VINEYARD OFFSHORE

SUBMISSION FOR PURCHASE OF OFFSHORE WIND RENEWABLE ENERGY CERTIFICATES

ORECRFP24-1

SEPTEMBER 9, 2024

PUBLIC

Confidentiality Statement

Certain information in this proposal is non-public, proprietary, commercial, and/or financial information (“Confidential Information”), which has been redacted from the version of this proposal marked “PUBLIC.” Such Confidential Information is highlighted in gray and/or is clearly marked as confidential in the version of this proposal marked “CONFIDENTIAL.” Vineyard Offshore intends for all such Confidential Information to remain confidential. Further, the version of this proposal marked “CONFIDENTIAL” should be treated as a non-public record that is exempt from disclosure under applicable laws and as set forth in the Request for Proposals ORECRFP24-1 Purchase of Offshore Wind Renewable Energy Certificates issued on July 17, 2024 and updated on August 13, 2024.

Section 6.0 Project Development Plan

Response to New York State Energy Research and Development Authority Request for Proposals ORECRFP24-1

VINEYARD OFFSHORE

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SECTION 6
PROJECT DEVELOPMENT PLAN

6.1 PROJECT TEAM

6.1.1 Business Entity Structure

Vineyard Offshore LLC ("Vineyard Offshore") was launched in April 2022 and is exclusively focused on the rapidly expanding United States (US) offshore wind market. [redacted]

Vineyard Offshore is CIP's dedicated offshore wind development team in the US, leading the development and commercialization of CIP's US offshore wind projects. [redacted]

[redacted]

Board of Directors

[redacted]

[redacted]

Officers

Vineyard Offshore is led by Chief Executive Officer (CEO) Alicia Barton. Additional members of the leadership team include Chief Development Officer (CDO) Rachel Pachter, Chief Commercial Officer (CCO) Ben Koffel, Chief Legal Officer and Corporate Secretary Jennifer Simon Lento, Chief Financial Officer (CFO) Ryan Wallace, Chief Project Officer Klaus Møller, and Chief External Affairs Officer Christian Scorzoni.

6.1.2 Organizational Chart

6.1.2.1 Vineyard Mid-Atlantic LLC

The lease agreement for the Lease Area is held by Vineyard Mid-Atlantic LLC, a Delaware limited liability company. [redacted]

[redacted]

[redacted]

6.1.3 Management Chart

The Vineyard Offshore team is made up of highly qualified individuals with decades of experience in the US and global offshore wind markets. Many members of the team supported the development of Vineyard Wind 1 and remain involved in that project as it moves through the construction phase. The experience gained developing and constructing the nation's first commercial-scale offshore wind project has been and will continue to be leveraged by Vineyard Offshore to ensure the success of the Project.

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6.1.3.1 *Senior Management Team Experience*

The following Project team principals are currently based in Boston, Massachusetts, and will remain at that office in their role on the Project.

Alicia Barton, CEO of Vineyard Offshore

Alicia is a seasoned executive with a career at the forefront of the renewable energy sector. As the former CEO of FirstLight Power, she played a pivotal role in developing and operating a more-than-1.6 GW portfolio of hydroelectric, pumped storage, battery storage, and solar assets in the US and Canada and led the company's investment in Leading Light Wind, an offshore wind project in development in the New York Bight. Prior to FirstLight Power, Alicia held key positions in some of the industry's leading organizations. At SunEdison, she managed operations for the Global Utility Group (a utility-scale solar and land-based wind developer in global markets) during its tenure as the largest renewable energy development company globally. Her experience in the public sector includes tenure as the CEO of the Massachusetts Clean Energy Center where she oversaw the development of the New Bedford Marine Commerce Terminal, a key staging port for the construction of Vineyard Wind 1. She also served as CEO of the New York State Energy Research and Development Authority (NYSERDA), where she led New York's record-setting procurements for renewable energy, with over 6,000 megawatts (MW) of new renewable energy resources put under long-term contracts, including the nation's largest offshore wind procurement at that time. While in private law practice, she also served as outside counsel to Vineyard Wind 1 LLC ("Vineyard Wind") leading up to its initial bid to Massachusetts. Through each of her prior roles, Alicia has been an instrumental leader in laying the groundwork for the offshore wind industry in the US. Alicia holds a bachelor's degree in Natural Resources from Ohio State University and a Juris Doctor (JD) degree from Boston College Law School.

Klaus Skoust Møller, Chief Project Officer

Klaus is currently serving as the CEO of Vineyard Wind 1. He has over 15 years of experience in offshore wind, including a successful track record of leading the development and construction of over 3 GW of large-scale offshore wind projects across four continents, including serving as Program Director for the Zhong Neng (Taiwan), and United Kingdom (UK) offshore wind projects, including Race Bank, Burbo Bank Extension, and Gunfleet Sands 3. Klaus holds a graduate diploma in business administration from Copenhagen Business School (Denmark), as well as a Master of Law from Aarhus University (Denmark), and a Higher Commercial Examination Program Degree (HHX) from Randers Business School (Denmark).

Rachel Pachter, CDO of Vineyard Offshore

Rachel also currently serves as the CDO for Vineyard Wind and was previously Vineyard Wind's Vice President of Permitting (2016 to 2019). She has more than 20 years of experience in offshore wind development, particularly in permitting and regulatory compliance, environmental and site investigation, and federal, state, and local regulations. In addition to overseeing permitting efforts for Vineyard Wind 1, she has developed geophysical, geotechnical, and avian surveys and conducted community outreach and public relations. To date, Rachel is the only person to successfully manage and complete permitting of not one, but two commercial-scale offshore wind projects located in US federal waters (Cape Wind and Vineyard Wind 1). Rachel advised and planned all environmental and permitting aspects of development for Vineyard Wind 1 and managed the first phase of offshore geophysical and geotechnical site investigations for that project. Rachel has a bachelor's degree in geology, Cum Laude, from the University of Alaska at Fairbanks and received the Geology and Geophysics Award for outstanding scholastic achievement.

Ben Koffel, CCO of Vineyard Offshore

Ben has more than a decade of experience in onshore renewables development and investment banking. As a developer at Enel Green Power, Ben previously worked on more than 3 GW of wind, solar, and hydropower developments in North America and Colombia, across all phases of the project lifecycle, from site origination and land acquisition, permitting, interconnection, pre-construction planning, and offtake structuring, to shepherding projects through Final Investment Decision. As an investment banker, Ben was involved in approximately $2 billion of successful structured finance transactions in the renewables and transportation sectors in North and South America, including greenfield debt and equity raising, mergers and acquisitions, and strategic divestments. He has a master’s degree in Regional Planning and a bachelor’s degree in Anthropology, both from Cornell University.

Ryan Wallace, CFO of Vineyard Offshore

Ryan has approximately 15 years of experience in renewable energy and merchant energy facilities throughout New England and New York. Before joining Vineyard Offshore, Ryan served as the Executive Vice President of Finance at Great River Hydro where he helped transition 13 facilities producing 1.6 GW of conventional hydropower throughout New England from a collection of high-quality, utility-scale assets into a premier, standalone platform of renewable energy growth. Ryan also previously worked at TransCanada Corporation where he supported the financial aspects of the development and successful operations of the Kibby Wind Farm in Maine. He has a master's degree in accounting from Bentley University and a bachelor's degree in finance from the University of Massachusetts Dartmouth.

Jennifer Simon Lento, Chief Legal Officer and Corporate Secretary of Vineyard Offshore

Jennifer is currently serving as the Chief Legal Officer and Corporate Secretary of Vineyard Wind. She also led the $2.3 billion debt financing process for the Vineyard Wind 1 project, which achieved financial close (FC) in 2021 and oversaw the project’s efforts to close on the first tax equity financing deal for an offshore wind project. In her General Counsel role at Vineyard Offshore, Jen oversaw successful defense of four federal court challenges of the project Construction and Operations Plan (COP) and helped to set precedent for the next generation of offshore wind projects. Jennifer has been practicing law in the renewable energy and environmental sectors for more than 20 years. Jennifer received her JD degree at the Rutgers School of Law and holds a bachelor’s degree in liberal arts from Sarah Lawrence College.

Christian Scorzoni, Chief External Affairs Officer of Vineyard Offshore

As Chief External Affairs Officer, Christian leads Vineyard Offshore’s policy development, regulatory and government affairs, and strategic communications work. Since 2016, Christian has worked closely with Vineyard Wind and Vineyard Offshore in various capacities to provide strategic counsel and government affairs support. Christian previously served as Assistant Secretary of Energy and Environmental Affairs under Governor Deval Patrick where he managed the policy development and implementation of several landmark energy bills, including the Green Communities Act, Global Warming Solutions Act, and Green Jobs Act. He received his JD degree from Suffolk Law School and has a bachelor's degree in political science from American University.

Bryan Mornaghi, Procurement Director

Bryan currently serves as Procurement Director and has 15 years of experience in the wind power industry, having worked as a developer, supplier of turbines, and advisor for merger and acquisition and real estate transactions in the wind power business. Bryan served as the Contracts and Procurement Director for Vineyard Wind 1, having led various efforts for the project's major EPC contracts. Bryan holds a JD degree and master's in environmental law from Vermont Law School, a bachelor's degree in biology from the University of Colorado and is registered to practice law in New York State.

Nora DeDontney, Development Director at Vineyard Offshore

As the Development Director, Nora oversees the early-stage activities of the Vineyard Mid-Atlantic lease area, including technical development, permitting, project management, procurement, tribal and fisheries engagement, and environmental activities. Nora has 13 years of experience in the energy industry with experience spanning research and development, business development, and early projects. In addition to early project development, she also worked in business development, acquiring acreage for development and supporting the portfolio evaluation for early investment decisions. Nora received a bachelor's degree in geology and mechanical engineering from the California Institute of Technology and a Doctor of Philosophy degree (PhD) in earth science from Harvard.

Tina Fuchs, Technical Director at Vineyard Offshore

As Technical Director, Tina oversees the technical development of the Project. She has more than 15 years of experience in the offshore wind industry through various roles in planning, engineering, contracting, and construction management. Tina joined the Vineyard Offshore team in early 2024 and oversees the technical team. Her experience provides her with a deep understanding of interdependencies and risks inherent to offshore wind development, technical and non-technical. Tina has a master's degree in industrial engineering from TU Kaiserslautern and ENSGSI Nancy (double diploma), as well as an executive Master of Business Administration (MBA) degree from the Antwerp Management School.

Sebastian Despuig Reid, Investment Senior Manager at Vineyard Offshore

As Investment Senior Manager, Sebastian oversees the business case and investment teams responsible for delivering project valuations and investment structures. He has worked in offshore wind across the globe for the past six years in development and investment banking. As a developer at Copenhagen Offshore Partners A/S, Sebastian previously worked on more than 5 GW of offshore wind projects in countries across Europe and the UK, as well as Japan, where he spent one and a half years setting up the company competences structuring partnerships, hiring advisors, and setting up the bidding and offtake strategy. He has a master's degree in climate change and finance from Imperial College London and a bachelor's degree in civil engineering from the University of Sheffield.

Zach Fuerst, Business Development Director at Vineyard Offshore

At Vineyard Offshore, Zach leads the development of investment guidance, business case, and market entry strategy for CIP in support of seabed lease acquisition, Canadian market entry efforts, and bids for North American energy offtake procurements. Zach joined the company in 2021 having completed his MBA from Yale University. Zach also holds master's and bachelor's degrees in mechanical engineering from Columbia University and the University of Michigan, respectively.

Ali Alrayes, Business Development Director at Vineyard Offshore

As Director of Business Development, Ali is responsible for the commercial development of Vineyard Offshore's projects, including origination of new projects and securing offtake for existing projects. Ali's experience in US offshore wind includes the preparation for and then participation in and eventual successful results from Bureau of Ocean Energy Management (BOEM) lease auctions, as well as the multiple solicitations for offtake. Prior to joining Vineyard Offshore, Ali worked at Enel Green Power, focusing on the development, engineering, and construction of utility-scale energy storage projects. Ali started his career at Black & Veatch as an electrical engineer responsible for the design and engineering of power generation and transmission facilities across the US. Ali is a graduate of the Massachusetts Institute of Technology (MIT) with an MBA and a master's degree in electrical engineering, as well as a bachelor's degree in electrical engineering from Michigan State University. Ali has also completed his Professional Engineer training in power systems engineering.

The following team principals currently reside and are based in New York State and will remain in New York in their role on the Project.

Scott Salmon, Senior Permitting Manager

As Senior Permitting Manager for New York, Scott is responsible for securing New York State and municipal permits for the Project. Scott has over 18 years of experience in the energy and utilities industry in siting, site assessment and survey, and licensing and permitting of energy infrastructure. Scott has previously supported the permitting programs of the Beacon Wind and Attentive Energy offshore wind projects and Champlain Hudson Power Express project as a consultant and has served key roles on numerous transmission projects that have successfully obtained New York State Public Service Commission (NYSPSC) approvals under Article VII in New York. Scott has a bachelor's degree in environmental studies from Prescott College and a master's degree in geography from Rutgers University.

Andrea Bonilla, Senior Manager, External Affairs

Andrea has more than a decade of experience in stakeholder and government relations, workforce and economic development, and implementing project permitting in coordination with stakeholder needs and input. Andrea previously worked with Eversource Energy on South Fork and Sunrise Wind and with New York's Workforce Development Institute on strengthening workforce needs in manufacturing, union, and other small business enterprises, as well as higher education and renewable energy initiatives. In addition to offshore wind, Andrea has experience in large-scale real estate development and entitlements on Long Island, grassroots organizing, political campaigns, and social and print media communications. She has a bachelor's degree in international relations and Latin American and Caribbean studies from Brown University and speaks five languages: English, Spanish, and French fluently, as well as basic Portuguese and Italian.

Blake Hyatt, New York Labor Relations Manager

As Labor Relations Manager, Blake will maintain Vineyard Offshore's relationships with local unions and labor organizations and will support the negotiation and implementation of a project labor agreement (PLA) for Vineyard Offshore's work in New York. Blake brings 18 years of experience in local government and community organizing to Vineyard Offshore. For the past five years he worked on Long Island for Suffolk County, serving as Deputy Commissioner of Labor and Assistant Deputy County Executive. There, he led the county's efforts to develop the Brentwood Center, a community resource and workforce training center focused on preparing community members for careers in offshore wind and advanced manufacturing. This project included the negotiation of a PLA governing construction of the Brentwood Center. Blake earned his master's degree in public policy from Harvard's Kennedy School of Government and his bachelor's degree in sociology and politics from Brandeis University.

Randhir Singh, Director of Transmission

Currently Randhir is the Director of Transmission at Vineyard Offshore in New York, with a proven track record of success in the sector. Previously, Randhir held key roles at Ørsted, PSEG, and Avangrid (UI). At Ørsted, he led the electrical development of offshore wind projects, storage, and hydrogen. At PSEG, Randhir oversaw power plant operations, including generator testing and compliance, for PSEG's 12 GW generation fleet, while contributing to the development of new power stations and coordinating with regional grid operators (PJM, ISO New England [ISO-NE], and NYISO). Randhir has also worked in Australia as an electrical engineer at Western Power the regional utility in various roles. Randhir has bachelor's and master's degrees in electrical engineering from Curtin University in Perth, Western Australia, and an advance degree in energy finance from NYU.

Christina Duong, Interconnection Manager at Vineyard Offshore

As the Interconnection Manager, Christina serves as the primary point of contact for large-scale generation interconnections, liaising with independent system operators, regional transmission operator's, and transmission service providers. She oversees the interconnection queue and manages complex utility studies and expansion plans to identify potential opportunities. Drawing on her previous role as a Market Design Specialist at NYISO, Christina keeps the team updated on independent system operator developments, offers guidance on key projects, and maintains strong communication with independent system operator staff to support the advancement of emerging technologies in the New York Control Area. Her experience at NYISO also includes roles in market mitigation and analysis and market operations, where she reviewed cost, operations, and revenue data for over 5 GW of Interconnection Requests in the Lower Hudson Valley and New York City, reformed NYISO's interconnection process, and led the implementation of new market mechanisms, including the capacity accreditation process. She holds bachelor's degrees in chemical engineering and environmental engineering from Clarkson University.

Marlena Fitzpatrick, Workforce Development Manager

Marlena is a labor and employee relations veteran with over 15 years of experience working in labor and workforce development. She is best known for her advocacy work on fair representation and diversity, equity, inclusion, and justice in the entertainment industry. She holds a Master of Fine Arts degree in bilingual creative writing from the University of Texas, El Paso, and a master's degree in labor relations from Interamerican University of Puerto Rico. She joined the Screen Actors Guild and the American Federation of Television and Radio Artists (SAG-AFTRA) as the Spanish Language Media Industry Relations Manager in 2008. In 2016, she was the Business Agent at AFM Local 802 representing musicians performing on Broadway and in off-Broadway productions. She has also represented the *Wall Street Journal* and Dow Jones union members at Independent Association of Publishers' Employees (IAPE). Marlena is currently pursuing her JD degree at the University of New Hampshire, Franklin Pierce.

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6.1.4 Responsible Entities

Vineyard Offshore has extensive contacts and access to the firms required to satisfy the financing, environmental assessment, operation, engineering, transmission, and legal counsel requirements of the Project.

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6.1.5 Project Experience

6.1.5.1 Vineyard Offshore

Vineyard Offshore brings industry-leading experience to every phase of the offshore wind project development process, from conception and design to permitting, financing, and construction. Headquartered in Massachusetts, we currently have more than 100 offshore wind specialists working in Massachusetts, New York, and California who are developing 6 GW of US offshore wind capacity and continually evaluating new development opportunities.

The company was established by the same team that founded Vineyard Wind, which is building the Vineyard Wind 1 project. Our knowledge of what is required to develop, permit, finance, and construct offshore wind projects in the US is unparalleled.

Vineyard Offshore develops offshore wind projects in the US that CIP owns and funds. CIP is a fund management company focused on energy infrastructure, including offshore wind, onshore wind, solar photovoltaic, biomass and energy from waste, transmission and distribution, reserve capacity and storage, and other energy assets like Power-to-X.

6.1.5.2 Copenhagen Infrastructure Partners P/S

CIP was established in 2012 by senior executives from the energy sector with PensionDanmark (one of the largest labor market pension funds in Denmark and one of the most experienced institutional investors in renewable energy) as the founding investor. Today, CIP is a global leader, market pioneer, and among the largest fund managers globally within renewable energy. CIP currently manages 12 funds and has approximately $27 billion from more than 150 global institutional investors under management (see Table 6.1-2). The funds represent different investment strategies with the five "flagship funds," indicated in bold, focusing on energy infrastructure projects in Organization for Economic Co-operation and Development (OECD) countries. Additional information about CIP's experience is provided in this section.

Table 6.1-2 Copenhagen Infrastructure Partners P/S Funds

Fund Name	Fund Size	Established
Copenhagen Infrastructure I K/S	~€1 billion (~$1.1 billion USD)	2012
CI Artemis I K/S	€400 million (~$442 million USD)	2014
Copenhagen Infrastructure II K/S	€2 billion (~$2.2 billion USD)	2014
Copenhagen Infrastructure III K/S	€3.5 billion (~$3.9 billion USD)	2017
Copenhagen Infrastructure New Markets Fund I K/S	$1 billion (~$1.1 billion USD)	2019
CI Artemis II K/S	~€300 million (~$332 million USD)	2020
Copenhagen Infrastructure IV K/S	€7 billion (~7.7 billion USD)	2020
Copenhagen Infrastructure Energy Transition Fund I K/S	€800 million (~$884 million USD)	2021
CI GCF I	€1 billion (target) (~$1.1 billion USD)	2021
CI Advanced Bioenergy Fund I	€1 billion (target) (~$1.1 billion USD)	2022
Copenhagen Infrastructure V	€5.6 billion with a target fund size of €12 billion (~$6.2 and $13.3 billion USD, respectively)	2023

CIP has a team of approximately 400 professionals across 30 nationalities, and offices in Copenhagen (headquarters), New York, Hamburg, London, Melbourne, Singapore, Seoul, Tokyo, and Utrecht, along with 17 project offices in the company's main markets. Project office locations are selected to secure a local presence in key markets. Advantages of this strategy include being close to local authorities, governmental bodies, and other stakeholders; developing local networks; having access to hiring local employees; understanding the culture and local business environment; and having ready access to project sites and local project teams.

CIP takes a proactive and hands-on approach to investing and managing assets and focuses on building and maintaining an execution platform with a local presence to support active involvement in investments and assets during all phases of the investment and asset lifecycle. [redacted]

[redacted]

6.1.5.2.1 Copenhagen Infrastructure Partners P/S Partner Group

CIP is controlled and majority-owned by four Senior Partners with a proven track record in the energy industry (see Figure 6.1-5). [redacted]

Figure 6.1-5 Copenhagen Infrastructure Partners P/S's Senior Partners

[redacted]

6.1.5.2.2 Offshore Wind Experience

CIP is active in offshore wind globally and currently has ownership or exclusive rights to approximately 50 GW of offshore wind projects in development, construction, or operation in North America, the UK, Germany, Italy, Taiwan, South Korea, Japan, and Australia (see Figure 6.1-6). CIP has pioneered the build-out of offshore wind in the US with Vineyard Wind 1. [redacted]

With its leading competencies and insight into offshore wind, CIP is widely considered to be a global leader and market pioneer, particularly within the offshore wind industry, and an early mover into new markets. [redacted]

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6.1.5.2.3 High Voltage Direct Transmission Experience

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6.1.5.4 Project Sponsor Portfolio

A list of offshore wind, onshore wind, and transmission projects that CIP has successfully developed or that are currently in development or under construction is provided as Attachment 6.1-1. [redacted]

6.1.6 Pending Health/Safety Enforcement Notices, Litigation, or Disputes

There are no pending Health/Safety Enforcement Notices, litigation, or disputes related to projects planned, developed, owned, or managed by Proposer or any direct parent company of Proposer, and Proposer has no JV partner. Though not required by this section, Proposer discloses that the Vineyard Wind 1 project, now under construction by an affiliate of Proposer is subject to a suspension order (the "Order") issued by the US Department of Interior, Bureau of Environmental Safety and Enforcement (BSEE), temporarily restricting energy production and certain construction activities of the Vineyard Wind 1 project, due to an isolated blade failure event that occurred as a result of non-performance by GE Vernova Inc., the project's turbine supplier. Vineyard Wind 1 is in full compliance with the Order and continues to cooperatively engage with all relevant government and community stakeholders.

6.1.6.1 Vineyard Offshore

Vineyard Offshore is not a named party in any pending (current or in the past three years) litigation or disputes related to projects planned, developed, owned, or managed in the US, or related to any energy product sale agreement.

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6.1.6.4 Parent Companies

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6.1.7 Material Litigation, Disputes, Claims or Complaints, or Events of Default

[redacted]

6.2 PERMITTING PLAN

Vineyard Offshore continues to lead the rapidly growing US offshore wind sector using the experience gained permitting multiple, coincident offshore wind projects. Having worked closely with BOEM and other federal agencies since 2017, we have the experience, knowledge, and resources needed to support successful federal permitting and review processes. The Vineyard Offshore team led the effort to secure all federal, state, and local permits for Vineyard Wind 1 and is using the same industry-leading approach to develop and permit the Project. Our permitting activities are supported by a suite of environmental consultants with the experience and expertise required to permit offshore wind projects successfully (see Section 6.1.5).

The federal permitting process for the Project is already underway. In January 2024, Vineyard Offshore submitted the Vineyard Mid-Atlantic COP to BOEM.[1,2] The permitting envelope for the COP includes 118 total WTG and electrical service platform (ESP) positions within the Lease Area.[3] One or two of those positions will be occupied by ESPs, and the remaining positions will be occupied by WTGs. [redacted] Excelsior Wind will be developed as part of Vineyard Mid-Atlantic.

Our permitting plan is informed by numerous consultations with federal, state, and local agencies. One of the key lessons learned from previous projects was to engage with agencies well before starting the permitting process. Consequently, we began agency outreach specific to Vineyard Mid-Atlantic well before the submission of the COP, and we have met with all

[1] For the purposes of federal permitting, "Vineyard Mid-Atlantic" is Vineyard Offshore's proposal to develop, construct, and operate Offshore Wind Generation Facilities (OWFs) in the Lease Area, along with associated offshore and onshore transmission systems.

[2] The Vineyard Mid-Atlantic COP is currently undergoing a completeness and sufficiency review before BOEM issues a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS).

[3] Six WTG/ESP positions along the northwestern boundary of Lease Area OCS-A 0544 are contingent upon the final layout of the neighboring Empire Wind 2 project. Vineyard Mid-Atlantic will not develop these contingent WTG/ESP positions if the final Empire Wind 2 layout includes WTGs at immediately adjacent positions within Lease Area OCS-A 0512.

federal agencies that will issue a permit for the Project, including BOEM, USACE, the US Environmental Protection Agency (EPA), NMFS, USFWS, the US Coast Guard, and the National Park Service (NPS). [redacted]

This frequent and early engagement with agencies enabled Vineyard Offshore to incorporate agency feedback into the siting and design of the facilities; methodologies for resource assessments; survey strategies; and proposed avoidance, minimization, and mitigation measures. In particular, consultations with numerous federal and state agencies, including consultations and meetings with BOEM, NMFS, USACE, US Coast Guard, and NYSDOS, as well as stakeholders, heavily informed the siting of the offshore export cable corridor (OECC).

Lists of the permits, licenses, and environmental assessments or environmental impact statements required for the Project are provided in Tables 6.2-1 through 6.2-3.

6.2.1 Permits, Licenses, and Environmental Impact Statements

6.2.1.1 Federal Permits and Approvals

Vineyard Offshore intends to seek coverage for Vineyard Mid-Atlantic under Title 41 of the Fixing America's Surface Transportation Act (FAST-41). FAST-41 is designed to improve the timeliness, predictability, and transparency of the federal environmental review and authorization process for covered infrastructure projects. Under FAST-41, the Permitting Council will be responsible for overseeing interagency coordination during the environmental review and decision-making process for Vineyard Mid-Atlantic.

Table 6.2-1 lists the expected federal permits and approvals required for the Project and their status. The timelines for each permit/approval are discussed in Section 6.2.2.

Table 6.2-1 Anticipated Federal Permits, Approvals, and Consultations

Agency/Regulatory Authority	Permit/Approval	Status
Bureau of Ocean Energy Management (BOEM)	Site Assessment Plan (SAP) Approval	SAP approved on February 20, 2024
	COP Approval	COP initially filed with BOEM in January 2024; under sufficiency review by BOEM
	EIS: NEPA review and Record of Decision (ROD)	To be initiated by BOEM
Bureau of Ocean Energy Management (BOEM) (continued)	Consultation under Section 106 of the National Historic Preservation Act (NHPA); consultation with NMFS under the Magnuson-Stevens Fishery Conservation and Management Act (MSA); consultation under Section 7 of the Endangered Species Act (ESA) with NMFS and USFWS; consultation with NOAA's Office of National Marine Sanctuaries (ONMS) under the National Marine Sanctuaries Act; and government-to-government tribal consultations	To be initiated by BOEM
Bureau of Safety and Environmental Enforcement (BSEE)	Facility Design Reports (FDRs) and Fabrication and Installation Reports (FIRs)	To be filed (TBF)
US Environmental Protection Agency (EPA)	National Pollutant Discharge Elimination System (NPDES) Permit(s), if needed	TBF
	Outer Continental Shelf (OCS) Air Permit	TBF
US Army Corps of Engineers (USACE)	CWA Section 404 Permit (for discharge of dredged material and installation of the offshore export cable and associated cable protection within state territorial limits) Rivers and Harbors Act of 1899 Section 10 Individual Permit (for all offshore structures) Section 408 permission pursuant to Section 14 of the Rivers and Harbors Act of 1899 (required if Vineyard Mid-Atlantic affects a USACE civil works project)	TBF

Table 6.2-1 Anticipated Federal Permits, Approvals, and Consultations (continued)

Agency/Regulatory Authority	Permit/Approval	Status
National Marine Fisheries Service (NMFS)	Incidental Take Regulation (ITR) and an associated Letter of Authorization (LOA)	TBF
US Coast Guard	Private Aid to Navigation (PATON) permits	TBF
Federal Aviation Administration (FAA)	No Hazard Determination (for activities at staging ports and vessel transits, if required)	TBF
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
New York State Department of State (NYSDOS) Division of Coastal Resources	Federal Consistency Concurrence under the Coastal Zone Management Act (CZMA)	TBF

6.2.1.1.1 <u>Bureau of Ocean Energy Management</u>

BOEM is the lead federal agency for Vineyard Mid-Atlantic, which includes the Project. The agency has jurisdiction under OCSLA to issue leases, easements, and rights-of-way (ROWs) for the development of renewable energy on the Outer Continental Shelf (OCS). BOEM authorizes development on the OCS through its review and approval of a project's Site Assessment Plan (SAP) and COP pursuant to 30 Code of Federal Regulations (CFR) Part 585. As described herein, BOEM coordinates and consults with other federal agencies as part of its review, but several separate authorizations from other federal agencies are also needed for the Project. BOEM will be responsible for the development of the Project-specific EIS under NEPA. The Proponent expects that the Project-specific EIS for Vineyard Mid-Atlantic will tier to or incorporate by reference BOEM's New York Bight Programmatic Environmental Impact Statement (PEIS).[4] Several other federal agencies (e.g., NMFS, USACE, and EPA) will issue permits for Vineyard Mid-Atlantic, but will rely on BOEM's EIS, PEIS, and/or consultations to support their decision making.

[4] On July 15, 2022, BOEM published a NOI to prepare a New York Bight PEIS and issued a Draft PEIS in January 2024. The PEIS will analyze the potential impacts of offshore wind energy development in the six New York Bight Lease Areas, including Lease Area OCS-A 0544, and will identify programmatic avoidance, minimization, mitigation, and monitoring (AMMM) measures. A project-specific EIS will still be required for Vineyard Mid-Atlantic.

A SAP describes the initial activities to characterize a site (e.g., installation of meteorological towers and meteorological and oceanographic ["metocean"] buoys). The SAP for the Lease Area was submitted to BOEM on April 19, 2023, to allow for the installation of a metocean buoy in the Lease Area. BOEM approved the SAP on February 20, 2024 (see Attachment 6.2-1), and the metocean buoy was deployed in the Lease Area on May 13, 2024.

Vineyard Offshore initially submitted the Vineyard Mid-Atlantic COP on behalf of the leaseholder, Vineyard Mid-Atlantic LLC, to BOEM on January 25, 2024. The Vineyard Mid-Atlantic COP is currently undergoing a completeness and sufficiency review. After this review is completed, BOEM will issue an NOI to prepare an EIS, which will be followed by a series of public scoping meetings. Excerpts of Volume II of the COP, which assesses the benefits and potential impacts of Vineyard Mid-Atlantic to biological resources and our proposed measures to avoid, minimize, and mitigate those potential impacts, are provided in Attachment 8.2-2.

In reviewing the COP, BOEM will comply with its obligations under NEPA, the National Historic Preservation Act (NHPA), the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Endangered Species Act (ESA), and the National Marine Sanctuaries Act. To fulfill these obligations, BOEM will coordinate and consult with numerous other federal agencies during the review process, including BSEE, NMFS, NOAA's)Office of National Marine Sanctuaries (ONMS), the US Coast Guard, USFWS, EPA, DoD, Federal Aviation Administration (FAA), and USACE. BOEM will also conduct government-to-government consultations with federally recognized Tribal Nations that may be affected by Vineyard Mid-Atlantic.

6.2.1.1.2 Bureau of Safety and Environmental Enforcement

According to 30 CFR § 285(g), before construction or installation, BSEE must have received and not objected to the Facility Design Report (FDR) and Fabrication and Installation Report (FIR), demonstrating that the design and methods for fabrication and installation are consistent with the approved General Activities Plan and engineering standards.

6.2.1.1.3 US Army Corps of Engineers

Section 10 of the Rivers and Harbors Act of 1899 prohibits the unauthorized obstruction or alteration of any navigable water of the US.[5] A Section 10 permit from USACE is needed for the installation of the Project's WTGs, ESP, and their associated foundations; the placement of scour protection and cable protection (if/where needed); and the installation of offshore cables.

Section 404 of CWA requires a permit before dredged or fill material can be discharged into waters of the US (within the 3 nautical mile [NM] limit for state waters). A Section 404 permit from the USACE is needed for the installation of the offshore export cable (and any associated cable protection) and the discharge of dredged materials from localized sand bedform

[5] USACE's authority to prevent obstructions to navigation in navigable waters of the US was extended to artificial islands, installations, and other devices located on the seabed, to the seaward limit of the OCS, by Section 4(f) of the OCSLA of 1953 as amended (43 USC § 1333(e) and 33 CFR § 320.2)

leveling within state waters. Similar to BOEM, USACE must comply with its obligations under NEPA, NHPA, MSA, and ESA. However, to avoid duplication of effort, USACE is a cooperating agency with BOEM through the NEPA process.

Section 408 of the Rivers and Harbors Act of 1899 requires USACE review when a project may affect a federal civil works project. Because it is not anticipated that offshore export cable crossings may be located near or cross a federal navigation channel as part of the Project, a Section 408 review is not expected to be necessary.

6.2.1.1.4 US Environmental Protection Agency

The OCS Air Regulations at 40 CFR Part 55, which implement Section 328 of the Clean Air Act, establish air pollution control requirements for OCS sources (i.e., certain vessels and equipment located in federal waters with the potential to emit air pollutants). Vineyard Offshore will obtain an OCS Air Permit for OCS sources used during the offshore construction and operation of the Project.

If an HVDC ESP seawater open-loop cooling system is needed, as in the case of Proposal EW-A (see Section 5.1), Vineyard Offshore also expects to be required an individual National Pollutant Discharge Elimination System (NPDES) permit pursuant to Section 402 of the CWA from EPA to authorize pollutant discharges and cooling water withdrawal for the seawater cooling system on the HVDC ESP.

For both the Section 402 NPDES permit and the OCS Air Permit, EPA is expected to coordinate with BOEM to satisfy its obligations under the ESA, MSA, and other relevant statutes.

6.2.1.1.5 National Marine Fisheries Service

Authorization under the Marine Mammal Protection Act is necessary for activities that may affect marine mammals. During construction of the Project, marine mammals may be affected by pile driving noise, geophysical survey work, and other noise-generating activities and are at risk of interaction with transiting vessels. Because these activities will occur over multiple years, Vineyard Offshore will request an Incidental Take Regulation (ITR) and associated Letter of Authorization (LOA) from NMFS for the incidental take of small numbers of marine mammals (by harassment), which would be valid for five years.

6.2.1.1.6 Federal Aviation Administration

The FAA requires public notice of the proposed construction or alteration of a structure that is more than 200 feet (ft) above ground level or within certain distances of airports. Vineyard Offshore will file Notices of Proposed Construction or Alteration for any structures within territorial airspace that exceed 200 ft or any obstruction standard contained in 14 CFR Part 77, which may be required for activities at staging ports (e.g., crane usage), vessel transits, and Ruland Road Substation Option 2 site under the alternative scenario. Once the FAA has completed an aeronautical study, the FAA will make a determination detailing the study's findings (e.g., a Determination of No Hazard).

The Project's WTGs are outside the FAA's jurisdiction (which extends 12 NM from the US coastline). However, for the portions of the Project that lie outside US territorial airspace but within BOEM's jurisdiction, BOEM will consult with the FAA regarding airspace impacts.

6.2.1.1.7 Federal Highway Administration

[redacted]

6.2.1.1.8 National Park Service

[redacted]

[redacted]

6.2.1.1.9 Coastal Zone Management Act

CZMA gives states the authority to review federal actions that affect their coastal uses and/or resources to ensure that such actions are consistent with a state's federally approved coastal zone management program and policies. The NYSDOS Coastal Management Program is responsible for implementing the federal consistency review process for New York and will have consistency review authority over the Project. As part of the Vineyard Mid-Atlantic COP, Vineyard Offshore will prepare a Consistency Certification to demonstrate that Vineyard Mid-Atlantic, and thus the Project, is consistent with New York's enforceable policies under CZMA contained within the NYSDOS Coastal Management Program and approved Local Waterfront Revitalization Program. NYSDOS is responsible for reviewing the activities for consistency with the applicable enforceable policies under each of these programs.

6.2.1.1.10 Additional Reviews and Authorizations

Additional federal reviews and authorizations may be required for the Project, such as Private Aid to Navigation (PATON) permits from the US Coast Guard and review by DoD's Military Aviation and Installation Assurance Siting Clearinghouse with respect to potential impacts to military operations (including radar).

6.2.1.2 New York State Permits and Approvals

An electric transmission line with a design capacity of 100 kilovolts (kV) or more, extending over 10 miles, or a design capacity of 125 kV, extending over 1 mile, is categorized as a major electric transmission facility and is subject to review and approval by NYSPSC under Article VII of the New York State Public Service Law (PSL). The Project meets or exceeds these regulatory review thresholds, and, as such, the New York components of the Project (including all portions within state waters and onshore) will be permitted through the Article VII process administered by NYSPSC. The New York components of the Project include the portions of the OECC, which extends from approximately 3 NM from the state jurisdictional boundary in New York state waters [redacted]

The Article VII process in New York coordinates environmental review among interested state agencies and provides a forum for municipalities as well as citizen and interest groups to give input on a project. New York State authorizations that do not involve authority delegated under federal law are subsumed under the Article VII process. That granting of a Certificate of Environmental Compatibility and Public Need ("Article VII Certificate") from NYSPSC supersedes the need for most New York State and municipal approvals, consents, and permits for the construction and operation of a major electric transmission facility, as discussed further in Section 6.2.1.2.1.

Article VII of the PSL does not provide the applicant with any property rights, so Vineyard Offshore will also seek utility easements and/or license agreements for use of onshore public roadway ROWs [redacted]

A summary of the anticipated New York State permits and approvals required for the Project and their current status is provided in Table 6.2-2.

Table 6.2-2 Anticipated New York State Permits and Approvals

Agency/Regulatory Authority	Permit/Approval[1]	Status
New York State Office of General Services Bureau of Land Management	Easement to Use New York State Lands Underwater	TBF
New York State Public Service Commission (NYSPSC)/New York State Department of Public Service (NYSDPS)	Article VII Certificate under Article VII of the New York State Public Service Law[2] Environmental Management & Construction Plan (EM&CP) approval Section 68 Petition (permission to exercise the grants of municipal rights, if required) Water Quality Certification (WQC) under Section 401 of CWA	TBF
New York State Department of Environmental Conservation (NYSDEC)	State Pollutant Discharge Elimination System Permit	TBF
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

Notes:

1. Required state permits/approvals will be based upon the final design of the Project and the associated effects on regulated resources.
2. The Article VII process obviates the need to prepare and submit separate applications to most state, county, and local agencies while allowing affected municipal and community organizations the ability to participate in the proceedings.

6.2.1.2.1 New York Article VII Review

NYSPSC approves applications filed under Article VII, with NYSDPS staff functioning as technical staff for NYSPSC. Article VII requires the submission of detailed reviews of environmental impacts and public needs related to the siting, design, construction, and operation of all aspects of a proposed transmission facility and appurtenant facilities located within state, county, and local jurisdictions. The process requires the issuance of an Article VII Certificate, as well as approval of an Environmental Management & Construction Plan (EM&CP) before the construction of a proposed transmission facility is allowed to commence.

Through the Article VII process, an applicant provides all affected stakeholders, including landowners, state agencies, and the municipalities in which project components will be located, with notice of the various aspects of the project as well as the right to become a party to the Article VII proceeding.

The Article VII process is made up of the following key aspects:

- Identifying the agencies, programs, and stakeholders that will be affected by a project
- Collaborating with state agencies, [redacted]
- Coordinating agency involvement with the proceedings, conditions, or required mitigation that would have otherwise been placed on individual permits obviating the need for separate permit applications to most other state or local agencies; e.g., NYSDEC is a statutory party to the Article VII process, and separate permits (e.g., Freshwater Wetlands Permits and Protection of Waters Permits) are not required
- Preparing a comprehensive EM&CP to demonstrate compliance with Article VII Certificate conditions
- Delegating authority to NYSPSC to issue a 401 Water Quality Certification (WQC) in conjunction with the Article VII Certificate
- Issuing a Public Involvement Plan, which NYSPSC considers to be integral to the process, although it is not required by statute

Vineyard Offshore has reviewed Article VII applications and proceedings for other awarded New York offshore wind projects to evaluate their permitting processes. We have also met with NYSPSC staff to review current policies and procedures. NYSPSC staff provided updated guidance on anticipated schedules and steps to improve Article VII submissions, which have been incorporated into the permitting plan and schedule. As discussed further in Section 6.2.2.2, Vineyard Offshore is currently preparing an application for an Article VII Certificate.

6.2.1.2.2 <u>Other New York State Permits</u>

State permits that are addressed through the Article VII Certificate include the following:

- State Environmental Quality Review Act
- Tidal Wetlands Permit
- Freshwater Wetlands Permit
- Coastal Erosion Management Permit
- Protection of Waters Permit-Excavation or Placement of Fill in Navigable Water and Their Adjacent and Contiguous Wetlands Permit

- State Lands Permit
- New York State Historic Preservation Act review (note that BOEM administers the federal Section 106 process)

Additional state reviews that may be required in select locations and jurisdictions are also incorporated into the Article VII process, including local harbor management plan and flood policy review, state-listed protected species regulatory review, and New York State air quality regulatory program compliance.

6.2.1.2.3 <u>Other Easements and Rights</u>

In addition to the Article VII Certificate, Vineyard Offshore will need to obtain an easement from the New York State Office of General Services (NYSOGS) for the use and occupation of lands underwater before installing offshore export cables in New York state waters. Vineyard Offshore will file an application for an Easement to Use State Lands Underwater with NYSOGS under the Public Lands Law once the final offshore export cable alignments in state waters have been identified and approved by NYSPSC and USACE. Vineyard Offshore will prepare and submit final maps to NYSOGS along with our application. NYSOGS will then prepare the easement agreement, calculate fees, and submit it to the Comptroller and New York State Attorney General (NYSAG) for approval.

[redacted]

[redacted]

6.2.1.3 County and Municipal Approvals

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

[redacted]

- [redacted]
- [redacted]

[redacted]

6.2.2 Permitting Timeline

Vineyard Offshore has planned and designed a robust and prudent schedule that ensures on-time delivery of the Project. An overview of the Project's permitting timeline is provided in Table 6.2-4, and major permitting milestones have been included in the Project schedule detailed in Section 5. [redacted]

[redacted]

[redacted]

6.2.2.1 *Federal Permitting Timeline*

Vineyard Offshore has met with all federal agencies that will issue a permit for the Project, including BOEM, USACE, EPA, NMFS, USFWS, and the US Coast Guard, and we have had detailed discussions with these agencies regarding Vineyard Mid-Atlantic's federal permitting schedule. We will continue to meet with agencies in advance of filing permit applications to ensure that we understand the agencies' expectations and their recommended application timelines. [redacted]

6.2.2.1.1 Bureau of Ocean Energy Management

As described in Section 6.2.1.1, BOEM approved the SAP for Lease Area OCS-A 0544 on February 20, 2024. Vineyard Offshore initially submitted the Vineyard Mid-Atlantic COP to BOEM on January 25, 2024. The Vineyard Mid-Atlantic COP is currently undergoing a completeness and sufficiency review. After this review is completed, BOEM will issue an NOI to prepare an EIS, which will be followed by a series of public scoping meetings. As a FAST-41 project, BOEM is expected to issue the Record of Decision (ROD) 24 months following NOI. The agency would then issue the COP Approval within 90 days of the ROD.

6.2.2.1.2 Bureau of Safety and Environmental Enforcement

BSEE has 60 days from complete submission of the FDR and FIR to object. If an objection is made, the clock stops until the objection is satisfied.

6.2.2.1.3 US Army Corps of Engineers

[redacted] USACE is expected to serve as a cooperating agency during BOEM's development of the EIS. USACE will coordinate its review with BOEM's NEPA process and is expected to issue a joint ROD with BOEM and NMFS. [redacted]

6.2.2.1.4 US Environmental Protection Agency

The OCS Air Permit process begins with the submission of an NOI by Vineyard Offshore to EPA. [redacted] EPA will review the application for completeness within approximately 30 days. Once the application is deemed complete, EPA will prepare a draft permit and fact sheet. The draft permit will then be available for public comment for approximately 30 days. Following the close of the comment period, EPA will address comments and issue a final permit. The permit typically becomes effective approximately 30 days after it is finalized.

[redacted]

In issuing the OCS Air Permit and NPDES permit (if needed), EPA has an obligation to comply with the ESA, MSA, and other relevant statutes. However, to avoid duplication of effort, EPA typically relies upon BOEM's consultations. Thus, the final OCS Air Permit and NPDES permit will be issued after BOEM's ROD.

6.2.2.1.5 National Marine Fisheries Service

Vineyard Offshore will seek an ITR and associated LOA from NMFS for the incidental take (by harassment) of small numbers of marine mammals. This regulatory process takes approximately 19 months from the time a complete application is received by NMFS. [redacted] NMFS is expected to serve as a cooperating agency during BOEM's development of the EIS. NMFS will coordinate its review with BOEM's NEPA process and is expected to issue a joint ROD with BOEM and USACE. [redacted]

6.2.2.1.6 Federal Aviation Administration and US Coast Guard

Both the FAA and US Coast Guard will be involved in the Project development process and ongoing permitting activities with Vineyard Offshore and through coordination with BOEM.

[redacted]

[redacted]

6.2.2.1.8 Coastal Zone Management Act

Vineyard Offshore will prepare a CZMA Consistency Certification for New York and submit it at the time of the issuance of the Draft EIS. The federal consistency review process will be completed prior to BOEM's issuance of the ROD.

6.2.2.2 State, County, and Municipal Permitting Timeline

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

6.2.3 SAP and COP Status

Vineyard Offshore submitted the Vineyard Mid-Atlantic SAP to BOEM on April 19, 2023. BOEM approved the SAP on February 20, 2024. The approved SAP is provided as Attachment 6.2-1. [redacted]

[redacted]

[redacted]

[redacted]

6.3 FINANCING PLAN

This financing plan demonstrates the financial viability of Excelsior Wind and its associated transmission system, which will be developed by Vineyard Offshore. [redacted]

[redacted] A summary of the ownership interests in Vineyard Offshore and the Lease Area is provided in Table 6.3-1.

[redacted]

Entity / Lease	Proposer	Lease Area OCS-A 0544
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

[redacted]

6.3.1 Proposer Financed Projects

A list of projects that the Sponsors have financed or are in the process of financing is included in Section 6.1.5.

6.3.2 Financing Plan

Excelsior Wind's financing plan is summarized herein [redacted]

[redacted] The Sponsors' experience, financial strength, and existing relationships with financing sources are key strengths in ensuring the successful delivery of Excelsior Wind.

6.3.2.1 Project Financiers

[redacted] In September 2021, CIP and joint venture partner Avangrid Renewables arranged approximately $2.3 billion for the financing of Vineyard Wind 1 from a group of nine domestic and international banks. This historic achievement led to Vineyard Wind 1 being named the Global ESG Deal of the Year by Project Finance International, in addition to numerous other project finance rewards.

The financing effort was led by Vineyard Offshore's Chief Legal Officer, Jennifer Simon Lento. Vineyard Wind 1 also includes debt commitments from Bank of America, J.P. Morgan, BBVA, NatWest, Santander, Credit Agricole, Natixis, BNP Paribas, and MUFG Bank. The project's financial advisor and lead counsel were Santander and Norton Rose Fulbright, respectively. This major milestone will serve as a guide on how to finance subsequent commercial-scale projects through collaboration with a syndicate of banks and stakeholders.

In October 2023, Vineyard Wind 1 closed a $1.2 billion first-of-its-kind tax equity package for commercial-scale offshore wind with three US banks: J.P. Morgan Chase, Bank of America, and Wells Fargo. CCA Group, Santander, and Kirkland & Ellis LLP served as financial and legal advisors in this transaction.

[redacted]

6.3.2.2 Financial Structure

[redacted]

[redacted]

[redacted]

[redacted]

6.3.2.3 Debt and Equity Financing

[redacted]

[redacted].

6.3.2.4 Fixed and Indexed OREC Form of Pricing

[redacted]

6.3.2.5 Estimated Construction Costs

[redacted]

[redacted]

[redacted]

6.3.3 Financing Resources and Strength

[redacted]

[redacted]

6.3.4 Insurance Program

Vineyard Offshore has benchmarked US insurance coverage for the construction and operations phases of the Project. Generally, during the construction phase, offshore wind project insurance coverage includes the following:

- **Construction All Risk:** This policy starts from load-out onto the transportation vessel and covers transportation, storage, pre-assembly, offshore works, testing, and commissioning of the project components and covers physical damage to project assets and revenue lost due to defects. Coverage requires an estimated maximum loss for property damage during construction.
- **Construction Delay and Startup:** This covers expected revenue for the indemnity period and requires determination of estimated minimum loss during construction for business interruption (i.e., the period required to replace component).

Generally, during the operations phase, offshore wind project insurance coverage includes the following:

- **Operational All Risk (OAR):** This covers full value, or a loss limit agreed upon by all parties based on estimated maximum loss, and is renewed annually or, at a maximum, every three years. Key is the coverage term for original equipment manufacturer (OEM) warranties and service and maintenance agreements, which typically cover at least five years of operations.
    - Additional natural catastrophe insurance will have a deductible be specific to the project's location and priced separately.
- **Business Interruption (BI):** This covers expected revenue during an outrage period following physical damage of assets covered by OAR and requires determination of estimated maximum loss during construction for BI (i.e., the period required to replace a damaged component). Typically, BI coverage does not start coverage for initial the period following an event causing lost production (e.g., the first 60 days

following cable failure is not covered) and has a limited coverage period once coverage starts (e.g., covers 90 days).

One of the main components of US offshore wind insurance premium is storm exposure; equivalent projects in the UK and Europe do not have coverage to the same extent. With a designed lifespan of more than 30 years, the WTG, foundation, and ESP components under consideration for the Project are designed to survive extreme weather events and the effects of rising sea levels.

Climate adaptation and resiliency related to sea level rise and the increased frequency and severity of storms are factors that Vineyard Offshore has accounted for through the application of best-in-class design standards, such as the International Electrotechnical Commission (IEC) 61400 framework and the IEC-compliant Det Norske Veritas framework. The Project's design will be certified, according to these standards, by an independent and accredited third party, as is being done for Vineyard Wind 1. Experience from certifying the design of Vineyard Wind 1 will be incorporated into the design and certification process for the Project.

[redacted]

[redacted]

As demonstrated in this section, the Project will incorporate resiliency into the design, and our proposed insurance policies will provide adequate coverage for unmitigated risks arising from climate-related physical risks. However, Vineyard Offshore is unable to comment on how such risks and their mitigation measures are factored into calculating the insurance deductibles and premiums as this information is not disclosed by insurance providers.

Additional information is provided in Section 4.7.

6.3.5 Inflation

[redacted]

6.3.6 Federal Tax Credits

Vineyard Offshore is one of the few developers with direct experience in raising tax equity financing in the US offshore wind market. We believe in exploring all opportunities to maximize benefits to New York ratepayers by leveraging federal incentives that reduce project costs wherever possible.

[redacted]

[redacted]

Vineyard Offshore plans to monetize the value of the ITC with an investment by a tax equity partner, as is common practice in the US renewable energy industry. In October 2023, our team led the financing efforts to close on the first-of-its-kind tax equity package for commercial-scale offshore wind with three US-based banks totaling $1.2 billion. We are eager to share this wealth of experience with New York.

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

6.3.7 Financial Statements and Credit Ratings

6.3.7.1 Vineyard Offshore

Vineyard Offshore was launched in April 2022 and is a privately held company. [redacted]

[redacted]

[redacted]

6.3.8 Security Requirements

[redacted]

6.3.9 Credit Issues / Credit Rating Downgrade Events

[redacted]

6.3.10 Events Of Default

[redacted]

6.3.11 High-Risk Contingencies and Cost Overruns

[redacted]

6.3.12 External Audit Management Letter

A recent external audit management letter covering the Proposer is included as Attachment 6.3-7.

6.4 EQUIPMENT, DEVELOPMENT, AND LOGISTICS PLAN

The Project is made up of a 1,350 MW OWF that will be installed in the Lease Area. [redacted] The Project includes either an HVAC or HVDC transmission system, as well as a Delivery Point in Uniondale or Melville, New York. The Project will use high performance equipment components with established track records in the offshore wind sector. The preliminary engineering plan provided in this section applies to all Proposals.

6.4.1 Foundation Type, Offer Capacity, and Transmission Technology

[redacted]

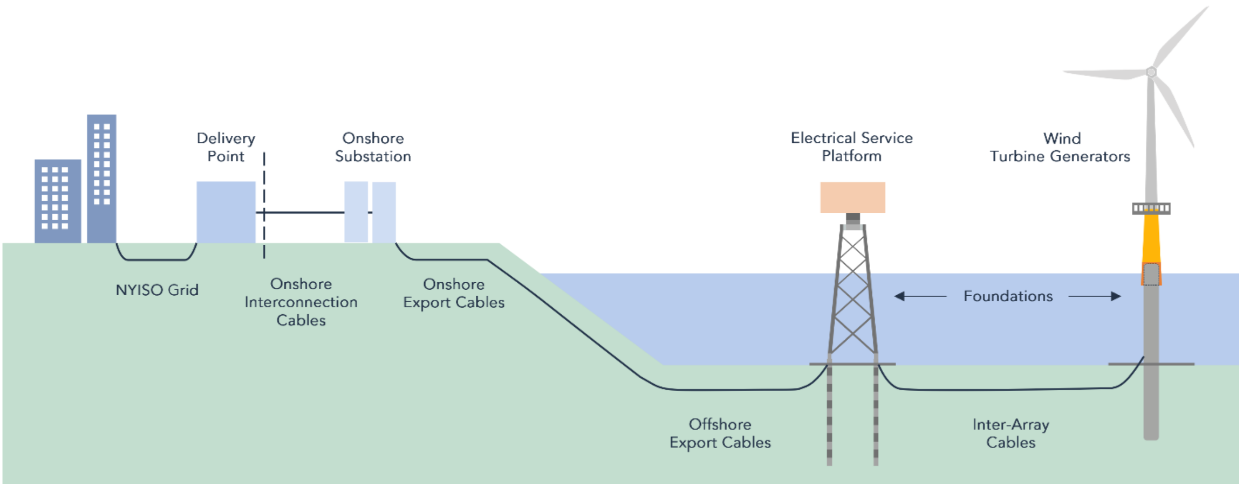
[redacted]

[redacted]

6.4.2 Primary Components

As illustrated on Figure 6.4-1 and further described in this section, the major technology and equipment groups that make up the Project include, from right to left, WTGs supported on foundations, inter-array cables, an ESP (also supported on foundations), offshore export cables, onshore export cables, and an onshore converter station or onshore substation (for Proposals with an HVDC or HVAC transmission system, respectively).

Figure 6.4-1 Offshore Wind Generation Facility and Transmission System



6.4.2.1 Wind Turbine Generators

[redacted]

[redacted]

[redacted] Nighttime WTG aviation obstruction lighting systems controlled using an aircraft detection lighting system or similar system will also be installed, subject to BOEM approval, which complies with FAA and/or BOEM requirements.

[redacted]

[redacted]

[redacted]

6.4.2.2 Foundations

[redacted]

[redacted]

6.4.2.3 Transmission Technology

6.4.2.3.1 Inter-array Cables

Inter-array cables will transmit electricity from the WTGs to the ESP. [redacted]

6.4.2.3.2 Electrical Service Platform

The term ESP is inclusive of both the offshore converter station for Proposals with an HVDC transmission system and the offshore substation for Proposals with an HVAC transmission system. An HVDC offshore converter station will be designed and installed as Meshed Ready, meeting the requirements outlined in ORECRFP24-1 Appendix F. Section 7 provides further discussion of Meshed Ready design.

The ESP is made up of two primary support structures: (1) the topside, which houses the electrical components, and (2) the foundation substructure, which supports the topside and is mainly below water and secured to the seabed. The ESP topside includes components such as transformers, gas-insulated switchgear (GIS) and circuit breakers, modular multilevel converters and braking choppers, reactors, and protection equipment.

Ultimately, the equipment that will be installed in the ESP will be determined by WTG selection and number of WTGs installed, in combination with the distance from the onshore substation and onshore transmission network.

[redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

[redacted]

[redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

[redacted]

In addition, the ESP will contain several additional components, such as a SCADA system; heating, ventilation, and air conditioning; a fire safety system; hydraulic platform crane(s); electrical hoist crane(s); a closed-circuit television system; a communication system (including antenna); safety kits; aviation and navigational marking and lighting; a pollution prevention system; export and inter-array cable hang-off supports; corrosion protection systems; and more.

6.4.2.3.3 Offshore Export Cables

Offshore export cables will be installed within OECCs and will transmit electricity from the ESP to a landfall site in New York. The Project will use either HVAC or HVDC transmission technology.

[redacted]

[redacted]

6.4.2.3.4 Onshore Export Cables

[redacted]

[redacted]

[redacted]

[redacted]

6.4.2.3.5 Onshore Substation or Onshore Converter Station

For the HVAC transmission systems, the onshore export cable voltage will be stepped up at the onshore substation in preparation for interconnection with the regional transmission grid at the Delivery Point. The onshore substation will house transformers, switchgear, necessary electrical control and protection equipment, and other related equipment. The electrical equipment to be used is typical of other onshore substations, and the size requirements are likewise typical for projects of this size. The onshore substation may use either an air-insulated switchgear design or a GIS design, pending the substation's final detailed design.

For the HVDC transmission systems, the onshore converter station will also contain equipment to convert the power from DC to AC, and, if necessary, the equipment to step up voltage in preparation for interconnection with the regional transmission grid at the Delivery Point.

6.4.3 Primary Component Acquisition Status

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted] [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

PUBLIC

[redacted]

[redacted]

[redacted]

[redacted]	[redacted]

[redacted]

6.4.4 Equipment Track Record

The following sections provide a description of the operational track record for equipment under consideration for the Project.

6.4.4.1 Wind Turbine Generators

[redacted]

6.4.4.2 Foundations

Monopiles and TPs are well-known and proven technologies used across numerous offshore wind projects worldwide. The first monopile projects were installed at the Lely offshore wind project in the Netherlands in 1994. The Blyth Offshore Windfarm (England), which began operation in 2000, and the Horns Rev 1 project (Denmark), which began operation in 2002, represent some of the first large-scale commercial deployments of the technology. Since then, more than 4,250 monopiles have been deployed in the offshore wind industry.

CIP also has extensive experience with monopiles, including monopiles with dimensions comparable with those required for the Project. Installation of monopiles for Vineyard Wind 1 commenced in 2023 and will be complete by the end of 2024. Monopile technology is well-established and bankable/financeable. All known projects in federal lease areas with water depths at or less than approximately 164 ft are proposing to use monopiles.

[redacted]

[11] See: Footnote 3

6.4.4.3 *Inter-array Cables*

Inter-array cables are a well-known technology that has been used for many years in the wind industry. [redacted]

6.4.4.4 *Electrical Service Platforms*

HVAC transmission technology is a well-established and mature technology for transmitting bulk power through onshore or subsea cables for offshore wind projects located within approximately 60 miles of the onshore substation. Most of the offshore wind projects constructed to date are located close enough to shore to use HVAC transmission systems. CIP has considerable experience developing and operating HVAC transmission systems for offshore wind projects, including Vineyard Wind 1 as well as Veja Mate (Germany), Changfang and Xidao (Taiwan), and Beatrice (Scotland).

HVDC transmission technology is a well-known and mature technology for transmitting bulk power through onshore or subsea cables and is increasingly being implemented as offshore wind projects move farther from shore. Approximately one third of the 40 offshore wind projects in Europe with a nameplate capacity above 200 MW connect to the grid using HVDC transmission, either individually or as part of a cluster.

6.4.4.5 *Onshore and Offshore Export Cables*

The Project's onshore and offshore export cables will be based on well-known and proven cable concepts for both onshore and offshore electricity transmission.

[redacted]

[redacted]

[redacted]

6.4.4.6 Onshore Substation

[redacted]

The entire HVAC electrical system design is based on well-known and proven concepts. There are many experienced contractors in New York and the rest of the US with the expertise to build this type of onshore substation required for an HVAC project.

6.4.4.7 Onshore Converter Station

[redacted]

This technology has been in operation for decades and is considered mature. A 300/345 kV HVDC converter station has been fully permitted and is currently being built in New York City as part of the Champlain Hudson Power Express project bringing hydroelectric power from Canada.

6.4.4.8 Technological Advancement

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

6.4.5 Responsible Disposal and Recycling

As is typical of a utility-grade generation and transmission infrastructure project, the Project's offshore facilities are expected to have a physical life expectancy of at least 30 years. Following the completion of the operations phase, the Project will be decommissioned. Unless otherwise authorized by BOEM, pursuant to the applicable regulations in 30 CFR Part 585, Vineyard Offshore is required to remove or decommission all facilities, projects, cables, pipelines, and obstructions and clear the seafloor of all obstructions created by activities on the Lease Area and any Project easements(s) within two years following lease termination in accordance with any approved SAP, COP, or approved Decommissioning Application.

Although the currently envisioned decommissioning process is the reverse of installation, it will ultimately use the latest technological and logistical developments in the offshore wind industry, as the overall industry approach is expected to evolve over the coming decades. The Project's general decommissioning concept, including how Vineyard Offshore expects to maintain an inventory of decommissioned components and ensure safe disposal, is elaborated in our decarbonization strategy, set out in Section 4.6. Offshore wind projects have been successfully decommissioned in Europe, the first of which was the Yttre Stengrund project in Swedish waters in 2015. The following discussion focuses on the anticipated recycling potential associated with decommissioning the Project's major offshore components.

[redacted]

WTGs are currently understood to be between 85 to 90% recyclable[13] when considering both traditional scrap recycling (steel) and component reuse in a circular market. [redacted]

For onshore components, the extent of decommissioning is subject to discussions with the host communities on the decommissioning approach that best meets local needs and has the fewest environmental impacts. The onshore cables, concrete-encased duct bank itself, splice vaults, and elements of the onshore substations and grid connections could be retired in place or retained for future use. If onshore cable removal is determined to be the preferred approach, the process will consist of pulling the cables out of the duct bank, loading them onto truck-mounted reels, and transporting them offsite for recycling or possible reuse. The splice vaults, conduits, and duct banks will likely be left in place, and available for reuse. Similarly, the onshore converter station or onshore substation will have a useful life beyond that of the Project and could be available for reuse.

Vineyard Offshore considers component disposal as a last resort and will continue to collaborate with the industry to support innovation in the supply chain that reduces carbon emissions and prioritizes recyclability. Further details on our how our decarbonization strategy will be implemented through our procurement process is outlined in Section 4.6.

6.4.6 Equipment Procurement Strategy for Manufacturers Not Yet Selected

As noted previously, Vineyard Offshore is advanced in its procurement strategy and has a clear plan for completing the procurement process. [redacted]

We will continue to leverage our experience in developing and completing the procurement process for Vineyard Wind 1 to identify cost-effective opportunities to use and support the offshore wind supply chain that is emerging along the Atlantic Coast and in New York in particular.

[redacted]

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13 See: "ZEBRA project launched to develop first 100% recyclable wind turbine blades."

[redacted]

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6.4.7 Construction and Logistics

The Project consist of the following six main work packages:

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

The projected sequence of major tasks for these work packages is depicted on the Project schedules, which are provided in Section 5.

In developing the Project schedule, Vineyard Offshore conducted a detailed logistical analysis for multiple installation scenarios for the Project. Among other things, this analysis examined various vessel spreads and the potential use of different harbors, including their operational and load-out capabilities. [redacted] These results provide Vineyard Offshore with unique insights and support the development of an ambitious and robust logistical concept and construction plan.

Table 6.4-3 provides definitions of the T&I vessel spread terminologies used throughout this section.

Table 6.4-3 Installation Vessels and Technologies

Description	Terminology
Feeder Vessels	
Transportation from US load-out harbors to the OWF site using Jones Act-compliant vessels; oceangoing tugs required for long distances	▪ Jack-up feeder vessels ▪ Tugs ▪ Articulated tug barges (ATBs) ▪ Barges
Transport Barges	
Transportation from manufacturer's fabrication facilities to the OWF site or a port for staging using non-US-flagged vessels (i.e., not Jones Act-compliant); oceangoing tugs required for long distances	▪ Tugs ▪ Barges ▪ ATBs
Heavy Lift Vessels (HLVs)	
Expected installation vessel for foundations and the ESP	▪ Dynamic positioning (DP) or anchored HLVs with cranes
WTG Installation Vessels	
Expected installation vessel for WTGs	▪ Jack-up WTG installation vessels with cranes
Heavy Transport Vessels (HTVs)	
General transport vessel for foundations, ESP, WTGs, and other equipment; for transportation from manufacturer site to the OWF site or staging port	▪ Semi-submersible HTVs ▪ HTVs with cranes (lower capacity than HLVs) ▪ Transportation vessels (without craneage capability)
Cable Installation Vessels	
Large cable laying vessels and cable transport vessels containing specialized cable spools for transport and payout of cable during installation	▪ Cable laying vessels ▪ Cable transport vessels
Specialized Support Vessels	
Various vessels specifically designed to support offshore wind construction and operation, crew lodging and transportation, and/or general port and offshore logistics	▪ Fall pipe vessels ▪ Offshore support vessels ▪ Noise mitigation support vessels ▪ Crew transfer vessel (CTV) ▪ Service operation vessel (SOV) ▪ Anchor handling tug supply (AHTS) vessel ▪ Dredging vessel ▪ Walk-to-work vessels ▪ Accommodation vessels ▪ Safety vessels

Table 6.4-4 provides an overview of the major tasks associated with the Project's deployment, including the specialized equipment required to complete each of the work packages.

Table 6.4-4 Major Tasks and Specialized Equipment for Deployment

Major Task	Specialized Equipment
Work Package: Foundations	
Scour protection T&I **Foundation transport** **Foundation installation**	▪ Scour protection (i.e., rock material) ▪ Fall pipe vessel or other specialized scour protection installation vessel ▪ Remotely operated vehicles (ROVs) ▪ Mud mats (if needed) ▪ Feeder vessels, transport barges, and/or HTVs ▪ HLV(s) ▪ Hydraulic hammer(s), pile gripper/piling frame, pile upending and lifting tool(s) ▪ Vibratory hammer and drilling equipment (if required) ▪ Grouting material and equipment (if needed) ▪ Noise mitigation support vessels ▪ Noise mitigation system(s) ▪ Protected Species Observer (PSO) team including vessel(s) ▪ Passive acoustic monitoring (PAM) system and vessel ▪ CTVs and helicopter ▪ Safety vessel ▪ Survey equipment
Work Package: ESP	
ESP transport **ESP installation** **ESP offshore commissioning**	▪ Feeder vessels, transport barges, and/or HTVs ▪ HLV(s) ▪ Hydraulic hammer, pile gripper/piling frame, pile upending and lifting tool(s) ▪ Vibratory hammer and drilling equipment (if required) ▪ Grouting material and equipment (if needed) ▪ Noise mitigation support vessels ▪ Noise mitigation system(s) ▪ PSO team including vessel(s) ▪ PAM system and vessel ▪ Accommodation vessel (either floating or jack-up vessel) ▪ CTVs and helicopter ▪ Survey equipment ▪ Generators (if required)

Table 6.4-4 Major Tasks and Specialized Equipment for Deployment (continued)

Major Task	Specialized Equipment
Work Package: Offshore Export Cables	
Pre-lay surveys and pre-lay grapnel run **Cable transport, installation (laying and burial), and jointing** **Landfall site installation** **Cable pull-in (into the ESP)** **Termination and commissioning works**	▪ Cable transport vessel(s) (if required) ▪ Survey vessel and equipment ▪ Pre-lay grapnel run vessel and grapnel train ▪ Jack-up vessel and AHTS vessels (if required) ▪ Boulder clearance vessel (if required) ▪ Installation buoys ▪ Cable laying vessel ▪ Cable support vessel (including ROVs) ▪ Burial tool(s) (including jet plow, jet trenchers, mechanical plow) ▪ Dredging vessel (if required) ▪ Cable entry protection system ▪ CTVs ▪ Cable protection placement vessels (if required) ▪ Cable protection (if required) ▪ Temporary and permanent hang-offs ▪ Messenger wires and cable pulling heads ▪ Safety vessels
Work Package: Inter-array Cables	
Cable transport **Pre-lay surveys and pre-lay grapnel run** **Cable installation (laying and burial)** **Cable pull-in (into the WTG foundations and ESP)** **Termination and commissioning works**	▪ Feeder vessels (if required) ▪ Cable transport vessel(s) (if required) ▪ Survey vessel and equipment ▪ Pre-lay grapnel run vessel and grapnel train ▪ AHTS (if required) ▪ Installation buoys ▪ Cable laying vessel ▪ Cable support vessel (including ROVs) ▪ Burial tool (including jet plow, jet trenchers, mechanical plow) ▪ Cable entry protection system ▪ CTVs and/or walk-to-work vessels ▪ Cable protection placement vessels (if required) ▪ Cable protection (if required) ▪ Temporary and permanent hang-offs ▪ Messenger wires and cable pulling heads ▪ Winches and generators (if required) ▪ Safety vessels

Table 6.4-4 Major Tasks and Specialized Equipment for Deployment (continued)

Major Task	Specialized Equipment
Work Package: WTGs	
WTG transportation to the pre-assembly harbor **Harbor logistics and pre-assembly** **WTG transportation and installation at the site** **WTG commissioning**	▪ Transport barges and/or HTVs ▪ Mobile harbor quayside cranes ▪ Harbor and offshore tugs (if required) ▪ Jack-up installation vessel ▪ Feeder vessels ▪ Climbing crane (if used) ▪ Lifting equipment, frames, and racks ▪ CTVs and helicopter ▪ Walk-to-work vessel, SOV, or accommodation vessel ▪ Generators (if required)
Work Package: Onshore Works	
Onshore substation construction **Landfall site construction** **Duct bank installation** **Cable transport, installation, and commissioning**	▪ Heavy lift equipment, excavating equipment, cranes, electrical cable/bus installation equipment ▪ Splicing equipment, cable pulling equipment, large cable reel trucks ▪ Delivery and crew vehicles ▪ Drilling equipment (e.g., HDD equipment, microtunnel boring machine) ▪ Erosion controls and containment ▪ Generators ▪ Concrete pouring equipment ▪ Milling and paving machines

6.4.8 Responsible Parties and Roles, and Contract Status

6.4.8.1 Responsible Parties and Roles

[redacted]

[redacted]

[redacted]

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6.4.9 Marine Terminals

Constructing an offshore wind project in a timely and cost-effective manner requires the availability of specialized facilities and vessels to stage, assemble, and deploy various project components. To determine the best available options, Vineyard Offshore has conducted a logistical analysis of different installation solutions, including harbor facilities and vessels.

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[redacted]

6.4.9.1 Staging Port

[redacted]

[redacted]

6.4.9.2 Operations and Maintenance

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6.4.10 Staging and Deployment

The following subsections provide an overview of the approach for staging and deployment of major components for each of the Project's six main work packages.

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6.4.11 Vessel Types and Respective Uses

Table 6.4-14 provides an overview of expected vessels, including the number, type, size, and anticipated uses on the Project for each offshore package. The list is indicative and non-exhaustive. The respective vessels will be secured through the relevant T&I packages as discussed in Section 6.4.8.

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6.4.12 Coastwise Laws

This section provides specific information on how the Project's deployment strategy will conform to the requirements of the Jones Act and the Passenger Vessel Services Act (PVSA; 46 USC § 55103). In September 2020, the US House of Representatives passed the Expanding Access to Sustainable Energy Act of 2019, which further affirms the currently understood position that foreign-flagged vessels cannot transport merchandise for offshore wind projects between ports and highlights that US Customs and Border Protection will enforce these regulations during offshore wind project construction. Congress's recent amendments to Section 4(a) of the OCSLA contained in the National Defense Authorization Act for Fiscal Year 2021 also cleared up any ambiguity and affirmed that US laws (including the Jones Act) governing offshore energy apply equally to the offshore wind industry.

The following subsections detail the relevant parts of the Jones Act, PVSA, and related court rulings.

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Table 6.4-15 summarizes Vineyard Offshore's approach to compliance with the Jones Act.

[redacted]

[redacted]

[redacted]

6.4.13 Outage Requirements

Table 6.4-16 provides maintenance outage requirements for the major OWF and onshore components. [redacted]

[redacted] NYISO will be informed of planned maintenance campaigns well in advance to minimize the impacts of any outages.

[redacted] To avoid unscheduled maintenance and ensure high production reliability, select Project components will be designed with condition monitoring systems (CMSs) so potential faults can be addressed before unexpected failures occur.

Table 6.4-16 Outage Requirements

Major Project Component	Approximate Yearly Outage Period Due to Scheduled Maintenance	Approximate Capacity Out of Service During Maintenance
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

6.4.13.1 Major Project Components

The following subsections detail the outage requirements for the major Project components.

6.4.13.1.1 Wind Turbine Generators

[redacted]

[redacted]

6.4.13.1.2 Inter-array Cables and Offshore Export Cables

[redacted]

[redacted]

6.4.13.1.4 Preventive Maintenance

Preventive maintenance will reduce the need for corrective intervention. Remote monitoring is a key element of preventive maintenance because it allows continuous assessment of the technical state of a project without having to send technicians offshore. [redacted] Data gathered by remote monitoring will also allow technicians to improve maintenance plans and identify potential future problems when conducting maintenance. If an alarm is raised in the remote monitoring system, technicians will be notified immediately; based on the type of notice, either a remote or an onsite intervention can be planned.

The primary systems available for monitoring offshore wind projects remotely are as follows:

- **CMS:** A CMS measures vibration and acceleration in specific WTG components, typically the main hub bearing, blades, main shaft, gearbox (if applicable), generator, and tower. The vibrations and accelerations are measured and sent to a centralized computer system. When defined levels are exceeded, an alarm is issued. If necessary, the WTG will automatically initiate a forced shutdown until the root cause has been identified and mitigating actions have been completed.

- **SCADA:** SCADA is a computer system that gathers and analyzes real-time data. The system connects the WTGs, ESP, onshore substation or onshore converter station, and meteorological stations to a central computer and gathers information such as temperature, pressure, and location. Trained technicians continuously analyze gathered data to establish monitoring routines and evaluate project components for early indications of wear and tear or potential breakdown. If a breakdown occurs, SCADA data can be analyzed to identify its root cause.
- **Cable CMS:** Cable CMSs, such as DTS, allow offshore cables to be continuously monitored. These systems can detect and locate areas of potential damage and other anomalous conditions, which can be used to predict potential cable failure and may indicate cable exposure. If offshore cable CMS detects an anomalous condition, Vineyard Offshore will carefully review the data and determine whether a cable survey is necessary.

Local experts from the Project's O&M base or an operational control center will manage these remote monitoring systems.

6.4.14 Operating Constraints and Restrictions

The Project's operating constraints are largely determined by the technical parameters of the WTGs and the transmission system components. Importantly, offshore WTGs and associated structures are designed to withstand the harsh offshore climate to ensure a long operational life. [redacted]

6.4.14.1 Weather-related Conditions

Operational constraints for the WTGs are dictated by temperature, wind speed, and sea states for safe vessel transfers. These operational constraints have been accounted for in the WTG availability calculation.

6.4.14.1.1 <u>Temperature</u>

[redacted]

[redacted]

6.4.14.1.2 Wind Speed

[redacted]

6.4.14.1.3 Sea States

[redacted]

6.5 QUALITY HEALTH AND SAFETY

Quality, health, safety, and environmental (QHSE) performance is an area that defines Vineyard Offshore as a top-tier employer and leader in the US offshore wind sector. Vineyard Offshore is fully committed to working with all stakeholders to achieve the highest standards and will take all reasonably practicable steps to ensure the Project is planned and delivered correctly, safely, and responsibly.

6.5.1 Quality Management

Vineyard Offshore recognizes that QA/QC is closely linked with the HSE success of any project. If project quality management is to a high standard, then it is very likely that the project will also run safely and responsibly. To assist with project success, Vineyard Offshore has developed a quality management system (QMS) that assists any project to ensure work is carried out on time, within budget, and to a high standard.

Vineyard Offshore views quality as an iterative process that consists of the following:

- Identify the correct standards and measurements.
- Identify metrics by which to measure the quality of project performance.

- Establish a quality standard and quality baselines for each defined metric.
- Monitor and respond to the measured results.
- Complete periodic quality assessment reviews.
- Determine appropriate actions to improve quality.
- Implement quality improvement activities (e.g., audits, inspections, and walkthroughs).
- Conduct meetings between the relevant parties (internal and external) and to discuss the assessments and areas of non-conformance.
- Update the plan or processes, if necessary.

Each Vineyard Offshore-controlled project develops its own Quality Management Plan, which defines the roles and responsibilities, standards, methods, and reporting requirements used to define how quality will be managed throughout the lifecycle of the Project, focusing in the following areas:

- **Quality Planning:** Provides the documentation standards and framework for quality during the lifecycle of the Project.
- **QA (Proactive):** Provides the necessary attention to detail for continuous improvement of activities and processes to achieve quality.
- **QC (Reactive):** Ensures every deliverable and work product is measured and tested and that results conform to quality standards through this monitoring and inspection process.
- **Quality Improvement:** Identifies quality improvement opportunities and implements corrective action or process improvement.

6.5.2 Contractor Assessment

As part of the supplier procurement phase, Vineyard Offshore assesses all potential suppliers via an initial quality questionnaire to ensure that the minimum contractor and subcontractor requirements are met.

Should a supplier be close to meeting Vineyard Offshore's required standards, then, as part of Vineyard Offshore's commitment to working with the supply chain, Vineyard Offshore will provide constructive feedback to the supplier and develop improvement plans or a bridging process.

The quality management requirements cover the following areas:

- Clarifies the contractor's organization.
- Clarifies the contractor's QMS, including minimum requirements.
- Stipulates subcontractor management principles.
- Details requirement for Inspection Test Plans (ITPs) and audits, including templates to be used.

- Provides process for material traceability.
- Details measurement strategy.
- Provides process for non-conformance reporting (NCRs) or concessions.
- Details the management of change process.
- Details the requirements in relation audits and contractor or subcontractor surveillance.
- Details document control and reporting process, including reporting on key quality metrics such as the following:
    - NCRs raised, remaining, and closed out in reporting period
    - Change requests raised, remaining, and closed out in reporting period
    - Technical queries raised, remaining, and closed out in reporting period
    - Factory acceptance test or site acceptance test completed during reporting period
    - Status of ITP submissions
- Provides details of transfer or custody and care.
- Provides details of handover process.
- Provides requirements for specialist markings where necessary.

6.5.3 Health and Safety Disclosure

As outlined in Section 6.1.6, there are no pending Health/Safety Enforcement Notices, litigation, or disputes related to projects planned, developed, owned, or managed by the Proposer or any direct parent company of the Proposer, and the Proposer has no joint venture partner. Though not required by Section 6.1.6, the Proposer discloses that the Vineyard Wind 1 project, now under construction by Vineyard Wind 1 LLC, an affiliate of the Proposer, is subject to an order issued by the US Department of Interior, Bureau of Environmental Safety and Enforcement, temporarily restricting energy production and certain construction activities of the Vineyard Wind 1 project, due to a non-performance quality control by GE Vernova Inc, the project's turbine supplier. Vineyard Wind 1 is in full compliance with the Order and continues to cooperatively engage with all relevant government and community stakeholders.

Vineyard Offshore can confirm that it has not been subject to any Health and Safety Convictions nor any Enforcement Notice(s) in the past 10 years.

6.5.4 Health, Safety, and the Environment Management

Vineyard Offshore has developed an HSE management system that guides the business in identifying and controlling any QHSE risks that could negatively impact our staff, suppliers, and projects. The following objective is in place throughout the business:

> *We shall deliver our work in a responsible manner that minimizes our impact on the environment and protects the health, safety, and wellbeing of our employees, contractors, and anyone else who may be affected by our activities*

Through our relationship with Copenhagen Offshore Partners A/S (Copenhagen Offshore Partners) (CIP's global offshore wind development partner that employs many of Vineyard Offshore's Leadership Team and technical subject matter experts), Vineyard Offshore has gained significant experience from a strong global portfolio of projects that allows us to maintain the high standard of HSE performance across our activities.

Vineyard Offshore will always work toward recognized "Good Industry Practice." However, appreciating that HSE standards can differ significantly across markets, tailored systems for each market that take into account all applicable legislation, supply chain limitations, and typical working practices are developed and implemented where required.

The HSE management system used by Vineyard Offshore is a framework of policies, procedures, and processes that allows projects to be delivered in line with the Vineyard Offshore objectives, ensures full legal compliance, and meets the requirements of our key stakeholders.

Where possible, the HSE management systems will be aligned to the following:

- Quality Management (International Organization for Standardization [ISO] 9001)
- Occupational Health and Safety (ISO 45001)
- Environmental Management (ISO 14001)
- Risk Management (ISO 3100)

Depending on the regulatory requirements of a market and project particulars, Vineyard Offshore may have the system externally certified by a suitable third-party organization.

The following sections describe the key areas of the Vineyard Offshore HSE management system.

6.5.4.1 Competence

Without a competent workforce, it is unlikely Vineyard Offshore projects would be delivered safely or responsibly. With this in mind, Vineyard Offshore places a high focus on ensuring that all project personnel, including our suppliers, are competent. Within Vineyard Offshore this is defined as follows:

> *The correct combination of, skills, experience, and knowledge that a person has and their ability to apply them to perform a task safely and to a high standard.*

Vineyard Offshore has developed a robust training matrix that details the various training requirements our staff and suppliers must hold before being considered competent to deliver any work activity.

6.5.4.2 Leadership, Commitment, and Culture

Vineyard Offshore strives to maintain a pragmatic and positive culture across the business, which includes how we manage HSE risks associated with our work activities, and our Leadership Team ensures HSE is considered a priority in all that we do.

HSE requirements and associated objectives have been developed to drive high HSE standards across all our operations, thus demonstrating our commitment to HSE to our employees, contractors, and other stakeholders.

Within Vineyard Offshore, the Leadership Team is committed to establishing a workplace whereby the following is true:

- Effective communication exists between all stakeholders.
- A "no-blame" approach is implemented across projects. The aim at Vineyard Offshore is to learn and improve, not to blame.
- Proactive indicators are used as performance indicators over reactive ones.
- Any HSE areas that can be improved in the local supply chain are identified, and we work with our suppliers to improve where possible.
- Effective investigation and learning are required following incidents.
- Site monitoring and auditing are recognized and promoted as an improvement tool, not a means of policing a project.

6.5.5 Legal Compliance

Legal compliance is considered **the minimum acceptable standard** across Vineyard Offshore and our projects.

Vineyard Offshore will ensure that all legislation relevant to a project is identified, understood, and fully complied with. To achieve this, Vineyard Offshore works with established local consultants to develop market-specific legal registers that detail all legislation pertaining to their work activities.

Where any gaps in legislation exist, Vineyard Offshore will adopt good practice principles from other more established locations and industries.

6.5.6 Quality, Health, Safety, and Environmental in Procurement

Recognizing that a high-performing supply chain is fundamental to the safe and responsible delivery any project, Vineyard Offshore operates an HSE in procurement system, which ensures QHSE competence is a primary consideration when procuring services for any project activity.

All potential suppliers are thoroughly assessed on their HSE competency before contracts are placed. Suppliers are responsible for their HSE performance and compliance with the Vineyard Offshore HSE objective.

The supplier assessment involves the following:

- An Initial HSE Questionnaire that is sent to the potential supplier to allow Vineyard Offshore to determine whether they are suitable to deliver works on our behalf
- A series of workplace audits and inspections to ensure works are being carried out as planned
- The HSE Employer Requirements document included in all contracts that details the minimum HSE requirements expected to be in place for any project
- A bridging process to allow alignment of a supplier's and Vineyard Offshore's HSE management system where required
- A supplier auditing process
- A lessons learned session upon completion of work

Vineyard Offshore recognizes that the industry is constantly developing and, as such, suppliers may not be familiar with new methods of working or legislation that governs work activities. In these cases, Vineyard Offshore is committed to working with its supply chain to ensure health and safety standards are met.

6.5.7 Safety-by-Design

Both Vineyard Offshore and its suppliers use a range of methods to manage risk within every phase of our projects, from initial design through construction. One of the most effective methods is Safety-by-Design.

Safety-by-Design is a critical component of risk management. The method considers potential health and safety risks of infrastructure, products, or processes and eliminating or controlling these at the earliest possible stages. A series Safety-by-Design principles are considered throughout a project's design stage:

- Eliminate risks wherever possible.
- Evaluate and assess risks that cannot be avoided.
- Adapt work to the individual.
- Replace the dangerous with the non-dangerous or the less dangerous.

- Develop a coherent overall prevention policy.
- Give appropriate information and instructions to workers.

To identify and manage project risks, a series of risk assessment techniques specific to the design stage are employed:

- Job safety analysis
- Hazard identification
- Hazard identification risk assessment
- Design risk assessment

In addition to the general principles of prevention, Vineyard Offshore has also implemented a series of design rules where typical high risk activated must be eliminated or, where this is not possible, mitigated to a level considered as low as reasonably practicable. These design rules include the following:

- Eliminate working at height where possible.
- Eliminate diving operations where possible.
- Incorporate lockout tagout where required.
- Eliminate confined spaces where possible.
- Minimize offshore operations wherever possible.

6.5.8 Safe Systems of Work

When a hazard cannot be eliminated at the design stage, a safe system of work (SSoW) will be in place to ensure the residual risks faced by the worker are sufficiently controlled.

A SSoW includes a defined set of assessments and procedures, resulting from a careful study of a work task, that informs how work must be carried out safely. The typical components of a SSoW include the following:

- A competency assessment of the workers to ensure they are trained to deliver the work
- A job safety analysis or risk assessment and method statement covering the work activity
- Certification or calibration of relevant work equipment and tools to be used
- Management of change process at the point of work
- Emergency response procedure
- Personal protective equipment matrix

Vineyard Offshore takes a risk-based approach to determine the complexity of an SSoW, e.g., an office-based activity is generally considered low-risk and, as such, will require a minimum SSoW. Examples of work activities where an SSoW will be in place are as follows:

- Marine coordination activities
- Complex lifting operations
- Working at height activities
- Hot work activities
- Confined space works
- Working with hazardous substances
- Working with ionizing radiation
- Working with vibrating equipment
- Working with excavations
- Working with electrically live conductors
- Working with stored kinetic energy
- Working in extreme weather conditions
- Pedestrian-vehicle interaction

All suppliers are required to develop their own SSoW for any works they are responsible for. Vineyard Offshore will review before work commences. Although Vineyard Offshore will not approve a contractor's SSoW, any gaps will be highlighted for the supplier and addressed before work proceeds.

6.5.9 Monitoring and Governance

To ensure effective governance is taking place across a project, the project's QHSE performance will be subject to monitoring, measurement, analysis, and evaluation through a robust governance model.

6.5.9.1 Auditing

Auditing is recognized as an essential tool for improvement at Vineyard Offshore. As such, periodic auditing will be carried out on Vineyard Offshore premises, projects, and associated work activities– the aim of which will be to identify areas where the management system is not functioning as intended and improve where we can.

Any non-conformities or corrective actions raised from internal or external monitoring will be recorded and tracked to closure by the appropriate team. Major non-conformities may be subject to independent verification by the Copenhagen Offshore Partners' Global HSE team.

The Global HSE team will also assess the management system's effectiveness and identify any areas of improvement. This assessment will be forwarded to the Leadership Team with a series of recommendations.

6.5.9.2 Key Performance Indicators

Vineyard Offshore uses several leading and lagging key performance indicators (KPIs) to monitor QHSE performance across the business and our projects.

Although using lagging indicators is important in understanding how the business has performed historically, it is well recognized that the sole use of these indicators is not effective when trying to manage HSE within an organization or a complex project. To address this, we record lagging data but focus on gathering, analyzing, and using leading data to formulate proactive improvement strategies across projects.

Table 6.5-1 presents examples of KPIs used within Vineyard Offshore and our projects.

Table 6.5-1 Examples of Safety Key Performance Indicators

Lagging Indicators	Leading Indicators
Total recordable frequency rates	Site walkthrough findings
Near-miss reporting	Staff feedback via direct consultation and safety committees
Sick days over a given period	Hours of HSE training carried out over a particular period
Incident investigation findings	Findings from Job Safety Analysis and Risk Assessment Method Statement reviews
Lost-time frequency rates	Reported unsafe conditions observed in the workplace
	Reported unsafe actions observed in the workplace

6.5.9.3 Incident Reporting and Investigation

All HSE incidents or quality observations are reported via an online HSE reporting tool to ensure they are reviewed, and appropriate corrective and preventive actions are applied to prevent reoccurrence and to ensure the sharing of good practice. Table 6.5-2 presents the reporting categories and definitions.

Table 6.5-2 Examples of Reporting Categories and Associated Definitions

Incident Type	Definition
Area for Improvement	Any HSE situation that has been found to fall outside the existing HSE management system
Environmental Incident	An event resulting from a work activity that may cause harm or potential harm to an environmental receptor (e.g., air, water, land, wildlife, or local habitat)
Equipment or Asset Damage	Any incident that resulted in damage to equipment that could not be immediately repaired with onsite resources or that renders an asset inoperable for a period greater than 12 hours
Fatal Incident	An incident resulting in the death of work personnel or a member of the public because of any work activities
First Aid Treatment	Any incident that results in the injured party receiving onsite first aid treatment and being unable to return to work
Lost-time Incident	Any incident that results in the injured party being unable to return to work for a period greater than 24 hours
Medical Treatment Incident	Any incident that requires the injured party to receive professional medical treatment outside the scope of what first aid treatment can provide
Near-miss	An incident that has occurred but did not result in harm to personnel, environment, or equipment
Positive	Any observation where HSE arrangements are found to be effective or exceeding expectations
Restricted Workday Incident	Any incident that results in the injured party being able to return to their contracted role in a reduced capacity
Unsafe Act	Any observed deviation from established and agreed-upon HSE arrangements and procedures
Unsafe Condition	Any observed physical or environmental factors within the workplace that increases the likelihood of an incident occurring

Depending on the severity of any incident or near-miss, the appropriate personnel will require notification and an investigation may be required. The aim of any investigation is to learn in order to prevent reoccurrence—not to place blame on any individual or supplier. Where necessary, Vineyard Offshore will ensure a joint investigation is carried out with our contractors.

6.6 PROJECT RISK REGISTER

A comprehensive Project risk register in .xlsx format has been included in this Proposal.

Section 6.0 Attachments

Response to New York State Energy Research and Development Authority Request for Proposals ORECRFP24-1

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Attachment 6.1-1: [redacted]

Redacted

VINEYARD OFFSHORE

Attachment 6.1-2: [redacted]

Redacted

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VINEYARD OFFSHORE

Attachment 6.2-1: Vineyard Mid-Atlantic SAP and SAP Approval

United States Department of the Interior

BUREAU OF OCEAN ENERGY MANAGEMENT
WASHINGTON, DC 20240-0001

Ms. Rachel Pachter
Chief Development Officer
Vineyard Mid-Atlantic LLC
412 West 15th Street, 15th Floor
New York, New York, 10011

Dear Ms. Pachter:

This letter serves to inform you that the Bureau of Ocean Energy Management (BOEM) has approved the Site Assessment Plan (SAP) that Vineyard Mid-Atlantic, LLC (Vineyard Mid-Atlantic) submitted for commercial wind lease OCS-A 0544 located offshore New Jersey and New York. Vineyard Mid-Atlantic initially filed the SAP on April 19, 2023, and submitted amended versions on June 29, August 31, November 17, 2023, and January 3, 2024. The five-year site assessment term of lease OCS-A 0544 commences on the date of this letter, pursuant to 30 C.F.R. § 585.235(a)(2).

On January 31, 2023, the U.S. Department of the Interior published a final rule that reassigns renewable energy regulations pertaining to safety, environmental oversight, and enforcement from BOEM to the Bureau of Safety and Environmental Enforcement (BSEE). Lease activities, including activities included in the SAP, are therefore subject to offshore renewable energy and alternate use regulations at 30 CFR Part 285 and Part 585.

BOEM's approval is subject to the enclosed Conditions of SAP Approval, incorporated into your SAP pursuant to 30 C.F.R. § 585.613(e)(1). Additionally, to ensure compliance with the approved SAP, Vineyard Mid-Atlantic must:

1. Notify BSEE in writing within 30 days of completing the installation activities approved in your SAP, pursuant to 30 C.F.R. § 285.615(a).

2. Submit to BOEM an annual report that summarizes your site assessment activities and the results of those activities, pursuant to 30 C.F.R. § 585.615. This report is due each November 1 of your site assessment term, starting on November 1, 2024.

3. Submit an annual certification of compliance to BSEE with the enclosed SAP Approval Conditions, pursuant to 30 C.F.R. § 285.615(b). This compliance certification must include:

a. Summary reports that cover, and demonstrate compliance with, all of the conditions (provided in sections 1 through 7 of the Conditions of SAP Approval); and

b. A statement identifying and describing any mitigation measures and monitoring methods that you have taken, as well as their effectiveness. If you identify measures that are not effective, you must make recommendations for new mitigation measures or monitoring methods and explain why you believe they would be effective.

4. Develop a comprehensive annual Self-Inspection Plan, pursuant to 30 C.F.R. § 285.824(a), and submit an annual Self-Inspection Report to BSEE, pursuant to 30 C.F.R. § 285.824(b). This report is due no later than November 1 of each year that your site assessment facility is in operation, starting on November 1, 2024.

Additionally, pursuant to 30 C.F.R. § 285.902(b), Vineyard Mid-Atlantic must submit a decommissioning application to, and receive approval from, BSEE before decommissioning the facilities under your SAP.

This letter constitutes a final BOEM decision that may be appealed pursuant to 30 C.F.R. § 585.118, 30 C.F.R. Part 590, and 43 C.F.R. Part 4, Subpart E.

If you have any questions, please contact Kristen Sinclair, Project Coordinator, Office of Renewable Energy Programs, at Kristen.Sinclair@boem.gov or (571) 536-1465.

Sincerely,

Karen J. Baker
Chief
Office of Renewable Energy Programs

Enclosures

VINEYARD MID-ATLANTIC

SITE ASSESSMENT PLAN

JANUARY 2024

PREPARED BY:

Epsilon ASSOCIATES INC.

SUBMITTED BY:

VINEYARD MID-ATLANTIC LLC

VINEYARD MID-ATLANTIC

VINEYARD OFFSHORE

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Vineyard Mid-Atlantic Site Assessment Plan

For Metocean Buoy

Lease OCS-A 0544

Prepared by:
Epsilon Associates

Prepared for:
Vineyard Mid-Atlantic LLC

January 2024

Site Assessment Plan (SAP)
For Metocean Buoy
Lease OCS-A 0544
Vineyard Mid-Atlantic

New York Bight

***Submitted by*:**

VINEYARD MID-ATLANTIC
200 Clarendon Street, 18th floor
Boston, Massachusetts 02116

Prepared by:

EPSILON ASSOCIATES, INC.
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Maynard, MA 01754

In association with:

GEO SUBSEA LLC
437 Main Street, Second Floor
Middletown, CT 06457

January 2024

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1.0 EXECUTIVE SUMMARY

Vineyard Mid-Atlantic LLC (the "Proponent") seeks Site Assessment Plan (SAP) Approval from the Bureau of Ocean Energy Management (BOEM) to install, maintain, operate, and decommission one "non-complex" meteorological and/or oceanographic (metocean) buoy and one supplemental wave and current sensor placed on the seafloor (referred to as a Trawl Resistant Bottom Mount [TRBM]) on its Lease Area OCS-A 0544. The installation of the metocean buoy and TRBM is referred to as "the Project." The purpose of the Project is to gather Lease-specific wind and ocean current data to support development of offshore renewable wind energy facilities in Lease Area OCS-A 0544. This development of offshore wind energy generation facilities is referred to as Vineyard Mid-Atlantic. Installation of the metocean buoy and TRBM, which will be conducted without anchoring of installation vessels to minimize seafloor impacts, is planned for February 2024. The proposed metocean buoy will be Ocean Tech's EOLOS FLS200 Light Detection and Ranging (LiDAR) buoy, a metocean buoy type that has already been approved by BOEM (for the Vineyard Northeast SAP). The floating metocean buoy will be secured to the seafloor by a single chain and a single mooring weight (also referred to as an "anchor") to minimize bottom disturbance and the risk of entanglement or entrainment of marine biota. The proposed TRBM measures 0.6 m (2.0 ft) high, 1.8 m (5.9 ft) long, and 1.6 m (5.2 ft) wide and will be placed on the seafloor approximately 100 m (328 ft) from the metocean buoy and will undergo recovery and replacement every six months.

The Proponent has identified two study areas (SAP-1 and SAP-2) within the Lease Area, one of which will be used for the metocean buoy and TRBM. The Proponent has also conducted all necessary field surveys and within the two study areas. Evaluation of the field survey data specific to the SAP study areas, including review by a Qualified Marine Archaeologist (QMA), has confirmed that conditions within both SAP study areas are suitable for deployment and operation of the metocean buoy and TRBM. Evaluation of the survey data in each SAP study area found no evidence of natural seafloor and shallow subsurface geohazards; no man-made hazards suggestive of shipwrecks, debris, abandoned fishing gear, cables, pipelines and potential ordnance; no evidence of sensitive habitats; no evidence of historic properties; and no evidence of shallow subsurface paleo features that could be indicative of former glacial meltwater streams or fluvial channels. Vibracore samples did not recover any peat layers that could be indicative of potential terrestrial soils. The QMA recommended a determination of "no historic properties" affected (36 Code of Federal Regulations (CFR) 800.4).

2.0 INTRODUCTION

2.1 Summary of Proposed Activities

Vineyard Mid-Atlantic LLC (the Proponent) proposes to install one metocean buoy in Lease Area OCS-A 0544 within the New York Bight Wind Energy Area (NYB WEA) of the Atlantic Ocean, as designated by the Bureau of Ocean Energy Management (BOEM). The Lease Area is located in federal waters of the Outer Continental Shelf (OCS), south of Long Island, New

York. One metocean buoy will be deployed in one of the two proposed locations (SAP-1or SAP-2). The device to be deployed is anticipated to be Ocean Tech's EOLOS FLS200 Light Detection and Ranging (LiDAR) buoy (see Section 4.0). The metocean buoy system will be comprised of a "simple and non-complex" device proven to operate effectively in open ocean conditions in support of offshore wind projects; the specific metocean buoy used has already been approved by BOEM (for the Vineyard Northeast Site Assessment Plan [SAP]). The metocean buoy will be moored to the seafloor using a single chain to avoid entanglement. A supplemental wave and current sensor (referred to as a Trawl Resistant Bottom Mount [TRBM]) will also be installed on the seafloor within SAP-1 or SAP-2, approximately 100 m (328 ft) from the metocean buoy. In addition to initial metocean buoy and TRBM installation, the activities proposed could include recovery and/or replacement of the metocean buoy at the same location if maintenance or repair is needed. Recovery and replacement of the TRBM will typically occur at six-month intervals, allowing for data downloads and refurbishment. Further performance standards for the equipment are described in Sections 4.0 and 9.0.

The information collected from the metocean buoy and TRBM will be used to further assess the wind resources and ocean conditions on the Lease, to supplement existing metocean measurement data available in the vicinity of the NYB WEA. Historical and ongoing collection of meteorological and oceanographic data in the region will inform the Construction and Operations Plan (COP) submittal and engineering of the wind turbine generators (WTGs) in support of development activities on the Lease Area.

2.2 Locations and Schedule

Two 300 meter (m) by 300 m (984 ft by 984 ft) study areas (SAP-1 and SAP-2), within which the metocean buoy and TRBM will be located, are shown on Figure 2.1-2. Coordinates and water depths at the center point of each study area are presented below.

SAP-1 (Southwest) Latitude: 40 14 07.2636 N Longitude: 73 06 17.3592 W Depth: 42.0 m (137.8 ft) Mean lower low water (MLLW)	SAP-2 (Northeast) Latitude: 40 15 08.5716 N Longitude: 73 03 40.7376 W Depth (m): 43.0 m (141.1 ft) MLLW

Note: geodetic position format = dd mm ss.sssss, where d=degrees, m=minutes, s=seconds

A geodatabase/shapefile for the Location Plat (Figure 2.1-2), compliant with BOEM's guidelines, is provided separately with the SAP submission.

Installation of the metocean buoy and TRBM is planned for February 2024. The installation process is expected to take up to two weeks, from arrival and onshore testing of the equipment and testing at the onshore staging area in Avalon, New Jersey (NJ) (shown on Figure 2.1-1) to the time the metocean buoy and TRBM are deployed at a location and the metocean buoy's

G:\Projects2\NY\6397\2023\MXD\SAP\Fig2.1-1_Location_Proposed_Activities_20230629.mxd

Data Source: U.S. Bureau of Ocean Energy Management (BOEM)

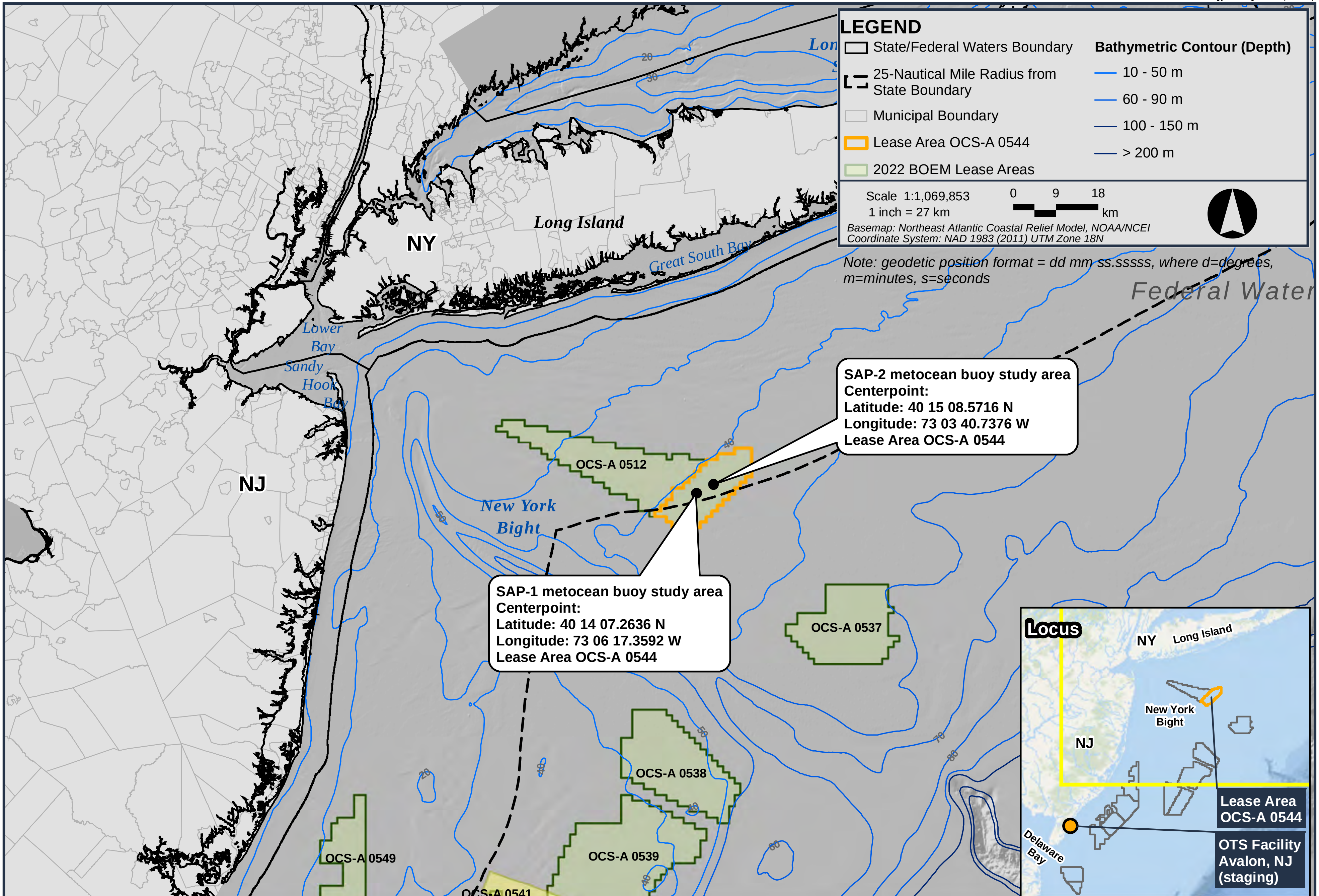

Figure 2.1-1
Location of Proposed Activities

VINEYARD MID-ATLANTIC
VINEYARD OFFSHORE

G:\Projects2\NY\6397\2023\MXD\SAP\Fig2.1-2_Location_Plat_20230629.mxd

Data Source: U.S. Bureau of Ocean Energy Management (BOEM)

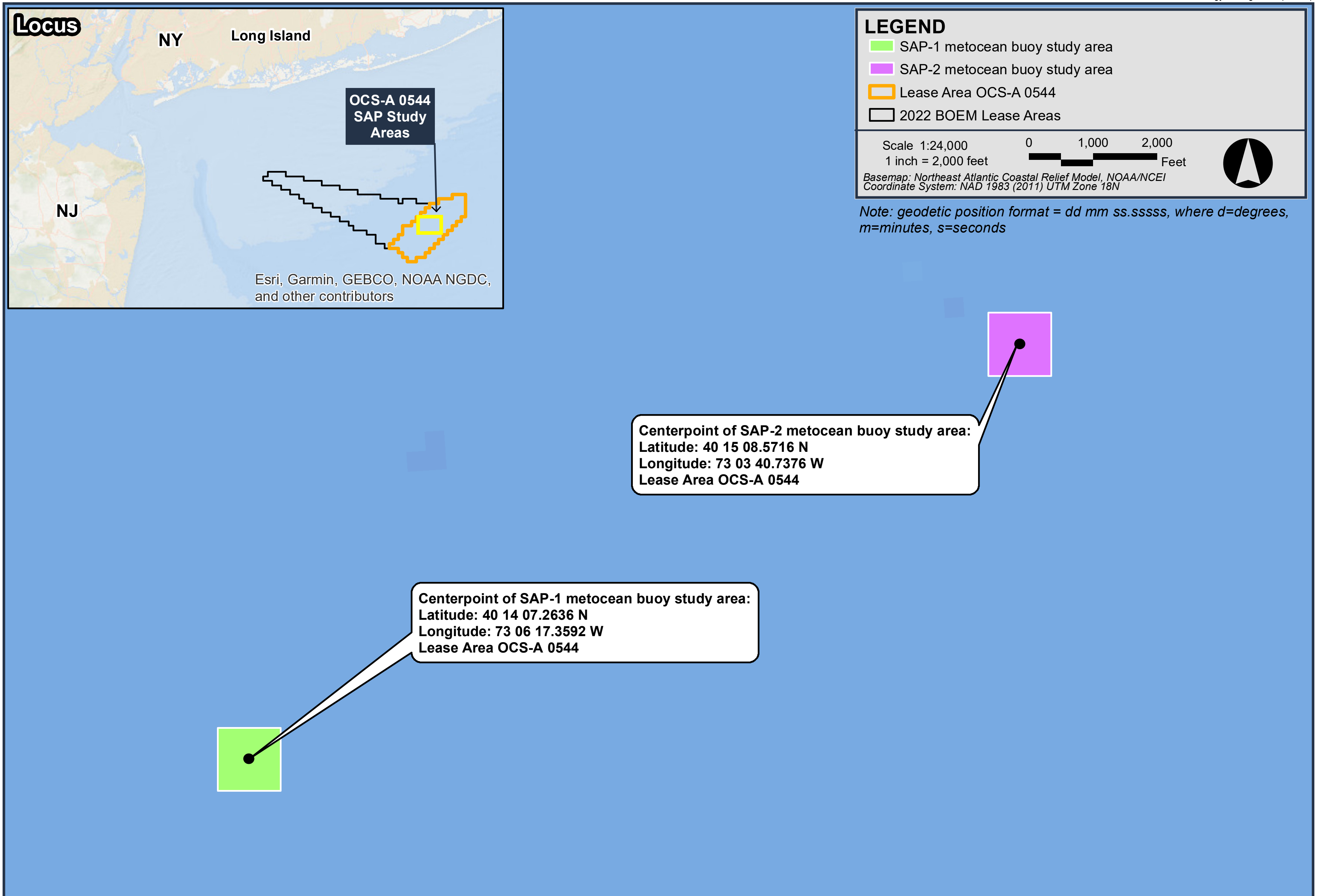

Figure 2.1-2
Location Plat

VINEYARD MID-ATLANTIC
VINEYARD OFFSHORE

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mooring weight is placed on the seafloor. No modifications of the onshore staging area are required. The total duration of the metocean buoy and TRBM offshore deployment for data collection is expected to be two years, but could last up to five years, coinciding with the site assessment term of the Lease.

2.3 Authorized Representative and Designated Operator

Rachel Pachter, Chief Development Officer, Vineyard Offshore
200 Clarendon Street, 18th floor
Boston, Massachusetts (MA) 02116
Tel: 508-717-8964; e-mail: **rpachter@vineyardoffshore.com**

The Proponent intends to be the sole operator of the metocean buoy and TRBM and will comply with the applicable stipulations stated in the Lease and regulations, as described in Section 3.0, as they relate to the BOEM-approved Site Assessment Survey Plan and proposed SAP activities.

2.4 Certified Verification Agent (CVA)

The type of metocean buoy selected by the Proponent is a standardized, proven, widely used and commercially available device and has been successfully deployed and operated in support of offshore wind projects in similar conditions to Lease Area OCS-A 0544. The metocean buoy type uses the best available and safest technology, does not require multi-point moorings or include new or uncommon technology, and therefore will not be "complex or significant" as defined on page eight of BOEM's Guidelines for Information Requirements for a Renewable Energy Site Assessment Plan (SAP), revised June 2019 (referred to hereafter as BOEM's 2019 SAP Guidelines). The mooring design has been checked and assessed by the Proponent. In addition, all installation and maintenance activities will be performed under supervision by key experts representing the Proponent. Similarly, the TRBM is a common and non-complex wave and current sensor that is placed on the seafloor and ballasted with lead. Accordingly, the nomination of a CVA is not required for this SAP activity. The Proponent hereby requests a waiver of the CVA requirement according to 30 Code of Federal Regulations (CFR) §585.610(a)(9) and 585.705(c).

2.5 Financial Assurance Information

In compliance with BOEM regulations at 30 CFR §585.610(a)(15), prior to SAP approval the Proponent will provide a Surety Bond issued by a primary financial institution or other approved security, as required in 30 CFR §585.515 and 30 CFR §585.516, to guarantee the commissioning obligation.

3.0 CONFORMANCE WITH APPLICABLE REGULATIONS, SAP GUIDANCE AND COMMERCIAL LEASE

3.1 Regulatory Framework

This SAP has been prepared and activities will be conducted by the Proponent in conformance with the following:

- Applicable regulations at 30 CFR §Part 585, entitled Renewable Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf;
- BOEM's Guidelines for Information Requirements for a Renewable Energy Site Assessment Plan (SAP) dated June 2019;
- Applicable terms of the Lease issued by BOEM for Lease Area OCS-A 0544; and
- Future terms and conditions of SAP approval.

In 2022, the Proponent completed field surveys across its Lease Area OCS-A 0544 in accordance with a pre-survey meeting with BOEM and the Proponent's BOEM-approved COP Survey Plan (see Section 8.0 and related appendices). The field surveys specific to the SAP study areas which will contain the metocean buoy and TRBM are detailed in Section 8.0 and related appendices; results of applicable resource assessments are summarized in Section 9.0 and relevant appendices.

The Proponent will conduct its proposed site assessment activities for the metocean buoy and TRBM in compliance with 30 CFR §585.606(a)(2 through 4) in a manner that conforms to all applicable laws, regulations, and Lease provisions for OCS-A 0544; is safe; does not reasonably interfere with other uses of the OCS; does not cause undue harm, to the extent practicable, to natural resources, life, property, the environment, or resources of historical or archaeological significance; uses BOEM's SAP best available and safest technology; complies with BOEM's applicable federal regulations (Table 3.1-1), applicable Lease stipulations (Table 3.1-2), uses best management practices (see Table 9.9-1); and uses properly trained personnel. The Proponent will take suitable measures, including briefing all SAP offshore support staff, to prevent unauthorized discharge of pollutants including marine trash and debris into the offshore environment. Table 3.1-1 lists relevant BOEM regulations and where the corresponding information can be found in this SAP.

Table 3.1-1 Lease Area OCS-A 0544 SAP Regulatory Crosswalk Table

Regulatory Requirement	Location of Information in SAP
30 CFR §585.605(a,b,&d)	
585.605(a) Describe the activities you plan to perform for the characterization of your commercial lease, including your project easement, or to test technology devices.	Section 2.1 Sections 4.0 through 8.0
585.605(a)(1) Describe how you will conduct your resource assessment	Section 8.0 and cited Appendices
585.605(b) Include data from physical characterization surveys and baseline environmental surveys	Sections 8.0 and 9.0 and cited Appendices
585.605(d) If the facilities are complex or significant, you must also comply with the requirements of subpart G of this part and submit your Safety Management System as required by § 585.810.	The metocean buoy and TRBM are not "complex or significant".
30 CFR §585.606	
585.606(a)(1) The project conforms to all applicable laws, regulations, and lease provisions of your commercial lease;	Section 3.1
585.606(a)(2) The project is safe;	Section 3.1
585.606(a)(3) The project does not unreasonably interfere with other uses of the OCS, including those involved with National security or defense;	Section 3.1 and Table 3.3-1
585.606(a)(4) The project does not cause undue harm or damage to natural resources; life (including human and wildlife); property; the marine, coastal, or human environment; or sites, structures, or objects of historical or archaeological significance;	Sections 3.1 and 9.0 and cited Appendices
585.606(a)(5) The project uses best available and safest technology;	Sections 2.4 and 3.1
585.606(a)(6) The project uses best management practices;	Sections 3.1, Table 9.9-1
585.606(a)(7) Uses properly trained personnel.	Section 3.1
585.606(b) The site assessment activities will collect all information needed for your COP	Section 3.1
30 CFR §585.610(a)(1-16)	
585.610(a)(1) Contact Information	Section 2.3
585.610(a)(2) The site assessment or technology testing concept	Section 2.1
585.610(a)(3) Designation of operator, if applicable	Section 2.3

Table 3.1-1 Lease Area OCS-A 0544 SAP Regulatory Crosswalk Table (Continued)

Regulatory Requirement	Location of Information in SAP
30 CFR §585.610(a)(1-16)	
585.610(a)(4) Commercial lease stipulations and compliance	Table 3.1-2, Sections 9.8; 9.9, Table 9.9-1
585.610(a)(5) A location plat	Section 2.2 Figures 2.1-1 and 2.1-2
585.610(a)(6) General structural and project design, fabrication, and installation	Section 2.1 Section 4.0 Section 5.0 Appendix A
585.610(a)(7) Deployment activities	Section 5.0
585.610(a)(8) Your proposed measures for avoiding, minimizing, reducing, eliminating, and monitoring environmental impacts	Sections 4.1, 4.2 and 4.4 Sections 5.2, 6.3, 7.2 Section 9.0 and Table 9.9-1
585.610(a)(9) CVA nomination, if required	Section 2.4; the Proponent requests a waiver of the CVA requirement
30 CFR §585.610(a)(1-16)	
585.610(a)(10) Reference information	Section 10.0
585.610(a)(11) Decommissioning and site clearance procedures	Section 7.0
30 CFR §585.610(a)(1-16)	
585.610(a)(12) Air quality information (refers to 585.659: comply with Environmental Protection Agency (EPA) Clean Air Act and implementing regulations)	Section 9.7
585.610(a)(13) A listing of all Federal, State, and local authorizations or approvals required to conduct site assessment activities on your lease	Sections 3.1, 3.3 Table 3.3-1
585.610(a)(14) A list of agencies and persons with whom you have communicated, or with whom you will communicate, regarding potential impacts associated with your proposed activities	Section 3.0: 3.2, 3.3, 3.4
585.610(a)(15) Financial assurance information	Section 2.5
585.610(a)(16) Other information	None

Table 3.1-1 Lease Area OCS-A 0544 SAP Regulatory Crosswalk Table (Continued)

Regulatory Requirement	Location of Information in SAP
30 CFR §585.610(b)(1-5)	
585.610(b)(1) Geotechnical – The results from the geotechnical survey with supporting data	Sections 8.0, 9.2 Appendix B
585.610(b)(2) Shallow hazards – The results from the shallow hazards survey with supporting data	Sections 8.0, 9.6 Appendix B
585.610(b)(3) Archaeological – The results from the archaeological survey with supporting data, if required	Sections 8.0, 9.5 Appendix C
585.610(b)(4) Geological survey – The results from the geological survey with supporting data	Sections 8.2, 9.2 Appendix B
585.610(b)(5) Biological survey – The results from the biological survey with supporting data	Sections 8.2, 9.4 Appendix D
30 CFR §585.611 National Environmental Policy Act (NEPA)	**See Table 9.9-1 for measures to minimize impacts to categorically excluded resources per BOEM's 2019 SAP Guidance**
585.611(b)(1) Hazard information	Section 8.0 Section 9.0
585.611(b)(2) Water quality	See Section 3.2: Categorically excluded per BOEM 2019 Guidance and 30 CFR §585.611(b).
30 CFR §585.611 NEPA	**See Table 9.9-1 for measures to minimize impacts to categorically excluded resources per BOEM's 2019 SAP Guidance**
585.611(b)(3) Biological resources	See Section 3.2: Categorically excluded per BOEM 2019 Guidance and 30 CFR §585.611(b); Addressed in Sections 8.5 and 9.4 and Appendix D under 30 CFR §585.610(b)5)
585.611(b)(4) Threatened or endangered species	See Section 3.2: Categorically excluded per BOEM 2019 Guidance and 30 CFR §585.611(b).
585.611(b)(5) Sensitive biological resources or habitats	See Section 3.2: Categorically excluded per BOEM 2019 Guidance and 30 CFR §585.611(b). Addressed in Sections 8.5 and 9.4 and Appendix D.

Table 3.1-1 Lease Area OCS-A 0544 SAP Regulatory Crosswalk Table (Continued)

Regulatory Requirement	Location of Information in SAP
585.611(b)(6) Archaeological resources	See Section 3.2: Categorically excluded per BOEM 2019 Guidance and 30 CFR §585.611(b). Addressed in Sections 8.4, 9.6 and Appendix C under 30 CFR §585.610(b)(5)
585.611(b)(7) Social and economic conditions	See Section 3.2: Categorically excluded per BOEM 2019 Guidance and 30 CFR §585.611(b).
585.611(b)(8) Coastal and marine uses	See Section 3.2: Categorically excluded per BOEM 2019 Guidance and 30 CFR §585.611(b).
585.611(b)(9) Consistency Certification	See Section 3.2: Categorically excluded per BOEM 2019 Guidance and 30 CFR §585.611(b).
585.611(b)(10) Other resources, conditions, and activities	See Section 3.2: Categorically excluded per BOEM 2019 Guidance and 30 CFR §585.611(b).

Table 3.1-2 demonstrates compliance with the commercial stipulations relevant to this SAP in BOEM's *Commercial Lease of Submerged Land for Renewable Energy Development on the Outer Continental Shelf* for Lease Area OCS-A 0544 (effective date May 1, 2022). Lease stipulations pertaining to minimizing impacts to marine resources are listed in Sections 9.8, 9.9, and Table 9.9-1. The Proponent will comply with the Lease stipulations described in Section 9.9 and in Table 9.9-1.

Table 3.1-2 Summary of Lease Area OCS-A 0544 Commercial Lease Stipulations and Compliance

Stipulation	Compliance
Section 4(a): The Lessee must make all rent payments to the Lessor in accordance with applicable regulations in 30 CFR Part 585, unless otherwise specified in Addendum "B."	The Proponent has made and will continue to make all rent payments in accordance with applicable regulations, unless otherwise specified in Addendum "B".
Section 4(b): The Lessee must make all operating fee payments to the Lessor in accordance with applicable regulations in 30 CFR Part 585, as specified in Addendum "B.	The Proponent will make all operating fee payments in accordance with applicable regulations.

Table 3.1-2 Summary of Lease Area OCS-A 0544 Commercial Lease Stipulations and Compliance (Continued)

Stipulation	Compliance
Section 5: The Lessee may conduct those activities described in Addendum "A" only in accordance with a SAP or COP approved by the Lessor. The Lessee may not deviate from an approved SAP or COP except as provided in applicable regulations in 30 CFR Part 585.	The Proponent will conduct activities as described in the SAP.
Section 7: The Lessee must conduct, and agrees to conduct, all activities in the leased area and project easement(s) in accordance with an approved SAP or COP, and with all applicable laws and regulations. The Lessee further agrees that no activities authorized by this lease will be carried out in a manner that: could unreasonably interfere with or endanger activities or operations carried out under any lease or grant issued or maintained pursuant to the Act, or under any other license or approval from any Federal agency; could cause any undue harm or damage to the environment; could create hazardous or unsafe conditions; or could adversely affect sites structures, or objects of historical, cultural, or archaeological significance, without notice to and direction from the Lessor on how to proceed.	The Proponent will conduct all activities in the leased area in accordance with the SAP and all applicable laws and regulations. (a) See Section 9.9.4 (b) See Sections 8.0, 9.0 (c) See Sections 4.1, 4.3, 6.2, 8, 9 (d) See Sections 8.0, 9.0
Section 10: The Lessee must provide and maintain at all times a surety bond(s) or other form(s) of financial assurance approved by the Lessor in the amount specified in Addendum "B."	The portions of the Lease development activities in federal waters will be covered by financial assurance in amounts and within time frames approved by BOEM and in accordance with Addendum "B," Section IV of the Lease. See Section 2.5.
Section 13: Unless otherwise authorized by the Lessor, pursuant to the applicable regulations in 30 CFR Part 585, the Lessee must remove or decommission all facilities, projects, cables, pipelines, and obstructions and clear the seafloor of all obstructions created by activities on the leased area and project easement(s) within two years following lease termination, whether by	Preliminary decommissioning plans are described in Section 7.0. Decommissioning will be in accordance with the applicable regulations.

Table 3.1-2 Summary of Lease Area OCS-A 0544 Commercial Lease Stipulations and Compliance (Continued)

Stipulation	Compliance
expiration, cancellation, contraction, or relinquishment, in accordance with any approved SAP, COP, or approved Decommissioning Application, and applicable regulations in 30 CFR Part 585.	
Section 14: The Lessee must: maintain all places of employment for activities authorized under this lease in compliance with occupational safety and health standards and, in addition, free from recognized hazards to employees of the Lessee or of any contractor or subcontractor operating under this lease; maintain all operations within the leased area and project easement(s) in compliance with regulations in 30 CFR Part 585 and orders from the Lessor and other Federal agencies with jurisdiction, intended to protect persons, property, and the environment on the OCS; and provide any requested documents and records, which are pertinent to occupational or public health, safety, or environmental protection, and allow prompt access, at the site of any operation or activity conducted under this lease, to any inspector authorized by the Lessor or other Federal agency with jurisdiction.	The Proponent will maintain all places of employment in compliance with applicable standards. The Proponent will maintain all operations in the leased area in compliance with applicable regulations. The Proponent will provide any requested pertinent documents and records.
Section 15: The Lessee must comply with the Department of the Interior's non-procurement debarment and suspension regulations set forth in 2 CFR Parts 180 and 1400 and must communicate the requirement to comply with these regulations to persons with whom it does business related to this lease by including this requirement in all relevant contracts and transactions.	The Proponent will comply with the applicable Department and suspension regulations.
Section 16: During the performance of this lease, the Lessee must fully comply with paragraphs (1) through (7) of Section 202 of Executive Order 11246, as amended (reprinted in 41 CFR 60-1.4(a)),	The Proponent will fully comply with paragraphs (1) through (7) of section 202 of Executive Order 11246, as amended.

Table 3.1-2 Summary of Lease Area OCS-A 0544 Commercial Lease Stipulations and Compliance (Continued)

Stipulation	Compliance
and the implementing regulations, which are for the purpose of preventing employment discrimination against persons on the basis of race, color, religion, sex, or national origin.	
Addendum "B," Section III (Payments): Unless otherwise authorized by the Lessor in accordance with the applicable regulations in 30 CFR Part 585, the Lessee must make payments as described below.	The Proponent will make payments as stipulated in Addendum "B," Section III.
Addendum "B," Section IV (Financial Assurance Amounts): The Lessor reserves the right to adjust the amount of any financial assurance and will notify the Lessee of any intended adjustment.	See Section 2.5: Financial Assurance Information
Addendum "C" Sections 3 (Reporting) and 5 (Standard Operating Conditions):	
Section 3.1: Progress Reporting	
3.1.2 Communication Plans: The Lessee must develop a publicly accessible Draft Fisheries Communication Plan, Native American Tribes Communication Plan and Agency Communication Plan.	The Lessee has developed a draft Fisheries Communication Plan (see Section 8.9.2) and an Agency Communication Plan. BOEM is coordinating with the Lessees who hold New Bight Lessees to develop a Native American Tribes Communication Plan.
Section 5.1: General Requirements	
5.1.3: The Lessee must ensure that a copy of ADDENDUM "C" and the Project Design Criteria and Best Management Practices listed in Appendix B of the NMFS Letter of Concurrence issued by the National Marine Fisheries Service (NMFS) on June 29, 2021, is made available on every project-related vessel.	The Lessee will provide a copy of the Project Design Criteria (PDCs) and Best Management Practices (BMPs) on every project-related vessel.
Section 5.3: Archaeological Survey Requirements	
5.3.1-5.3.2 Archaeological Survey: Lessee must provide the results of an archaeological survey with its plans, prepared by a Qualified Marine Archaeologist (QMA)	See Sections 8.4, 9.5, and Appendix C
5.3.3 Tribal Pre-Survey Meeting: Lessee must hold a pre-survey meeting inviting involved tribal representatives, to inform them of planned SAP activities.	See Section 3.4 Consultations and Meetings. Tribal pre-survey meetings were held in June and July 2022.

Table 3.1-2 Summary of Lease Area OCS-A 0544 Commercial Lease Stipulations and Compliance (Continued)

Stipulation	Compliance
5.3.4-5.3.6 QMA Review before Disturbance: Lessee must only conduct geotechnical activities where analysis of geophysical survey has been completed and reviewed by a QMA to assess the presence/absence of potential historic properties prior to ground disturbance.	See Sections 8.4, 9.5, and Appendix C
5.3.7 Post-Review Discovery Clauses: Lessee must follow a specific notification process if unanticipated potential archaeological resources are discovered during SAP activities.	See Sections 8.4, 9.6, and Appendix C
Section 5.4: Avian and Bat Survey and Reporting Requirements	
5.4.1 Lighting:[1] The Lessee must ensure any lights used to aid marine navigation must meet USGG requirements. Any additional lighting must be used only when necessary and must be hooded downwards when possible.	See Section 6.1.
5.4.2 Motus Wildlife Tracking System: The Lessee must install Motus stations on meteorological buoys in coordination with U.S. Fish and Wildlife Service's Offshore Motus network.	See Section 6.1

Notes:

1. This text summarizes stipulations in Lease OCS-A 0544 (effective date May 1, 2022). The Proponent understands that the United States Coast Guard (USCG) has worked with BOEM to develop standard language for use in COP and/or SAP approvals and that the conditions of SAP approval will supersede the Lease stipulations. The Proponent understands that the USCG's suggested standard language is: "Nothing in this condition supersedes or is intended to conflict with the lighting, marking, and signaling requirements of the Federal Aviation Administration (FAA), United States Coast Guard (USCG), or BOEM. The Lessee must use lighting technology that minimizes impacts on avian species to the extent practicable including lighting designed to minimize upward illumination."

3.2 SAP Format and Categorical Exclusions for Portions of NEPA Analysis

The SAP is in conformance with the 2019 BOEM issued SAP report template specifically for "non-complex" metocean buoys (included as Attachment C of BOEM's 2019 SAP Guidelines).

In 2021, BOEM completed a Final Environmental Assessment (EA) for Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf Offshore New York Bight (OCS EIS/EA BOEM 2021-073), which is referred to herein as the "NYB EA." 30 CFR §585.611(b) and BOEM's 2019 SAP Guidelines (Section IV.1) allow BOEM to consider previous analyses of site assessment activities in the assessment of proposed SAP activities:

- **Metocean Buoy:** If a lessee is proposing the installation and operation of metocean buoy in an area where BOEM has previously analyzed such activities under NEPA, then regulatory requirements in 585.611(b)(2 through 10) will likely not be applicable. Regulatory requirements in 585.611(b)(1) may be applicable for BOEM technical review outside of NEPA.

The scope of the NEPA analyses conducted by BOEM as part of the NYB EA included site assessment activities for up to 20 metocean buoys on leases to be issued within the WEA. The NYB EA resulted in a Finding of No Significant Impact for the activities under the EA's purview.

As shown in Table 3.2-1, the scope and assessment of the proposed metocean buoy are consistent with the scope and assessment of the site assessment activities previously analyzed by BOEM as part of the NYB EA.

Table 3.2-1 Consistency of Proposed SAP with New York Bight EA

Component	New York Bight EA	Proposed SAP	Consistency
Number of Buoys	One to two buoys per lease	One buoy	One proposed buoy is consistent with the scope of the EA
Meteorological Buoy Height	Generally less than 12 m (39 ft) above sea level	Approximately 5.3 m (17 ft) above sea level	The height is consistent with the expected height evaluated in the EA
Meteorological Boat and Discus Shaped Buoy Mooring (Anchor) Weight1	Approximately 2,721 – 4,536 kg (6,000 - 10,000 lbs)	Approximately 5,000 kg (11,023 lbs)	The weight of the anchor proposed is similar to that evaluated in the EA
Meteorological Boat and Discus Shaped Buoy Mooring Weight (Anchor) Footprint	Approximately 0.5 m^2 (six square feet [SF])	Approximately 1.8 m^2 (19.38 SF)	The proposed anchor footprint is comparable to that evaluated in the EA (which considered spar-type buoy footprints of up to 45 m^2 [484 SF])

1 While not anticipated to be used, spar-type metocean buoys evaluated by BOEM were approximately 100 tons, with an anchor weight footprint of 484 SF, and a seafloor disturbance area of 1,268 SF.

Table 3.2-1 Consistency of Proposed SAP with New York Bight EA (Continued)

Component	New York Bight EA	Proposed SAP	Consistency
Boat and Discus Shaped Mooring Weight (Anchor) Sweep Area	0.034 km^2 (8.5 acres)	With a 71m (234 ft) radius, the anchor sweep area is estimated to be approximately 0.016 km^2 (4.0 acres)	The anchor sweep area is within the sweep area evaluated in the EA.
Anchoring During Meteorological Buoy Installation	The EA assumed additional seafloor impacts from vessel anchoring during installation	No vessel anchoring is proposed during installation	The amount of seafloor disturbance is less than area evaluated in the EA
Data Collection & Transmission	Assumed a small, tethered buoy with Acoustic Doppler Current Profilers (ADCP). LiDAR, Sonic Detection and Ranging (SODAR), and Coastal Ocean Dynamic Applications Radar (CODAR) technologies could be used.	The buoy will use LiDAR and ADCP.	The data collection and transmission requirements are consistent with the scope of the EA.
Installation and Decommissioning	Estimated to take approximately one to two days to install and remove using a barge, tug, or similar vessel assuming a vessel speed of 4.5 knots during a ten-hr day.	Estimated to require approximately one day with one work boat for installation and decommissioning assuming a vessel speed of nine to ten knots.	The proposed timeline is comparable to the timeline evaluated in the EA.

Given that the scope and assessment of the proposed metocean buoy are consistent with the scope and assessment of the site assessment activities previously analyzed by BOEM as part of the NYB EA, the categories and resources in 30 CFR §585.611(b)(2 through 10), which are listed below, can be excluded from duplicative analyses[2]. These categories are therefore not assessed in the SAP except where noted:

- Water quality (Note: shallow hazards, including sediment transport, are required to be analyzed under 30 CFR §585.610(b)(2); see Sections 8.0 and 9.0 for a description of sediment transport);
- Biological resources (Note: biological resources are required to be analyzed under 30 CFR §585.610(b)(5); see Sections 8.5 and 9.4 and Appendix D for a description and assessment of the seafloor community);
- Threatened or endangered species (Note: biological resources are required to be analyzed under 30 CFR §585.610(b)(5); see Section 9.8 and Tables 9.8-1 and 9.9-1 for protected species avoidance measures);
- Sensitive biological resources or habitats (Note: biological resources are required to be analyzed under 30 CFR §585.610(b)(5); see Sections 8.5 and 9.4 and Appendix D);
- Archaeological resources (Note: archaeological resources are required to be analyzed under 30 CFR §585.610(b)(3); see Sections 8.4 and 9.6 and Appendix C);
- Social and economic conditions;
- Coastal and marine uses; and
- Consistency certification.

3.3 Regulatory Permits and Approvals

The Proponent will apply for the following approvals and/or authorizations shown in Table 3.3-1 to conduct site assessment activities (metocean buoy and TRBM installation, operation, and decommissioning).

[2] The TRBM is a common and non-complex wave and current sensor and so does not affect the categories to be analyzed in the SAP.

Table 3.3-1 Lease Area OCS-A 0544 SAP Permitting Plan

Permitting Agency	Applicable Permit or Approval	Statutory Basis And Implementing Regulations	Status
BOEM	Site Assessment Plan (SAP) Approval BOEM will conduct National Historic Preservation Act Review & State Historic Preservation Act Consultation	30 CFR § 585.600-618-	Filed March 2023
	National Historic Preservation Act (NHPA) Section 106 Consultation/ Abandoned Shipwreck Act	NHPA 16 U.S.C. 470 36 CFR Part 60, Part 800	An archaeological assessment was prepared to support the SAP (Appendix C). The activities proposed in the SAP
BOEM		43 U.S.C §§ 2101-2106, *et seq*	will have no impact on submerged pre- or post-contact period historic properties or preserved ancient submerged landforms
NMFS	Endangered Species Act (ESA) Section 7 Consultation	50 United States Code (U.S.C) 1536 50 CFR § 402	No additional action required. The activities proposed in the SAP are within the scope of BOEM's prior consultation with NMFS and outlined in the June 29, 2021 Letter of Concurrence (See Section 9.8.1).
NMFS	Incidental Take Authorization	Marine Mammal Protection Act of 1972 16 U.S.C §§ 1361, et seq.	Incidental Harassment Authorization (IHA) for geophysical and geotechnical survey work issued July 27, 2022 (1-year term). New IHA issued July 27, 2023 (1-year term).
	Magnuson-Stevens Fishery Conservation and Management Act	16 U.S.C 1801 50 CFR 600	No additional action required. The SAP implements conservation measures suggested by NMFS during consultation to minimize impacts on essential fish habitat and sensitive habitats.

Table 3.3-1 Lease Area OCS-A 0544 SAP Permitting Plan (Continued)

Permitting Agency	Applicable Permit or Approval	Statutory Basis And Implementing Regulations	Status
US Army Corps of Engineers (USACE)	Section 10/404 Permit via Nationwide Permit 5: Scientific Collection Device	Clean Water Act 33 U.S.C. 134 33 CFR § 320	Filed with the USACE on September 5, 2023
US Coast Guard (USCG)	Private Aid to Navigation	14 U.S.C 81 33 CFR § 66	Expected filing date Winter (Q1) 2024
US Fish and Wildlife Service (USFWS)	ESA Section 7 Consultation	50 U.S.C 1536 50 CFR § 402	No additional action required. The activities proposed in the SAP are within the scope of BOEM's prior consultation with USFWS.
New York Department of State, Division of Coastal Resources New Jersey Department of Environmental Protection	Federal consistency review	Coastal Zone Management Act of 1972 (16 USC 1451 et seq.); 15 CFR 930 Subpart C	No additional action required. BOEM provided a final Coastal Zone Consistency Determination (CD) for SAP activities in the New York Bight Wind Energy Areas to New York and New Jersey on August 18, 2021. New Jersey provided no response; therefore, BOEM presumed concurrence. New York provided concurrence.[1]

Notes:

1. A separate Consistency Assessment Form was submitted on September 5, 2023 to New York Department of State as part of the USACE Nationwide Permit 5 application process, and approval was granted on October 26, 2023 (see Appendix E).

3.4 Consultations and Meetings

The Proponent has conducted or will conduct outreach with the following local, state, and federal agencies via meetings and/or correspondence. This outreach will address planned site assessment and development activities in the Lease Area, including the proposed metocean buoy and TRBM. These agencies include:

- BOEM
- NMFS
- USACE
- USCG, District Commander

- Department of Defense (DoD), US Navy – Fleet Forces

As outlined in Table 3.4-1, the Proponent met with USACE on April 11, 2023, USCG on March 21 and April 25, 2023, and NMFS on April 13, 2023, and informed each agency of the plan to deploy a metocean buoy. Most outreach to the agencies has been through verbal communication during meetings advising of the buoy deployment and the Proponent did not request feedback in writing.

Table 3.4-1 Agency Communication

Date	Meeting Title	Entity	Topics of Discussions
March 21, 2023	Vineyard Mid-Atlantic Lease Area 544	USCG	Pre-COP filing project overview; navigation constraints; OECC constraints; SAP
April 11, 2023	Vineyard Offshore/VMA Lease Development Discussion with USACE-NY	USACE	Pre-COP filing project overview; OECC constraints; SAP
April 13, 2023	Vineyard Offshore Lease 544 Discussion with NMFS	NMFS	Pre-COP filing project overview; habitat type; fisheries; aquatic resources; SAP
April 25, 2023	VO Lease 544 Update - Coast Guard	USCG	OECC routes; Navigation Safety Risk Assessment preparation; WTG layout; SAP

Furthermore, prior to conducting SAP survey activities (as specified in the Lease Section 5.3.3) the Proponent held a pre-survey meeting on June 27, June 28, and July 6, 2022, and invited members of the federally recognized Wampanoag Tribe of Gay Head/Aquinnah, the Mashpee Wampanoag Tribe, the Narragansett Indian Tribe, the Mashantucket Pequot Tribal Nation, the Mohegan Tribe of Indians of Connecticut, and the Shinnecock Indian Nation. Only Representatives of Wampanoag Tribe of Gay Head/Aquinnah, the Mashpee Wampanoag Tribe and Shinnecock Indian Nation responded and attended.

As noted in the NYB EA, the Proponent will adhere to USCG and BOEM structural lighting requirements for the metocean buoy to minimize collision risks in the Narragansett Bay operating area (OPAREA).

4.0 PROJECT EQUIPMENT AND PERFORMANCE STANDARDS

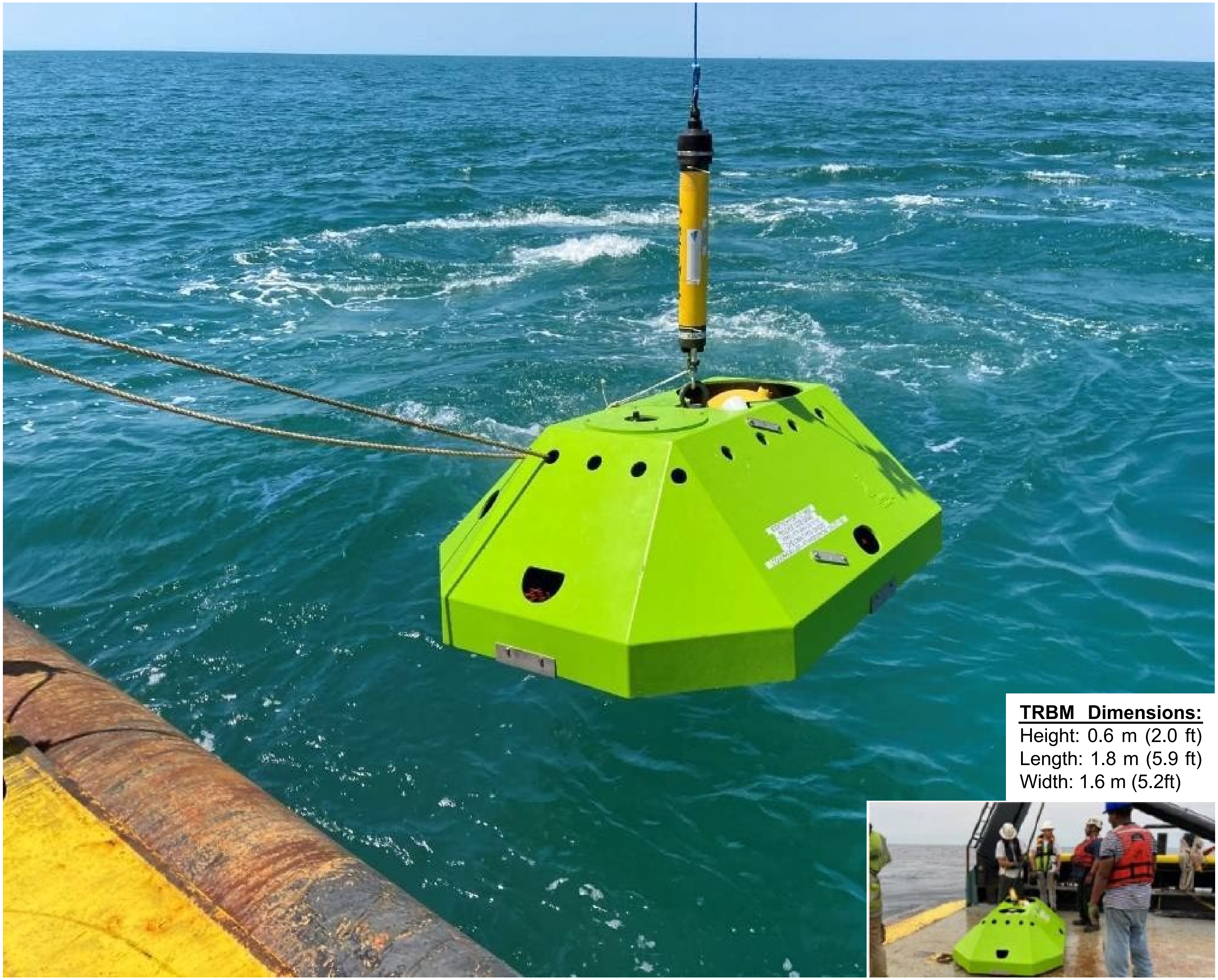
The following sections describe the performance standards and constraints that the metocean buoy equipment will meet.

4.1 Equipment

The Proponent has selected a proven multi-purpose non-complex metocean buoy, which has previously been approved by BOEM (for the Vineyard Northeast SAP, approved July 1, 2022), that meets or exceeds all performance standards set by BOEM for this type of marine measuring device and is tailored for the renewable energy industry and open Atlantic Ocean conditions. The metocean buoy will accurately measure and collect wind profiles (speed and direction) at different heights within a vertical measurement cone projected above the metocean buoy. Within the cone, wind data can be obtained at varying heights, including heights of the blade spans of the planned offshore wind turbines. The metocean buoy is equipped with oceanographic sensors that can obtain ocean wave height and direction data, and current profiles from the sea surface to the seabed. The information collected by the metocean buoy will be utilized to assess site-specific wind resources and assist in developing engineering design criteria for the development activities in the Lease Area. The mooring chain is designed to resist abrasion and corrosion to last through the maximum deployment period of five years. Regular maintenance will include inspection of the mooring chain, similar to USCG's inspection routines every two years. The metocean buoy will be easily deployed and relocated, either by towing or lifting on-board support vessels. The metocean buoy will conform to applicable USCG standards for special purpose buoys and will have a yellow hull. The metocean buoy will not utilize fuel oil to avoid the risk of accidental release and emissions into the environment.

The metocean buoy that will be deployed in Lease Area OCS-A 0544 is the Ocean Tech EOLOS FLS200 LiDAR Buoy (EOLOS buoy or EOLOS). A diagram of the EOLOS FLS200 buoy system is shown in Appendix A. In summary, the EOLOS is made of polyethylene, aluminum, and stainless steel, with a buoy weight of approximately 5,000 kg (11,023 lbs). The metocean buoy has a modular hull for easy assembly and transport, an overall height of 5.3 m (17.4 ft), is 4 m (13.1 ft) in length and width, and an overall mast height above water of 4.2 m (13.8 ft). The metocean buoy has 64 gigabytes (GB) of data storage; a real-time operating system; flexible data acquisition software; full on-board processing of all measured data; and real-time data transfer. The EOLOS buoy is powered by renewable energy, specifically solar panels and wind turbines, and is equipped with back-up batteries as well as a methanol fuel cell.

The TRBM platform is made of fiberglass and is ballasted with 140kg (309 lbs) of lead. It measures 0.6 m (2.0 ft) high, 1.8 m (5.9 ft) long, and 1.6 m (5.2 ft) wide, shown on Figure 4.2-1 It is expected the TRBM will contain a Nortek AWAC-600 and could contain other instrumentation packages as well.



TRBM Dimensions:
Height: 0.6 m (2.0 ft)
Length: 1.8 m (5.9 ft)
Width: 1.6 m (5.2ft)

Figure 4.2-1
Picture of Trawl Resistant Bottom Mount

VINEYARD MID-ATLANTIC
VINEYARD OFFSHORE

PUBLIC

The metocean buoy will be equipped with the proper safety lighting, markings, and signal equipment per USCG Private Aids to Navigation (PATON) requirements. Tracking of the metocean buoy will be done by means of Global Positioning System (GPS) and Automatic Identification System (AIS) device. The location of the metocean buoy will be monitored daily. In addition, there will be up to three locator beacons that send alarms to the EOLOS data center when they are outside the designated metocean buoy watch circle. The Proponent will maintain a list of known and pre-validated vessel providers to assist. If immediate emergency recovery is necessary, the closest suitable recovery vessel will be contacted. Additional information should an emergency recovery be needed is provided in Section 6.2.

The metocean buoy system will be moored to the seafloor using a gravity-based single mooring weight. The proposed mooring "line" is a mooring chain and is expected to be under tension, which reduces entanglement risk. The length of the mooring chain utilized depends on the water depth but is the shortest possible, while still reliably securing the metocean buoy system. The mooring chain is designed to resist abrasion and corrosion to last through the five-year planned deployment period and will be regularly inspected for signs of abrasion and corrosion (see Section 6.2). Typical mooring weights consist of a cement, cast iron, or steel weight linked to the floating metocean buoy by a single chain to limit impacts to the seafloor (see Section 4.1); the proposed metocean buoy(s) will use a cast iron mooring weight.

4.2 Bottom Disturbance

The total seafloor impacts of the proposed metocean buoy system will be caused by a combination of the mooring weight, the mooring chain sweep zone; and the limited deep-water shallow marine sediments temporarily displaced below the mooring weight. The TRBM will also occupy a limited portion of the seafloor.

Metocean Buoy Mooring Weight: For the metocean buoy, the cast iron mooring weight will occupy an expected seafloor footprint of approximately 1.8 m x 1.4 m (5.9 ft x 4.6 ft), resulting in an area of 2.5 m^2 (27.1 SF). Upon placement on the seafloor, the mooring weight is expected to vertically penetrate the deep-water fine silty sands and silts to a depth of approximately 2.5 m (8.2 feet), displacing approximately 10 m^3 (13 cubic yards) of deep-water marine sediments.

As described in Section 9.2, the absence of any size of mobile seafloor features (ripples, megaripples, sand waves) suggests minimal bottom currents are operating in the area, and therefore scour around the weight is expected to be minimal.

Metocean Buoy Mooring Chain Sweep Zone: The majority of the mooring chain from the mooring weight will traverse the water column to secure the floating metocean buoy. A varying length of the mooring chain will likely rest at times upon the seafloor and sweep around the mooring weight as the floating metocean buoy is moved at the surface by winds, tides, and currents. The maximum length (radius) of mooring chain for the metocean buoy that could rest on the seafloor is estimated at 71.0 m (234 ft).

It should be noted that the seafloor impact of the mooring chain may not be fully radial around the mooring weight, as the metocean buoy will be preferentially directed by prevailing seasonal patterns. However, assuming the entire circumference is affected, the maximum estimated radial mooring chain sweep of seafloor that could be surficially and temporarily affected for the metocean buoy as the single chain moves across it is approximately 15,837 m^2 (170,466 SF; 3.91 acres). The sweep zone will be within the 300 m x 300 m (22 acre) (984 ft by 984 ft) study area assessed for each metocean buoy deployment location.

TRBM: The TRBM will occupy an expected seafloor footprint of approximately 1.8 m x 1.6 m (5.9 ft x 5.2), resulting in an area of 2.9 m^2 (31 SF). The TRBM is ballasted with 140 kg (309 lbs) of lead and will be placed on the seafloor, where it may settle a few inches into the seafloor.

No seafloor impacts will result from metocean buoy and TRBM support vessels as activities will be conducted without anchoring. The seafloor is expected to recover naturally from these minimal impacts; no mitigation is necessary.

4.3 Oil Spill Response Measures

As described in Section 4.1, neither the selected metocean buoy nor the TRBM will use fuel oil. Vessel trips to support the metocean buoy system and TRBM will be minimal and fuel spills are not expected, as vessels will be expected to comply with USCG regulations at 33 C.F.R. § 151 relating to the prevention and control of oil spills.

If a vessel spill did occur, it is likely to be small. According to the Bureau of Transportation Statistics (2023), between 2000 and 2021, the average oil spill size for vessels other than tank ships and tank barges in all U.S. waters was 382 liters (101 gallons). Because a diesel fuel or similar fuel spill of this size is expected to dissipate rapidly and evaporate within days, impacts to any affected resources would be short-term and localized to the vicinity of the spill.

The Proponent has identified three Oil Spill Response Organizations (OSROs) located in the vicinity of the Lease that are available to execute planned response measures, in the event of a release. While not under contract, in compliance with the SAP Guidance, these organizations are:

- Marine Spill Response Corporation (**www.msrc.org**)
- US Ecology (**www.usecology.com**)
- T&T Marine Salvage, Inc. (**www.teichmangroup.com**)

In the event of an oil spill, the Proponent's designated point of contact (POC) for the SAP activities will be Health, Safety, and Environmental Manager Geoffrey Neild (contact information 407-616-4760; **gneild@vineyardoffshore.com**).

An alternative POC will be Marine Liaison Jeannot Smith (contact information 904-613-0134; **jsmith@vineyardoffshore.com**). Within 24 hours of learning of an oil spill related to the SAP activities, the Proponent POC will contact the POCs identified at BOEM, the contracted OSRO, the captain of the subject vessel, if applicable, and any other appropriate officials or personnel. Efforts will be made to respond and minimize impacts of the spill in accordance with applicable laws. Appropriate documentation, including all relevant contact information and records of any oil spills, will be kept at the Proponent's office at 412 West 15th Street, New York, NY 10011.

Annually, the Proponent POC and alternate POC will conduct a notification drill to test the ability of the POCs to communicate pertinent information regarding the emergency situation and the necessary response measures to an OSRO and to BOEM.

5.0 DEPLOYMENT / INSTALLATION

5.1 Overview of Installation and Deployment Activities

It is anticipated that the deployment activities will be conducted from Ocean Tech Services' (OTS) waterfront facility in Avalon, NJ or a similar suitable port in the area (see Figure 2.1-1). No modifications to existing facilities at the selected port are anticipated.

Deployment and installation activities for the metocean buoy and TRBM that will operate in Lease Area OCS-A 0544 are expected to require approximately one day (including vessel transits) with one workboat making a single roundtrip. No vessel anchoring is expected. Mobilization is expected to occur at Avalon, NJ. The metocean buoy is expected to be lifted off the quay and onto the deck of the deployment vessel and secured with chain binders for transit. The mooring weight and mooring chain are expected to be secured onto the center deck of the vessel.

Transit time to the Lease Area is expected to take approximately twelve hours, one-way, at speeds of nine to ten knots. At the deployment location, the metocean buoy will be lifted off the deck of the vessel into the water, and the mooring weight will be lowered to its planned location on the seafloor. Similarly, the TRBM will be lifted off the deck of the vessel and placed on the seafloor. Confirmatory GPS measurements of the metocean buoy system will be obtained.

5.2 Reporting Requirements

The Proponent will report deployment and installation information about the metocean buoy and TRBM to BOEM as required in 30 CFR §585.615 and as specified in the SAP approval, when issued by BOEM. These include:

1. notifying BOEM in writing within 30 days of completing installation activities;
2. preparing and submitting an annual report to BOEM on November 1 of each operational year summarizing the site assessment activities and results; and

3. annual submission of a certification of compliance with certain terms and conditions of the SAP approval, including any mitigation measures and monitoring measures and their effectiveness.

The Proponent will also provide other notifications that may be required by other Federal agencies for metocean buoy and TRBM deployment.

6.0 OPERATIONS AND MAINTENANCE

6.1 Data Collection and Operations for Metocean Data:

During operation, the location of the metocean buoy will be tracked by GPS located on the top cover of the attached metocean buoy. In addition to this, there will be up to three locator beacons that send alerts to the EOLOS buoy data center when they are outside of the designated metocean buoy watch circle.

The proposed metocean buoy will be lit by a Carmanah M701 self-contained amber LED obstruction lamp. The lamp is programmed to displace a flash every 20 seconds according to IALA regulations for AToN. The navigation/obstruction light is powered autonomously including a solar panel and battery with an average five-year lifespan.

The metocean buoy is expected to carry sensors to accurately measure and collect wind profiles (speed and direction) at different heights within a vertical measurement cone projected above the metocean buoy. Within the cone, wind data can be obtained at varying heights, including heights of the blade spans of the planned offshore wind turbines. The metocean buoy will also likely be equipped with oceanographic sensors that can obtain ocean wave height and direction data, and current profiles from the sea surface to the seabed.

The metocean buoy is expected to have on-board data storage, a real-time operating system, and flexible data acquisition software. All measured data are typically processed on-board and accessed through a two-way communication link for data transfer. This information will be utilized to assess site-specific wind resources and assist in developing engineering design criteria for the development activities in the Lease Area.

The metocean buoy will also include an avian acoustic recorder (operating at 20 Hz – 40 kHz) and bat ultrasonic recorder (operating at 256 kHz). The avian acoustic recorder is always on; the bat ultrasonic recorder operates from one hour before sunset to one hour before sunrise. Both recorders have their own housings on the top of the buoy, where the wiring and data recorders are housed inside the buoy while only the microphone is exposed to the environment. Data are expected to be retrieved from the metocean buoy every three months, weather permitting. Once the data are retrieved, the Proponent or the Proponent's contractor will upload the data to Motus, typically within one-two months of retrieval. Data will be acquired during the entire period of buoy deployment as described in Section 2.2.

The TRBM is expected to contain multiple sensors to collect wave and current data. It is expected that the TRBM will contain a Nortek AWAC-600 to provide near full water column profiles of current speed and direction, at multiple configurable depths. Surface wave height, direction, period, and other characteristics will also be obtained.

During deployment, the Proponent will share near real-time metocean data on a website; the real-time data will provide a snapshot of current metocean conditions and will not be searchable or downloadable. After the end of the buoy deployment period, the Proponent will publicly share non commercially-sensitive metocean data from the entire period of deployment; these data will be searchable and downloadable.

6.2 Maintenance Activities

The Proponent will prepare a Self-Inspection Plan in accordance with 30 CFR Parts 585.615 and 585.824. These will include comprehensive on-site inspections of all metocean buoy components approximately every six months (subject to vessel availability and weather conditions). The inspections will also comply with manufacturer's guidance to test and maintain the specific metocean buoy system.

Metocean buoy maintenance activities typically include pre-deployment inspections and testing of components, and once deployed, include routine battery changes, replacement of worn or damaged parts, and checks of mechanical, electrical, and sensor systems. The mooring chain will be inspected for abrasion and corrosion consistent with routine USCG inspections for similar mooring chains. In addition to these planned maintenance activities every six months, the metocean buoy will also be visually inspected every three months as part of the effort to retrieve the avian and bat acoustic recorder data. Finally, metocean buoy performance will also be monitored remotely on a daily basis, based upon satellite-transmitted data, to continually assess the power systems and sensors on the metocean buoy.

Scheduled on-site maintenance activities of the metocean buoy will use a vessel that is comparable to the vessel used for installation, with sufficient lift capacity as needed. Any device that suffers from malfunction or collision will be replaced with a similar device. Maintenance activities could include recovery and/or replacement at the same location of a metocean buoy with the same or similar type if circumstances require such action (e.g., metocean buoy damage or loss). For recovery operations, either during normal maintenance or in an emergency, after confirming the location and visually sighting the metocean buoy, the vessel will be positioned adjacent to the mooring for a visual inspection by the crew and safety toolbox talk, including details of the recovery procedure.

Once the crew has been briefed on the most suitable method for retrieval with respect to site conditions, the captain will commence the operation by repositioning the vessel appropriately. An A-frame and winch will be attached to the recovery line of the metocean buoy. This line will be pulled up to reach the main mooring line. The full mooring will be pulled from the water onto the deck of the vessel. The mooring weight will be lifted off the seafloor in one motion and raised to a height such that it does not drag and cause bottom disturbance. The metocean buoy will be lifted out of the water onto the deck of the vessel. Once fully retrieved, the mooring system and metocean buoy will be secured to the vessel for safe travel back into the harbor.

TRBM maintenance activities will typically occur at six-month intervals (subject to vessel availability and weather conditions). The TRBM platform is recovered by triggering an acoustic release to allow a recovery buoy and line to float from the TRBM to the surface. Once recovered, a fully configured and tested replacement system is installed. Data will be downloaded from the recovered system and the TRBM will be refurbished for redeployment during the next maintenance event.

Unscheduled maintenance, if required, will be conducted as soon as it is safe and practicable to access the metocean buoy and/or TRBM.

6.3 Reporting

The Proponent will report operations and maintenance information about the metocean buoy and TRBM to BOEM as required in 30 CFR §585.615 and as specified in the SAP approval, when issued by BOEM. These include:

1. preparing and submitting an annual report to BOEM on November 1 of each operational year summarizing the site assessment activities and results; and

4. annual submission of a certification of compliance with certain terms and conditions of the SAP approval, including any mitigation measures and monitoring measures and their effectiveness.

The Proponent will continue to provide notifications to other federal agencies as required (e.g., to USCG) during operation and maintenance of the metocean buoy.

7.0 DECOMMISSIONING

7.1 Decommissioning Activities

Decommissioning is expected to be the reverse of deployment and installation activities described in Section 5.1. As stipulated, all facilities will be removed to a depth of 15 feet below the mudline, unless otherwise authorized by BOEM.

Duration of deployment is expected to last two years, but could last up to five years, coinciding with the site assessment term of the Lease. Before decommissioning occurs, the Proponent will submit a decommissioning application for approval by BOEM. The application will contain the information required by 30 CFR §585.906, including a schedule for removal, a description of the removal methods and procedures, the types of equipment, vessels and moorings that will be used, and plans for transportation and disposal or salvage. Planned measures to protect archaeological and sensitive biological features during removal (if any) and to prevent unauthorized discharge of pollutants, trash, and debris during removal will also be included in the application.

Following approval of the application, the Proponent will submit a decommissioning notice at least 60 days prior to commencing decommission activities, in accordance with 30 CFR §585.908.

Device recovery will be undertaken by vessels similar to those used during commissioning. The recovery of the metocean buoy will typically proceed by decoupling the metocean buoy from the mooring and conducting a standard marine mooring recovery process.

The metocean buoy and all related moorings will be removed, in accordance with 30 CFR §585.902. The seafloor will be cleared of all obstructions. The metocean buoy will then be moved to shore and decommissioned.

Recovery of the TRBM will consist of triggering the acoustic release to allow a recovery buoy and line to float from the TRBM to the surface. The TRBM will then be moved to shore.

If any archaeological resources are discovered during decommissioning activities, bottom-disturbing activities will be halted immediately within 1,000 feet (304.8 m) of the discovery and reported to BOEM for guidance within 72 hours, in accordance with 30 CFR §585.902e.

The Proponent will also conduct a post-decommissioning high-resolution geophysical (HRG) survey of the buoy deployment area. The Proponent plans on using multibeam echosounder (MBES) technology to clear the area after metocean buoy decommissioning. This technology does not operate below 180 kiloHertz (kHz).

7.2 Reporting

The Proponent will report decommissioning information about the metocean buoy and TRBM to BOEM as required in 30 CFR §585.912 and as specified in the SAP approval upon issuance by BOEM. Within 60 days of removal of the metocean buoy, TRBM, and related equipment, the Proponent will submit a report to BOEM summarizing the removal activities, describing mitigation measures taken, and including a statement by an authorized representative that explosives used, if applicable, were consistent with those described in the approved decommissioning application.

The Proponent will also provide notifications to other Federal agencies as required (e.g., to USCG) prior to decommissioning of the metocean buoy and TRBM.

8.0 FIELD INVESTIGATIONS AND STUDIES IN THE SAP STUDY AREAS

This section and the Appendices referenced herein describe the site-specific SAP field surveys conducted in two 300 m by 300 m (984 ft by 984 ft) deployment study areas (SAP-1 and SAP-2) that are expected to be occupied by the metocean buoy on Lease Area OCS-A 0544, as shown on Figures 2.1-1 and 2.1-2. Each 22-acre SAP study area constitutes the maximum Affected Environment of the metocean buoy and TRBM, in that the buoy could be located anywhere within its study area. Resources and hazards identified by the surveys in the study areas are described in Section 9.0. Impacts are assessed and measures to avoid, minimize, or mitigate are also described in Section 9.0.

The following site-specific field surveys were conducted to assess the Affected Environment of the metocean buoy and TRBM:

- Geophysical survey of each SAP study area, to identify and assess seafloor conditions and shallow hazards;
- Shallow geotechnical survey to collect sediment samples and measurements from each study area for information on seabed materials and potential sediment dispersion;
- Archaeological resource survey utilizing the geophysical datasets, to assess the presence or absence of potentially significant shipwrecks and other archaeological resources; and
- Biological survey to identify the benthic communities and organisms in sediment samples and along underwater video transects.

In addition, oceanographic and meteorological information has been compiled from existing scientific literature and online data sources referenced herein. Once the metocean buoy and TRBM are deployed, site specific metocean data collection will commence.

Geophysical and shallow geotechnical field investigations in the Lease Area OCS-A 0544 SAP study areas took place on select days between 05 August and 30 December 2022 as part of the coordinated 2022 field campaign that addressed scope in Lease Area OCS-A 0544. Details of these investigations in the SAP study areas are included in the survey operations reports in Appendix B.

Two SAP study areas were investigated in Lease Area OCS-A 0544, centered on the proposed metocean buoy and TRBM deployment locations. A full geophysical suite of instruments was employed along a series of 11 primary lines spaced 30 m (98.4 ft) apart in a N-S orientation. Systems included a multibeam echosounder, side-scan sonar, gradiometer (dual magnetometers), sub-bottom profiler, and single channel seismic system.

For ground truthing of the acoustic data and assisting with surficial sediment and biological and benthic habitat characterization, as well as shallow subsurface sediment identification, one cone penetration test, one vibracore, one sediment grab sample, and one underwater video transect were acquired near the center of each SAP study area. Figure 8.0-1 through Figure 8.0-4 show the tracklines and sample locations within the SAP study areas. Results and interpretations of the data are presented in the following sub-sections as well as Appendices B and D.

8.1 Geophysical and Shallow Geotechnical Surveys and Geologic Characteristics

The OCS-A 0544 lease SAP study areas are located on the OCS south of Long Island, New York within the NYB WEA in a region dominated by reworked sediments under transport without significant amounts of deposition or erosion apparent. The seabed is dominated by a combination of recent marine sediments (Holocene age) and reworked glacial deposits (Pleistocene) of varying thicknesses. SAP-1 gradually deepens in a SW to NE orientation (diagonally across the SAP) with depths ranging from ~41.7 m (136.8 ft) to ~43.0 m (141.1 ft) MLLW. SAP-2 exhibits a similar trend but deepens in a NE to SW orientation with depths ranging from ~42.7 m (140 ft) to ~44.2 m (145.0 ft) MLLW. Limited low relief bedforms (sand ripples) suggest minimal seabed mobility in the area. Grain size is fairly homogenous throughout the Lease Area and is composed of mostly fine and medium grained sands; as supported by sediment grabs and side-scan sonar.

The combination of all remote sensing (geophysical and video) and sampling (benthic grab and vibracore) datasets have helped to define the local geologic characteristics of the SAP study areas in the areas potentially impacted by the metocean buoy and TRBM installation. While a 300 m by 300 m (984 ft by 984 ft) square area was surveyed, the actual footprint of the buoy mooring weight, associated chain sweep, and TRBM are much smaller in comparison.

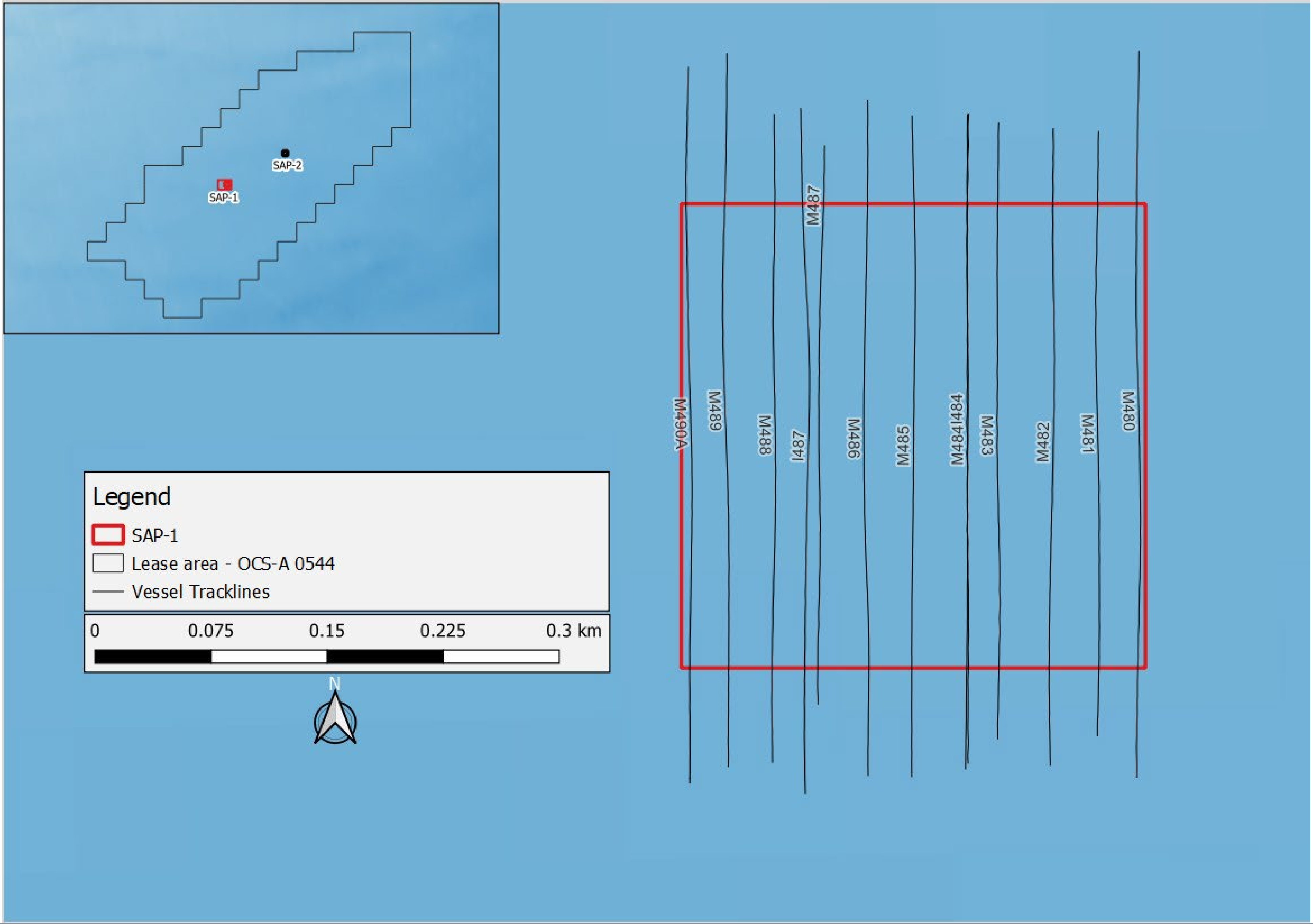


Figure 8.0-1
Location of SAP-1 Field Surveys

VINEYARD MID-ATLANTIC
VINEYARD OFFSHORE

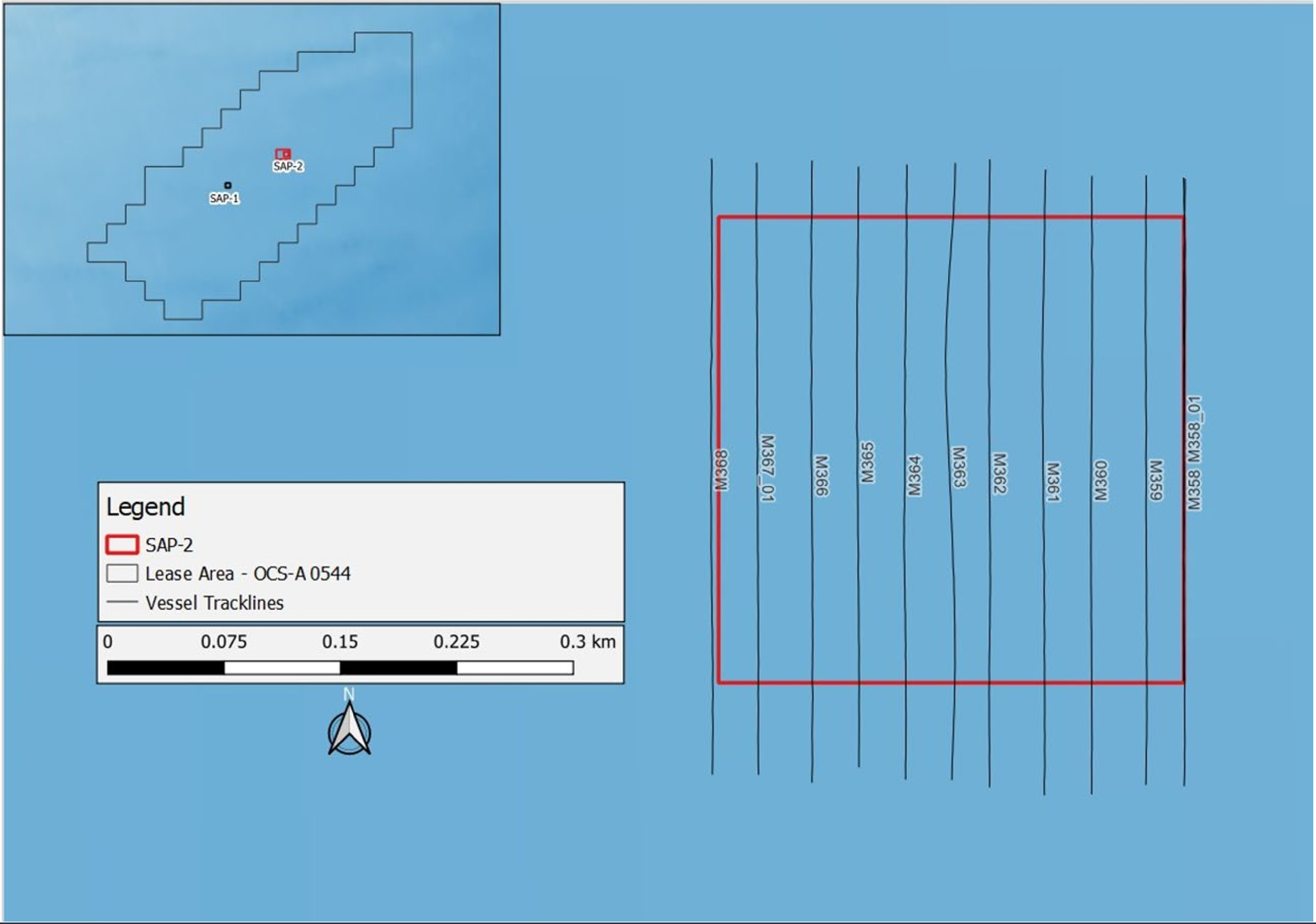


Figure 8.0-2
Location of SAP-2 Field Surveys

VINEYARD MID-ATLANTIC
VINEYARD OFFSHORE

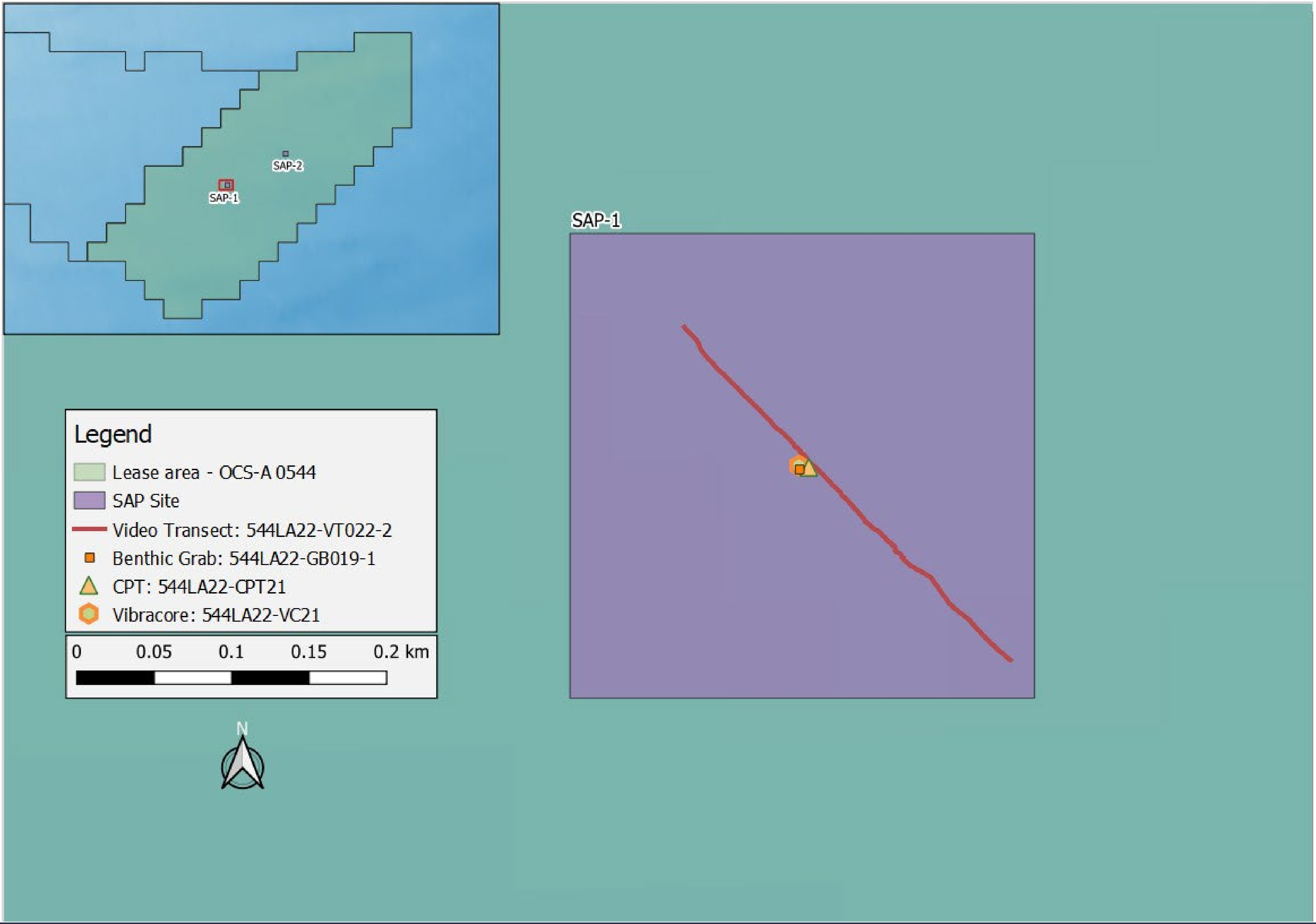


Figure 8.0-3
Map of SAP-1 Sampling Locations

VINEYARD MID-ATLANTIC
VINEYARD OFFSHORE

PUBLIC

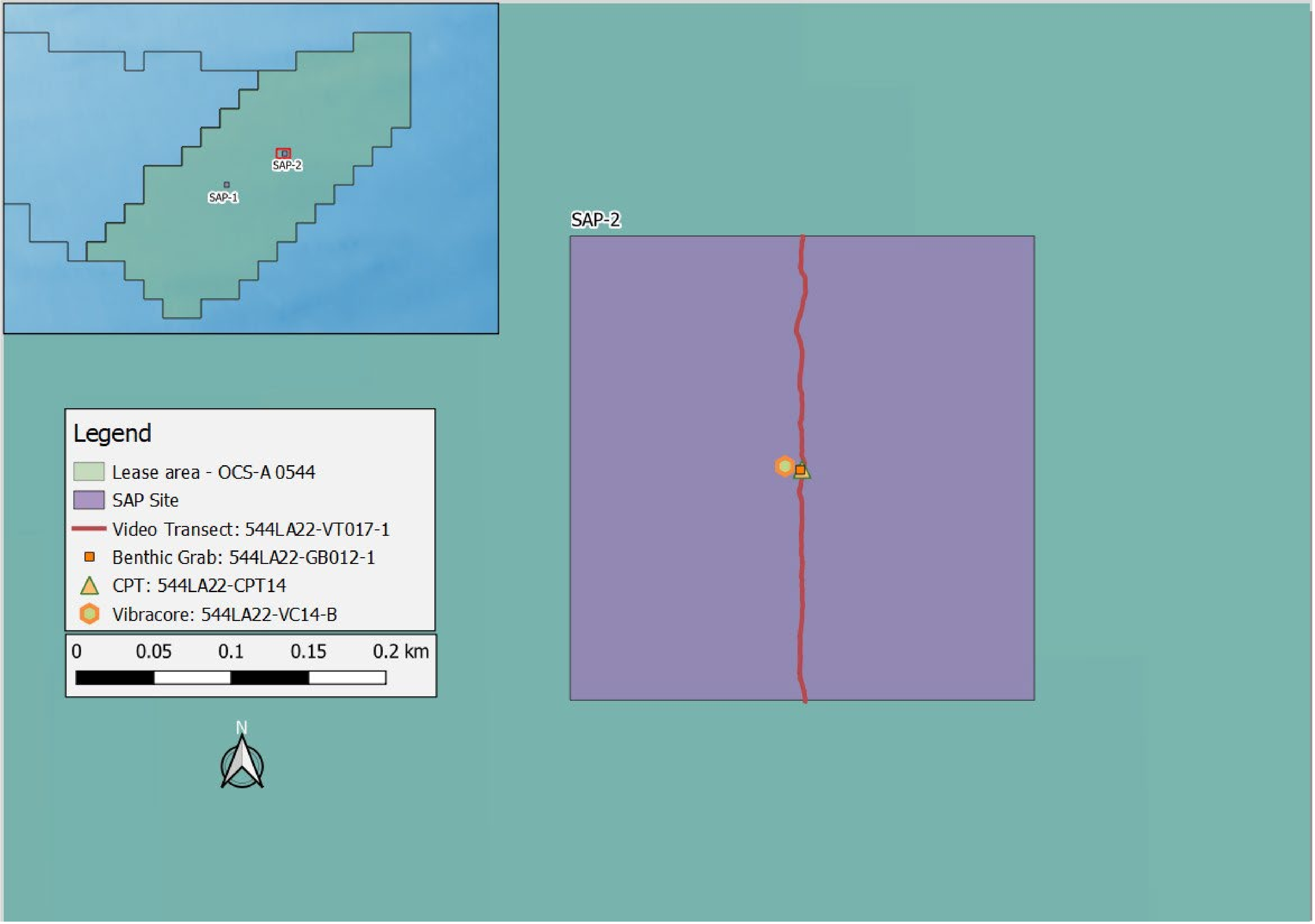


Figure 8.0-4
Map of SAP-2 Sampling Locations

PUBLIC

VINEYARD MID-ATLANTIC
VINEYARD OFFSHORE

Table 8.1-1 SAP Study Areas Geologic Characteristics

	SAP-1	SAP-2
Water Depth (MLLW)	42.0 m (138.8 ft)	43.0 m (141.1 ft)
Surface geology	Fine to medium grained sand with ripples containing low to moderate amounts of shell fragments within the troughs	Fine sand with ripples containing low to moderate amounts of shell fragments within the troughs
Subsurface geology	Medium to fine grained sand with shell fragments. Pockets of silty sand and some organics (to 2.64 m (8.66 ft) below the seabed (bsb); VC14-B)	Fine to medium grained sand with shell fragments in the upper 2.00 m. Medium and coarse sand with pockets of silty sand in the lower segments (to 5.61 m bsb; VC21)
Unique features	None	None

Fine grained sediments exist on the seafloor, mainly fine and medium grained sand (based on the Unified Soils Classification System [USCS]), with minor morphological and textural variation. A slight increase in overall particle size is apparent in the (benthic grab samples) grain size results for SAP-1, with a median grain size of 0.474 mm (0.019 in), in comparison to the median grain size of 0.383 mm (0.015 in) observed in SAP-2. Both SAP-1 and SAP-2 exhibit low relief bedforms (< 0.2 m [0.66 ft]), characterized as ripples. No other notable features were observed in either SAP study areas (Figures 8.1-1 to 8.1-4).

Uniform conditions persist in the subsurface as the geophysical and vibracore results indicate mostly medium to fine grain sand present in the upper three m (ten ft) bsb. Both vibracore samples also exhibit sections containing shell fragments, silty sand and some organics (in VC14-B). No additional sediment layers were recovered in the core samples. Geotechnical results suggest the sediments are relatively competent and not overly soft (loose, high water content).

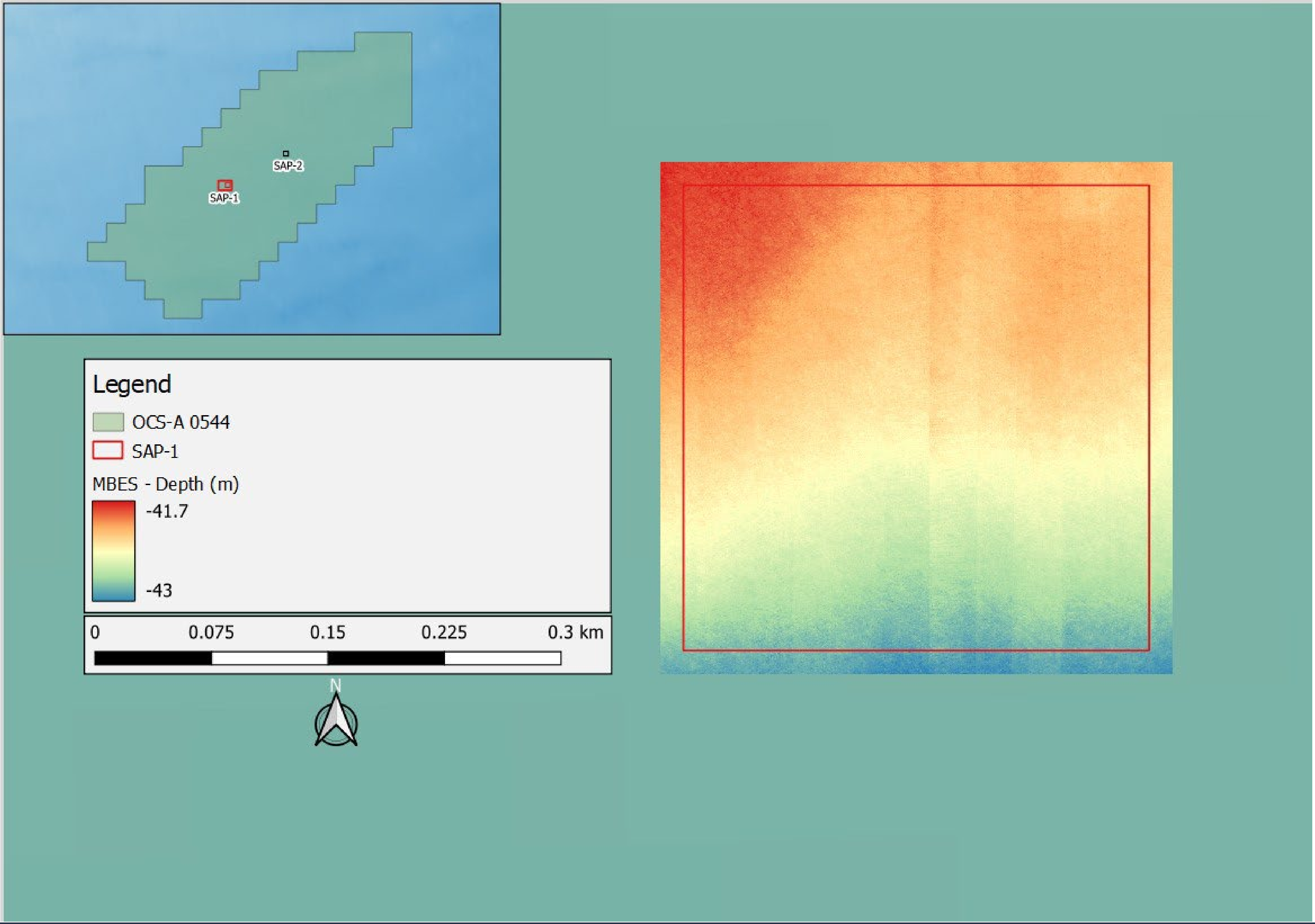


Figure 8.1-1
SAP-1 Seafloor Features (Multibeam)

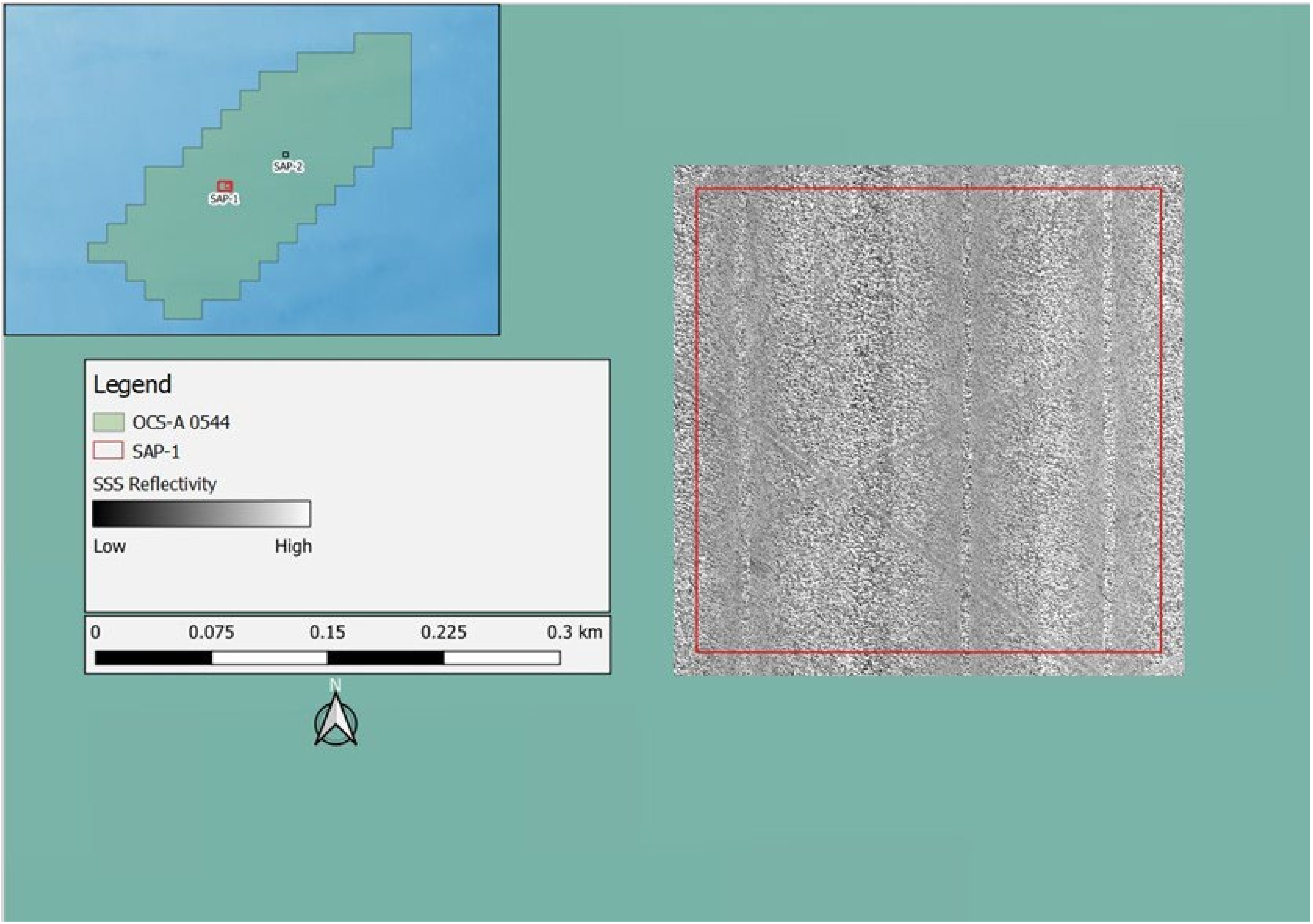


Figure 8.1-2
SAP-1 Seafloor Features (Side-scan Sonar)

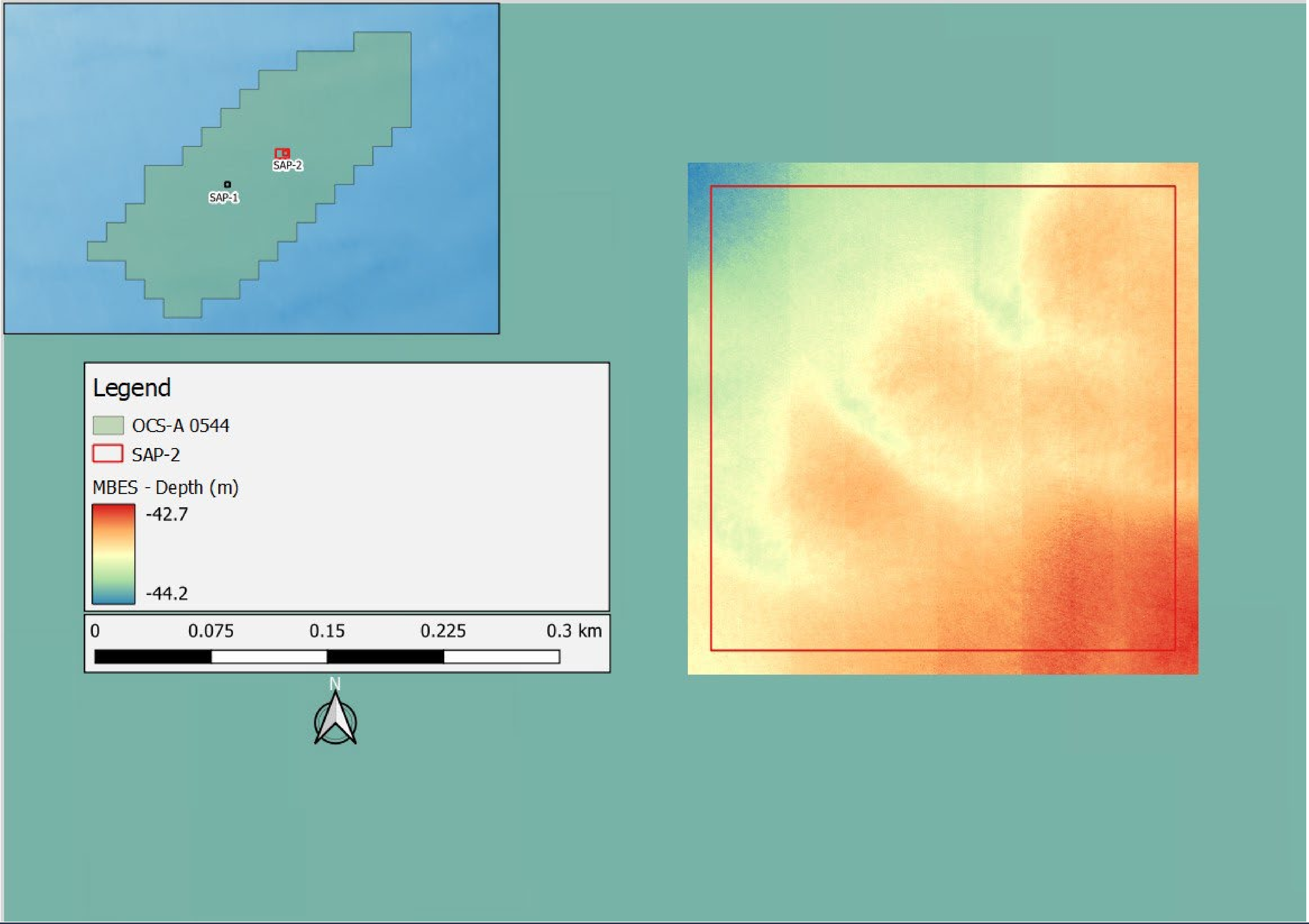


Figure 8.1-3
SAP-2 Seafloor Features (Multibeam)

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VINEYARD MID-ATLANTIC
VINEYARD OFFSHORE

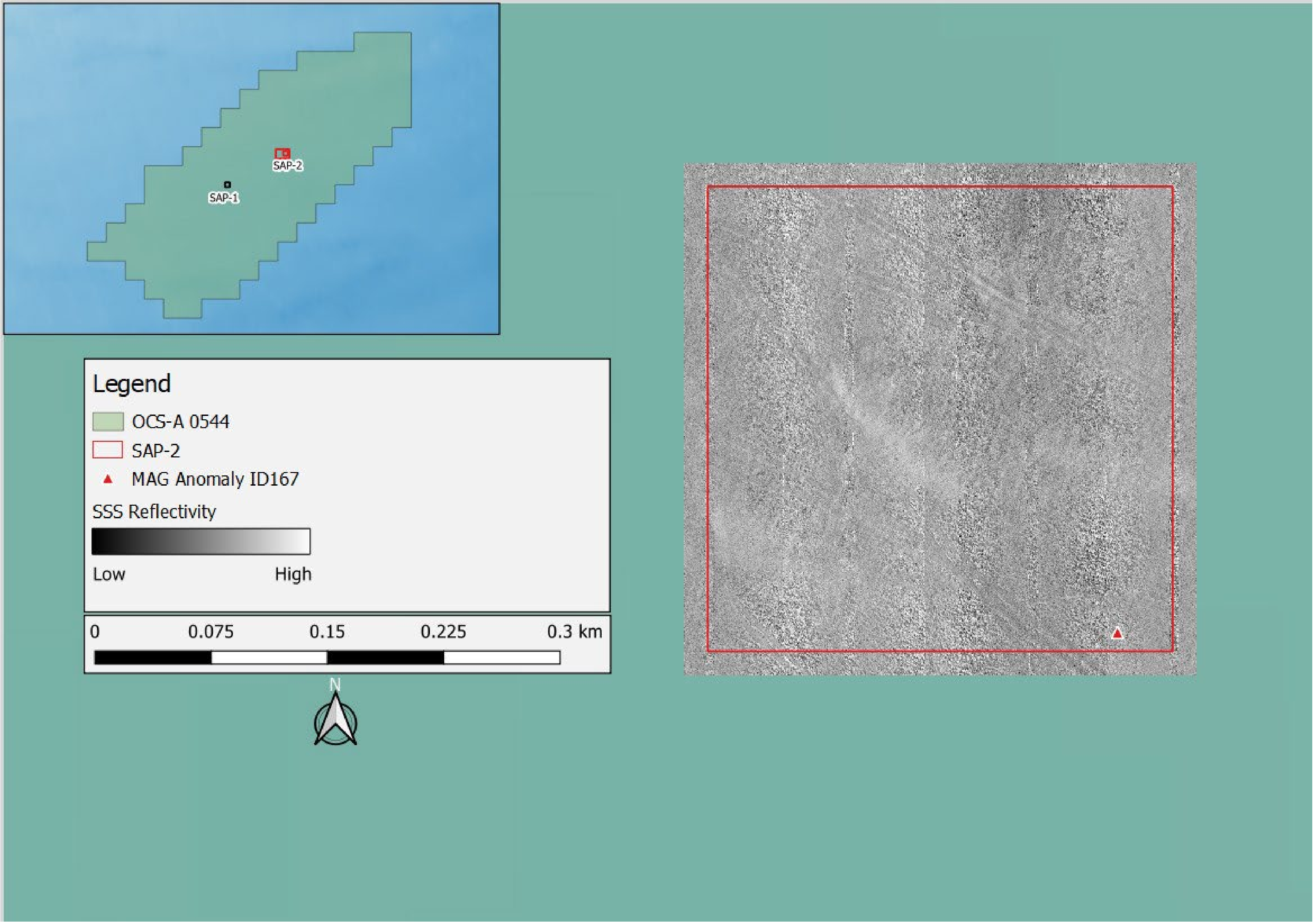

Figure 8.1-4
SAP-2 Seafloor Features (Side-scan Sonar)

VINEYARD MID-ATLANTIC
VINEYARD OFFSHORE

PUBLIC

8.2 Shallow Hazards

Review of the geophysical data was performed to specifically assess the SAP study areas for the presence of shallow hazards exhibiting surficial or subsurface expression on the records. The surface sonar imagery (multibeam echosounder and side scan sonar), magnetic intensity measurements, and subsurface data (sub-bottom profiling and single channel seismic reflection) were interpreted and then evaluated for the following hazards, as detailed in 30 CFR § 585.610(b):

Table 8.2-1 Shallow Hazards in the SAP Study Areas

30 CFR § 610(b)(2)	
Shallow faults	Not evident in the data
Gas seeps or shallow gas	Not evident in the data
Slump blocks or slump sediments	Not evident in the data
Hydrates	Not evident in the data; not common in these shallow water depths
Ice scour of seabed sediments	Not evident in the data
30 CFR § 610(b)(4)	
Seismic activity	Uncommon to this offshore region based on publicly available information (USGS earthquake database) [1]
Fault zones	Not evident in the data
Possibility and effects of seabed subsidence	Low probability and not apparent if occurring at all; insignificant to the proposed activity at low rates
Extent and geometry of faulting attenuation	Not evident in the data

Notes:

1. **Earthquakes | U.S. Geological Survey (usgs.gov)**

Other potential hazards (listed below) that could pose impacts to the project were also considered and evaluated. None were interpreted or observed to a significant level in the geophysical datasets.

- Organics/gaseous sediments
- Boulders, coarse deposits
- Bedforms, slope instability
- Mobile sediments, scour
- Buried channels
- Sensitive benthic habitats (see Section 8.5)
- Man-made debris, obstructions, potential ordnance

- Cultural resources (shipwrecks, paleofeatures; see Section 8.4)

The only feature identified on or below the seafloor inside of the 300 m by 300 m (984 ft by 984 ft) SAP study areas was a single magnetic anomaly within SAP-2. No acoustic targets were observed in either SAP study areas with SAP-1 also lacking any magnetic anomalies.

Within SAP-2, one magnetic anomaly was observed (ID 167; dipole) with an amplitude of 5.13nT (Figure 8.1-4). This anomaly was not accompanied by any evident acoustic target within the sonar data. The single target was also assessed by the QMA at R. Christopher Goodwin & Associates, Inc (RCG&A) and determined to be debris not found to have cultural significance nor warrant avoidance. Additional target details are reported in Appendix C (RCG&A Report).

No other potential shallow hazards were observed, and the single magnetic anomaly was small in amplitude and well away from the center of the SAP study area where the buoy weight would ideally be placed. Therefore, it may be concluded that no notable hazards exist in the deployment areas. Additionally, the absence of bedforms of any significant relief indicate relatively low bottom currents, and thus limited sediment mobility within the SAP study areas.

8.3 Meteorological and Oceanographic Conditions

Two main sources of meteorological and oceanographic data (metocean) near Lease Area OCS-A 0544 were used to report local wind and wave patterns from 2012 to 2022. NOAA Buoy 44025 (Long Island) is moored 30 NM (55.6 km) South of Islip, Long Island in a depth of 36.3 m (119.1 ft). NOAA Buoy 44066 is positioned 75 NM (139 km) East of Long Beach, New Jersey in a depth of 77 m (252.6 ft). These metocean stations have been referenced to provide the general background of wind and wave conditions in the region and expected at the Lease Area as a proxy for meteorological and oceanographic data analyzed prior to SAP study area occupancy (Figure 8.3.1). NOAA Buoy 44025 is located 0.25 NM (0.46 km) northwest of the Lease Area. NOAA Buoy 44066 is located 40 NM (74.1 km) southeast of the Lease Area. Quality Controlled data provided by NOAA were sourced from the historical logs for each buoy utilizing data from 2012 through 2022; data sets were assessed for consistency, missing data, and erroneous values prior to analysis of wind and wave data for this report.

In general for the continental shelf off New York and New Jersey, wind speeds and wave heights at the buoys were higher during winter and tapered off into summer (Figures 8.3-2, 8.3-3, 8.3-4 and 8.3-5). The prevailing wind direction was approximately south-southeast. Waves generally traveled to the east, southeast, and south, with a prevailing wave direction of approximately south. Nearshore currents within the Middle Atlantic Bight are directly influenced by seasonal wind stress with winds directing currents westward along Long Island during winter and fall and offshore during spring and summer (Fredj 2016). Mean depth-averaged currents along the continental shelf in the Middle Atlantic Bight is toward the equator. Current speeds increase with water depth starting at 3 cm s-1 (0.06 knots) at the 15 m isobath and reaching ten cm s-1 (0.19 knots) at the 100 m (328 ft) isobath (Lentz 2008).

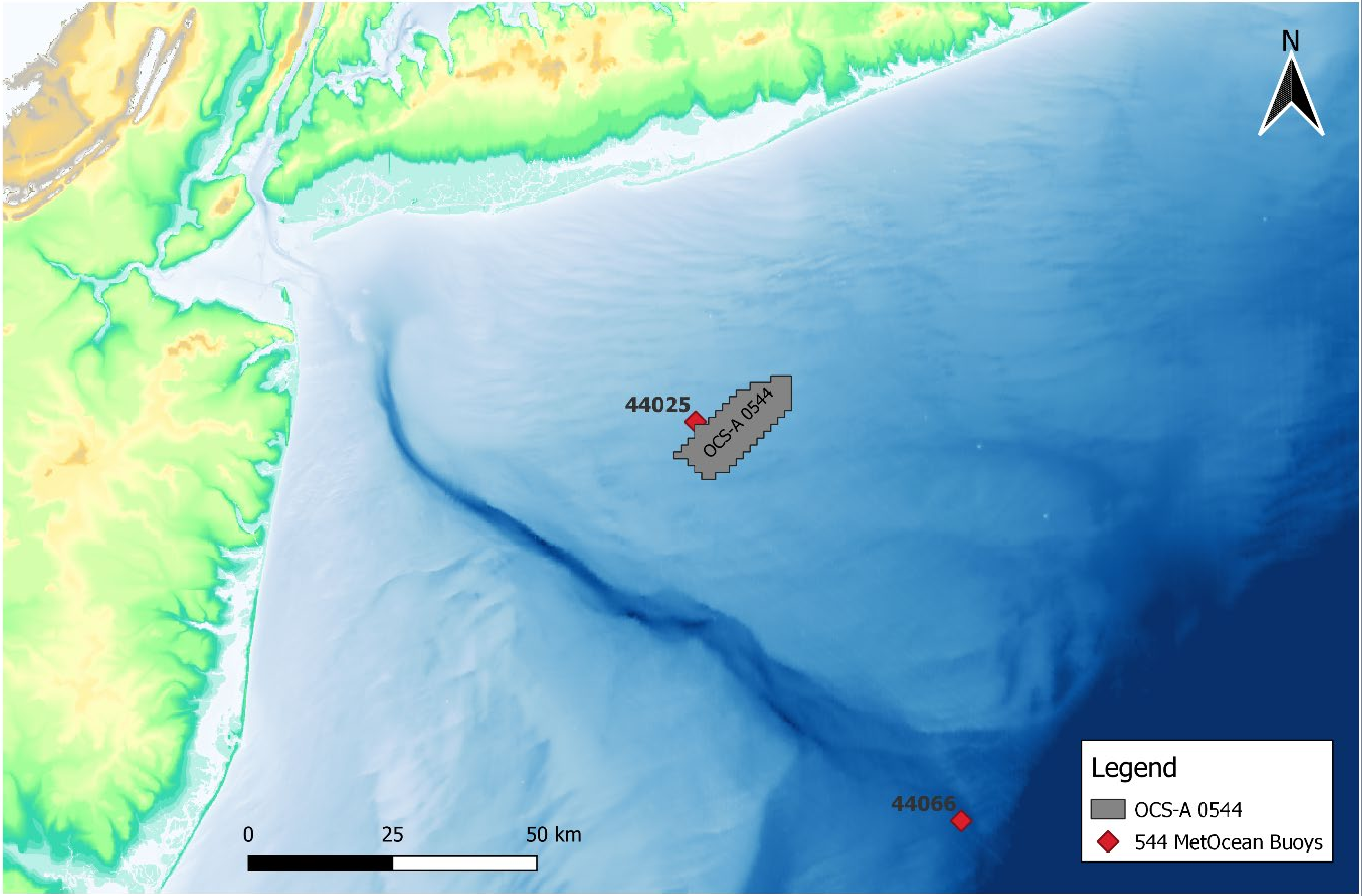

Figure 8.3-1
NOAA Buoy Locations Southeast of Nantucket Shoals

VINEYARD MID-ATLANTIC
VINEYARD OFFSHORE

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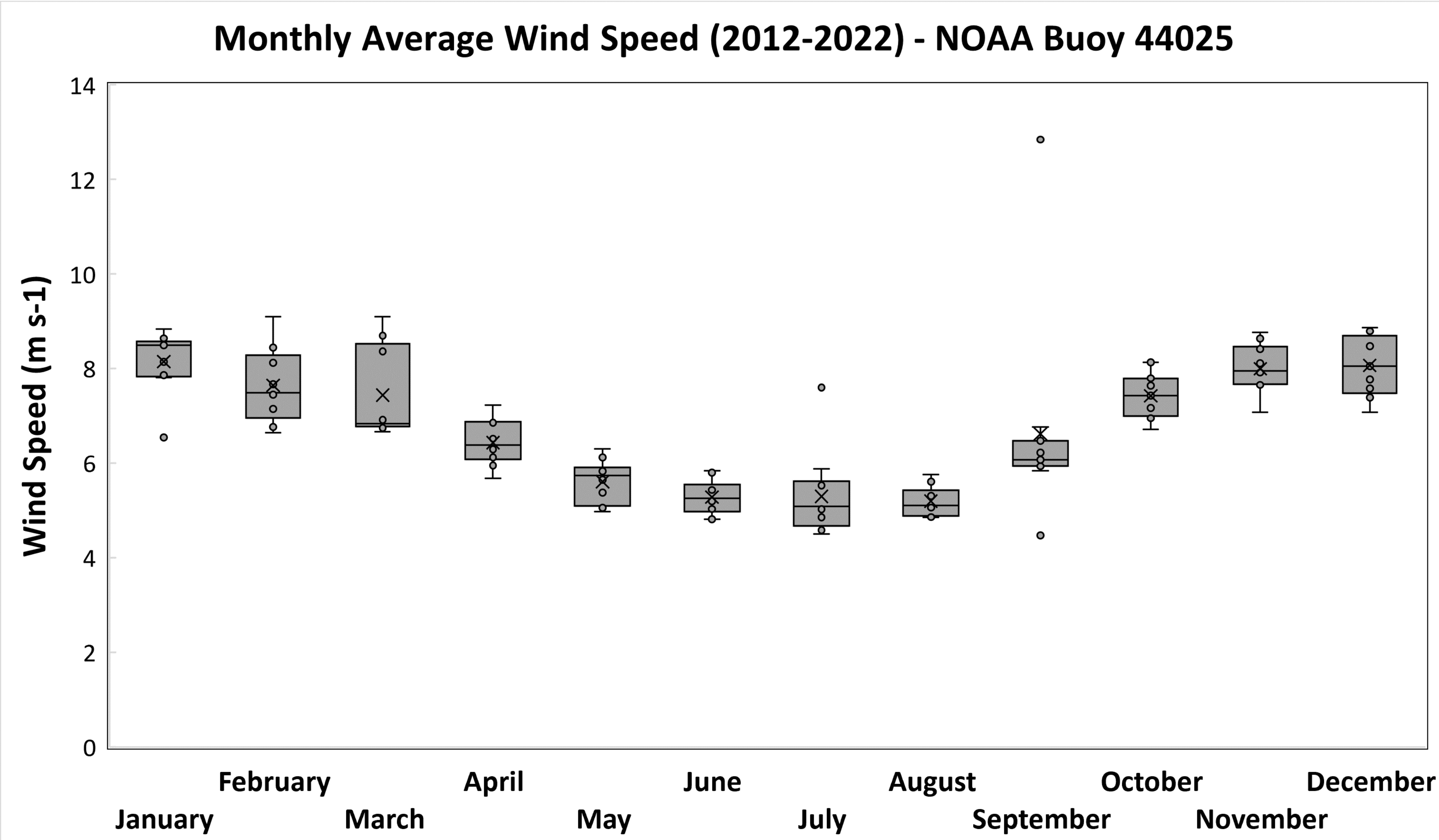

Figure 8.3-2
Wind Speeds at NOAA Buoy 44025, 2012-2022

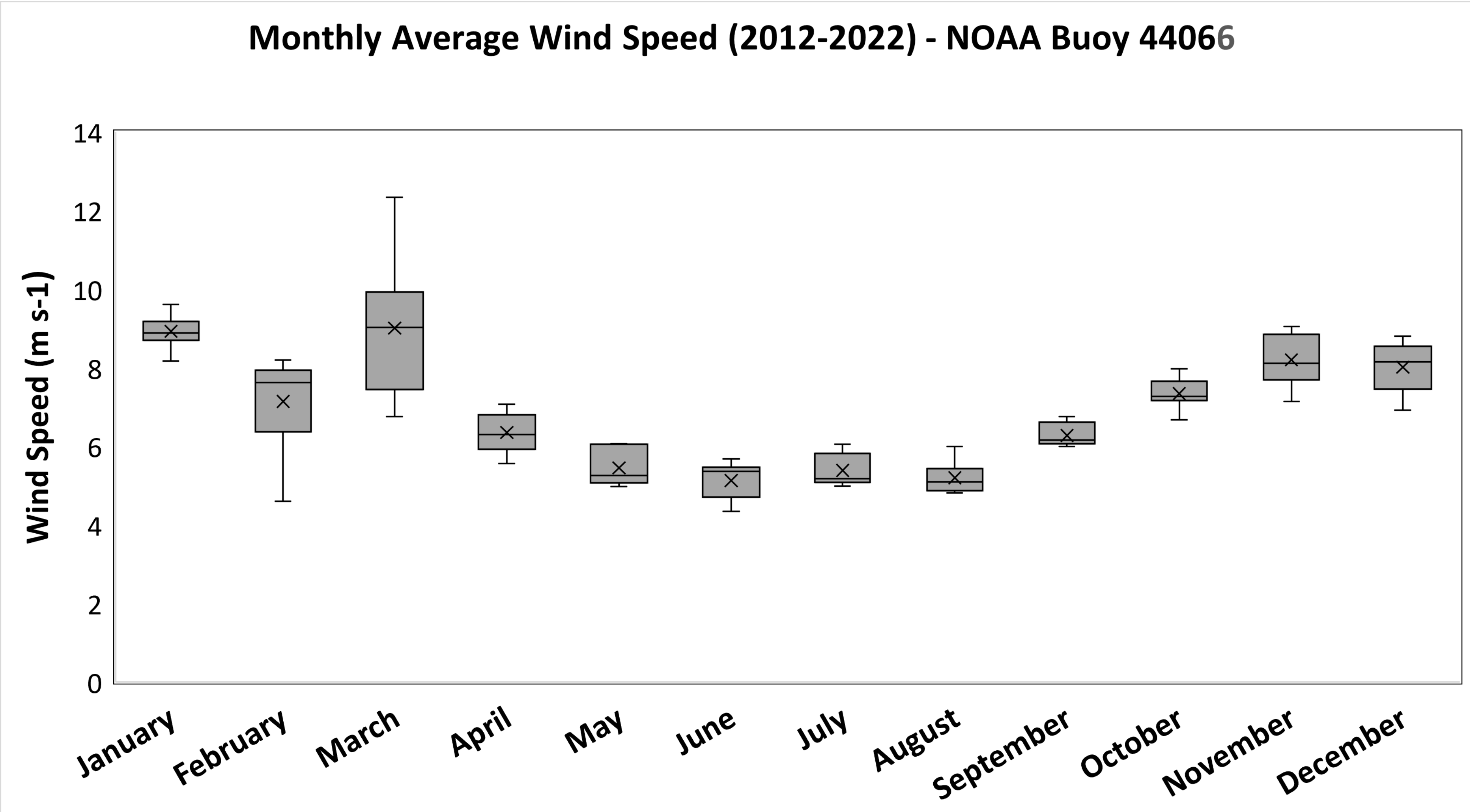

Figure 8.3-3
Wind Speeds at NOAA Buoy 44066, 2012-2022

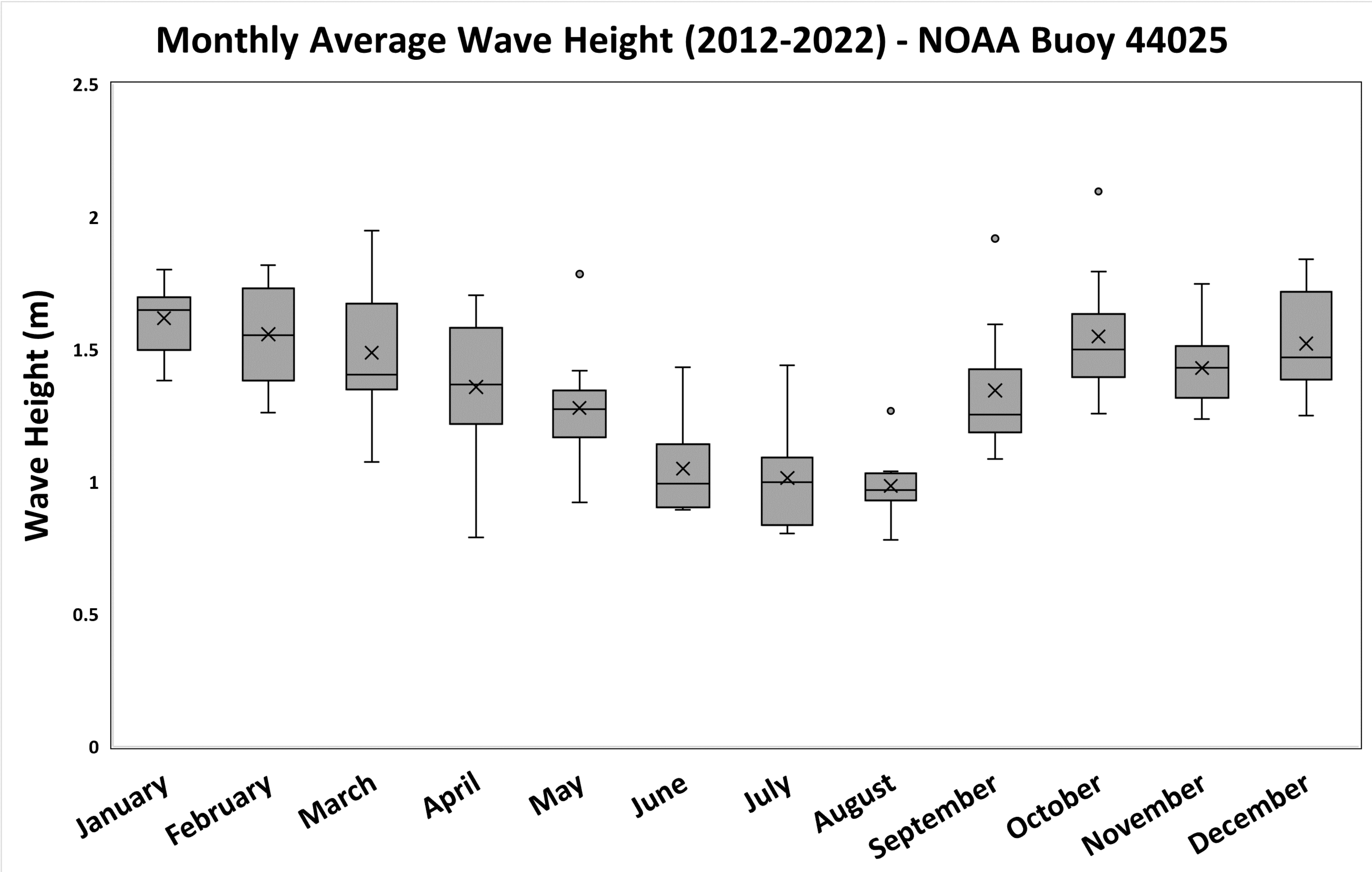

Figure 8.3-4
Wave Heights at NOAA Buoy 44025, 2012-2022

VINEYARD MID-ATLANTIC
VINEYARD OFFSHORE

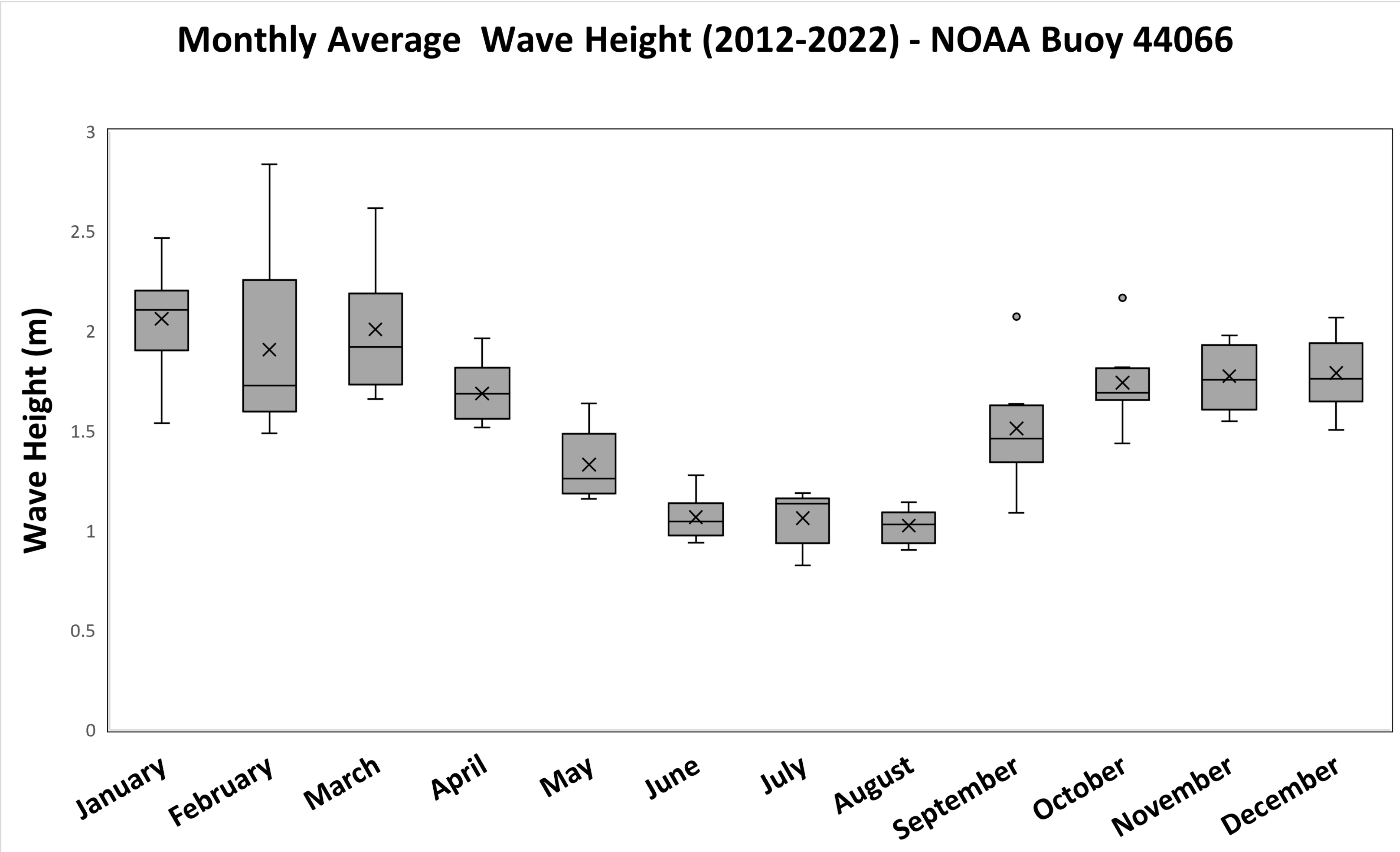

Figure 8.3-5
Wave Heights at NOAA Buoy 44066, 2012-2022

Extreme wind and wave conditions during major storms significantly impact water conditions and sedimentation in the Lease Area OCS-A 0544 region (Twichell et al. 1981). The storms near the Lease Area typically travel along the east coast toward the north-northeast, as seen by the tracks of major hurricanes between 2012 and 2022 in Figure 8.3-6. Buoys 44025 and 44066 demonstrate that significant wave heights can increase on the order of four times their typical range during the extreme weather events such as Nor'easters (Table 8.3-1) and Hurricanes (Table 8.3-2). Two storms in particular tracked close to the Lease Area with records indicating waves up to 3.3 m (11 ft) in height impacted that area of the NYB.

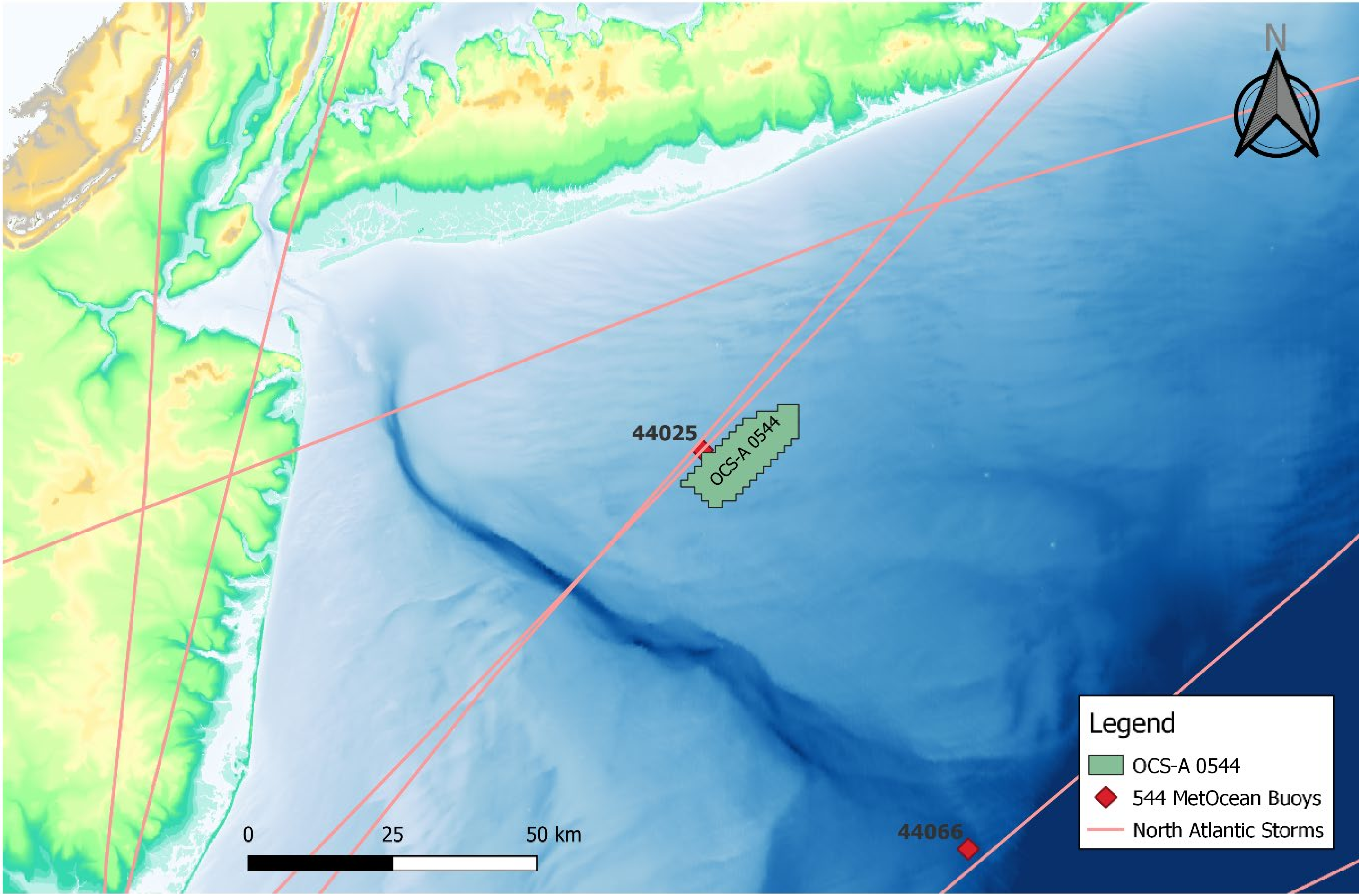

Figure 8.3-6
Major Hurricanes 2012-2022 Near the NYB WEA

VINEYARD MID-ATLANTIC
VINEYARD OFFSHORE

PUBLIC

Table 8.3-1 Nor'easter Storms with Highest Significant Wave Heights since 2012

Peak Significant Wave Heights at NOAA Station 44025 and 44066 for Nor'easters			
Storm	**Date**	**Wave Height (44025)**	**Wave Height (44066)**
November 2012 Nor'easter	November 7–10, 2012	6.10 m (20.0 ft)	NA
Late December 2012 North American storm complex	December 17–31, 2012	7.35 m (24.1 ft)	NA
Early February 2013 North American blizzard	February 7–18, 2013	6.44 m (21.1 ft)	NA
March 2013 Nor'easter	March 1–21, 2013	5.64 m (18.5 ft)	9.56 m (31.4 ft)
January 2015 North American blizzard	January 23–31, 2015	4.86 m (15.9 ft)	NA
October 2015 North American storm complex	September 29 – October 2, 2015	4.19 m (13.7 ft)	NA
January 2016 United States blizzard	January 19–29, 2016	7.01 m (23.0 ft)	8.36 m (27.4 ft)
February 2017 North American blizzard	February 6–11, 2017	3.67 m (12.0 ft)	6.28 m (20.6 ft)
February 12–14, 2017 North American blizzard	February 12–15, 2017	3.25 m (10.7 ft)	5.48 m (18.0 ft)
March 2017 North American blizzard	March 12–15, 2017	6.11 m (20.0 ft)	7.05 m (23.1 ft)
October 2017 North American storm complex	October 28–31, 2017	5.0 m (16.4 ft)	6.41 m (21.0 ft)
January 2018 North American blizzard	January 2–6, 2018	5.40 m (17.7 ft)	9.26 m (30.4 ft)
March 2018 Nor'easter	March 1–9, 2018	4.92 m (16.1 ft)	7.85 m (25.8 ft)
March 2018 Nor'easter	March 11–14, 2018	3.87 m (12.7 ft)	6.68 m (21.9 ft)
March 2018 Nor'easter	March 20–22, 2018	4.16 m (13.6 ft)	5.75 m (18.9 ft)
Early December 2020 Nor'easter	December 4–6, 2020	3.26 m (10.7 ft)	5.21 m (17.1 ft)
Mid-December 2020 Nor'easter	December 14–19, 2020	7.08 m (23.2 ft)	6.22 m (20.4 ft)
January/February 3, 2021 Nor'easter	January 31 – February 3, 2021	7.03 m (23.1 ft)	NA
April 2021 Nor'easter	April 15–17, 2021	1.86 m (6.10 ft)	NA
Late October 2021 Nor'easter	October 25–28, 2021	3.49 m (11.5 ft)	5.85 m (19.2 ft)
April 2022 Nor'easter	April 18–20, 2022	4.70 m (15.4 ft)	5.44 m (17.8 ft)
NA = Not Available indicates buoy metocean data was missing for the specified event.			

Table 8.3-2 Hurricanes and Tropical Storms with Highest Significant Wave Heights since 2012

Peak Significant Wave Heights at NOAA Station 44025 and 44066 for Named Storms			
Storm	**Date**	**Wave Height (44025)**	**Wave Height (44066)**
Hurricane Sandy	October 29-30, 2012	9.65 m (31.7 ft)	NA
Hurricane Joaquin	October 2-5, 2015	4.74 m (15.6 ft)	NA
Tropical Storm Jose	September19-22, 2017	4.17 m (13.7 ft)	6.29 m (20.6 ft)
Tropical Storm Philippe	October 29-30, 2017	3.38 m (11.1 ft)	5.91 m (19.4 ft)
Hurricane Florence	September 18, 2018	1.96 m (6.4 ft)	1.71 m (5.6 ft)
Hurricane Michael	October 12, 2018	2.89 m (9.5 ft)	4.68 m (15.4 ft)
Hurricane Dorian	September 7, 2019	3.72 m (12.2 ft)	5.4 m (17.7 ft)
Tropical Storm Melissa	October 11-13, 2019	4.6 m (15.1 ft)	6.5 m (21.3 ft)
Tropical Storm Fay	July 9-11, 2020	3.48 m (11.4 ft)	2.98 m (9.8 ft)
Hurricane Isaias	July 30–August 4, 2020	6.14 m (20.1 ft)	4.94 m (16.2 ft)
Hurricane Paulette	September 7-22, 2020	3.08 m (10.1 ft)	4.47 m (14.7 ft)
Hurricane Teddy	September 12-23, 2020	3.08 m (10.1 ft)	3.27 m (10.7 ft)
Hurricane Epsilon	October 19-26, 2020	2.74 m (9.0 ft)	3.02 m (9.9 ft)
Tropical Storm Claudette	June 19-22, 2021	1.71 m (5.6 ft)	NA
Tropical Storm Elsa	June 30–July 9, 2021	3.38 m (11.1 ft)	5.3 m (17.4 ft)
Hurricane Henri	August 15-23, 2021	2.57 m (8.4 ft)	3.48 m (11.4 ft)
Tropical Storm Odette	September 17-18, 2021	1.95 m (6.4 ft)	2.47 m (8.1 ft)

8.4 Archaeological Surveys

The geophysical surveys conducted in the two SAP study areas met BOEM guidelines for data acquisition and coverage. High-Resolution Geophysical (HRG) survey data, provided by Vineyard Mid-Atlantic, were used to identify magnetic anomalies, sonar contact, and sub-bottom acoustic reflectors within a 300 m by 300 m (984 ft by 984 ft) square area around each SAP study area centerpoint. These data were reviewed and assessed for cultural resources prior to the vibracore sampling. The lack of archaeological findings allowed the areas to be cleared for sampling.

RCG&A conducted an archaeological assessment of the geophysical remote sensing survey and geotechnical investigations conducted within the SAP-1 and SAP-2 areas, within Lease Area OCS-A 0544, in advance of the proposed installation of meteorological data collection buoys in two buoy deployment areas, which constitute the areas of potential effects (APEs). Review of remote sensing data within the two APEs identified no side scan sonar (SSS) contacts and one magnetic anomaly in the APE of SAP-2. There were no submerged cultural resources identified in either of the SAP APEs. Shallow- and medium-penetration sub-bottom profiler (SBP) data were collected and analyzed to identify paleolandscape features. The seismic data indicated that no ancient submerged landforms (ASLFs) are present that may preserve inundated archaeological sites within the two APEs.

No historic properties were identified within the two APEs. It is concluded that no potential archaeological resources will be affected by the proposed installation, operation, and maintenance of met-ocean data collection buoys. Therefore, a determination of "No historic properties affected" (36 CFR 800.4) is recommended and concurrence with this recommendation is sought from BOEM.

For more detailed information regarding the cultural resource assessment of the SAP study areas refer to the RCG&A report in Appendix C.

8.5 Benthic Survey

To characterize surficial sediment conditions and to categorize benthic habitats in the two SAP study areas, sediment grab samples were collected and underwater video transects (obtained by a remotely operated vehicle [ROV]) were run in late summer of 2022 by TDI Brooks. Locations of benthic survey samples are shown in Figures 8.0-3 and 8.0-4.

Benthic infauna analysis was conducted on both SAP study areas grab samples which were then processed, analyzed, and interpreted for benthic infauna community characteristics by TDI Brooks. At SAP-1, the benthic grab (544LA22-GB019-1) contained 37 organisms, dominated by annelids (86.5%), including 32 polychaetes, 23 belonging to the genus Polygordius. At SAP-2, the benthic grab (544LA22-GB012-1) contained 15 organisms, again dominated by annelids (86.7%), including ten polychaetes and three oligochaetes. Annelids are the dominant infauna member within the SAP study areas and indicate a macrobenthic community typical of sandy, soft-bottom habitats. These results align with the soft bottom habitats observed throughout the video transects as well as with the benthic grab grain size analysis results, presented below.

In order to further characterize the benthic habitat, sediment was collected from the top 1-2 centimeters (cm) (0.39-0.79 in) of the grab samples to be analyzed for grain size distribution. This analysis was completed by TDI Brooks' geotechnical laboratory. Once grain size data were obtained, grab samples were classified using the NMFS Recommendations for Mapping Fish Habitat (NMFS 2021). This system is based on the Coastal and Marine Ecological Classification Standard (CMECS) system (FGDC 2012) and further modified by NMFS. Sediment from both SAP study areas was comprised of mainly fine unconsolidated sediment within the substrate subgroup of Medium Sand. Based on the results of the grain size analysis, both sample stations are classified as Soft Bottom habitats.

Video transects recorded bottom conditions and macrofauna and flora occurrence along two 300-m (984 ft) long transects, one per SAP study area. 544LA22-VT022-2 (VT022) was collected within SAP-1, while 544LA22-VT017-1 (VT017) was collected within SAP-2. Transect videos were reviewed and organisms were identified (to the lowest practical taxonomic level) along the transect. After video analysis, an ACFOR (abundant, common, frequent, occasional, rare) scale was used to assign an abundance to each organism. Along both transects, the common sand dollar *(Echinarachnius parma)* was the most abundant organism, followed by hermit crabs (*Pagurus spp)*. No flora were observed along either transect.

Bottom conditions along both transects were characterized by mostly flat sand with some benthic features (sand ripples). Scattered shell fragments and whole shells were observed in low to moderate densities along the entirety of both transects, within the troughs of the benthic features. Additionally, transect footage showed a frequent occurrence of small, isolated depressions/burrows possibly created by sea scallop activity. Figures (8.5-1 and 8.5-2) are representative images of habitats seen along VT022 and VT017. Similar to the grab samples collected in the areas, both video transects were assigned a benthic habitat type of Soft Bottom being comprised mostly of sand.

Review of underwater video transects, sediment grabs, vibracore photographs, and analysis around the planned metocean buoy and TRBM deployment locations found no evidence of sensitive or complex habitats; no evidence of sensitive macrofaunal communities; and only limited epifaunal activity. No aquatic vegetation, evidence of fishing activity, encrusting or colonial organisms, or anthropogenic debris were observed on the footage from video transects.

For complete and detailed information on benthic sampling and results, please refer to the information in Appendix D.

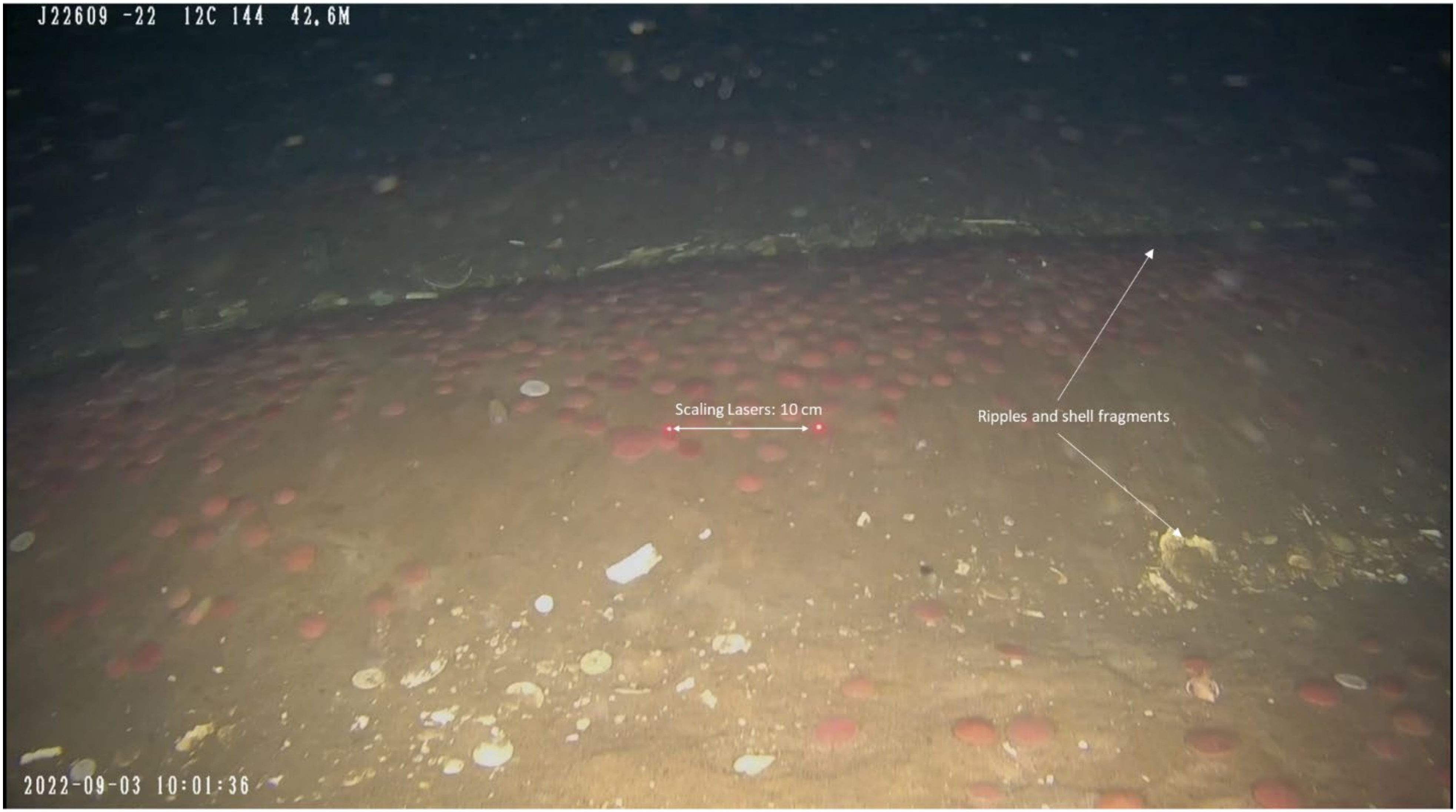

Figure 8.5.1
Video Transect VT022 Screen Captures

VINEYARD MID-ATLANTIC
VINEYARD OFFSHORE

PUBLIC

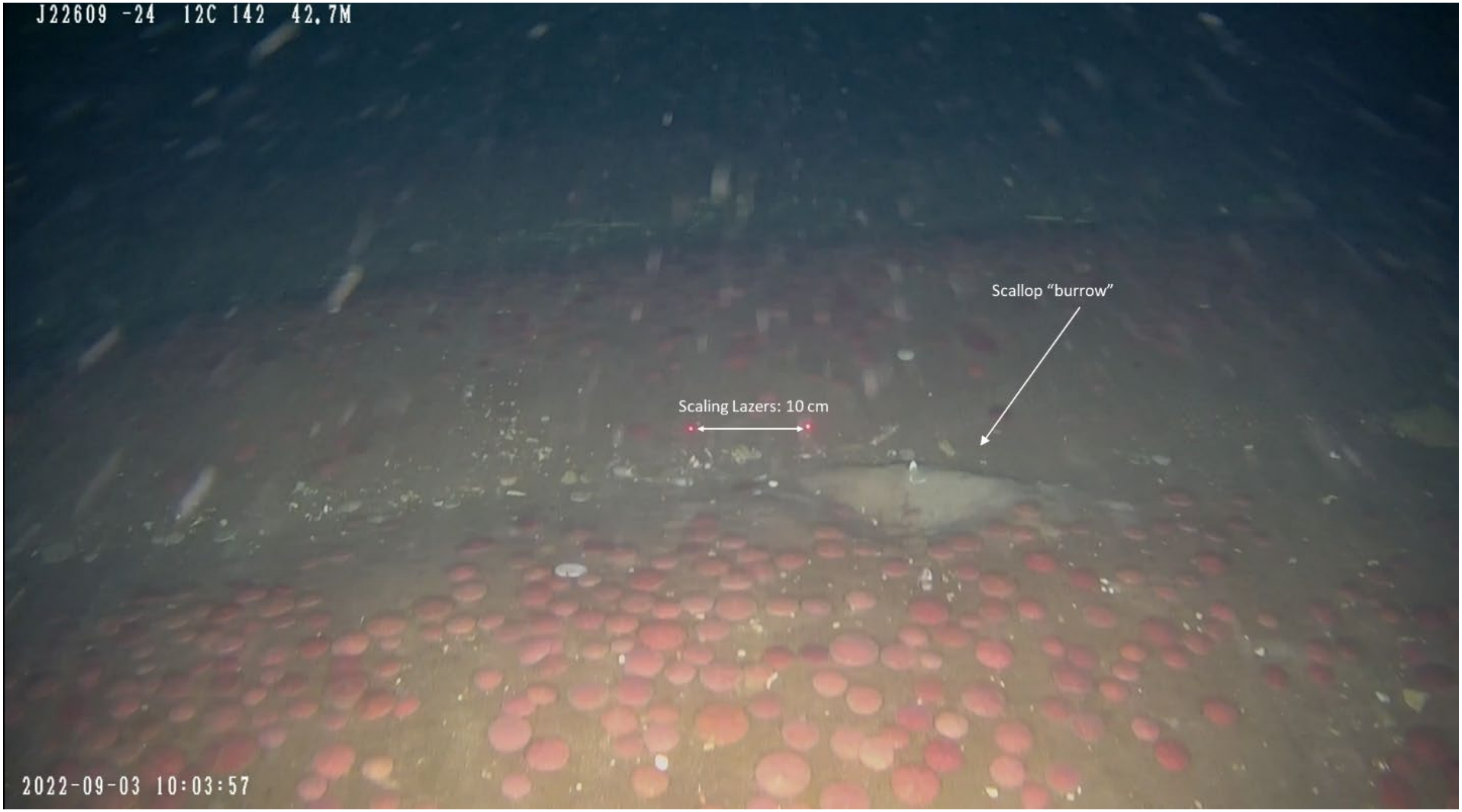

Figure 8.5.2
Video Transect VT022 Screen Captures

PUBLIC

VINEYARD MID-ATLANTIC
VINEYARD OFFSHORE

Figure 8.5.3
Video Transect VT017 Screen Captures

PUBLIC

VINEYARD MID-ATLANTIC
VINEYARD OFFSHORE

9.0 AFFECTED ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

9.1 Categories to Be Assessed

As required in 30 CFR §585.610(a), 30 CFR §585.610(b)(1-5), 30 CFR §585.611(b)(1) and 30 CFR §585.659(2) and in conformance with Table 2 of BOEM's SAP Guidance, the following sections describe existing conditions based on the field surveys described in Section 8.0 (see also Section 3.2):

- Hazard information
- Geotechnical surveys
- Biological surveys
- Archaeological resources
- Air quality

Potential impacts to these resources from proposed SAP activities and measures to avoid, minimize or mitigate these impacts are described below.

9.2 Surficial and Shallow Subsurface Geology

For both SAP study areas, based on the sediments found on and below the seafloor in the upper three meters (homogenous fine to medium grained sand), there will be negligible to minor impact from installation and operation of the metocean buoy and TRBM. These impacts include (1) some typical settling of the mooring weight and TRBM into the seabed, (2) minor scour possible around the mooring weight and TRBM, and (3) chain sweep on the seafloor around the weight. The absence of any sizable mobile seafloor features (megaripples or sand waves) suggest minimal bottom currents are operating in the area, so scour is expected to be minimal. The seafloor disturbance from the metocean buoy and TRBM is described in Section 4.2.

9.3 Shallow Hazards

None of the surficial or subsurface features identified within the SAP study areas limits are considered hazards due to their minimal sizes and locations relative to the proposed metocean buoy weight and TRBM deployment positions. As there are no hazards identified on or below the seafloor in either SAP study area, there will be no impact from installation of the metocean buoy and TRBM. Furthermore, there are no anticipated hazardous or adverse conditions that could significantly impact the metocean buoy system or TRBM.

9.4 Benthic Resources

Direct, minor impact on the benthos from installation of the metocean buoy system and placement of the TRBM would include some injury and possibly mortality of epifauna and infauna from the mooring weight sinking into the seabed and the TRBM placement on the seabed. This will consolidate and displace benthic habitats, forcing organisms into surrounding areas. Indirect impacts from suspended sediment on the surrounding seafloor immediately after mooring weight placement are expected to be negligible due to very little expected resuspended material.

Some habitat alteration may occur temporarily, as a new hard substrate is introduced where a relatively soft sediment seabed existed previously. Sessile benthic communities (encrusting) may inhabit the mooring weight and/or the TRBM during their deployment period.

Operational impacts from the mooring chain sweep are anticipated to be negligible to minor, as the chain does not sink very far into the seabed but will create a dynamic equilibrium at the sediment-water interface due to the periodic scraping of the seafloor. The area of impact will be controlled by the tidal current flow and/or ocean circulation.

Finally, direct, minor impact from removal of the metocean buoy system and/or TRBM is expected in the form of injury or mortality to epifaunal communities attached to the mooring weight when it is removed from the seafloor. Subsequent recolonization of the underlying unconsolidated sediment by original epifaunal and infaunal organisms will occur fairly rapidly, given the limited area of impact and the large surrounding area of undisturbed habitat. Similar to installation, mooring removal will have negligible impact due to very little resuspended sediments mobilized into the water column.

In summary, the overall small area of impact compared to the large source area of similar undisturbed habitat adjacent to it, is expected to result in rapid recovery of benthic resources following removal of the metocean buoy and TRBM, as has been observed following temporary physical disturbance in similar habitats (e.g., Guerra-García et al. 2003, Schaffner 2010). Thus, potential long-term impacts to benthic resources from SAP activities are anticipated to be negligible, if any.

9.5 Oceanography and Meteorology

The placement of a metocean buoy and/or TRBM in either of the SAP study areas will not significantly affect the ocean current circulation or wind and wave patterns locally or regionally. The footprint of the mooring weight, diameter of the mooring cable, size of the buoy, and overall dimensions of the TRBM are not large and will not cause significant impact to the flow of air or water.

The only negligible-minor impact will be slight turbulent flow created from the mooring weight and TRBM just above the bottom and the resultant localized and limited scour around the weight. While there are no measurements of bottom current speed and direction in the SAP study areas or Lease Area OCS-A 0544, the seafloor features present are not indicative of fast-moving currents. Therefore, only a minor amount of scour around the mooring weight and TRBM is predicted.

9.6 Archaeological Resources

No impacts to archaeological resources are expected, as no recorded or potential historic or pre-contact submerged cultural resources have been identified within either of the SAP study areas.

9.7 Air Quality

EPA has air quality jurisdiction over the portion of the Outer Continental Shelf where the proposed SAP activities will take place (see 30 CFR §585.659). However, EPA's OCS Air Regulations, which establish federal air pollution control requirements for OCS sources, do not apply to the proposed activities (see 40 CFR §55). That is because the metocean buoy and TRBM will not contain any combustible fuel and will not have the potential to emit any criteria air pollutants. Instead, the metocean buoy and TRBM will be powered by clean, renewable energy (e.g., batteries, solar, wind, and/or fuel cells). In addition, the vessels used for the deployment, maintenance, and recovery of the metocean buoy and TRBM will not attach to the seafloor (i.e., anchor) or securely attach to the metocean buoy for the purposes of remaining stationary. Therefore, none of the equipment or vessels involved in the proposed activities will become OCS sources subject to regulation under 40 CFR §55.

Although the proposed activities are not regulated under 40 CFR §55, there will be emissions from the main propulsion engines, auxiliary engines, and auxiliary equipment on vessels that are used to deploy, maintain, and recover the metocean buoy and TRBM. In order for BOEM to assess impacts to air quality resulting from the proposed activities, a conservative estimate of emissions was developed based on the following assumptions:

- Installation of the metocean buoy and TRBM at the SAP study area will take approximately six hours and will require one vessel trip from Avalon, NJ (see Section 5.1).
- Annually, maintenance of the metocean buoy and TRBM will require approximately four vessel trips from New York Harbor, with each maintenance activity lasting approximately one eight-hour day (at the SAP study area).
- The metocean buoy and TRBM will be deployed for five years.
- Decommissioning of the metocean buoy and TRBM at the SAP study area will take up to approximately eight hours and will require one vessel trip from Avalon, NJ.

The table below provides an estimate of the total tons of nitrogen oxides (NOx), volatile organic compounds (VOC), carbon monoxide (CO), particulate matter with a diameter less than or equal to 10 and 2.5 micrometers (PM_{10} and $PM_{2.5}$, respectively), sulfur dioxide (SO_2), carbon dioxide equivalent (CO_2e), and hazardous air pollutants (HAPs) emitted during the installation, maintenance, and decommissioning of the metocean buoy and TRBM.

Table 9.7-1 Air Emissions from SAP Activities

Activity	Air Emissions (US tons)							
	NOx	VOC	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2e	HAPs
Deployment	0.57	0.01	0.14	0.02	0.02	0.00	39	0.00
Maintenance	5.63	0.10	1.35	0.19	0.19	0.02	384	0.02
Decommissioning	0.58	0.01	0.14	0.02	0.02	0.00	40	0.00
Total	**6.78**	**0.12**	**1.63**	**0.23**	**0.22**	**0.02**	**463**	**0.02**

Air emissions associated with the installation, maintenance, and decommissioning of the metocean buoy and TRBM will only occur periodically for very short durations throughout the Site Assessment term. Since the SAP Study Areas are approximately 58 kilometers (36 miles) at their closest (SAP-2) from the nearest landmass, the emissions within the SAP Study Areas are unlikely to have any effect on onshore areas. Furthermore, the low level of additional vessel traffic from the proposed activities will likely contribute only a small fraction of air pollution that is already caused by marine vessel traffic within the region. As described in Section 9.7.1, measures to minimize emissions from vessels used during deployment, maintenance, and decommissioning of the metocean buoy and TRBM will be consistent with industry standard, area-wide measures for marine vessels (e.g., the use of low sulfur fuels and internal combustion engines that are in compliance with applicable air quality regulatory standards). Thus, the potential impacts of the proposed activities to ambient air quality are expected to be negligible, if any.

9.7.1 Avoidance, Minimization, and Mitigation Measures

The metocean buoy and TRBM will not contain any combustible fuel and will not have the potential to emit any criteria air pollutants. Instead, the metocean buoy and TRBM will be powered by clean, renewable energy (e.g., batteries, solar, wind, and/or fuel cells). Measures to avoid, minimize, and mitigate emissions from vessels will be consistent with industry standard, area-wide measures for marine vessels. For example, air emissions from vessels will be minimized through the use of low sulfur fuels and through the use of internal combustion engines that are in compliance with applicable air quality regulatory standards.

9.8 Marine Mammals, Sea Turtles, and Other Protected Species

ESA-listed species that may be present in the study areas and surrounding region are presented in Table 9.8-1.

Table 9.8-1 ESA-Listed Species That May Be Present in the Study Areas

Common Name	Scientific Name	ESA Status
Marine Mammals - Cetaceans		
North Atlantic right whale	*Eubalaena glacialis*	Endangered
Fin whale	*Balaenoptera physalus*	Endangered
Sei whale	*Balaenoptera borealis*	Endangered
Sperm whale	*Physeter macrocephalus*	Endangered
Blue whale	*Balaenoptera musculus*	Endangered
Sea Turtles		
Loggerhead sea turtle	*Caretta*	Threatened
Green sea turtle	*Chelonia mydas*	Threatened
Kemp's ridley turtle	*Lepidochelys kempii*	Endangered
Leatherback sea turtle	*Dermochelys coriacea*	Endangered
Fishes		
Atlantic sturgeon	*Acipenser oxyrinchus*	Endangered
Giant manta ray	*Manta birostris*	Threatened

9.8.1 Avoidance, Minimization, and Mitigation Measures

As required by Section 7 of the ESA, BOEM completed a programmatic consultation with NMFS for data collection activities such as the deployment of metocean buoys. On June 29, 2021, NMFS issued a Letter of Concurrence under the ESA that covers site characterization (HRG, geotechnical, and biological surveys) and site assessment/data collection (deployment, operation, and retrieval of meteorological and oceanographic data buoys) activities associated with Atlantic OCS leases. As a result of this consultation, PDCs and BMPs associated with the mitigation, monitoring, and reporting conditions have been developed for those data activities covered in the consultation. These PDCs and BMPs collectively implement the ESA requirements for these offshore wind activities on the Atlantic OCS. The Proponent will follow all applicable PDCs/BMPs as provided in the June 29, 2021 NMFS Letter of Concurrence. The Proponent will provide a copy of the most-recent PDCs and BMPs on every project-related vessel. Further, the Proponent will comply with applicable regulations in Table 3.1-1, applicable Lease stipulations in Table 3.1-2 (which also include a requirement to follow the PDCs and BMPs for protected species) and implement best management practices in Table 9.9-1 to eliminate or minimize the potential for adverse environmental impacts to protected species and other significant resources during metocean buoy and TRBM installation, operation, and decommissioning.

9.9 Additional Avoidance, Minimization, and Mitigation Measures

9.9.1 Measures to Reduce Impacts to Fisheries

In accordance with Lease Stipulation 3.1.2.1, the Proponent has developed a publicly available FCP that describes the ways the Proponent will communicate with fisheries stakeholders potentially affected by the development of the Proponent's offshore wind projects (including activities pertaining to metocean buoys). The document continues to evolve with continuous feedback and guidance from fishermen, fishing organizations, and regulatory agencies. The FCP includes contact information for individuals retained by the Proponent as its primary point(s) of contact with fisheries stakeholders (i.e., the Fisheries Liaison(s)). The current version of the FCP can be found at the following website link: **https://www.vineyardoffshore.com/fishermen**.

9.9.2 Measures to Reduce Impacts to Marine Navigation

As listed on Table 9.9-1 under Transportation and Vessel Traffic, the metocean buoy will be equipped with the proper safety lighting, markings, and signal equipment per USCG PATON requirements, including USCG Navigation and Vessel Inspection Circular 02-23. Coordination with the USCG will occur prior to deployment (see Table 3.3-1).

The metocean buoy will be sited within the NYB WEA, which, after public comment, was developed to avoid shipping lanes and International Maritime Organization (IMO)-designated Traffic Separation Schemes. The Proponent will issue Offshore Wind Mariner Updates and coordinate with USCG to issue Local Notices to Mariners for buoy deployment, maintenance, and recovery activities.

The metocean buoy will be located beyond Federal Aviation Administration (FAA) jurisdiction, will not exceed 61 m (200 ft) in height and therefore do not require any aviation obstruction lighting per BOEM's (2021) Guidelines for Lighting and Marking of Structures Supporting Renewable Energy Development.

9.9.3 Measures to Reduce Impacts to Birds and Bats

As noted in Section 2.3 in BOEM's 2021 EA for the NYB WEA, impacts to birds and bats are negligible. Due to the low height and simple design of metocean buoy, there are few opportunities for avian species to perch or nest. Further, in accordance with Lease Stipulation 5.4 (see Table 3.1-2), the Proponent will comply with all avian and bat survey and reporting requirements. Additional findings are presented under Avian Resources in Table 9.9-1.

9.9.4 Best Management Practices

The SAP activities will comply with BOEM's BMPs outlined in Attachment B of BOEM's (2019) Guidelines for Information Requirements for a Renewable Energy Site Assessment Plan. Table 9.9-1 identifies how the SAP activities will address or adhere to all of BOEM's BMPs that are applicable to metocean buoys. As stated in Section 9.8.1, the Proponent will also follow all applicable PDCs/BMPs as provided in the June 29, 2021 NMFS Letter of Concurrence to implement avoidance, minimization and mitigation measures.

Table 9.9-1 BOEM's SAP Best Management Practices

Best Management Practices: BOEM 2019 SAP Guidance	SAP Activities
Preconstruction Planning	
Lessees shall minimize the area disturbed by preconstruction site monitoring and testing activities and installations.	This SAP proposes the use of one metocean buoy and TRBM to obtain Lease-specific data. Buoys minimize disturbed areas as compared with meteorological towers. Similarly, the Proponent's preconstruction geophysical and geotechnical survey work is designed to minimize impacts in accordance with approved survey plans and lease requirements. Wildlife studies have employed minimally invasive techniques for observing species and habitat presence.
Lessees shall contact and consult with the appropriate affected Federal, state, and local agencies early in the planning process.	The Proponent has engaged with federal, state, local agencies, and stakeholder groups to identify and address any issues of potential concern. This engagement has informed the design of the Project and the activities presented in the SAP.
Lessees shall consolidate necessary infrastructure requirements whenever practicable.	The Proponent has made every effort to consolidate infrastructure requirements. The maximum horizontal radius of the mooring chain contacting the seafloor will not be more than 71.0 m (234 ft) and will be within the assessed 300 m x 300 m (984 ft by 984 ft) buoy deployment area. Any impact from installation vessels will be very limited, as the installation will be performed without anchoring.
Lessees shall develop a monitoring program to ensure that environmental conditions are monitored during construction, operation, and decommissioning phases. The monitoring program requirements, including adaptive management strategies, and shall be established at the project level to ensure that potential adverse impacts are mitigated.	A monitoring program should be commensurate with potential impacts from a proposed activity. The Proponent's monitoring program for each metocean buoy and TRBM includes appropriate marine notifications of buoy locations, including issuance of Offshore Wind Mariner Updates and coordination with USCG to issue Local Notices to Mariners for buoy deployment, maintenance, and recovery activities; on-going locational monitoring of the buoy system by GPS and alerts if the buoy moves outside the designated buoy

Table 9.9-1 BOEM's SAP Best Management Practices (Continued)

Best Management Practices: BOEM 2019 SAP Guidance	SAP Activities
Preconstruction Planning	
	watch circle; efforts to minimize and remove marine debris associated with SAP activities; submission of compliance reports to BOEM as required, including recommendations for adaptive management measures; and removal of each metocean buoy and TRBM systems as described in Section 7.0.
Seafloor Habitats[1]	
Lessees shall conduct seafloor surveys in the early phases of a project to ensure that the alternative energy project is sited appropriately to avoid or minimize potential impacts associated with seafloor instability or other hazards.	The Project is located within the New York Bight Wind Energy Area (NYB WEA), which BOEM has identified as appropriate for development of wind energy. In addition, the Proponent has conducted geophysical and geotechnical surveys under a BOEM-approved Survey Plan, to confirm that site conditions are suitable for the installation of the metocean buoy and TRBM.
Lessees shall conduct appropriate pre-siting surveys to identify and characterize potentially sensitive seafloor habitats and topographic features.	Pre-siting surveys have been conducted to identify and characterize potentially sensitive seafloor habitats and topographic features. See Sections 8.0 and 9.0 and related appendices for detailed findings. No sensitive seafloor habitats have been identified within the metocean buoy and TRBM deployment study areas.
Lessees shall avoid locating facilities near known sensitive seafloor habitats, such as coral reefs, hard-bottom areas, and chemosynthetic communities.	No sensitive seafloor habitats have been identified within the metocean buoy and TRBM deployment study areas.
Lessees shall avoid anchoring on sensitive seafloor habitats.	Installation of the metocean buoy and TRBM will be performed without vessel anchoring. The mooring weight for each buoy will not be placed on sensitive seafloor habitats, as none have been identified in the study areas.
Lessees shall reduce scouring action by ocean currents around foundations and to seafloor topography by taking all reasonable measures and employing periodic routine inspections to ensure structural integrity.	There will be no foundations. Little to no scour development around the chain and TRBM is expected due to minimal currents and relatively cohesive seabed conditions. The Proponent will conduct periodic inspections of the metocean buoy and TRBM.

Table 9.9-1 BOEM's SAP Best Management Practices (Continued)

Best Management Practices: BOEM 2019 SAP Guidance	SAP Activities
Marine Mammals and Sea Turtles[1]	
Vessels related to project planning, construction, and operation shall travel at reduced speeds when assemblages of cetaceans are observed, and maintain a reasonable distance from whales, small cetaceans, and sea turtles as determined during site-specific consultations.	The Proponent will adhere to legally mandated speed, approach, and other vessel requirements included in BOEM's PCDs/BMPs, unless BOEM approves a waiver. Additional measures to protect marine mammals and sea turtles are described in Section 9.8.1.
Lessees shall minimize potential vessel impacts to marine mammals and turtles by requiring project-related vessels to follow the National Marine Fisheries Service (NMFS) Regional Viewing Guidelines while in transit. Operators shall be required to undergo training on applicable vessel guidelines.	Project vessels will comply with the NMFS Regional Viewing Guidelines while in transit (see Section 9.8.1). In addition, vessel operators will undergo training on applicable guidelines.
Lessees shall use the best available mooring systems using buoys, lines (chains, cables, or coated rope systems), swivels, shackles, and anchors that prevent any potential entanglement or entrainment of marine mammals and sea turtles, while ensuring the safety and integrity of the structure or device.	The metocean buoy and TRBM will utilize entanglement or entrainment avoidance measures agreed upon with BOEM and NMFS. These are expected to include using a single steel chain to link the bottom mooring weight with the floating buoy (see Section 4.1). All attachment lines will utilize one or more of the following measures to reduce entanglement risk: shortest practicable line length, rubber sleeves, weak-links, chains, cables, or similar equipment types that prevent lines from looping or wrapping around animals or entrapping protected species. No entanglement or entrainment of marine mammals and sea turtles is expected.
Lessees shall locate cable landfalls and onshore facilities so as to avoid impacts to known nesting beaches.	The metocean buoy and TRBM will not require any cable landfalls or onshore facilities.

Table 9.9-1 BOEM's SAP Best Management Practices (Continued)

Best Management Practices: BOEM 2019 SAP Guidance	SAP Activities
Fish Resources and Essential Fish Habitat[1]	
Lessees shall conduct pre-siting surveys (may use existing data) to identify important, sensitive, and unique marine habitats in the vicinity of the projects and design the project to avoid, minimize, or otherwise mitigate adverse impacts to these habitats.	Pre-siting surveys have been conducted to identify and characterize potentially sensitive marine habitats. See Section 9.0 for detailed findings. No sensitive marine habitats have been identified within the metocean buoy and TRBM deployment study areas.
Lessees shall minimize seafloor disturbance during construction and installation of the facility and associated infrastructure.	Seafloor disturbance will be minimized to the extent practicable. The maximum expected horizontal radius of the mooring chain contacting the seafloor will not be more than 71.0 m (234 feet) and will be within the 300 m x 300 m (984 ft by 984 ft) buoy deployment area. Any impact from installation vessels will be very limited, as the installation will be performed without anchoring.
Avian Resources	
The lessee shall evaluate avian use in the project area and design the project to minimize or mitigate the potential for bird strikes and habitat loss. The amount and extent of ecological baseline data required will be determined on a project-to-project basis.	Avian use and impacts to avian resources due to the installation of the metocean buoy was thoroughly analyzed for the entire NYB WEA in BOEM's (2021) Final Environmental Assessment (EA). The Revised EA found that impacts to birds are expected to be negligible. The low profile of the metocean buoy will minimize the avian use of the buoy as a perch or nesting site.
Lessees shall take measures to reduce perching opportunities.	The Revised EA found that meteorological buoys provide few perching opportunities for birds and that those opportunities would pose no threat to birds.
Lessees shall comply with FAA and USCG requirements for lighting while using lighting technology (e.g., low-intensity strobe lights) that minimize impacts to avian species[2].	Marine navigation lighting on the metocean buoy will comply with USCG requirements and are expected to have characteristics that minimize impacts to avian species.
Lessees shall work cooperatively with commercial/recreational fishing entities and interests to ensure that the construction and operation of a project will minimize potential conflicts with commercial and recreational fishing interests.	As described in BOEM's Revised EA, "activities related to the installation/operation of the meteorological towers and buoys would not measurably impact commercial or recreational fishing activities."

Table 9.9-1 BOEM's SAP Best Management Practices (Continued)

Best Management Practices: BOEM 2019 SAP Guidance	SAP Activities
Avian Resources	
Lessees shall review planned activities with potentially affected fishing organizations and port authorities to prevent unreasonable fishing gear conflicts. Lessees shall minimize conflict with commercial fishing activity and gear by notifying registered fishermen of the location and time frame of the project construction activities well in advance of mobilization with updates throughout the construction period.	The SAP study areas for the metocean buoy and TRBM were selected to avoid heavily trawled areas. The Proponent will issue Offshore Wind Mariner Updates and coordinate with USCG to issue Local Notices to Mariners for buoy deployment, maintenance, and recovery activities. Coordinates for the buoy will be provided to fishermen and mariners.
Lessees shall use practices and operating procedures that reduce the likelihood of vessel accidents and fuel spills.	The Proponent is firmly committed to full compliance with applicable safety and environmental protection regulations and codes. The oil spill response measures are described in Section 4.4.
Lessees shall avoid or minimize impacts to the commercial fishing industry by marking applicable structures (e.g., wind turbines, wave generation structures) with USCG-approved measures (such as lighting) to ensure safe vessel operation.	The metocean buoy and TRBM will be equipped with the proper safety lighting, markings, and signal equipment per USCG PATON requirements, including USCG Navigation and Vessel Inspection Circular 02-23. Coordination with the USCG will occur prior to deployment (see Table 3.3-1).
Coastal Habitats[1]	
Lessees shall avoid hard-bottom habitats, including seagrass communities and kelp beds, where practicable, and restore any damage to these communities.	No sensitive seafloor habitats have been identified within the metocean buoy and TRBM deployment study areas.
Lessees shall implement turbidity reduction measures to minimize effects to hard-bottom habitats, including seagrass communities and kelp beds, from construction activities.	No hard-bottom habitats have been identified within the metocean buoy and TRBM deployment study areas.
Lessees shall minimize effects to seagrass and kelp beds by restricting vessel traffic to established traffic routes.	No sensitive seafloor habitats have been identified within the metocean buoy and TRBM deployment study areas. If sensitive resources are known along transit routes, vessels will be advised to avoid the area to the greatest extent practicable.

Table 9.9-1 BOEM's SAP Best Management Practices (Continued)

Best Management Practices: BOEM 2019 SAP Guidance	SAP Activities
Coastal Habitats	
Lessees shall site alternative energy facilities to avoid unreasonable interference with major ports and United States Coast Guard (USCG)-designated Traffic Separation Schemes.	The metocean buoy and TRBM will be sited within the NYB WEA, which, after public comment, was developed to avoid shipping lanes and IMO-designated Traffic Separation Schemes.
Lessees shall meet FAA guidelines for sighting and lighting of facilities.	The metocean buoy will be located beyond FAA jurisdiction, will not exceed 61 m (200 ft) in height and therefore do not require any aviation obstruction lighting per BOEM's (2021) *Guidelines for Lighting and Marking of Structures Supporting Renewable Energy Development*.
Lessees shall place proper lighting and signage on applicable alternative energy structures to aid navigation per USCG circular navigation and vessel inspection circular 07-02 (USCG 2007) and comply with any other applicable USCG requirements.	The metocean buoy and TRBM will be equipped with the proper safety lighting, markings, and signal equipment per USCG PATON requirements, including USCG Navigation and Vessel Inspection Circular (NVIC) 02-2023. Coordination with the USCG will occur prior to deployment (see Table 3.3-1).
Operations	
Lessees shall prepare waste management plans, hazardous material plans, and oil spill prevention plans, as appropriate, for the facility.	The Proponent is firmly committed to full compliance with applicable environmental protection regulations and codes. The Project's Oil Spill Response measures are described in Section 4.4.

Notes:

1. The Proponent will follow all applicable PDCs/BMPs as laid out in the June 29, 2021 NMFS Letter of Concurrence (see Section 9.8.1).
2. This text summarizes stipulations in BOEM's 2019 SAP Best Management Practices. The Proponent understands that the USCG has worked with BOEM to develop standard language for use in COP and/or SAP approvals and that the conditions of SAP approval will supersede the Best Management Practices. The Proponent understands that the USCG's suggested standard language is: "Nothing in this condition supersedes or is intended to conflict with the lighting, marking, and signaling requirements of the FAA, USCG, or BOEM. The Lessee must use lighting technology that minimizes impacts on avian species to the extent practicable including lighting designed to minimize upward illumination."

10.0 REFERENCES

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Vineyard Mid-Atlantic Site Assessment Plan

Appendix A

Buoy Specifications

Prepared by:
EOLOS/Ocean Tech

Prepared for:
Vineyard Mid-Atlantic LLC

January 2024

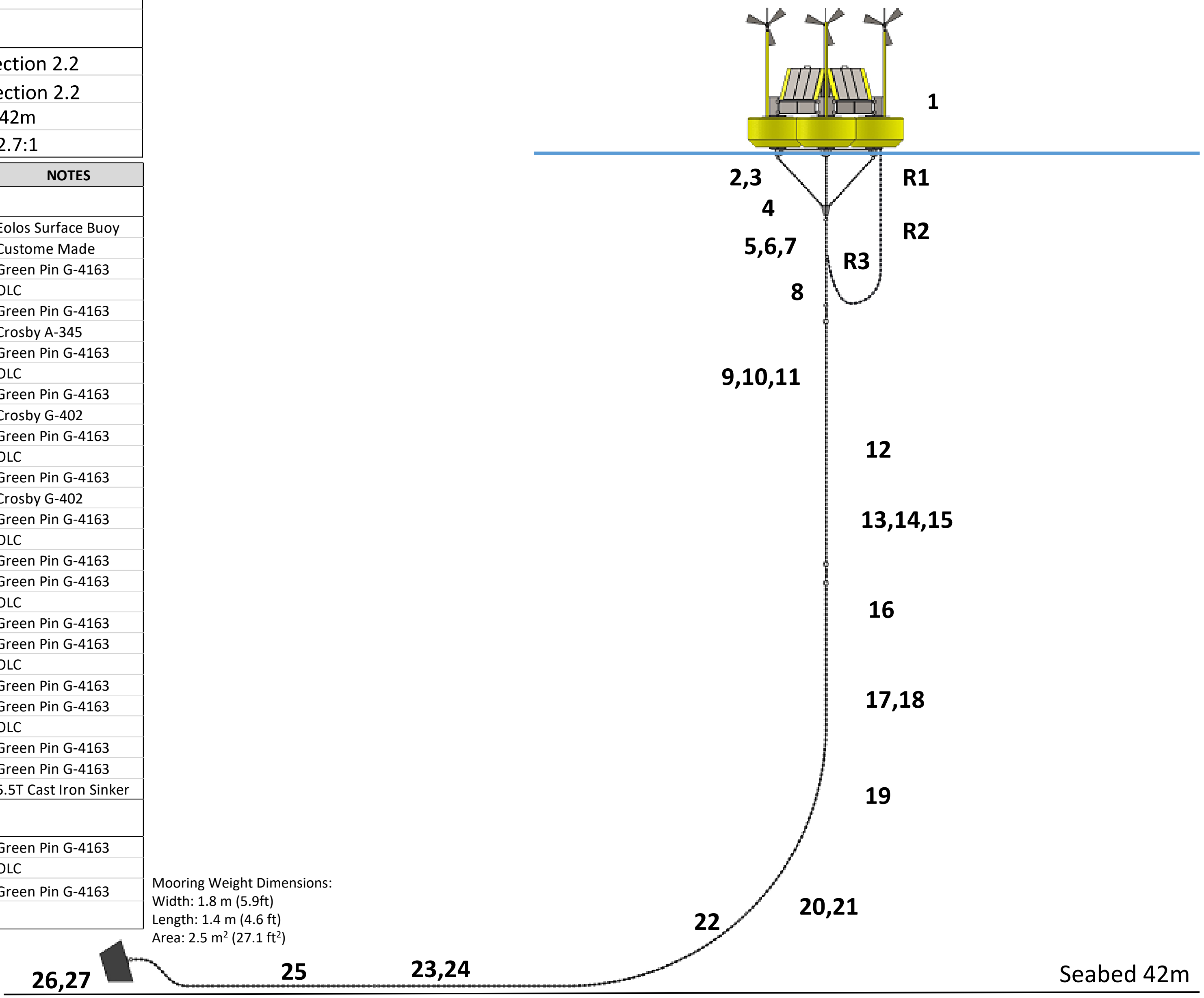
PRELIMINARY MOORING DESIGN
VINEYARD MID-ATLANTIC, OCS-544

Eolos FLS200 Floating Lidar and Metocan Buoy

DATE	27 October, 2022	**LATITUDE**	See Section 2.2
REVISION		**LONGITUDE**	See Section 2.2
CREATED BY	SPO	**WATER DEPTH**	42m
MOORING LENGTH	113m	**MOORING SCOPE**	2.7:1

Item #	DESCRIPTION	SIZE	WLL[1]	LENGTH	NOTES
		Mooring			
1	FLS-200	FLS-200			Eolos Surface Buoy
2	(4) Isolation shackle and pin	1-1/4" (32mm)			Custome Made
3	(4) Shackle (bow)	1-1/4" (32mm)	12T		Green Pin G-4163
4	(4) Bridle chain	1" (26mm)		3m	OLC
5	(4) Shackle (bow)	1-1/4" (32mm)	12T		Green Pin G-4163
6	Master Link Assembly	1-1/2" (38mm)	30.5T		Crosby A-345
7	Shackle (bow)	1-3/8" (35mm)	13.5T		Green Pin G-4163
8	Chain	1" (26mm)		10m	OLC
9	Shackle (bow)	1-3/8" (35mm)	13.5T		Green Pin G-4163
10	Swivel	1-1/2" (38mm)			Crosby G-402
11	Shackle (bow)	1-1/2" (38mm)	17T		Green Pin G-4163
12	Chain	1-1/2" (38mm)		10m	OLC
13	Shackle (bow)	1-1/2" (38mm)	17T		Green Pin G-4163
14	Swivel	1-1/2" (38mm)			Crosby G-402
15	Shackle (bow)	1-1/2" (38mm)	17T		Green Pin G-4163
16	Chain	1-1/2" (38mm)		27.5m	OLC
17	Shackle (bow)	1-1/2" (38mm)	17T		Green Pin G-4163
18	Shackle (bow)	1-1/2" (38mm)	17T		Green Pin G-4163
19	Chain	1-1/2" (38mm)		27.5m	OLC
20	Shackle (bow)	1-1/2" (38mm)	17T		Green Pin G-4163
21	Shackle (bow)	1-1/2" (38mm)	17T		Green Pin G-4163
22	Chain	1-1/2" (38mm)		27.5m	OLC
23	Shackle (bow)	1-1/2" (38mm)	17T		Green Pin G-4163
24	Shackle (bow)	1-1/2" (38mm)	17T		Green Pin G-4163
25	Chain	1-1/2" (38mm)		10.5m	OLC
26	Shackle (bow)	1-1/2" (38mm)	17T		Green Pin G-4163
27	Shackle (bow)	1-3/4" (44mm)	25T		Green Pin G-4163
28	5,000 Kg Anchor	5,000 kg			5.5T Cast Iron Sinker
		Recovery Line			
1	Shackle (bow, hung on FLS-200 hook)	7/8" (23mm)	6.5T		Green Pin G-4163
2	Chain	3/4" 19mm)		12m	OLC
3	Shackle (bow, secured to 10m mooring chain)	7/8" (23mm)	6.5T		Green Pin G-4163

1 - Working Load Limit



Mooring Weight Dimensions:
Width: 1.8 m (5.9ft)
Length: 1.4 m (4.6 ft)
Area: 2.5 m² (27.1 ft²)

PUBLIC

Vineyard Mid-Atlantic Site Assessment Plan

Appendix B

CONFIDENTIAL Geophysical, Geotechnical & Environmental Survey Reports for Site Assessment Plan

Prepared by:
Fugro and TDI-Brooks International, Inc.

Prepared for:
Vineyard Mid-Atlantic LLC

January 2024

This Appendix has been redacted in its entirety.

Vineyard Mid-Atlantic Site Assessment Plan

Appendix B-1

CONFIDENTIAL Geophysical Survey Reports for Site Assessment Plan

Prepared by:
Fugro

Prepared for:
Vineyard Mid-Atlantic LLC

January 2024

This Appendix has been redacted in its entirety.

Vineyard Mid-Atlantic Site Assessment Plan

Appendix B-2

CONFIDENTIAL Geotechnical & Environmental Survey Reports for Site Assessment Plan

Prepared by:
TDI-Brooks International, Inc.

Prepared for:
Vineyard Mid-Atlantic LLC

January 2024

This Appendix has been redacted in its entirety.

Vineyard Mid-Atlantic Site Assessment Plan

Appendix C

CONFIDENTIAL Archaeological Report for Site Assessment Plan

Prepared by:
R. Christopher Goodwin & Associates, Inc

Prepared for:
Vineyard Mid-Atlantic LLC

January 2024

This Appendix has been redacted in its entirety.

Vineyard Mid-Atlantic Site Assessment Plan

Appendix D

Biological Survey Report for Site Assessment Plan

Prepared by:
Geo SubSea LLC

In association with:

TDI-Brooks International, Inc & TRC

Prepared for:
Vineyard Mid-Atlantic LLC

January 2024

Vineyard Mid-Atlantic

Benthic Environmental Report

544 SAP Environmental Survey

Prepared By: Geo SubSea LLC

In Association With:

TDI-Brooks & TRC

Prepared For:

Vineyard Offshore LLC

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List of Acronyms and Abbreviations

ACFOR	Abundant, Common, Frequent, Occasional and Rare
BMCC	R/V Brooks McCall
BOEM	Bureau of Ocean Energy Management
CMECS	Coastal and Marine Ecological Classification System
DGPS	Digital Global Positioning System
GSA	Grain Size Analysis
H’	Shannon-Weiner Diversity Index
HDPE	high density polyethylene
J’	Pielou’s Evenness
LPTL	Lowest Practical Taxonomic Level
NMFS	National Marine Fisheries Service
NYB WEA	New York Bight Wind Energy Area
QC	Quality Control
ROV	Remotely Operated Vehicle
SAP	Site Assessment Plan
TDI-Brooks	TDI-Brooks International, Inc.
USBL	Ultra Short Baseline

1. INTRODUCTION

TDI-Brooks International, Inc. (TDI-Brooks), with primary support from TRC and CR Environmental LLC (collectively, the benthic environmental survey team), conducted a benthic environmental survey in support of Vineyard Offshore's (the Proponent) efforts to promote further site characterization studies for the permitting, siting, and design for Vineyard Mid-Atlantic in Bureau of Ocean Energy Management (BOEM) Lease Area OCS-A 544 (Lease Area) within the New York Bight Wind Energy Area (NYB WEA). This survey was conducted from August to September of 2022 and included the collection and analysis of underwater video transects and benthic grabs from within the Lease Area. The grab samples and video imagery data conclusions presented within this Appendix will support interpretation of geophysical data to characterize surficial sediment conditions and classify the benthic habitats in the Lease Area for inclusion in the Site Assessment Plan (SAP) for BOEM. Habitat interpretations were determined according to the National Marine Fisheries Service (NMFS) Recommendations for Mapping Fish Habitat (NMFS, 2021). This system is based on the Coastal and Marine Ecological Classifications Standards (CMECS; FGDC, 2012) and further modified by NMFS.

The Proponent has identified two study areas (SAP-1 and SAP-2) within the Lease Area, one of which will be used for the installation of a meteorological and/or oceanographic (metocean) buoy and a supplemental wave and current sensor placed on the seafloor (referred to as a Trawl Resistant Bottom Mount [(TRBM]). The focus of this report is to document the benthic conditions in support of the proposed metocean buoy and TRBM deployment in one of the SAP study areas. Samples from the remainder of the Lease Area OCS-A 0544 (544) will be summarized in a following report. This document provides the following information for samples collected within the designated SAP study areas:

- A description of the benthic grab sampling methods, results, and analysis;
- The analysis of benthic grab sampling results using key statistical analyses such as taxa richness, density per cubic meter, and community composition;
- A description and analysis of the video data collected; and
- CMECS classifications of each sample site based on the video, grain size, and benthic community lab results.

2. METHODS

2.1 Field Survey

TDI Brooks mobilized the vessel RV Brooks McCall (BMCC) in April and October of 2022 in Fall River, Massachusetts to provide benthic environmental survey support associated with the Proponent's development and installation of Vineyard Northeast (OCS-A 0522). Field operations for OCS-A 0544 Geotechnical and Environmental Survey Campaign were conducted during a period between field acquisition for Vineyard Northeast OCS-A 0522 Geotechnical and Environmental Survey Campaign. TRC supported TDI-Brooks with onboard collection of benthic infauna samples and underwater video transects (Figure 2.1-1 and 2.1-2).

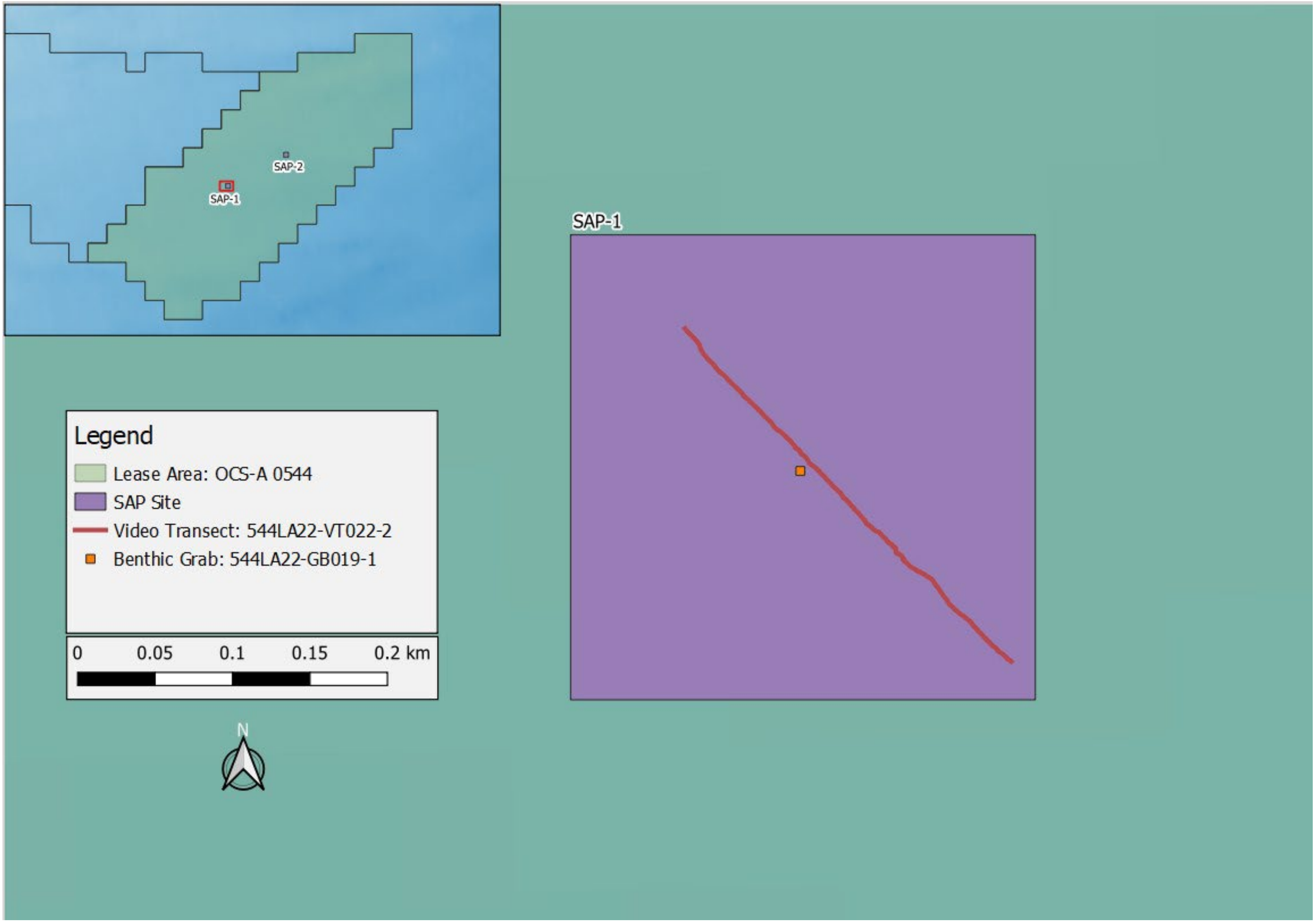


Figure 2.1-1 Map of OCS-A 0544 SAP-1 underwater video transect (VT022) and sediment grab sample station (GB019)

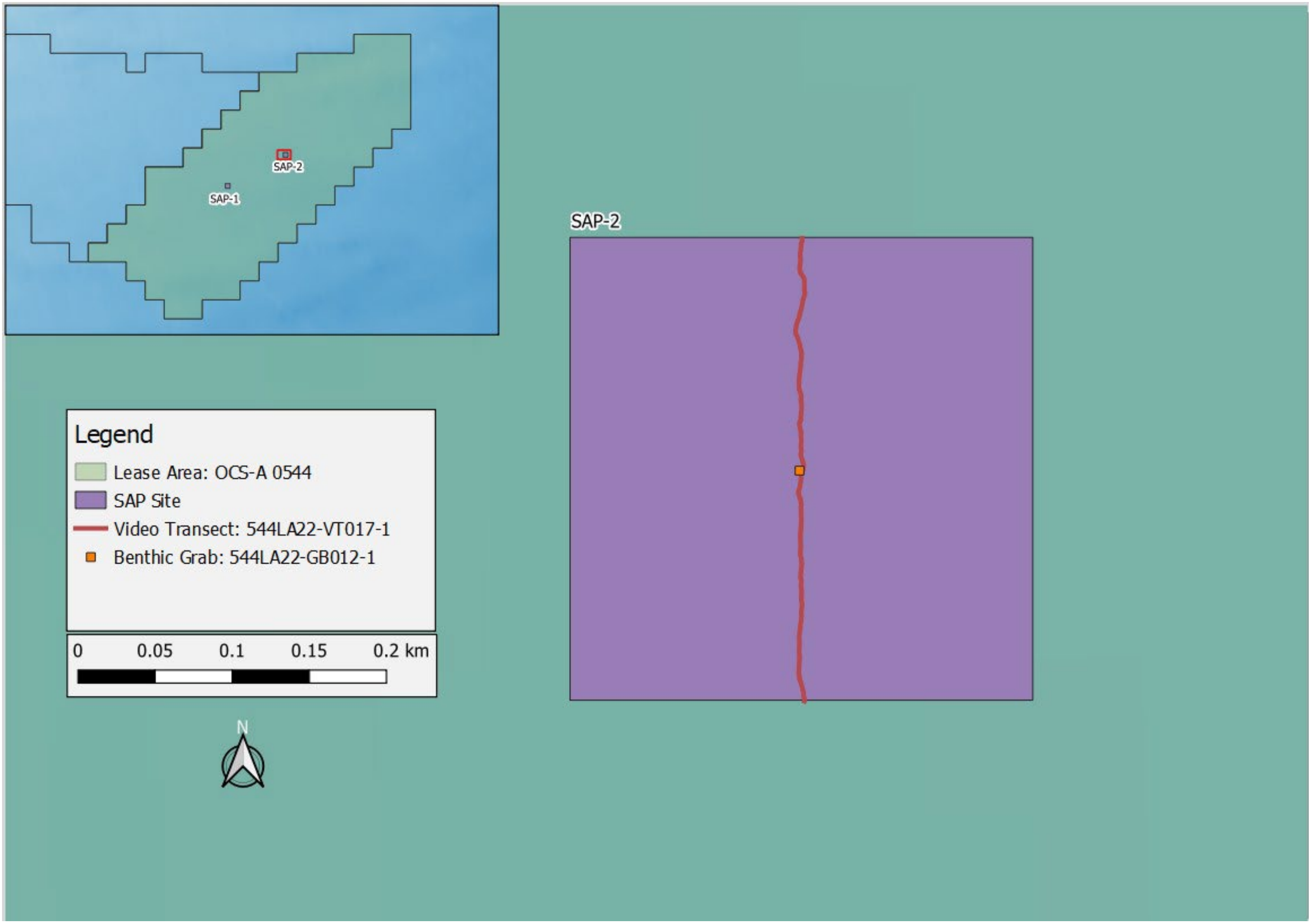


Figure 2.1-2 Map of OCS-A 0544 SAP-2 underwater video transect (VT017) and sediment grab sample station (GB012).

2.1.1 Underwater Video Transects

Video imagery was collected from the BMCC with a small commercial inspection Remotely Operated Vehicle (ROV), the DeepTrekker REVOLUTION (refer to TDI-Brooks Field Report #22-4333 for full technical specifications in Appendix C-1). The ROV was equipped with 6 ½ HP thrusters, two 1,000 Lumen LED floodlights, a 1080p HD integrated camera, a GoPro Hero 9, and scaling lasers (scaling distance of 10 cm). A TDI-Brooks pilot controlled the ROV integrated camera's field of view which was angled forward and slightly downward. The ROV was controlled with an integrated control box via the ROV's tether. An Ultra short baseline (USBL) acoustic tracking system interfaced with a Digital Global Positioning System (DGPS) was used to track the location of the ROV on the seafloor. A remote beacon transponder mounted on the ROV was used to relay signals to the USBL system. To navigate the ROV, the USBL/DGPS system was connected to a laptop running WinFrog navigation software on the vessel. Real-time positions of the vessel and ROV were recorded in one second intervals.

Underwater video transects were performed on a 24-hour operations schedule. Transects were targeted for 300 meters (m) in length with 50-100 m lead ins for ROV approach. Video transects generally ranged from fifteen to thirty-four minutes in length with an average duration of approximately twenty-one minutes. Both SAP area transects averaged around eighteen minutes in duration. At each station, the ROV was towed by the vessel in drift mode, slightly above the seafloor, at speeds ranging from 0.14 to 1.02 knots. Video imagery was monitored in real time to ensure data quality and was obtained using digitally recorded built-in camera feed and GoPro recordings.

Onboard data processing and storage was handled by personnel trained to use this specific system. Imagery and associated positional data were reviewed to ensure accurate recording of metadata. The metadata are descriptive data sources composed of information that TDI/TRC used to process the images. Backup data were also collected and later used for further quality checks.

Several quality control (QC) conventions (i.e., decision rules) were required to address the image quality and transect performance. Weather, sea state (e.g., currents), and underwater visibility constrained the acceptability of the both the ROV positioning and video quality. The acceptable limits were defined by data post-processing capabilities (i.e., ability to identify substrate and organisms) and ensured a consistent standard for all imagery collected. Unacceptable imagery was either rejected or aborted onboard, based on environmental or technical complications, by trained analysts and/or ROV operators. The rejected and/or aborted transects were re-attempted either immediately after retrieving the ROV, or at a later time when site conditions improved. For video transects acquired within the SAP study areas, only one of the two transects (544LA22-VT022) required a second attempt.

2.1.2 Grab Sampling

The benthic grab samples collected from the BMCC were obtained using a 0.25 m^2 (0.3-m deep) box core sediment sampler. A GoPro Hero 9 was mounted to the box corer and recorded *in situ* HD video for each benthic sample location. Grain size and infauna samples, when collected together (as was the case for both SAP stations), were collected from different portions of the retained box corer sample.

After retrieval, each sample was examined for quality and a decision was made to accept or reject the sample based on sediment volume and representativeness of the grab. Sample grabs showing evidence of uneven penetration (i.e., angled sample) or washout were rejected as unrepresentative and incomplete. In these cases, the grab was redeployed until an acceptable sample was retained. Additionally, the target recovery for infauna grab samples was a depth of 10 cm. Sample grabs that did not retain at least 8 cm of material or showed evidence of uneven penetration (i.e., angled sample) were rejected as unrepresentative and incomplete. In these cases, the grab was redeployed until an acceptable sample was retained.

Once an acceptable sample was retrieved, undisturbed sample material was photographed from above on deck. Then a set area was subsampled from each infauna grab sample, for which a plastic core liner was used as a reference. The diameter of the core liner used for field subsampling was 6.99 cm (2.75 in). Two core liners were used for each primary subsample and each backup subsample. Grain size samples were collected from the top 3 cm of sediment retained within the benthic grab sampler (surrounding the cores) and were stored in plastic bags for grain size analysis.

Field descriptions of sample recovery and sediment type (i.e., grain size) were recorded for each grab sample. Additionally, the presence of large or abundant organisms was noted. Depending on the depth of the material retained in the sampler, the top 8-10 cm of sediment in one side of the grab was removed using the core liner and a stainless-steel spoon to prevent loss of material. Material was transferred to a 500-µm bucket sieve and gently rinsed with seawater to remove fine sediments.

Sieved samples were then fixed in a solution containing 10% buffered formalin in seawater. Fixed samples were stored on the survey vessel in high density polyethylene (HDPE) quart-size sample jars and labeled with the project name, sample identification code, sampling date, preservative, and the initials of the collector. Preserved samples were returned to TRC offices for storage and laboratory analysis of benthic infauna.

2.2 Lab Analysis

2.2.1 Grain Size Analysis

Grain size analysis was completed by TDI-Brooks' geotechnical laboratory. Samples were dried at 110 ± 5 °C in an oven overnight, or longer for fine-grained samples and were then disaggregated in a ceramic mortar by either a rubber pestle or a ceramic pestle, depending on the hardness of the aggregates.

A gradation-representative specimen of the dried, disaggregated sample was weighed, then sieved through a sieve stack (with sieve number and order per client's request). The specimen-bearing sieve stack was then securely mounted on a mechanical shaker and was shaken for 10 minutes. Afterwards, sediment retained on each sieve and collected in the bottom pan were separately collected into pre-weighed tins and weighed. The mass of sediment retained on each sieve and collected in the bottom pan was then calculated by subtracting the tin mass from the total mass of sediment and tin. The sum of retained sediment mass was compared against the initial specimen mass for QC purposes. A retest was conducted if mass change was over 5% of the initial specimen mass.

Sediment mass/weight values for each sieve/grain size category were recorded in a project Excel spreadsheet and converted to percentage of the total sample for creation of grain size cumulative plots. After importing the grain size data, gradation plots were generated in Excel and included as an appendix, allowing comparison of primary sediment classification between sample locations.

2.2.2 Benthic Infauna Analysis

Upon receipt at TRC's infaunal analysis laboratory, each sample was logged in and decanted through a 500-µm sieve. Samples were gently rinsed in the sieve to remove the formalin fixative and any additional fine sediment that remained after the initial field sieving process. Once thoroughly rinsed, each sample was returned to a labeled jar and preserved with 70% ethanol for storage. Once preserved, the primary subsamples proceeded to the sorting stage. Backup subsamples were held but not processed further.

For sorting, the contents of each sample were examined using a high-power dissecting microscope (7X to 45X magnification) and high-intensity gooseneck fiber optic lamp. Organisms found during the sorting process were removed with forceps and placed in 70% ethanol. Each vial was labeled with the project name, collection date, and sample identification number. All residue (sediment and organic matter) from the sorted and unsorted portion of each sample was placed in a separate labeled container and re-preserved in 70% ethanol.

Sorted organisms were subsequently identified by a qualified taxonomist to the lowest practical taxonomic level (LPTL) using a dissecting microscope and readily available taxonomic keys and references (e.g., Bartholomew, 2001; Martinez, 1999; Pollock, 1998; Abbott and Morris, 1995; Weiss, 1995; Gosner, 1978; Bousfield, 1973; Gosner, 1971; Smith, 1964; Pettibone, 1963). Temporary slide mounts were prepared for oligochaete worms, capitellid polychaetes, and certain amphipod taxa as necessary to improve the taxonomic precision of identification for these groups. Slide-mounted organisms were identified under a compound microscope capable of 64X to 1600X magnification.

For quality assurance and control (QA/QC) purposes, a second qualified staff member (quality assurance officer) re-sorted 10% of the samples (or one, whichever was greater) analyzed by each sorter to ensure organisms were being adequately removed from the samples. The quality assurance officer checked the sorted sample material for remaining organisms and calculated an efficiency rating (*E*) using the following formula:

$$E = 100 \times \frac{n_a}{n_a + n_b}$$

Where n_a is the number of individuals originally sorted and verified as identifiable organisms by the QC checker and n_b is the number of organisms recovered by the QC checker. If the original sorter achieved *E* < 90% (i.e., less than 90% of the organisms in the sample removed), corrective action was taken to ensure greater sorting efficiency for other samples sorted by the same individual. Corrective action includes, but is not necessarily limited to, additional training on organism recognition and re-sorting of sample material.

2.3 Video Data Post-Processing

2.3.1 Objectives

Underwater videos were used to estimate relative species abundance of macro-organisms, identify point substrates (standalone boulders or anthropogenic gear), classify bottom substrate types, and mark any notable habitat features present on each 300-m transect line.

2.3.2 Methods

Each video was viewed in its entirety, a minimum of twice, to focus on different annotations. The first viewing was focused on flora, fauna, biogenic features, point substrates, and miscellaneous event notes; while the second viewing was focused on video quality, classifications of continuous substrates, and identification of seafloor features. Videos were viewed on VLC Media Player at 0.70x speed.

Identification of fauna was completed to the LPIL for video imagery by marine taxonomists. To ensure accurate and consistent flora and fauna identifications, video analysts consulted taxonomic reference guides (e.g., Kells and Carpenter, 2011; Martinez, 1999; Taylor and Villalard, 1972). Although the target identification level for fish and macroinvertebrates was genus/species, some identifications were left at a higher taxonomic level, especially if a specimen could not be confidently identified due to video quality, obscured diagnostic features, or other complicating factor.

No flora was identified along either transect within the SAP areas, therefore, flora identification methodology has been excluded from this report.

Observations of fauna were noted and assigned an overall relative abundance as categorized by the ACFOR scale (abundant, common, frequent, occasional, and rare). This method provides a generalized characterization of taxa distribution along the video transects. The ACFOR method is a semi-quantitative scale often used for the rapid assessment of species composition and abundance. The following category definitions were used for the evaluation of underwater video transects:

- Abundant: observed in high densities (individuals per unit area) over the majority of the transect. An example of this would be the extensive fields of common sand dollar *(Echinarachnius parma)* observed along both transects.

- Common: observed many times over the course of the transect, but in moderate densities.

- Frequent: observed several times over the course of the transect but in low densities or patchy distribution of high-density occurrences.

- Occasional: observed multiple times over the course of the transect in very low densities (one to two individuals per occurrence) or infrequent patchy distribution of moderate density occurrences.

- Rare: present, but infrequently observed over the course of the transect (typically limited to a single individual).

Video analysts assigned transect substrate types based on the NMFS 2021 guidelines, defined in "Updated Recommendations for Mapping Fish Habitat" guidance dated March 29, 2021.

2.4 Benthic Infauna Data Post-Processing

2.4.1 Taxonomic Composition

2.4.1.1 Macrofaunal Density

Macrofaunal density is a measure of abundance expressed as an estimate of the number of individuals per unit area. Although macrofaunal density can reflect the productivity of marine habitats (Taylor, 1998), it may also serve as an indication of stress or disturbance at a location (Dean, 2008). Consequently, the density of benthic organisms may increase or decrease in response to different types of stress (e.g., thermal or chemical pollution, sediment deposition, physical abrasion or displacement) (Dean, 2008; Thrush and Dayton, 2002).

The density of benthic organisms responds to disturbance as mitigated by the tolerance (or preference) of a given organism to the particular source of disturbance. However, density may vary substantially over small areas or short periods of time and should therefore be interpreted cautiously. For this study, macrofaunal density is expressed as the number of organisms per square meter.

2.4.2 Richness, Diversity, Evenness

2.4.2.1 Shannon Diversity

The Shannon index is a univariate summary measure of diversity that is influenced by both the number of taxa in a sample and the evenness of organism distribution between taxa, and is calculated as follows:

$$\text{Shannon Index } (H') = 1\sum_{i=1}^{n} p_i \ln p_i$$

Where p_i is the proportion of total individual represented by taxa I, ln is the natural log, and n is the number of taxa. Lower Shannon index values indicate lower diversity (samples with only one taxa will have a Shannon index of 0), and higher values indicate increasing diversity. Diversity increases both with greater taxa richness and with great uniformity in the distribution of organisms between taxa. PRIMER v7 was used to calculate Shannon diversity using enumeration data for each sample.

2.4.2.2 Pielou's Evenness

Pielou's evenness is a univariate summary measure of the evenness of organism distribution between different taxa within a sample, and is calculated as follows:

$$\text{Pielou's Evenness } (J') = \frac{H'}{\ln S}$$

Where H' is the Shannon diversity index value and ln$S$ is the maximum possible Shannon diversity index value (H'_{max}). Pielou's evenness is constrained between 0 and 1, with higher values indicating greater evenness (in a sample where all taxa are represented at the same density Pielou's evenness would equal 1). PRIMER v7 was used to calculate Pielou's evenness using enumeration data for each sample.

3. RESULTS

3.1 Video Analysis

Characteristics and location of two priority SAP underwater video transects within the 544 lease area are described in Table 3.1-1 and shown in Figure 2.1-1 and Figure 2.1-2. Run-in/out distances were removed to accurately constrain the distance of each transect so that only the designated areas of each proposed line were then used for analysis.

Table 3.1-1 Underwater video transect details for two proposed 544 SAP areas.

Site	Transect	Date	Duration (min)	Length (m)	Start Time	End Time	Equipment
SAP-1	VT022	9/3/2022	~18 mins.	300	10:00	10:18	DeepTrekker REVOLUTION
SAP-2	VT017	9/1/2022	~17.5 mins.	300	09:51	10:08	DeepTrekker REVOLUTION

3.1.1 Fauna Counts

Relative abundance, localized density and taxonomic identification of visible invertebrates and fish were recorded during the video review process. Organisms were identified to the LPTL, usually Order or Family. Among the common groups were hermit crabs (Paguridae) observed 45 and 73 times respectively, in VT022 and VT017 (Figure 3.1-1). Sea scallops were seen frequently along both transects. The most abundant organism was the common sand dollar, *Echinarachnius parma*, present in high abundance along both SAP transects.

Table 3.1.1-1 Fauna counts from review of the two video transects at potential SAP areas.

LPTL	Common Name	Counts per Transect		ACFOR	
		SAP-1 VT022	SAP-2 VT017	SAP-1 VT022	SAP-2 VT017
Cerianthidae	Burrowing Anemone	4	1	Occasional	Rare
Cancer borealis	Cancer Crab	3	3	Occasional	Occasional
Pisces	Fish		1		Rare
Pleuronectidae	Flounder		1		Rare
Paguridae	Hermit Crab	45	73	Common	Common
Polychaeta	Polychaete		1		Rare
Placopecten magellanicus	Sea Scallop	10	14	Frequent	Frequent
Luecoraja sp.	Skate		1		Rare
Leucoraja sp.	Skate Egg Case		1		Rare
Cliona	Sponge	1	2	Occasional	Rare

Table 3.1.1-1 Fauna counts from review of the two video transects at potential SAP areas (Continued)

LPTL	Common Name	Counts per Transect SAP-1 VT022	Counts per Transect SAP-2 VT017	ACFOR SAP-1 VT022	ACFOR SAP-2 VT017
Busycon carica	Whelk (knobbed)		1		Rare
Naticidae	Moon Snail Eggs	1		Rare	
Gastropoda	Snail	1		Rare	
Echinarachnius parma	Common Sand Dollar	100s	100s	Abundant	Abundant

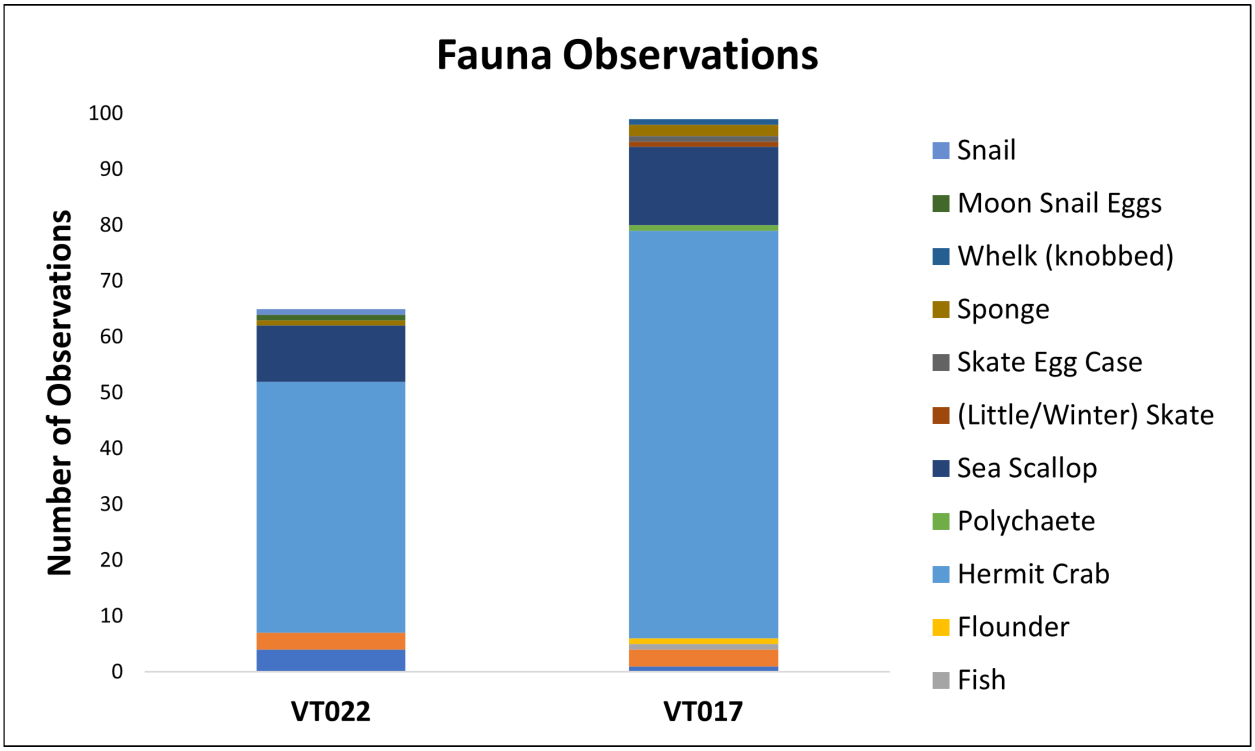


Figure 3.1.1-1 Observed fauna from proposed SAP study areas.

*Note: Sand dollars have been removed from the above figure as the extremely high number of observations caused the appearance of the graphs to be skewed.

3.2 Grab Samples

A total of two priority grab samples were made in the 544 Lease Area, one sample (GB019) was taken in SAP-1, the second sample (GB012) was taken in SAP-2 (Table 3.2-1).

Table 3.2-1 Location, Date of Grab Sampling, and Depth for 544 SAP sites.

Site	Sample	Date	X	Y	Water Depth (m)
SAP-1	544LA22-GB019	9/2/2022	4455599.67	661218.35	42.3
SAP-2	544LA22-GB012	9/1/2022	4457571.34	664878.73	43.2

3.2.1 Sediment Analysis

Results of particle size distribution analyses from TDI-Brooks are presented from two grab samples collected in the 544 Lease Area SAP areas. Samples from the two grabs, GB019 and GB012 were generally sandy, comprised of 98.09 % and 97.81 % sand, respectively (Table 3.2.1-1). Only a tiny fraction of gravel-sized particles was present in samples (Figure 3.2.1-1). GB012 had a higher proportion of Gravel (2.15%) and Fine Sand (55.36%) compared to GB019 (1.14% and 42.75%, respectively).

Table 3.2.1-1 Grain size composition with sand type and percentage of total shown.

Sample	% Gravel (> 4.75 mm)	% Coarse Sand (2-4.75 mm)	% Medium Sand (0.41-2 mm)	% Fine Sand (0.075-0.41 mm)	Silt and Clay (< 0.075 mm)	Total Sand
GB019	1.14	11.52	45.35	42.75	0.12	98.09
GB012	2.15	11.35	32.96	55.36	0.04	97.81

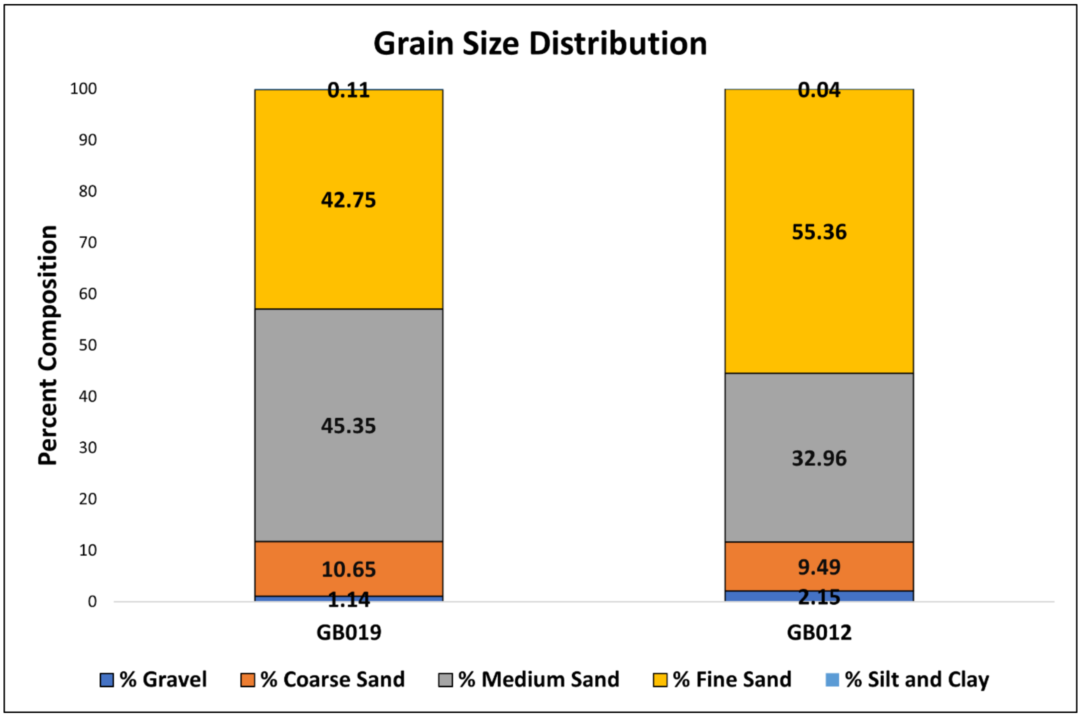


Figure 3.2.1-1 Distribution of particle size classes among the two grab samples collected from the potential SAP study areas.

3.2.2 Benthic Community Analysis

3.2.2.1 Taxonomic Composition

Two successful grab samples at the SAP areas yielded a total of 52 individuals from 5 phyla with 13 unique taxa groups identified to the lowest practical taxonomic level (LPTL). Annelida was the dominant phyla accounting for 86% of the total abundance (Figure 3.2.2.1-1) and more than half of the unique taxa found within the samples (Figure 3.2.2.1-2, Table 3.2.2.1-1).

Table 3.2.2.1-1 Phyla present in two benthic grab samples.

Phyla	Dominant Genera/Species	Density (Individuals m^{-2})	Number of Taxa
Annelida	Polygordius, Glycera	2,935	7
Arthropoda	*Byblis serrata, Phoxocephalus sp.*	195	3
Mollusca		130	1
Echinodermata	*Echinarachnius parma*	65	1
Nemertea	Ribbon Worms	65	1
Totals		**3392**	**13**

Infauna abundance was greater at SAP-1 with 37 individuals found in grab GB019 compared to 15 individuals in grab GB012 at SAP-2 (Figure 3.2.2.1-1). Percent composition for each phyla at individual SAP areas is shown in Figure 3.2.2.1-3 and Table 3.2.2.1-2.

Table 3.2.2.1-2 Phylum abundance (number of individuals) within each grab sample.

Station	Annelida	Arthropoda	Mollllusca	Echinodermata	Nemertea	Total Abundance
SAP-1	32	2	2	1	0	37
SAP-2	13	1	0	0	1	15
Totals	**45**	**3**	**2**	**1**	**1**	**52**

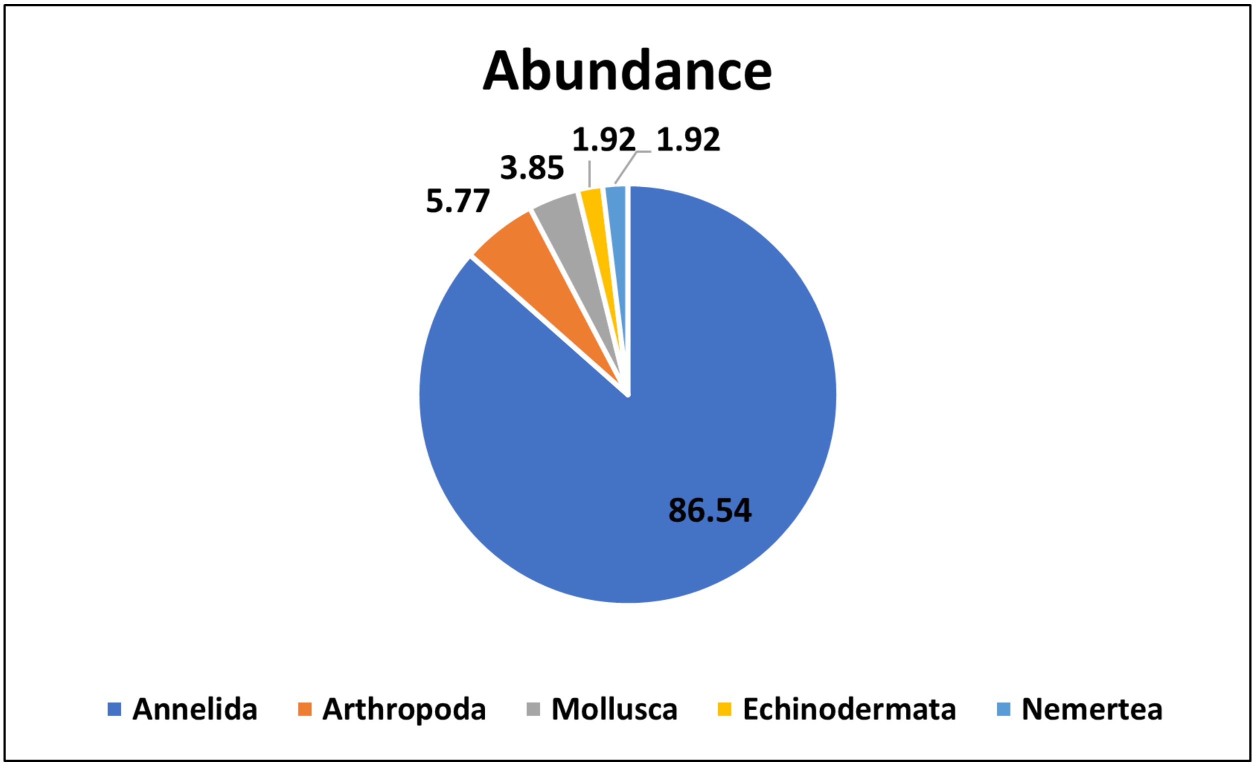


Figure 3.2.2.1-1 Proportion of abundance of infauna individuals within each phylum for SAP-1 and SAP-2 sites.

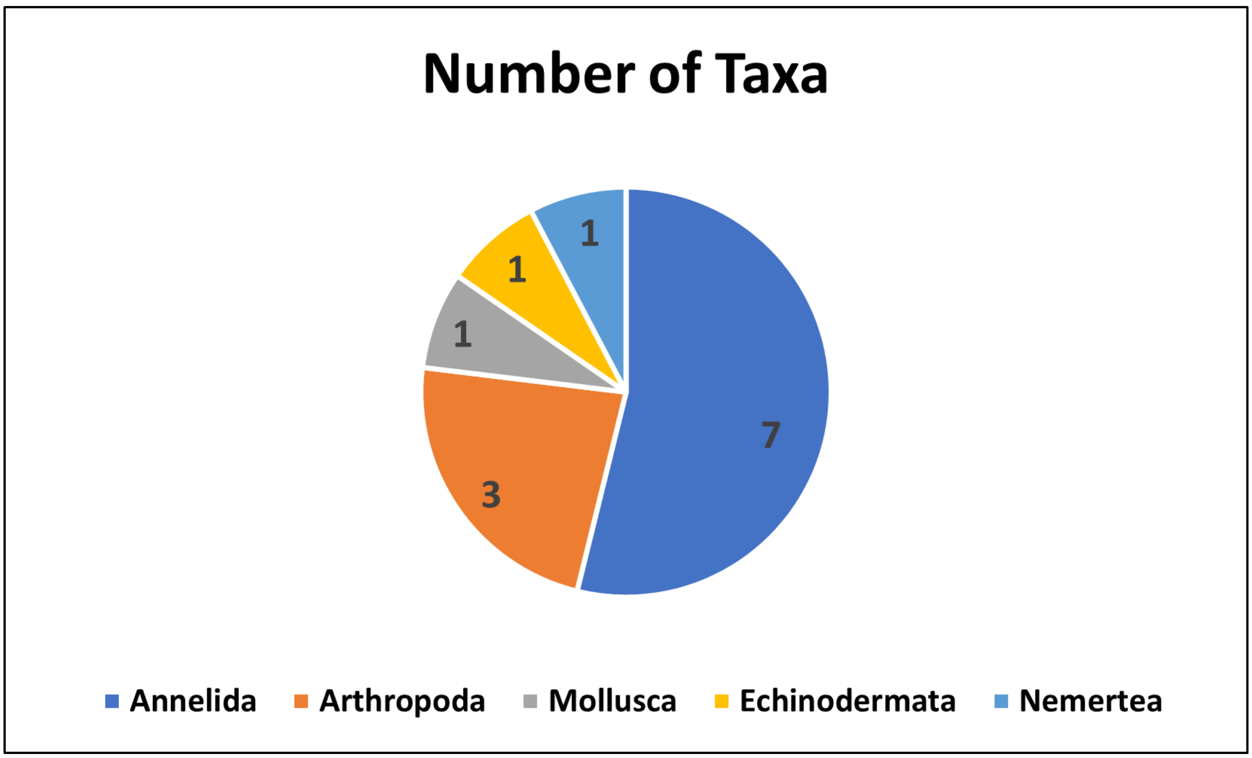


Figure 3.2.2.1-2 Number of identified taxa within each Phylum.

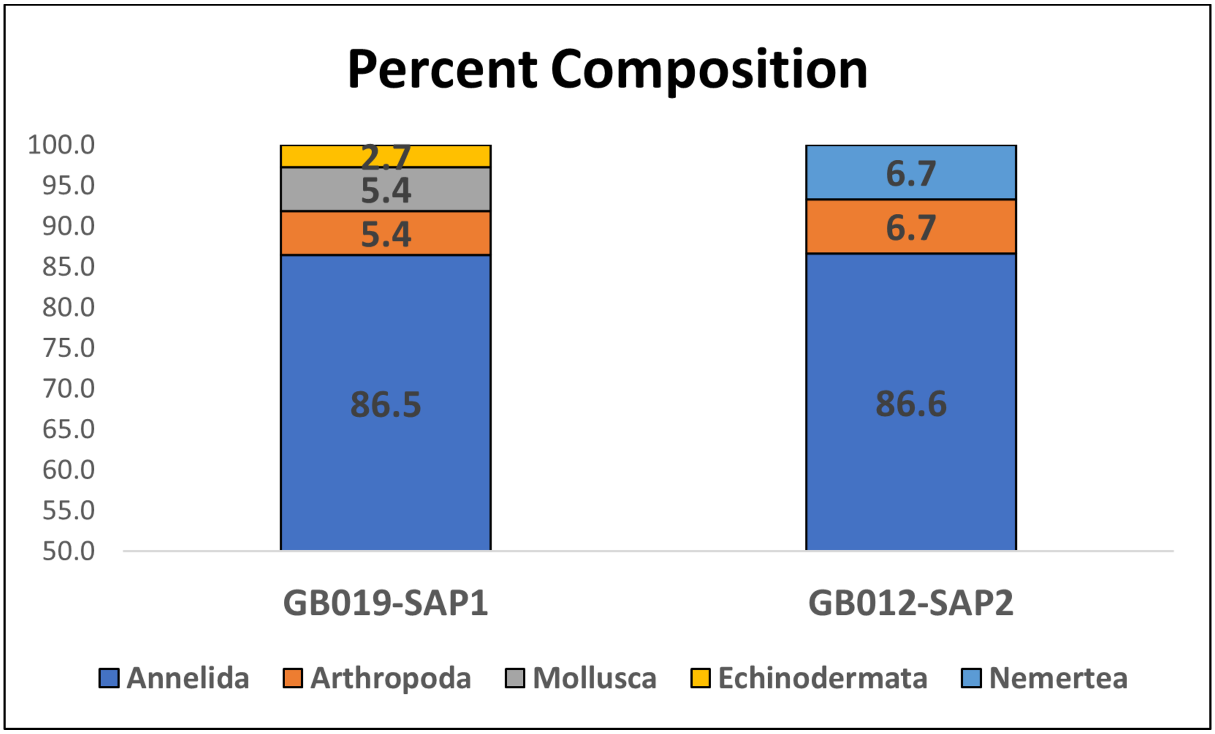


Figure 3.2.2.1-3 Composition of infauna as a percentage of the total community within a phylum.

3.2.2.2 SAP-1 GB019

Infauna community numbers were dominated by annelids at SAP-1 with 32 of the total 37 individuals in the Class Polychaeta. Among the polychaetes, a single species, *Scalibregma inflatum*, was numerically dominant, responsible for 72% of the abundance among all invertebrates enumerated (Table 3.2.2.2-1). Annelida, Arthropoda, and Mollusca accounted for all but one individual at this site.

Table 3.2.2.2-1 Abundance and density of infauna found in benthic grab sample from SAP-1.

Phyla	Family or LPTL	Abundance (#)	Density (Ind. m^{-2})
Annelida	*Polygordius sp.*	23	3001
	Scoletoma sp.	2	261
	Scalibregma inflatum	1	130
	Goniadidae	5	652
	Ampharetidae	1	130
Total Annelida		**32**	**4175**
Arthropoda	Tanaidacea	1	130
	Byblis serrata	1	130
Total Arthropoda		**2**	**260**
Mollusca	Bivalvia	**2**	**260**
Echinodermata	*Echinarachnius parma*	**1**	**130**
Total Abundance at SAP-1 – GB019		**37**	**4828**

3.2.2.3 SAP-2 GB012

Organisms collected in GB012 at SAP-2 belonged to three phyla with one individual for both Arthropoda and Nemertea. The other 13 individuals belonged to Annelida (Table 3.2.2.3-1). Annelids were evenly spread among 4 taxa, including Nadid oligochaetes. *Polgordius* sp. was the most abundant annelid with 5 individuals.

Table 3.2.2.3-1 Abundance and density of infauna found in benthic grab sample from SAP-2.

Phyla	Family or LPTL	Abundance (#)	Density (Ind. m^{-2})
Annelida	*Polygordius sp.*	5	652
	Glycera capitata	3	391
	Scalibregma inflatum	2	260
	Nadidae with chaeta hair	3	391
Total Annelida		**13**	**1696**
Arthropoda	*Phoxocephalus sp.*	**1**	**130**
Nemertea	Nemertea	**1**	**130**
Total Abundance at SAP-2 – GB012		**15**	**1957**

3.2.3 Richness, Diversity, and Evenness

Taxonomic richness among the two grab samples was similar; however, the distribution of species or LPTL affected the ecological measures of health. SAP-1 was characterized by a high richness value (Margalef's d) due to the greater number of taxa, but overall diversity and evenness was suppressed due to the dominance of *Scalibregma inflatum* in the sample (Table 3.2.3-1). SAP-2 was a more diverse (H') and had a more equitable spread of species as a community despite a lower number of individuals found or taxa represented.

Table 3.2.3-1 Ecological metrics of infauna communities at two SAP sites.

Station	Density (Ind. m^{-2})	# of Taxa	Ecological Indices		
			Richness (d)	Diversity (H')	Evenness (J')
SAP-1	4,175	23	2.2155	1.3694	0.62324
SAP-2	1,826	5	1.8463	1.6397	0.91514
Average	**3392**	**14**	**2.031**	**1.505**	**0.769**

4. CMECS CLASSIFICATIONS

Benthic habitats in the two analyzed video transects (one per SAP) were classified in accordance with NMFS 2021 guidelines, defined in “Updated Recommendations for Mapping Fish Habitat” guidance dated March 29, 2021. This guidance modifies the Coastal and Marine Ecological Classification Standard (CMECS) for use in classifying benthic habitats for offshore wind projects. A simplified graphic depicting the NMFS-modified CMECS approach is presented as a decision tree in Figures 4-1 and 4-2. Classifications were determined based on visual observations in the transect videos and supported by grain size analysis (GSA) results from the nearby sediment grabs. Additionally, sediment grabs were assigned (NMFS modified) CMECS classifications based on GSA results.

Figure 4-3 shows the images of each grab sample after retrieval, along with their assigned CMECS substrate subgroup classifications, while Figures 4-4 to 4-6 depict screen captures of representative conditions observed along the video transects as well as their assigned habitat types and primary substrate type.

Grab samples retrieved from both SAP areas were classified under the CMECS substrate subgroup of Medium Sand (both ~ 98%). Additionally, all substrate observed along both video transects falls within the CMECS substrate group of Sand. In summary, as observed in the grab samples and video imagery, and suggested by the sonar reflectivity interpreted over the remainder of the area, the two SAP areas are designated entirely as soft bottom habitat with lesser percentages of shells and gravel which define this classification.

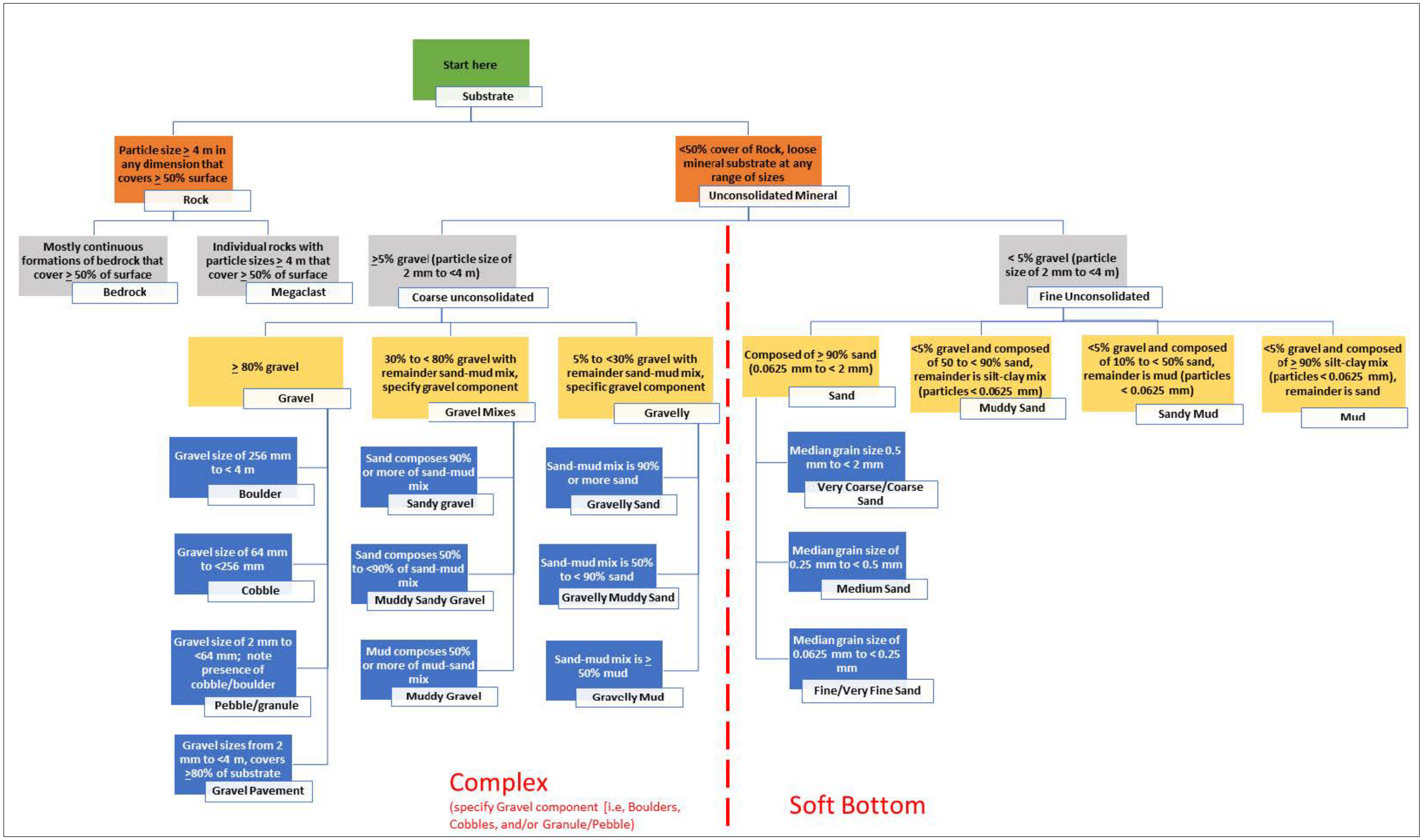


Figure 4-1 NMFS-Modified CMECS Decision Tree (Substrate)

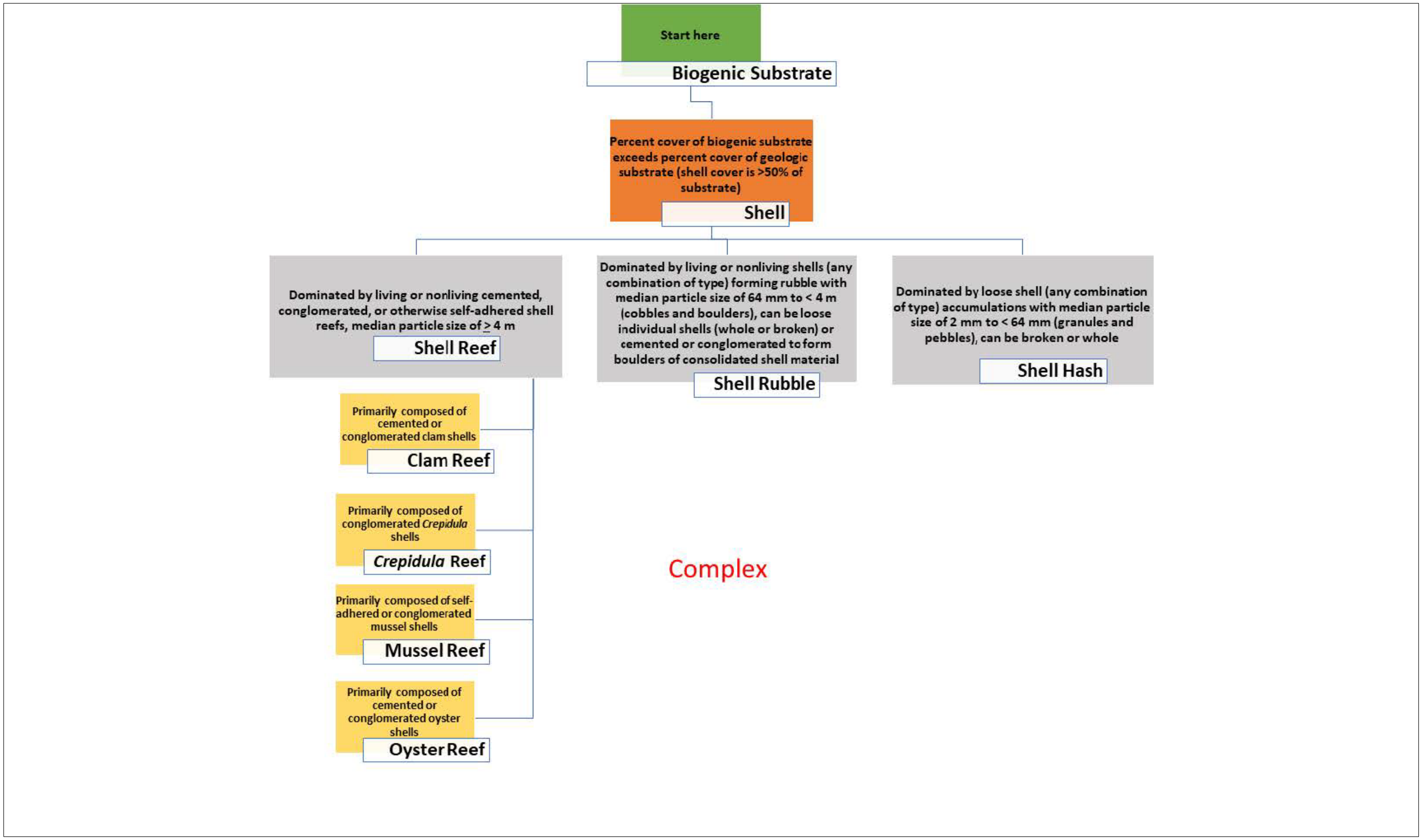
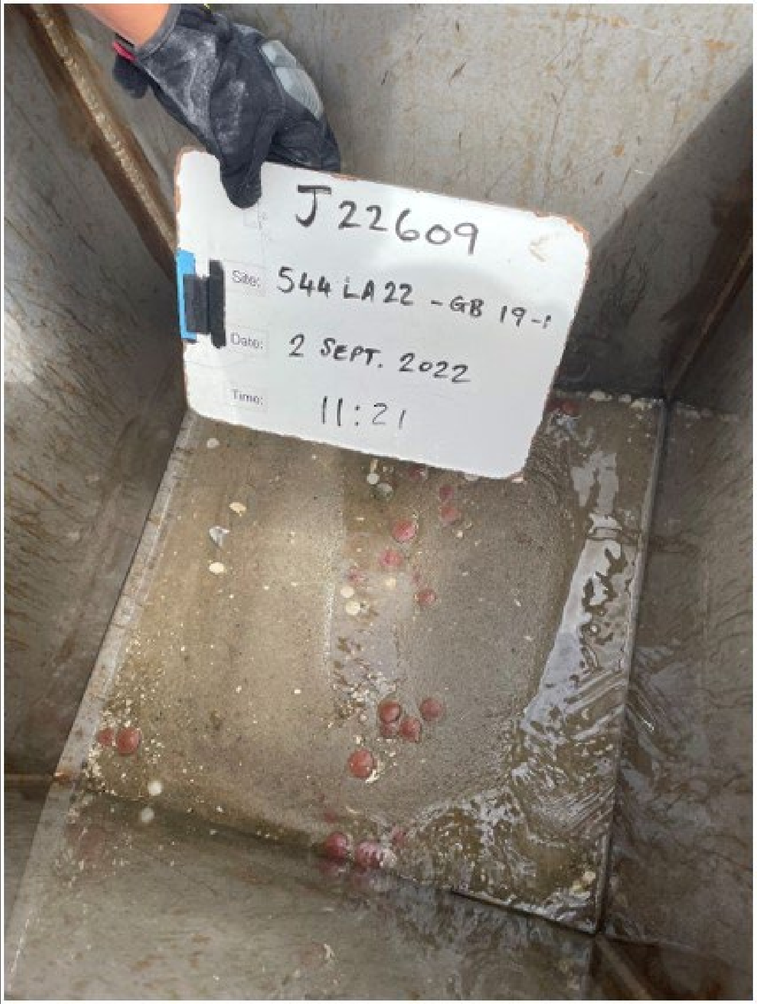
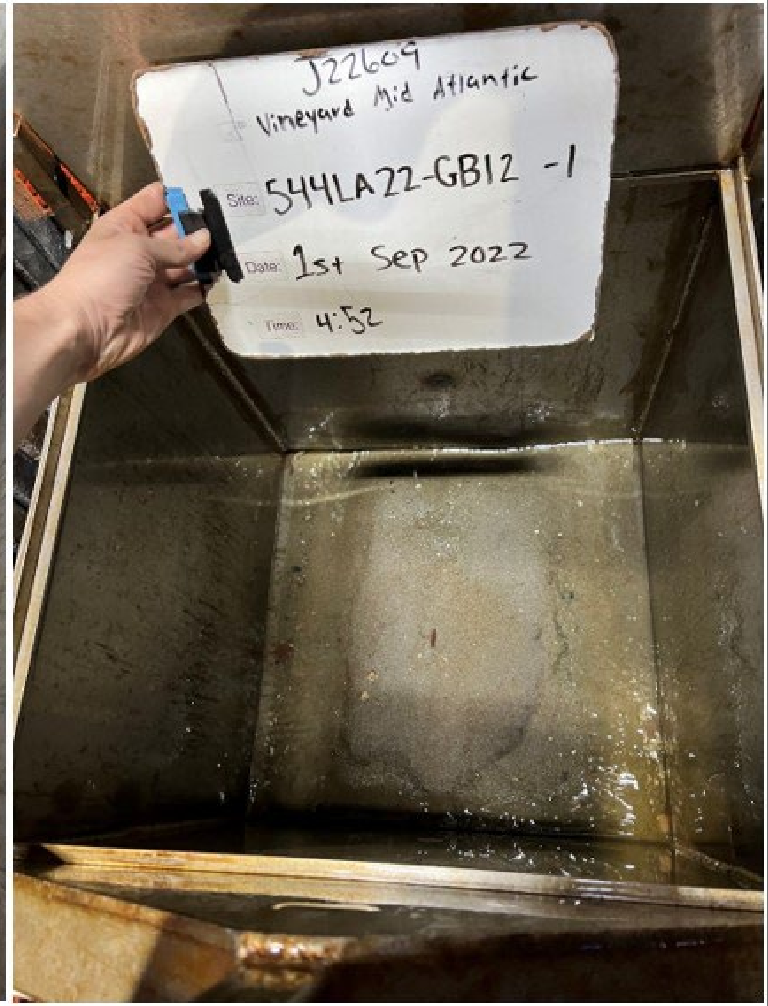


Figure 4-2 NMFS-Modified CMECS Decision Tree (Biogenic Substrate)





SAP-1: GB019; Medium Sand	SAP-2: GB012; Medium Sand

Figure 4-3 Deck images of grab samples, along with CMECS classifications

Figure 4-4 VT022 Representative image of SAP-1 VT022; Soft Bottom Habitat

Figure 4-5 VT022 Representative image of SAP-1 VT022; Soft Bottom Habitat

Figure 4-6 VT022 Representative image of SAP-2 VT017; Soft Bottom Habitat

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Vineyard Mid-Atlantic Site Assessment Plan

Appendix E

New York State Department of State General Concurrence Letter

Prepared by:
Geo SubSea LLC

In association with:

TDI-Brooks International, Inc & TRC

Prepared for:
Vineyard Mid-Atlantic LLC

January 2024

STATE OF NEW YORK
DEPARTMENT OF STATE
ONE COMMERCE PLAZA
99 WASHINGTON AVENUE
ALBANY, NY 12231-0001
HTTPS://DOS.NY.GOV

KATHY HOCHUL
GOVERNOR

ROBERT J. RODRIGUEZ
SECRETARY OF STATE

October 26, 2023

Jill Rowe
Epsilon Associates
3 Main & Mill Place, Ste 250
Maynard, MA 01754
Jrowe@epsilonassociates.com

Re: F-2023-0639
U.S. Army Corps of Engineers/New York District
Permit Application – ***Vineyard Mid-Atlantic, LLC.***
Installation and maintenance of one metocean buoy and one Trawl Resistant Bottom Mount in Lease Area OCS-A 0544 for 2-5 years.
Atlantic Ocean
General Concurrence

Dear Jill Rowe:

The Department of State (DOS) received your Federal Consistency Assessment Form and consistency certification and supporting information for this proposal on September 6, 2023.

The Department of State has determined that this proposal meets the Department's general consistency concurrence criteria. Therefore, further review of the proposed activity by the Department of State and the Department's concurrence with an individual consistency certification for the proposed activity are not required.

This determination is without prejudice to and does not obviate the need to obtain all other applicable licenses, permits, and other forms of authorizations or approvals which may be required pursuant to existing New York State statutes.

The Department recognizes that following the survey activities proposed in this action Vineyard Mid-Atlantic may propose to install wind turbine generators and electric transmission lines in the area being surveyed and develop its lease area. Please be advised of the applicability of New York's recently approved Renewable Energy Geographic Location Description (GLD)[1], which extends DOS's federal consistency review of specific activities (such as offshore wind development) in this geographic area.

As with all major infrastructure projects, early and continual coordination with all applicable regulatory and resource agencies will ensure that relevant concerns are understood and can be addressed early in the project planning. Therefore, the Department strongly advises Vineyard Mid-Atlantic contact us early in the process to discuss additional information and data needs anticipated as part of DOS's future federal consistency reviews of the Project.

[1] The NOAA-approved GLD can be found at https://dos.ny.gov/projects-outer-continental-shelf

For similar projects, the Department has found the following types of information are useful in supporting an applicant's consistency certification:

1. A robust alternatives analysis that includes all relevant project components and methods including consideration of relevant plans and assessments (e.g., NYSERDA Cable Corridor Constraints Assessment Report [NYSERDA, 2023]).
2. A detailed project description of the full range of activities, accessory facilities and support activities (e.g., installation methods, disturbance extents, burial depths, proximity to recreational uses, proximity to special area designations, interconnection facilities, types of vessels and specific ports engaged in construction activities, Operations & Maintenance facility upgrades and use, staging and marshaling activities, proximity to existing infrastructure, etc.)
3. A description of potential effects on existing land and ocean uses.
4. A description of any proposed avoidance, minimization, and mitigation measures.
5. A description of the construction, operation, and decommissioning phases of the project.
6. Shapefiles for project components, including metadata and a data dictionary. Please also consider providing this information to the Mid-Atlantic Ocean Data Portal (https://portal.midatlanticocean.org/) and the Northeast Ocean Data Portal (https://www.northeastoceandata.org/).

When communicating with us regarding this matter, please contact us at (518) 474-6000 and refer to our file #F-2023-0639.

Sincerely,

Rebecca Ferres
Supervisor, Consistency Review Unit
Office of Planning, Development and
Community Infrastructure

MK/RF
ecc: COE – Christopher Minck
DEC Central – Karen Gaidasz
Applicant – Rachel Pachter, Vineyard Offshore

VINEYARD OFFSHORE

Attachment 6.3-1: [redacted]

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PUBLIC

Attachment 6.3-2: [redacted]

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VINEYARD OFFSHORE

Attachment 6.3-3: [redacted]

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Attachment 6.4-1: [redacted]

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