Leading Light Wind

Attachments to Section 2

Attachment 2.1

BOEM Lease for OCS-A 0542

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Office of Renewable
Energy Programs

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF OCEAN ENERGY MANAGEMENT **COMMERCIAL LEASE OF SUBMERGED LANDS FOR RENEWABLE ENERGY DEVELOPMENT ON THE OUTER CONTINENTAL SHELF** ***Paperwork Reduction Act of 1995 statement:*** *This form does not constitute an information collection as defined by 44 U.S.C. § 3501 et seq. and therefore does not require approval by the Office of Management and Budget.*	Office Sterling, VA	Renewable Energy Lease Number OCS-A 0542
	Cash Bonus and/or Acquisition Fee $645,000,000.00	Resource Type Wind
	Effective Date May 1, 2022	Block Number(s) See Addendum A

This lease, which includes any addenda hereto, is hereby entered into by and between the United States of America, ("Lessor"), acting through the Bureau of Ocean Energy Management ("BOEM"), its authorized officer, and

Lessee	Interest Held
Invenergy Wind Offshore LLC	100%

("Lessee"). This lease is effective on the date written above ("Effective Date") and will continue in effect until the lease terminates as set forth in Addendum "B." In consideration of any cash payment heretofore made by the Lessee to the Lessor and in consideration of the promises, terms, conditions, covenants, and stipulations contained herein and attached hereto, the Lessee and the Lessor agree as follows:

Section 1: Statutes and Regulations.

This lease is issued pursuant to subsection 8(p) of the Outer Continental Shelf Lands Act ("the Act"), 43 U.S.C. §§ 1331 *et seq.* This lease is subject to the Act and regulations promulgated pursuant to the Act, including but not limited to, offshore renewable energy and alternate use regulations at 30 CFR Part 585 as well as other applicable statutes and regulations in existence on the Effective Date of this lease. This lease is also subject to those statutes enacted (including amendments to the Act or other statutes) and regulations promulgated thereafter, except to the extent that they explicitly conflict with an express provision of this lease. It is expressly understood that amendments to existing statutes, including but not limited to the Act, and regulations may be made, and/or new statutes may be enacted or new regulations promulgated, which do not explicitly conflict with an express provision of this lease, and that the Lessee bears the risk that such amendments, regulations, and statutes may increase or decrease the Lessee's obligations under the lease.

Section 2: Rights of the Lessee.

(a) The Lessor hereby grants and leases to the Lessee the exclusive right and privilege, subject to the terms and conditions of this lease and applicable regulations, to:

(1) submit to the Lessor for approval a Site Assessment Plan (SAP) and Construction and Operations Plan (COP) for the project identified in Addendum "A" of this lease; and (2) conduct activities in the area identified in Addendum "A" of this lease ("leased area") and/or Addendum "D" of this lease ("project easement(s)"), that are described in a SAP or COP that has been approved by the Lessor. This lease does not, by itself, authorize any activity within the leased area.

(b) The rights granted to the Lessee herein are limited to those activities described in any SAP or COP approved by the Lessor. The rights granted to the Lessee are limited by the lease-specific terms, conditions, and stipulations required by the Lessor per Addendum "C."

(c) This lease does not authorize the Lessee to conduct activities on the Outer Continental Shelf (OCS) relating to or associated with the exploration for, or development or production of, oil, gas, other seabed minerals, or renewable energy resources other than those renewable energy resources identified in Addendum "A."

Section 3: Reservations to the Lessor.

(a) All rights in the leased area and project easement(s) not expressly granted to the Lessee by the Act, applicable regulations, this lease, or any approved SAP or COP, are hereby reserved to the Lessor.

(b) The Lessor will decide whether to approve a SAP or COP in accordance with the applicable regulations in 30 CFR Part 585. The Lessor retains the right to disapprove a SAP or COP based on the Lessor's determination that the proposed activities would have unacceptable environmental consequences, would conflict with one or more of the requirements set forth in subsection 8(p)(4) of the Act (43 U.S.C. § 1337(p)(4)), or for other reasons provided by the Lessor pursuant to 30 CFR 585.613(e)(2) or 30 CFR 585.628(f)(2). Disapproval of plans will not subject the Lessor to liability under the lease. The Lessor also retains the right to approve with modifications a SAP or COP, as provided in applicable regulations.

(c) The Lessor reserves the right to suspend the Lessee's operations in accordance with the national security and defense provisions of Section 12 of the Act and applicable regulations.

(d) The Lessor reserves the right to authorize other uses within the leased area and project easements(s) that will not unreasonably interfere with activities described in an approved SAP and/or COP, pursuant to this lease.

Section 4: Payments.

(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."

(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."

Section 5: Plans.

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.

Section 6: Associated Project Easement(s).

Pursuant to 30 CFR 585.200(b), the Lessee has the right to one or more project easement(s), without further competition, for the purpose of installing gathering, transmission, and distribution cables, pipelines, and appurtenances on the OCS, as necessary for the full enjoyment of the lease, and under applicable regulations in 30 CFR Part 585. As part of submitting a COP for approval, the Lessee may request that one or more easement(s) be granted by the Lessor. If the Lessee requests that one or more easement(s) be granted when submitting a COP for approval, such project easements will be granted by the Lessor in accordance with the Act and applicable regulations in 30 CFR Part 585 upon approval of the COP in which the Lessee has demonstrated a need for such easements. Such easements must be in a location acceptable to the Lessor, and will be subject to such conditions as the Lessor may require. The project easement(s) that would be issued in conjunction with an approved COP under this lease will be described in Addendum "D" to this lease, which will be updated as necessary.

Section 7: Conduct of Activities.

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:

(a) 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;

(b) could cause any undue harm or damage to the environment;

(c) could create hazardous or unsafe conditions; or

(d) 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.

Section 8: Violations, Suspensions, Cancellations, and Remedies.

If the Lessee fails to comply with (1) any of the applicable provisions of the Act or regulations, (2) the approved SAP or COP, or (3) the terms of this lease, including associated Addenda, the Lessor may exercise any of the remedies that are provided under the Act and applicable regulations, including, without limitation, issuance of cessation of operations orders, suspension or cancellation of the lease, and/or the imposition of penalties, in accordance with the Act and applicable regulations.

The Lessor may also cancel this lease for reasons set forth in subsection 5(a)(2) of the Act (43 U.S.C. § 1334(a)(2)), or for other reasons provided by the Lessor pursuant to 30 CFR 585.437.

Non-enforcement by the Lessor of a remedy for any particular violation of the applicable provisions of the Act or regulations, or the terms of this lease, will not prevent the Lessor from exercising any remedy, including cancellation of this lease, for any other violation or for the same violation occurring at any other time.

Section 9: Indemnification.

The Lessee hereby agrees to indemnify the Lessor for, and hold the Lessor harmless from, any claim caused by or resulting from any of the Lessee's operations or activities on the leased area or project easement(s) or arising out of any activities conducted by or on behalf of the Lessee or its employees, contractors (including Operator, if applicable), subcontractors, or their employees, under this lease, including claims for:

a. loss or damage to natural resources,
b. the release of any petroleum or any Hazardous Materials,
c. other environmental injury of any kind,
d. damage to property,
e. injury to persons, and/or
f. costs or expenses incurred by the Lessor.

Except as provided in any addenda to this lease, the Lessee will not be liable for any losses or damages proximately caused by the activities of the Lessor or the Lessor's employees, contractors, subcontractors, or their employees. The Lessee must pay the Lessor for damage, cost, or expense due and pursuant to this Section within 90 days after written demand by the Lessor. Nothing in this lease will be construed to waive any liability or relieve the Lessee from any penalties, sanctions, or claims that would otherwise apply by statute, regulation, operation of law, or could be imposed by the Lessor or other government agency acting under such laws.

"Hazardous Material" means

1. A "hazardous substance" or a "pollutant or contaminant" as defined by the *Comprehensive Environmental Response, Compensation, and Liability Act* at 42 U.S.C. §§ 9601(14) and (33);
2. Any "regulated substance" as defined by the Resource Conservation and Recovery Act ("RCRA") at 42 U.S.C. § 6991(7), whether or not contained in or released from underground storage tanks, and any hazardous waste regulated under RCRA pursuant to 42 U.S.C. §§ 6921 *et seq.*;
3. "Oil," as defined by the Clean Water Act at 33 U.S.C. § 1321(a)(1) and the Oil Pollution Act at 33 U.S.C. § 2701(23); or
4. Other substances that applicable Federal, state, tribal, or local laws define and regulate as "hazardous."

Section 10: Financial Assurance.

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." As required by the applicable regulations in 30 CFR Part 585, if, at any time during the term of this lease, the Lessor requires additional financial assurance, then the Lessee must furnish the additional financial assurance required by the Lessor in a form acceptable to the Lessor within 90 days after receipt of the Lessor's notice of such adjustment.

Section 11: Assignment or Transfer of Lease.

This lease may not be assigned or transferred in whole or in part without written approval of the Lessor. The Lessor reserves the right, in its sole discretion, to deny approval of the Lessee's application to transfer or assign all or part of this lease. Any assignment will be effective on the date

the Lessor approves the Lessee's application. Any assignment made in contravention of this section is void.

Section 12: Relinquishment of Lease.

The Lessee may relinquish this entire lease or any officially designated subdivision thereof by filing with the appropriate office of the Lessor a written relinquishment application, in accordance with applicable regulations in 30 CFR Part 585. No relinquishment of this lease or any portion thereof will relieve the Lessee or its surety of the obligations accrued hereunder, including but not limited to, the responsibility to remove property and restore the leased area and project easement(s) pursuant to section 13 of this lease and applicable regulations.

Section 13: Removal of Property and Restoration of the Leased Area and Project Easement(s) on Termination of Lease.

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 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: Safety Requirements.

The Lessee must:

a. 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;

b. 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

c. 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.

Section 15: Debarment Compliance.

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.

Section 16: Equal Opportunity Clause.

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)), 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. Paragraphs (1) through (7) of Section 202 of Executive Order 11246, as amended, are incorporated in this lease by reference.

Section 17: Certification of Nonsegregated Facilities.

By entering into this lease, the Lessee certifies, as specified in 41 CFR 60-1.8, that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. As used in this certification, the term "facilities" means, but is not limited to, any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees. Segregated facilities include those that are segregated by explicit directive or those that are in fact segregated on the basis of race, color, religion, sex, or national origin, because of habit, local custom, or otherwise; provided, that separate or single-user restrooms and necessary dressing or sleeping areas must be provided to assure privacy as appropriate. The Lessee further agrees that it will obtain identical certifications from proposed contractors and subcontractors prior to awarding contracts or subcontracts unless they are exempt under 41 CFR 60-1.5.

Section 18: Notices.

All notices or reports provided from one party to the other under the terms of this lease must be in writing, except as provided herein and in the applicable regulations in 30 CFR Part 585. Written notices and reports must be delivered to the Lessee's or Lessor's Lease Representative, as specifically listed in Addendum "A," either electronically, by hand, by facsimile, or by United States first class mail, adequate postage prepaid. Each party must, as soon as practicable, notify the other of a change to their Lessee's or Lessor's Contact Information listed in Addendum "A" by a written notice signed by a duly authorized signatory and delivered by hand or United States first class mail, adequate postage prepaid. Until such notice is delivered as provided in this section, the last recorded contact information for either party will be deemed current for service of all notices and reports required under this lease. For all operational matters, notices and reports must be provided to the party's Operations Representative, as specifically listed in Addendum "A," as well as the Lease Representative.

Section 19: Severability Clause.

If any provision of this lease is held unenforceable, all remaining provisions of this lease will remain in full force and effect.

Section 20: Modification.

Unless otherwise authorized by the applicable regulations in 30 CFR Part 585, this lease may be modified or amended only by mutual agreement of the Lessor and the Lessee. No such modification or amendment will be binding unless it is in writing and signed by duly authorized signatories of the Lessor and the Lessee.

Invenergy Wind Offshore LLC	The United States of America
Lessee	Lessor
(Signature of Authorized Officer)	(Signature of Authorized Officer)
BRYAN SCHUELER	James F. Bennett
(Name of Signatory)	(Name of Signatory)
VICE PRESIDENT	Program Manager, Office of Renewable Energy Programs
(Title)	(Title)
APRIL 8, 2022	APR 28 2022
(Date)	(Date)

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF OCEAN ENERGY MANAGEMENT

ADDENDUM "A"

DESCRIPTION OF LEASED AREA AND LEASE ACTIVITIES

Lease Number OCS-A 0542

I. Lessor and Lessee Contact Information

Lessee Company Number: 15091

(a) Lessor's Contact Information

	Lease Representative	**Operations Representative**
Title	Program Manager, Office of Renewable Energy Programs	Same as Lease Representative
Address	U.S. Department of the Interior Bureau of Ocean Energy Management 45600 Woodland Road Sterling, Virginia 20166	
Phone	(703) 787-1300	
Fax	(703) 787-1708	
Email	renewableenergy@boem.gov	

(b) Lessee's Contact Information

	Lease Representative	**Operations Representative**
Name	Joshua Weinstein	Same as Lease Representative
Title	Vice President	
Address	One South Wacker Drive, Suite 1800 Chicago, IL 60606	
Phone	(206) 276-5677	
Fax		
Email	jweinstein@invenergy.com	

II. Description of Leased Area

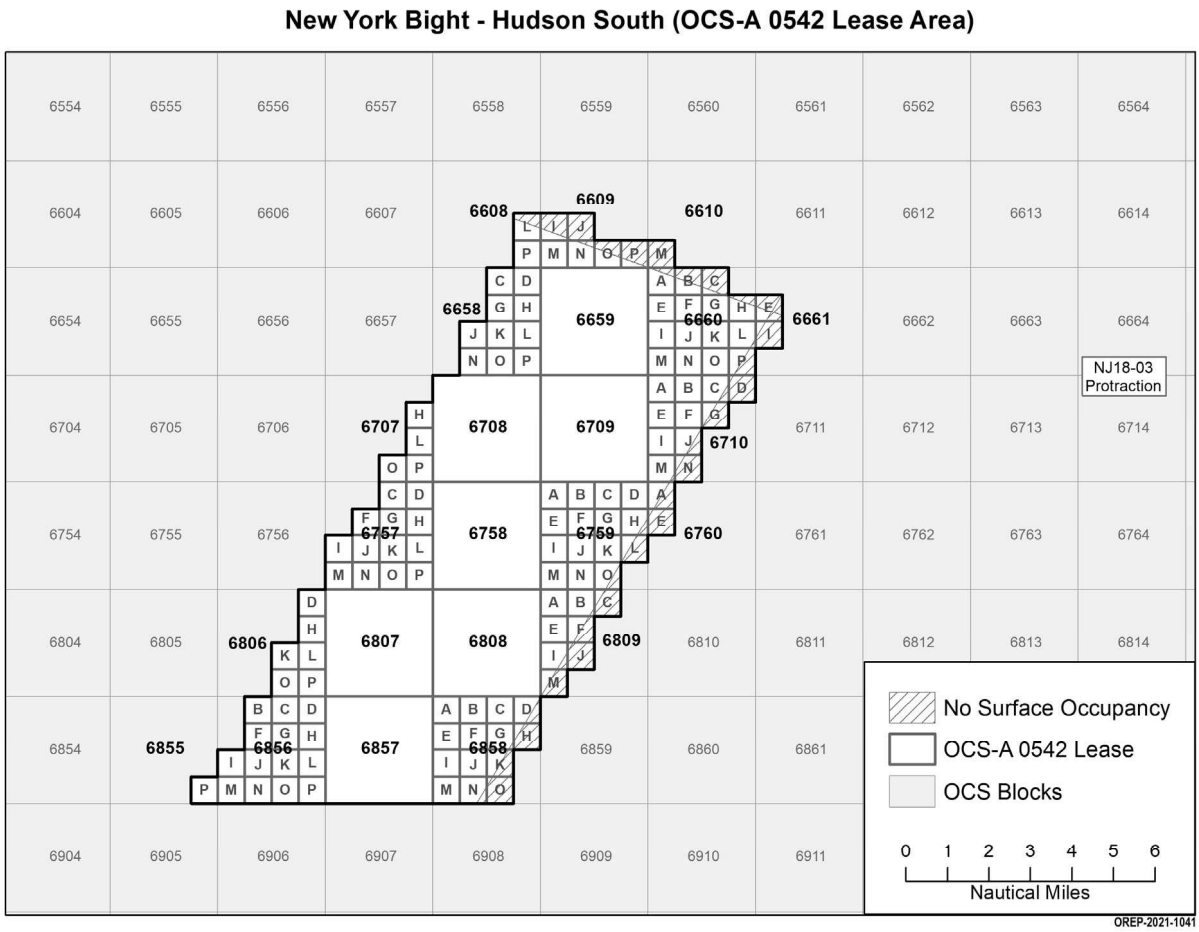
The total acreage of the leased area is approximately 83,976 acres.

This area is subject to later adjustment, in accordance with applicable regulations (*e.g.*, contraction, relinquishment).

Lease OCS-A 0542
The following Blocks or portions of Blocks lying within Official Protraction Diagram Hudson Canyon NJ18-03, are depicted on the map below and comprise 83,976 acres, more or less.

1) Block 6608, E1/2 of SE1/4
2) Block 6609, SW1/4, S1/2 of SE1/4
3) Block 6610, SW1/4 of SW1/4
4) Block 6658, E1/2, E1/2 of SW1/4
5) Block 6659, All of Block
6) Block 6660, NW1/4 of NE1/4, S1/2 of NE1/4, W1/2, SE1/4
7) Block 6661, SW1/4 of NW1/4, NW1/4 of SW1/4
8) Block 6707, SE1/4 of NE1/4, NE1/4 of SE1/4, S1/2 of SE1/4
9) Block 6708, All of Block
10) Block 6709, All of Block
11) Block 6710, NE1/4 of NE1/4, W1/2 of NE1/4, W1/2
12) Block 6757, E1/2, SE1/4 of NW1/4, SW1/4
13) Block 6758, All of Block
14) Block 6759, N1/2, N1/2 of S1/2, S1/2 of SW1/4, SW1/4 of SE1/4
15) Block 6760, W1/2 of NW1/4
16) Block 6806, E1/2 of NE1/4, SE1/4
17) Block 6807, All of Block
18) Block 6808, All of Block
19) Block 6809, NW1/4 of NE1/4, NW1/4, N1/2 of SW1/4, SW1/4 of SW1/4
20) Block 6855, SE1/4 of SE1/4
21) Block 6856, E1/2, E1/2 of W1/2, W1/2 of SW1/4
22) Block 6857, All of Block
23) Block 6858, N1/2, SW1/4, W1/2 of SE1/4

For the purposes of these calculations, a full Block is 2,304 hectares. The acreage of a hectare is 2.471043930.



The No Surface Occupancy area totals 7,082 acres. It is depicted on the lease map and is subject to Addendum "C", No Surface Occupancy Stipulation No. 8.2 and includes the portion of the lease area lying northeast and southeast of a line extending from point number 1 to point number 3.

Point Number	Direction	Longitude DD	Latitude DD
1	Start (NW to SE)	-73.452425	39.427638
2	Corner	-73.319568	39.388465
3	End (NE to SW)	-73.476757	39.192103

Coordinate System/Datum - Geographic NAD83, Decimal Degrees

III. Renewable Energy Resource

Wind

IV. Description of the Project

A project to generate energy using wind turbine generators and any associated resource assessment activities, located on the Outer Continental Shelf (OCS) in the leased area, as well as associated offshore substation platforms, inter-array cables, and subsea export cables.

V. Description of Project Easement(s)

Once approved, the Lessor will incorporate Lessee's project easement(s) in this lease as ADDENDUM "D."

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF OCEAN ENERGY MANAGEMENT

ADDENDUM "B"

LEASE TERM AND FINANCIAL SCHEDULE

Lease Number OCS-A 0542

I. Lease Term

The duration of each term of the lease is described below. The terms may be extended or otherwise modified in accordance with applicable regulations in 30 CFR Part 585.

Lease Term	**Duration**
Preliminary Term	1 year
Site Assessment Term	5 years
Operations Term	33 years

Schedule: Addendum "C" includes a schedule and reporting requirements for conducting site characterization activities.

Renewal: The Lessee may request renewal of the operations term of this lease, in accordance with applicable regulations in 30 CFR Part 585. The Lessor, at its discretion, may approve a renewal request to conduct substantially similar activities as were originally authorized under this lease or in an approved plan. The Lessor will not approve a renewal request that involves development of a type of renewable energy not originally authorized in the lease. The Lessor may revise or adjust payment terms of the original lease as a condition of lease renewal.

II. Definitions

"Lease Issuance Date" refers to the date on which this lease has been signed by *both* the Lessee and the Lessor.

"Effective Date" has the same meaning as "effective date" in the Bureau of Ocean Energy Management (BOEM) regulations provided in 30 CFR 585.237.

"Lease Anniversary" refers to the anniversary of the Effective Date of the lease.

"End Date" refers to the earlier of a) the last calendar day of the last month of the Operations Term; or b) the date on which the lease terminates in the event of a lease termination for another reason under 30 CFR 585.432.

"Commercial Operations" means the generation of electricity or other energy product for commercial use, sale, or distribution.

"Commercial Operation Date," or "COD," refers to the date on which the Lessee first begins Commercial Operations on the lease.

"Delivery Point" is the meter identified in the Construction and Operations Plan (COP) where the Lessee's facility interconnects with the electric grid to deliver electricity for sale.

An individual wind generation turbine is said to be "available for Commercial Operations" on or after the first day that it engages in Commercial Operations on the lease; and to be no longer available for Commercial Operations on or after the day when it is permanently decommissioned. These dates are determined by the COP, the Facility Design Report (FDR) or Fabrication Installation Report (FIR).

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.

(a) ***Rent.*** The Lessee must pay rent as described below:

Rent payments prior to the COD, or prior to the lease End Date in the event that the lease terminates prior to the COD, are calculated by multiplying the acres in the leased area times the rental rate per acre. The acreage for your lease is documented in Addendum A. For example:

- Acres: 100,000
- Annual Rental Rate: $3.00 per acre or fraction thereof
- Rental Fee for Entire Leased Area: $3.00 x 100,000 = $300,000

The first year's rent payment is due within 45 days of the date that the lease is received by the Lessee for execution, in accordance with 30 CFR 585.503. Rent for the entire leased area for the next year and for each subsequent year is due on or before each Lease Anniversary through the year in which the COD occurs. The rent for each year subsequent to the COD on the imputed portion of the lease not authorized for Commercial Operations is due on or before each Lease Anniversary.

Once a portion of the lease begins commercial operations, rent will only be due for the undeveloped or non-operating acreage. The rent calculation becomes a three-step process:

(1) rent is calculated on the portion of the lease not authorized for commercial operations.

(2) rent is calculated on the portion of the lease authorized for commercial operations, but without operating turbines.

(3) the sum of (1) and (2) yield the rent due.

Step (1): The Lessee will continue to pay rent at the lease rate for acreage outside the approved commercial project area. The demarcation between acreage for a commercial project and undeveloped acreage will be defined in the COP or supplemental documents approved by BOEM. For example, if the total lease acreage is 100,000 acres and exactly three-quarters of the lease acreage is approved for commercial operations, 25,000 acres is not authorized for commercial operations.

- Acres: 25,000
- Annual Rental Rate: $3.00 per acre or fraction thereof
- Rental Fee for Undeveloped Leased Area: $3.00 x 25,000 = $75,000

Step (2): Acreage for the approved project area subject to rent will be the complement of the operating name plate capacity divided by the total nameplate capacity, $\frac{M_t}{\sum N_w}$, as defined in Section III (b) (4) below, prior to any adjustments as specified in the most recent approved COP for turbine maintenance, replacements, repowering, or decommissioning. If contiguous acreage for an approved project cannot be developed due to buffers or other surface occupancy restrictions, it will be considered part of the operating area of the lease and covered by the lease's operating fee payment.

- Acres: 75,000
- Annual Rental Rate: $3.00 per acre or fraction thereof
- Rental Fee for Undeveloped Acreage Authorized for Commercial Operations: $3.00 x 75,000 x $(1 - \frac{M_t}{\sum N_w})$ = $Rent

Using the summed capacity of 14.21 megawatt (MW) from the 30 MW project in Table 1 from Section III (b) (4) below, the rental calculation for the project area is: $3.00 x 75,000 x (1 - 0.473667) = $118,425

Step (3): Summing the rent due in steps (1) & (2): $75,000 + $118,425 = $193,425.

- The Adjusted Annual Rent Payment will be rounded up to the nearest dollar.

All rent payments must be made as required in 30 CFR 1218.51. Late rent payments will be charged interest in accordance with 30 CFR 1218.54.

Advance lease rent and operating fee payments are due annually, before the lease anniversary date. All rent payments, including the last rent payment, are payable for the full year and will not be prorated to the COD or other installation milestones. If the installation schedule proceeds more quickly than projected by the lessee, lease payments may need to be reconciled. The Lessee should work with BOEM's Office of Renewable Energy Programs and the Office of Natural Resources Revenue on any payment reconciliation as instructed in Section III (c).

(1) ***Project Easement.***

Rent for any project easement(s) is described in ADDENDUM "D".

(2) ***Relinquishment.***

If the Lessee submits an application for relinquishment of a portion of the leased area within the first 45 calendar days following the date that the lease is received by the Lessee for execution, and the Lessor approves that application, no rent payment will be due on that relinquished portion of the leased area. Later relinquishments of any leased area will reduce the Lessee's rent payments due the year following the Lessor's approval of the relinquishment, through a reduction in the Acres in Leased Area and the corresponding Rental Fee for the Entire Leased Area and any related Adjusted Annual Rent Payments.

(b) ***Operating Fee.*** The Lessee must pay an operating fee as described below:

(1) **Initial Operating Fee Payment.**

The Lessee must pay an initial prorated operating fee within 45 calendar days after the COD. The initial operating fee payment covers the first year of Commercial Operations on the lease and will be calculated in accordance with subsection (4) below, using an operating fee rate of 0.02 and a capacity factor of 0.4.

(2) **Annual Operating Fee Payments.**

The Lessee must pay the operating fee for each subsequent year of Commercial Operations on or before each Lease Anniversary following the formula in subsection (4) below. The Lessee must calculate each operating fee annually subsequent to the initial operating fee payment using an operating fee rate of 0.02 through the thirty-three year operations term of the lease. If the Lessor determines that the Lessee has met the threshold for the supply chain incentive under section 7.2 of Addendum C, then the operating fee rate will be 0.01 instead of 0.02 for five years starting the year after the Lessor makes the determination. After five years at 0.01, the operating fee rate will be 0.02 for the remainder of the lease. The capacity factor of 0.4 will remain in effect until the Lease Anniversary of the year in which the Lessor adjusts the capacity factor.

(3) **Final Operating Fee Payment.**

The final operating fee payment is due on the Lease Anniversary prior to the End Date. The final operating fee payment covers the last year of Commercial Operations on the lease and will be calculated in accordance with the formula in subsection (4) below.

(4) **The formula for calculating the operating fee in year *t*.**

F_t	=	M_t	*	H	*	c_p	*	P_t	*	r_t
(annual operating fee)		(nameplate capacity)		(hours per year)		(capacity factor)		(power price)		(operating fee rate)

Where:

t =	the year of Commercial Operations on the lease starting from each Lease Anniversary, where *t* equals 1 represents the year beginning on the Lease Anniversary prior to, or on, the COD.
F_t =	the dollar amount of the annual operating fee in year *t*.
M_t =	the nameplate capacity expressed in megawatts (MW) rounded to the nearest second decimal place in year *t* of Commercial Operations on the lease. The capacity calculation is a two-step process: (1) scaling each turbine's nameplate capacity in proportion to the number of days in the year that it is operational and (2) summing these scaled values across all turbines. The value of M_t, reflecting the availability of turbines, will be determined based on the FDR or FIR. This value will be adjusted to reflect any changes to installed capacity approved by BOEM as of the date each operating fee payment is due, in accordance with the calculation in Equation 1, for each year of Commercial Operations on the lease. **(1)** $M_t = \sum_{w=1}^{W_t} \left(N_w \, x \left[\frac{Y_{w,t}}{D} \right] \right)$

Where:

W_t = Number of individual wind generation turbines, *w*, that will be available for Commercial Operations during any day of the year, *t*, per the FDR or FIR.

N_w = Nameplate capacity of individual wind generation turbine, *w*, per the FDR or FIR expressed in MW.

$Y_{w,t}$ = Number of days that turbine *w* is commercially available during year.

D = Days in the year set equal to 365 in all years for purposes of this calculation.

M_t may be reduced only in the event that installed capacity is permanently decommissioned. M_t will not be changed in response to routine or unplanned maintenance of units, including the temporary removal of a nacelle for off-site repair or replacement with a similar unit.

EXAMPLE: Table 1 illustrates the calculations represented by Equation (1) for a single lease year for a lease on which the lessee plans to erect six turbines, each with a nameplate capacity of 5 MW. Based on the days in each turbine's commercial operations period (column B), the exhibit shows the number of days during the year that the turbine is available for operation. Dividing this value by 365 (column D) yields the percent of days during the year that the turbine is available for operation (column E). For each turbine, the resulting percentage (column E) is multiplied by its nameplate capacity (column A) to calculate its scaled capacity for the year (column F). The individual values in column F are then summed across all six turbines to calculate total capacity (Mt).

Table 1: Example of M_t Calculations for Installation

Turbine	Nameplate Capacity (N_w) [A]	Days in Turbine's Commercial operations Period [B]	Number of days Turbine is available for operation in year t ($Y_{w,t}$) [C]	Number of days in the Year [D]	Percent of days available for Commercial Operation $\left(\frac{Y_{w,t}}{D}\right)$ [E = C ÷ D]	Turbine capacity scaled based on percent of days in commercial operation $N_w \times \frac{Y_{w,t}}{D}$ [F = A × E]
#1	5	January 1 to December 31	365	365	100%	5.00
#2	5	January 1 to December 31	365	365	100%	5.00
#3	5	October 1 to December 31	92	365	25.2%	1.26
#4	5	October 1 to December 31	92	365	25.2%	1.26
#5	5	October 1 to December 31	92	365	25.2%	1.26
#6	5	December 1 to December 31	31	365	8.5%	0.42
Available capacity summed across all turbines: $M_t = \sum_{w=1}^{W_t}\left(N_w \times \left[\frac{Y_{w,t}}{D}\right]\right)$ = 14.21						

The same calculation would be performed for the lease during the decommissioning phase.

H =	the number of hours in the year for billing purposes which is equal to 8,760 for all years of Commercial Operations on the lease.
c_p =	the "Capacity Factor" in Performance Period p, which represents the share of anticipated generation of the facility that is delivered to where the Lessee's facility interconnects with the electric grid (i.e. the Delivery Point) relative to its generation at continuous full power operation at the nameplate capacity, expressed as a decimal between zero and one. The initial Capacity Factor (C_0) will be set to 0.4. The Capacity Factor will be subject to adjustment at the end of each Performance Period. After the sixth year of Commercial Operations on the lease has concluded, the Lessee will utilize data gathered from years two through six of Commercial Operations on the lease and propose a revised Capacity Factor to be used to calculate subsequent annual payments, as provided for in Table 2 below. A similar process will be conducted at the conclusion of each five-year Performance Period, thereafter.

Table 2: Definition of Performance Periods

Performance Period (p)	Commercial Operation Years (t)	Payments Affected by Adjustment	Capacity Factor (C)	Date End Year (n)
0 (COD)	Not Applicable	Payments 1 to 7	$C_{0=0.4}$	--
1	t = 2 to 6	Payments 8 to 12	C_1	n_1=6
2	t = 7 to 11	Payments 13 to 17	C_2	n_2=11
3	t = 12 to 16	Payments 18 to 22	C_3	n_3=16
4	t = 17 to 21	Payments 23 to 27	C_4	n_4=21
5	t = 22 to 26	Payments 28 to 32	C_5	n_5=26
6	t = 27 to 31	Payment 33	C_6	n_6=31

Adjustments to the Capacity Factor

The Actual 5-year Average Capacity Factor (Xp) is calculated for each Performance Period after COD ($p > 0$) per Equation 2 below. Xp represents the sum of actual, metered electricity generation in megawatt-hours (MWh) at the Delivery Point to the electric grid (A_t) divided by the amount of electricity generation in MWh that would have been produced if the facility operated continuously at its full, stated capacity (M_t) in all of the hours (h_t) in each year, t, of the corresponding five-year period.

$$\textbf{(2)}\ X_p = \frac{\sum_{t=n-4}^{n} A_t}{\left(\sum_{t=n-4}^{n} M_t \times h_t\right)}$$

Where:

M_t = Nameplate Capacity as defined above.

n = "Date End Year" value for the Performance Period, p, as defined in Table 2.

p = Performance Period as defined in Table 2.

A_t = Actual generation in MWh associated with each year of Commercial Operations, t, on the

	lease that is transferred at the Delivery Point; Delivery Point meter data supporting the values submitted for annual actual generation must be recorded, preserved, and timely provided to the Lessor upon request. The generation data for the facility must be the same data reported on the Energy Information Administration's EIA-923. h_t = Hours in the year on which the Actual Generation associated with each year of Commercial Operations, *t*, on the lease is based; this definition of "hours in the year" differs from the definition of H in the operating fee equation above. The hours in the year for purposes of calculating the capacity factor must take into account the actual number of hours, including those in leap years. The value of the Capacity Factor at the outset of Commercial Operations ($p = 0$) is set to 0.4 as stated in equation 3: **(3)** $c_0 = 0.4$
P_t =	a measure of the annual average wholesale electric power price expressed in dollars per MW hour. The Lessee must calculate P_t at the time each operating fee payment is due, subject to approval by the Lessor. The Price (P_t) must equal the simple average of the "on-the-hour" spot price indices for the *NYISO NYC-J* power market for the most recent calendar year of data available as reported by the Federal Energy Regulatory Commission (FERC). Alternatively, P_t may be based on aggregated data from commercial subscription services such as S&P Global Market Intelligence Platform or Hitachi ABB Velocity Suite. BOEM will post the power price data it intends to use for the lessee's reference. The source of data used in the calculations must be noted in the Lessee's documentation supporting their estimate of the value of Pt each year for review and approval by the Lessor. BOEM will use the posted prices to verify the lessee's calculations.
r_t =	the operating fee rate of 0.02 (2%) or 0.01 (1%), as applicable.

(c) ***Reporting, Validation, Audits, and Late Payments*.**

The Lessee must submit the values used in the operating fee formula to the Lessor at the time the annual payment based on these values is made. Submission of this and other reporting, validation, audit and late payment information as requested by the Lessor must be sent to the Lessor using the contact information indicated in Addendum "A", unless the Lessor directs otherwise. Failure to submit the estimated values and the associated documentation on time to the Lessor may result in penalties as specified in applicable regulations.

Within 60 days of the submission by the Lessee of the annual payment, the Lessor will review the data submitted and validate that the operating fee formula was applied correctly. If the Lessor validation results in a different operating fee amount, the amount of the annual operating fee payment will be revised to the amount determined by the Lessor.

The Lessor also reserves the right to audit the meter data upon which the Actual 5-year Average Capacity Factor is based at any time during the lease term. If, as a result of such audit, the Lessor

determines that any annual operating fee payment was calculated incorrectly, the Lessor has the right to correct any errors and collect the correct annual operating fee payment amount.

If the annual operating fee is revised downward as a result of the Lessee's calculations, as validated by the Lessor, or an audit of meter data conducted by the Lessee or Lessor, the Lessee will be refunded the difference between the amount of the payment received and the amount of the revised annual operating fee, without interest. Similarly, if the payment amount is revised upward, the Lessee is required to pay the difference between the amount of the payment received and the amount of the revised annual operating fee, plus interest on the balance, in accordance with 30 CFR § 1218.54.

Late operating fee payments will be charged interest in accordance with 30 CFR § 1218.54.

IV. Financial Assurance

The Lessor will base the determination for the amounts of all Site Assessment Plan (SAP), COP, and decommissioning financial assurance requirements on estimates of the cost to meet all accrued lease obligations. The Lessor will determine the amount of supplemental and decommissioning financial assurance requirements on a case-by-case basis. The amount of financial assurance required to meet all lease obligations includes:

(a) **Initial Financial Assurance.** Prior to the Lease Issuance date, the Lessee must provide an initial lease-specific bond, or other approved means of meeting the Lessor's initial financial assurance requirements in an amount equal to $100,000.

(b) **Additional Financial Assurance.** In addition to the initial lease-specific financial assurance discussed above, the Lessee is also required to provide additional supplemental bonds associated with the SAP and COP, or other form of financial assurances and a decommissioning bond or other approved means of meeting the Lessee's decommissioning obligations.

(1) Prior to the Lessor's approval of a SAP, the Lessor will require an additional supplemental bond or other form of financial assurance in an amount determined by the Lessor based on the complexity, number, and location of all facilities involved in the site assessment activities planned in the SAP, and estimates of the costs to meet all accrued obligations, in accordance with applicable BOEM regulations (30 CFR 585.515-537). The supplemental financial assurance requirement is in addition to the initial lease-specific financial assurance in the amount of $100,000. The Lessee may meet these obligations by providing a new bond or other acceptable form of financial assurance, or increasing the amount of its existing bond or other form of financial assurance.

(2) Prior to the Lessor's approval of a COP, the Lessor may require an additional supplemental bond or other form of financial assurance in an amount determined by the Lessor based on the complexity, number, location of all facilities, activities and Commercial Operations planned in the COP, and estimates of the costs to meet all

accrued obligations, in accordance with applicable BOEM regulations (30 CFR 585.515-537). The supplemental financial assurance requirement is in addition to the initial lease-specific financial assurance in the amount of $100,000 and an additional supplemental bond or other form of financial assurance required with the SAP. The Lessee may meet this obligation by providing a new bond or other acceptable form of financial assurance, or increasing the amount of its existing bond or other form of financial assurance.

(3) The Lessor will require a decommissioning bond or other form of financial assurance based on the anticipated decommissioning costs in accordance with applicable BOEM regulations (30 CFR 585.515-537). The decommissioning obligation must be guaranteed through an acceptable form of financial assurance and will be due according to the schedule beginning before commencement of the installation of commercial facilities on a date or dates to be determined by the Lessor.

(c) **Adjustments to Financial Assurance Amounts.** The Lessor reserves the right to adjust the amount of any financial assurance requirement (initial, supplemental, or decommissioning) associated with this lease and/or reassess the Lessee's cumulative lease obligations, including decommissioning obligations, at any time. If the Lessee's cumulative lease obligations and/or liabilities increase or decrease, the Lessor will notify the Lessee of any intended adjustment to the financial assurance requirements and provide the Lessee an opportunity to comment in accordance with applicable BOEM regulations.

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF OCEAN ENERGY MANAGEMENT

ADDENDUM "C"

LEASE-SPECIFIC TERMS, CONDITIONS, AND STIPULATIONS

Lease Number OCS-A 0542

The Lessee's rights to conduct activities on the leased area are subject to the following terms, conditions, and stipulations. The Lessor reserves the right to impose additional terms and conditions incident to the future approval or approval with modifications of plans, such as a Site Assessment Plan (SAP) or Construction and Operations Plan (COP).

1 DEFINITIONS

1.1 Definition of "Archaeological Resource": The term "archaeological resource" has the same meaning as "archaeological resource" in the Bureau of Ocean Energy Management (BOEM) regulations provided in 30 CFR 585.112.

1.2 Definition of "Effective Date": The term "Effective Date" has the same meaning as "effective date" in BOEM regulations provided in 30 CFR 585.237.

1.3 Definition of "Geological and Geophysical Survey (G&G Survey)": The term "G&G Survey" serves as a collective term for surveys that collect data on the geology of the seafloor and landforms below the seafloor. High resolution geophysical surveys and geotechnical (sub-bottom) exploration are components of G&G surveys.

1.4 Definition of "Geotechnical Exploration": The term "Geotechnical Exploration," also referred to as "Sub-bottom Sampling," or "Geotechnical Testing," is used to collectively refer to site specific sediment and underlying geologic data acquired from the seafloor and the sub-bottom and includes geotechnical surveys utilizing deep borings, vibracores, and cone penetration tests.

1.5 Definition of "High Resolution Geophysical Survey (HRG Survey)": The term "HRG Survey" means a marine remote-sensing survey using, but not limited to, such equipment as side-scan sonar, magnetometer, shallow and medium (Seismic) penetration sub-bottom profiler systems, narrow beam or multibeam echo sounder, or other such equipment employed for the purposes of providing data on geological conditions, identifying shallow hazards, identifying archaeological resources, charting bathymetry, and gathering other site characterization information.

1.6 Definition of "Protected Species": The term "protected species" includes marine mammals (those protected under the Endangered Species Act and those protected under the Marine Mammal Protection Act), sea turtles, sturgeon, and giant manta ray.

1.7 Definition of "Site Assessment Activities": The term "site assessment activities" or "site assessment," has the same meaning as "site assessment activities" in 30 CFR 585.112.

1.8 Definition of "Qualified Marine Archaeologist": The term "qualified marine archaeologist" means a person retained by the Lessee who meets the Secretary of the Interior's Professional Qualifications Standards for Archaeology (48 FR 44738- 44739), and has experience analyzing marine geophysical data.

2 SITE CHARACTERIZATION

2.1 **Survey Plan(s):** Prior to conducting each physical, biological, or cultural resources survey in support of the submission of a plan, the Lessee must submit to the Lessor a survey plan. Each distinct survey effort (e.g., mobilization) must be addressed by a survey plan, although a single survey plan may cover more than one survey effort and may cover multiple types of activities (e.g., geotechnical and geophysical surveys on lease and along cable routes).

Each survey plan must include details of activities to be conducted and timelines of each survey effort necessary to support the submission of a plan (i.e., necessary to satisfy the information requirements in the applicable regulations, including but not limited to 30 CFR 585.606, 610, 611, 621, 626, 627, et al.). The Lessor will not accept survey plans that do not provide sufficient detail for review, including but not limited to specific description and illustration of the geographic areas to be surveyed, specific discussion of the survey methods and equipment to be employed, and a schedule of survey activities.

The Lessee must demonstrate compliance with each of the lease stipulations in Section 4 of Addendum "C" and include any waiver requests in its initial survey plan. Each survey plan must be consistent with the Lessee's Fisheries Communication Plan (FCP) (see 3.1.2.1) and Native American Tribal Communications Plan (NATCP) (see 3.1.2.2), and include a description of the Lessee's intentions to coordinate with the U.S. Coast Guard (USCG) to prepare a Notice to Mariners for the specific survey activities described in the survey plan.

The Lessee must submit a survey plan to the Lessor at least 90 calendar days prior to commencement of any survey activities described in the survey plan. Within 30 calendar days from receipt, the Lessor may request the Lessee modify the survey plan to address any comments the Lessor submits to the Lessee on the contents of the survey plan. Comments must be addressed by the Lessee in a manner deemed satisfactory by the Lessor prior to commencement of the survey activities. If the Lessor does not respond with comments or objections within 30 calendar days of receipt of the survey plan, the Lessee may proceed with the survey activities per the proposed schedule. The lack of Lessor comment or objection to the survey plan does not ensure acceptance of the survey results with the SAP and/or COP. If the Lessee is proposing a fisheries survey that could result in the take of species listed under the Endangered Species Act, additional time should be allowed for consultation and/or permits authorizing the activity (see Section 5.1.4).

2.2 Pre-Survey Meeting(s) with the Lessor: If requested by the Lessor, the Lessee must hold a pre-survey meeting with the Lessor prior to the commencement of survey activities to discuss the applicable survey plan. The Lessee must ensure the presence at this meeting of any relevant subject matter experts, as requested by the Lessor.

3 REPORTING

3.1 **Progress Report**: The Lessee must submit to the Lessor a progress report every six months (unless BOEM directs otherwise) through the duration of the site assessment term that includes a brief narrative of the overall progress since the last progress report, or – in the case of the first report – since the Effective Date. Within 60 calendar days from receipt, the Lessor may request the Lessee modify the progress report to address any comments the Lessor submits to the Lessee on the contents of the document. The Lessee must address comments in a manner deemed satisfactory by the Lessor. Should the Lessee not address the comments provided by the Lessor in a timely and adequate manner, BOEM reserves the right to require specific mitigation such as, but not limited to, third party verification/mediation at the Lessee's expense, adjustment of required reporting frequency, or designation that the Lease is not in good standing. This obligation does not expire at the end of the site assessment term and continues until approval of a Construction and Operations Plan.

3.1.1 Engagement: The Lessee shall make reasonable efforts to consult with "Tribes and parties,"

that may be potentially affected by the project activities on the OCS, which include, but are not limited to:

- Coastal Communities
- Commercial and Recreational Fishing Industries
- Educational and Research Institutions
- Environmental and Public Interest Non-Governmental Organizations
- Federal, State, and Local Agencies
- Federally recognized Tribes (see 5.3.3)
- Mariners and the Maritime Industry
- Ocean Users
- Submarine Cable Operators
- Underserved Communities, as defined in Section 2 of Executive Order 13985

The Lessee shall make reasonable efforts to implement the project in a manner that minimizes, mitigates, and/or redresses the project's adverse effects, if any, on Tribes and parties. To facilitate consultation under this section, the Lessee should work collaboratively with federal, state, and local governments, community organizations, and Tribes.

The Progress Report must:

- Identify Tribes and parties applicable to the project;
- Document, and update for subsequent reports, engagement with Tribes and parties since the previous reporting period;
- Document potential adverse effects from the Lessee's project to the interests of Tribes and parties;
- Document how, if at all, the design or implementation of the project has been informed by or altered to address these potential effects (including by investing in, or directing benefits to Tribes and parties).
- The report must also include a description of any anticipated or scheduled engagement activities for the next reporting period.
- The report must also include feedback from engagement with Tribes and parties regarding transmission planning, prior to proposing any export cable route.
- The report must provide information that can be made available to the public and posted on the BOEM website.

The intent of this requirement is to improve Lessee communication and transparency with Tribes, parties, and the general public, and to encourage lessees to identify and engage with underserved communities, including environmental justice communities that may be disproportionately impacted by the Project's OCS activities, in order to avoid, minimize, and mitigate potential adverse effects by, for example, investing in these communities.

BOEM will protect privileged or confidential information that you submit, as required by the Freedom of Information Act (FOIA) and 30 CFR 585.113. Exemption 4 of FOIA applies to ''trade secrets and commercial or financial information that you submit that is privileged or confidential.'' 5 U.S.C. 552(b)(4). If you wish to protect the confidentiality of such

information, clearly mark it "Contains Privileged or Confidential Information" and consider submitting such information as a separate attachment. BOEM will not disclose such information, except as required by FOIA. Information that is not labeled as privileged or confidential may be regarded by BOEM as suitable for public release. Further, BOEM will not treat as confidential aggregate summaries of otherwise nonconfidential information.

3.1.2 Communication Plans: The Progress Report must include a section with plan(s) on how the Lessee will communicate with fisheries, federally recognized Tribes, and agencies (see 3.1.2.1, 3.1.2.2, 3.1.2.3). In addition to the plans, each progress report should provide updates on the progress of communication efforts with those and other affected stakeholder or ocean user groups during the reporting period (see 3.1.1).

3.1.2.1 Fisheries Communications Plan and Fisheries Liaison: The Lessee must develop a draft FCP and make it publicly available within 120 days of lease execution. The Lessee must update and refine the FCP from time to time, in response to feedback obtained by engagement with Tribes and parties and BOEM consultation. If the Lessee does not develop a project website, the Lessee must make the FCP available to the Lessor and the public upon request. The plan must include the following:

- A description of the strategies that the Lessee intends to use for communicating with commercial and recreational fisheries prior to and during activities in support of the submission of a plan (e.g. SAP or a COP). This description must include mechanisms to distribute notices to Federal and state fisheries license holders known to operate near the lease area through a local "Notice to Mariners" and outreach to, e.g., Fisheries Management Councils, newsletters, websites, Fisheries Liaison Officers and/or Fisheries Representatives, and applicable state agencies.
- The contact information for an individual retained by the Lessee as its primary point of contact with commercial and recreational fisheries (i.e., Fisheries Liaison).
- The strategy and general timing of discussions with commercial and recreational fisheries regarding the reduction of conflicts with facility designs, pursuant to Lease stipulation 3.1.1.
- A process to file a complaint with the offshore wind operator and seek the replacement of or compensate for lost gear.
- Plans to coordinate with commercial and recreational fisheries to identify peak fishing seasons and, to the extent practicable, avoid interaction offshore between survey vessels and commercial fishermen.

Additionally, the Lessee is required to (i) notify applicable ocean users two weeks in advance of any geological and geophysical survey activities and, (ii) provide an annual summary of filed complaint claims and outcomes to BOEM to better understand the frequency and extent of gear interactions.

3.1.2.2 Native American Tribes Communication Plan: The Lessee must develop a publicly available NATCP that describes the strategies that the Lessee intends to use for communicating with federally recognized Tribes, and that should outline specific methods for engaging with and disseminating information to federally recognized Tribes with cultural and/or historical ties to the lease area. The NATCP must include the contact information for an individual retained by the Lessee as its primary point of contact with federally recognized Tribes (i.e., a Tribal Liaison). The NATCP should include detailed information and protocols for regular engagement with federally recognized Tribes

including, but not limited to, the types of engagement activities (e.g., one-on-one meetings, group meetings, open houses, open information sharing meetings, etc.); the frequency of proposed engagements/meetings (e.g., monthly, quarterly, bi-annually, annually, etc.); meeting locations and/or virtual platforms; and contact information (e.g., telephone numbers, email addresses, website addresses, etc.). The Lessee must make the NATCP available to the Lessor and the federally recognized Tribes upon request. The Lessee must provide a draft NATCP to BOEM and federally recognized Tribes for review and comment, and hold a meeting with federally recognized Tribes to discuss the NATCP, within 120 days of lease execution. The Lessee must invite federally recognized Tribes with cultural and historical ties to the lease area to participate in the development of the NATCP. If a federally recognized Tribe wishes to participate, the Lessee should request that the Tribe designate a Tribal Representative from each Tribe to serve as the Tribe's primary point of contact for communicating with the Lessee. If a federally recognized Tribe does not wish to participate in the development of the NATCP, the Lessee is no longer required to include them in NATCP communications. If a Tribe does not respond to outreach from the Lessee, the Lessee will continue to invite the Tribe to participate in NATCP engagement opportunities until the Tribe provides a written response to the Lessee or Lessor.

3.1.2.3 Agency Communication Plan (ACP): The Lessee must develop a publicly available ACP that describes the strategies that the Lessee intends to use for communicating with federal, state and local agencies with authority related to the lease area and should outline specific methods for engaging with and disseminating information related to permits and trust resources to these agencies. The purpose of the ACP is to ensure early and active information sharing, focused discussion of potential issues, and collaborative identification of solutions in order to improve the quality and efficiency of various agency decision-making processes, and to promote the sustainable development of offshore wind energy projects. The ACP must include the contact information for an individual retained by the Lessee as its primary point of contact with agencies, (i.e., an Agency Liaison). The ACP should include detailed information and protocols for regular engagement with permitting and resource agencies including, but not limited to, the types of engagement activities (e.g., one-on-one meetings, interagency meetings, open information sharing meetings, etc.); the frequency of proposed engagements/meetings (e.g., monthly, quarterly, bi-annually, annually, etc.); meeting locations and/or virtual platforms; and contact information (e.g., telephone numbers, email addresses, etc.). The Lessee must make the ACP available to the Lessor and other agencies upon request. The Lessee must provide a draft ACP to BOEM and other permitting and resource agencies with authority related to the lease area for review and comment, and host a meeting with each interested agency, to discuss the ACP within 120 days of lease execution. Meetings may include multiple agencies. The Lessee must invite agencies with permitting roles and/or resource expertise to participate in the ACP. The Lessee should request that the agency designate a primary point of contact(s) for communicating with the Lessee. If an agency states in writing to the Lessee or Lessor that it does not wish to participate in the ACP, the Lessee need no longer include that agency in ACP communications and must document this change in the ACP. If an agency does not respond to outreach from the Lessee, the Lessee will continue to invite the agency to participate in ACP engagement opportunities until the agency provides a response. Note that a decision to not participate in the ACP in no way changes the agency regulatory authority or the need to communicate with that agency. The Lessee must update the ACP or provide other written summary of how the Lessee used information gained during agency engagement to inform project planning and

development.

3.1.2.4 Coordinated Engagement: To the maximum extent practicable, the Lessee must coordinate engagement activities for Tribes and parties (see Section 3.1.1) with other regional lessees and document their activities in the Progress Report. Lessee(s) must design coordinated engagement activities to decrease the communication and consultation burden on Tribes and parties. BOEM appreciates that not all engagement can be coordinated.

3.1.3 Survey Plans: The progress report must include an update regarding progress in executing the activities included in the survey plan(s), and include as an enclosure an updated survey plan(s) accounting for any modifications in schedule.

4 NATIONAL SECURITY AND MILITARY OPERATIONS

4.1 **Hold and Save Harmless**: Whether compensation for such damage or injury might be due under a theory of strict or absolute liability or otherwise, the Lessee assumes all risks of damage or injury to persons or property, which occur in, on, or above the Outer Continental Shelf (OCS), to any persons or to any property of any person or persons in connection with any activities being performed by the Lessee in, on, or above the OCS, if such injury or damage to such person or property occurs by reason of the activities of any agency of the United States Government, its contractors, or subcontractors, or any of its officers, agents or employees, being conducted as a part of, or in connection with, the programs or activities of the individual military command headquarters (hereinafter "the appropriate command headquarters") listed in the contact information provided as an enclosure to this lease.

Notwithstanding any limitation of the Lessee's liability in Section 9 of the lease, the Lessee assumes this risk whether such injury or damage is caused in whole or in part by any act or omission, regardless of negligence or fault, of the United States, its contractors or subcontractors, or any of its officers, agents, or employees. The Lessee further agrees to indemnify and save harmless the United States against all claims for loss, damage, or injury in connection with the programs or activities of the command headquarters, whether the same be caused in whole or in part by the negligence or fault of the United States, its contractors, or subcontractors, or any of its officers, agents, or employees and whether such claims might be sustained under a theory of strict or absolute liability or otherwise.

4.2 **Evacuation or Suspension of Activities:**

4.2.1 General: The Lessee hereby recognizes and agrees that the United States reserves and has the right to temporarily suspend operations and/or require evacuation on this lease in the interest of national security consistent with Section 3(c) of this lease.

4.2.2 Notification: Every effort will be made by the appropriate military agency to provide as much advance notice as possible of the need to suspend operations and/or evacuate. Advance notice will normally be given before requiring a suspension or evacuation. Temporary suspension of operations may include, but is not limited to the evacuation of personnel and appropriate sheltering of personnel not evacuated. "Appropriate sheltering" means the protection of all Lessee personnel for the entire duration of any Department of Defense activity from flying or falling objects or substances and will be implemented by an order (oral and/or written) from the BOEM, Office of Renewable Energy Programs (OREP) Program Manager, after consultation with the appropriate command headquarters or other appropriate military agency, or higher Federal authority. The appropriate command headquarters, military agency, or higher authority will provide information to allow the Lessee to assess the degree of risk to, and provide sufficient protection for, the Lessee's personnel and property.

4.2.3 Duration: Suspensions or evacuations for national security reasons will not generally exceed seventy-two (72) hours; however, any such suspension may be extended by order of the OREP Program Manager. During such periods, equipment may remain in place, but all operations, if any, must cease for the duration of the temporary suspension if so directed by the OREP Program Manager. Upon cessation of any temporary suspension, the OREP Program Manager will immediately notify the Lessee such suspension has terminated and operations on the leased area can resume.

4.2.4 Lessee Point-of-Contact for Evacuation/Suspension Notifications: The Lessee must inform the Lessor of the persons/offices to be notified to implement the terms of 4.2.2 and 4.2.3.

4.2.5 Coordination with Command Headquarters: The Lessee must establish and maintain early contact and coordination with the appropriate command headquarters, in order to avoid or minimize the potential to conflict with and minimize the potential effects of conflicts with military operations.

4.2.6 Reimbursement: The Lessee is not entitled to reimbursement for any costs or expenses associated with the suspension of operations or activities or the evacuation of property or personnel in fulfillment of the military mission in accordance with 4.2.1 through 4.2.5 above.

4.3 **Electromagnetic Emissions**:_The Lessee, prior to entry into any designated defense operating area, warning area, or water test area, for the purpose of commencing survey activities undertaken to support SAP or COP submittal must enter into an agreement with the commander of the appropriate command headquarters to coordinate the electromagnetic emissions associated with such survey activities. The Lessee must ensure that all electromagnetic emissions associated with such survey activities are controlled as directed by the commander of the appropriate command headquarters.

5 STANDARD OPERATING CONDITIONS

5.1 General Requirements

5.1.1 Prior to the start of operations, the Lessee must hold a briefing to establish responsibilities of each involved party, define the chains of command, discuss communication procedures,

provide an overview of monitoring procedures, and review operational procedures. This briefing must include all relevant personnel, crew members and Protected Species Observers (PSOs). New personnel must be briefed as they join the work in progress.

5.1.2 The Lessee must ensure that all vessel operators and crew members, including PSOs, are familiar with, and understand, the requirements specified in this ADDENDUM "C".

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 2021 Biological Assessment and letter of concurrence may be found here: (https://www.boem.gov/environmental-consultations).

5.1.4 Endangered Species Act (ESA) Consultation for Biological Surveys: The Lessee must consult with BOEM, the NMFS, and the U.S. Fish and Wildlife Service (USFWS) prior to designing and conducting biological surveys intended to support offshore renewable energy plans that could interact with ESA-listed species. Please see the 2021 Biological Assessment (BA)and letter of concurrence here: (https://www.boem.gov/renewable-energy/nmfs-esa-consultations) for data collection activities that have been previously consulted upon.

5.2 Protected Species

5.2.1 Protected Species: Unless otherwise authorized by BOEM, Lessee's OCS activities must comply with the standards in the Project Design Criteria and Best Management Practices found in BOEM's notice (https://www.boem.gov/sites/default/files/documents//PDCs%20and%20BMPs%20for%20Atlantic%20Data%20Collection%2011222021.pdf) last revised on November 22, 2021. The 2021 BA and letter of concurrence from which these measures were derived may be found here: (https://www.boem.gov/renewable-energy/nmfs-esa-consultations). At the Lessee's option, the Lessee, its operators, personnel, and contractors may satisfy this requirement by complying with the NMFS-approved measures to safeguard protected species that are most current at the time an activity is undertaken under this lease, including but not limited to new or updated versions of the 2021 BA or 2021 NMFS Letter of Concurrence, or through new or activity-specific consultations.

5.3 Archaeological Survey Requirements

5.3.1 Archaeological Survey Required: The Lessee must provide the results of an archaeological survey with its plans.

5.3.2 Qualified Marine Archaeologist: The Lessee must ensure that the analysis of archaeological survey data collected in support of plan (e.g., SAP and/or COP) submittal and the preparation of archaeological reports in support of plan submittal are conducted by a Qualified Marine Archaeologist.

5.3.3 Tribal Pre-Survey Meeting: The Lessee must coordinate a tribal pre-survey meeting by sending a letter through certified mail, and following up with email or phone calls as necessary, to the following Tribes:

- Absentee-Shawnee Tribe of Indians of Oklahoma;
- Delaware Tribe of Indians;
- Eastern Shawnee Tribe of Oklahoma;

- Mashantucket Pequot Tribal Nation;
- Mashpee Wampanoag Tribe;
- Mohegan Tribe of Connecticut;
- Shawnee Tribe;
- Stockbridge-Munsee Community Band of Mohican Indians;
- The Delaware Nation;
- The Narragansett Indian Tribe;
- The Shinnecock Indian Nation; and
- Wampanoag Tribe of Gay Head (Aquinnah).

The purpose of this meeting will be for the Lessee and the Lessee's Qualified Marine Archaeologist to discuss the Lessee's Survey Plan and consider requests to monitor portions of the archaeological survey and the geotechnical exploration activities, including the visual logging and analysis of geotechnical samples (e.g., cores, etc.). Notification of the tribal pre-survey meeting must be sent at least 15 calendar days prior to the date of the proposed tribal pre-survey meeting. The meeting must be scheduled for a date at least 30 calendar days prior to commencement of survey activities performed in support of plan submittal and at a location and time that affords the participants a reasonable opportunity to participate. The anticipated date for the meeting must be identified in the timeline of activities described in the applicable survey plan (see 2.1). The Lessee must provide the Lessor with documentation of compliance with this stipulation prior to commencement of surveys.

5.3.4 Geotechnical Exploration: The Lessee may only conduct geotechnical exploration activities performed in support of plan (i.e., SAP and/or COP) submittal in locations where an analysis of the results of geophysical surveys has been completed. This analysis must include a determination by a Qualified Marine Archaeologist as to whether any potential archaeological resources are present in the area. Except as allowed by the Lessor under 4.2.6, the geotechnical exploration activities must avoid potential archaeological resources by a minimum of 50 meters (164 feet), and the avoidance distance must be calculated from the maximum discernible extent of the archaeological resource. A Qualified Marine Archaeologist must certify, in the Lessee's archaeological reports, that geotechnical exploration activities did not impact potential historic properties identified as a result of the HRG surveys performed in support of plan submittal, except as follows: in the event that the geotechnical exploration activities did impact potential historic properties identified in the archaeological surveys without the Lessor's prior approval, the Lessee and the Qualified Marine Archaeologist who prepared the report must instead provide a statement documenting the extent of these impacts.

5.3.5 Monitoring and Avoidance: The Lessee must inform the Qualified Marine Archaeologist that he or she may elect to be present during HRG surveys and bottom-disturbing activities performed in support of plan (i.e., SAP and/or COP) submittal to ensure avoidance of potential archaeological resources, as determined by the Qualified Marine Archaeologist (including bathymetric, seismic, and magnetic anomalies; side scan sonar contacts; and other seafloor or sub-surface features that exhibit potential to represent or contain potential archaeological sites or other historic properties). In the event that the Qualified Marine Archaeologist indicates that he or she wishes to be present, the Lessee must reasonably facilitate the Qualified Marine Archaeologist's presence, as requested by the

Qualified Marine Archaeologist, and provide the Qualified Marine Archaeologist the opportunity to inspect data quality.

5.3.6 No Impact without Approval: In no case may the Lessee knowingly impact a potential archaeological resource without the Lessor's prior approval.

5.3.7 Post-Review Discovery Clauses: If the Lessee, while conducting geotechnical exploration or any other bottom-disturbing site characterization activities in support of plan (i.e., SAP and COP) submittal and after review of the location by a Qualified Marine Archaeologist under 4.2.4, discovers an unanticipated potential archaeological resource, such as the presence of a shipwreck (e.g., a sonar image or visual confirmation of an iron, steel, or wooden hull, wooden timbers, anchors, concentrations of historic objects, piles of ballast rock) or evidence of a pre-contact archaeological site (e.g. stone tools, pottery or other pre-contact artifacts) within the project area, the Lessee must:

5.3.7.1 Immediately halt seafloor/bottom-disturbing activities within the area of discovery;

5.3.7.2 Notify the Lessor within 24 hours of discovery;

5.3.7.3 Notify the Lessor in writing via report to the Lessor within 72 hours of its discovery;

5.3.7.4 Keep the location of the discovery confidential and take no action that may adversely impact the archaeological resource until the Lessor has made an evaluation and instructs the applicant on how to proceed; and

5.3.7.5 If (1) the site has been impacted by the Lessee's project activities; or (2) impacts to the site or to the area of potential effect cannot be avoided, conduct additional investigations, as directed by the Lessor, to determine if the resource is eligible for listing in the National Register of Historic Places (30 CFR 585.802(b)). If investigations indicate that the resource is potentially eligible for listing in the National Register of Historic Places, the Lessor will inform the Lessee how to protect the resource or how to mitigate adverse effects to the site. If the Lessor incurs costs in protecting the resource, then, under Section 110(g) of the National Historic Preservation Act, the Lessor may charge the Lessee reasonable costs for carrying out preservation responsibilities under the OCS Lands Act (30 CFR 585.802(c-d)).

5.4 Avian and Bat Survey and Reporting Requirements

5.4.1 Lighting: Any lights used to aid marine navigation by the lessee during construction, operations, and decommissioning of a meteorological buoy must meet USCG requirements for private aids to navigation [https://www.uscg.mil/forms/cg/CG_2554.pdf] and BOEM's Guidelines for Lighting and Marking of Structures Supporting Renewable Energy Development [https://www.boem.gov/2021-lighting-and-marking-guidelines]. For any additional lighting, the lessee must use such lighting only when necessary, and the lighting must be hooded downward and directed when possible, to reduce upward illumination and illumination of adjacent waters.

5.4.2 Motus Wildlife Tracking System: To help address information gaps on offshore movements of birds and bats, including ESA-listed species, the Lessee must install Motus stations on meteorological or environmental data buoys in coordination with U.S. Fish and Wildlife Service's Offshore Motus network.

5.4.3 Bird Deterrents: To minimize the attraction of birds, the Lessee must install bird deterrent devices (e.g., anti-perching), where appropriate.

5.4.4 Avian Annual Reporting: The Lessee must provide an annual report to the Lessor and USFWS using the contact information provided as an Enclosure to this lease, or updated contact information as provided by the Lessor. This report must document any dead or injured birds or bats found during activities conducted in support of plan submittal. The first report must be submitted within 6 months of the start of the first survey conducted in support of plan submittal, and subsequent reports must be submitted annually thereafter until all surveys in support of plan submittal have concluded and all such birds and bats have been reported. If surveys are not conducted in a given year, the annual report may consist of a simple statement to that effect. An annual report must be provided to BOEM and USFWS documenting any dead (or injured) birds or bats found on vessels and structures during construction, operations, and decommissioning. The report must contain the following information: the name of species, date found, location, a picture to confirm species identity (if possible), and any other relevant information. Carcasses with Federal or research bands must be reported to the United States Geological Survey Bird Band Laboratory, available at https://www.pwrc.usgs.gov/bbl/.

5.4.5 Survey Results and Data: The Lessee must provide the results of avian surveys and data to BOEM and USFWS with its plans.

6 PROJECT LABOR AGREEMENTS

The Lessee must make every reasonable effort to enter a Project Labor Agreement(s) (PLA) covering the construction stage of any project proposed for the leased area.

7 SUPPLY CHAIN

7.1 **Supply Chain Statement of Goals**: The Lessee must submit to the Lessor a statement of goals in which the Lessee will describe any plans by Lessee for contributing to the creation of a robust and resilient US-based offshore wind supply chain. The Statement of Goals must include the Lessee's plans for investments in supply chain improvements, if any, to support the offshore wind industry, including investments in:

- Installation, downpipe, survey and other vessels,
- Port infrastructure,
- Grid upgrades,
- Research & development,
- Manufacturing of components and facilities,
- Supply chain architecture like fabrication and assembly halls, port storage, laydown areas,
- Dry docks and navigation channels,
- Onshore and offshore docking and refueling stations for autonomous vehicles,
- Workforce diversity, training, and development, and
- Ensuring equal access to contracting opportunities.

Annually following COP approval, the Lessee must send updates to the Lessor on the Supply Chain Statement of Goals, and the Lessee's progress in meeting those goals. This

information may be provided as part of the certification of compliance statement pursuant to 30 CFR 585.633(b).

The Lessee must submit an evaluation of the Lessee's success in meeting these goals no later than the last required Fabrication and Installation Report submission. The Lessee must submit a version of the Statement of Goals, updates, and final report that do not contain confidential information, so that BOEM can make them publicly available.

7.2 **Supply Chain Operating Fee Credit**: To promote the development of the United States' offshore wind supply chain, the Lessee is encouraged to procure major offshore wind components domestically. The Lessee may be eligible for an operating fee rate of 1% for a period of five years. To qualify, the Lessee must satisfy four or more of the following conditions:

- All nacelles for the project are assembled in the United States;
- All turbine blades are manufactured in the United States;
- All towers are manufactured in the United States;
- All foundations are manufactured in the United States;
- All transition pieces are manufactured in the United States;
- All inter-array cables are manufactured in the United States;
- All export cables are manufactured in the United States;
- The offshore substations are manufactured in the United States.

The domestic assembly and manufacturing conditions described above must be meaningful and substantial, as determined by BOEM. For example, a nacelle that is assembled abroad with minor components added in the United States would not satisfy the requirement.

To qualify for the operating fee credit, Lessees must request the credit and must provide to BOEM evidence that four or more of the above-listed conditions were met. Upon BOEM's review and determination that the requesting Lessee has met the criteria to earn the operating fee rate adjustment, the operating fee rate starting in the year after the completion of the review and determination will be 0.01 for five years.

8 SITING CONDITIONS

8.1 **Surface Structure Layout and Orientation**: If the Lessee's lease area abuts a neighboring BOEM lease area, in its COP project design, the Lessee must endeavor to design a structure layout that contains two common lines of orientation across the adjacent leases (as described in Navigation and Vessel Inspection Circular 01-19). If the Lessee and the neighboring BOEM lessee cannot agree on such a structure layout, the Lessee must incorporate a 1 nautical mile setback from the boundary of the neighboring lease, within which the Lessee must not construct any surface structures. Rent will be collected on all areas assigned to the lessee, as outlined in Addendum A, regardless of potential restrictions.

8.2 **No Surface Occupancy**: This lease is subject to no surface occupancy for areas identified in Addendum A. No surface occupancy is defined as a prohibition on the permanent placement of an object on the ocean surface within a specific space.

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF OCEAN ENERGY MANAGEMENT

ADDENDUM "D"

PROJECT EASEMENT

Lease Number OCS-A 0542

This section includes a description of the Project Easement(s), if any, associated with this lease, and the financial terms associated with it. This section will be updated as necessary.

I. Rent

The Lessee must begin submitting rent payments for any project easement associated with this lease commencing on the date that BOEM approves the Construction and Operations Plan or modification of the COP describing the project easement. Annual rent for a project easement 200 feet wide, centered on the transmission cable, is $70.00 per statute mile. For any additional acreage required, the Lessee must also pay the greater of $5.00 per acre per year or $450.00 per year.

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF OCEAN ENERGY MANAGEMENT

ADDENDUM "E"

RENT SCHEDULE

Lease Number OCS-A 0542

This section includes a description of the schedule for rent payments that will be determined if the Construction and Operations Plan has been approved or approved with modifications. BOEM will update this section as necessary.

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF OCEAN ENERGY MANAGEMENT

Lease Number OCS-A 0542

CONTACT INFORMATION FOR REPORTING REQUIREMENTS

The following contact information must be used for the reporting and coordination requirements specified in ADDENDUM "C", Stipulation 5.4:

United States Fleet Forces (USFF) N46
1562 Mitscher Ave, Suite 250
Norfolk, VA 23551
(757) 836-6206

All Other Reporting Requirements in Stipulation 5.3:

Bureau of Ocean Energy Management

Environment Branch for Renewable Energy

Phone: 703-787-1340

Email: renewable_reporting@boem.gov

ENCLOSURE

Attachment 2.2

Memorandum of Understanding

between Leading Light Wind and

Atlantic Shores Offshore Wind

MEMORANDUM OF UNDERSTANDING

This MEMORANDUM OF UNDERSTANDING ("MOU") is made and entered into effective as of January 20, 2023 (the "Effective Date"), between **Invenergy Wind Offshore LLC**, a Delaware limited liability company with its principal office located at One S. Wacker Drive, Suite 1800, Chicago, Illinois 60606 ("LLW"), and **Atlantic Shores Offshore Wind Bight, LLC**, a Delaware limited liability company, with its place of business at 1 Dock 72 Way, Floor 7, Brooklyn, NY 11205 ("ASOW"). LLW and ASOW shall each be referred to as a "Lessee" or collectively as the "Lessees".

RECITALS

WHEREAS, LLW acquired and is actively developing the offshore wind lease in the New York Bight area numbered OCS-A 0542 (the "LLW Lease");

WHEREAS, ASOW acquired and is actively developing the offshore wind lease in the New York Bight area numbered OCS-A 0541 (the "ASOW Lease" and together with the LLW Lease, the "Leases") which is adjacent to the LLW Lease (as shown on Exhibit A);

WHEREAS, the Lessees recognize they can mutually benefit from collaborating on common principles regarding the development of the Leases and intend to work together in a cooperative and coordinated effort (the "Collaboration"); and

WHEREAS, the Lessees desire to memorialize certain terms and conditions of the Collaboration.

NOW THEREFORE, in consideration of the mutual promises and covenants contained herein, the Lessees agree as follows:

Section 1. Defined Terms. Terms not otherwise defined herein shall have the meanings set forth in the table below:

ATLW-8	Atlantic Wind Lease Sale 8
BOEM	Bureau of Ocean Energy Management
COD	Commercial Operations Date
COP	Commercial Operations Plan
NSO	No Surface Occupancy
NVIC	Navigation and Vessel Inspection Circular
OREC	Offshore Renewable Energy Certificate
OREI	Offshore Renewable Energy Installation
SAR	Search and Rescue
TSS	Traffic Separation Scheme
USCG	United States Coast Guard
WEA	Wind Energy Area
WTG	Wind Turbine Generator

Section 2. Background.

BOEM (with USCG input) set formal requirements for the Leases, as detailed in BOEM's ATLW-8, relating to the design of offshore wind farm structure layouts (the "BOEM Lease Stipulations"). The BOEM Lease Stipulations applicable to the Collaboration are excerpted in Exhibit B.

It is commonly understood by the Lessees that BOEM Lease Stipulations contemplate that adjacent leaseholders work together to (i) design a structure layout that contains two common lines of orientation across their adjacent leases or (ii) implement a 1 nautical mile (nm) setback on each side of the shared lease boundary.

LLW and ASOW have committed to coordinate the Lease area designs as provided for in the BOEM Lease Stipulations.

Section 3. Agreed Principles. The Lessees shall, in good faith, work in accordance with the following common layout principles:

(a) Overarching Principles.

(i) The Lessees agree the excerpted provisions in Exhibit D define the buildable area in the Leases as the defined lease blocks except for the NSO areas.

(ii) The Lessees agree there are no formal USCG-defined navigational routes or fairways directly adjacent to the buildable areas (see Exhibit C).

[redacted]

(iv) The Lessees agree there is a mutual benefit associated with allowing temporary encroachment of components and installation and/or surveying equipment within the neighboring Lease due to the jagged boundary formed by the individual BOEM lease blocks and aliquots that make up the shared boundary. Any temporary encroachment of such components or equipment that will likely contact the seabed within the neighboring Lease will require prior written consent of the affected Lessee. Consideration of permanent encroachment is beyond the scope of this MOU.

(v) The Lessees agree to coordinate and work in good faith in formal and informal engagements with USCG, BOEM, and other external parties as may be necessary to achieve the mutual benefits of this Collaboration.

(b) Blade Overhang.

[redacted]

[redacted]

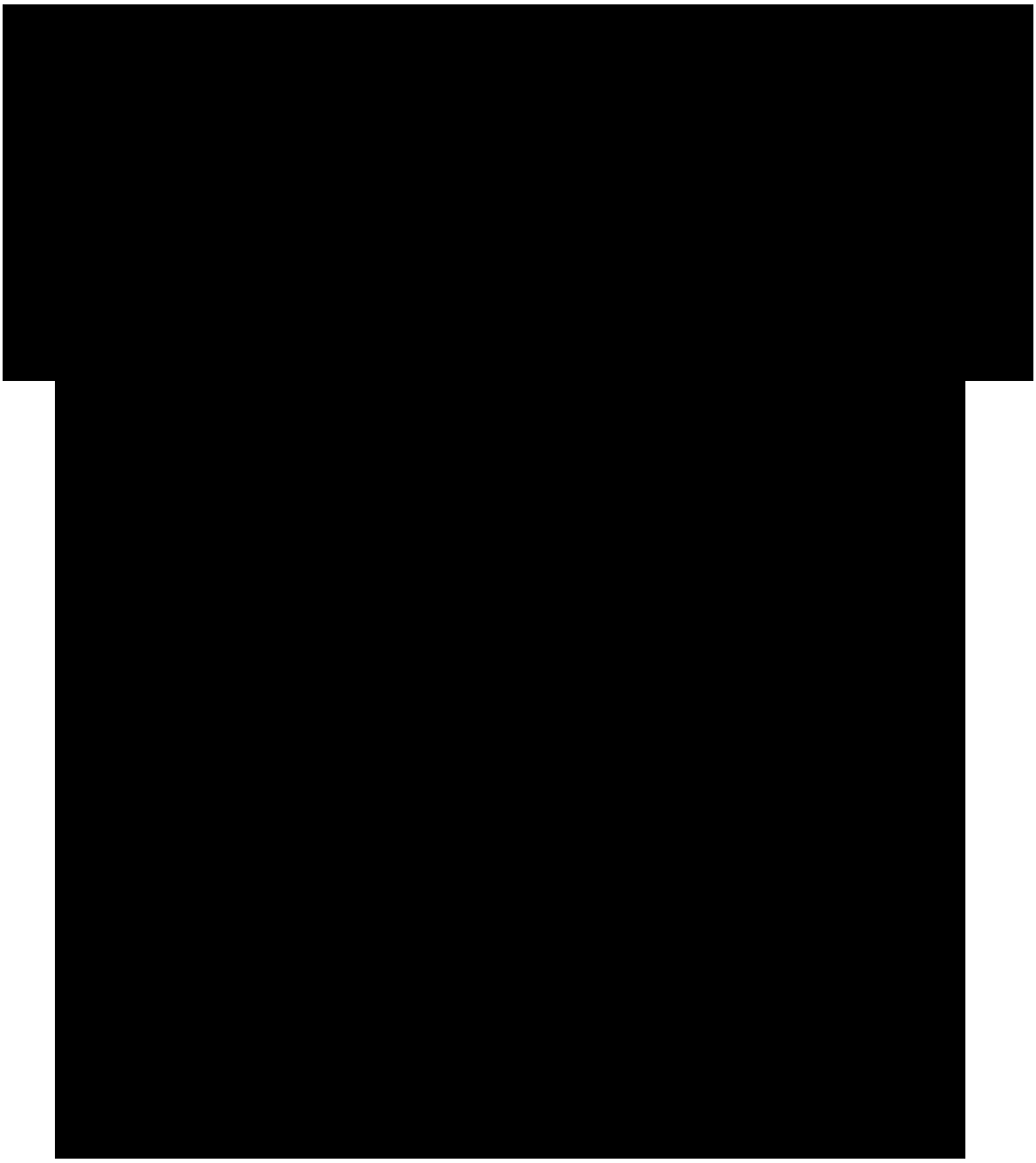
(ii) The maximum blade overhang from each applicable wind turbine foundation center point shall be one half of the wind turbine's rotor diameter.

(iii) The limit of the permanent substructure shall be the maximum radial distance of all permanent substructure components of a foundation from the foundation center point, including any scour protection.

[redacted]

(c) Lines of Orientation.

[redacted]



(d) Corridor Width.

(i) Corridor width in a given direction is defined as the perpendicular spacing between adjacent parallel rows running in the given direction. For illustration, the corridor width for Orientation 1 is shown below in Figure 3 for an indicative layout spacing.

Figure 3: Indication of how to define and measure corridor width for a given orientation and example layout spacing

[redacted]

(ii) Minor future modification or micrositing of these specific WTG locations along the lease boundary, once agreed, will require mutual agreement between the Lessees.

[redacted]

(f) Vessels.

(i) For vessel activity primarily supporting one of the Lease areas, the Lessees agree to work collaboratively, in good faith, to facilitate temporary vessel access within their Lease area for the neighboring Lessee, noting associated stipulations in Sections 3(f)(ii) and 3(f)(iii) below. Applicable vessel activities are those likely to contact the seabed within the neighboring lease, for example jack up vessels, some other construction and installation vessels, and survey vessels conducting geotechnical investigations.

(ii) If vessels and vessel activities primarily supporting one Lease area are likely to contact the seabed in the neighboring Lessee's Lease area, consent from the affected Lessee will be required prior to any vessel encroachment by the other Lessee.

[redacted]

(g) Marking and Lighting.

(i) The Lessees agree to work collaboratively and in good faith on aspects of offshore structure marking and lighting where there is mutually agreed benefit in such collaboration.

(h) Right of Way Corridors.

(i) The Lessees agree to work collaboratively and in good faith on identification and development of offshore cable corridors outside of the Lease areas, inclusive of export cable and meshed cable considerations, where there is a mutually agreed benefit in such collaboration.

(i) Energy and Wake Modeling.

(i) Following competitive OREC offtake solicitations that cumulatively contract for the full offtake capacities of both Lease areas and upon subsequent mutual agreement, Lessees will share limited details of the developing projects sufficient to inform and support improved modelling of wake effects and energy generation for the combined lease area. These data could include offshore structure layout, WTG model, rotor diameter, hub height, etc. as mutually agreed. In no case will data of a commercially sensitive nature be shared where the sharing could create anticompetitive harm.

Section 4. Term. The term of this MOU shall commence on the Effective Date and shall terminate on the first to occur of (a "Termination Event"):

(a) the last COD associated with either of the Leases;

(b) mutual agreement by the Lessees to terminate this MOU; or

(c) The execution of a definitive agreement governing the Lessees' relationship and obligations during the operations and maintenance periods for the respective Leases.

Upon the occurrence of a Termination Event, this MOU shall automatically terminate and, (i) except as otherwise expressly provided in Section 15, this MOU shall be of no further force or effect, and (ii) each of the Lessees shall no longer have any rights, duties, or obligations with respect to this MOU.

Section 5. Public Announcement. No public announcement (whether in the form of a press release or otherwise) shall be made by or on behalf of either Lessee or their representatives with respect to the subject matter of this MOU unless:

(a) the other Lessee has agreed in writing to permit such public announcement to be made, which permission shall not be unreasonably conditioned or withheld; or

(b) such public announcement is required by law and the Lessee required to make such announcement has given prior written notice thereof to the other Lessee.

Any public announcement made as permitted under this Section 5 shall be made only in accordance with a text mutually agreed upon by the Lessees. For the avoidance of doubt, any reference to this MOU or the Collaboration made by either Lessee solely within such Lessee's bid materials for the NYSERDA open solicitation or the anticipated NJ BPU 2023 solicitation for the procurement of ORECs shall not be considered (i) a "public announcement" or (ii) a breach of Section 6.

Section 6. Confidentiality. The Non-Disclosure and Confidentiality Agreement entered into between ASOW's parent company, Atlantic Shores Offshore Wind, LLC, and LLW, as of December 23, 2022, (the "NDA") is hereby incorporated into this MOU by reference as if fully set forth herein. All information provided hereunder or pursuant hereto shall be "Confidential Information" as defined in the NDA. Notwithstanding anything to the contrary in the NDA, each Lessee's obligations with respect to the Confidential Information related in any way to or obtained in connection with this MOU shall survive until the latest of (i) two (2) after the end of the Term, or (ii) the expiration of the relevant period set forth in the terms of the NDA.

Section 7. Limitation of Liability. Notwithstanding anything to the contrary contained in this MOU, LLW and ASOW waive all claims against each other (and against each other's representatives) for any consequential, incidental, indirect, special, exemplary or punitive damages (including loss of actual or anticipated profits, revenues or product; loss by reason of shutdown or non-operation; increased expense of operation, borrowing or financing; loss of use or productivity; or increased cost of capital) to the extent related to this MOU, and regardless of whether any such claim arises out of breach of contract or warranty, tort, product liability, indemnity, contribution, strict liability or any other legal theory.

Section 8. Notices.

(a) Any notice or other communication required or permitted to be given hereunder shall be in writing and shall be given by prepaid first-class mail, overnight delivery, by email or other means of electronic communication (receipt confirmed) or by hand-delivery as hereafter provided.

(b) The Lessees' addresses for service are:

To ASOW: Atlantic Shores Offshore Wind Bight, LLC
1 Dock 72 Way
Floor 7
Brooklyn, NY 11205
Attn: Joris Veldhoven, CEO
Email: joris.veldhoven@atlanticshoreswind.com

With a copy to:

Atlantic Shores Offshore Wind Bight, LLC
1 Dock 72 Way
Floor 7
Brooklyn, NY 11205
Attn: Julia Pettit, General Counsel
Email: julia.pettit@atlanticshoreswind.com

To LLW: Invenergy Wind Offshore LLC
One South Wacker Drive
Suite 1800
Chicago, IL 60606
Attn: General Counsel
Email: generalcounsel@invenergy.com

Section 9. Costs. Each Lessee shall bear its own costs and expenses (including but not limited to fees of legal counsel and outside advisors) in connection with the preparation, negotiation and execution of this MOU and the Collaboration.

Section 10. Assignment. Neither Lessee shall convey, transfer or assign this MOU, or any interest herein, without the prior written consent of the other Lessee, except that assignment by a Lessee to such Lessee's affiliate shall not require consent.

Section 11. No Third-Party Beneficiary. This MOU is intended for the benefit of the Lessee and is not intended to and does not confer any benefit on third parties.

Section 12. Governing Law. This MOU shall be governed by and construed in accordance with the laws of the State of New York, without regard to its conflicts of law principles.

Section 13. Counterparts and Electronic Copies. This MOU may be executed in counterparts, each of which shall have the effect of and be considered as an original of this MOU. Signatures of the Lessee transmitted by facsimile, email or other electronic means shall be deemed to be their original signatures for all purposes.

Section 14. Entire Agreement. This MOU, together with the NDA, represents the entire agreement between LLW and ASOW with respect to the subject matter herein, and supersedes all prior negotiations, representations or agreements, whether written or oral.

Section 15. Binding Effect. Except as otherwise provided in this Section 15, each Lessee acknowledges and agrees that this MOU is not intended to be a binding agreement but merely an expression of intent with regard to the matters discussed herein. Notwithstanding the prior sentence, Sections 4, 5, 6, 7, 8, 9, 12, and 15 of this MOU shall be binding upon the Lessees and shall survive the expiration or termination of this MOU indefinitely or if otherwise stated, for the period specified therein.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, the Lessee have caused this MOU to be executed by their duly authorized representatives on the Effective Date.

ATLANTIC SHORES OFFSHORE WIND BIGHT, LLC

By: DocuSigned by: _____ FE672F5EAAF8456...

Name: Joris Veldhoven _____

Title: CEO_____

INVENERGY WIND OFFSHORE LLC
By: NY Bight Offshore Holdings LLC, its Manager
By: Forward Power Offshore LLC, its Managing Member
By: Forward Power Offshore Holdings LLC, its Manager

By: DocuSigned by: _____ 485AED04FDD945B...

Name: Bryan Schueler _____

Title: Vice President _____

DocuSigned by:

LEGAL REVIEWED

Exhibit A
Lease Areas

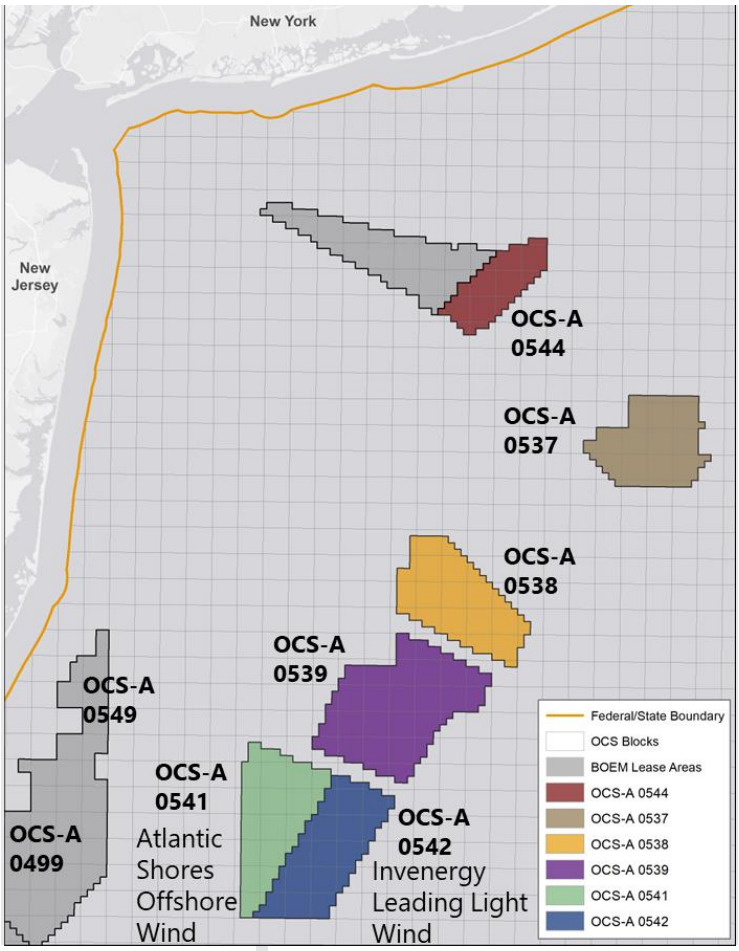


Figure 5. ASOW and LLW lease areas

Exhibit B
Background

Section 1. Lease Stipulations

Section 2. NY Bight Lease Siting Conditions

(i)OCS-A 0541 Lease (BOEM)

(ii)OCS-A 0542 Lease (BOEM)

(iii)NVIC 01-19 (USCG)

(b)8.1 Surface Structure Layout and Orientation

"If the Lessee's lease area abuts a neighboring BOEM lease area, in its COP project design, the Lessee must endeavor to design a structure layout that contains two common lines of orientation across the adjacent leases (as described in Navigation and Vessel Inspection Circular 01-19). If the Lessee and the neighboring BOEM lessee cannot agree on such a structure layout, the Lessee must incorporate a 1 nautical mile setback from the boundary of the neighboring lease, within which the Lessee must not construct any surface structures. Rent will be collected on all areas assigned to the lessee, as outlined in Addendum A, regardless of potential restrictions."

(c)8.2 No Surface Occupancy

"This lease is subject to no surface occupancy for areas identified in Addendum A. No surface occupancy is defined as a prohibition on the permanent placement of an object on the ocean surface within a specific space."

Section 3. Enclosure (2) to Navigation and Vessel Inspection Circular 01-19 (August 1, 2019)

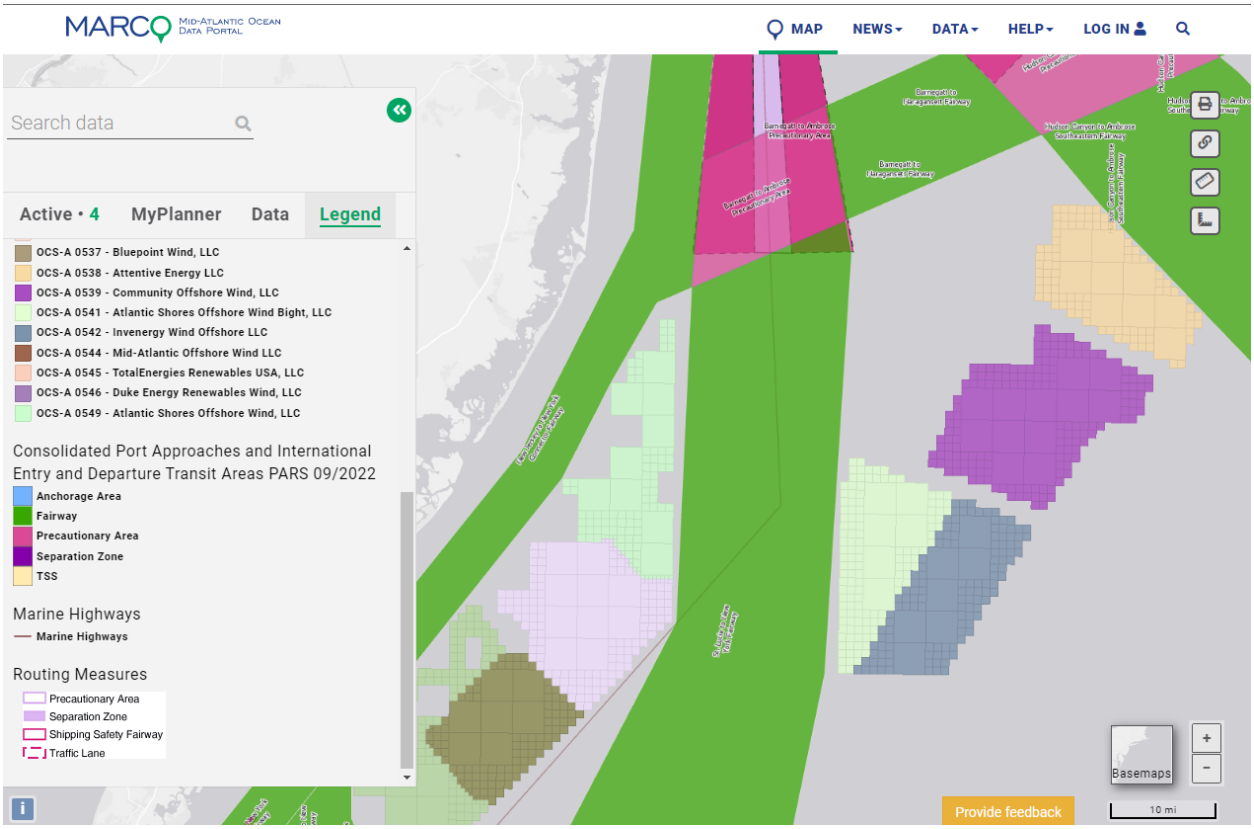
(a)Section 8.d

"In order to minimize risks to surface vessels and/or SAR helicopters transiting through an OREI, structures (turbines, substations etc.) should be aligned and in straight rows or columns. Multiple lines of orientation may provide alternative options for passage planning and for vessels and aircraft to counter the environmental effects on handling, that is, sea state, tides, currents, weather, visibility etc. Developers should plan for at least two lines of orientation unless they can demonstrate that fewer are acceptable."

Exhibit C
Blade Overhang Communications

[redacted]

Per the discussions above and image below, the Lessees agree there are no formal navigational routes abutting the shared or external Lease boundaries.



[Mid-Atlantic Ocean Data Portal - Marine Planner (midatlanticocean.org)]

Figure 6. Navigation routes near lease areas

Exhibit D
Lease Buildable Areas

Section 1. OCS-A 0541

OCS-A 0541 buildable land is described in Exhibit "A" of the BOEM Lease. OCS-A 0541 Lease (BOEM), excerpted below.

Lease OCS-A 0541
The following Blocks or portions of Blocks lying within Official Protraction Diagram Hudson Canyon NJ18-03, are depicted on the map below and comprise 79,351 acres, more or less.

1) Block 6555, S1/2 of NE1/4, SE1/4
2) Block 6556, SW1/4, NW1/4 of SE1/4, S1/2 of SE1/4
3) Block 6557, SW1/4 of SW1/4
4) Block 6605, E1/2, E1/2 of W1/2
5) Block 6606, All of Block
6) Block 6607, All of Block
7) Block 6608, SW1/4 of NE1/4, S1/2 of NW1/4, SW1/4, W1/2 of SE1/4
8) Block 6655, E1/2, E1/2 of W1/2
9) Block 6656, All of Block
10) Block 6657, All of Block
11) Block 6658, NW1/4, W1/2 of SW1/4
12) Block 6705, E1/2, E1/2 of W1/2
13) Block 6706, All of Block
14) Block 6707, N1/2 of NE1/4, SW1/4 of NE1/4, W1/2, NW1/4 of SE1/4
15) Block 6755, E1/2, E1/2 of W1/2
16) Block 6756, All of Block
17) Block 6757, N1/2 of NW1/4, SW1/4 of NW1/4
18) Block 6805, E1/2, E1/2 of W1/2
19) Block 6806, W1/2 of NE1/4, W1/2
20) Block 6855, NE1/4, E1/2 of W1/2, N1/2 of SE1/4, SW1/4 of SE1/4
21) Block 6856, W1/2 of NW1/4

For the purposes of these calculations, a full Block is 2,304 hectares. The acreage of a hectare is 2.471043930.

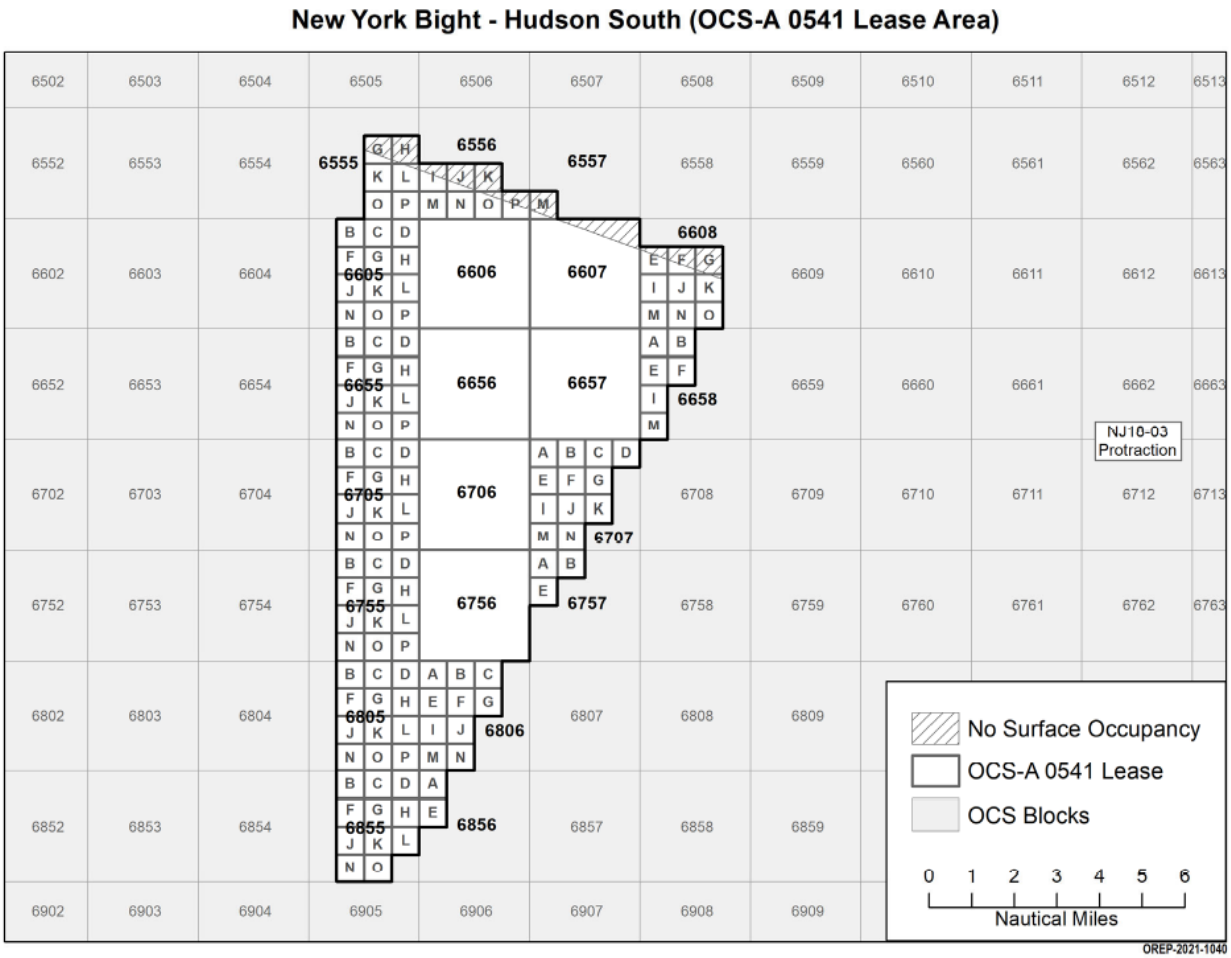


Figure 7. Official Protraction Diagram Hudson Canyon NJ18-03, are depicting OCS-A 0541

The No Surface Occupancy area totals 3,212 acres. It is depicted on the lease map and is subject to Addendum "C", No Surface Occupancy Stipulation No. 8.2 and includes the portion of the lease area lying northeast of a line extending from point number 1 to point number 2.

Point Number Direction Longitude DD Latitude DD

1 Start (NW to SE) -73.632632 39.480460

2 End (NW to SE) -73.452425 39.427638

Coordinate System/Datum - Geographic NAD83, Decimal Degrees

Section 2.OCS-A 0542

OCS-A 0542 buildable land is described in Exhibit “A” of the BOEM Lease OCS-A 0542 Lease (BOEM), excerpted below.

Lease OCS-A 0542

The following Blocks or portions of Blocks lying within Official Protraction Diagram Hudson Canyon NJ18-03, are depicted on the map below and comprise 83,976 acres, more or less.

1) Block 6608, E1/2 of SE1/4

2) Block 6609, SW1/4, S1/2 of SE1/4
3) Block 6610, SW1/4 of SW1/4
4) Block 6658, E1/2, E1/2 of SW1/4
5) Block 6659, All of Block
6) Block 6660, NW1/4 of NE1/4, S1/2 of NE1/4, W1/2, SE1/4
7) Block 6661, SW1/4 of NW1/4, NW1/4 of SW1/4
8) Block 6707, SE1/4 of NE1/4, NE1/4 of SE1/4, S1/2 of SE1/4
9) Block 6708, All of Block
10) Block 6709, All of Block
11) Block 6710, NE1/4 of NE1/4, W1/2 of NE1/4, W1/2
12) Block 6757, E1/2, SE1/4 of NW1/4, SW1/4
13) Block 6758, All of Block
14) Block 6759, N1/2, N1/2 of S1/2, S1/2 of SW1/4, SW1/4 of SE1/4
15) Block 6760, W1/2 of NW1/4
16) Block 6806, E1/2 of NE1/4, SE1/4
17) Block 6807, All of Block
18) Block 6808, All of Block
19) Block 6809, NW1/4 of NE1/4, NW1/4, N1/2 of SW1/4, SW1/4 of SW1/4
20) Block 6855, SE1/4 of SE1/4
21) Block 6856, E1/2, E1/2 of W1/2, W1/2 of SW1/4
22) Block 6857, All of Block
23) Block 6858, N1/2, SW1/4, W1/2 of SE1/4

For the purposes of these calculations, a full Block is 2,304 hectares. The acreage of a hectare is 2.471043930.

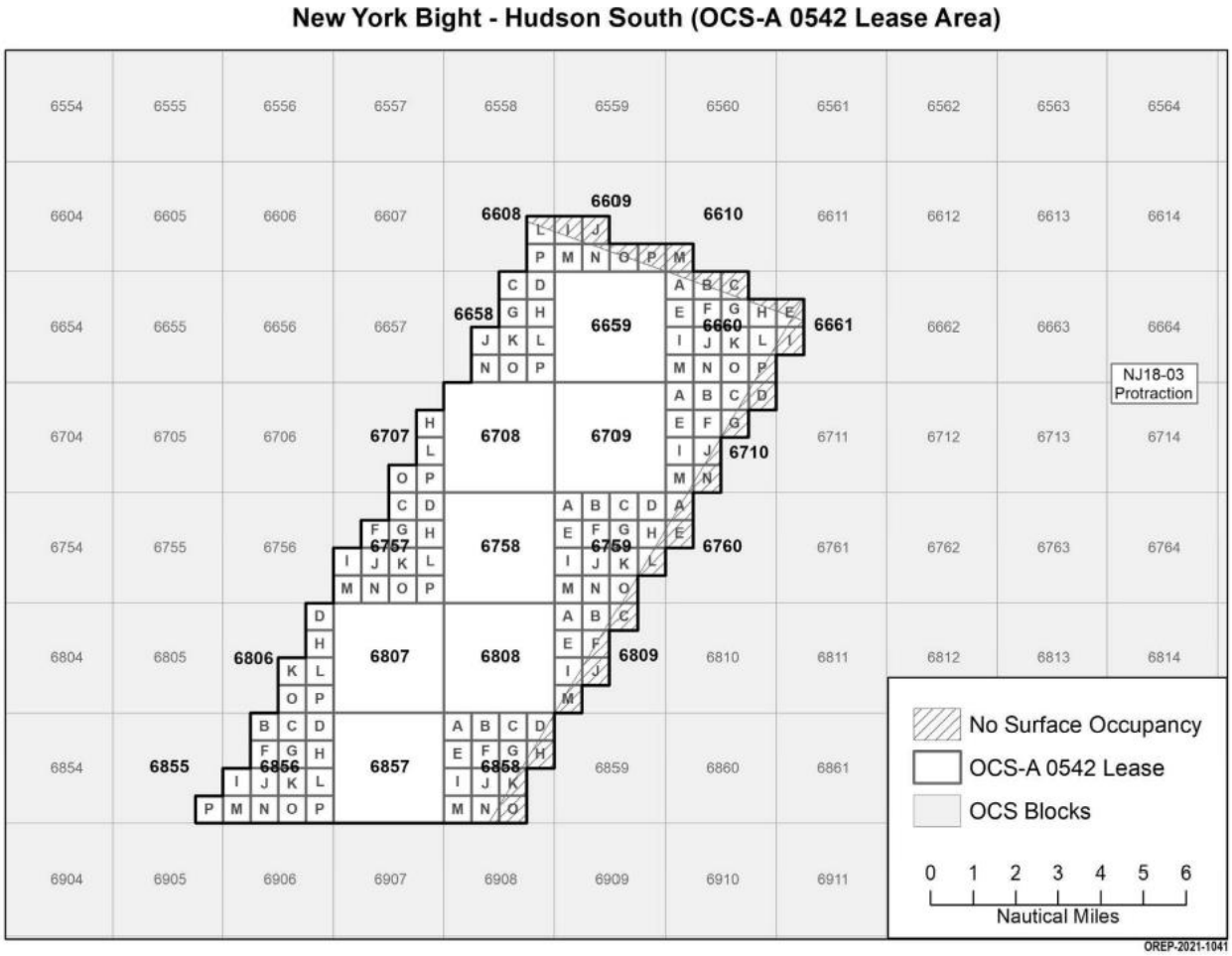


Figure 8. Official Protraction Diagram Hudson Canyon NJ18-03, are depicting OCS-A 0542

The No Surface Occupancy area totals 7,082 acres. It is depicted on the lease map and is subject to Addendum "C", No Surface Occupancy Stipulation No. 8.2 and includes the portion of the lease area lying northeast and southeast of a line extending from point number 1 to point number 3.

Point Number Direction Longitude DD Latitude DD

1 Start *(NW* to SE) -73.452425 39.427638

2 Corner -73.319568 39.388465

3 End (NE to SW) -73.476757 39.192103

Coordinate System/Datum - Geographic NAD83, Decimal Degrees

Exhibit E
Mutually Agreed Layout Values

Attachment 2.3

Geotechnical Interpretation Report

VOLUME I - FIELD OPERATIONS AND PRELIMINARY RESULTS

Invenergy 2022 Geotechnical Soil Investigation

Prepared for: Invenergy Wind Offshore LLC

Invenergy

Geoquip Marine Ref: US22-G-004-FLD-01

Revision: B3

Date: 21 September 2022

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DOCUMENT CONTROL AND REVISION STATUS

Document Title	Volume I - Field Operations and Preliminary Results
Project	Invenergy 2022 Geotechnical Soil Investigation
Client	Invenergy Wind Offshore LLC
Project No.	US22-G-004
Document Ref.	US22-G-004-FLD-01
Revision No.	B3

Document Distribution		
Copy Number	**Distributed to**	**Date**
Master	GMOP Server	21 September 2022
1	GMOP	21 September 2022

Revision History		**Date**	**Original**	**Checked**	**Approved**	**Client**
A1	Draft	10 July 2022	DC/SHK	CBL		
B1	Issued to COMPANY	15 July 2022	DC/SHK	CBL	CBL	
B2	Issued to COMPANY following comments	01 August 2022	SHK	CBL	CBL	
B3	Issued to COMPANY following comments	21 September 2022	MD/SHK	CBL	CBL	

Signatory Legend:		
	CBL	Chris Brandish Lowe
	DC	Dustin Cheng
	SHK	Safrizal Kasri
	MD	Matthew Devoto

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EXECUTIVE SUMMARY

Geoquip Marine USA Inc (GEOQUIP) have completed a geotechnical site investigation for Invenergy Wind Offshore LLC (COMPANY) at a proposed offshore windfarm located in COMPANY's lease area no. OCS-A 0542. The purpose of this geotechnical investigation campaign is to improve the understanding of the soil conditions across the site. The site is located approximately 120km south of Long Island, New York, United States of America.

In general, the scope of work (SoW) consisted of the following:

Wind turbine generator (WTG)

- 9 continuous downhole CPTU locations with target depth of 40m bsf
- 4 alternating sampling and CPTU boreholes with target depth ranging from 60 to 80m bsf (with 2 bumpover locations)

Fieldwork operations for this project have been conducted from MV Dina Polaris, that is on a long term charter to GEOQUIP. The twin derrick rig, GMTR120 which is permanently installed on the vessel was used to achieve the target borehole depths deploying the suite of downhole tools available.

The summary of the investigation completed including the type of the investigation, coordinates and target depths is presented in two tables below.

Summary of Completed Fieldworks

Location ID	Downhole CPTU	Alternating Sampling & Downhole CPTU	Sampling Only	PS Logging	Final Depth below seafloor (m)	Start Date	Remarks
C-1	x				41.18	19/06/2022	Target depth achieved
C-2	x				40.89	20/06/2022	Target depth achieved
C-3	x				41.22	20/06/2022	Target depth achieved
C-4	x				41.25	21/06/2022	Target depth achieved
C-5	x				5.70	23/06/2022	Terminated due to scheduled port call
C-6	x				41.70	22/06/2022	Target depth achieved
C-7	x				42.17	21/06/2022	Target depth achieved
C-12	x				7.82	07/07/2022	Terminated due to weather
C-16	x				40.48	23/06/2022	Target depth achieved
BH-1		x		x	79.65	25/06/2022	Target depth achieved
BH-2			x		3.20	29/06/2022	Terminated due to technical issue with seabed frame
BH-2A[1]		x		x	81.68	29/06/2022	Bumpover location. Target depth achieved
BH-3		x		x	80.33	03/07/2022	Target depth achieved
BH-6		x			1.60	05/07/2022	Terminated due to weather
BH-6A		x			61.30	06/07/2022	Bumpover location. Target depth achieved

Note:

1 PS logging for BH-2A was terminated at 58.50m due to borehole collapsed. This led to another bumpover location BH-2B where destructive drilling was completed to 60.00m. However, PS logging did not commence due to weather (wind).

Coordinates, Date Commenced and Water Depth of Each Location

.

Location ID	Target Coordinates[1]		Actual Coordinates[1]		Start Date	Water depth reduced to MLLW (m)	
	Easting	Northing	Easting	Northing		Drill String	Echo Sounder
C-1	641606.30	4359858.40	641606.49	4359858.46	19/06/2022	48.84	48.55
C-2	632585.00	4346359.50	632585.65	4346360.13	20/06/2022	43.59	43.44
C-3	625387.70	4341863.60	625388.59	4341864.13	20/06/2022	45.09	44.69
C-4	629003.20	4350860.70	629003.49	4350860.9	21/06/2022	47.61	47.21
C-5	639796.40	4364361.80	639795.94	4364361.04	23/06/2022	42.14	41.74
C-6	632597.00	4355362.90	632597.43	4355363.36	22/06/2022	47.52	47.00
C-7	629003.50	4341862.30	629004.02	4341862.8	21/06/2022	44.65	44.19
C-12	636200.30	4350861.70	636199.45	4350861.35	07/07/2022	45.65	45.27
C-16	636200.40	4359859.80	636200.11	4359859.50	23/06/2022	42.62	42.42
BH-1	641602.70	4359861.90	641603.57	4359861.69	25/06/2022	48.47	48.08
BH-2	632580.00	4346359.50	632580.96	4346358.97	29/06/2022	43.90	43.50
BH-2A	632580.00	4346359.50	632581.21	4346363.11	29/06/2022	43.69	43.39
BH-3	625382.70	4341863.70	625383.510	4341864.53	03/07/2022	45.30	44.93
BH-6	632601.90	4355363.00	632601.51	4355363.86	05/07/2022	47.64	47.34
BH-6A	632601.90	4355363.00	632600.96	4355360.45	06/07/2022	47.53	47.23

NOTE

1. Coordinates displayed are referenced to UTM Zone 18 North, NAD83(2011), meters

Preliminary borehole logs are presented in Appendix A are based on the field data and testing carried out offshore.

PS Logging was conducted on BH-1, BH-2A and BH-3 after the completion of downhole CPTU and sampling. This was completed at interval of 0.5m from the base of the borehole progressing towards the mudline. PS logging for BH-1, BH-2A and BH-03 were terminated at 4.50, 58.5 and 25.50m bsf respectively. PS logging for BH-2A was terminated at 58.5m bsf due to borehole collapsed whereas the PS logging for BH-3 was terminated at 25.50m bsf due to no P-wave response and it was agreed with the client representative onboard to terminate at that depth.

Local mobilisation and demobilisation took place in Port of Newark, New Jersey, USA on 16 June 2022 and 8 July 2022 respectively. The scope of work was completed on 8 July 2022. Total project fieldworks duration was 25 vessel days including mobilisation and demobilisation period.

All samples were offloaded from the vessel on 8 July 2022. At the time of writing the report, the samples have arrived at the Geoquip Marine Laboratory in Bristol, and are undergoing further onshore laboratory testing.

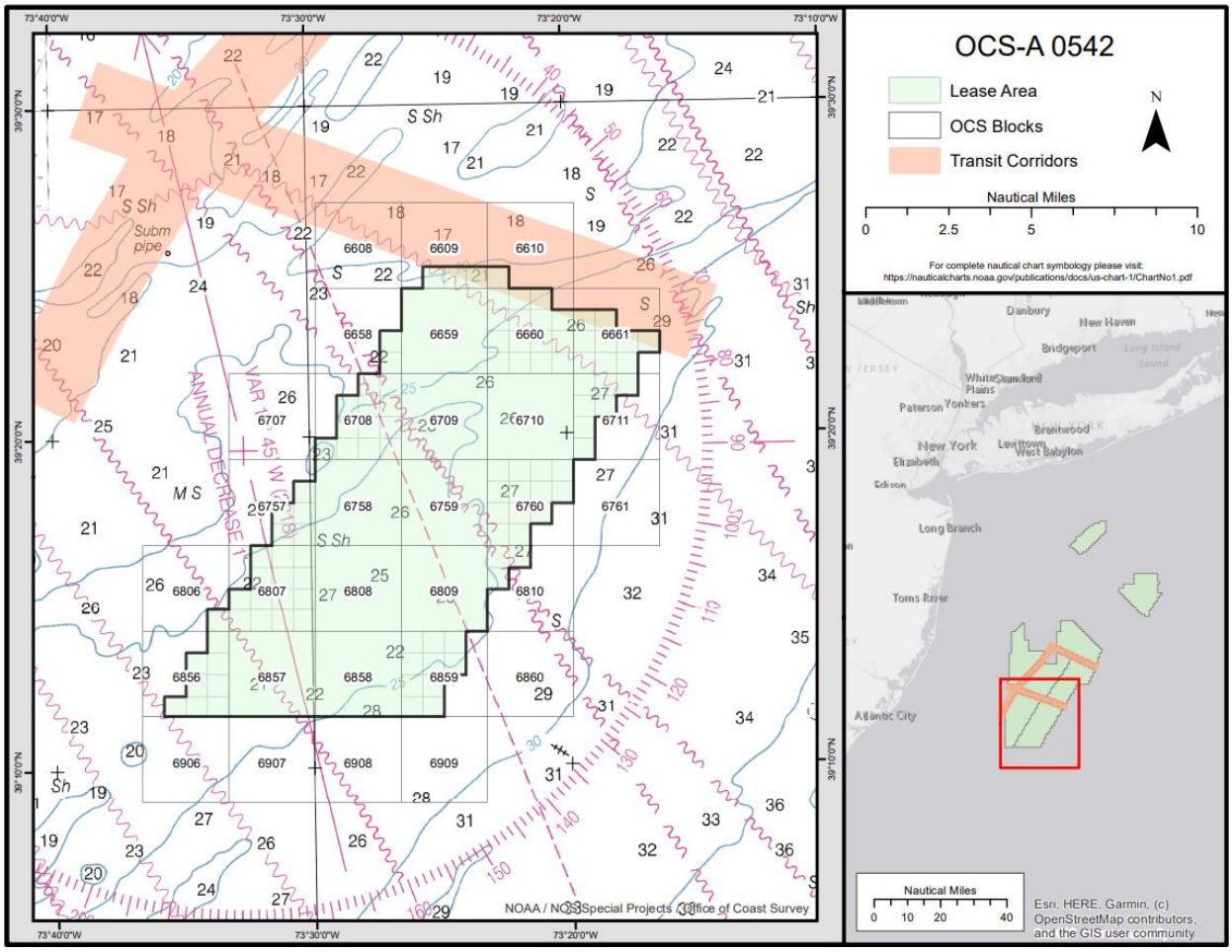
The drilling at the lease area was generally successful. The encountered ground consisted predominantly of dense to very dense sand with a few layers of over consolidated clays. The very dense sand layers encountered has meant that slow rate of sample recovery but overall recoveries from sample tests and CPTU testing were successfully completed to achieve the target depth set for each borehole.

Onboard were 4PSOs, and 1FLO. There were no issues reported at the seabed or with the marine fauna, nor with fishing vessels or any other trading/commercial vessels during this offshore campaign.

The overview map and location map for the site are provided below, with a larger rendition of the map provided in Figure 1 and Figure 2.

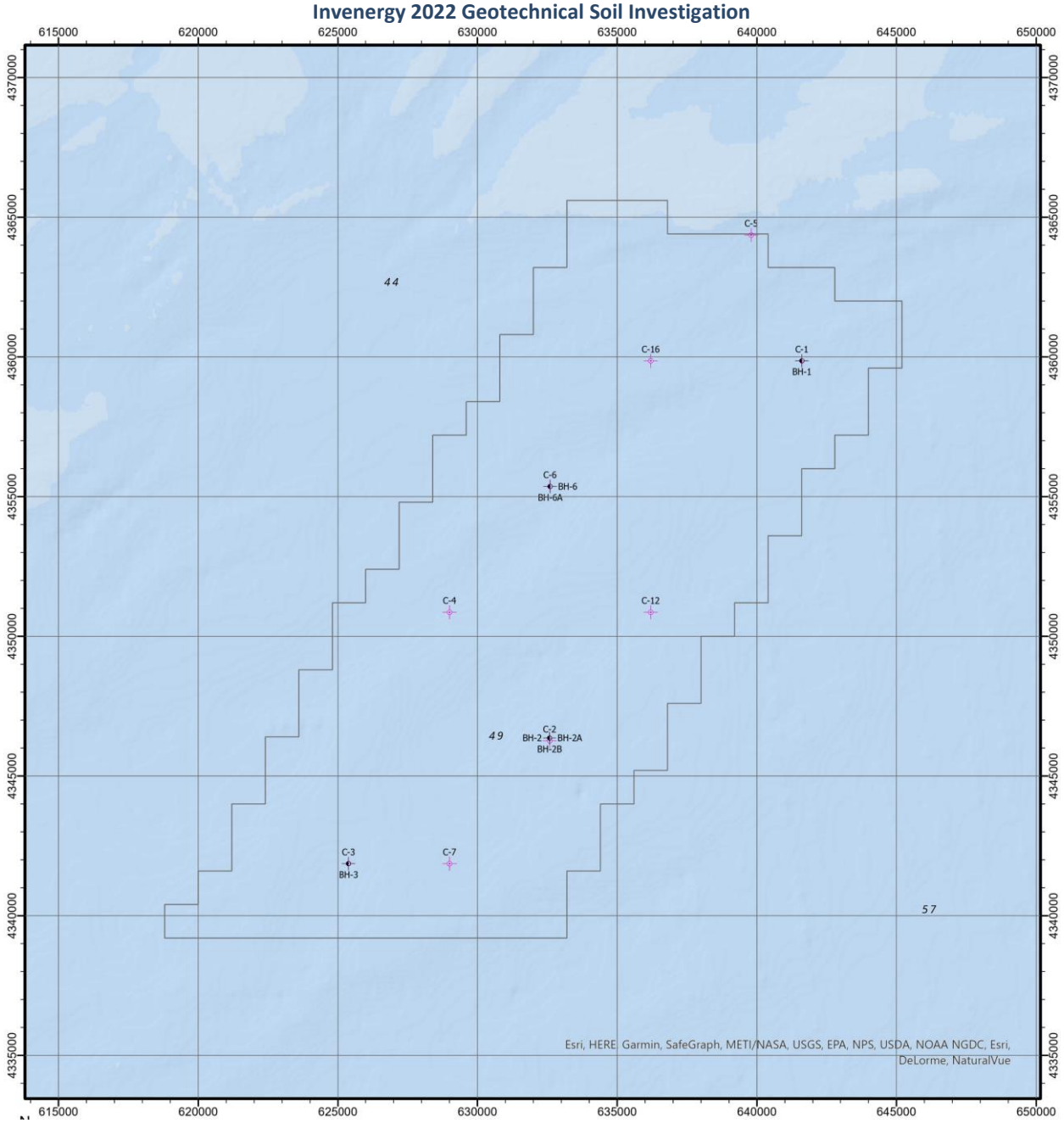
OVERVIEW MAP

Invenergy 2022 Geotechnical Soil Investigation



LOCATION MAP

Invenergy 2022 Geotechnical Soil Investigation



REPORTING STRUCTURE

Volume I – Field Report	Volume II – Factual Report
Field operations and preliminary results	**Measured and derived geotechnical parameters and final results**
Cover Page	Cover Page
Revision status and QA/QC	Revision status and QA/QC
	Summary of main report modifications from previous revision
Executive summary, including an overview map of investigated points	Executive summary, including an overview map of investigated points
Table of contents	Table of contents
List of symbols and terms used	List of symbols and terms used
Chapter 1: Scope of field operations with description of the soil investigation platform (vessel/rig), HSE statistics and project organisation	**Chapter 1:** Project Summary
Chapter 2: Log of drilling operations	**Chapter 2:** Final geotechnical borehole logs and soil profiles, with proposed stratigraphic schematization
Chapter 3: In situ testing operations, procedures and preliminary results	**Chapter 3:** Final in situ test results, including discussion on validity of results
Chapter 4: Sampling operations, procedures and preliminary results including inventory of recovered samples	**Chapter 4:** Laboratory test procedures and final results
Chapter 5: Field laboratory operations, procedures, and test results	**Chapter 5:** Other test results not included in Section 4
Chapter 6: Preliminary geotechnical borehole logs	**Chapter 6:** Other data and results (seismic piezocone results. etc)
Chapter 7: Log of daily field operations	References
Chapter 8: Positioning and survey. including water depth and tidal measurements	
References	
Appendices	

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LIST OF TABLES IN REPORT

LIST OF FIGURES AFTER REPORT

LIST OF APPENDICES

LIST OF ABBREVIATIONS AND DEFINITIONS

English

B_q	pore pressure ratio
D_r	relative density
e_{max}	maximum voids ratio
e_{min}	minimum voids ratio
f_s	sleeve friction
h	depth (below seabed) at start of test
m	metre
q_c	measured cone resistance
q_{net}	net cone resistance
q_t	corrected cone resistance
R_f	friction ratio
s_u	undrained shear strength
u_2	measured pore pressure
z	test depth below bottom of the borehole

Greek

α	net area ratio of cone
γ'	submerged unit weight
γ_w	unit weight of water, assumed to be 9.81kN/m^3
Δu	excess pore pressure
σ_{v0}	*in situ* vertical total stress

Abbreviations

BHA	Bottom Hole Assembly
BOEM	Bureau of Ocean Energy Management
bsf	Below Seafloor
COMPANY	Invenergy Wind Offshore LLC
CPTU	Piezocone Penetration Test with pore pressure measurement

DGPS	Differential Geographical Positioning System
DOR	Daily Operations Report
FLO	Fisheries Liaison Officer
GEOQUIP	Geoquip Marine Operations AG
GMTR	Geoquip Marine Twin Derrick Rig
HSE	Health Safety and Environment
IRF	Incident Report Form
MLLW	Mean Lower Low Water
PD	Project Director
PM	Project Manager
PS	Primary or compressive (P) and Secondary or shear (S) waves
PSO	Protected Species Observer
SBF	Seabed Frame
SVP	Sound Velocity Profile
USBL	Ultra-short baseline
UU	Unconsolidated Undrained Triaxial
WoW	Waiting on Weather
WTG	Wind Turbine Generator

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OCTOBER 2022
INVENERGY

CONCEPTUAL STUDY FOR BLOCK OCS-A 0542

PRELIMINARY GEOTECHNICAL INTERPRETIVE REPORT

PROJECT NO.	DOCUMENT NO.				
A240810	A240810-DR-10403				
VERSION	DATE OF ISSUE	DESCRIPTION	PREPARED	CHECKED	APPROVED
F01	2022-10-11	Issued for client review	CONN	MHKD	FALK

CONTENTS

Attachment 2.4

Preliminary Ground Model

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SEPTEMBER 2022
INVENERGY

CONCEPTUAL STUDY FOR BLOCK OCS-A 0542

GEOTECHNCIAL DESIGN REPORT

PROJECT NO.	DOCUMENT NO.				
A240810	A240810-DR-10402				
VERSION	DATE OF ISSUE	DESCRIPTION	PREPARED	CHECKED	APPROVED
F01	2022-10-05	Issued for client review	CONN	MHKD	FALK

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OCTOBER 2022
INVENERGY

CONCEPTUAL STUDY FOR BLOCK OCS-A 0542

PRELIMINARY SOIL CLUSTERING REPORT

PROJECT NO.	DOCUMENT NO.				
A240810	A240810-DR-10404				
VERSION	DATE OF ISSUE	DESCRIPTION	PREPARED	CHECKED	APPROVED
F01	2022-10-24	Issued for client review	CONN/GMME	MHKD/SOSU	FALK

CONTENTS

Attachment 2.5

Pile Drivability Analysis

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DECEMBER 2022
INVENERGY

CONCEPTUAL STUDY FOR BLOCK OCS-A 0542

GEOTECHNCIAL DESIGN REPORT

PROJECT NO.	DOCUMENT NO.				
A240810	A240810-DR-10402				
VERSION	DATE OF ISSUE	DESCRIPTION	PREPARED	CHECKED	APPROVED
F02	2022-12-02	Issued for client review	MHKD	FALK	FALK
F01	2022-10-05	Issued for client review	CONN	MHKD	FALK

CONTENTS

4 Pile driveability assessment

Pile driving analysis is carried out based on wave equation analysis of pile driving using GRLWEAP, cf. Ref. /4/. The installation is assumed to be performed with standard hydraulic hammer and standard pile cap or hammer sleeve. The three components of the driving system (piling hammer incl. pile cap, pile and soil) are modeled by point masses, springs and damping elements.

The soil resistance during driving acting on the pile shaft and pile tip is calculated to determine the number of blows and pile stresses over the whole length of the pile. The methodology for derivation of soil resistance to driving is described in this section.

The aim of the current driveability analysis is to:

- Verify the driveability of the monopiles and jacket pin piles
- Estimate the appropriate pile driving equipment.

4.1 Soil resistance to driving

The static resistance to driving (SRD) is determined with the CPT based approach of Alm and Hamre presented in Ref. /13/. For the driveability assessment it is assumed that the pile behaves unplugged (coring). Hence, the following equations for side friction is applied to both the exterior and interior pile surface (exterior and interior side friction are assumed to be similar). Further, the toe resistance is applied to the steel annulus only.

The approaches described in Ref. /13/ takes into account the friction fatigue concept:

- the unit side friction during driving at the pile toe at a penetration increment is given as an initial side friction to driving, i.e. pile driving has not affected the side friction at the pile toe.
- the unit side friction during driving at a given depth decreases as a function of the distance from the pile to the given depth
- full degradation of the side friction is governed by the residual side friction to driving.

[redacted]

The above expression for incorporation of friction fatigue is applicable for the Alm and Hamre method, cf. Ref. /13/. [redacted]

a) Soil resistance to driving in sand

The initial side friction to driving, the degradation shape factor and the side friction soil setup for coarse grained materials are determined based on the methodology in Ref. /13/.

b) Soil resistance to driving in clay

The initial side friction to driving, the degradation shape factor and the side friction soil setup for fine grained materials are determined based on the methodology in Ref. /13/.

c) CPTU values to be adopted for determination of soil resistance to driving

As input to the estimation of soil resistance to driving a fit will be adopted to the available CPTU measurements. The UB soil parameters for the CPTU will be presented adopted for the driveability analyses and fatigue calculation.

d) Quake/damping

Quake and damping factors in accordance with Ref. /4/ are applied as summarised in Table 4-1.

4.2 Energy concept in PDA

The concept of energy in the wave equation analysis of pile driving has been extensively discussed in GRLWEAP Background report, Ref. /4/, and its key concepts are described in this section.

Rated Energy (E_r): this value represents the theoretical potential energy of the ram of the hammer which is the ram weight times the maximum stroke height. This nominal value is also part of the name of hammers for some manufacturers.

Hammer efficiency (e_h): this value represents the actual amount of energy available at the time of the impact of the ram. This coefficient somehow represents the reduction of kinetic energy of the ram due to internal frictions that the ram experiences during fall.

Energy loss in the driving system: modern hammers have attachments, e.g. a helmet at the bottom of the hammer, and one or two cushions. These and other devices make up the components of the driving system. Energy is lost in the driving system and may be modeled with another loss factor or by correct and detailed simulation of the hammer. The second approach is normally used in GRLWEAP and for calculating this loss in the driving system, the wave equation analysis requires that stiffness values and coefficients of restitution of the cushions and the weight of the helmet which are provided by manufacturer and set up in Hammer database.

Energy loss in pile and soil: part of the energy after impact will be lost in pile and soil. Pile portion can be calculated using elastic modulus, length, specific weight of the pile and a coefficient of restitution of the pile top are considered. Energy loss in the pile itself is generally low and can be also ignored. The energy loss in soil is computed by considering both a soil stiffness and a soil damping factor. In the early stages of driving, the elastic limit of the soil is readily exceeded and virtually all of the energy into the pile top ends up in the soil. As pile resistance increases with increasing penetration, the elastic characteristics of the soil become more important, and then return a portion of the energy back to the hammer-pile system. This is referred to as rebound. These effects are considered during wave equation analysis.

Energy loss due to entrapped water in conical section of monopile: For perfect cylindrical pile, water has no effective resistance against pile driving. However, the conical or tapered section of the monopile create an extra resistance against driving. Such effect cannot be explicitly accounted for in 1D wave equation analysis. Comprehensive study was done on this factor by 3D Finite Element simulation of pile-water-soil system and this effect was quantified as a function of pile diameter, taper angle, and submerged length. In order to account for this effect in 1D PDA model, recommendation was given to indirectly include this as hammer efficiency and this approach is currently available for some IHC hammers including IHC S-4000. COWI included this recommendation in the PDA procedure for monopiles.

Transferred Energy (Enthru): this concept is mainly used to avoid all those complexities related to energy losses in the hammer-pile-soil system. In fact, in wave equation analysis, the Enthru is calculated from the actual time history of force and velocity of the pile and represent the actual work that has been done on the pile. Ratio of this parameter to the rated energy is known as global or system efficiency.

Aside from energy, time history of any point along the pile can be extracted. For example, the advance noise emission analyses based on finite element simulation of pile-soil-water use the time-history of force at a point on top of the pile as an input to the model.

Attachment 2.6

Monopile Design for Each Cluster and WTG Size

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MARCH 2022
INVENERGY

CONCEPTUAL STUDY FOR BLOCK OCS-A-0542

DESIGN BASIS

PROJECT NO.	DOCUMENT NO.
A240810	A240810-DB-10001

VERSION	DATE OF ISSUE	DESCRIPTION	PREPARED	CHECKED	APPROVED
F03	2022-12-21	Issued for client review	MHKD/SOSU	FALK	FALK
F02	2022-12-12	Issued for client review	MHKD/SOSU	FALK	FALK
F01	2022-03-27	Issued for client review	PADS/AMNO/NAZU/ SOSU	SSRE/FALK	FALK

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MAY 2023
INVENERGY

CONCEPTUAL STUDY FOR BLOCK OCS-A-0542

TP-LESS MONOPILE CONCEPTUAL STUDY REPORT

PROJECT NO.	DOCUMENT NO.				
A240810	A240810-DR-10211				
VERSION	DATE OF ISSUE	DESCRIPTION	PREPARED	CHECKED	APPROVED
C02	2023-07-26	Issued for client review	NNKI	SOSU	FALK
C01	2023-05-19	Issued for client review	NNKI/MHKD	SOSU	FALK

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JULY 2023
INVENERGY

CONCEPTUAL STUDY FOR BLOCK OCS-A 0542

SCOUR PROTECTION CONCEPTUAL STUDY REPORT

PROJECT NO.	DOCUMENT NO.
A240810	A240810-DR-10251

VERSION	DATE OF ISSUE	DESCRIPTION	PREPARED	CHECKED	APPROVED
C01	2023-06-09	Issued for client review	EFCH	NAGE	FALK
C02	2023-07-17	Updated with client's comments	EFCH	NAGE	FALK

CONTENTS

Attachment 2.7a

Strategic Partnerships

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Attachment 2.7b

Letters of Support

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Attachment 2.8

EEW 2022 Track Records, Financial Statements, Proposed Warranty Terms

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Attachment 2.9

Track Records, Financial Statements, and Proposed Warranty Terms for Certain WTG Suppliers Under Consideration, As Available

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Attachment 2.10

Track Records, Financial Statements, and Proposed Warranty Terms for Certain HVDC Equipment

Suppliers Under Consideration, As Available

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Attachment 2.11

Track Records, Financial Statements, and Proposed Warranty Terms for Certain Cable Suppliers Under Consideration, As Available

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