

Geophysical and Geotechnical Investigations in Support of Offshore Wind Energy
Request for Proposal (RFP) 4260

Up to Approximately \$ 5,500,000 Available

NYSERDA reserves the right to extend and/or add funding to the Solicitation should other program funding sources become available.

Proposals Due: January 21, 2020 by 3:00 p.m. Eastern Time*

Offshore wind energy could become a major source of affordable, renewable power for New York State, particularly on Long Island and in the New York City metropolitan area, where demand on the electric grid is greatest. Generating electricity with wind turbines located off New York's Atlantic coast has the potential to provide up to 39,000 megawatts (MW) of clean power for the State, enough to power 15 million homes. On behalf of New York State, the New York State Energy Research and Development Authority (NYSERDA) is coordinating work being conducted by New York State agencies to advance the responsible and cost-effective development of offshore wind resources. As part of its leadership role, NYSERDA spearheaded the development of the New York State Offshore Wind Master Plan <https://www.nyserderda.ny.gov/offshorewind>, a comprehensive roadmap that encourages the development of offshore wind in a manner that is sensitive to environmental, maritime, economic, and social issues while addressing market barriers for offshore wind technology and aiming to lower electricity costs for consumers.

A strong knowledge of seabed soil conditions is essential for the safe and efficient design and operation of offshore wind installations. Although several geophysical surveys and geological studies have been carried out in the New York Bight, only a limited amount of soil sampling and testing has been undertaken. Uncertainty in physical conditions increases development risk and by extension offtake bid prices. Obtaining better characterization of the soil conditions of the offshore wind study area would help increase certainty of development conditions, which are useful in planning activities such as the refinement of project layout and turbine siting, key variables in lease auctions, and offtake.

In 2019, NYSERDA commissioned a Geotechnical and Geophysical Desktop Study (Fugro, "Geotechnical and Geophysical Desktop Study to Support Offshore Wind Energy Development in the New York Bight", Final Report, NYSERDA Report 19-19, April 2019 available here: <https://www.nyserderda.ny.gov/ny/Offshore-Wind-Geo-Investigations>). Publicly available geological and geophysical information on the middle continental shelf, offshore New York and New Jersey, was collated with the objective of creating a regional overview of the seafloor and sub-seafloor environment insofar as it is relevant to a potential offshore wind energy developer. The report describes, as far as the available information allows, the evolution and resultant geological structure, lithology, and soil characteristics within New York State's Area for Consideration, from the seafloor to approximately 100 m (330 ft) below seafloor. An indication of the available data coverage is given and potential geohazards are highlighted.

Through this solicitation, NYSERDA seeks proposals to advance the development of the primary and secondary areas identified by the Bureau of Ocean Energy Management (BOEM) as Hudson North and Hudson South draft Wind Energy Areas (draft WEAs) (<https://www.boem.gov/Task-Force-Meeting-November-2018/>; shapefiles available here: <https://www.nyserderda.ny.gov/ny/Offshore-Wind-Geo-Investigations>). The solicitation seeks to appoint contractors to undertake Geophysical and Geotechnical investigations and develop reconnaissance ground models for each contiguous draft WEA, and an Owner's Engineer to support NYSERDA throughout the ground model development process.

BOEM has not yet converted draft WEAs to final WEAs. Optimally, NYSERDA would undertake the investigations over the final WEAs to avoid data collection outside of leased space and maximize the cost-effectiveness of the investigations. However, NYSERDA would also like to ensure that the investigations are performed in the 2020 favorable weather season to reduce weather downtime. This solicitation has been prepared based on the draft WEA's in anticipation of the WEA's being finalized by BOEM in early 2020, prior to finalization of the Investigation scopes and start of the offshore operations. If finalization of the WEAs is

delayed past the finalization of the scopes, NYSERDA will contract for the investigations to be conducted in the Hudson North and Hudson South draft Wind Energy Areas.

Along with reducing the cost of offshore wind energy, maximizing the benefit for State ratepayers, and accelerating the deployment of wind energy development off the coast of the State, the core goal of this undertaking will be to obtain and make public high-quality seabed soil data sufficient for reducing lease holder uncertainty at the time of offtake and helping to advance the design and installation requirements for offshore wind farms within the study areas including, but not limited to, foundations and cables.

Proposal Submission: Online submission is preferable. Proposers may submit Word, Excel, or PDF files (file formats include csv, doc, docx, gif, jpeg, jpg, pdf, png, ppt, pptx, pps, ppsx, tif, txt, xls, xlsx, and zip). Individual files should be 100MB or less in file size. Proposal PDFs should be searchable and should be created by direct conversion from MS Word, or other conversion utility. Files should not be scanned. For ease of identification, all electronic files must be named using the proposer's entity name in the title of the document. NYSERDA will also accept proposals by mail or hand-delivery if online submission is not possible. For detailed instructions on how to submit a proposal (online or paper submission), click the link "[Application Instructions and Portal Training Guide](#) [PDF]" located in the "Current Opportunities" section of NYSERDA's website (<https://www.nyserda.ny.gov/Funding-Opportunities/Current-Funding-Opportunities.aspx>).

No communication intended to influence this procurement is permitted except by contacting (Gregory Lampman— primary contact) (Designated Contact) at (518) 862-1090, ext. 3372 or by e-mail environmentandoffshorewind@nyserda.ny.gov or (Kate McClellan Press – secondary contact) (Designated Contact) at (518) 862-1090, ext. 3110 or by e-mail environmentandoffshorewind@nyserda.ny.gov (for technical questions). If you have contractual questions concerning this solicitation, contact Nancy Marucci (Designated Contact) at (518) 862-1090, ext. 3335 or NancySolicitations@nyserda.ny.gov. Contacting anyone other than the Designated Contacts (either directly by the proposer or indirectly through a lobbyist or other person acting on the proposer's behalf) in an attempt to influence the procurement: (1) may result in a proposer being deemed a non-responsible offeror, and (2) may result in the proposer not being awarded a contract.

* All proposals must be received by 3 p.m. Eastern Time on the date noted above. Late, faxed, or emailed proposals will not be accepted. Incomplete proposals may be subject to disqualification. It is the proposer's responsibility to ensure that all pages have been included in the proposal. Please note: for online submission, there are required questions that you will have to answer in addition to uploading attachments and you should allot at least 60 minutes to enter/submit proposals. The online proposal system closes promptly at 3 p.m. Eastern Time, files in process or attempted edits or submission after 3 p.m. Eastern Time on the date above, will not be accepted. If changes are made to this solicitation, notification will be posted on the "Current Opportunities" section of NYSERDA's website (<https://www.nyserda.ny.gov/Funding-Opportunities/Current-Funding-Opportunities.aspx>).

PART 1. INTRODUCTION

Section I. Background

New York State Energy Research and Development Authority (NYSERDA) seeks to advance New York State's 9GW offshore wind energy mandate in a way that are both responsible and cost-effective. As a result of this philosophy, the State is continuing its proactive approach to investing in predevelopment activities.

As part of the New York State Offshore Wind Master Plan¹ released in January 2018, the State invested in bringing together existing data, new research, and feedback from stakeholders to inform the federal Bureau of Ocean Energy Management (BOEM) in the identification of new lease areas in the New York Bight. New lease areas in proximity to New York City, the State's "load center," are critical in advancing the State's goals.

As BOEM reviews the draft Wind Energy Areas,² the State is investing in predevelopment activities to gain a better understanding of the physical and environmental conditions in these areas to reduce developer risk, which will enable developers to submit more competitive bid prices in response to New York's offshore wind solicitations ("offtake"). These activities are expected to provide a starting point for project development, but not to displace entirely the work developers will need to undertake to design, permit, and construct projects.

For example, in August 2019, NYSERDA deployed two metocean buoys more than 40 miles off New York's coast (in the BOEM-designated Draft Wind Energy Areas) and each buoy will collect data for two years. The two made-to-order buoys were validated in accordance with Carbon Trust OWA Stage 2 Standard and International Electrotechnical Commission (IEC) standard 61400-12-1 CDV. Similarly, In the summer of 2017, NYSERDA began to conduct a 3-year, 4-season planning level wildlife survey of the NY Bight using digital aerial surveys. The project, which recently completed its last survey, collected more than 3.5 million images and provides broad scale contemporary data about the seasonal, interannual, and spatial distributions of wildlife in the NY Bight, as well as support BOEM in the identification of new, responsibly sited lease areas.

In addition to these activities, New York State is now advancing an approach to invest in planning level geophysical and geotechnical investigations of BOEM's draft Wind Energy Areas. These investigations will provide developers the data they need, when they need it, maximizing the value of the data at the offtake stage, and helping advance the State's progressive mandate efficiently, cost-effectively, and responsibly.

Section II. Goals

The goal of the Geophysical and Geotechnical investigations is the development of reconnaissance Ground Models of sufficient quality to progress the preliminary design and installation requirements for offshore wind farms, including, but not limited to, foundations and cables. Reconnaissance hydrographic, geophysical and geotechnical surveys are to be undertaken that will contribute to the bathymetrical, morphological and geological understanding of the draft Wind Energy Areas (WEAs) in the New York Bight designated as Hudson North and Hudson South primary and secondary areas (shapefiles available here: <https://www.nyserdera.ny.gov/ny/Offshore-Wind-Geo-Investigations>).

The investigations are required to obtain seabed and sub-seabed information about the soil to a depth below which the possible existence of weak formations are not likely to influence the safety or performance of the wind turbines and their support structure. In addition, investigations must provide high resolution information regarding the shallower soils as input for cable burial and morphodynamic assessments. Although the planned surveys have only a reconnaissance level of coverage, the surveys should aim to deliver high-quality data that are suitable for use as baseline data for future surveys and studies (e.g. seabed sediment mobility assessment). The program will comprise the following key tasks:

¹ <https://www.nyserdera.ny.gov/All-Programs/Programs/Offshore-Wind/Offshore-Wind-in-New-York-State-Overview/NYS-Offshore-Wind-Master-Plan>

² <https://www.boem.gov/NY-Bight/>

1. **Geophysical Investigation:** Prepare and carry out geophysical and hydrographic surveys. Process, analyze, and interpret data to develop geological models for each contiguous draft WEA. Use geological models to target the Geotechnical Investigations.
2. **Geotechnical Investigation:** Prepare and carry out a geotechnical survey. Process, analyze, and interpret data to develop geotechnical parameterization of the geological models.
3. **Ground Model Update** (*optional, depending on timing and budget*): Update the geological ground models through joint refinement of the geophysical and geotechnical interpretations to produce validated ground models.

Section III. Available Funds

NYSERDA has a budget of approximately \$5,500,000 available for completing the Geophysical and Geotechnical Investigations and Ground Model Update, and any related project management costs (including Owner's Engineer).

The Geophysical Investigation will provide the underlying framework for Ground Models for the draft WEAs. A key deliverable of the Geophysical Investigation will be a geological ground model per each contiguous draft WEA based primarily on seismic interpretation. The Geotechnical Investigation will target specific locations to provide ground-truth data for these ground models, and to develop the geotechnical parameterization of the draft WEAs. As such, higher priority will be given to the Geophysical Investigation in the allocation of the available budget. However, considering the cost of vessel mobilization and the overall size of the two offshore wind farm areas, a minimum spend will need to be set for a meaningful geotechnical investigation. Estimated spends are tabulated below.

Component	Spend Estimate
Geophysical Investigation	Up to approximately \$3,000,000
Geotechnical Investigation	Up to approximately \$2,000,000
Owner's Engineer	Up to approximately \$500,000

The balance of spending between the various components will be re-evaluated once the tenders for both the geophysical and geotechnical work packages have been received and it is established if the ground model update will be undertaken (and by whom).

PART 2. INVESTIGATIONS

Section I. Datums

All data shall be collected in NAD83 (2011), as per BOEM guidelines, projected where necessary using NAD83 UTM Zone 19 North. The vertical datum shall be Mean Lower Low Water (MLLW). All co-ordinates shall be reported in compliance with relevant BOEM guidelines.

Section II. Geophysical Investigation program requirements

A. Objective of Geophysical Investigation

The Geophysical Investigation will be a reconnaissance investigation that is not expected to provide full coverage of the site. According to BOEM Geophysical and Geotechnical Guidelines³ the investigation constitutes a 'site reconnaissance survey' rather than a 'site characterization investigation'. The overall objective is to produce a reconnaissance Ground Model for each contiguous draft WEA that provides information suitable to understand the general site conditions. The reconnaissance Ground Models must be suitable for the design of subsequent geotechnical investigations.

The Geophysical Investigation should provide for each contiguous draft WEA:

- An accurate bathymetric chart for the reconnaissance survey footprint.
- Information on the presence within the reconnaissance survey footprint of all seabed features of significance to the construction of wind farm facilities including but not limited to:
 - o any natural features such as boulders, scour hollows, pock-marks; and
 - o any non-natural features such as wrecks and debris (both known and previously unmapped), pipelines, cables and infrastructure.
- A reconnaissance unconstrained geological model of the site, including as a minimum:
 - o elevation and depth below seabed charts for the main geological formation interfaces including any mobile sediments, layers of potential archaeological significance (including palaeolandscape reconstruction if necessary), and any other significant interfaces that might impact on the engineering design;
 - o locations of any structural complexities or geohazards within the shallow geological succession such as faulting, accumulations of shallow gas, peat, buried channels etc.; and
 - o detailed geological interpretation to show facies variations and structural feature changes via appropriate maps and sections.
- The exact, current position of existing (in service & out of service) cables and pipelines.
- Input into the specification and scope for a geotechnical sampling and testing program following the completion of the geophysical survey.
- A comprehensive interpretative report on the survey results obtained to assist design of the offshore foundations/structures and cable burial.

The Geophysical Investigation precedes and supplies information to the Geotechnical Investigation.

Due to the limited amount of relevant geotechnical data available in the area of interest, the Ground Model developed from the Geophysical Investigation will be largely unconstrained. Optionally, following the subsequent Geotechnical Investigation the Geological Ground Model should be updated to incorporate the Geotechnical Investigation results and produce an updated Ground Model.

³https://www.boem.gov/G_G_Guidelines_Providing_Geophysical_Geotechnical_Geohazard_Information_Pursuant_to_30_CFR_Part_585/

B. Services Requested

NYSERDA is seeking an offshore geophysical site investigation Contractor to undertake a reconnaissance geophysical investigation in accordance with international standards and guidelines and with the following Bureau of Ocean Energy Management guidelines:

- “Guidelines for Information Requirements for a Renewable Energy Construction and Operations Plan (COP)” dated April 7,, 2016 (Version 3.0) (BOEM 2016).
- “Guidelines for Providing Geophysical, Geotechnical, and Geohazard Information Pursuant to 30 CFR Part 585” dated July 2, 2015 (BOEM 2015a).
- “Data Gathering Process: Geotechnical Departures for Gathering Offshore Wind Energy” dated September 19, 2018 (BOEM 2018).
- “Guidelines for Submission of Spatial Data for Atlantic Offshore Renewable Energy Development Site Characterization Survey” dated February 1, 2013 (BOEM 2013a).
- “Guidelines for Providing Archaeological and Historic Property Information Pursuant to 30 CFR Part 585: dated March 2017 (BOEM 2017).
- “Guidelines for Providing Benthic Habitat Survey Information for Renewable Energy Development on the Atlantic Outer Continental Shelf” dated November 2013 (BOEM 2013b).
- Guidelines for Submission of Spatial Data for Atlantic Offshore Renewable Energy Development Site Characterization Surveys (BOEM, 2015b).

Although the coverage of the survey is only at a reconnaissance level and is not intended to meet permitting regulatory requirements, the techniques used shall be compliant with BOEM HRG and SAP guidelines and the survey line spacing should be a multiple of recommended BOEM line spacings. This is required so that the information acquired in this investigation can be easily supplemented by infill surveys at a later date, to build towards a combined dataset that is compliant with BOEM guidelines.

An archive of GIS data compiled as part of Fugro’s Desk Study is available here:

<https://www.nyserda.ny.gov/nY/Offshore-Wind-Geo-Investigations>. As such, collection and collation of such background data is not required. Furthermore, reference is made to an earlier MBES survey conducted for this site (see <https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Biomass-Solar-Wind/Master-Plan/17-25a-MBES-and-Benthic-Survey-Data.pdf>).

The services should include: development of a field survey plan for field investigations including process for coordinating with fishermen and other mariners; obtaining all authorizations/permits necessary to perform the work; acquisition with Multi-Beam Echo Sounder (MBES), Side-Scan Sonar (SSS), magnetic, Shallow-Penetration Seismic (SPS), and Medium-Penetration Seismic (MPS) systems; data processing; data analysis and interpretation; development of unconstrained Geological Ground Models; and factual and interpretative reporting. Marine mammal and sea turtle monitoring will also be required.

This solicitation also includes the option of updating the Ground Models following the subsequent Geotechnical Investigation.

As the Geophysical Investigation will not obtain full coverage of the Hudson North and South WEAs, the line planning shall incorporate some bathymetry transects co-located with transects from previous surveys (see e.g. <https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Biomass-Solar-Wind/Master-Plan/17-25a-MBES-and-Benthic-Survey-Data.pdf>), in order to contribute to development of a bathymetry time-series dataset. However, seabed mobility analysis is not a requested service.

C. Types and Locations of Measurements

The data density (line spacing) will depend on the total area to be surveyed in each WEA and the available budget.

For the purposes of proposal submission, proposers should assume a provisional maximum permitted inline spacing of 900 m (N-S oriented) and maximum permitted tieline spacing of 4,500 m (W-E oriented)

over the draft WEAs (shapefiles available here: <https://www.nyserda.ny.gov/ny/Offshore-Wind-Geo-Investigations>). Once the survey area and the balance of budgets between investigations has been finalized, the line spacing and line orientation may require adjustment. However, a nominal line-km (excluding transit, run-in/out, re-shoots, borehole tie-lines, and bathymetry time-series dataset lines) has been calculated for each draft WEA based on the provisional line spacings as follows:

- Hudson North WEA: 514 km²/~685 line-km
- Hudson South WEA: 2,444 km²/~3,259 line-km

Applying a ~1% contingency for additional borehole tie lines and bathymetry lines gives a provisional value for costing of approximately 4,000 line-km.

D. Vessel Requirements

Vessel(s) should have as a minimum approximately a length overall of 40 metres and a beam of 10 metres and must be capable of undertaking the Work as specified in the Scope of Work. It is up to the proposer to propose to engage one or two vessels: engagement of more than two vessels is not permitted.

Vessel(s) must be capable of continuous operation 7 days a week, 24 hours a day;

Vessel(s) must have adequate capacity and facilities for:

- Accommodating (berths and workspace) for both marine and survey crews including two Client Offshore Representatives for working in two 12 h shifts per day;
- Onboard QC and all required processing of survey data;
- Storage and bunkering capacity for spares, consumables, fuel etc.
- Comply, as a minimum, to the code of practise for workboats as specified in IMCA M 189 Rev. 2. (contractor must submit prior to mobilization an independent inspection report that includes 'Checklist Based on Approved Code of Practice for Workboats' as specified in IMCA M 189 Rev. 2, IMCA S 004 Rev. 2'. This inspection report should not be older than six months and all items in the checklist are answered with 'Yes' or 'N/A'.)

Equipment for the performance of MBES, SSS, magnetometer and seismic surveys as described in Section E, including an appropriate spares inventory, should be deployed ready for use on the survey vessel.

E. Survey Technology

All survey technology is required to comply with BOEM HRG and SAP guidelines at minimum. The data acquired will be used as baseline data for future work (e.g. seabed sediment mobility assessment) so must be acquired to a high standard even though the investigation coverage is only reconnaissance-level.

The seismic survey must be designed to optimize vertical and horizontal resolution (nominally defined as ¼ wavelength for both), the signal-to-noise ratio and the recovery of coherent signal throughout the depth of interest. The following minimum requirements must be achieved:

- 0-10 m below seabed (bsb): trace spacing of <1 m and vertical resolution of 0.2 m or better.
- 10-30 m bsb: trace spacing of <1 m and vertical resolution ≤ 0.75 m.
- 30-100 m bsb: Inline (stack) trace spacing ≤ 1.57 m and vertical resolution ≤ 2 m.

These requirements exceed BOEM guidelines but are necessary to address the Investigation objectives.

- An SPS survey will be required to image the top 10 m bsb at the required resolution.
- An MPS survey will be required to image to the required investigation depth of 100 m, given the anticipated water depths of 25-60 m. For the MPS surveying, Multi-Channel Seismic (MCS) will be required to image to the full depth of investigation. The proposer may propose a combination of Single-

Channel Seismic (SCS) and Multi-Channel Seismic (MCS), or MCS only: in either case, the proposed solution must be demonstrated to be capable of achieving the resolution requirements throughout the depth range. Note that the investigation is outcome focused and requires that the *delivered* (i.e. processed) data meet the resolution and depth investigation criteria.

NYSERDA has a strong preference for the following types of geophysical equipment to be used to satisfy the Geophysical Investigation objectives:

1. SPS: The equipment when deployed shall be suitable to obtain the resolution requirements in the top 10 m bsb. The preferred technology is an 'Innomar SES-2000 standard' parametric Sub-Bottom Profiler (SBP). Chirp and Pinger SBP systems will also be acceptable. The selected system must be hull, pole, or moon-pool mounted to allow heave compensation to be applied to the data. The proposer must demonstrate that they can achieve the required resolution and depth penetration with the equipment proposed and given the sub-bottom conditions described in Fugro's Desk Study, which includes the presence of sandy sediments that can be expected to impede energy transmission.
2. MPS:
 - a. SCS (if used): Preference is for a high-frequency Sparker as Boomers are generally seen as being more disruptive to marine mammals. The system shall be optimized to obtain the resolution requirements in the top 10-30 m bsb depth range. The source and streamer tow depths will preferably be < 1 m and selected to minimize the effects of ghosting.
 - b. MCS: A high-resolution, multi-channel MPS system shall be used. The system shall be optimized to obtain the resolution requirements in the top 30-100 m bsb depth range.

A high bandwidth Sparker system (dual- or triple-plate source) or alternative source with demonstrated similar spectral characteristics suitable for the resolution specifications shall be used. Sound source levels require testing against National Marine Fisheries Service (NMFS) specifications to ensure they do not potentially lead to unacceptable harassment of marine mammals. As per BOEM guidelines, the National Marine Fisheries Service (NMFS) currently considers sound levels above 160 dB re 1 μ Pa (RMS) to constitute Level B harassment under the Marine Mammal Protection Act and sounds above 180 dB re 1 μ Pa (RMS) are considered Level A harassment. For clarity, air guns are not an option under this RFP.

A multi-channel streamer shall be used with a minimum of 48 channels and a group spacing of preferably 2 m or less and no greater than 3.125 m to provide high horizontal resolution. An active streamer length of between ~70 m and 150 m is required. The streamer tow depth shall be < 1 m (flat) and selected to minimize the effects of ghosting. The shot interval shall be as small as practically possible and defined to maximize CMP fold (minimum 24 fold without trace interpolation). Shots must be distance triggered, not time triggered.

Slant-cable or hybrid-cable (mixed group interval) proposals are acceptable if the vessel operations team can be guaranteed to have had prior experience of the systems proposed and any required data processing schemes are proven to be established in production work. Slant-cable may only be proposed in conjunction with documented and proven mitigation for receiver ghost effects. Both slant-cable and hybrid cable proposals must be accompanied by specific descriptions of the methods of geometry assignment and QA metrics to ensure acceptable performance.

3. Magnetic gradiometer: Two or more magnetometers in gradiometer configuration. Although a single magnetometer would be enough to fulfil BOEM HRG survey guidelines, a magnetic gradiometer will be required in order to fulfil BOEM SAP technology guidelines and to assist with archaeological clearance to inform the selection of locations for the Geotechnical Investigation. Individual magnetometer sensitivity should be 1.0 gamma (γ ; 1.0 nano-Tesla [nT]) or less. Background noise level should not exceed a total of 3.0 γ peak to peak. The data sampling rate should be at minimum 4.0 Hz and preferably ≥ 10 Hz to ensure sufficient data point density. The gradiometer altitude from seabed should preferably be ≤ 4 m, with a maximum of 6 m above seabed.

4. MBES: Data shall be acquired to IHO Standards for Hydrographic Surveys Order 1a, which has a feature detection requirement of a cubic features > 2 m in water depths up to 40 m, or better. In addition, an output bathymetry grid of 0.5-m resolution is required. Based on consideration of site conditions, including anticipated water depths, the proposer must demonstrate that the technology to be employed can achieve a sufficient ping density to achieve these requirements and advise on the maximum swath width for a single line over which these requirements can be met. Snippets/backscatter data must be recorded with consistent gain settings compatible with Acoustic Ground Definition System (AGDS) analysis for seabed classification. Sound velocity data must be recorded in real time at receiver and Sound Velocity Profiles (SVPs) must be obtained at least twice per day.
5. SSS: The SSS survey should be carried out using dual-channel, simultaneous dual-frequency side scan sonar with low and high frequencies of ≥ 200 kHz and ≥ 600 kHz, respectively. The side-scan sonar sensor should be towed above the seafloor at a distance that is 10% to 20% of the range of the instrument. The system must be capable of providing resolution of small, discrete targets 0.5 m in diameter at maximum range. All individual targets above $0.5 \times 0.5 \times 0.5$ m shall be mapped. Based on consideration of site conditions, including anticipated water depths, the proposer must demonstrate that the technology to be employed can achieve a sufficient ping density to achieve these requirements and advise on the maximum swath width for a single line over which these requirements can be met (excluding the nadir gap).
6. Marine mammal and sea turtle monitoring: The monitoring strategy is to be finalized in conjunction with regulatory authorities and the Owner's Engineer: the monitoring scope outlined here is provisional for use in the preparation of cost estimates. Visual observations shall be conducted during the hours of daylight with Night Vision and Infrared Spotlights used during the hours of darkness. In addition, Passive Acoustic Monitoring (PAM) systems shall be operated during any hours of reduced visibility. The monitoring plan should be informed by NYSERDA's *Marine Mammals and Sea Turtles Study* (NYSERDA, 2017).

Materials and equipment or parts thereof provided by the proposer must be of good quality and workmanship and fit for the intended purpose.

NYSERDA will consider alternative technology options provided that the likely quality of results and the cost-effectiveness of the works can be demonstrated clearly by the proposer. If a conflict between BOEM guidance and direction from NYSERDA is identified, the proposer shall immediately notify the Owner's Engineer for direction.

Each data type should be collected by one vessel, to avoid variable data quality/accuracy issues when attempting to combine data of the same type that has been acquired by two or more different vessels. Equipment interference must be minimised in all cases and shall not impact the data quality. As MCS and SCS acquisition can interfere, simultaneous acquisition of MCS and SCS data from the same vessel is strongly discouraged, to avoid degradation of data quality and resolution. The proposer may therefore suggest a multi-vessel solution to avoid SCS/MCS interference. The following options should be considered in order to maximize data quality:

- If only SPS and MCS seismic data are to be acquired (no SCS), then a single acquisition pass with all with hydrographic and geophysical sensors may be acceptable if the proposer can demonstrate that the equipment can be deployed with acceptably low levels of interference.
- If SCS is to be acquired in addition to SPS and MCS, then one of the following options is preferred:
 - o One-vessel solution: one pass to cover the MBES, SSS, magnetic gradiometer, SPS and SCS survey lines, followed by one separate pass to cover MCS lines.
 - o Two-vessel solution: vessel 1 acquiring MBES, SSS, magnetic gradiometer, SPS, and SCS data in one pass and vessel 2 acquiring only MCS data (with MBES data for statics calculations).

A field-testing phase will be required after mobilization and equipment calibration to establish the appropriate configuration and parameterization of data acquisition equipment and finalization of the survey QA parameters. Where data processing operations are critical to either in-field QA/QC or evaluation of the suitability of the data acquisition configuration, design and parameterization of these operations shall be part of the testing phase.

F. Data Analysis

1. MBES

Data shall be reduced to datum, then gridded to produce a raster Digital Terrain Model (DTM) of the seabed at 0.5 x 0.5 m resolution or better. Details of the vertical reduction process must be described in the contractor's report and demonstrated to meet or exceed the investigation requirements, using appropriate illustrations. Regardless of the theoretical capability of the hydrographic and navigational systems deployed, full QA/QC must be carried out in order to generate statistical proof that the survey does not exceed the Total Vertical Uncertainty (TVU) and Total Horizontal Uncertainty (THU) error allowances as defined for Order 1a surveys in the IHO Standards for Hydrographic Surveys. A quantitative assessment of the feature detection thresholds for the survey must also be reported and demonstrated to meet or exceed the IHO Order 1a requirements.

MBES target picking should be carried out based on gridded data to support the interpretation of SSS targets. Targets must be classified at minimum into the following categories:

- Wreck-associated, correlated to local wreck registers, if available, and associated magnetometer/SSS targets;
- Debris-associated, correlated to associated magnetometer/SSS targets;
- Possible pipeline (with appropriate ID to indicate where multiple targets are thought to be associated with the same pipeline);
- Possible cable (with appropriate ID to indicate where multiple targets are thought to be associated with the same cable);
- Mound.
- Depression.

The seabed slope shall also be calculated.

2. SSS

Data shall be corrected for slant range, towfish skew, absorption of sound by seawater, geometric spreading and ship speed to produce the SSS mosaic. The bathymetry elevation data should be used for topographic corrections such that the corrections are carried out based on 3D positioning.

SSS target picking must be carried out. Identified features must include *at minimum*:

- Wrecks;
- Both linear and point debris ≥ 0.5 m;
- Boulders ≥ 0.5 m;
- Pock-marks/depressions
- Cables;
- Pipelines; and
- Trawl scars and regions of trawl scars

All targets must be correlated with the NYSEDA's Offshore Wind Master Plan *Cultural Resources Study* (NYSEDA, 2017) and local wreck registers. Additionally, the nadir must be checked for evidence of gas plumes.

The thresholds indicated are nominal, and a higher threshold and/or mapping of discrete areas of anomalously high target density may be appropriate if feature densities are high, subject to approval.

3. Seabed classification

Seabed classification may be carried out based primarily on MBES backscatter/snippets data. (AGDS classification) or SSS data. The classification methodology must be reported. If grab samples are available from another source, they should be incorporated into the seabed sediment characterisation analysis.

4. Bedform classification

Bedform zonation must be carried out according to a classification scheme compliant with BOEM specifications. The classification methodology must be reported.

5. Magnetic gradiometer

The magnetic gradiometer data must be edited to remove obvious spikes. All processing and editing procedures must be reported in detail.

The picking threshold is a peak-to-trough amplitude of $\geq 5 \gamma$. Targets must be classified *at minimum* into the following categories:

- Wreck-associated, correlated to local wreck registers, if available, and associated bathymetry/SSS targets;
- Debris-associated, correlated to associated bathymetry/SSS targets;
- Possible pipeline (with appropriate ID to indicate where multiple targets are thought to be associated with the same pipeline);
- Possible cable (with appropriate ID to indicate where multiple targets are thought to be associated with the same cable);
- Possible UXO (for potential further analysis outside of the scope of this project);
- Undesignated.

Checks must be carried out on the magnetometer data to identify those magnetometer targets that are probably related to wrecks that are visible in the SSS/MBES data, and to identify additionally any magnetometer targets that may be indicative of buried wrecks (or potentially UXO). If possible UXO targets are identified, these must be indicated in the target table.

6. Seismic

SPS, SCS and MCS data require data processing to be applied to optimize quality. Full processing reporting is required for each type of data collected. MCS data may have 'brute stacks' generated for use in the QA operations on-board. Brute Stacks should contain the minimum processing required to evaluate the quality of the recorded data. Final processing of MCS data may be applied onboard or ashore, in either case the details of any processing undertaken must be explained and discussed in the contractor's report. At minimum, the processing operations applied to each dataset must be described and parameter test panels presented. It is expected that all necessary processing will be undertaken to all SCS and MCS data to maximize the data interpretability. The time-depth conversion method(s) by which depth values have been obtained and the derivation of velocities used must be clearly reported. The processing flows must be approved by NYSERDA prior to the processing of the full datasets.

Subsurface data are to be interpreted using a workstation package at least capable of representation of all subsurface data elements in a common system, capable of picking interfaces in the time domain and rationalising those picks between the data elements and at line intersections to ensure consistency. The Kingdom application from IHS Markit is preferred. The interfaces and geohazards to be interpreted are to be identified based on Fugro's Desk Study agreed with NYSERDA prior to the

interpretation of the full datasets: in addition, as NYSERDA's Offshore Wind Master Plan *Cultural Resources Study* (NYSERDA, 2017) has identified the potential presence of submerged landforms that may have the potential to be archaeologically sensitive, palaeolandscape reconstruction may be required. The interpretation must include consistency/line-tie checks between the single- and multi-channel seismic datasets within the same interpretation environment, and these checks must be described in the interpretative reporting.

Extensive interfaces must be gridded and contoured to provide ribbon plots along the seismic survey lines. A single grid should be provided for each interface. The selection and application of gridding methods and parameters used to generate interface grids from the original pick files must be described in full. Where a single interface has been picked from more than one seismic dataset (e.g. SPS and MCS) then a single interface grid must be generated, and the reporting must describe how the final grid for that interface was derived from the picks of each seismic dataset. Geohazard and intra-formational interfaces may be gridded or presented as pick plots depending on their extent and continuity. The spatial extents of interfaces, units and point features are to be defined and reported. If a significant portion of the subsurface is characterised by intense faulting, the characterisation of the faulting pattern (mean fault throw and density) can replace the picking of each individual fault. A quantitative discussion of the elevation uncertainty of all interfaces and feature types must be included in the reporting.

G. Task Outline

A suggested task outline is provided below to assist the proposer in considering appropriate timings and levels of effort.

- Work planning and coordination
- Mobilization
- Field testing
- Acquisition
- Processing, analysis & reporting

The selected contractor shall work with NYSERDA to finalize the scope of work (and workstreams) and develop an agreed set of Tasks and Milestone Deliverables as part of the preparation of the project documentation.

H. Reporting

1. Field Verification Test report. Noise verification work in the survey area in compliance with BOEM Lease requirements and an approved BOEM survey plan (including Field Verification Plan) shall be conducted prior to operation of instruments operating below 200 kHz. Reporting shall be accordance with the BOEM approved field verification form and shall be provided to the Owner's Engineer within 24 hours of collecting data. The full field verification report shall be submitted within three weeks of collecting the data.
2. Mobilization Report: one per vessel describing the mobilization and calibration tests. The mobilization report(s) shall be submitted within two calendar weeks of acceptance of the data acquisition configuration.
3. Testing Report

The testing report shall be submitted within two calendar weeks of acceptance of the data acquisition configuration. The report must:

- describe and show examples of tested equipment and configurations; and
- demonstrate that the selected equipment and configurations can meet the Investigation objectives.

4. Daily Progress Reports

During the offshore execution of the works contractor shall issue to NYSERDA Daily Progress Reports (DPR) to be submitted before 12:00hrs the next day. The format and content of the daily report shall be submitted to NYSERDA for approval prior to implementation, but shall include as a minimum:

- Activities executed in the past 24 hours and cumulative to date described in all phases, in total numbers and in percentages;
- Activities planned for the upcoming 24 hours;
- Any occurrence causing delay to the project with consistent abbreviations/codes, including but not limited to:
 - o equipment downtime;
 - o scheduled maintenance;
 - o instrument calibrations;
 - o occurrence of Waiting on Weather;
 - o Weather standby below workable weather limits;
 - o other standby;
- Daily observation and registration of weather and sea state;
- HSE occurrences such as incidents, accidents, near misses, safety meetings, safety stand downs, number of safety drills, toolbox talks and persons on board, number of HSE observations, together with measures taken and status
- Non-conformance reporting

The DPRs will be provided in a consistent PDF format to be pre-approved by NYSERDA and will not be scanned. The contractor submits the Daily Progress Report to the Client Offshore Representative for comments.

5. Daily summary reports of all PSO observation activities.

6. Weekly reports

The contractor shall also issue a weekly report providing insight in the progress of the Work on a weekly basis. The report shall include, but not be limited to, the following subjects:

- Work in progress;
- Health Safety & Environment;
- Safety Statistics;
- Status summary work schedule, including weekly planning update;
- Forward looking information for the next two reporting periods;
- In case of deviations from the program: proposals for remedial action together with any revised plans and projections needed to substantiate or explain proposals.
- Status of queries / concession requests;
- Risk Log including areas of concern and actions taken to address them;
- Change control, including list of issued and potential Variation Orders;
- Updated document register;
- Photographs of relevant achievements;
- Areas of concern.

7. Data Quality Reports.

The contractor may be requested by the NYSERDA to provide seismic Data Quality Reports (DQRs) when appropriate. The DQRs will not have to be provided on a daily basis but the contractor must be prepared to compile and provide these reports under the supervision of the Client Representative. Upon request from NYSERDA, to support the DQRs the contractor shall provide a portion of raw or processed data by email or web transfer for the purpose of Quality Control monitoring. The contractor shall provide the NYSERDA such data within 24 hours of the request.

8. Field Report

The contractor shall be required to submit a reporting template for the Field Report within one week after the start of the offshore works. The Draft Field Report shall be made available within two weeks of the completion of the fieldwork.

The Field Report shall contain daily logs and summaries of the work completed, together with any preliminary results that can be provided. The Field Report should include as a minimum:

- A statement of the purpose of the investigation and Scope of Work;
- A description of the work carried out, including:
 - o Project personnel; vessels; equipment list;
 - o Vessel Offset Diagrams for each vessel and, if instrument configurations were changed in the field, each instrument configuration;
 - o Exact positions of all survey works and details of survey positioning control (positioning calibrations, geodetic data, etc.), with accompanying calibration records;
 - o Field procedures, including methodology;
 - o Acquisition Quality Control procedures and reference to the PQP and the specifications and standards adopted and any deviations from them for each survey type;
 - o End-of-line reports for the MCS survey;
 - o Environmental observations;
 - o Relevant signed calibration sheets
- The mobilization, field verification and testing report(s), as appendices;
- Copies of Client concessions, as an appendix.

9. Operations Report

Unlike the Field Report and the Geophysical Interpretative Report, the Operations Report will not be published and will only be for NYSERDA internal use only since it may contain information that is sensitive or confidential for the Contractor, and this and similarly-situated work products should be marked accordingly with guidance from the NYSERDA Project Manager.

The draft Operations Report shall be made available to NYSERDA within two weeks of the completion of the fieldwork. The Operations Report shall contain:

- Daily logs (DPRs)
- Health & Safety records, Incident reports and safety meeting minutes.

10. Geotechnical location memo

This memo should propose suitable locations for in situ investigations in the subsequent geotechnical campaign, to support BOEM review of proposed geotechnical locations. The recommendations for geotechnical investigation locations should be designed to qualify the seismic interpretation for stratigraphy, lithology, geohazards and representative geotechnical parameters, including sufficient 'typical' and 'anomalous' locations to characterize the variation across each draft WEA. The plan is for the Geotechnical location memo to be issued as a separate memo, detailing the general recommendation strategy and a table that details for each location:

- Justification for choosing the location.
- Marine archaeological resource (including cultural landscape) potential.
- Recommendation if a CPT or borehole should be executed and to what depth.
- Recommendation for locations and depth intervals for dating analysis to confirm stratigraphy.

The memo shall be accompanied by:

- Chart and description of predicted geological sequence.
- Excel spreadsheet of recommendation table
- Shapefile of locations, with populated attribute table as per the previous points.

11. Geophysical Interpretative Reports

Although the Geophysical Investigation constitutes a 'site reconnaissance survey' as defined in BOEM's Guidelines for Providing Geophysical, Geotechnical, and Geohazard Information Pursuant to 30 CFR Part 585⁴, the interpretative report should be compliant with BOEM guidelines for the content of site characterization reports as far as is possible with partial site coverage.

The contractor shall be required to submit a reporting template for the Interpretative Report within two weeks after the start of the offshore works. The Draft Interpretative Report shall be made available within seven weeks of the completion of the fieldwork.

One stand-alone Interpretative Report must be submitted for each contiguous draft WEA.

This Interpretative Report shall include:

- i. An Executive Summary;
- ii. A statement of the purpose of the investigation;
- iii. A description of the work carried out, including methodology used for the processing and analysis of each dataset and the associated positioning data, plus reference to specification and standards adopted and any deviations from them;
- iv. Exact locations of all survey lines;
- v. Processing procedures;
- vi. Interpretation procedures;
- vii. Processing and interpretation Quality Control procedures and reference to the PQP and the specifications and standards adopted and any deviations from them;
- viii. A description of the ground model that demonstrates that the Investigation requirements have been met, including a description of the bathymetry, summary tables of seabed and sub-bed targets, a stratigraphic summary table, a full description of all identified seismic facies and features with accompanying example figures, and identification of any areas of potential archaeological significance, summary table of pipelines cables and other infrastructure, qualitative discussion of potential seabed mobility and scour;
- ix. Charts at an appropriate scale on ARCH E of all outputs defined by NYSERDA as required;
- x. Appropriate ground model 2D and 3D visualizations;
- xi. Geotechnical location memo, as an appendix.

The reports and data deliverables shall be submitted to NYSERDA and the Owners Engineer and shall be accompanied by metadata that are compliant the Guidelines for Submission of Spatial Data for Atlantic Offshore Renewable Energy Development Site Characterization Surveys. Both the Draft and Final Reports must be accompanied by a complete set of data deliverables, including the project GIS archive. Data shall be provided via multiple portable hard drives (4).

I. Reporting and data deliverables

1. General

A complete data archive as defined in the following sections must be provided with both the draft and final interpretative reports. A complete, separate archive must be provided for each draft WEA. Clear documentation of data deliverables and demonstration of adherence to BOEM guidelines is required as these deliverables will be important input to future investigations.

⁴ https://www.boem.gov/sites/default/files/renewable-energy-program/G_G_Guidelines_Providing_Geophysical_Geotechnical_Geohazard_Information_Pursuant_to_30_CFR_Part_585.pdf

All data shall be provided with appropriate metadata that are compliant with BOEM metadata requirements specified in Guidelines for Submission of Spatial Data for Atlantic Offshore Renewable Energy Development Site Characterization Surveys.⁵ Spatial data attribute tables (e.g., SSS targets) must satisfy at minimum BOEM SAP and HRG attribution requirements and shall be approved by NYSERDA prior to delivery.

A table of file names against line names for all MBES, Side-Scan Sonar, magnetometer and seismic data files as plain text file or spreadsheet must be supplied. For lines associated with multiple line-part data files, each data file should have its own entry in the index table. The table should also contain the following information against each line name entry:

- Acquisition vessel;
- Acquisition date;
- Source type and ID;
- Receiver type and ID;
- Start and End fix points;
- Name of the relevant Vessel Offset Diagram;
- Indication of whether the file is a production file or has not been processed;

The following data deliverables are required.

2. Raw data

The following raw data deliverables are required at minimum.

- Swath bathymetry data per line/file (full density), in the form of cleaned, de-spiked text (x,y,z) files, after application of positioning QA/QC.
- MBES backscatter data, in standard format such as Generic Sensor Format (GSF).
- Speed of sound in seawater vertical dip data profiles as Excel spreadsheets containing graphs, and as plain text files stripped of trailing values. Data columns must include, at minimum, depth of sounding, recorded speed and corrected speed. Correction parameters should also be included as headers or data columns. Data from both down- and up-going casts must be included.
- Side-Scan Sonar data in the form of raw, un-mosaiced data files (e.g. *.xtf files)
- Cleaned, de-spiked magnetometer data as text (x,y,z) files per magnetometer/line/file, after application of positioning QC and layback
- Raw SPS data with correct navigation applied in SEG-Y format (if applicable, heave information shall be provided separately and not applied to the raw data).
- If acquired, raw SCS data with correct navigation applied in SEG-Y format (if applicable, heave information shall be provided separately and not applied to the raw data).
- Multi-channel raw seismic data with geometry and correct navigation applied (shot gathers) in SEG-Y or SEG-D format.

3. Processed data

The following processed data deliverables are required at minimum.

- Vessel trackplot.
- MBES trackplot (fix point and line).
- The bathymetry at a resolution of 0.5 x 0.5 m or better reduced to datum and produced by gridding the swath bathymetry data to a regular grid, as a single or tiled set of xyz text files (*.xyz/*.pts); and an equivalent single or tiled raster/grid.
- Bathymetry contours at an appropriate interval for the topographic complexity, the grid vertical accuracy/precision and the depth range (typically 1 m).

⁵https://www.boem.gov/uploadedFiles/BOEM/Renewable_Energy_Program/Regulatory_Information/Spatial_Data_Guidelines.pdf

- MBES backscatter image at an appropriate resolution, produced by gridding the swath bathymetry backscatter data to a regular grid, as: a single or tiled set of xyz text files (*.xyz/*.pts); and an equivalent single or tiled raster/grid.
- Bathymetry Total Vertical Uncertainty (TVU) and Total Horizontal Uncertainty (THU) grids at an appropriate resolution, as: a single or tiled set of xyz text files (*.xyz/*.pts); and an equivalent single or tiled raster/grid.
- The bathymetry slope in degrees calculated from the bathymetry grid as a single or tiled set of xyz text files (*.xyz/*.pts); and an equivalent single or tiled raster/grid.
- A time-stamp indexed text file of the tidal correction.
- SSS trackplot (fix point and line).
- Magnetometer trackplot (fix point and line).
- Single or tiled Side-Scan Sonar mosaic at 0.5 m resolution in raster format (e.g. *.tif).
- Cleaned, de-spiked magnetometer data as text (x,y,z) files per line/file, including layback, both for individual magnetometers and gradient data.
- Trackplot for the SPS survey (point and line).
- Trackplot for the SCS survey (based on the source-receiver mid-point) (point and line).
- Trackplot for the MCS survey (based on the CDPs) (point and line).
- Processed SPS data with correct navigation and tidal correction applied in SEG-Y format (if applicable, the processed data shall be heave corrected) in time.
- If acquired, processed SCS data with correct navigation and tidal correction applied in SEG-Y format (if applicable, the processed data shall be heave corrected) in time.
- Multi-channel processed seismic data with correct navigation and tidal correction applied in SEG-Y format (including processed data at major interim stages of the processing, e.g. brute stack, after multiple attenuation and before and after migration, in time and depth).

All raster deliverables for single-variable data should be supplied as single-band files with actual cell values (e.g. elevation, intensity), not as multi-band RGB images, with the exception of the SSS mosaic. All processed spatial deliverables listed above that are not natively generated in ArcGIS (e.g. CAD, microstation products), must be provided additionally in the project GIS archive.

4. Interpretative data

The following interpretative deliverables are required at minimum.

- Bedform classification polygon(s).
- Sandwave crests as polylines.
- Sediment distribution/seabed classification, depending on the classification method used, to be provided as: either a single or tiled set of xyz text files (*.xyz/*.pts) and an equivalent single or tiled raster/grid; or as a polygon spatial data file.
- Full Side Scan Sonar contact report containing information and images for all identified SSS targets in Microsoft Word and Adobe pdf formats.
- Side-Scan Sonar target table and associated point, line and polygon spatial data files.
- MBES target table and associated point, line and polygon spatial data files.
- Magnetometer target table and associated point, line and polygon spatial data files.
- Separate table containing all vertex co-ordinates for each identified cable/pipeline, indexed by cable/pipeline ID.
- Text (or csv) pick files for each interpreted horizon (including seabed and interfaces/features that were of too small extent or too sparse to be gridded) in an exchangeable format with at minimum columns for XY coordinates, survey line name, shot point/trace number, time and elevation.
- Elevation surfaces for all interpreted horizons at an appropriate resolution to be agreed with NYSERDA, reduced to datum and produced by gridding the pick data to a regular grid, as an xyz text file (*.xyz/*.pts) and a raster/grid.
- Elevation contours for all interpreted horizons at an appropriate interval.
- Depth below seabed information for all interpreted horizons at the same resolution as the elevation grids, as an xyz text file (*.xyz/*.pts) and a raster/grid.

- Depth below seabed contours at an appropriate interval.
- Sub-surface point geohazard (such as diffraction apices that may indicate the presence of boulders) table(s) and associated point spatial data with columns for X and Y co-ordinates at minimum and depth where appropriate as point data files (one per type).
- Formation/formation member/unit and laterally extensive geohazard (such as shallow gas or peat) extents as polygon spatial data files. Extent polygons should:
 - o include and clearly indicate areas where the unit/feature is thought to be present, but the base/top cannot be interpreted, and exclude areas where the unit/feature is absent; and
 - o indicate any areas of particular uncertainty.
- Faulting as linear features (individual faults) and/or polygons (areas of faulting).
- Kingdom project (or similar, depending on interpretation environment), preferably in Kingdom 2015.

All raster deliverables for single-variable data should be supplied as single-band files with actual cell values (e.g. elevation, intensity), not as multi-band RGB images. All interpretative spatial deliverables listed above that are not natively generated in ArcGIS (e.g. CAD, microstation products), must be provided additionally in the project GIS archive. If provided, tiled grids shall not have overlaps.

5. GIS data

A project GIS archive in a single GIS deliverables folder must be provided to NYSERDA and the Owners Engineer. Raw and Processed spatial data supplied in the project GIS archive (e.g. grids, polygon files) do not need to be provided elsewhere in the data delivery. Duplication of data deliverables should be avoided where possible.

Spatial data should ideally be provided in a geodatabase, but shapefile data would be acceptable with appropriate handling of 'null' values. The GIS data must be consistent with all other data deliverables (e.g. target feature classes in the GIS archive must contain the same attribute columns and values as in the Excel/text file target tables and report appendices, Kingdom-generated elevation grids and GIS elevation rasters should match, etc.). The GIS data archive must include at minimum:

- Project area, wind farm and survey boundaries (polygons).
- Vessel trackplot(s) and fix points.
- Sensor trackplots and fix points (transmitter/receiver midpoint where transmitter and receiver are not co-located; CDP-based for the MCS trackplots).
- Bathymetry grid (full resolution) and contours.
- TVU and TVH uncertainty grids.
- MBES backscatter grids.
- SSS mosaic (full resolution).
- MBES, SSS and magnetometer targets (point, linear and polygon targets to be symbolized appropriately; e.g. significant linear targets should be recorded as line features and not points), including as-found cables, pipelines, wrecks etc. MBES and SSS targets may be combined into a single Feature Class/shapefile but magnetometer targets must be kept separate.
- Elevation and depth below seabed grids and contours for all interpreted interfaces (including gridded geohazards, e.g. top shallow gas). Grid and contour coverage must be consistent with the associated extent polygons.
- Polygon extents for each identified geological unit and Formation and all spatially-extensive geohazards (gas, significant channels, areas of faulting etc.). Areas where an interface or geohazard is thought to be present but is not interpretable must be differentiated from areas where it is thought to be absent.
- Point and polyline geohazards (suspected boulders, isolated peat occurrences of too small an extent to be gridded, etc.).
- Seabed sediment classification.

- Bedform classification.
- Geotiffs of all reported side scan sonar contacts.

All raster deliverables for single-variable data should be supplied as single-band files with actual cell values (e.g. elevation, intensity), not as multi-band RGB images, with the exception of the SSS mosaic.

The master map (*.mxd document) should include a layout containing at minimum a map window (with appropriate graticule), scale bar and legend. All data should be symbolized using similar schemes as per the report charts for ease of cross-referencing.

Layers should be grouped into meaningful categories (background mapping, geohazards, seabed features, etc.) and layer and group names should be used that can be easily cross-referenced to the report.

Section III. Geotechnical Investigation program requirements

A. Objective of Geotechnical Investigation

The objectives of the field investigation and laboratory testing program are:

1. To supplement the preceding geophysical survey by collecting soil data at specific locations in order to calibrate or “ground-truth” the seismic data. This will enable the further development of the geological ground models for each contiguous draft WEA in Hudson North and Hudson South (shapefiles available here: <https://www.nyserda.ny.gov/ny/Offshore-Wind-Geo-Investigations>) that will be initially based on the geological desk study and the results of the geophysical survey;
2. To help determine, together with the seismic data, the general vertical and lateral variation in seabed conditions across the two study areas;
3. To provide relevant geotechnical data for the preliminary design of potential offshore wind farms in the region, including, but not limited to foundations and cables;
4. To support the assessment of suitability of construction vessels used during the construction phase of WTG and OSS structures.

B. Services Requested

NYSERDA seeking an offshore geotechnical site investigation Contractor to undertake a preliminary soil investigation in accordance with international standards and guidelines, and relevant BOEM guidelines. The services should include: development of a field survey plan for field investigations including process for coordinating with fishermen and other mariners, obtaining all authorizations/permits necessary to perform the work, *in situ* testing using a piezocone penetrometer, collection of soil samples from drilled boreholes, laboratory testing of soil samples, data processing and analysis, and reporting. Archaeological resource identification surveying may also be required to provide coverage of any seafloor area that will be physically disturbed by the geotechnical investigation, as per *BOEM Guidelines for Providing Archaeological and Historic Property Information*.

Following the state-of-practice for offshore wind farm site investigations, it is preferred that the *in situ* piezocone penetrometer testing (PCPT) is carried out using both a seabed system and within the boreholes. A seabed PCPT system is widely acknowledged as providing the most cost-effective means of gathering high quality soil data and is particularly useful for preliminary investigations where a large area needs to be investigated on a tight budget. The only disadvantage is that the maximum test depth cannot be guaranteed, since it is dependent on the soil conditions encountered. In contrast, it is possible to guarantee the depth of (down-hole) PCPT testing within a drilled borehole.

However, it is not sufficient to obtain only PCPT data. Laboratory testing of soil samples is also necessary in order to confirm the soil type and to calibrate the interpreted geotechnical parameters derived from the CPT

data, especially the undrained shear strength of cohesive materials. In order to obtain soil samples over the full depth of interest, drilled boreholes are required at selected representative locations.

The contractor may, at NYSERDA's request, be required to coordinate with one or more research or academic institutions, making reasonable accommodations to share sediment samples and/or information to support appropriate and relevant research projects.

C. Types and Locations of Measurements

NYSERDA will select the investigation locations and depths based on the results of the geophysical surveys. The quantities of seabed PCPTs and sampling boreholes will depend on the available budget (current estimate is around \$2,000,000). The balance between seabed PCPTs and boreholes will also depend on the lateral variability in geological conditions across the two sites and a consideration of the need to have as many investigation points as possible versus the need for soil samples at specific locations. However, it is anticipated that the ratio of seabed PCPTs to boreholes will be around 5:1.

D. Vessel Requirements

The vessel(s) must fulfil all requirements in accordance with the national and international provisions and conventions applicable in each case at the place of performance, including the IMO Convention (for example SOLAS, ISM, MARPOL and STCW). This must be substantiated with valid certificates for vessels, crew and (anchoring-, crane-, lifting-, lifesaving-, firefighting-, etc.) equipment. Certificates must be valid until 3 months after end of the Work, at a minimum. Insurance commensurate with industry standards for the type of work solicited will also be required.

- Vessel(s) (at least Dynamic Position System 2 (DP2)) must be capable of undertaking the Work as specified in the Scope of Work. Vessel(s) should have as a minimum a length overall of 70 metres and a beam of 15 metres.
- Vessel(s) must be capable of continuous operation of 7 days, 24 hours a day.
- Vessel(s) must have adequate capacity and facilities for:
 - o Accommodating (berths and workspace) for both marine and survey crews including Client Offshore Representatives for working in two 12 hour shifts per day;
 - o storage and bunkering capacity for spares, consumables, fuel etc.;
 - o onboard QC and processing of investigation data.
- Vessel(s) must comply, as a minimum, to the code of practice according to IMCA guidelines (Contractor must submit prior to start of mobilization an independent inspection report/audit that fulfils the corresponding IMCA guideline for the used vessel category and have been passed successfully. This inspection report should not be older than six months before start of mobilization and all items in the checklist are answered with 'Yes' or 'N/A'.)

E. Survey Technology

NYSERDA has a strong preference for the following types of geotechnical equipment to be used:

1. A seabed PCPT system with a minimum 20-tonne thrust capacity and sufficient rod length for a target penetration depth of 50m below seabed.
2. A conventional offshore heave-compensated rotary-flush drilling rig with the capability for deploying downhole tools for push sampling (76mm / 3-inch diameter Shelby tubes), hammer sampling (2-inch & 3-inch diameter), and PCPT.

Furthermore, NYSERDA anticipates that the optimum geotechnical solution will involve a combination of seabed PCPT and drilled boreholes (involving sampling, rock coring if necessary, and downhole in situ testing i.e. PCPT, SCPT). This combination of techniques normally maximizes the number of investigation locations

and the total depth over which data is obtained, whilst ensuring that a site-specific calibration is undertaken of the CPT data from laboratory tests on soil samples. However, it is acknowledged that the vessel mobilization costs could represent a significant proportion of the available budget, which may limit the typical benefits of this solution, depending on whether one or two vessels would be required. Therefore, the proposer is invited to consider the cost-benefit of a borehole-only solution, a seabed CPT-only solution, and a combination of the two when formulating a proposal for the geotechnical investigation.

NYSERDA will consider alternative technology options provided that the likely quality of results and the cost-effectiveness of the works can be demonstrated clearly by the proposer. However, it should be noted that a jack-up vessel is considered to be an unsuitable option for this site considering the general uncertainty in soil conditions and the lack of any soil data for the necessary site-specific leg penetration assessments at each location.

The proposer shall demonstrate that they can provide, and deploy appropriately, geophysical survey equipment for the purposes of archaeological resource identification that meets the specifications described by the BOEM *Guidelines for Providing Archaeological and Historic Property Information* (Side-Scan Sonar, magnetic gradiometer and Sub-Bottom Profiler). However, pricing of archeological resource identification surveying is not required in the proposer's tender.

Materials and equipment or parts thereof provided by the proposer must be of good quality and workmanship and fit for the intended purpose.

F. Recovery of Samples and Laboratory Testing

1. General

The following tasks shall be carried out offshore on the geotechnical drilling vessel:

- Sample logging immediately after a sample has been retrieved by a qualified Contractor's (engineering) geologist, and photography;
- Moisture content and unit weight measurements;
- Pocket penetrometer tests or torvanes if appropriate on cohesive soil samples;
- Unconsolidated Undrained Triaxial Compression Tests (UU tests);
- Selection and proper preservation of suitable of "undisturbed" cohesive samples to avoid a change of the soil properties (e.g. waxing of and preservation in cardboard tubes or preservation of whole cores) including labelling of core sub-samples for onshore testing.

All core logging and soil testing shall be carried out, where applicable, respectively to Eurocode EN 1997-2:2007, ISO 19901-8:2014, BS 5930, and BS 1377 or NYSERDA approved equivalent.

2. Sample Photography

Each recovered sample shall be cleaned of drilling fluid, photographed intact, and after removal of a thin veneer of sample to expose any stratigraphy, surface structure or change in properties shall be photographed again. After subsampling to preserve undisturbed material and testing the remaining core shall be split and photographed again to record the internal structure so that all details are clearly recognizable in accordance with a NYSERDA approved standard. As a minimum 12MPX resolution is required in order that quality, focus, color and resolution shall be adequate to resolve millimeter scale features.

The borehole identification, date of sampling, depth data and top/bottom identification must be legible along with the project identification, borehole number, sample identification, sample depth, a graphic length scale and a standard of tints.

The Contractor shall be required to demonstrate a system to prove that every sample is photographed to a standard to be accepted by NYSERDA and recorded on to hard storage media. Examples shall be provided to the Client Offshore Representative for approval prior to photography commencing.

3. Laboratory Testing

Onshore Laboratory testing shall be performed on the preserved samples at an approved laboratory selected by the Contractor. Any subcontracted testing shall require the approval of NYSERDA. As a general guideline, the following types of tests will normally be required for the different material types expected. The actual testing program shall be proposed by the Contractor and approved by NYSERDA.

Cohesionless Soil

- Natural water (moisture) content
- Bulk density
- Particle density
- Particle size analysis (sieve)
- Particle size analysis (using sieve and pipette method for fines fraction)
- Maximum and minimum density
- Carbonate tests
- Organic tests (dichromate or loss on ignition)
- Isotropically consolidated drained (CID) compression triaxial tests
- Shear box tests

Cohesive Soil

- Natural water (moisture) content
- Bulk density
- Particle density
- Particle size analysis (using pipette method for fines and if applicable sieve)
- Atterberg limits (plastic and liquid limits, fall cone test)
- Organic tests (dichromate or loss on ignition)
- Unconsolidated undrained (UU) triaxial compression tests on undisturbed samples
- Unconsolidated undrained (UU) triaxial compression tests on remoulded samples
- Isotropically consolidated undrained triaxial compression test (CIU)
- Incremental Loading (IL) oedometer compressibility tests
- Constant Rate of Strain (CRS) compressibility tests

Rock

- Natural water (moisture) content
- Uniaxial compressive strength (UCS) tests
- Point load tests
- Carbonate tests

4. Storage of Samples

On board the vessel, samples shall be stored in a temperature stable environment (5-10°C) with no exposure to direct sunlight and in compliance with the standards as specified above. In the onshore laboratory, samples shall be stored in a temperature (5-10°C) and humidity-controlled enclosure and in compliance with the standards as specified. NYSERDA shall approve proposed methods and conditions of storage.

The soil samples shall be stored onshore by the Contractor for a period of thirty-six (36) months following the soil samples receipt at the onshore laboratory during which time NYSERDA shall be granted free access to the same. The Contractor shall store the cores in containers so that they can be retrieved easily. Storage shall be in a temperature and humidity-controlled environment to ensure the samples do not dry out or suffer any other damage and in compliance with the standards as specified.

The Contractor shall confirm and detail the precise method of long-term storage and temperature control for NYSERDA approval.

Following the minimum thirty-six (36) months storage period, NYSERDA shall instruct the Contractor of one of the following:

- a further period of storage,
- safe and legal disposal of all samples or
- NYSERDA collection of said samples.

For the avoidance of doubt, the Contract Price shall include for the safe and legal disposal of all samples of storage. Further storage shall be at cost to NYSERDA by contract modification.

G. Data Analysis

The Contractor is required to process, analyze and present the factual data in accordance with the relevant test standards. In accordance with standard practice, the Factual Geotechnical Report should include factual results from the laboratory tests and measured parameters from the PCPT tests (i.e. cone tip resistance, sleeve friction, excess pore water pressure) in addition to the normal geotechnical parameters that are interpreted from the measured parameters (i.e. net cone resistance, friction ratio, pore pressure ratio, undrained shear strength of cohesive soils, and relative density of cohesionless soils).

The Contractor may also be required to analyze all the results from the geotechnical investigation and the geophysical survey in order to develop a Geological Ground Model for the study areas. However, this is an optional item, which will be requested at the discretion of NYSERDA.

The detailed contents of the geotechnical investigation reports are presented in Section H below.

H. Reporting and data deliverables

1. Daily Progress Reports

During the offshore execution of the works Contractor shall issue to NYSERDA Daily Progress Reports (DPR) to be submitted before 12:00hrs the next day. The format and content of the daily report shall be submitted to NYSERDA for approval prior to implementation, but shall include as a minimum:

- Activities executed in the past 24 hours and cumulative to date described in all phases, in total numbers and in percentages;
- Activities planned for the upcoming 24 hours;
- Any occurrence causing delay to the project with consistent abbreviations/codes, including but not limited to:
 - o equipment downtime;
 - o scheduled maintenance;
 - o instrument calibrations;
 - o occurrence of Waiting on Weather;
 - o Weather standby below workable weather limits;
 - o other standby;
- Daily observation and registration of weather and sea state;
- HSE occurrences such as incidents, accidents, near misses, safety meetings, safety stand downs, number of safety drills, toolbox talks and persons on board, number of HSE observations, together with measures taken and status
- Non-conformance reporting

The DPRs will be provided in a consistent PDF format to be pre-approved by NYSERDA and will not be scanned. The Contractor submits the Daily Progress Report to the Client Offshore Representative for comments.

2. Weekly Reporting

The Contractor shall also issue a weekly report providing insight in the progress of the Work on a weekly basis.

The weekly progress report of the Contractor shall include, but not be limited to, the following subjects:

- Work in progress;
- Health Safety & Environment;
- Safety Statistics;
- Status summary work schedule, including weekly planning update;
- Forward looking information for the next two reporting periods;
- In case of deviations from the program: proposals for remedial action together with any revised plans and projections needed to substantiate or explain proposals.
- Status of queries / concession requests;
- Risk Log including areas of concern and actions taken to address them;
- Change control, including list of issued and potential Variation Orders;
- Updated document register;
- Photographs of relevant achievements;
- Areas of concern.

3. Preliminary Field Borehole Logs and PCPT Results

The Contractor is to provide preliminary PCPT results within 24 hours of completion of the borehole. The Contractor is to provide the preliminary (field) borehole logs containing the offshore lab test results within 48 hours of completion of the borehole. Prior to submitting the borehole logs and PCPT results, the Contractor's lead engineer shall review and approve the data for release to NYSEDA. The combined results will be used to complete the onshore laboratory test schedule.

4. Field Report

The Contractor shall be required to submit a reporting template for the Field Report within one week after the start of the offshore works. The draft Field Report shall be made available within two weeks of the completion of the fieldwork.

The Field Report shall include but is not limited to:

- Executive management summary
- A statement of the purpose of the investigation;
- A description of the work carried out, including reference to specification and standards adopted and any deviations from them;
- Exact locations of all boreholes and seabed PCPTs. The coordinates should also be provided in electronic format (xlsx);
- Drawings (GIS format or similar as well as PDF) showing the locations of the boreholes and seabed PCPTs undertaken;
- Preliminary (field) borehole logs (including offshore laboratory tests results);
- Plots of the following final (quality assured) PCPT results:
 - o Measured cone resistance
 - o Measured sleeve friction
 - o Measured pore water pressure
 - o Friction Ratio
 - o Net cone resistance
 - o Interpreted relative density (granular materials), inclusive of a description of the type of correlation used for the interpretation

- o Interpreted undrained shear strength (cohesive materials), inclusive of a description of the type of correlation used for the interpretation
- Calibration report including all on board calibration sheets and calibration certificates of PCPT cones used;
- Mobilization report;
- Positioning data;
- Full details of all lost and damaged equipment.

5. Operations Report

Unlike the Field Report and the Geotechnical Investigation Report, the Operations Report will not be published and will only be for NYSERDA internal use only since it may contain information that is sensitive or confidential for the Contractor.

The draft Operations Report shall be made available within two weeks of the completion of the fieldwork. The Operations Report shall contain:

- Daily logs (DPRs)
- Driller's and CPT operator's log and recorded drilling parameters (i.e. torque, mud pressure, bit weight)
- Incident reports

6. Geotechnical Investigation Report

The contractor shall submit a reporting template for the Geotechnical Investigation Report within two weeks after start of the offshore works. The contractor shall also submit an interim version of the Geotechnical Investigation Report containing all available standard laboratory test results six (6) weeks following the completion of fieldwork. The Contractor shall submit a draft final version of the Geotechnical Investigation Report containing all laboratory test results no later than twelve (12) weeks following the completion of fieldwork.

One Investigation report and associated data archive shall be submitted for each contiguous draft WEA.

The draft final version should include:

- Executive management summary;
- A statement of the purpose of the investigation;
- A description of the work carried out, including reference to specification and standards adopted and any deviations from them;
- Exact locations of all boreholes and seabed PCPTs. The coordinates should also be provided in electronic format (xlsx);
- Drawings (GIS or similar as well as PDF) showing the locations of the boreholes and seabed PCPTs undertaken;
- Plots of the following final (quality assured) PCPT results:
 - o Measured cone resistance
 - o Measured sleeve friction
 - o Measured pore water pressure
 - o Friction Ratio
 - o Net cone resistance
 - o Interpreted relative density (granular materials), inclusive of a description of the type of correlation used for the interpretation
 - o Interpreted undrained shear strength (cohesive materials), inclusive of a description of the type of correlation used for the interpretation
- Final offshore and onshore and laboratory test results including summary tables;
- Final borehole logs including the measurement while drilling results;
- Color photographs of samples and cores;

- ASCII data of PCPTs;
- Lab test data in AGS format;
- An overview of the remaining samples that will be stored.

The contractor must ensure that the terminology used in the geophysical report is transferred without alteration into the Geotechnical Investigation Report, including that of geological formation naming.

The contractor shall provide a digital draft report, which shall be made final after processing of comments and approval by NYSERDA. The draft report shall contain all the information which is to be included in the final report. Both draft and final field report shall consist of two (2) electronic copies to be provided digitally (HDD). The contractor shall provide four (4) electronic copies of the final Factual Geotechnical Report and data. Digital data shall be provided for both draft and final reports.

Section IV. Ground Model Update program requirements

A. Objective of Updated Ground Model

The objective of this ground model update is to produce an integrated set of data and reports that build on the Geophysical and Geotechnical Investigations results. The goal is that, through integration and refinement of the Investigation results, more robust Ground Models are developed that are consistent with all available data and are suitable as a basis for full-coverage, BOEM-compliant Ground Models (development of full-coverage Ground models is outside the scope of the works requested in this RFP).

In developing the ground model update, the contractor shall re-assess and refine the interpreted seismo-acoustic model developed during the geophysical survey using the geotechnical data and assign geotechnical parameters to each soil unit.

B. Data Analysis

If selected by NYSERDA to carry out this work, the contractor shall integrate all geophysical and geotechnical data sets (including all other relevant data provided by NYSERDA and available in the public domain) and create an updated ground model (report including drawings) for each contiguous draft WEA.

The ground model update scope shall be developed in conjunction with NYSERDA and the Owner's Engineer. As part of the integration and modelling process, should difficulties be experienced in integration due to either the geophysical or soils data, the Contractor shall discuss with NYSERDA and agree what processes are required to enhance the integration process. This may involve but not be limited to reinterpretation of the geophysical data set. The Contractor is encouraged to discuss any issues that may arise and to seek advice and guidance where required. The Contractor is also encouraged to engage with NYSERDA throughout the ground model update phase and to encourage discussion on the progression of the works and any perceived issues.

C. Reporting and Data Deliverables

1. Strategy Note

Prior to starting work, the selected contractor will be required to prepare a short technical note listing all input data and reports and outlining the proposed strategy for the integration of the various available datasets.

2. Ground Model Report

The contractor shall be required to submit a reporting template for the Ground Model Report on instruction from the Owner's Engineer, following the geotechnical field campaign. The ground model reporting and data archive must build upon the Geophysical and Geotechnical Investigation results: all

seabed and sub-bed grids/rasters, point, polyline and polygon features mapped by these Investigations must also be present in the Ground Model data archive, whether unchanged or updated. They must also be reported/mapped in the Ground Model report at an appropriate level of detail (with references as necessary to the Geophysical and Geotechnical Investigation reports) such that the Ground Model report can be understood as a stand-alone document.

One Ground Model report and associated data archive will be required for each contiguous draft WEA.

In addition to the existing Ground Model data as described above, the Ground Model shall include the following:

- Depth to top of Soil Unit maps, and contours for all units;
- Thickness of Soil Unit maps, and contours for all units;
- Identification of any geohazards;
- Location of all geophysical and hydrographic survey lines;
- Location of all boreholes and seabed PCPTs.

The Ground Model Report shall also include the following:

- Identification of the soil layers and extent thereof that can be found over the two study areas.
- Plots of the following geotechnical parameters versus depth (below seabed and below LAT) for each borehole and each geological soil unit:
 - o Measured water content and Atterberg Limits
 - o Measured bulk and dry unit weights
 - o Derived submerged unit weight
 - o Particle size by mass percentage less than 2, 60 & 2000 μm
 - o Net cone resistance
 - o Friction ratio
 - o Undrained shear strength (measured from lab tests and interpreted from PCPT results)
 - o Relative density (interpreted from PCPT results)
- Identification of areas within the study areas that can be qualified in terms of suitability and quantified in terms of reduced or elevated development and installation costs.
- Identification of the suitability of or possible constraints across the two study areas regarding:
 - o Transfer of forces from wind turbine & substation foundation to seabed
 - o Piling of foundations e.g. presence of boulders or rocks
 - o The use of jack-ups
 - o The use of gravity base foundations
 - o The use of foundations based on suction piles or suction buckets
 - o The use of novel or composite foundations
 - o The installation of cables
- The following charts / cross-sections are to be reported and are considered to be a minimum:
 - o Long-line and cross-line sections through boreholes and seabed PCPTs (superimposed and fully annotated).
 - o Minimum three type section charts per development area showing interpreted seismic data with superimposed geotechnical interpretations that demonstrate that the geotechnical and geophysical interpretations are consistent, and the constrained ground model is robust.
 - o Charts comprising the mapped top of each major geological soil unit surface identified and the mapping of each of the major geological soil unit thicknesses.
- Charts are to be provided in PDF and in an approved GIS-compatible format.

All data shall be provided with appropriate metadata that are compliant with BOEM metadata requirements specified in Guidelines for Submission of Spatial Data for Atlantic Offshore Renewable Energy Development Site Characterization Surveys⁶. Both the Draft and Final Reports must be accompanied by a complete set of data deliverables, including the project GIS archive. Data shall be provided via multiple portable hard drives (4).

Section V. Waiting on Weather principles

A. Definitions

Waiting on Weather shall mean standby or non-operational time of equipment and/or vessels of the contractor due to adverse weather conditions or forecasted weather conditions at the site.

Waiting on Weather occurs if the offshore Investigation cannot be continued or started at the time planned for its commencement, as stated in the contractors program and as specified in the daily progress reports.

Waiting on Weather can only occur if the Workable Weather Limits as stated by the contractor are exceeded.

Exceptional Weather Delay shall mean the number of Waiting on Weather days exceeding the estimated number of such days (Waiting on Weather Allowance) specified in the contractor's proposal (Attachment A – Cycle times and Rates – 5.1 (geophysical campaign) and 8.1 (geotechnical campaign)).

B. Principles

The consequences of Waiting on Weather incurred by the contractor in executing the work are handled as follows:

- Option 1: Lump sum including weather
In this scenario the contractor has an allowance for Waiting on Weather and will be granted an extension of the Key Dates for delivery of the deliverables in case the contractor can demonstrate to have suffered Exceptional Weather Delay. However, no adjustments of the Contract Price shall be made in case of Exceptional Weather Delay.
- Option 2: Lump sum excluding weather
In this scenario the contractor has not allowed for any compensation for Waiting on Weather. The Contract Price shall be adjusted by way of variation for actual Waiting on Weather and such adjustment shall be on a pro-rata basis measured to the nearest minute based upon the standby rate set out in Attachment A. The contractor will be granted an extension of the Key Dates for delivery of the deliverables in case the contractor can demonstrate to have suffered Exceptional Weather Delay.

The contractor is required to include the Workable Weather Limits, the Waiting on Weather Allowance and vessel standby rate in Attachment A. NYSERDA will choose the preferred way forward (option 1 or 2) based on an assessment of the prices.

C. Determination

1. Waiting on Weather will not apply under the following conditions:
 - (a) Before commencement of the work;
 - (b) During mobilization and demobilization activities;
 - (c) During suspension of the work, except when requested by NYSERDA

⁶https://www.boem.gov/uploadedFiles/BOEM/Renewable_Energy_Program/Regulatory_Information/Spatial_Data_Guidelines.pdf

- (d) When contractors vessel and/or equipment required for the execution of the survey activity is not or not fully operational and available due to, inter alia, breakdown, calibrations, maintenance or any other reason preventing the use of the equipment;
 - (e) When the full complement of contractors personnel required for the execution of the work is not available or operational;
 - (f) When contractors vessel or auxiliary equipment is on standby as a consequence of weather conditions below the Workable Weather Limits specified in Attachment A;
 - (g) After the Offshore Completion Date including Waiting on Weather as defined in Attachment A
2. In case more than one vessel is engaged, Waiting on Weather will be determined per vessel based on the principles described above and the Workable Weather Limits of the concerned vessel including equipment.
 3. Extension of the Offshore Completion date is only applicable in case the vessel experiencing Waiting on Weather is on the critical path towards the Offshore Completion Date.
 4. Waiting on Weather for a given day shall never be counted twice when determining extension of the Offshore Completion Date. E.g. if two vessels are on the critical path towards offshore completion, and both qualify for Waiting on Weather for a given day, then this will amount to a single day of extension.

Section VI. Environmental Protection

The selected contractor(s) will be responsible for obtaining all required permits to support the campaigns. The proposer(s) must demonstrate that:

- to the extent necessary for the execution of the services, the proposer has the ability to secure any required environmental permits and comply with the prevailing environmental laws and regulations, and
- the proposer has an environmental management system for which he holds a valid internationally recognized certificate, such as the ISO 14001 certificate.

Or that it has a quality assurance system that is at least equivalent to a certified environmental management system. The term 'equivalent' should be interpreted as 'having the following attributes':

- environmental performance is embedded organization-wide (in policy), adopted by the responsible management, and promoted by that management. That management is also responsible for the proper setup, implementation, and control of the environmental policy;
- comprehensive insight in the environmental laws applicable to the business operations and the compliance with them (observed based on control/enforcement);
- insight in where the business operations impact the environment and how to reduce this impact;
- the presence of plans and the execution of actions to further reduce the environmental impact;
- the presence of a periodical and independent verification of the compliance with the agreements on environmental performance;
- the presence of reports on the compliance with the agreements on environmental performance;
- If the Offer is submitted by a partnership (consortium), then each participant in the partnership must individually meet the requirements concerning environmental performance.

Section VII. Management of Data

1. Quality Management System

The contractor shall operate a quality assurance (QA/QC) system compliant with latest international quality standards (European standards series EN 45000 or equivalent) certified by an accredited body as recognized by European Co-operation for Accreditation (EA), or the International Accreditation Forum (IAF). The certified system must relate to all stages of the work and provide a full auditable trail for all works. The possession of valid certification will not affect NYSERDA's right to verify and monitor the contractor's QA/QC arrangements being comprehensive and implemented for the work.

2. Project Execution Plan

The contractor shall implement a management system assuring the safe and adequate management of the Work covering all (Work) preparation, engineering, transportation, measurement/inspection, quality, health, safety, environmental and interface aspects, all in accordance with the requirements of the Contract.

The overall management structure of the project shall be described in a Project Execution Plan to be submitted by contractor. The Project Execution Plan shall describe the implemented procedures with regard to, but not limited to, the management of:

- The overall project
- Scope
- Methods and vessel(s) used
- Planning
- QHSE
- Organization
- Communication and Information
- Risks
- Procurement

Geodetic Parameters (Datum Definitions, Projection Definitions and Height Datum Definitions), navigational accuracy, tidal height accuracy, frequency and method of navigation checks and positioning specifications and the specifics of all co-ordinate system transforms are expected to be stated in the contractor's Project Execution Plan for approval by NYSERDA and reported in the Field Report.

The PEP shall demonstrate that the vessel(s) and equipment have been thoroughly thought through to achieve the investigation objectives in an efficient manner. It shall be described in detail how the vessel(s) and equipment configuration are optimized for efficient data acquisition. The investigation data processing, analysis, interpretation and reporting methodologies must sufficiently detailed to demonstrate that they can achieve the Investigation objectives. Proposed deliverables and their formats must be tabulated to demonstrate that all deliverables required for the Investigation will be provided in BOEM-compliant formats.

The contractor shall ensure that the Project Execution Plan is approved by NYSERDA at least 3 days before the offshore survey work under the Contract is commenced, and that any subsequent amendments to the Project Execution Plan during the execution of the Work by the contractor are approved beforehand by NYSERDA.

The contractor shall allow for sufficient time for review and revision taking into account the review periods as detailed in this Contract document.

3. Project Quality Plan

The contractor shall prepare a Project Quality Plan (PQP) describing how its quality policy is implemented for the Work. The PQP shall address the systems and specific Quality Assurance (QA) requirements, taking into account all relevant provisions in all Sections of the Contract. The PQP shall be in accordance with contractor's documented quality management system and shall describe, as a minimum, all quality assurance and quality control issues that are relevant for all activities of the Works awarded under the Contract. The PQP shall describe at least:

- Quality management organization and staffing (including but not limited to organization charts, CV's, qualifications, previous experiences, etc.);
- Quality management procedures;
- Project control procedures;
- Procedure handling of documents;
- Calibration and checks of equipment procedure;

- Validation, verification & performance test procedures;
- Project Audit Plan.
- A comprehensive inventory of the risks that lead to a lower data quality or risks that have an impact on the quality of the deliverables of the survey including mitigation measures.
- Processes used to continuously monitor to ensure coverage and quality.
- The quantitative data acceptance thresholds that will be used by the offshore survey team, and how these will be applied, and approximate timelines for approval/rejection of data.
- Re-shoot policy in the case one or more data type is rejected for any line.

All activities and works by the contractor and his subcontractors shall be carried out in compliance with the Project Quality Plan.

The contractor shall ensure that the Project Quality Plan is approved by NYSERDA at least three days before the offshore Work under the Contract is commenced, and that any subsequent amendment to it by the contractor is approved beforehand by NYSERDA.

The contractor shall allow for sufficient time for review and revision, accounting for the review periods as detailed in point 6 below.

4. Document Management System

The contractor shall implement a document management system in which all documents are uniform, in which they have a unique number, in which they can be traced, and in which they are kept in a safe and easy way. All documents should be appropriately labeled, as applicable, in the event that they contain any confidential or proprietary information.

The quality documents must be part of/integrated in the overall document management system. All documents produced by or on behalf of the contractor shall be subject to the contractor's internal review, to verify compliance with the Contract requirements, statutory requirements and good engineering practice.

The contractor shall provide a Master Document Register or similar. Where naming, status and planning of transfer of documents shall be maintained.

5. Document Flow

The contractor shall provide NYSERDA with a procedure describing its document flow system: every document can be followed, at each moment the actual situation is visible, the distribution is clear (who is informed, who is concerned).

Information requested by NYSERDA in any stage of the project shall be submitted as soon as possible and within the timeline as indicated by NYSERDA, as far as reasonable.

The reporting requirements for the work are detailed in Section II.H and Section III.H.

Reports and deliverables will be delivered by the contractor in pdf and original, regular, formats (docx; xlsx; ppt; etc.).

PART 3. OWNERS ENGINEER

Section I. Program requirements

A. Services Requested

NYSERDA is looking for a contractor with specific qualifications and expertise in order to act as the Owner's Engineer and project manager of the Geophysical Investigation, Geotechnical Investigation, and (optional) Ground Model update described in PART 2 of this RRP, including interfaces.

The following sections describe the required support tasks and equivalent requirements for the expert support team for each task.

B. Geophysical Investigation Support

Task 1: Geophysical expertise (approximately 500 hours)

These expert(s) must be geophysicist(s) with experience in geophysical soil investigations and operations for wind farm/foundation/infield cable design. Experience on the New York coastal areas is preferable, but experience in other geographical areas with similar conditions is also considered relevant.

Required know how (the experts together must cover the required know how):

1. The general site conditions, especially the shallow geology to 100 meters below seabed (m bsb), in the Atlantic coastal areas off New York;
2. Relevant state of the art research, data acquisition and analysis methodologies of geophysical campaigns for wind farm/foundation/infield cable design projects;
3. Ground Model construction from geophysical, hydrographic and geotechnical data;
4. State of the art equipment (vessels, hydrographical and geophysical (in particular seismic survey equipment)).
5. Working with IHS Kingdom software (version 2015 or higher) - software must be available, will not be supplied by NYSERDA.
6. Provision of a Qualified Marine Archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738- 44739) with experience in conducting HRG surveys and processing and interpreting the resulting data for archaeological potential, who can provide archaeological expertise in line with NYSERDA's Cultural Resources Study (<https://www.nyserdera.ny.gov/-/media/Files/Publications/Research/Biomass-Solar-Wind/Master-Plan/17-25h-Final-Cultural-Resources-Study.pdf>).
7. Working with relevant BOEM guidelines, in particular:
 - *Guidelines for Providing Geophysical, Geotechnical, and Geohazard Information Pursuant to 30 CFR Part 585* dated July 2, 2015 (BOEM 2015a).
 - *Guidelines for Providing Archaeological and Historic Property Information Pursuant to 30 CFR Part 585* dated March 2017 (BOEM 2017).
 - *Guidelines for Submission of Spatial Data for Atlantic Offshore Renewable Energy Development Site Characterization Survey* dated February 1, 2013 (BOEM 2013a).

Activities will include (but are not limited to):

- Support finetuning and finalizing Scope of Work for the geophysical campaign;
- Review and evaluate technical requirements of project plans (e.g. project documentation, suitability vessels and equipment, equipment set up, project execution plan, line plan), in some cases providing a second opinion;
- Review of (intermediate) deliverables (for example reports, hydrographical data, geophysical data and ground model if appropriate);
- Support in transferring results of geophysical survey to geotechnical survey;

- Support in disclosing deliverables;
- Support in managing interfaces with other studies (Geotechnical Investigation and Ground Model Update).

Two senior experts need to be included in the proposal at a minimum.

Task 2: Support project and contract management of geophysical survey (approximately 500 hours)

Required know how (the experts together must cover the required know how):

1. Good understanding of geophysical surveys for offshore wind farm development;
2. Procurement and (contract) management of geophysical surveys;

Activities will include (but are not limited to):

- Review and evaluate commercial requirements of project plans (e.g. project documentation, suitability vessels and equipment, weather downtime arrangements, project execution plan);
- Support the commercial negotiations to close the contract.
- Support in managing the geophysical survey, monitor progress and take action where needed (including check on required actions from daily reports during the survey and the weekly progress reports from the geophysical contractor);
- Organize weekly progress meetings and participate in weekly progress meetings with the geophysical contractor;
- Quality assurance and quality control;
- Align input from other tasks and experts (experts under Task 1.1 and other NYSERDA experts). This includes participation in expert meetings;
- Document control, e.g. manage all documents of geophysical campaign;
- Contract management (including interface management);
- Prepare potential handovers of task to other experts.
- Data storage and distribution by means of an appropriate method such as SFTP.

Two senior experts need to be included in the offer as a minimum.

Task 3: Onboard Client Representation (approximately 400 hours)

The Geophysical Client Representative will be responsible for:

1. independently monitoring the contractor's geophysical and hydrographic data quality with respect to the investigation objectives.
2. take decisions offshore within a predefined mandate
3. Independently monitor the campaign is performed in accordance with the projects HSE requirements

The Client Representative should therefore have:

1. Required: Experience with shallow seismic surveying for shallow geological characterization, meaning work focused on depths from seabed to 100 m bsb *and* experience with all of the following
 - Sub-Bottom Profiling (SBP) as a primary method for geological characterization in depths of 0-15 m bsb,
 - Boomer or high-bandwidth Sparker Single-Channel Seismic surveying with particular reference to the top 30-40 m bsb, and
 - Ultra-High-Resolution Multi-Channel (UHR-MCS) surveying focused on the full depth range from seabed to 100 m bsb, preferably with a high-bandwidth Sparker source.
2. Required: Experience as offshore client representative on at least 2 previous offshore geophysical investigations for offshore wind farms.

3. Required: Experience of operating in similar survey conditions (sea states, seabed conditions) to those encountered in the New York Bight.
4. Required: Experience with Multi-Beam Echo-Sounder, Side-Scan Sonar and magnetometer or magnetic gradiometer surveying in water depths of up to ~50 m.
5. Required: Experience with health, safety and environmental regulations onboard geophysical survey vessels
6. Preferred: Experience of working in the New York coastal areas on geological investigations.
7. Preferred: Experience in data acquisition to compliance with BOEM guidelines for High-Resolution Geophysics (HRG) surveys.

It is foreseen that one Offshore Client Representative will be onboard during the operations.

Two senior representatives need to be included in the proposal at a minimum.

C. Geotechnical Investigation Support

Task 1: Geotechnical expertise (approximately 500 hours)

These experts must have geotechnical engineering skills with experience in operations for wind farm / foundation / infield cable design, preferably for projects off the New York coast of the United States. Experience in other geographical areas with similar conditions to the New York coastal areas is also considered relevant.

Required know how (the experts together must cover the required know how):

1. The general site conditions, especially the shallow geology till 100 meters BSF, in the Atlantic coastal areas off New York;
2. State-of-the-art methods and equipment for drilling, sampling and *in situ* testing (PCPT);
3. State-of-the-art lab tests (standard and effective stress testing);
4. Provision of a Qualified Marine Archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738- 44739) with experience in conducting HRG surveys and processing and interpreting the resulting data for archaeological potential, who can provide archaeological expertise in line with NYSERDA's *Cultural Resources Study* (<https://www.nyserdera.ny.gov/-/media/Files/Publications/Research/Biomass-Solar-Wind/Master-Plan/17-25h-Final-Cultural-Resources-Study.pdf>). Interpretation of results for wind turbine foundation and infield cable design purposes;
5. State-of-the-art design methods for wind turbine foundations;
6. Compiling or reviewing ground models;
7. Working with IHS Kingdom software (version 2015 or higher) - software must be available, will not be supplied by NYSERDA.
8. Working with relevant BOEM guidelines, in particular:
 - *Guidelines for Providing Geophysical, Geotechnical, and Geohazard Information Pursuant to 30 CFR Part 585* dated July 2, 2015 (BOEM 2015a).
 - *Guidelines for Providing Archaeological and Historic Property Information Pursuant to 30 CFR Part 585* dated March 2017 (BOEM 2017).
 - *Guidelines for Submission of Spatial Data for Atlantic Offshore Renewable Energy Development Site Characterization Survey* dated February 1, 2013 (BOEM 2013a).

Activities will include (but are not limited to):

- Support finetuning and finalizing Scope of Work for the geotechnical campaign, including liaison with BOEM to ensure that any archaeological survey requirements have been identified and met by the geotechnical investigation plan before submission for BOEM approval;

- Review and evaluate technical requirements of project plans (e.g. project documentation; suitability vessels and equipment; equipment set up; project execution plan), in some case providing a second opinion;
- Contribute to defining a CPT and borehole plan;
- Contribute in defining a lab testing program (standard and cyclic)
- Onshore QC of results during project execution in co-operation with the on-board Client Representative;
- Review of deliverables (for example reports, geotechnical data and ground model);
- Support in disclosing deliverables;
- Support in managing interface with other studies (including geophysical survey, geological ground model study, etc.).

Two senior experts need to be included in the proposal a minimum.

Task 2: Support project and contract management of geotechnical survey (approximately 500 hours)

These expert(s) must have experience in managing geotechnical investigations for offshore wind farm development.

Required know-how (the experts together must cover the required know how):

1. Good understanding of geotechnical surveys for offshore wind farm development;
2. Procurement and (contract) management of geotechnical investigations;

Activities will include (but are not limited to):

- Drafting the procurement documents for the geotechnical campaign tender;
- Review and evaluate commercial requirements of project plans (e.g. project documentation, suitability vessels and equipment, equipment set up, project execution plan)
- Support the commercial negotiations to close the contract.
- Support in managing the geotechnical survey, monitor progress, take action where needed (including check on required actions from daily reports during the survey and the weekly progress reports from the geotechnical contractor);
- Organize weekly progress meetings and participate in weekly progress meetings with the geotechnical contractor;
- Quality assurance and quality control;
- Align input from other tasks including participation in expert meetings;
- Document control, e.g. manage all documents of geotechnical campaign;
- Managing interfaces of all relevant desk studies and surveys (for example transferring results geotechnical survey to ground model development team);
- Managing the disclosure of documents;
- Manage the interface with the certifying body, if applicable;
- Contract management (including interface management) with other studies.
- Data storage and distribution by means of mutually agreed upon appropriate methods such as SFTP.

Two senior experts need to be included in the proposal at a minimum.

Task 3: Onboard Client Representation (approximately 400 hours)

The Geotechnical Client Representative will be responsible for:

1. independently monitoring the contractor's geotechnical data quality with respect to the investigation objectives.
2. taking decisions offshore within a predefined mandate

3. independently monitoring that the campaign is performed in accordance with the project's HSE requirements

The Client Representative should therefore have:

1. Required: Experience with performing geotechnical investigations for offshore wind farms
2. Required: Experience as offshore client representative on at least 2 previous offshore geotechnical investigations for offshore wind farms.
3. Required: Experience of operating in similar survey conditions (sea state, seabed morphology) to those encountered in the New York Bight.
4. Required: Experience with health, safety and environmental regulations onboard geophysical survey vessels
5. Preferred: Experience of working in the New York coastal areas on geological investigations.
6. Preferred: Experience in data acquisition to compliance with BOEM guidelines for geotechnical surveys.

It is foreseen that two Offshore Client Representatives will be onboard on a rotation basis during the operations.

Two senior representatives need to be included in the proposal at a minimum.

D. Ground Model Update support

Geophysical/geological/geotechnical expertise (approximately 100 hours).

If the Geotechnical or Geophysical Investigation contractor is directed to undertake the ground model update, the Owner's Engineer will be required to provide experts who have a combination of relevant geological, geophysical and geotechnical experience in developing geological ground models for offshore wind farms in the coastal waters off the eastern United States and/or other geographical areas with similar soil conditions.

Required know-how:

1. Experienced with assessment of geological ground model studies for offshore wind farms;
2. The general seabed conditions in the coastal waters off the eastern United States and/or other geographical areas with similar soil conditions;
3. Project management skills including interfacing with other campaigns (geophysical and geotechnical).

Activities will include (but are not limited to):

- Support in finalizing detailed scope of work for Geological Ground Model (if needed);
- Evaluate proposals (if needed);
- Review of the (draft) reports for the Geological Ground Model study;
- Review of the input data for the model;
- Manage reporting and document control e.g. during the Geological Ground Model study;
- Organize and participate in expert meetings;
- Support in additional questions from the market and disclosure information to the market.
- Data storage and distribution.

Section II. Management of data

The Owner's Engineer shall be responsible for storing all processed data acquired during the work described in Part 2 of this RFP. The Owners Engineer shall also develop a data platform to make the data publicly available. Proposals should cost for a storage period of three years following completion of the project and include an anticipated lump sum rate for both storing and serving the data over this period. The data shall be available for download via SFTP with an easily accessible index: see <https://oswbuoysny.resourcepanorama.dnvgl.com/> for an

example of a suitable format. Where datasets are too large to serve via SFTP a hard-drive distribution method shall be used. Provision of at least 20 hard drives shall be included within the lump sum.

PART 4. GENERAL INFORMATION

Section I. Timing of Proposed Works

The detailed planning of the geotechnical investigation needs to be based on the results of the geophysical survey. This means that there will be a minimum gap between the completion of the geophysical fieldwork and commencement of the geotechnical fieldwork, to allow time for development of a targeted geotechnical plan based on the geophysical investigation preliminary results.

The main constraints on the schedule will be:

1. Potentially the timing of BOEM finalization of WEAs (if an announcement is imminent at the time of contracting).
2. Weather window for field campaign (optimal conditions anticipated in June through August 2020).
3. Timing of BOEM lease auction (all fieldwork must be completed).

An indicative, ideal timeline is proposed as follows:

- December 2019: Release RFP package
- January 2019: Close RFP
- February 2020: Contract Development
- Early June 2020: Commence geophysical and hydrographic surveys
- Early July 2020: Complete geophysical and hydrographic surveys
- July 2020: Geophysical Field & Operations report submission
- August/September 2020: Draft Geophysical Interpretative report submission; Geotechnical location memo submission
- September 2020: Commence geotechnical survey
- October 2020: Complete geotechnical survey
- October 2020: Second Geophysical Interpretative report submission
- October 2020: Final Geophysical Interpretative report; Geotechnical Field & Operations report submission
- November 2020: Draft Geotechnical Investigation report submission
- January 2021: Second Draft Geotechnical Investigation report submission
- January 2021: Final Geotechnical Investigation report submission
- February 2021: Draft Ground Model reporting.
- March 2021: Final Ground Model reporting.

Section II. Delineation of Responsibilities

The Geophysical and Geotechnical Investigations and Constrained Ground Model Development will be managed jointly by NYSERDA and the Owner's Engineer.

The specific responsibilities of the Owner's Engineer will include:

- Review of geophysical site investigation tender submissions;
- Assisting NYSERDA with the contract negotiations;
- Finalizing the Scope of Works and Contracts;
- Reviewing the Geophysical Site Investigation contractor's project planning documentation (including Project Execution Plan, Project Quality Plan and Project Health Safety Environment Plan);
- Reviewing the contractor's geophysical field-testing report and selected acquisition parameters;
- Monitoring and assuring the progress and quality of the fieldwork through regular meetings (teleconferences) with the contractor's project management team and through the provision of client representatives onboard the vessel(s);
- Assisting NYSERDA in managing the geophysical and geotechnical contracts and any related interfaces;
- Reviewing the contractor's proposed seismic and interpretation workflows;
- Reviewing all contractor's deliverables.

The Geophysical Site Investigation contractor has the following responsibilities:

- Co-operating fully with the Owner's Engineer and any other contractors directly involved in the project including the providing a free-flow of any data obtained during the geotechnical site investigation, in accordance with any specific instructions given by NYSERDA;
- Obtaining all necessary permissions and/or notifications;
- Preparation of the hydrographic and geophysical survey plans that need to be provided (and approved) before the works can start;
- Preparation of a Field Verification Plan for the seismic source verification;
- Preparation of a marine mammal and sea turtle monitoring plan;
- Preparation of a field-testing report;
- Carrying out the works in accordance with ISO standards and other relevant guidelines for offshore site investigations for offshore wind farms;
- Informing NYSERDA on the progress of the works through provision of daily and weekly reports;
- Processing, analyzing and interpreting the data obtained through the geophysical and hydrographic surveys and presenting all results in clear reports and drawings.
- Optional: Ground Model Update.

The Geotechnical Site Investigation Contractor has the following responsibilities:

- Co-operating fully with the Owner's Engineer and any other contractors directly involved in the project including the providing a free-flow of any data obtained during the geotechnical site investigation, in accordance with any specific instructions given by NYSERDA;
- Obtaining all necessary permissions and / or notifications;
- Carrying out an independent UXO risk assessment for the proposed borehole and seabed CPT locations and undertaking any required additional measures in order to reduce the risk to as low as reasonably practical (ALARP);
- Carrying out location-specific archaeological clearance assessments for the proposed borehole and seabed CPT locations in accordance with BOEM Guidelines for Providing Archaeological and Historic Property Information (optional). Preparation of the geotechnical survey and plans that need to be provided (and approved) before the works can start;
- Carrying out the works in accordance with ISO standards and other relevant guidelines for offshore site investigations for offshore wind farms;
- Preparing the necessary laboratory testing specifications and schedules for NYSERDA approval and performing laboratory testing on obtained soil samples;
- Informing NYSERDA on the progress of the works;
- Processing the data obtained through the geotechnical survey and presenting all results in clear reports and drawings.
- Optional: Ground Model Update.

Section III. Collaboration and Co-ordination

It has not yet been decided whether the Geophysical Investigation contractor or the Geotechnical Investigation contractor will be asked to develop the updated Ground Model following the completion of the Geotechnical Investigation. This will depend on the proposals received, which will be evaluated based on contractor capability and value-for-money.

For the purpose of this RFP, production of the updated Ground Model should be considered an optional item at the discretion of NYSERDA. In any case, full co-operation will be required between the geophysical and geotechnical contractors to ensure a smooth transfer of any data needed for the production of the updated model.

Section IV. Review and Approval process

For documents that shall be submitted to NYSERDA and/or to third parties for approval, the following maximum review terms shall be taken in account:

- Review times for the main deliverables are specified in Attachment A
- For other documents, the following review times apply:
 - o if approval only by NYSERDA is necessary: 2 weeks for each first revision of the document and 5 working days for each subsequent revision;
 - o if approval by any third party is necessary: 4 weeks for each first revision of the document and 2 weeks for each subsequent revision;
- The contractor shall issue an updated revision of a commented document, which was sent for approval to NYSERDA, within one week after the comments have been issued by NYSERDA.
- In case approval documents are provided to NYSERDA during the field investigation and maintaining these review terms causes a delay of the campaign, then all costs arising from this delay will be borne by the contractor.
- For reviewing documents, NYSERDA shall use the document review form. When NYSERDA has sent the review form to the contractor, the contractor shall respond as quickly as possible. The contractor shall fill in the complete contractor response box with its answer. NYSERDA shall respond in the same form. Maximum review terms as described above shall be maintained.

Section V. Proposal Requirements

All responses submitted as part of this solicitation process become the property of NYSERDA. Careful consideration should be given before confidential information is submitted to NYSERDA as part of any proposal. Review should include whether it is critical for evaluating a proposal, and whether general, non-confidential information, may be adequate for review purposes. See Section VI. Proprietary Information for details.

Proposers will not be reimbursed by NYSERDA for any costs associated with the preparation of their proposals.

A. Proposal Submittal

Proposals must follow the format below. proposers should include sufficient, succinct information to demonstrate their experience with similar work and detail their approach for this project. Each page of the proposal should state the name of the proposer, "RFP 4260", and the page number. The maximum length of each proposal section is shown in Section B.

In compliance with §139-j and §139-k of the State Finance Law (see Section VI, General Conditions, for additional information), proposers will be required to answer questions during proposal submission, which will include making required certification under the State Finance Law and to disclose any Prior Findings of Non-Responsibility.

B. Proposal Format

Proposals must be submitted as a single file, inclusive of all supporting documents, including a filled in Attachment A. The file should be 100MB or less in file size. Proposals must follow the format provided below and should include sufficient, succinct information to support the proposed approach, confirm the requirements and answer the questions described in the Proposal Evaluation Criteria listed in Part C. Proposals should not be excessively long or submitted in an elaborate format. Unnecessary attachments beyond those sufficient to present a complete, comprehensive, and effective response will not influence the evaluation of the proposal. The maximum length of each proposal section is shown and should not be exceeded. If the proposer wishes to provide alternative options to those presented here for consideration by the reviewers, they may be presented along with appropriate justification and sufficient cost implications. NYSERDA reserves the right to negotiate changes to the proposed project approach, deliverables and deliverable formats with the selected proposer.

Proposed Program Component Checklist (1 page)

A filled-in Proposed Program Component Checklist must be attached as the front cover of your proposal.

Component		Bid	Ground model option
Investigations	Geophysical Investigation	Y/N	Y/N
	Geotechnical Investigation	Y/N	
Owner's Engineer	Owner's Engineer	Y/N	

1. You may not bid for both the Owner's Engineer and the Investigations.
2. You may bid for one or both of the Geophysical and Geotechnical Investigations.
3. If you bid for one or both of the Investigations, you may also bid for the Ground Model option.
4. The Owner's Engineer may not bid for the Ground Model option.

Project Summary, Background and Objectives (1 Page)

Briefly describe the proposed approach and proposer qualifications as they pertain to the options in this RFP that are being tendered for. Provide context for the approach and experience in relation to completed and ongoing relevant work in the region and around the world. Include a description of the limitations of the project. The Project Summary should be a complete, stand-alone summary of the proposer's role in supporting this offshore Geophysical Investigation site investigation and (optional) constrained Geological Ground Model production on a single page.

Project Approach (5 - 6 Pages + supporting documents not included in page count)

For the Investigation components, the proposal must describe the proposer's experience in provision of vessels and equipment and executing the required survey types. For all components, the proposal must detail the proposer's experience in processing, analysis, ground model development, and reporting for an offshore geophysical and hydrographic soil investigation in order to obtain information that is suitable for development, engineering and installation purposes for an offshore wind farm. The proposal must also describe the proposer's degree of experience in carrying out the required work in areas of similar geology, preferably within the offshore wind sector and focused on the top 100 m below seabed. The proposer's experience in combining geophysical, hydrographic, and geotechnical data for constrained ground model production.

For the Investigations, the proposal must describe in detail the proposed vessel(s) including the vessel positioning system, and environmental operating limits, and demonstrate that they fulfil the RFP requirements. The proposal shall demonstrate that the proposed vessels have suitable stability and noise characteristics with respect to deployment of equipment for geophysical and hydrographic surveying. The proposal must also describe in detail the proposed equipment for the performance of the required surveys, demonstrating that they fulfil the RFP requirements, and how they will be deployed on the vessel to minimize interference. The proposal should describe the availability of spares and the back-up procedures in place if the primary equipment fails. If multiple vessels are proposed, then the proposal must describe which vessel will be responsible for which aspect of the survey activities. Typical vessel availability must be indicated, and a brief mobilization plan proposed (port of mobilization, transit times, etc.). The proposal shall briefly describe proposed vessel sheltering procedures for when weather limits are exceeded.

The proposal should demonstrate that the composition of the proposed offshore and onshore survey teams as a whole covers the knowledge and experience needed for the execution of the work from planning through to final reporting. All personnel involved with the execution of the offshore geophysical survey activities (data acquisition, data processing, interpretation and reporting) must be demonstrated to have the appropriate qualifications and experience for the roles in which they are to be deployed. All key staff must have contributed to at least one relevant offshore geophysical investigation using the equipment (including software) proposed. Offshore personnel must have (medical) certificates valid to perform work in the US Atlantic Ocean, including as a minimum BOSIET (Basic Offshore Safety Induction and Emergency Training) or similar and a working permit (the right to work in the investigation area) valid for the duration of the contract.

The proposal must outline the proposed project tasks and key project milestones. The proposal should include an overview of data acquisition, processing and interpretation procedures, including quality control methods, and demonstrate that they fulfil the RFP requirements. The flow of data from task to task shall be defined,

including data backup procedures. Any potential risk points should be identified and described, and the proposer shall detail proposed mitigation measures.

If the proposer intends to undertake the optional constrained ground model production, then he should describe his proposed workflow and how the geotechnical and geophysical data will be integrated.

The proposal must describe the proposers experience working with BOEM or other federal regulators and experience securing permits to carry out geophysical and hydrographic site investigations in waters off the coast of the United States and/or elsewhere. Any issues or concerns with permitting, such as data needs and anticipated timeframes should be described. Any issues or concerns with securing insurance generally required by industry standards should be described.

The proposal must include a copy of the proposer's Quality Management System manual. The proposal must also include draft or example versions of the Project Execution Plan (PEP) and Project Quality Plan (PQP) with specific reference to all equipment and all acquisition, processing and interpretation procedures proposed for this project.

Project Management Plan and Qualifications (up to 5 pages + resumes)

Briefly describe the Project Management Plan at a high level that includes the Project Manager and all key personnel, along with their role in the project. List the organizations participating in the project, the contact for each organization and describe the role that each will play. (1 page)

Include an organizational chart showing all key personnel and any subcontractors or other involved entities. (1 page)

Include a one-paragraph description of a sample of related projects that have been undertaken by the key personnel that demonstrates experience with the proposed project area. (up to 3 pages)

Include relevant portions of key personnel resumes that include education and experience relevant to the proposed work. (1 page each – not included in page count)

Master Schedule (1-2 pages)

Complete a schedule showing start and completion times for all major tasks, in terms of months after project initiation by means of a Gantt chart. Include planned meetings, major deliverables or milestones and other key events.

Cycle Times and Rates Form (Attachment A)

Complete the attached Cycle Times and Rates form tab associated with the services for which you are proposing. Include any supplemental information necessary to fully understand the project on a separate sheet, including any deviations from what is requested and a rationale for the deviation. Care should be taken to provide sufficient information to allow reviewers to understand what each of the components (e.g. personnel, equipment, methodologies, subcontracts).

NYSERDA reserves the right to audit any indirect rate presented in the proposal and to make adjustment for such difference. Requests for financial statements or other needed financial information may be made if deemed necessary.

Letters of Support

If the proposer is relying on other organizations or businesses to perform work, provide services or equipment, data or share in the non-NYSERDA cost, include a letter from that organization or business describing the commitment. The absence of letters of commitment or support will be interpreted as the proposer not having commitment/support from those parties. (1-page each, not included in page count).

C. Proposal Evaluation

Investigations

The proposal evaluation criteria for the Geophysical and Geotechnical Investigations are described below and are in order of importance. Scoring for the Geotechnical and Geophysical Investigation proposals will be carried out separately, using the same scoring system for each proposal.

EVALUATION CRITERIA
Quality of the proposal This criterion is judged by assessing the following aspects jointly for the extent to which: • The proposal includes a project specific description of the elements as required to be included; • The proposal includes a comprehensive inventory of risks that have an impact on: ▪ the project management aspects (e.g. scope planning, financial aspects), ▪ HSE (Health, Safety and Environment) and ▪ data quality (e.g. positioning/navigation quality control procedures, equipment calibration procedures/certificates, data quality control procedures, interpretation quality control/cross-checking procedures of the works and the identified risks are worked out comprehensively and mitigated; • The proposal is detailed, and processes are described project specific and SMART (specific, measurable, acceptable, realistic and time-related); • The suggested cycle times are realistic and substantiated in relation to the site conditions and proposed vessels and equipment. • The investigation data processing, analysis, interpretation and reporting methodologies are outlined to demonstrate compliance with the scope of work. • The deliverables are outlined to demonstrate that they are compliant with the scope.
Qualifications of personnel This criterion is judged by assessing, for the key personnel proposed, the following aspects: • Education and training • Experience with similar surveys • Number of surveys performed As part of the proposal, the tenderer is required to provide a description of the personnel in a tabular format describing these aspects. In addition, CVs of the proposed key personnel should be supplied. The actual personnel engaged is required to have a similar level of qualifications to those proposed in the bid.
Vessels and equipment <u>Vessels</u> This criterion is assessed on the following aspects jointly to the extent to which: • The vessel(s) and equipment have been thoroughly thought through to achieve the investigation objectives in an efficient manner. The vessel(s) and equipment configuration are optimized for efficient data acquisition and are described in adequate detail to demonstrate this along with vessel track record. • Vessel(s) are suitable for the work intended; • Vessel(s) are already mobilized and ready to use (working and tested) equipment are preferred); • Vessel(s) are stable to ensure good data quality acquisition within workable limits. • The availability of the proposed vessel(s) is guaranteed by Tenderer. <u>Equipment</u> This criterion is assessed on the following aspects jointly to the extent to which: • The proposed investigation equipment for carrying out the investigation within the scope of the agreement is suitable and effective, also considering the wind farm site characteristics and anticipated operational characteristics; • Spare equipment is available in case of breakdowns.
Prices

This criterion will be assessed based on:

- The overall lump sum price, including mobilization and weather downtime
- The completeness and level of detail of the breakdown provided

Cycle times

This criterion will be assessed based on:

- The overall time duration of the campaign
- The level of detail of the Gantt planning provided and provided substantiation

Owner's Engineer

The proposal evaluation criteria for the Owners Engineer are described below and are presented in order of importance:

EVALUATION CRITERIA

Plan of action

Tenderers are requested to provide a Plan of Action describing:

- The knowledge and experience of the experts (names, relevant knowledge and experience of the experts that will carry out the work).
- The availability of experts (specific measures taken to secure the availability of the required experts and the specific measures for providing back up capacity to guarantee availability during the duration of the project, max. 2 A4).
- Approach, team composition and foreseen roles of the team members, max. 3 A4s
- Data storage and distribution, max. 1 A4

In addition, Attachment A – tab “owners engineer” will need to be completed with the name, rate and the qualifications of the experts intended to be engaged for the services.

The score for this criterion is given by assessing, for the experts:

- Their experience with similar services performed (max. 20 points);
- Coverage of the requested know how (max. 20 points);
- Availability (max 10 points)
- Approach and team composition (max. 20 points).

CV's should also be provided for all experts proposed. All experts should be of senior level.

Prices

This criterion will be assessed based on:

- The average hourly rates of the senior experts proposed.
- Data hosting and distribution rate

Section VI. General Conditions

Proprietary Information - Careful consideration should be given before confidential information is submitted to NYSERDA as part of your proposal. Review should include whether it is critical for evaluating a proposal, and whether general, non-confidential information, may be adequate for review purposes. The NYS Freedom of Information Law, Public Officers law, Article 6, provides for public access to information NYSERDA possesses. Public Officers Law, Section 87(2)(d) provides for exceptions to disclosure for records or portions thereof that "are trade secrets or are submitted to an agency by a commercial enterprise or derived from information obtained from a commercial enterprise and which if disclosed would cause substantial injury to the competitive position of the subject enterprise." Information submitted to NYSERDA that the proposer wishes to have treated as proprietary, and confidential trade secret information, should be identified and labeled "Confidential" or "Proprietary" on each page at the time of disclosure. This information should include a written request to except it from disclosure, including a written statement of the reasons why the information should be excepted. See Public Officers Law, Section 89(5) and the procedures set forth in 21 NYCRR Part 501 <https://www.nyserda.ny.gov/About/-/media/Files/About/Contact/NYSERDA-Regulations.ashx>. However, NYSERDA cannot guarantee the confidentiality of any information submitted.

Omnibus Procurement Act of 1992 - It is the policy of New York State to maximize opportunities for the participation of New York State business enterprises, including minority- and women-owned business enterprises, as bidders, subcontractors, and suppliers on its procurement Agreements. Information on the availability of New York subcontractors and suppliers is available from:

Empire State Development
Division for Small Business
625 Broadway
Albany, NY 12207

A directory of certified minority- and women-owned business enterprises is available from:

Empire State Development
Minority and Women's Business Development Division
625 Broadway
Albany, NY 12207

State Finance Law sections 139-j and 139-k - NYSERDA is required to comply with State Finance Law sections 139-j and 139-k. These provisions contain procurement lobbying requirements which can be found at <https://online.ogs.ny.gov/legal/lobbyinglawfaq/default.aspx>. proposers are required to answer questions during proposal submission, which will include making required certification under the State Finance Law and to disclose any Prior Findings of Non-Responsibility (this includes a disclosure statement regarding whether the proposer has been found non-responsible under section 139-j of the State Finance Law within the previous four years).

Tax Law Section 5-a - NYSERDA is required to comply with the provisions of Tax Law Section 5-a, which requires a prospective Contractor, prior to entering an agreement with NYSERDA having a value in excess of \$100,000, to certify to the Department of Taxation and Finance (the "Department") whether the Contractor, its affiliates, its subcontractors and the affiliates of its subcontractors have registered with the Department to collect New York State and local sales and compensating use taxes. The Department has created a form to allow a prospective Contractor to readily make such certification. See, ST-220-TD (available at http://www.tax.ny.gov/pdf/current_forms/st/st220td_fill_in.pdf). Prior to contracting with NYSERDA, the prospective Contractor must also certify to NYSERDA whether it has filed such certification with the Department.

The Department has created a second form that must be completed by a prospective Contractor prior to contacting and filed with NYSERDA. See, ST-220-CA (available at http://www.tax.ny.gov/pdf/current_forms/st/st220ca_fill_in.pdf). The Department has developed guidance for Contractors which is available at <http://www.tax.ny.gov/pdf/publications/sales/pub223.pdf>.

Contract Award - NYSEERDA anticipates making multiple awards under this solicitation. NYSEERDA anticipates a contract duration of one to three years, unless NYSEERDA management determines a different structure is more efficient based upon proposals received. A contract may be awarded based on initial applications without discussion, or following limited discussion or negotiations pertaining to the Statement of Work. Each proposal should be submitted using the most favorable cost and technical terms. NYSEERDA may request additional data or material to support applications, either through written submission or interview. NYSEERDA will use the Sample Agreement to contract successful proposals. NYSEERDA may at its discretion elect to extend and/or add funds to any project funded through this solicitation. NYSEERDA reserves the right to limit any negotiations to exceptions to standard terms and conditions in the Sample Agreement to those specifically identified in the checklist questions. proposers should keep in mind that acceptance of all standard terms and conditions will generally result in a more expedited contracting process. NYSEERDA expects to notify proposers in approximately four-eight weeks from the proposal due date whether your proposal has been selected to receive an award. NYSEERDA may decline to contract with awardees that are delinquent with respect to any obligation under any previous or active NYSEERDA agreement.

Accessibility Requirements - If awardees from this solicitation will be posting anything on the web, or if the awardee will produce a final report that NYSEERDA will post to the web, the following language must be included. NYSEERDA requires Contractors producing content intended to be posted to the Web to adhere to New York State's Accessibility Policy. This includes, but is not limited to, deliverables such as: documents (PDF, Microsoft Word, Microsoft Excel, etc.), audio (.mp3, .wav, etc.), video (.mp4, .mpg, .avi, etc.), graphics (.jpg, .png, etc.), web pages (.html, .aspx, etc.), and other multimedia and streaming media content. For more information, see [NYSEERDA's Accessibility Requirements](#).

Limitation - This solicitation does not commit NYSEERDA to award a contract, pay any costs incurred in preparing a proposal, or to procure or contract for services or supplies. NYSEERDA reserves the right to accept or reject any or all proposals received, to negotiate with all qualified sources, or to cancel in part or in its entirety the solicitation when it is in NYSEERDA's best interest. NYSEERDA reserves the right to reject proposals based on the nature and number of any exceptions taken to the standard terms and conditions of the Sample Agreement. NYSEERDA reserves the right to disqualify proposers based upon the results of a background check into publicly available information and the presence of a material possibility of any reputational or legal risk in making of the award.

Disclosure Requirement - The proposer shall disclose any indictment for any alleged felony, or any conviction for a felony within the past five years, under the laws of the United States or any state or territory of the United States and shall describe circumstances for each. When a proposer is an association, partnership, corporation, or other organization, this disclosure requirement includes the organization and its officers, partners, and directors or members of any similarly governing body. If an indictment or conviction should come to the attention of NYSEERDA after the award of a contract, NYSEERDA may exercise its stop-work right pending further investigation or terminate the agreement; the Contractor may be subject to penalties for violation of any law which may apply in the particular circumstances. proposers must also disclose if they have ever been debarred or suspended by any agency of the U.S. Government or the New York State Department of Labor.

Vendor Assurance of No Conflict of Interest or Detrimental Effect - The proposer shall disclose any existing or contemplated relationship with any other person or entity, including any known relationships with any member, shareholders of 5% or more, parent, subsidiary, or affiliated firm, which would constitute an actual or potential conflict of interest or appearance of impropriety, relating to other clients/customers of the proposer or former officers and employees of NYSEERDA, in connection with proposer's rendering services as proposed. If a conflict does or might exist, please describe how your company would eliminate or prevent it. Indicate what procedures will be followed to detect, notify NYSEERDA of, and resolve any such conflicts.

The proposer must disclose whether it, or any of its members, or, to the best of its knowledge, shareholders of 5% or more, parents, affiliates, or subsidiaries, have been the subject of any investigation or disciplinary action by the New York State Commission on Public Integrity or its predecessor State entities (collectively, "Commission"), and if so, a brief description must be included indicating how any matter before the Commission was resolved or whether it remains unresolved.

Public Officers Law – For any resulting awards, the Contractor and its subcontractors shall not engage any person who is, or has been at any time, in the employ of the State to perform services in violation of the provisions of the New York Public Officers Law, other laws applicable to the service of State employees, and the rules, regulations, opinions, guidelines or policies promulgated or issued by the New York State Joint Commission on Public Ethics, or its predecessors (collectively, the “Ethics Requirements”). proposers are reminded of the following Public Officers Law provision: Contractors, consultants, vendors, and subcontractors may hire former NYSERDA employees. However, as a general rule and in accordance with New York Public Officers Law, former employees of NYSERDA may neither appear nor practice before NYSERDA, nor receive compensation for services rendered on a matter before NYSERDA, for a period of two years following their separation from NYSERDA service. In addition, former NYSERDA employees are subject to a “lifetime bar” from appearing before any state agency or authority or receiving compensation for services regarding any transaction in which they personally participated, or which was under their active consideration during their tenure with NYSERDA.

Any awardee will be required to certify that all of its employees, as well as employees of any subcontractor, whose subcontract is valued at \$100,000 or more who are former employees of the State and who are assigned to perform services under the resulting contract, shall be assigned in accordance with all Ethics Requirements. During the term of any agreement, no person who is employed by the Contractor or its subcontractors and who is disqualified from providing services under the contract pursuant to any Ethics Requirements may share in any net revenues of the Contractor or its subcontractors derived from the contract. NYSERDA may request that Contractors provide it with whatever information the State deems appropriate about each such person’s engagement, work cooperatively with the State to solicit advice from the New York State Joint Commission on Public Ethics, and, if deemed appropriate by the State, instruct any such person to seek the opinion of the New York State Joint Commission on Public Ethics. NYSERDA shall have the right to withdraw or withhold approval of any subcontractor if utilizing such subcontractor for any work performed would be in conflict with any of the Ethics Requirements. NYSERDA shall have the right to terminate any contract at any time if any work performed is in conflict with any of the Ethics Requirements.

For Technology and Business Innovation solicitations, include the following:

Due Diligence – NYSERDA, at its discretion, may conduct broad due diligence to validate any or all elements of an application and to assess applicants’ prospects of success, including gathering information to assess a proposal relative to any of the topics listed in evaluation criteria, whether or not such topic is explicitly addressed in a proposal. NYSERDA may conduct due diligence on some or all proposals based on NYSERDA’s current guidelines at the time of a review. NYSERDA staff may follow up with proposers to request additional information or clarification regarding applicant’s proposal, including questions regarding applicant’s business prospects and resources, whether or not those questions are specifically related to the elements of the proposal. Additionally, customized due diligence may be conducted by internal or external staff or Contractors based on questions on any proposal raised by NYSERDA staff and/or the Scoring Committee. Due diligence may include (but is not limited to): interviews of independent references and background checks of team members; assessment of prior business experience of any team member associated with a proposal; research on intellectual property claims; customer and partner reference checks; market research on the applicants’ target market and any other related or possibly competitive technology or market area; research to validate any assumptions on current or future revenues, costs, capital needs, and financing prospects for proposers’ business, including similar (or unrelated) technologies, processes, or competitive solutions; or any other research that could reasonably inform the evaluation of a proposal, or the prospects for commercial success of the proposers’ business (whether directly related to, or unrelated to the specific elements in a proposal). Due diligence may include discussions with proposers’ former and current business partners, employees, investors, customers, and competitors. Due diligence may be conducted by NYSERDA personnel or Contractors including members of the scoring committee, before, during, or after a scoring process, and prior to finalization of a contract award, any information gleaned in diligence may be used to score or re-score a proposal

If Recoupment is required, include the following in the General Conditions after “Contract Award:”

Recoupment - For any new product research and/or development, NYSERDA will generally require a royalty based on sales of the new product developed. NYSERDA’s standard royalty terms are 1% of sales/ten percent

(10%) of all license revenue accruing to the Contractor for products produced (for a period of fifteen years or until the Contractor pays NYSERDA an amount equal to the amount of funds paid by NYSERDA to the Contractor, whichever comes first).

Stipulated Damages - If the Contractor fails to complete in accordance with the following milestone dates as referred to in Attachment A – Cycle times and Rates

Geophysical campaign

- a. Offshore Completion Date excluding Waiting on Weather (3a)
- b. Draft Final Geophysical Interpretative Report (4b)
- c. CPT & borehole location memo for geotechnical campaign (4c)

Geotechnical campaign

- a. Offshore Completion Date excluding Waiting on Weather (3a)
- b. Draft Geotechnical Investigation Report (4b)
- c. Final Geotechnical Investigation Report (4f)

the Contractor shall be liable to NYSERDA for Stipulated Damages. The amounts of such Stipulated Damages shall be 0.5% of the Contract Price for each day that it fails to perform the work as agreed.

All amounts of such Stipulated Damages for which the Contractor may become liable are agreed as a genuine pre-estimate of the losses which may be sustained by NYSERDA in the event that the Contractor fails in its respective obligations under the contract.

The Stipulated Damages will be deducted from amounts payable by the Clients regardless of whether the claim for payment of such amounts has been transferred to a third party.

For the avoidance of doubt, the Stipulated Damages liability shall not exceed fifteen per cent (15%) of the Contract Price in aggregate.

Section VII. Attachments:

Attachment A – Cycle times and Rates form

Attachment B – Sample Agreement