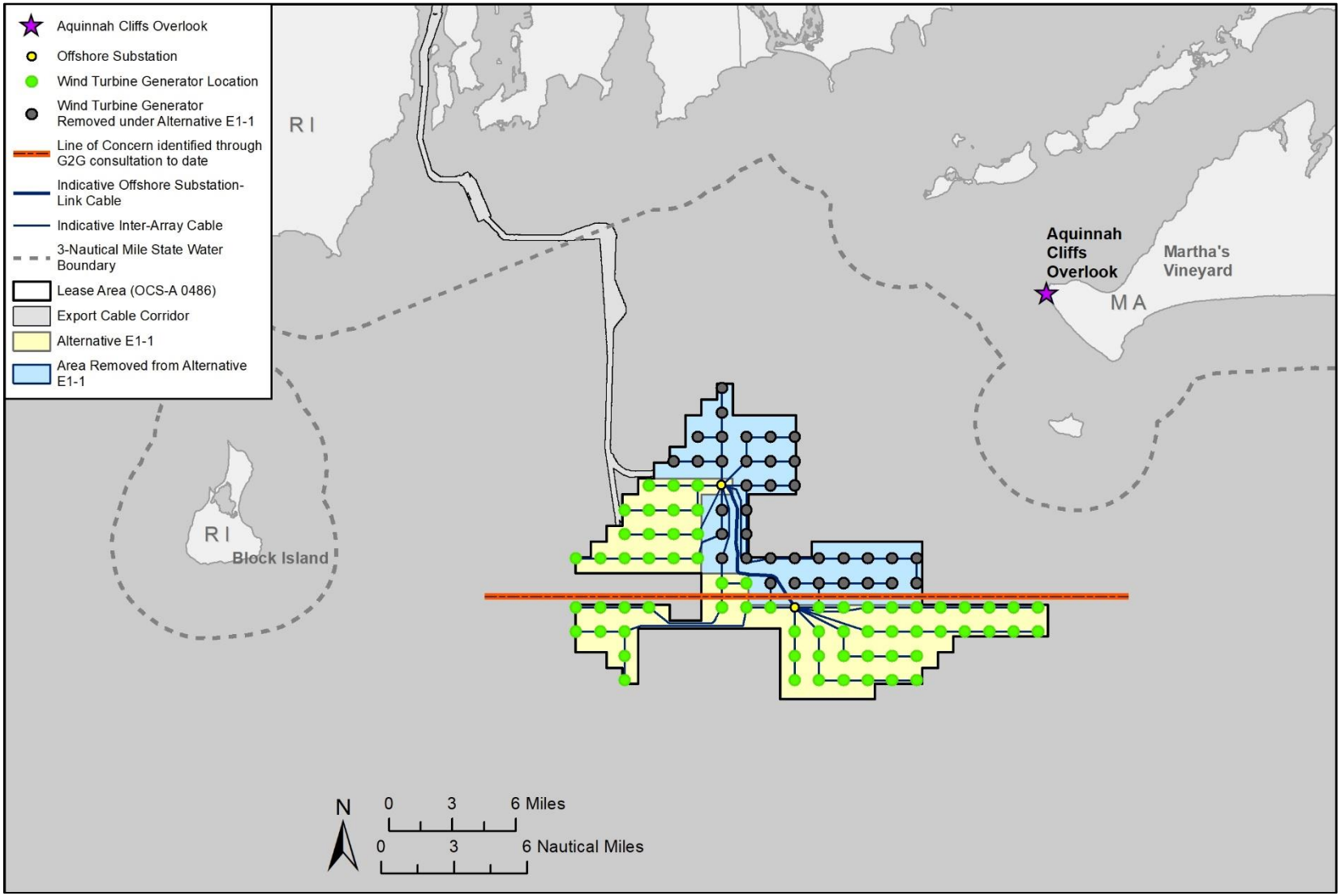

Figure K-5. Layout Alternative E1-1. Gray shaded wind turbine generator positions in the blue field are those that would be eliminated from consideration. 704-megawatt maximum output; removal of 36 wind turbine generator positions (leaves 64 positions available).

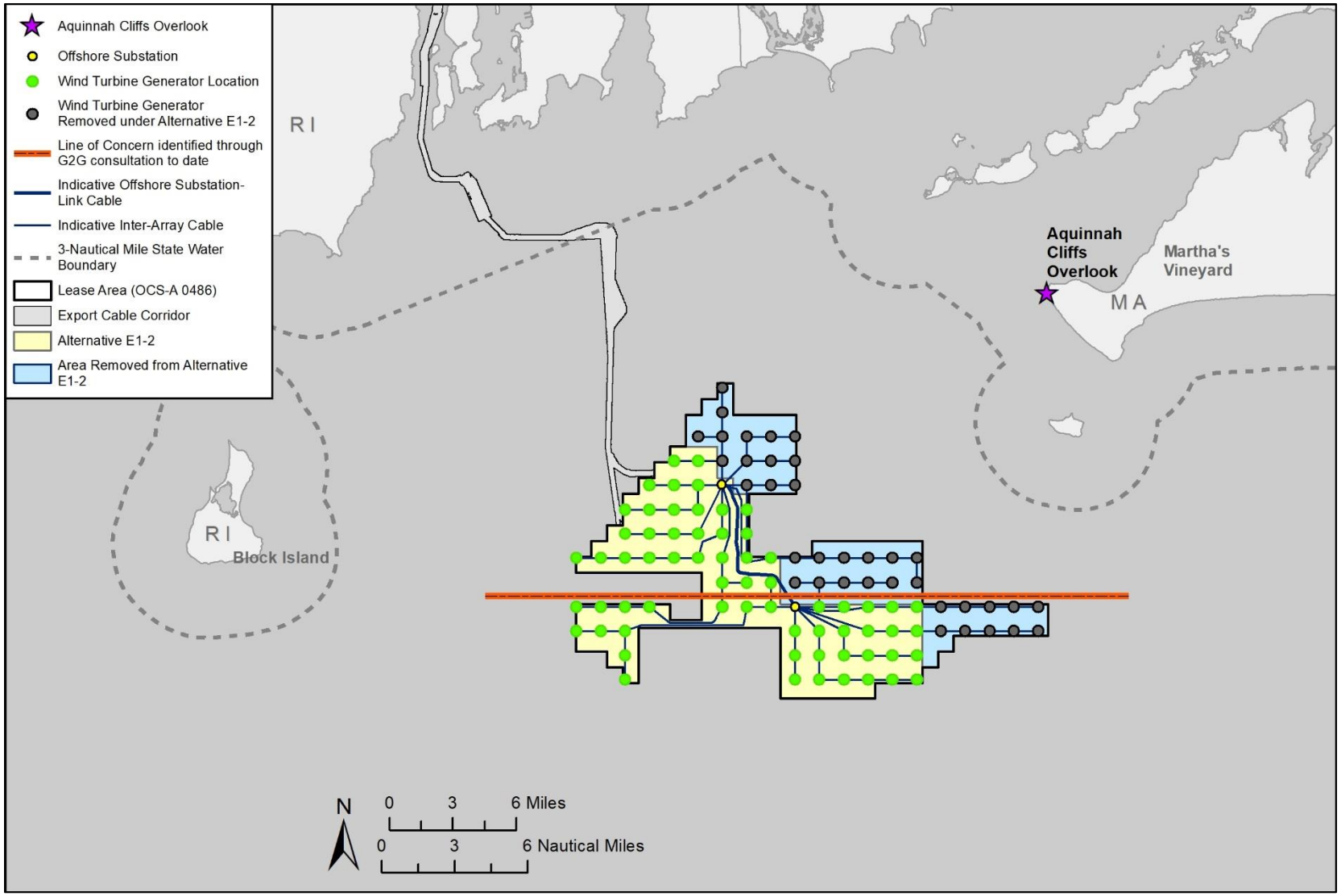

Figure K-6. Layout Alternative E1-2. Gray shaded wind turbine generator positions in the blue field are those that would be eliminated from consideration. 704-megawatt maximum output; removal of 36 wind turbine generator positions (leaves 64 positions available).

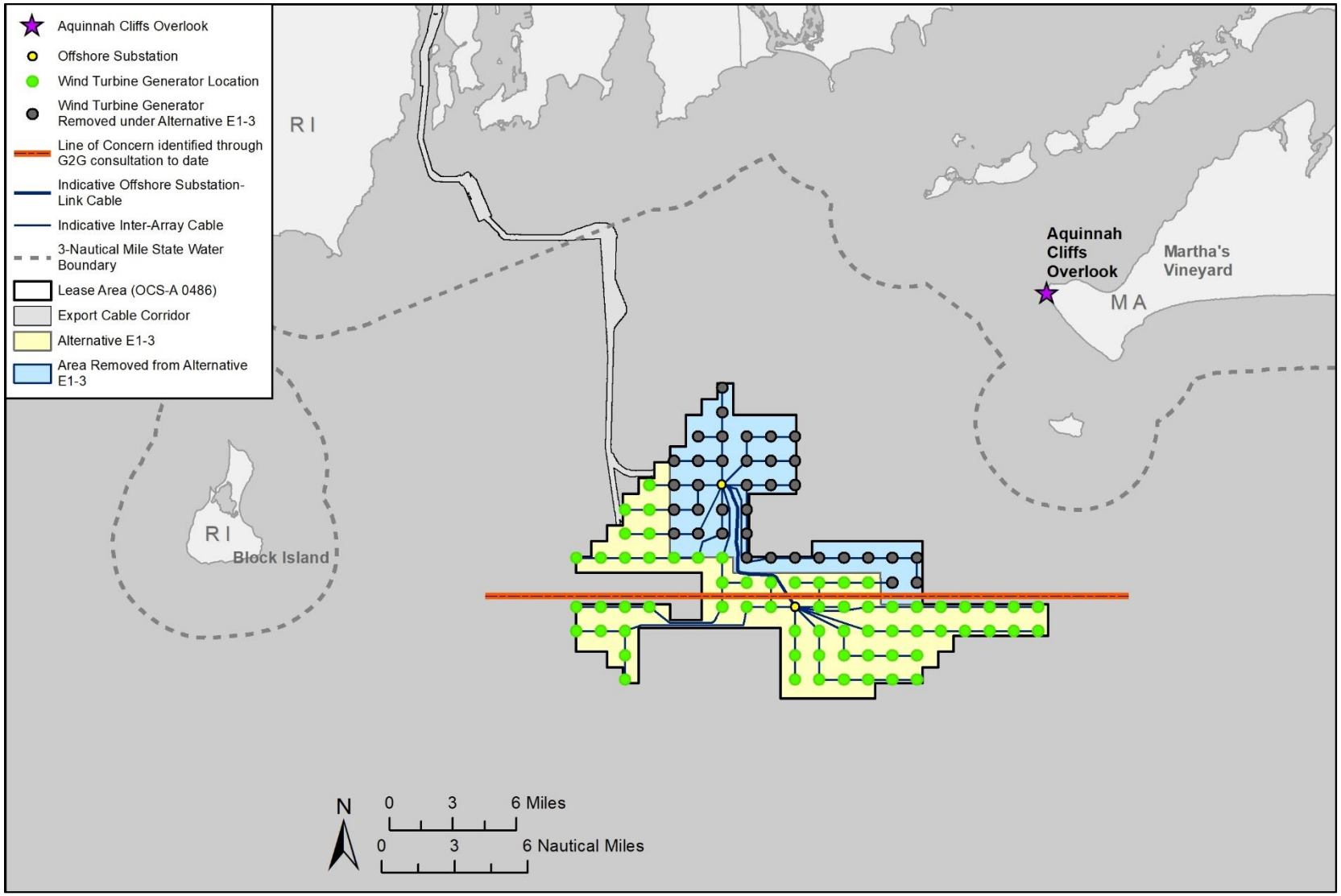

Figure K-7. Layout Alternative E1-3. Gray shaded wind turbine generator positions in the blue field are those that would be eliminated from consideration. 704-megawatt maximum output; removal of 36 wind turbine generator positions (leaves 64 positions available).

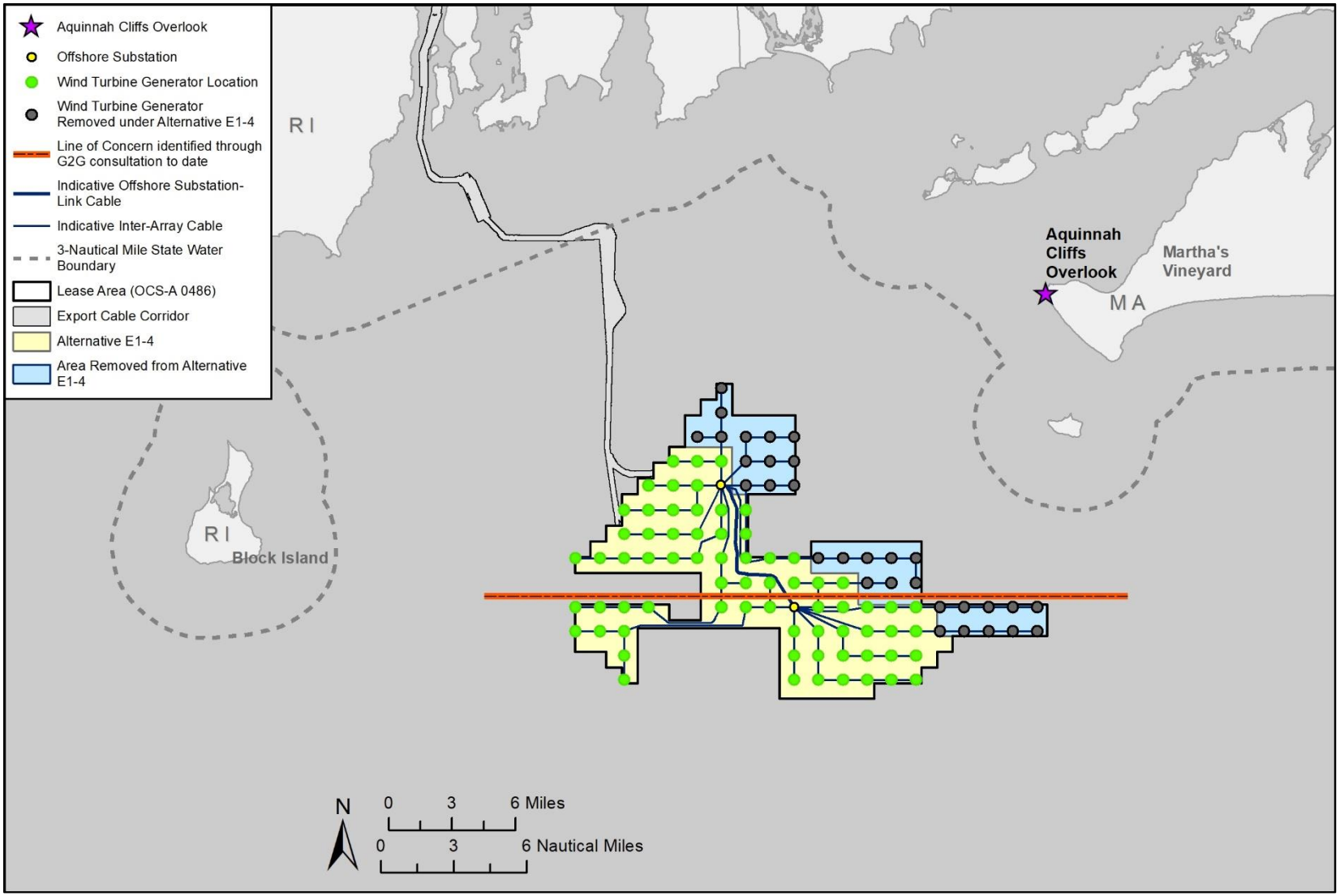

Figure K-8. Layout Alternative E1-4. Gray shaded wind turbine generator positions in the blue field are those that would be eliminated from consideration. 828-megawatt maximum output; removal of 31 wind turbine generator positions (leaves 69 positions available).

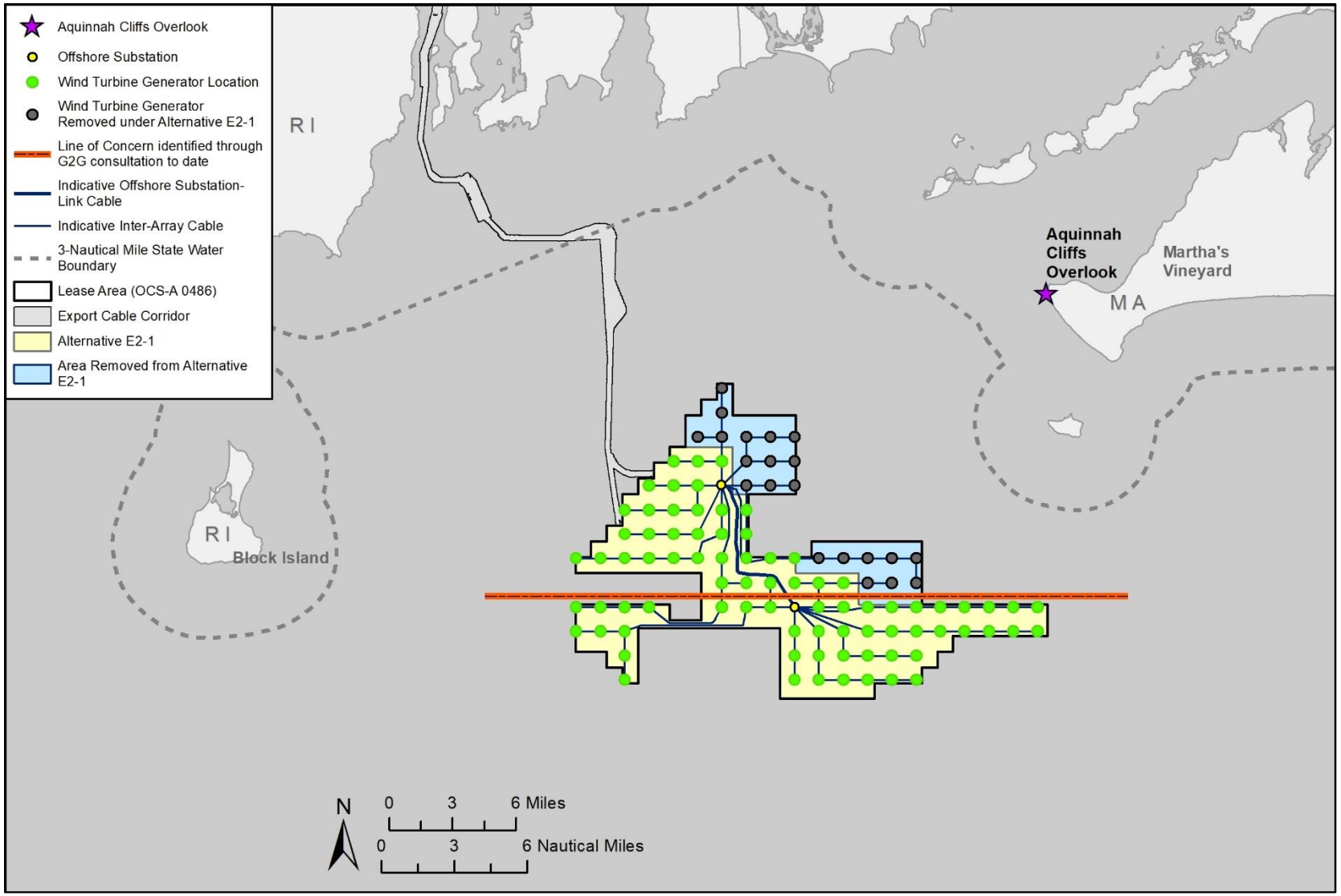

Figure K-9. Layout Alternative E2-1. Gray shaded wind turbine generator positions in the blue field are those that would be eliminated from consideration. 880-megawatt maximum output; removal of 21 wind turbine generator positions (leaves 79 positions available).

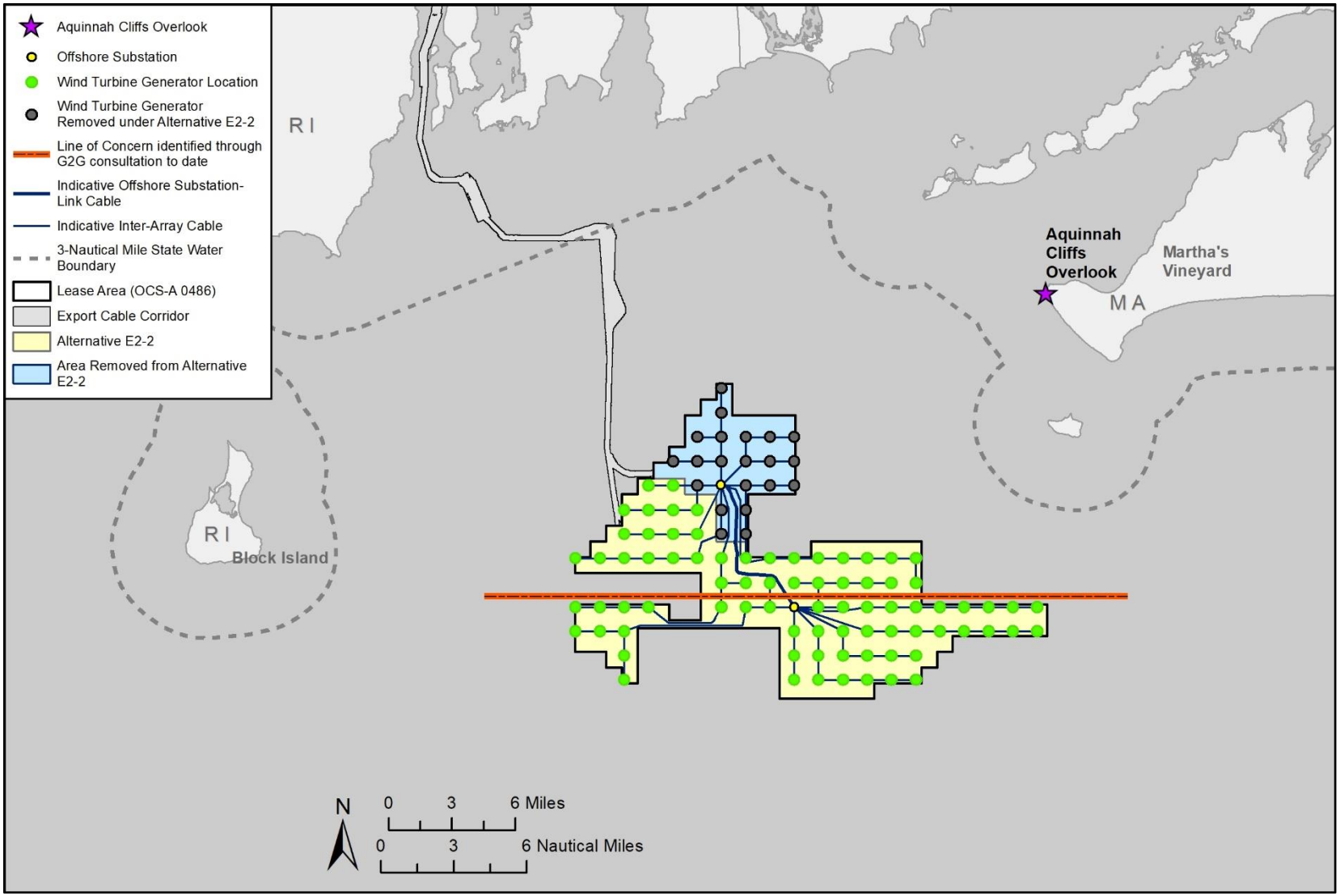

Figure K-10. Layout Alternative E2-2. Gray shaded wind turbine generator positions in the blue field are those that would be eliminated from consideration. 880-megawatt maximum output; removal of 21 wind turbine generator positions (leaves 79 positions available).

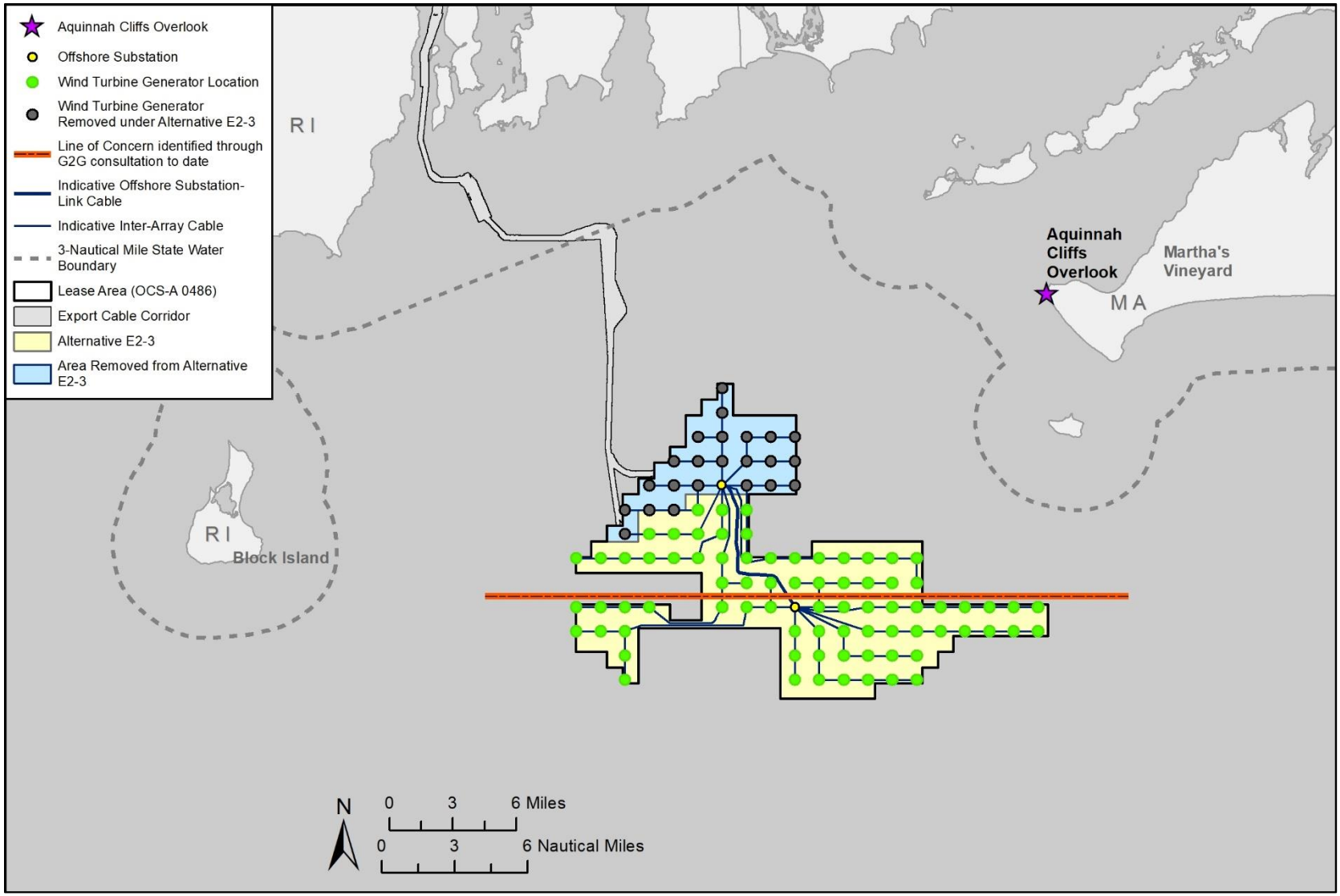

Figure K-11. Layout Alternative E2-3. Gray shaded wind turbine generator positions in the blue field are those that would be eliminated from consideration. 880-megawatt maximum output; removal of 23 wind turbine generator positions (leaves 77 positions available).

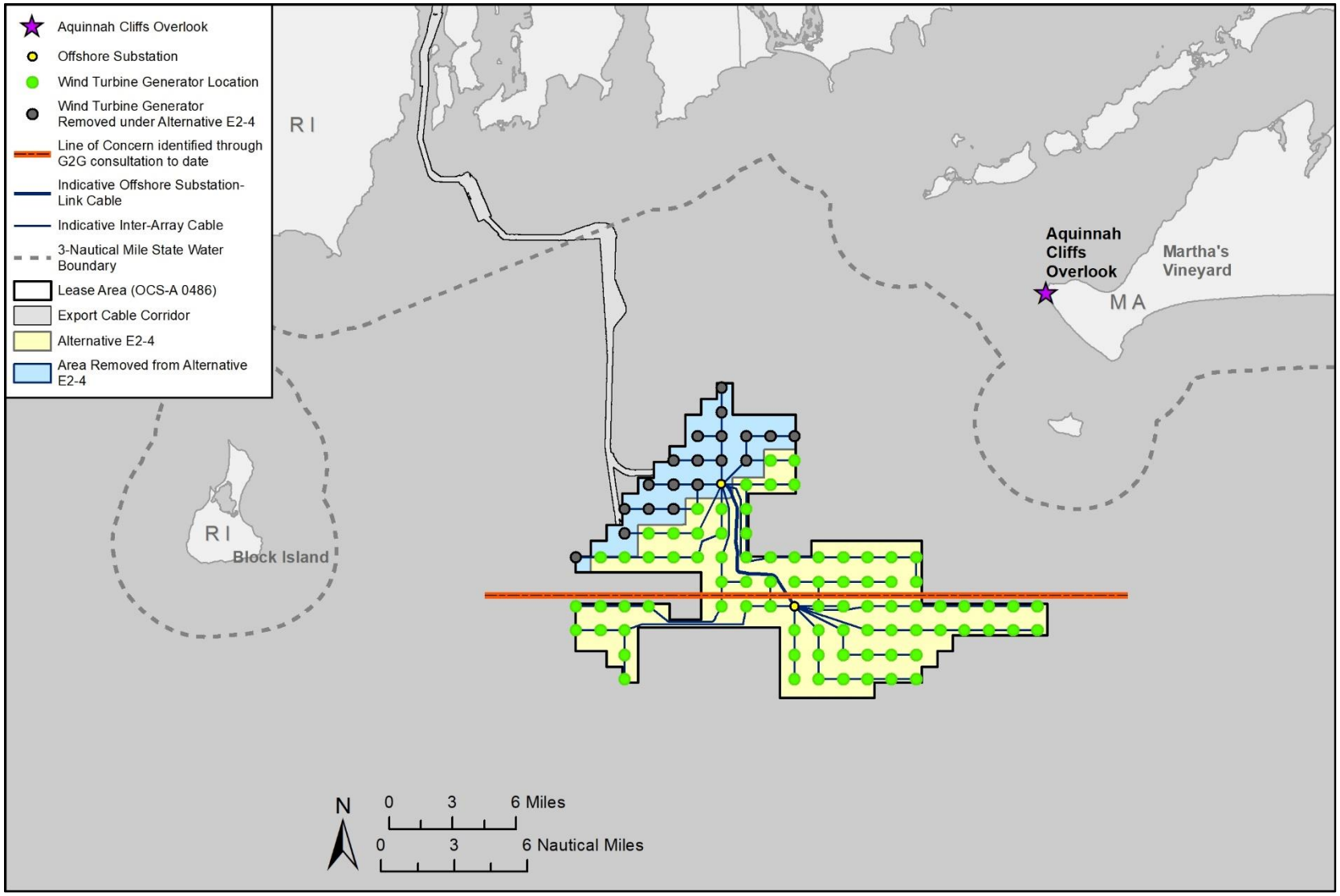

Figure K-12. Layout Alternative E2-4. Gray shaded wind turbine generator positions in the blue field are those that would be eliminated from consideration. 880-megawatt maximum output; removal of 23 wind turbine generator positions (leaves 77 positions available).

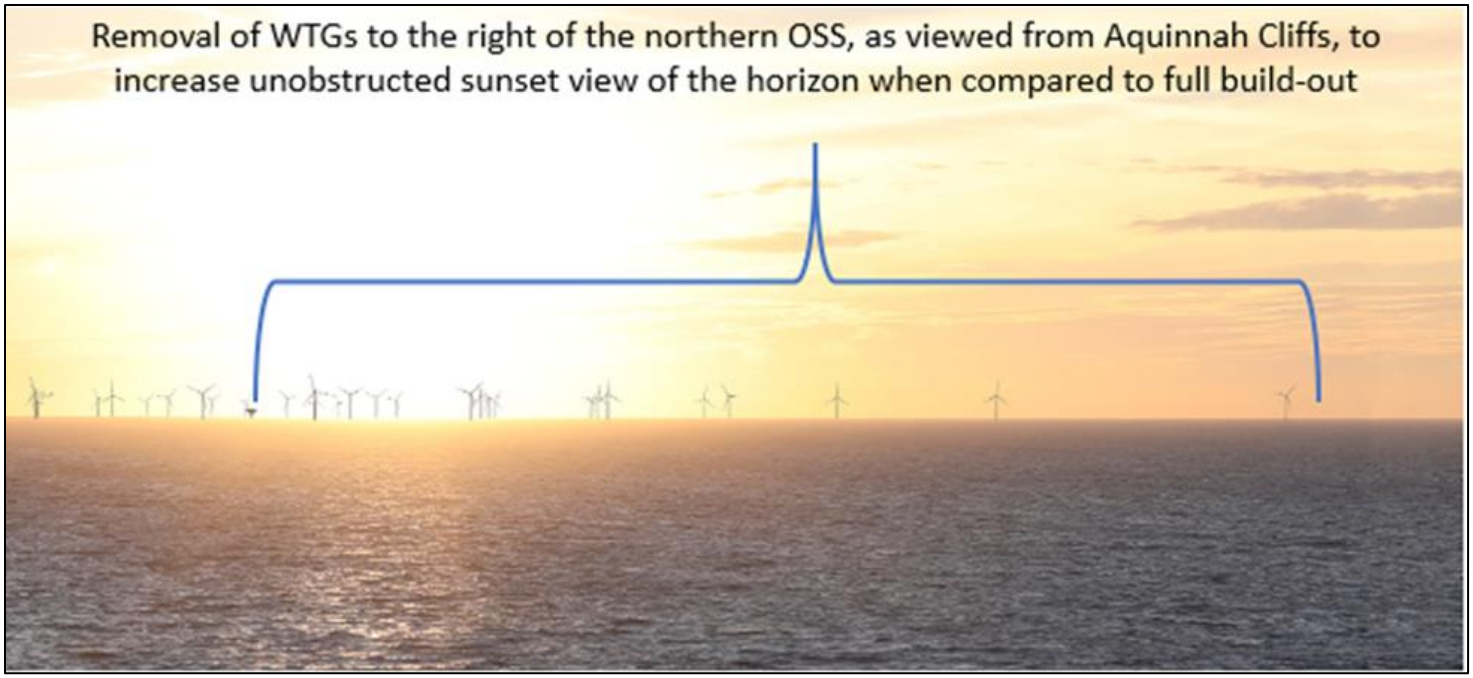

Figure K-13. Simulated sunset view facing the Project from Aquinnah Cliffs, indicating the wind turbine generator positions that would be removed under layout Alternative E2-4.

Alternative G: Habitat and Viewshed Minimization Hybrid Alternative (Preferred Alternative)

After carefully considering the EIS alternatives, including feedback and information received from the public, cooperating agencies, tribal nations, key stakeholder groups (e.g., commercial fishermen), and the applicant, BOEM has identified Alternative G (Habitat and Viewshed Minimization Hybrid Alternative), as the Preferred Alternative. Alternative G is a hybrid alternative combining elements of Alternatives C, D, and E. BOEM engaged their subject-matter experts within the Environmental Branch for Renewable Energy and the Engineering and Technical Review Branch, as well as the National Renewable Energy Laboratory, to review and advise on data and information received and considered in the development of Alternative G.

BOEM eliminated 21 WTG positions under Alternative G due to infeasibility (see gray dots in Figure K-14); 79 WTG positions remain from the up to 100 WTG positions available under the Proposed Action (see green dots in Figure K-14). Table K-1 provides latitude and longitude coordinates for the 79 WTG positions of Alternative G shown in Figure K-14.

Alternative G in comparison to the Proposed Action would reduce benthic habitat impacts in areas deemed critical by the NMFS (Alternative C), reduce transit and access impacts in areas of active marine use (Alternative D), reduce visual impacts to culturally important resources (Alternative E), and address design concerns voiced by the applicant, striking a reasonable balance between these varied resources.

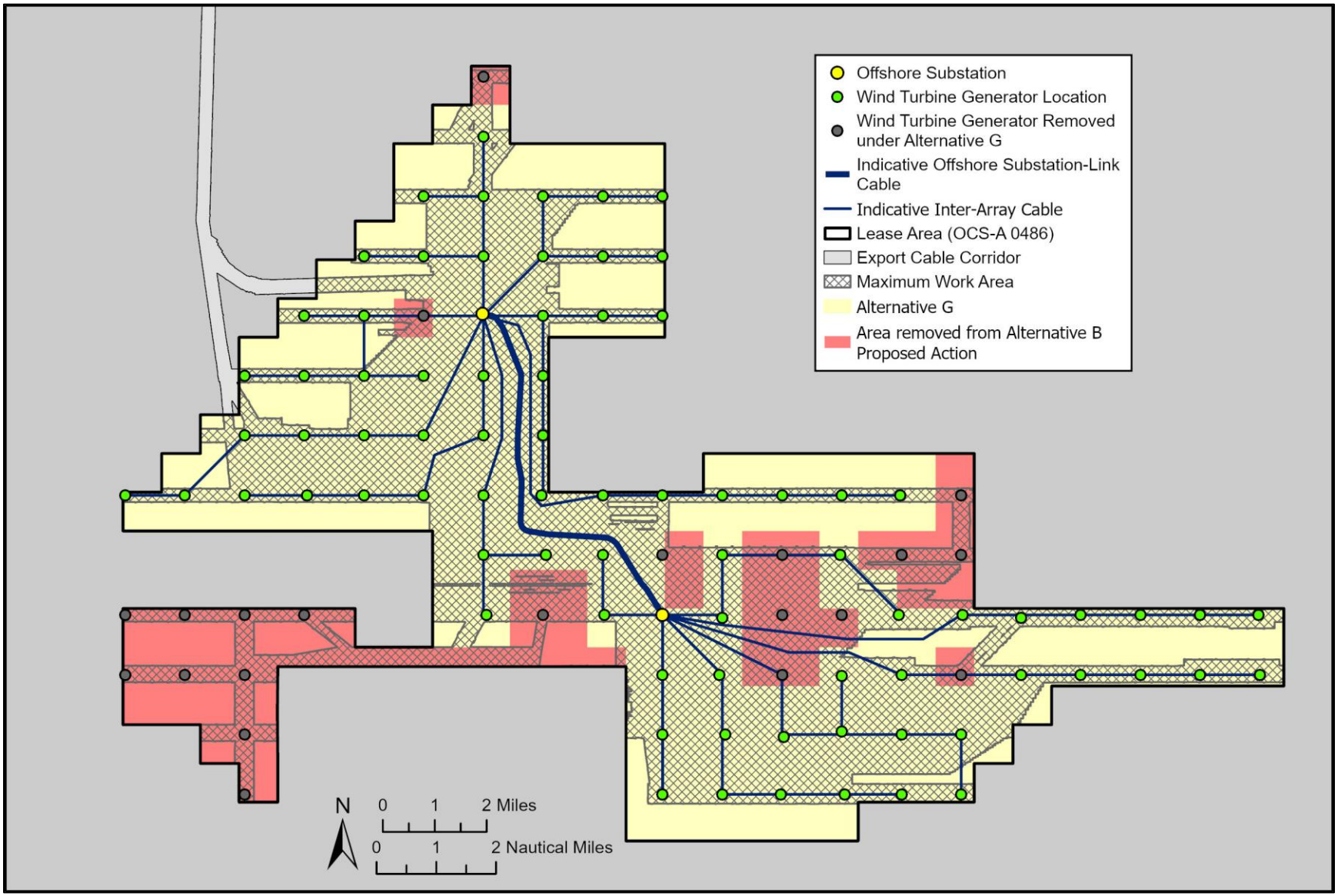

Figure K-14. Alternative G with 79 possible wind turbine generator positions.

Table K-1. Applicant Wind Turbine Generator Identification, Longitude and Latitude, and U.S. Coast Guard Wind Turbine Generator Identification for Alternative G

Applicant WTG Identification (ID)	Applicant WTG Short ID	Longitude (decimal degrees)	Latitude (decimal degrees)	U.S. Coast Guard Wind WTG ID
L045_65	65	-70.905013	41.130564	AL18
L045_66	66	-70.882961	41.130927	AL19
L045_67	67	-70.860908	41.131285	AL20
L045_73	73	-70.97067	41.112778	AM15
L045_75	75	-70.926578	41.113524	AM17
L045_76	76	-70.904531	41.113891	AM18
L045_77	77	-70.882484	41.114253	AM19
L045_78	78	-70.860437	41.114611	AM20
L045_79	79	-70.838389	41.114965	AM21
L045_62M	62M	-70.97224	41.129433	AL15
L045_63M	63M	-70.948582	41.129835	AL16
L045_64M	64M	-70.927042	41.129387	AL17
L045_68M	68M	-70.83939	41.131631	AL21
L045_72M	72M	-70.992703	41.111993	AM14
L055_2	2	-71.129836	41.260075	AC08
L055_3	3	-71.151382	41.242993	AD07
L055_4	4	-71.129295	41.243404	AD08
L055_6	6	-71.085119	41.244213	AD10
L055_8	8	-71.172916	41.225908	AE06
L055_9	9	-71.150835	41.226322	AE07
L055_10	10	-71.128754	41.226733	AE08
L055_11	11	-71.106672	41.227139	AE09
L055_12	12	-71.08459	41.227541	AE10
L055_14	14	-71.194439	41.208818	AF05
L055_15	15	-71.172364	41.209237	AF06
L055_17	17	-71.106137	41.210468	AF09
L055_18	18	-71.08406	41.21087	AF10
L055_20	20	-71.215951	41.191725	AG04
L055_21	21	-71.193882	41.192148	AG05
L055_22	22	-71.171813	41.192566	AG06

Applicant WTG Identification (ID)	Applicant WTG Short ID	Longitude (decimal degrees)	Latitude (decimal degrees)	U.S. Coast Guard Wind WTG ID
L055_24	24	-71.127673	41.193391	AG08
L055_25	25	-71.105602	41.193796	AG09
L055_26	26	-71.215389	41.175055	AH04
L055_28	28	-71.171262	41.175896	AH06
L055_29	29	-71.149198	41.17631	AH07
L055_30	30	-71.127133	41.176719	AH08
L055_31	31	-71.105068	41.177125	AH09
L055_32	32	-71.258941	41.157528	AJ02
L055_33	33	-71.236884	41.157958	AJ03
L055_34	34	-71.214827	41.158385	AJ04
L055_36	36	-71.170711	41.159225	AJ06
L055_37	37	-71.148653	41.159639	AJ07
L055_5	5	-71.107207	41.24381	AD09
L055_7	7	-71.063031	41.244611	AD11
L055_13	13	-71.062507	41.227939	AE11
L055_19	19	-71.061983	41.211267	AF11
L055_23	23	-71.149743	41.192981	AG07
L055_27	27	-71.193325	41.175477	AH05
L055_38	38	-71.126594	41.160048	AJ08
L055_40	40	-71.082474	41.160855	AJ10
L055_41	41	-71.060414	41.161251	AJ11
L055_42	42	-71.038353	41.161644	AJ12
L055_43	43	-71.016292	41.162033	AJ13
L055_44	44	-70.99423	41.162417	AJ14
L055_47	47	-71.126055	41.143377	AK08
L055_49	49	-71.081946	41.144183	AK10
L055_51	51	-71.037836	41.144972	AK12
L055_69	69	-71.058849	41.111235	AM11
L055_80	80	-71.058328	41.094563	AN11
L055_84	84	-70.970171	41.096105	AN15
L055_85	85	-70.948131	41.09648	AN16
L055_86	86	-71.057807	41.077891	AP11

Applicant WTG Identification (ID)	Applicant WTG Short ID	Longitude (decimal degrees)	Latitude (decimal degrees)	U.S. Coast Guard Wind WTG ID
L055_87	87	-71.035774	41.078282	AP12
L055_90	90	-70.969673	41.079432	AP15
L055_91	91	-70.947638	41.079806	AP16
L055_39M	39M	-71.10507	41.160444	AJ09
L055_45M	45M	-70.972704	41.162788	AJ15
L055_53M	53M	-70.994261	41.145735	AK14
L055_56M	56M	-71.124445	41.126725	AL08
L055_58M	58M	-71.080883	41.127521	AL10
L055_35M	35M	-71.191727	41.158827	AJ05
L055_48M	48M	-71.102959	41.143801	AK09
L055_70M	70M	-71.037846	41.111609	AM12
L055_81M	81M	-71.035248	41.094973	AN12
L055_82M	82M	-71.013444	41.09476	AN13
L055_83M	83M	-70.992235	41.096513	AN14
L055_88M	88M	-71.014276	41.07866	AP13
L055_59M	59M	-71.037296	41.127512	AL12
L055_89M	89M	-70.990666	41.079071	AP14

Alternatives G1, G2, and G3

In further considering the implementation of 11-MW WTGs under Alternative G, BOEM has deemed that up to an additional 14 WTG positions could be feasibly removed from the Project, resulting in 65 WTGs constructed, and the applicant would still be capable of meeting the capacity requirement of the PPAs, which would meet the purpose and need under the National Environmental Policy Act (NEPA). The 14 WTG positions would remain as part of Alternative G as "spares" for contingency and would only be constructed on a case-by-case basis to accommodate unforeseen siting conditions that render any of the 65 WTG installations impractical in terms of technical feasibility or due to environmental impact or safety concerns.

Two of the 65 WTGs have the flexibility to be located in three different spots within the 79 WTG positions (see Figures K-15, K-16, and K-17). As a result, Alternative G includes the analysis of three layouts (Alternatives G1, G2, and G3) for installation of the 65 WTGs as described below and shown in Figures K-15, K-16, and K-17. This flexibility in design could allow for further refinement for visual resources impact reduction or habitat impact reduction.

Alternative G1 maximizes the avoidance of complex benthic habitat and cod spawning areas within NMFS priority areas (see Figure K-16). Alternative G2 provides the greatest reduction of impacts to the sunset viewshed from key observation points on Martha's Vineyard, as well as to points along the Rhode

Island coastline (see Figure K-17). Alternative G3 provides the greatest reduction of impacts to the proximity to shore viewshed from Martha's Vineyard, as well as to points along the Rhode Island coastline (Figure K-18). All three configurations of Alternative G (G1, G2, G3) include the same reduction in WTGs to minimize navigation risks and conflicts with other competing space uses.

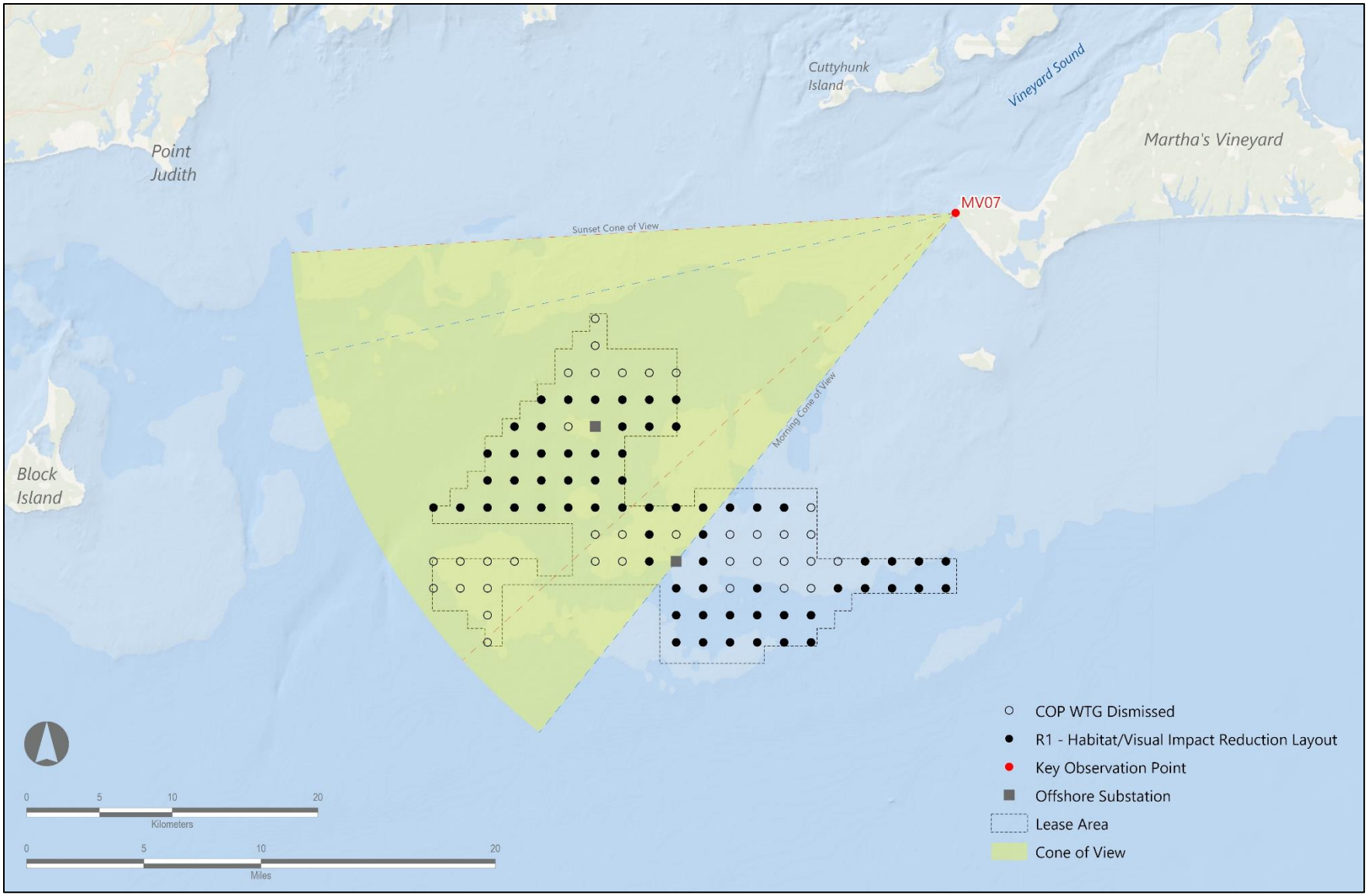

Figure K-15. Alternative G1 includes the installation of 65 wind turbine generators placed to maximize avoidance of complex habitat.

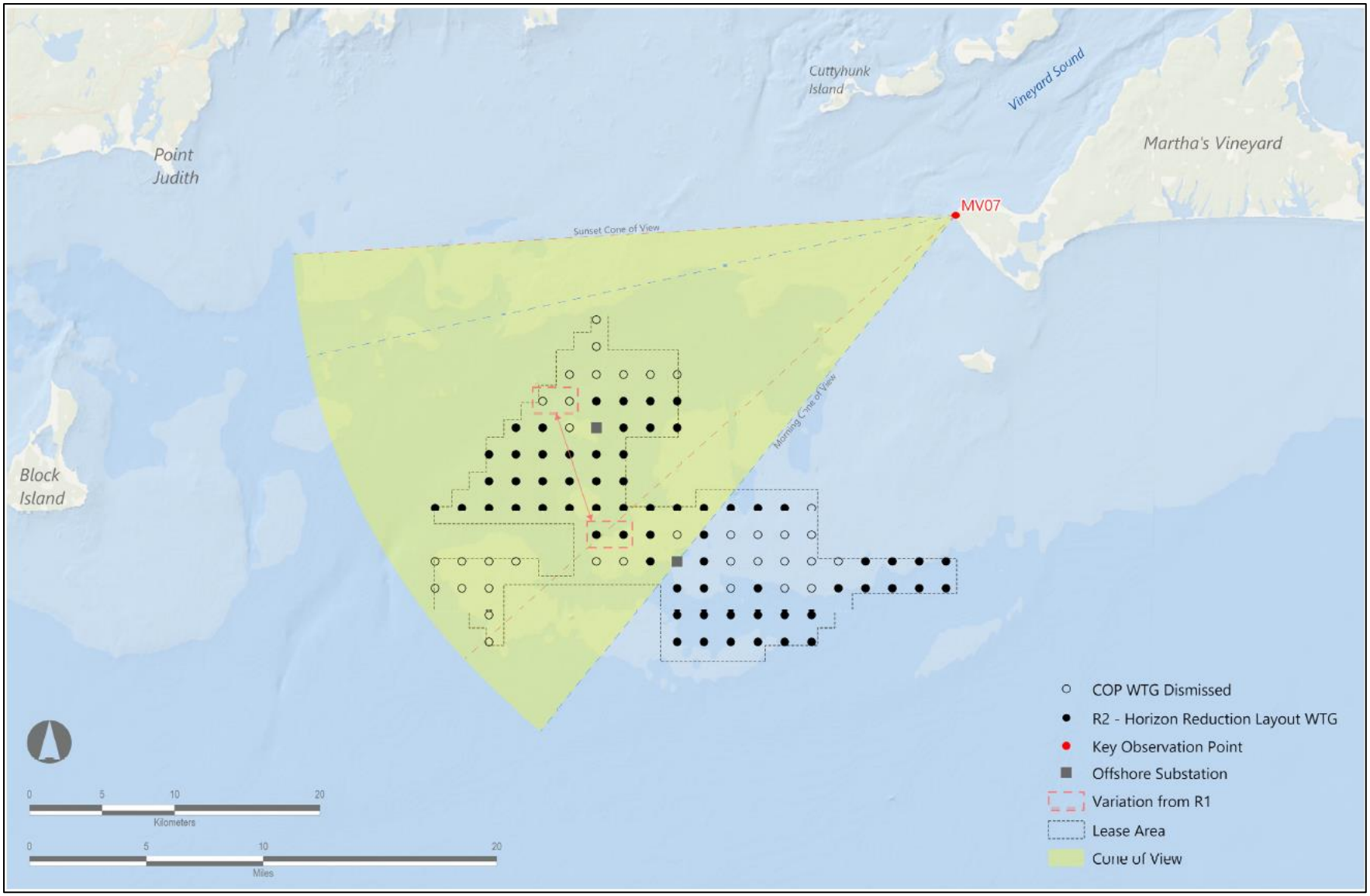

Figure K-16. Alternative G2 includes the installation of 65 wind turbine generators placed to reduce impacts on the sunset viewshed from Martha's Vineyard and from areas along the Rhode Island coastline.

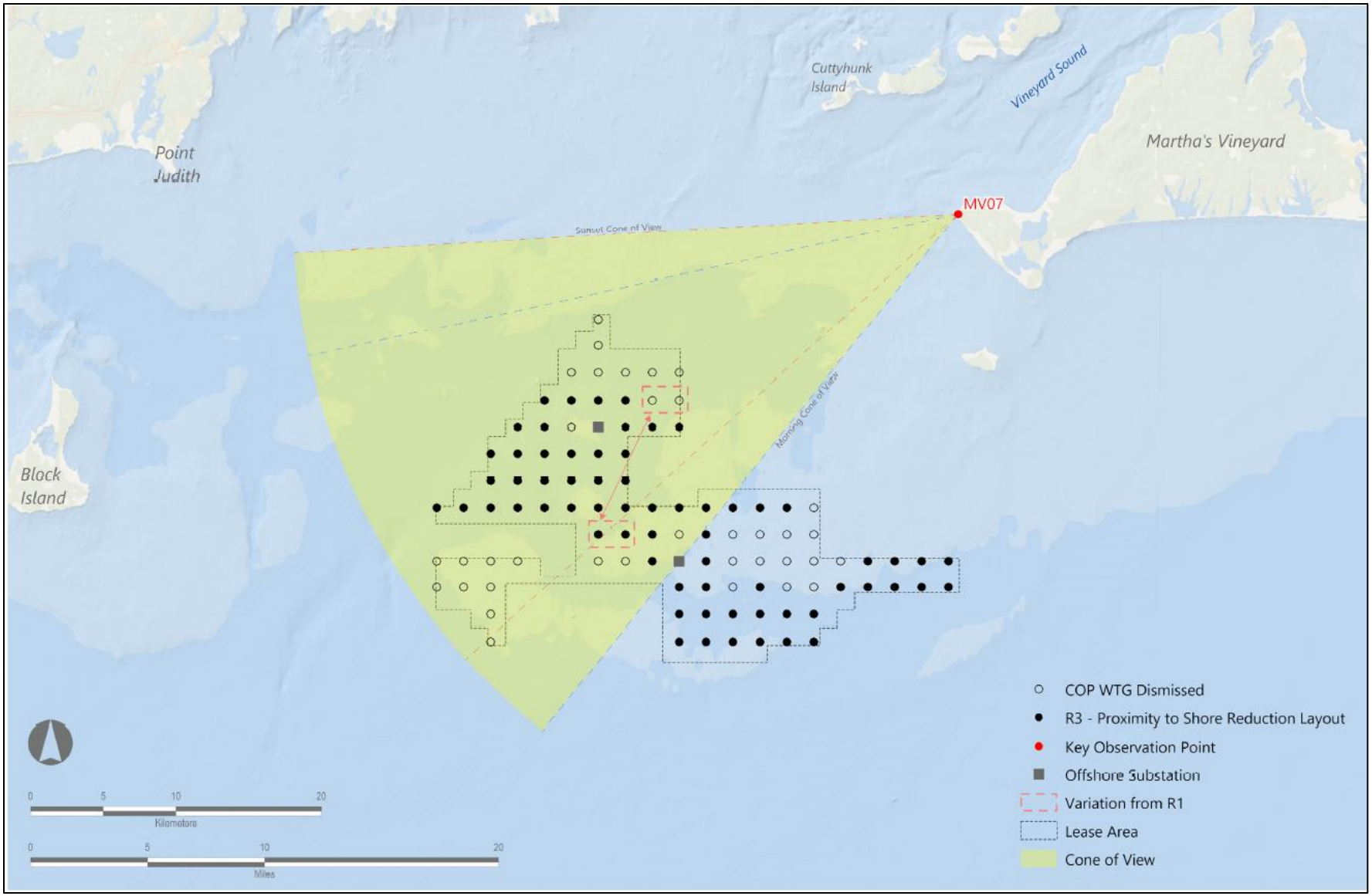

Figure K-17. Alternative G3 includes the installation of 65 wind turbine generators placed to reduce impacts to the proximity to shore viewshed from Martha's Vineyard and from areas along the Rhode Island coastline.

Alternatives G1, G2 and G3 strike a reasonable balance of addressing the primary environmental, socioeconomic, and technical feasibility concerns raised in public comments and identified during Draft and Final EIS development, including the following:

- Disturbance to essential fish habitat (EFH), including Cox Ledge, as well as disruption to Atlantic cod spawning
- Maximize the avoidance and minimization principles for habitat and species protection
- Navigation safety
- Visual impacts to culturally important resources
- Lost revenues to certain commercial and for-hire fisheries due to displacement from preferred fishing grounds, as well as concerns on damaged or lost fishing gear
- Timely implementation of the Project to promote economic growth and create jobs
- Implementation of mitigation and monitoring measures to reduce impacts to fisheries, threatened and endangered species, birds, bats, cultural, and tribal resources

Across all action alternatives, including Alternatives G1, G2 and G3, the WTGs and IAC routes would be microsited to avoid boulder fields, large individual boulders, unexploded ordnance and marine archaeological exclusion zones, difficult terrain and soil conditions, survey coverage, existing infrastructure, and other offshore installation and operation activities to the maximum extent practicable. Figure K-18 provides an example layout with microsited WTGs and IACs.

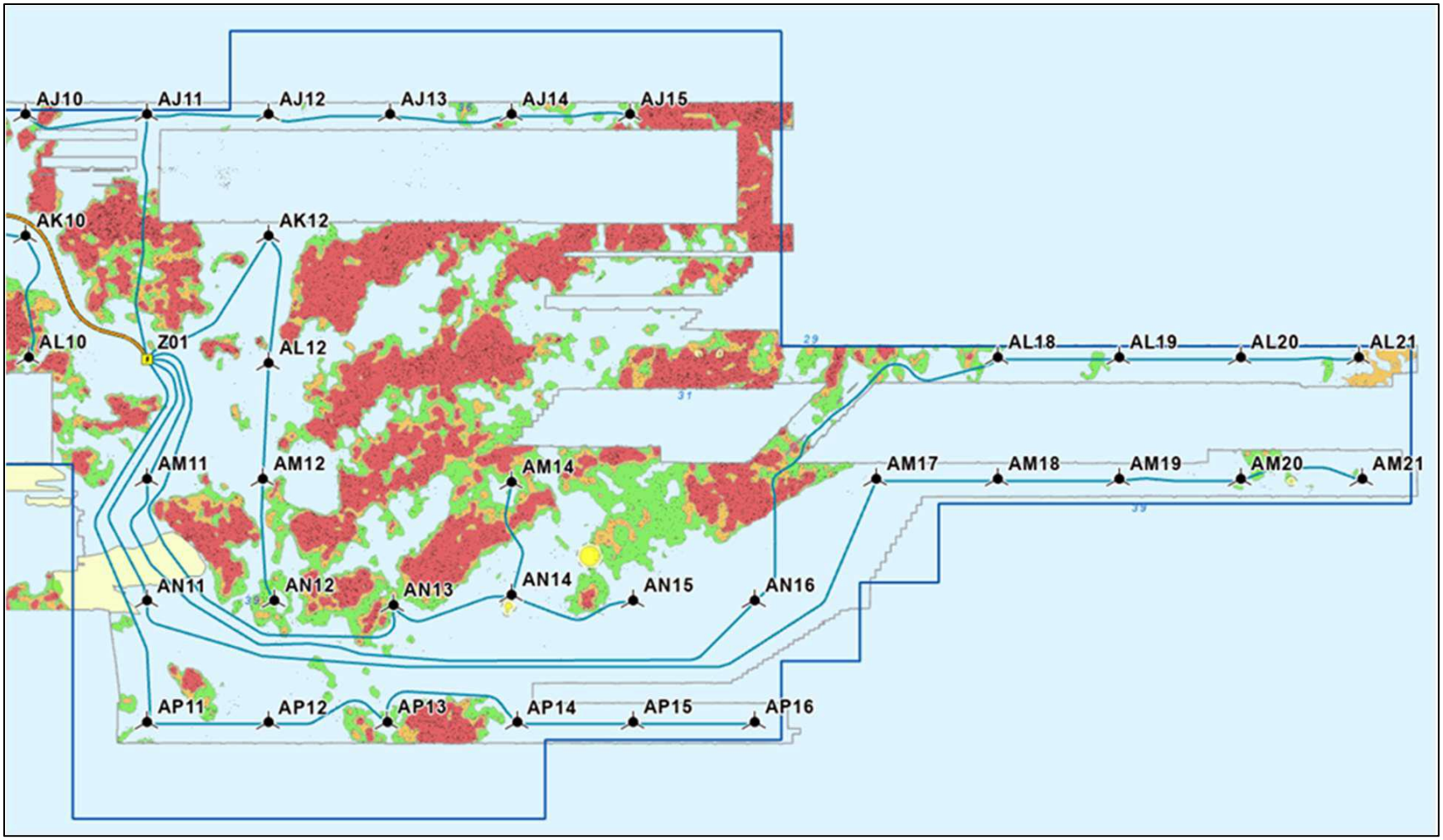

Figure K-18. Example microsited wind turbine generators and inter-array cable routes to avoid boulders, complex benthic habitat, unexploded ordnance, marine archaeological resources, and other engineering constraints.

In summary, Alternative G as defined by BOEM would include the construction, operations and maintenance, and eventual decommissioning of 65 WTGs within 79 possible WTGs positions (as illustrated in Alternatives G1, G2, and G3) at a capacity of 11 MW and up to two offshore substations within Lease Area OCS-A 0468. The Alternative G export cables would extend from Lease Area OCS-A 0468 to the mainland, making landfall in North Kingstown, Rhode Island see (Figure K-14). Like the other action alternatives analyzed in the EIS, Alternative G would occur within the range of design parameters outlined in the COP and is subject to applicant-committed environmental protection measures as well as possible additional agency-proposed mitigation measures to avoid or reduce impacts.

Alternatives C, D, E, and F: Feasibility Analysis Updates

Feasibility Analysis Update for Alternatives C1, C2, D1+D2, D1+D2+D3, E1, E2, and F

BOEM received additional information from Revolution Wind regarding 1) geotechnical feasibility for Alternatives C1, C2, D1+D2, D1+D2+D3, E1, and E2, and 2) WTG model availability for Alternative F. In response, BOEM conducted an independent review of the information, including engagements with National Renewable Energy Laboratory, the Engineering and Technical Review Branch, and BOEM's Economics Division. A summary of BOEM's findings is below.

Geotechnical Feasibility for Alternatives C1, C2, D1+D2, D1+D2+D3, E1, and E2

Revolution Wind provided geotechnical feasibility and electrical engineering information and analysis regarding 21 of the 100 WTG positions included in the Proposed Action. BOEM's independent review confirmed that the 21 WTG positions identified by Revolution Wind are technically and economically infeasible for use in the RWF, as follows:

- Alternatives C1 and C2 relied on the use of 11 WTG positions that are infeasible for use in the RWF. Without those 11 WTG positions, the RWF would not have enough WTGs to meet its PPAs. Alternative C1 would have only 54 WTGs and Alternative C2 would have only 53 WTGs when 65 are needed for the PPAs. Alternatives D1 through D3 are still feasible *if selected individually*. However, Alternatives D1+D2 together would be infeasible because the RWF would not have enough WTGs to meet its PPAs. Alternatives D1+D2 together would only have 64 WTGs when 65 are needed for the PPAs.
- Similarly, Alternatives D2+D3 together would be infeasible because the RWF would not have enough WTGs to meet its PPAs. Alternatives D2+D3 together would only have 64 WTGs when 65 are needed for the PPAs.
- Alternatives D1+D2+D3 together would be infeasible because the RWF would not have enough WTGs to meet its PPAs. Alternatives D1+D2+D3 together would only have 59 WTGs when 65 are needed for the PPAs.
- Alternative E1 relied on the use of 16 WTG positions that are infeasible for use in the RWF. Without those 16 WTG positions, the RWF would not have enough WTGs to meet its PPAs. Alternative E1 would only have 48 WTGs when 65 are needed for the PPAs.

- Alternative E2 relied on the use of 19 WTG positions that are infeasible for use in the RWF. Without those 19 WTG positions, the RWF would not have enough WTGs to meet its PPAs. Alternative E2 would only have 62 WTGs when 65 are needed for the PPAs.

Wind Turbine Generator Model Availability for Alternative F

Alternative F (Selection of a Higher Capacity Wind Turbine Generator) contains the following qualifier:

- The higher capacity WTG would fall within the physical design parameters of the PDE and be commercially available to the Project proponent within the time frame for the construction and installation schedule proposed in the COP.

Revolution Wind selected Siemens Gamesa as their WTG manufacturer. Siemens Gamesa verified in a signed letter that no WTG models with a nameplate capacity larger than 11 MW were available for use in the RWF (Revolution Wind 2022a). Specifically,

> … however, after evaluating the anticipated installation schedules and required certification timelines; as well as a lack of production capacity available from Siemens Gamesa, the change in platform was, and is still not a possibility. (Revolution Wind 2022a)

While preparing the Final EIS, BOEM conducted its own market research regarding other potentially available WTG models for the RWF and found that there are no models available with a larger capacity than the 11-MW model selected by Revolution Wind. The U.S. Department of Energy's *Offshore Wind Market Report: 2022 Edition* identifies General Electric (GE), Siemens Gamesa, and Vestas as the three manufacturers of WTGs that could theoretically be available for the Project under Alternative F (U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy 2022). However, GE's Haliade-X WTG is currently unavailable because it is "subject to a permanent injunction, issued Sept. 7, 2022, which bars the U.S. firm from selling the 12-MW to 14-MW megaturbine in the American market, except for exemptions granted for the Vineyard Wind 1 project off Massachusetts and the Ocean Wind project off southern New Jersey" (Powers 2022). Given the uncertainty regarding the future availability of the GE model and the length of time needed to order WTGs and prepare WTG-specific engineering, BOEM determined the Haliade-X is not economically feasible for consideration under Alternative F. Finally, the Vestas WTG has a rotor diameter that is larger (236 m) than the PDE for the RWF (220 m), rendering it inconsistent with the parameters for the alternative established in the Draft EIS (Vestas 2023).

U.S. Army Corps of Engineers Section 404: Export Cable Route Alternatives Analysis Information

The EPA's Section 404(b)(1) guidelines can be found at 40 Code of Federal Regulations [CFR] 230 and apply to the U.S. Army Corps of Engineers' (USACE's) review of proposed discharges of dredged or fill material into waters of the United States (WOTUS) regulated under Section 404 of the Clean Water Act. In tidal waters, the shoreward limit of Section 404 jurisdiction is the high tide line, whereas the seaward limit is 3 nautical miles (nm) from the baseline of the territorial seas. In non-tidal waters, the Section 404 jurisdictional limit is the ordinary high-water mark of a waterbody. The guidelines also address impacts to special aquatic sites (SAS) identified in 40 CFR 230 subpart E. SASs are geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other

important and easily disrupted ecological values. SASs include wetlands, sanctuaries and refuges, vegetated shallows (such as eelgrass), mud flats, coral reefs, and riffle and pool complexes.

Except as provided under Section 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge that would have fewer adverse impacts on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Where the activity associated with a discharge which is proposed for a special aquatic site (as defined in 40 CFR 230 subpart E) does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (i.e., is not ‘‘water dependent’’), practicable alternatives that do not involve SASs are presumed to be available, unless clearly demonstrated otherwise. In addition, where a discharge is proposed for an SAS, all practicable alternatives to the proposed discharge that do not involve a discharge into an SAS are presumed to have fewer adverse impacts on the aquatic ecosystem, unless clearly demonstrated otherwise.

For the proposed RWF, the USACE has determined that the basic Project purpose is offshore wind energy generation. The following information on alternatives was provided to the USACE by the applicant and will be analyzed by the USACE according to the appropriate criteria in the guidelines in order to determine whether the applicant’s proposed discharge complies with the guidelines.

Summary of Alternatives Considered

Revolution Wind evaluated combinations of nine potential export cable routes connecting the RWF with the mainland at five different landing locations (Figure K-19 and Figure K-20). Table K-2 provides a summary of cable routes considered and their potential impacts of concern to the USACE. The sections following Figure K-19, Figure K-20, and Table K-2 provide summaries of the nine export cable route evaluations.

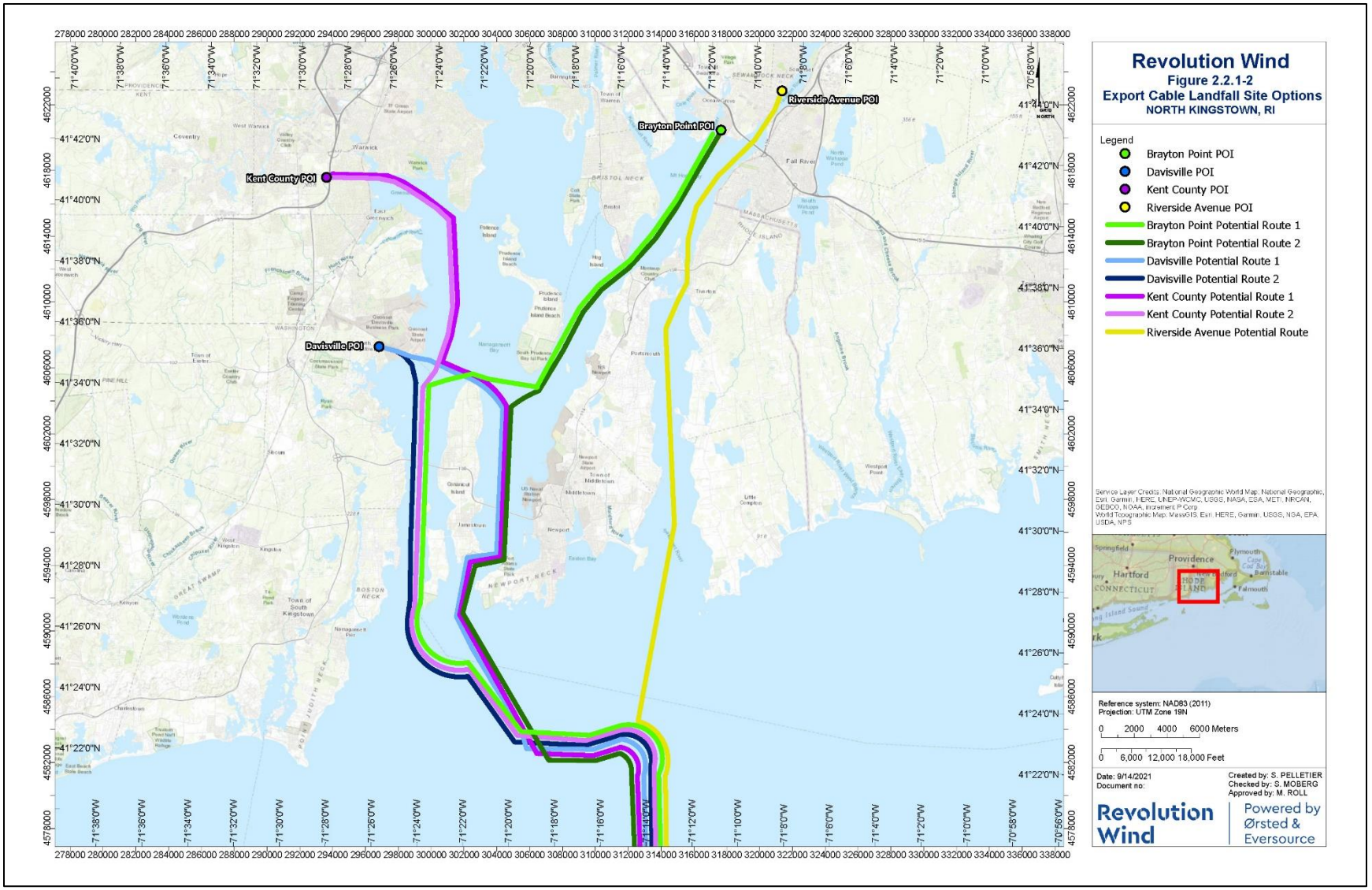

Figure K-19. Cable routes and landing sites considered (Brayton Point Routes 1 and 2, Riverside Avenue Route, Kent County Routes 1 and 2, Davisville Routes 1 and 2).

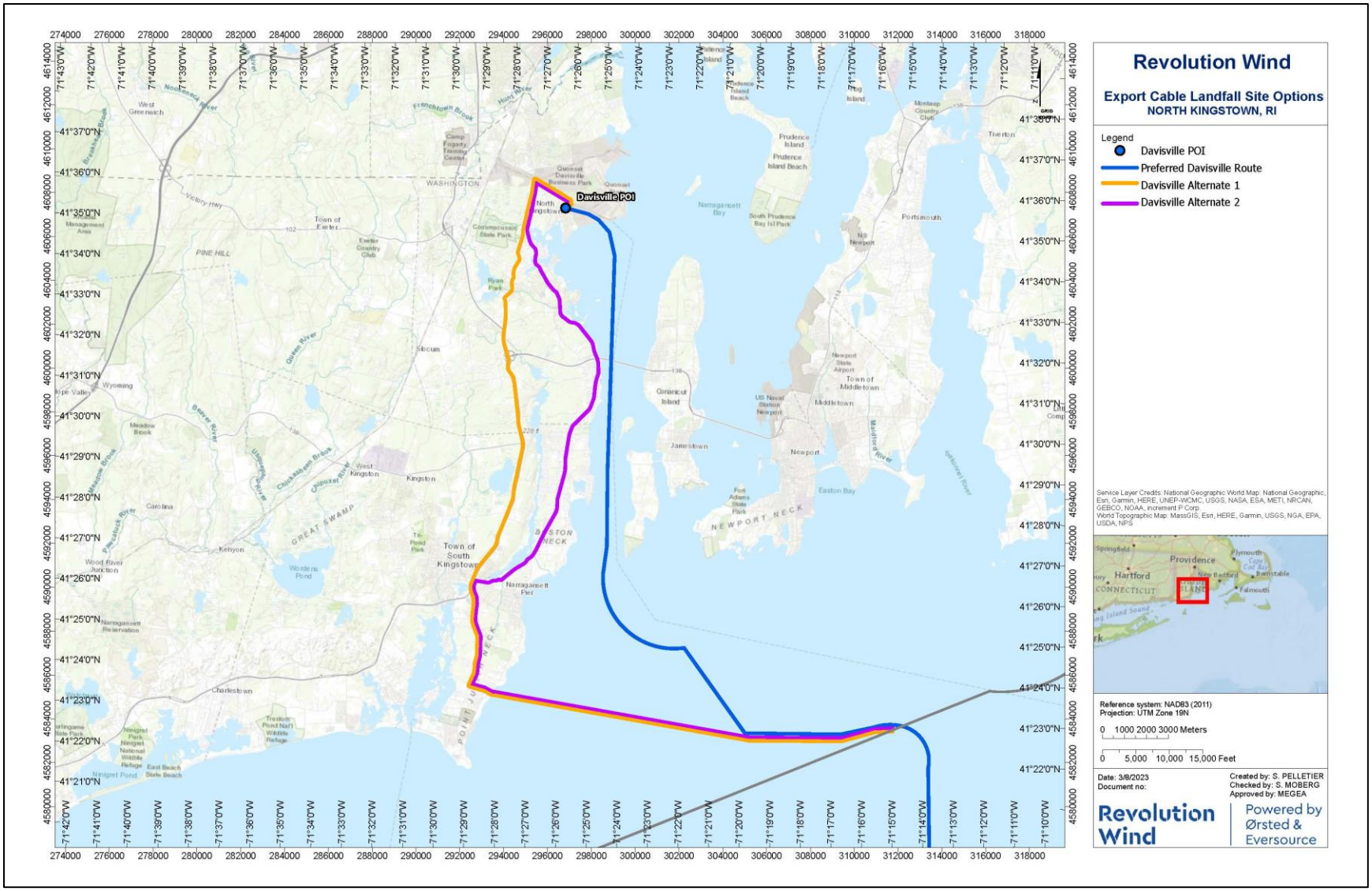

Figure K-20. Cable routes and landing sites considered (selected Davisville Route 2 and Davisville Over Land Alternates 1 and 2).

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Table K-2. Summary of Cable Routes Considered

Factors	No Action Alternative	Brayton Point Route 1	Brayton Point Route 2	Riverside Avenue Route	Kent County Route 1	Kent County Route 2	Davisville Route 1	Davisville Route 2 (Selected)	Davisville Over Land Alternate 1	Davisville Over Land Alternate 2
Linear feet of cable[*,†,‡]	0	379,104	307,296	272,448	305,184	316,800	221,760	242,880	121,440	121,440
Amount of redeposition of dredge material from horizontal directional drilling pits (square feet)[§]	0	41,290	41,290	41,290	41,290	41,290	41,290	41,290	41,290	41,290
Amount of fill material (acres)[¶]	0	61.1	54.1	47.9	53.7	50.2	39.0	32.9	5.4	5.4
Wetland impacts (square feet)	0	0	0	0	30,000[††] fresh water	30,000[††] fresh water	0[**]	0[**]	13,476[##] fresh water	139,470[#] (54,547 fresh water and 84,923 tidal)
Impacts to other SASs (square feet)[‡‡]	0	0	0	0	0	0	0	0	0	0
Other concerns	N/A	Northern long-eared bat (NLEB)[§§]	U.S. Department of Defense (DOD) use conflicts NLEB[§§]	N/A	DoD use conflicts NLEB[§§] Submerged cultural resources[¶¶]	NLEB[§§] Submerged cultural resources[¶¶]	DOD use conflicts NLEB[§§]	NLEB[§§]	USCG and DOD use conflicts NLEB[§§] High cost of overland construction Need to obtain multiple real estate easements	USCG and DOD use conflicts NLEB[§§] High cost of overland construction Need to obtain multiple real estate easements
Reasons for non-selection	Does not meet purpose and need	Longest cable length Highest amount of fill in tidal waters	Cable length Fill amount DOD use conflicts	Cable length Fill amount	Wetland fill DoD use conflicts Cable length Fill amount Submerged cultural resources	Wetland fill Cable length Fill amount Submerged cultural resources	Fill Amount DOD use conflicts	N/A	Wetland fill USCG/DOD use conflicts Cost Project delays due to need for multiple real estate easements	Wetland fill USCG/DOD use conflicts Cost Project delays due to need for multiple real estate easements

Source: Revolution Wind (2023).

[*] Excludes onshore export cable segments.

[†] Distances reported from state waters boundary to landfall.

[‡] Distances reported in linear feet are inclusive of both export cable circuits.

[§] Assumes all export cable landfalls achieved by use of horizontal directional drilling methodology.

[¶] Approximate fill depths of 1 foot are anticipated from secondary cable protection. Fill is limited to secondary cable protection. Acreages shown include fill anticipated for cable crossings. Cable installation method is such that displaced material is incidental fallback; therefore, cable installation not subject to Section 404 review.

[#] Based on data obtained from MassGIS OLIVER online mapping tool, accessed September 2018.

[**] Up to 4,370 square feet of proposed tree clearing activities at Davisville Routes 1 and 2 are not considered to be wetland impacts as described in the "No Permit Required" letter issued by the USACE on February 11, 2022. No discharge of fill materials is proposed.

[††] Approximate area based on assumed Project substation footprint 150 × 200 feet. Existing site constraints would require the substation to be built in wetlands.

[‡‡] Data from Narragansett Bay National Estuarine Research Reserve (2009).

[§§] Within northern long-eared bat habitat range.

[¶¶] Data from Morissette (2014).

Fill impacts associated with cable installation.

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Brayton Point Route 1

The Brayton Point Route 1 (BPR1) export cable route would run from the Lease Area north into Narragansett Bay through the Lower West Passage between the towns of Jamestown, Narragansett, and North Kingstown, Rhode Island. The route would then pass through the Upper East Passage between Aquidneck Island and Prudence Island into Mount Hope Bay and terminate on the west side of Brayton Point in Somerset, Massachusetts. The BPR1 export cable route would be approximately 189,552 linear feet from the 3-nm limit of state waters to the landfall at Brayton Point.

- Revolution Wind assumed that a landfall at any potential location would be accomplished using horizontal directional drilling (HDD) techniques. This would require the excavation of two HDD exit pits in subtidal waters. The redeposition of the dredged material back into the pits at the conclusion of the HDD work would constitute a fill impact regulated under Section 404 of the Clean Water Act. The exit pits would total 41,290 square feet.
- Fill in subtidal WOTUS is limited to secondary cable protection where installation of the export cable may not reach target burial depth and cable protection is deemed warranted based on site specific conditions. Additionally, cable protection is anticipated for cable crossings of existing assets. Approximate fill depths of 1 foot are anticipated from secondary cable protection. Approximately 61.1 acres of secondary cable protection is anticipated for BPR1. The proposed impacts involve subtidal waters only. No fill impacts to tidal SASs, including salt marsh, mudflat, and eelgrass, are proposed.
- Revolution Wind performed a desktop review of available information regarding onshore freshwater wetlands subject to Section 404 jurisdiction. No Section 404 wetlands are present at the point of interconnection to the regional transmission grid, and consequently, no wetland impacts are associated with the BPR1 project substation.

BPR1 was excluded from further consideration based on having the greatest overall cable length and requiring the greatest amount of fill in tidal WOTUS.

Brayton Point Route 2

The Brayton Point Route 2 (BPR2) export cable route would run from the Lease Area north into Narragansett Bay through the Lower East Passage between the towns of Jamestown and Newport and Middletown, Rhode Island, on Aquidneck Island. The route would then pass through the Upper East Passage between Aquidneck Island and Prudence Island into Mount Hope Bay and terminate on the west side of Brayton Point in Somerset, Massachusetts. The BPR2 export cable route would be approximately 153,648 linear feet from the 3-nm limit of state waters to the landfall at Brayton Point.

- 41,290 square feet of subtidal impacts is anticipated for the redeposition of dredged material back into the two HDD exit pits.
- Fill anticipated in subtidal WOTUS associated with secondary cable protection along BPR2 is 54.1 acres. No fill impacts to tidal SASs, including salt marsh, mudflat, and eelgrass, are proposed.

- Similar to BPR1, no Section 404 wetlands are present at the point of interconnection to the regional transmission grid, and consequently, no wetland impacts are associated with the BPR2 Project substation.
- Beginning in 2018, Revolution Wind consulted with the United States Navy (Department of Defense [DOD]) regarding the potential for siting an export cable in the Lower East Passage. Although the DOD did not issue correspondence to Revolution Wind denying the use of the East Passage as a potential export cable route, their preference for avoiding siting a cable in the East Passage was expressed consistently during a series of meetings occurring in 2018 and 2019. Consequently, Revolution Wind focused its attention on identifying and engineering a preferred export cable route in the West Passage of Narragansett Bay (Revolution Wind 2022b). This constraint applies to any export cable route option occupying the Lower East Passage.

BPR2 was excluded from further consideration based on DOD use conflicts and based on having a longer cable route and requiring a higher amount of fill in tidal WOTUS than several other routes, including the Project proponent's selected route.

Riverside Avenue Route

The Riverside Avenue Route (RAR) export cable would run from the Lease Area north into Narragansett Bay through the Sakonnet River between Aquidneck Island and the Towns of Little Compton and Tiverton, Rhode Island, into Mount Hope Bay. The RAR export cable would continue north through Mount Hope Bay into the Taunton River between the town of Somerset and the city of Fall River, Massachusetts, and terminate near the former Montaup Power Plant on the east side of Somerset. The RAR export cable route would be approximately 136,224 linear feet from the 3-nm limit of state waters to the landfall at Montaup.

- 41,290 square feet of subtidal impacts is anticipated for the redeposition of dredged material back into the two HDD exit pits.
- Fill anticipated in subtidal WOTUS associated with secondary cable protection along RAR is 47.9 acres. No fill impacts to tidal SASs, including salt marsh, mudflat, and eelgrass, are proposed.
- Similar to BPR1, no Section 404 wetlands are present at the point of interconnection to the regional transmission grid, and consequently, no wetland impacts are associated with the RAR Project substation.

RAR was excluded from further consideration based on having a longer cable length and requiring a higher amount of fill in tidal WOTUS than several other routes, including the Project proponent's selected route.

Kent County Route 1

The Kent County Route 1 (KCR1) export cable route would run from the Lease Area north into Narragansett Bay through the Lower East Passage between the towns of Jamestown and Newport and Middletown, Rhode Island, on Aquidneck Island. The route would then pass through the Upper West Passage between Prudence Island and the town of North Kingstown, town of East Greenwich, and the city of Warwick, Rhode Island, and terminate near Chipewanoxet Point in Warwick, Rhode Island. The KCR1

export cable route would be approximately 152,592 linear feet from the 3-nm limit of state waters to the landfall at Chipewanoxet Point.

- 41,290 square feet of subtidal impacts are anticipated for the redeposition of dredged material back into the two HDD exit pits.
- Fill anticipated in subtidal WOTUS associated with secondary cable protection along KCR1 is 53.7 acres. No fill impacts to tidal SASs, including salt marsh, mudflat, and eelgrass, are proposed.
- For the Kent County routes, the point of interconnection to the regional transmission grid is The Narragansett Electric Company (TNEC) Kent County Substation. The substation site is bordered by wetland resource areas on the north, west, and south, and by Interstate 95 on the east. Revolution Wind concluded based on these constraints that the Project substation would need to be built in Section 404 jurisdictional wetlands. Based on an assumed Project substation footprint of 150 × 200 feet, the KCR1 export cable route would result in 30,000 square feet of impacts to Section 404 wetlands.
- The DOD expressed a preference to avoid the Lower East Passage due to potential use conflicts.
- During its preliminary cable routing analysis, Revolution Wind identified the potential for significant pre-Contact submerged cultural resource constraints within Greenwich Bay (Morissette 2014), making either Kent County export cable route less desirable.

KCR1 was excluded from further consideration based on wetland impacts, the potential for greater impacts to submerged cultural resources, DOD use conflicts, and having a longer cable length and requiring more fill in tidal WOTUS than some other routes, including the proponent's selected route.

Kent County Route 2

The Kent County Route 2 (KCR2) export cable route would run from the Lease Area north into Narragansett Bay through the Lower West Passage between the towns of Jamestown, Narragansett, and North Kingstown, Rhode Island. The route would then pass through the Upper West Passage between Prudence Island and the town of North Kingstown, town of East Greenwich, and the city of Warwick, Rhode Island, and terminate near Chipewanoxet Point in Warwick, Rhode Island. The KCR2 export cable route would be approximately 158,400 linear feet from the 3-nm limit of state waters to the landfall at Chipewanoxet Point.

- 41,290 square feet of subtidal impacts is anticipated for the redeposition of dredged material back into the two HDD exit pits.
- Fill anticipated in subtidal WOTUS associated with secondary cable protection along KCR2 is 50.2 acres. No fill impacts to tidal SASs, including salt marsh, mudflat, and eelgrass, are proposed.
- Similar to KCR1, because of existing wetland constraints at the Kent County Substation, the KCR2 export cable route would result in 30,000 square feet of impacts to Section 404 wetlands.
- There are potential submerged cultural resources within Greenwich Bay.

KCR2 was excluded from further consideration based on wetland impacts, the potential for greater impacts to submerged cultural resources, and having a longer cable length and requiring a higher amount of fill in tidal WOTUS than some other routes including the proponent's selected route.

Davisville Route 1

The Davisville Route 1 (DR1) export cable route would run from the Lease Area north into Narragansett Bay through the Lower East Passage between the towns of Jamestown, Newport, and Middletown, Rhode Island, on Aquidneck Island and terminate at the south side of Quonset Point in North Kingstown, Rhode Island. The DR1 export cable route would be approximately 110,880 linear feet from the 3-nm limit of state waters to the landfall at Quonset Point.

- 41,290 square feet of subtidal impacts is anticipated for the redeposition of dredged material back into the two HDD exit pits.
- Fill anticipated in subtidal WOTUS associated with secondary cable protection along DR1 is 39.0 acres. No fill impacts to tidal SASs, including salt marsh, mudflat, and eelgrass, are proposed.
- DR1 avoids impacts to onshore freshwater wetlands.
- The DOD expressed a preference to avoid the Lower East Passage due to use conflicts.

DR1 was excluded from further consideration based on DOD use conflicts and because it would require a higher amount of fill in tidal waters than the proponent's selected route.

Davisville Route 2 (Selected)

The Davisville Route 2 (DR2) export cable route would run from the Lease Area north into Narragansett Bay through the Lower West Passage between the towns of Jamestown, Narragansett, and North Kingstown, Rhode Island, and terminate at the south side of Quonset Point in North Kingstown, Rhode Island. The DR2 export cable route would be approximately 121,440 linear feet from the 3-nm limit of state waters to the landfall at Quonset Point.

- 41,290 square feet of subtidal impacts is anticipated for the redeposition of dredged material back into the two HDD exit pits.
- Fill anticipated in subtidal WOTUS associated with secondary cable protection along DR2 is 32.9 acres. No fill impacts to tidal SASs, including salt marsh, mudflat, and eelgrass, are proposed.
- DR2 avoids impacts to onshore freshwater wetlands .
- DR2 avoids potential DOD/USCG use conflicts.

DR2 was selected by the Project applicant based on the avoidance of wetland impacts and DOD/USCG use conflicts. Moreover, the potential for major Project delays associated with Davisville Over Land Alternates 1 and 2 would likely render those alternatives inconsistent with the purpose and need for the Project because they would negate the applicant's ability to meet their offtake agreement terms. The DR2 route is used in all action alternatives analyzed in this EIS.

Davisville Over Land Alternate 1

The Davisville Over Land Alternate 1 (DA1) export cable route would run from the Lease Area north into Narragansett Bay and terminate at Scarborough State Beach in Narragansett, Rhode Island. The DA1 export cable route would be approximately 60,720 linear feet from the 3-nm limit of state waters to the landfall at Narragansett. Onshore, the underground ductbank would follow existing paved roadways (Burnside Road, State Route 108, and U.S. Route 1) in the towns of Narragansett, South Kingstown, and North Kingstown before joining the TNEC 115-kilovolt (kV) Davisville Transmission Tap right-of-way (ROW) and would follow the TNEC ROW to the Davisville Substation for an overall onshore distance of approximately 17 miles (89,760 linear feet). Between the Davisville Substation and the Project's onshore substation, the underground ductbank would be co-located in the overhead ROW.

Construction of DA1 would impact 13,476 square feet of palustrine scrub-shrub and palustrine forested wetland primarily along the Davisville Transmission Tap ROW. The DA1 export cable route would cross the USCG traffic separation scheme entering the bay and a DOD torpedo testing range.

- 41,290 square feet of subtidal impacts is anticipated for the redeposition of dredged material back into the two HDD exit pits.
- Fill anticipated in subtidal WOTUS associated with secondary cable protection along the selected route is 5.4 acres. No fill impacts to tidal SASs, including salt marsh, mudflat, and eelgrass, are proposed.
- DA1 would result in 13,476 square feet (0.3 acre) of impacts to onshore freshwater wetlands. No fill impacts to tidal SAS- including salt marsh, mudflat, and eelgrass- are proposed.
- DA1 would cross the USCG traffic separation scheme entering the bay and would cross a DOD torpedo testing range, thereby creating potential DoD/USCG use conflicts.
- DA1 would have the second highest construction cost due to the length of the onshore route and would be estimated to cost 60% more than Davisville Route 2.
- DA1 would have difficult constructability issues due to its location along high traffic, limited access roadways.
- The cable installation work for DA1 would take much longer than for the cable routes that are primarily located in the water, which would cause a major delay in the completion of the Project.
- DA1 would require that the Project proponent obtain real estate easements from state and local entities, which would cause a major delay in the implementation of this alternative.

DA1 was excluded from further consideration based on wetland impacts, potential DOD/USCG use conflicts, major delays in Project implementation based on the need to obtain real estate easements from state and local entities, and higher construction costs and a much longer construction timeframe than the proponent's selected alternative.

Davisville Over Land Alternate 2

The Davisville Over Land Alternate 2 (DA2) export cable route would run from the Lease Area north into Narragansett Bay and terminate at Scarborough State Beach in Narragansett, Rhode Island. The DA1

export cable route would be approximately 60,720 linear feet from the 3-nm limit of state waters to the landfall at Narragansett. Onshore, the underground ductbank would follow existing paved roadways (Burnside Road, State Route 108, and U.S. Route 1) in the towns of Narragansett, South Kingstown, and North Kingstown before joining a TNEC 34.5-kV distribution ROW. At that point, it would follow the TNEC distribution ROW cross country to the Davisville Transmission Tap ROW, then follow the Davisville Transmission Tap ROW to the Davisville Substation for an overall onshore distance of approximately 18.8 miles (99,264 linear feet). Between the Davisville Substation and the Project's onshore substation, the underground ductbank would be co-located in the overhead ROW.

Construction of DA2 would impact 144,262 square feet of palustrine scrub-shrub and forested and estuarine emergent wetland. The DA2 export cable route would cross the USCG traffic separation scheme entering the bay and a DOD torpedo testing range.

- 41,290 square feet of subtidal impacts is anticipated for the redeposition of dredged material back into the two HDD exit pits.
- Fill anticipated in subtidal WOTUS associated with secondary cable protection along the selected route is 5.4 acres.
- DA2 would result in 139,470 square feet (3.2 acres) of fill impacts to wetlands (1.25 acres of freshwater wetlands and 1.95 acres of tidal wetlands) related to the cable installation along the overland route. There would also be 1,269 square feet (0.03 acre) of fill impacts to a freshwater pond and 3,523 square feet (0.08 acre) of fill impacts to tidal waters.
- DA2 would cross the USCG traffic separation scheme in the bay and would cross a DOD torpedo range, thereby creating potential USCG/DOD use conflicts.
- DA2 would have the highest construction cost of any of the alternatives due to having the greatest length of onshore route and would cost approximately 75% more than Davisville Route 2.
- DA2 would have difficult constructability issues due to its location along a cross-country utility ROW with multiple wetland and waterway crossings.
- The cable installation work for DA1 would take much longer than for the cable routes that are primarily located in the water, which would cause a major delay in the completion of the project.
- DA2 would require that the Project proponent obtain real estate easements from state and local entities, TNEC, and potentially private property owners, which would cause a major delay in implementation of this alternative.

DA2 was excluded from further consideration based on wetland impacts; potential DOD/USCG use conflicts; major delays in Project implementation based on the need to obtain real estate easements from state, local, and possibly private entities; and higher construction costs and a much longer construction timeframe than the proponent's selected alternative.

Summary

Of the potential export cable routes evaluated, the Brayton Point routes, the Kent County routes, the Riverside Avenue route, Davisville Route 1, and the two Davisville Over Land Alternate routes were ultimately excluded from further consideration by the Project applicant. Subsequently, as part of its

implementation of the NEPA regulations governing the development of a "reasonable range of alternatives" and its alternatives screening criteria, BOEM also excluded these routes from further consideration based on a variety of factors, including wetland impacts, fill impacts, USCG and/or DOD use conflicts, construction costs, and Project implementation and completion delays. Consequently, Revolution Wind identified Davisville Route 2 as their selected route for the export cable. This alternative accommodates the full generation capacity of the Project while avoiding wetland impacts, DoD/USCG use conflicts, and the major Project delays and higher construction costs associated with the two over land alternatives. This route also involves the least fill in tidal waters of the primarily in-water routes and is used in all action alternatives analyzed in this EIS.

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