CONSISTENCY DETERMINATION
For Leasing Wind Energy Areas
Offshore Morro Bay, California

U.S. Department of the Interior
Bureau of Ocean Energy Management
Pacific Outer Continental Shelf Region

From BOEM Flickr Webpage

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I. AUTHORITY

The Bureau of Ocean Energy Management (BOEM) is submitting this Coastal Consistency Determination in compliance with Section 930.34 *et seq. of* the National Oceanic and Atmospheric Administration (NOAA) Federal Consistency Regulations (Title 15 Code of Federal Regulations (CFR) part 930 Subpart C). The Energy Policy Act of 2005 (EPAct) authorized BOEM to issue leases, easements and rights of way to allow for renewable energy development on the Outer Continental Shelf (OCS). EPAct provided a general framework for BOEM to follow when authorizing these renewable energy activities. For example, EPAct requires that BOEM coordinate with relevant Federal agencies and affected State and local governments, obtain fair return for leases and grants issued, and ensure that renewable energy development takes place in a safe and environmentally responsible manner. *See* 74 Fed. Reg. 19,638 (Apr. 29, 2009); *see also* 30 CFR part 585 and 43 U.S.C § 1337(p)(1)(C).

II. DETERMINATION

In accordance with the Federal Coastal Zone Management Act of 1972, as amended, BOEM has determined that the leasing activities planned for the Morro Bay Wind Energy Area offshore central California is consistent to the maximum extent practicable with the California Coastal Management Program (CCMP), pursuant to the requirements of the Coastal Zone Management Act of 1972, as amended, (CZMA) and the California Coastal Act of 1976, as amended (CCA).

III. BACKGROUND

In early 2021, the Biden-Harris Administration catalyzed progress towards the development of a robust offshore wind industry. This will result in the creation of tens of thousands of jobs while combating the negative effects of climate change. This announcement established a goal of 30 gigawatts of offshore wind by 2030 and plans to be achieved by the review of at least 16 construction and operations plans for wind energy projects by 2025. The Department of the Interior, Department of Defense, and the State of California have agreed to advance wind energy offshore the Central and Northern Coasts of California. These initial areas for offshore wind development will bring up to 4.6 gigawatts of clean energy to the grid, enough to power 1.6 million homes and support thousands of good paying jobs. Offshore wind development in the Pacific will help the administration achieve its goal of 30 gigawatts of offshore wind capacity by 2030 and will help California reach its goal of carbon-free electricity by 2045. Read the Fact Sheet here - *https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/29/fact-sheet-biden-administration-jumpstarts-offshore-wind-energy-projects-to-create-jobs/*

The Biden-Harris initiative supports California's SB 100 known as 'The 100 Percent Clean Energy Act of 2018. SB 100 states that California has the goal of 50 percent clean energy by 2026 and 60 percent by 2030. Read the text here - *https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB100*

The State of California is the most populous state in the United States and home to an estimated 39 million people and two of the top ten largest metropolitan population centers in the United States, representing significant energy demand. In 2002, the State of California established a Renewables Portfolio Standard (RPS), which mandates that certain

percentages of the State's energy must be generated from renewable resources. California expanded the RPS in 2015 through passage of California Senate Bill 350, the Clean Energy and Pollution Reduction Act, and in 2018 through passage of California Senate Bill 100 (SB 100). SB 100 increases the State's existing RPS to 50 percent by 2025 and 60 percent by 2030 and requires that 100 percent of the State's electricity be generated using zero-carbon resources by December 31, 2045. California's RPS is one of the most ambitious renewable energy standards in the country.

California aims to be carbon-neutral by 2045; therefore, the state has been investing heavily in renewable energy generation, primarily in solar energy. At the same time, California is decreasing its generation of nuclear energy, and forecasts that the last nuclear power plant in the State will be offline by 2025, which represents a loss of approximately 10% of in-State energy production.

Diversifying renewable energy generation can help reduce the cost for California to meet its renewable energy targets, and offshore wind can complement the State's vast solar and land-based wind resources.

BOEM established the Intergovernmental Renewable Energy Task Force (Task Force) with California in 2016 to facilitate coordination among relevant Federal agencies and affected State, local, and tribal governments on renewable energy on the Outer Continental Shelf (OCS) throughout the leasing process. The planning process focused on floating offshore wind technologies. Relatively deep water and the steep continental shelf offshore California preclude the use of the monopile technologies commonly used in Europe. Ninety-six percent of the technical offshore wind resource potential off the coast of California is in waters deeper than 60 meters (m), indicating that floating wind technology will likely be the most viable option in California (BOEM 2016-074): https://www.boem.gov/2016-074/).

Figure 1 BOEM Renewable Energy Approval Process

Following the first Task Force meeting , BOEM and the State of California through the leadership of the California Energy Commission (CEC) engaged in a collaborative, data-based offshore wind energy planning process to foster coordinated and informed decisions about California's shared ocean resources and the many users who depend on them. This outreach consisted of numerous public meetings, webinars, and briefings with coastal communities, fishing communities, Federally and non-Federally recognized tribes, State and

Federal agencies, academia and scientists, environmental non-governmental organizations (NGOs), and the offshore renewable energy industry. A summary of key findings is contained in the *California Offshore Wind Energy Planning Outreach Summary Report* published in December 2018 and Addendum that was published in 2021 (www.boem.gov/california). Additional information gathered by BOEM and the State of California during the offshore wind energy planning process, including maps and spatially represented data, is available online at https://caoffshorewind.databasin.org.

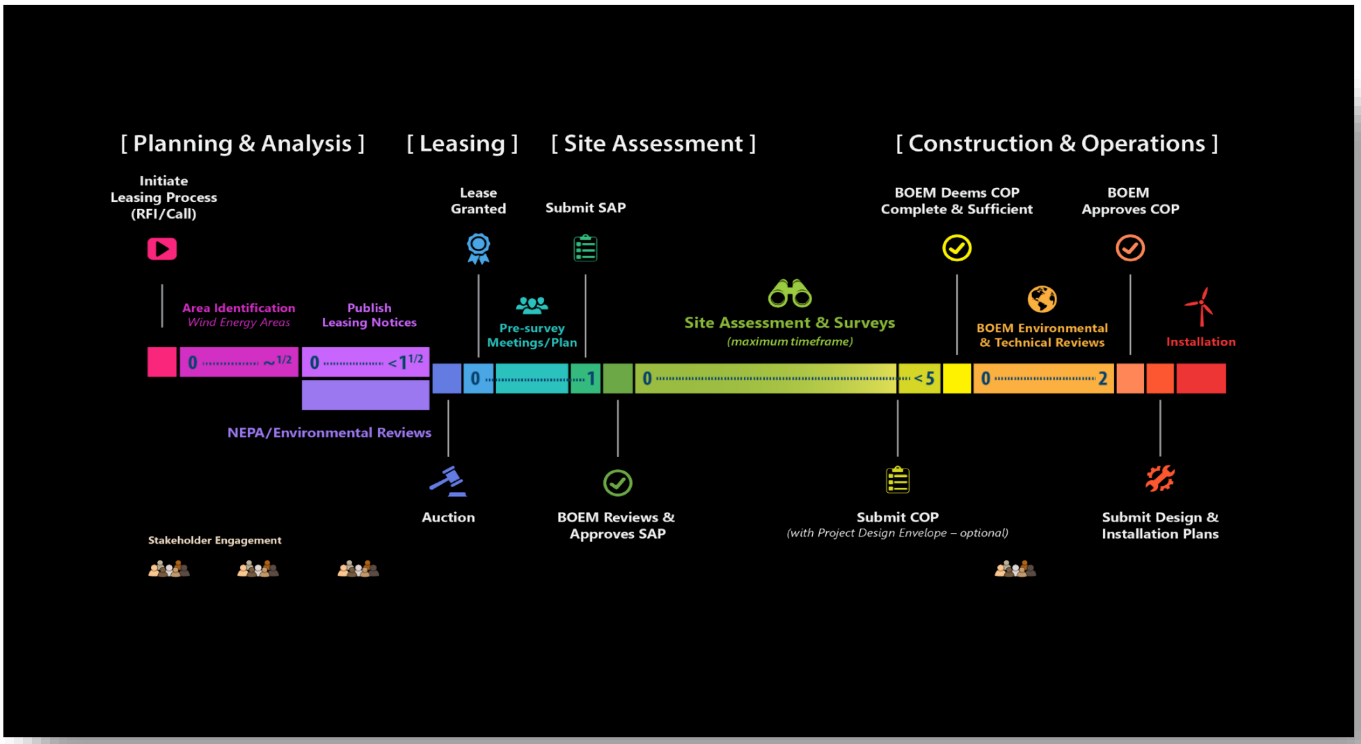

Figure 2 BOEM Renewable Energy Approval Process Timeline

Call for Information and Nominations

On October 19, 2018, BOEM published a Call for Information and Nominations for Commercial Leasing for Wind Power Development on the Outer Continental Shelf (OCS) Offshore California (Call Areas; 30 CFR § 585.211(a)) for three Call Areas BOEM identified offshore California. These Call Areas included: Humboldt Call Area on the north coast, and the Morro Bay Call Area and the Diablo Canyon Call Area on the central coast. In addition to soliciting public comments in the Federal Register, BOEM hosted a public meeting on December 13, 2018, in San Luis Obispo, California, with participation from members of the Task Force and the public, as well as other representatives from relevant Federal, State, and local government entities. In response to the Call, BOEM received nominations of interest from 14 qualified entities proposing to develop offshore wind for those Call Areas. Information about BOEM's 2018 Call for Nominations of Interest, go here - https://www.regulations.gov/docket/BOEM-2018-0045/document. Additional information about each nomination, including maps, nomination rationales, and OCS block tables are available here: https://www.boem.gov/regions/pacific-ocs-region/2018-nominations.

On May 25, 2021, Departments of the Interior and Defense and the State of

California announced identification of an area, known as the "Morro Bay 399 Area" that could support up to 3 gigawatts of offshore wind on roughly 399 square miles (255,487 acres) off California's central coast within and adjacent to the 2018 Morro Bay Call Area. The text of the announcement can be read here - *https://www.doi.gov/pressreleases/biden-harris-administration-advances-offshore-wind-pacific*. Shortly after, on July 29, 2021, BOEM published the Morro Bay East and West Extensions – Call for Information and Nominations in the Federal Register, which initiated a 45-day public comment period. The text of this Federal Register Notice can be found here - *https://www.federalregister.gov/documents/2021/07/29/2021-16134/commercial-leasing-for-wind-power-development-on-the-outer-continental-shelf-ocs-offshore-morro-bay*.

Area Identification

Area Identification (Area ID) is a required regulatory step under the renewable energy competitive leasing process used to identify areas for environmental analysis and consideration for leasing. *See* 30 C.F.R. § 585.211(b). The goal of BOEM's Area ID process is to identify the offshore locations that are the most suitable for leasing. The Area ID process balances consideration of multiple competing uses and environmental concerns against a proposed area's potential for commercial wind energy development. BOEM analyzes potential impacts of a specific proposed renewable energy facility in the identified areas during the review of a proposed Construction and Operations Plan (COP), when project-specific information is available.

On November 10, 2021, BOEM released the central California Area Identification Memorandum (Area ID Memo), which can be viewed here - *https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Area-ID-CA-Morro-Bay.pdf.* The Area ID Memo documents the analysis and rationale in support of the recommended designation of the Morro Bay Wind Energy Area (WEA) offshore San Luis Obispo County, California for leasing.

The Morro Bay WEA is described as option 2 in the Area ID Memo and includes portions of the Call Areas described in the 2018 and 2021 Calls. BOEM removed a northern portion of the 2018 Morro Bay Call Area consisting of 33,804 acres (53 square mi) that conflicted with national security, military training, and testing activities. The 2021 Morro Bay Call Area consisted of the East and West Extensions. The Morro Bay WEA includes the West Extension and consists of approximately 240,898 total acres (376 square miles), providing a potential of about 2.9 GW of electricity.

The East Extension was dropped from further consideration based on stakeholder identification of various resource conditions or use conflicts, primarily Tribal concerns and potential commercial fishing and avian impacts. BOEM also acknowledges concerns including potential impacts to viewshed of areas closer to shore.

This Consistency Determination only applies to the Morro Bay WEA. The Morro Bay WEA is located approximately 20 miles offshore the central California coastline and contains approximately 240,898 acres (376 square miles; *see* Figure 3 and Table 1).

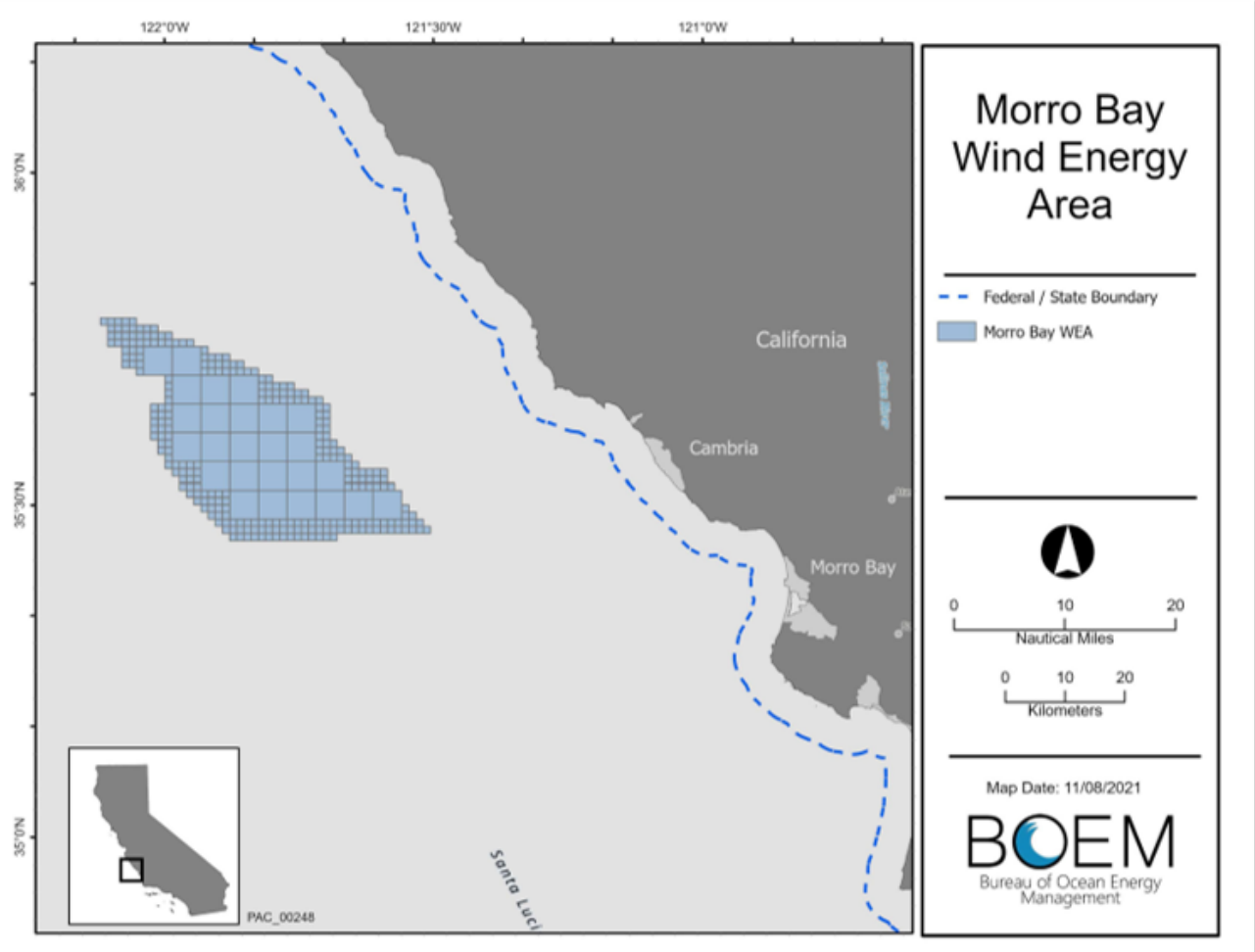

Figure 3 Morro Bay WEA Map.

Table 1 Morro Bay Wind Energy Area Descriptive Statistics.

	Acres	Installation Capacity (MW)[3]	Homes Powered	Power Production (MWh/year): 40% Capacity Factor	Power Production (MWh/year 60% Capacity Factor	Max Depth (meters)	Min Depth (meters)
Morro Bay WEA	240,898	2,924	1,023,623	10,245,696	15,368,544	1,300	900

The Morro Bay WEA was chosen as a potential development area because it meets key technical criteria generally used to determine the appropriateness of floating offshore wind energy development including sustainable wind speeds, suitable water depths, and access to existing transmission interconnection.

During the Area ID process, BOEM considered the following non-exhaustive list of information sources:

- Comments and nominations received in response to the 2018 Call
- Comments and nominations received in response to the 2021 Call
- BOEM California Intergovernmental Renewable Energy Task Force meetings
- California Offshore Wind Energy Planning Outreach Summary Report and Appendices
- Input from State and Federal agencies
- Comments received via consultation meetings and written comment from Federally recognized Tribes
- Comments from Tribal outreach meetings with Federally and non-Federally recognized Tribes, led by the California Energy Commission (CEC)
- Comments from relevant stakeholders, including the maritime community, environmental NGOs, offshore wind developers, and commercial fishing industry
- State and local renewable energy goals
- Domestic and global offshore wind market and technological trends
- California Offshore Wind Energy Gateway data and information (Data Basin)
- Outreach meetings and comments received under the CEC Notice of Availability of Outreach on Additional Considerations for Offshore Wind Energy off the Central Coast
- California Offshore Wind Energy Planning Outreach Summary Report Addendum 19

More information is available in BOEM's Central California Area Identification Memo found here - *https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Area-ID-CA-Morro-Bay.pdf*

Environmental Assessment

BOEM has prepared an environmental assessment (EA) on the Morro Bay WEA (see additional information here - *https://www.boem.gov/renewable-energy/state-activities/morro-bay-wind-energy-area-draft-environmental-assessment-and*). The Draft EA is available for public comment from April 6 through May 6, 2022. BOEM expects to publish the Final EA in mid 2022 to determine whether the issuance of leases within the Morro Bay WEA would lead to reasonably foreseeable significant impacts on the environment and, thus, whether an Environmental Impact Statement (EIS) should be prepared before any lease(s) may be issued.

A lease gives the lessee the exclusive right to subsequently seek BOEM approval for the development of a leasehold. The lease does not grant the lessee the right to construct any facilities; rather, a lease grants the right to use the lease area to develop plans, which must be approved by BOEM before the lessee can move on to the next stage of the process. Accordingly, the EA also considers the impacts of the site characterization and site assessment activities, which may occur under the lease, and are necessary to determine the suitability of the Morro Bay WEA for commercial offshore wind production and/or transmission. The EA will include mitigation measures and other best practices to ensure that these survey activities are conducted in a safe and environmentally responsible manner.

The EA will also detail the results of BOEM consultations with other Federal, State, and local agencies as well as tribal governments, industries reliant on coastal waters, and the energy industry. BOEM has established a number of mechanisms to collaborate with other agencies. For example, BOEM has developed Memoranda of Understanding (MOUs) with other Federal agencies describing each agency's roles for reviewing renewable energy projects on the OCS helping to streamline the leasing and permitting processes. As mentioned previously, BOEM has also established Intergovernmental Renewable Energy Task Forces on a State-by-State basis to coordinate among States, Tribes, local governments, and relevant Federal agencies. To learn more, visit BOEM's Stakeholder Engagement and Partnerships website here - *https://www.boem.gov/renewable-energy/stakeholder-engagement*

BOEM issues a lease and later may receive a project specific Site Assessment Plan or Construction and Operation Plan. At each of these points, as appropriate, BOEM establishes cooperating agency agreements with Tribes, Federal, and State agencies when there is collateral expertise or authority. BOEM also conducts government-to-government consultation with Federally-recognized Tribes, and coordinates other required consultations pursuant to the partial list of agencies listed below. More information can be found in BOEM's *A Citizens' Guide to BOEM's Renewable Energy Authorization Process* found here - *https://www.boem.gov/KW-CG-Broch/*

BOEM Consultations for Renewable Energy Projects may include but are not limited to:

1. Endangered Species Act (ESA)

BOEM initiated consultation with National Oceanographic and Atmospheric Administration's National Marine Fisheries Service (NMFS), and US Fish and Wildlife regarding the Proposed Action focused on reasonably foreseeable site assessment and site characterization activities (including all types of surveys) following a lease and prior to a COP. BOEM will complete the consultations before activities occur. BOEM directs all operators on the OCS to incorporate best management practices to minimize or eliminate potential effects from site assessment and site characterization activities to protected ESA-listed species, including vessel strike avoidance measures, visual monitoring, and shutdown and reporting. These practices have been developed through years of ESA consultations for similar conventional energy operations in the Pacific OCS and refined through BOEM's renewable energy program on the Atlantic OCS consultations with NMFS. These practices are described in the EA under Appendix D *Typical Mitigation Measures for Protected Marine Mammal Species* and in Section 3.6.2.1.9 *Coastal and Marine Birds*. Plans will be reviewed by BOEM prior to all survey and site activities to ensure inclusion of appropriate avoidance measures. BOEM will also request a pre-survey meeting. Surveys must be within the scope of activities described in this EA and ESA consultation, or the Lessee must consult further.

2. Magnuson-Stevens Fishery Conservation and Management Act,

BOEM is including Essential Fish Habitat consultation with NMFS as part of a wholistic approach to biological consultations regarding the Proposed Action. Essential Fish Habitat (EFH) is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act requires all Federal agencies to consult on proposed actions authorized by the agency that may adversely affect EFH. Adverse effect means any impact that reduces quality and/or quantity of EFH.

3. Marine Mammal Protection Act (MMPA)

BOEM is not engaged in consultations under the MMPA. If a lease is issued, BOEM anticipates a lessee may need to follow additional practices or measures because of future consultations under MMPA. The MMPA requires that an incidental take authorization be obtained for the unintentional "take" of marine mammals (from NMFS) or sea otters (US Fish and Wildlife) incidental to activities including construction projects, scientific research projects, and energy development. There are two types of incidental take authorizations: Incidental Harassment Authorization (IHA) and Letter of Authorization (LOA). A future lessees will need to determine which type of authorization is appropriate for their planned activity.

4. National Historic Preservation Act (NHPA)

Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470-470t) requires the head of any Federal agency, having direct or indirect jurisdiction over a proposed Federal or Federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. BOEM has determined that issuing commercial or research leases within the Morro Bay WEA and granting ROWs and RUEs within the region constitutes an undertaking subject to Section 106 of the NHPA (16 U.S.C. 470f) and its implementing regulations (36 CFR § 800) as the resulting site characterization and site assessment activities have the potential to cause effects on historic properties.

BOEM has implemented a Programmatic Agreement pursuant to 36 CFR § 800.14(b) to fulfill its obligations under Section 106 of the NHPA for renewable energy activities on the OCS offshore California. BOEM initiated consultation through letters on November 24, 2021, with the California State Historic Preservation Office (SHPO), Advisory Council on Historic Preservation, and the following Federally recognized Tribal Nation: Santa Ynez Band of Chumash Indians. BOEM further identified potential consulting parties pursuant to 36 CFR § 800.3(f) through a November 24, 2021, letter to over forty (40) non-recognized Tribal governments, certified local governments, historical preservation societies, and museums, which solicited public comment and input regarding the identification of, and potential effects on, historic properties for the purpose of obtaining public input for the Section 106 review (36 CFR § 800.2(d)(3)) and invited them to participate as a consulting party. The finding of effects for the undertaking was drafted and is under review with consulting parties.

5. Clean Water Act Consultations

The CWA is the principal law governing pollution control and water quality of the Nation's waterways. The object of the CWA is to restore and maintain the chemical, physical and biological integrity of the Nation's waters (33 U.S.C. § 1251).

6. Clean Air Act Consultations

Per the Clean Air Act, the U.S. Environmental Protection Agency (EPA) has air quality jurisdiction in California. BOEM consults with the EPA for air quality issues in California.

7. Migratory Bird Treaty Act Consultations

The Migratory Bird Treaty Act (MBTA) implements the United States' commitment to four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. BOEM uses the NEPA process to evaluate potential impacts of proposed actions and alternatives, including impacts to migratory birds and their habitats. .

8. Tribal Consultations

With the start of the EA process, BOEM provided written notice to 65 Federally recognized Tribes informing them of the WEA designation (*See* Appendix B to this document), BOEM's leasing process, and next steps. BOEM invited consultation on its leasing process and activities in California. BOEM also contacted the Government Affairs and Cultural Director of the Santa Ynez Band of Chumash Indians.

The letters invited government-to-government consultation and provided the opportunity for interested Federally recognized Tribes to participate in the NEPA review as a cooperating agency. In addition, on November 29 and 30, 2021 BOEM attended with California State Agencies in person meetings focused on tribal interests in Santa Barbara and Morro Bay. BOEM also sent written correspondence to the Santa Ynez Band of Chumash Indians with the release of the EA for public review. BOEM will continue with the consultation process as the EA circulates for public comment.

9. US Coast Guard Consultations

On July 28, 2021, the USCG announced it will conduct a "Pacific Port Access Route Study" (PACPARS) to evaluate safe access routes for the movement of vessel traffic proceeding to or from ports along the western seaboard to determine whether a Shipping Safety Fairway and/or routing measures should be established, adjusted or modified. The PACPARS will help the USCG determine what impacts, if any, the siting of offshore wind facilities may have on existing maritime users and any potential impacts to vessel traffic and maritime navigation. BOEM has coordinated closely with the USCG throughout its planning and siting process and will continue this coordination to address potential maritime impacts from any future offshore wind development.

For additional information about a variety of topics, please see the following sections of the EA.

Table 2 Information found in BOEM's Environmental Assessment (EA) for the Morro Bay WEA

Environmental Assessment Section Number	Information about …
2.2.4	Foreseeable Activities and Impact-Producing Factors
2.2.4.1	Surveying and Sampling Assumptions
2.2.4.3	Noise Generation Assumptions
2.2.4.4	Port Facilities Assumptions
2.2.4.5	Vessel Traffic
2.2.4.6	Site Characterization Surveys
2.2.4.7	Collection of Geophysical Information
2.2.4.9	Buoy Hull Types and Anchoring Systems
2.2.5.1	Allisions and Collisions
2.2.5.2	Spills
3.1	Geology
3.2	Air Quality
3.3	Water Quality
3.3.1.1	Coastal Waters

3.4	Marine and Coastal Habitats and Associated Biotic Assemblages
3.4, 3.5, 3.6	Threatened and Endangered Species
3.5	Marine Mammals and Sea Turtles
3.6	Coastal and Marine Birds
3.6.2.1	Active Acoustic Sound Sources
3.6.3.3	Bats
3.7	Commercial Fishing
3.11	Environmental Justice
3.12	Tribes and Tribal Resources
4	Consultations and Coordination, and Stakeholder Comments
Appendix B	Current and Reasonably Foreseeable Actions
Appendix C	Section 106 Programmatic Agreement
Appendix D	Typical Mitigation Measures for Protected Marine Mammal Species

IV. PROJECT AREAS AND ACTIVITIES SUBJECT TO CONSISTENCY DETERMINATION

The implementing regulations of the CZMA and the policies of the California Coastal Commission (CCC) apply to lands and waters within coastal zone boundaries and to activities conducted outside the coastal zone that may affect lands or waters within the coastal zone. This Consistency Determination (CD) includes actions and programs outside the coastal zone within Federal waters. The term “coastal zone” is defined in 16 U.S.C. § 1453(1) as “the coastal waters (including the lands therein and thereunder) and the adjacent shorelands (including the waters therein and thereunder), strongly influenced by each other and in proximity to the shorelines of the several coastal States, and includes islands, transitional and intertidal areas, salt marshes, wetlands, and beaches...”. Excluded from the coastal zone are lands the use of which is by law subject solely to the discretion of or which is held in trust by the Federal Government, its officers or agents.” This activity will take place beyond the three-mile boundary that designates the beginning of Federal waters and within the Exclusive Economic Zone of the United States of America which terminates at 200 miles offshore (*see* United Nations Convention on the Laws of the Seas, Part V Exclusive Economic Zone, Article 57).

This CD evaluates all these in as much detail as is presently available. Some actions, programs, and proposals will need additional Federal consistency certifications in the future when lease-specific information is available.

Standard of Review

Under Section 307(c)(1) of the CZMA, 16 USC § 1456(c)(1), Federal activities that effect any land or water use or natural resource of the coastal zone are required to be consistent with the affected State's coastal management program to the "maximum extent practicable." Section 930.32 of NOAA’s regulations implementing the CZMA (15 CFR part 930) defines

"consistent to the maximum extent practicable" as follows:

(a)(1) The term ''consistent to the maximum extent practicable'' means fully consistent with the enforceable policies of management programs unless full consistency is prohibited by existing law applicable to the federal agency.

The standard of review for Federal consistency determinations consists primarily of the principal component of the CCMP, namely the policies of Chapter 3 of the Coastal Act. Section A(6) of the Introduction to the CCMP also States, that, once incorporated into the CCMP, certified Local Coastal Plans (LCPs) "will be used in making Federal consistency determinations". If an LCP that the Commission has certified and incorporated into the CCMP provides development standards that are applicable to the post-lease site assessment and site characterization activities sites, the LCP can provide guidance in applying Chapter 3 policies in light of local circumstances. If the Commission has not incorporated the LCP into the CCMP, it cannot guide the Commission's decision, but it can provide background information.

The CCC has a certified LCP for area in San Luis Obispo County that are relevant to management of this area. For the purposes of this CD, the San Luis Obispo County LCP planning document entitled the "County of San Luis Obispo Coastal Plan Policies") found *here* and the North Coast, San Luis Bay Coastal, Estero, and the South County Area Plans found *here* will apply to this review.

The Energy Policy Act of 2005 (EPAct) authorized BOEM to issue leases, easements, and rights of way to allow for renewable energy development on the Outer Continental Shelf (OCS). EPAct provided a general framework for BOEM to follow when authorizing these renewable energy activities. For example, EPAct requires that BOEM coordinate with relevant Federal agencies and affected State and local governments, obtain fair return for leases and grants issued, and ensure that renewable energy development takes place in a safe and environmentally responsible manner. *See* 74 Fed. Reg. 19,638 (Apr. 29, 2009); *see also* 30 CFR part 585 and 43 U.S.C § 1337(p)(1)(C). The Secretary must ensure that activities under this subsection are carried out in a manner that provides for 12 specific enumerated requirements, including safety, protection of the environment, and consideration of other uses of the sea or seabed. *Id.* § 1337(p)(4)(A)– (L). BOEM has issued regulations governing the leasing process and management of offshore renewable energy projects. *See* 74 Fed. Reg. 19,638 (Apr. 29, 2009); *see also* 30 C.F.R. part 585.

V. Project Description

The Proposed Action for this CD is the issuance of up to three commercial wind energy leases within the Morro Bay WEA. The EA associated with this CD considers BOEM's issuance of leases that may cover the entirety of the Morro Bay WEA. The Proposed Action could result in site assessment activities on leases and site characterization activities on the leases, grants, and potential easements. Site assessment activities would most likely include the temporary placement of up to three meteorological buoys and or oceanographic devices. Site characterization activities would most likely include geophysical, geotechnical, and biological surveys. While site characterization activities that extend into State waters and onshore to ports or existing substations are a reasonably foreseeable result of a wind energy lease issued in the Morro Bay WEA, BOEM is not authorizing any activities in State waters and onshore areas and does not have regulatory authority to apply mitigation measures outside of the OCS. The analysis found here and found in the EA does not consider construction and

operation of any commercial wind power facilities, which would be evaluated if the lessee submits a Construction and Operations Plan (COP). BOEM takes this approach based on several factors.

First, the issuance of a lease only grants the lessee the exclusive right to submit to BOEM a Site Assessment Plan (SAP) and Construction and Operations Plan (COP) proposing development of the leasehold; the lease does not, by itself, authorize any activity within the lease area. After lease issuance, a lessee could conduct surveys and, pursuant to an approved SAP, install meteorological measurement devices to characterize the site's wind resources in the leased area. A lessee would collect this information to determine whether the site is suitable for commercial development and, if so, submit a COP with its project-specific design parameters for BOEM's review. The analysis contained within this CD will consider the effects of a lease sale and activities that are foreseeable such as SAPs and activities such as site characterization anticipated as vessel focused surveys.

Second, BOEM does not consider the impacts resulting from the development of a commercial wind power facility within the WEA to be reasonably foreseeable. Based on the limited experiences of the floating offshore wind industry, project design and the resulting environmental impacts are often geography- and design-specific, and it would therefore be premature to analyze environmental impacts related to potential approval of any future COP at this time. A number of design parameters would be identified in the COP including turbine size, foundation type, project layout, installation and anchoring methods, and associated onshore facilities. Each design parameter, or combination of parameters submitted by individual leaseholders, would have varying environmental effects, and will be reviewed individually.

Therefore, additional analyses under the National Environmental Policy Act (NEPA) is required before any future decision is made regarding construction of wind energy facilities on the OCS. The timing of lease issuance, as well as weather and sea conditions, would be the primary factors influencing timing of site characterization and site assessment activities. Under the reasonably foreseeable site characterization scenario, BOEM could issue leases in 2022. BOEM assumes lessees would begin survey activities as soon as possible after receiving a lease, when sea states and weather conditions allow for site characterization and site assessment survey activities. Lessees have up to five years to perform site characterization activities before they must submit a COP (30 CFR § 585.235(a)(2)). For leases issued in late 2022, those lessees' surveys could continue through late 2027 prior to submitting their COPs.

In the meantime, BOEM continues to gather information that will inform COP decision making and currently has 16 studies ongoing with the purpose of finding out more information about how renewable energy will affect the State of California. BOEM also has nine studies that will inform BOEM's review of COPs in the future which are not specific to the State of California. Please see visit BOEM's Environmental Studies webpage for the Pacific for more information here - *https://www.boem.gov/Selected-BOEM-Research-Renewable-CA/*

Potential Site Characterization Activities: BOEM assumes that lease holders, during the site assessment phase of the lease, will potentially undertake the types of surveys described in Table 3 below. BOEM further assumes that lease holders will use the High Resolution and Geophysical Survey Equipment and Methods as found in Table 4 . Vessel traffic assumptions for site characterization are shown in Table 5. Lease holders must submit a SAP for BOEM review prior to conducting site assessment activities according to the regulations found at 30 CFR § 585.613. A SAP describes the resource assessment activities (e.g. installation of

meteorological buoys) planned on a commercial lease, including a project easement. The SAP must describe how the lessee will conduct resource assessment (e.g., meteorological and oceanographic data collection) or technology testing activities per 30 CFR § 585.605. A plan for how the lessee will conduct site assessment activities under their lease is required per 30 CFR § 585.610(a). The lessee must provide the results of geophysical and geological surveys, hazards surveys, archaeological surveys (if required), and baseline collection studies (e.g., biological) with the supporting data per 30 CFR § 585.610(b).

Table 3 Potential Site Characterization Survey Details for the Morro Bay Wind Energy Area

Survey Type	Survey Equipment and/or Method	Resource Surveyed or Information Used to Inform
High-resolution geophysical surveys	Side-scan sonar, sub-bottom profiler, magnetometer, multi-beam echosounder	Shallow hazards, archaeological, bathymetric charting, benthic habitat
Geotechnical/sub-bottom sampling	Vibracores, piston cores, gravity cores, cone penetration tests	Geological
Biological	Grab sampling, benthic sled, underwater imagery/sediment profile imaging, Remotely Operated Vehicle (ROV), Autonomous Underwater Vehicle (AUV)	Benthic habitats
	Aerial digital imaging, visual observation from boat or airplane, radar, thermal and acoustic monitoring	Avian
	Ultrasonic detectors installed on buoy and survey vessels used for other surveys, radar, thermal monitoring	Bats
	Aerial and/or vessel-based surveys and acoustic monitoring	Marine mammals and sea turtles
	Direct sampling using vessel-based surveys; underwater imagery; acoustic monitoring; environmental DNA	Fishes and some invertebrates

Table 4 Potential High-Resolution Geophysical (HRG) Survey Equipment and Methods

Equipment Type	Data Collection and/or Survey Types	Description of the Equipment
Bathymetry/depth sounder (multi-beam echosounder)	Collection of geophysical data for shallow hazards, archaeological resources, benthic habitats, and Bathymetric charting	A depth sounder is a microprocessor-controlled, high-resolution survey-grade system that measures precise water depths in both digital and graphic formats. The system would be used in such a manner as to record with a sweep appropriate to the range of water depths expected in the survey area. This EA assumes the use of multi-beam bathymetry systems, which may be more appropriate than other tools for characterizing those lease areas containing complex bathymetric features or sensitive benthic habitats, such as hardbottom areas.
Magnetometer	Collection of geophysical data for shallow hazards and archaeological resources assessments	Magnetometer surveys would be used to detect and aid in the identification of ferrous or other objects having a distinct magnetic signature. The magnetometer sensor is typically towed as near as possible to the seafloor and anticipated to be no more than approximately 6 m (20 ft) above the seafloor. This methodology will not be used in the WEA since depths are 500 m or greater, but will be used to survey potential cable routes that will occur in depths shallower than 500 m.

Side-scan sonar	Collection of geophysical data for shallow hazards and archaeological resources assessments	This survey technique is used to evaluate surface sediments, seafloor morphology, and potential surface obstructions (MMS, 2007). A typical side-scan sonar system consists of a top-side processor, tow cable, and towfish with transducers (or "pingers") located on the sides, which generate and record the returning sound that travels through the water column at a known speed. BOEM assumes that the lessee would use a digital dual-frequency side-scan sonar system with 300–500 kHz frequency ranges or greater to record continuous planimetric images of the seafloor.
Shallow and medium (seismic) penetration sub-bottom profilers:	Collection of geophysical data for shallow hazards and archaeological resources assessments and to characterize subsurface sediments	Typically, a high-resolution CHIRP System sub-bottom profiler is used to generate a profile view below the bottom of the seabed, which is interpreted to develop a geologic cross-section of subsurface sediment conditions under the track line surveyed. Another type of sub-bottom profiler that may be employed is a medium penetration system such as a boomer, bubble pulser or impulse-type system. Sub-bottom profilers are capable of penetrating sediment depth ranges of 3 m (10 ft) to greater than 100 m (328 ft), depending on frequency and bottom composition.

Notes:
CHIRP = Compressed High Intensity Radar Pulse kHz = kilohertz

Table 5 Projected Maximum Vessel Trips for Site Characterization over a 3 year period

Survey Task	Number of Survey Days/Round Trips[1]	
	Based on 24-hour Days	Based on 10-hour Days
HRG surveys of all OCS blocks within lease area(s)	64	153
Geotechnical sampling	18	247
Avian surveys	30-54[2]	30-54[2]
Fish surveys	8-365[3]	8-365[3]
Marine mammal and sea turtle surveys	30-54[2]	30-54[2]
Total:	150-555	464-873

Notes:
[1] A range has been provided when data or information was available to determine an upper and lower number of round trips. Otherwise, only a maximum value was determined.
[2] Avian, marine mammal and sea turtle surveys are most likely to occur at the same time, from the same vessel. However, since it is possible that they may occur separately, totals include vessel trips for both.
[3] Number of surveys are conservative estimates, meaning the highest possible number of trips is assumed even though it is unlikely this many trips will take place.
HRG = high-resolution geophysical

Metocean Buoys: Metocean buoys would be anchored at fixed locations in potential commercial lease areas to conduct site assessment activities to monitor and evaluate the viability of wind as an energy source. The activities may include data gathering on wind velocity, barometric pressure, atmospheric and water temperatures, and current and wave measurements. To obtain these data, scientific measurement devices consisting of anemometers, vanes, barometers, and temperature transmitters would be mounted either directly on a buoy or on a buoy's instrument support arms. In addition to conventional anemometers, floating light detection and ranging (FLiDAR) and sonic detection and ranging (SODAR) equipment may be used to obtain meteorological data. To measure the speed and direction of ocean currents, Acoustic Doppler Current Profilers (ADCPs) would most likely be installed. Buoys could also accommodate environmental monitoring equipment, such as bird and bat monitoring equipment (e.g., radar units, thermal imaging cameras), visual or acoustic monitoring equipment for marine mammals and fishes, data logging computers, power

supplies, visibility sensors, water measurement equipment (e.g., temperature, salinity), communications equipment, material hoist, and storage containers. Projected vessel traffic in support of metocean buoy placement is shown in Table 6.

To assist the CCC's evaluation of fill analysis from metocean buoys, Table 8 represents a maximum mooring scenario. This scenario was created from metocean FLiDAR buoy deployment California WEAs described from PNNL (2019) but with additional considerations to provide a conservative estimate of a potential maximal scenario. Doubling the anchor radius of known metocean buoys to increase the area from 2.3 m^2 to 9.3 m^2 conservatively estimates fill. Typically, a buoy is held in place with a gravity anchor, which is one solid circular weight, but sometimes in depths over 1000 m, the weight is distributed into two separate anchors each with 6 feet of chain joining at the transition to one nylon cord (Thomson and Emery 2014). Maximum chain sweep area was estimated by tripling the current 1.8 m (6 ft) of chain used to 5.5 m (18 ft). Additional types of anchors are not currently used, but could be used, to anchor metocean buoys.

Embedded anchors 'dig in' to the seafloor and come in many shapes and sizes with more common names listed as suction, drag, or pile anchors (Figure 4; Randolph and Gourvenec 2011). Some embedded anchors such as grapnels or plows embed in the sediment by dragging along the seafloor. Other embedded anchors such as helix or pile anchors are installed with the aid of hydraulic mechanisms that screw or dig the anchor through soil. All types of embedded anchors disturb the surrounding sediments when being positioned into the seafloor. Within two years following termination of a lease BOEM requires that the operator remove all facilities, projects, cables, pipelines, and obstructions; and clears the seafloor of all obstructions created by activities (*30 CFR § 585.902*). To see more information about current buoy use in the Pacific, please go here - *https://www.pnnl.gov/news-media/offshore-wind-research-buoys-float-californias-waters.*

Table 6 Example of Projected Maximum Vessel Trips for Metocean Buoy(s)

Buoy	Site Assessment Activity	Round Trips	Formula
Metocean buoys	Metocean buoy installation	3	1 round trip x 3 buoys
	Metocean buoy yearly maintenance trips	15	3 buoys x 5 years
	Metocean buoy decommissioning	3	1 round trip x 3 buoys
	Total buoy trips over 5-year period	21–30	Adds on additional maintenance/weather challenges

VI. CONSISTENCY OF PROPOSED CD WITH PROVISIONS OF THE CALIFORNIA COASTAL ACT

This portion of the Federal consistency determination analyzes consistency between policy sections of the California Coastal Act (Division 20, California Public Resources Code) and this CD which covers the proposed lease sale and reasonably foreseeable effects such as SAPs and site characterization activities offshore on Federal waters in the area offshore San Luis Obispo County, California. The relevant policies are listed first, followed by comment and analysis.

Policies under the California Coastal Act that are not applicable to CD for the proposed

lease sale and reasonably foreseeable effects such as SAP or site characterization and site assessment activities are:

- All sections of Article 7 (Industrial Development)

ARTICLE 2, PUBLIC ACCESS

Section 30211 Development not to interfere with access
Development shall not interfere with the public's right of access to the sea, where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

Analysis and Comment:

The lease sale shall not hinder public access to the sea or the coastline. According to 30 CFR § 585.605(a) "[a] SAP describes the activities (e.g., meteorological buoys) you plan to perform for the characterization of your commercial lease, including your project easement, or to test technology devices." It is unlikely that foreseeable activities such as site assessment and site characterization could reduce public access to the sea as boats used to tow buoys and other survey equipment would not have any priority over other boats.

Access to the sea issues created by activities such as the construction of onshore facilities or the laying of transmission lines will also be reviewed once a COP has been submitted by a lessee.

In order to be able to make informed decisions regarding a submitted COP, BOEM is working to complete studies relating to this issue. See the following for more information:

- **Ongoing (2016-2022) — Scenarios for Offshore Renewable Energy along the Central California Coast**

This study by California Polytechnic State University, San Luis Obispo is delineating feasible offshore renewable energy scenarios along the central coast of California. Researchers will determine information needs and evaluate scenarios, tradeoffs, and generating capacity of various facilities as well as information needed to conduct environmental reviews. Study Profile: *https://www.boem.gov/pc-16-01/*
Journal Article: *https://www.sciencedirect.com/science/article/pii/S096456912100096X*

- **Completed (2016) — Determining the Infrastructure Needs to Support Offshore Floating Wind and Marine Hydrokinetic Facilities on the Pacific West Coast and Hawaii**

This study by ICF International evaluated the current infrastructure and vessel requirements and capabilities existing on the Pacific West Coast of the U.S. and the Hawaiian islands of Oahu, Maui, and Kauai to support the burgeoning offshore renewable energy industry. Understanding the infrastructure needs of the offshore renewable industry will help to identify the port-related requirements for offshore floating wind development and marine hydrokinetic industries and assess the utilization of the available marine equipment and facilities along the U.S. West Coast.
Report (BOEM 2016-011): *https://espis.boem.gov/final%20reports/5503.pdf*

ARTICLE 3 RECREATION

Section 30224 Recreational boating use; encouragement; facilities
Increased recreational boating use of coastal waters shall be encouraged, in accordance with this division, by developing dry storage areas, increasing public launching facilities, providing additional berthing space in existing harbors, limiting non-water-dependent land uses that congest access corridors and preclude boating support facilities, providing harbors of refuge, and by providing for new boating facilities in natural harbors, new protected water areas, and in areas dredged from dry land.

Analysis and Comment:

The lease sale is unlikely to affect recreational boating use. Although site assessment activities would result in a slight increase in vessel traffic to the Morro Bay WEA and surrounding areas, the total vessel traffic associated with site characterization surveys and site assessment activities would be at most a couple of vessel trips per day on the heaviest days of operations. BOEM also assumes that during the site characterization and site assessment stages, lessees will likely stage from the Port of Morro Bay, approximately 32.2 km (20 mi) east of the Morro Bay WEA. The generation of trash and debris is also a concern with site assessment and characterization activities, but the small numbers of vessel trips along with compliance with Federal regulations would minimize this impact.

Work to deploy and retrieve meteorological buoys offshore the west coast will use approximately 70-100-foot-long vessels, along with secondary smaller 6-15-foot zodiac boats. Site characterization survey vessels used offshore the west coast range from vessels 36’ feet long that make day trips (e.g., the US Geological Survey Research Vessel *Parke Snavely*) to vessels that are 211 feet and collect data for weeks at a time (e.g., *EV Nautilus*). Larger vessels are less likely to be used. If used, most likely for the geophysical collection of 10 ft or greater sediment cores. Vessels larger than 200 ft are more likely to depart from larger ports such as the Port of Los Angeles/Long Beach or the San Francisco Port Complex. BOEM estimated a maximal range of 598 vessel trips over the five-year period, assuming vessels under 100 feet and surveys utilized day trips and staying in the port during the duration of the particular deployment or survey. Exact timing and duration are not known at this time.

Regarding vessel traffic, BOEM assumes lessees would likely survey the entire proposed lease area during a 5-year site assessment term. Vessel trips are anticipated for both site characterization and site assessment activities. The EA assumes the number of vessel trips would amount to no more than 500 total 10-hour survey days, when survey activities only take part of the day, or 180 total 24-hour survey days, when survey activities take place 24 hours per day, throughout the assessment period.

The number of round trips for project-related vessels over a 3-year period will range from 188–274 for 24-hour operations or 566–598 for 10-hour daily operations. An additional 21–30 round trips will be conducted over a 5-year period for the deployment, maintenance, and decommissioning of 3 metocean buoys. Vessel speeds during site characterization surveys within the Proposed Action Area will likely be limited to less than 5 knots (2.57 m/s), but transit speeds will vary. Considering the current annual level of vessel traffic around the Proposed Action Area including tug and tows, cargo ships and tankers, the project-related vessel traffic would increase the overall vessel traffic and risk of collision with marine mammals in the Proposed Action Area; however the required vessel strike avoidance measures, as well as

reporting requirements, will minimize vessel interactions with protected species to negligible levels.

For additional information about BOEM's review of this issue in the EA, please see section 3.8 as described in Table 2.

Potential impacts of offshore renewable energy development on recreational boating will be analyzed once a COP has been submitted by a lessee. For example, BOEM will have to analyze access for recreational boating purposes based on proposed layouts of turbines and mooring line configurations submitted in the COP. Any additional mitigation measures informing safety around floating wind turbines will be discussed in detail in the COP, if one is received.

For additional information from BOEM studies relating to this issue, please see the following:

- ***Completed (2012) —*** **Identification of Outer Continental Shelf Renewable Energy Space-Use Conflicts and Analysis of Potential Mitigation Measures**

This study by Industrial Economics, Incorporated captured baseline space-use information on the Atlantic and Pacific Coasts; the Pacific study area included Federal waters offshore Washington, Oregon, and northern California. It collected data on more than a dozen space uses (including commercial fishing and shipping), identified potential and known conflicts that may arise with renewable energy development, and provided insights on potential mitigation and avoidance measures.
Report (BOEM 2012-083): *https://espis.boem.gov/final%20reports/5203.pdf*

ARTICLE 4 MARINE RESOURCES

Section 30230 Marine resources; maintenance
Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Analysis and Comment:

The lease sale is not likely to result in the degradation of marine resources. Permanent or large-scale impacts to marine resources are not expected for site characterization and assessment activities, which may occur only after a lease sale. Noise from high-resolution geophysical (HRG) surveys, project vessels, and buoy moorings may alter bird, mammal, and fish behavior within the WEA, but the effect will be temporary, and is not expected to affect viability of regional populations. Moorings will be designed to minimize or remove entanglement risk for protected species.

A spill of petroleum product could occur as a result of hull damage from allisions with a met buoy, collisions between vessels, accidents during the maintenance or transfer of offshore equipment and/or crew, or due to natural events (i.e., strong waves or storms). From 2000 to 2009, the average spill size for vessels other than tank ships and tank barges was 88 gallons (USCG 2011); should a spill from a vessel associated with the Proposed Action occur, BOEM

anticipates that the volume would be similar. Diesel fuel is lighter than water and may float on the water's surface or be dispersed into the water column by waves. Diesel would be expected to dissipate very rapidly, evaporate, and biodegrade within a few days (MMS 2007a). The NOAA's Automated Data Inquiry for Oil Spills (an oil weathering model) was used to predict dissipation of a maximum spill of 2,500 barrels, a spill far greater than what is assumed as a non-routine event during the Proposed Action. Results of the modelling analysis showed that dissipation of spilled diesel fuel is rapid. The amount of time it took to reach diesel fuel concentrations of less than 0.05 percent varied between 0.5 and 2.5 days, depending on ambient wind (Tetra Tech Inc. 2015), suggesting that 88 gallons would reach similar concentrations much faster and limit the environmental impact of such a spill.

Vessels are expected to comply with USCG requirements relating to prevention and control of oil spills, and most equipment on the met and buoys would be powered by batteries charged by small wind turbines and solar panels. BOEM expects that each of the vessels involved with site assessment and site characterization activities would minimize the potential for a release of oils and/or chemicals in accordance with 33 CFR Parts 151, 154, and 155, which contain guidelines for implementation and enforcement of vessel response plans, facility response plans, and shipboard oil pollution emergency plans. Based on the size of the spill, it would be expected to dissipate very rapidly and would then evaporate and biodegrade within a day or two (at most), limiting the potential impacts to a localized area for a short duration.

The site characterization and site assessment-related vessel traffic would increase the overall vessel traffic and risk of collision with marine mammals in the Morro Bay WEA; however, the required vessel strike avoidance measures, as well as reporting requirements, will minimize vessel interactions with protected species to negligible levels. Commonly used measures are listed in the EA Appendix D, such as reduced vessel speed and marine observers. BOEM will also finalize a consultation with the National Marine Fisheries Service regarding endangered species prior to lease issuance. The U.S. Fish and Wildlife Service is consulted regarding sea otters and birds.

The Marine Mammal Protection Act requires that an incidental take authorization be obtained from NOAA for the unintentional "take" of marine mammals incidental to activities including construction projects, scientific research projects, and energy development. There are two types of incidental take authorizations: Incidental Harassment Authorization (IHA) and Letter of Authorization (LOA). A lessee will need to determine which type of authorization is appropriate for their planned activity.

The lease sale will not result in the degradation of sensitive habitat areas. Impacts to sensitive habitat areas are not expected for site characterization and assessment activities. Noise from HRG surveys and post-lease site assessment and site characterization activities vessels may alter fish behavior within the WEA, but the effect will be temporary, and is not expected to affect viability of regional populations. Any impacts that could occur would be from accidental events, such as vessel grounding or collision.

Geotechnical surveys (vibracores, piston cores, gravity cores) related to offshore renewable energy activities are discrete seafloor sampling activities that introduce relatively low levels of sound into the environment. The larger source of vessel noise is produced from vessel engines and dynamic positioning to keep the vessel stationary while equipment is deployed, and sampling conducted. Recent analyses of the potential impacts to protected species exposed to noise generated during geotechnical survey activities determined that effects to protected species from exposure to this noise source are extremely unlikely to occur (NMFS,

2021).

Geophysical surveys have a range of sound sources depending on the HRG equipment used, ranging from pulsing sparkers (2.7kHZ) to continuous sounds of side scan sonar (>200k HZ). The disturbance distances to 160 dB re 1 µPa RMS for marine mammals and 175 dB re 1 µPa RMS for sea turtles were calculated using a spherical spreading model (20 LogR). These results describe maximum disturbance exposures for protected species to each potential sound source.

For additional information about BOEM's review of this issue in the EA, please see sections 2.4, 3.4, 3.5, 4.3.1 and Appendix D as described in Table 2.

Table 7 Summary of Maximum Disturbance Distances for Protected Marine Mammal Species from Mobile High-Resolution geotechnical (HRG) Sources Towed at a Speed of 4.5 knots

HRG SOURCE	DISTURBANCE DISTANCE (m)					
	Low Frequency (e.g., Baleen Whales)[a]	Mid-Frequency (e.g., Dolphins and Sperm Whales)[a]	High Frequency (e.g., Porpoise)	Phocids (true seals)	Otariids (sea lions and fur seals)	Sea Turtles
Mobile, Impulsive, Intermittent Sources						
Boomers, Bubble Guns (4.3 kHz)	224	224	224	224	224	40
Sparkers (2.7 kHz)	502	502	502	502	502	90
Chirp Sub-Bottom Profilers (5.7 kHz)	282	282	282	282	282	50
Mobile, Non-Impulsive, Intermittent Sources						
Multi-beam Echosounder (100 kHz)	NA	370	370	NA	NA	NA
Multi-beam Echosounder (>200 kHz)	NA	NA	NA	NA	NA	NA
Side-scan Sonar (>200 kHz)	NA	NA	NA	NA	NA	NA

Notes:

[a] PTS injury distances for listed marine mammals were calculated with NOAA's sound exposure spreadsheet tool using sound source characteristics for HRG sources in Crocker and Fratantonio (2016).

NA = not applicable due to the sound source being out of the hearing range for the group.

Potential impacts of offshore renewable energy development on marine resources will be reviewed once a COP has been submitted by a lessee. To inform future reviews, BOEM plans to complete the studies mentioned below to better understand how the COP phase of development could affect marine resources. For example, potential impacts of anchoring floating wind turbines and laying transmission cables on marine resources will be analyzed when a COP is submitted with project design details.

In order to be able to make informed decisions regarding a submitted COP, BOEM is working to complete studies relating to this issue. See the following for more information:

- ***Ongoing (2020–2023)* — ADRIFT: Spatial and Temporal Distribution of Cetaceans in the California Current Ecosystem Using Drifting Archival Passive Acoustic Monitoring**

This study by the National Oceanic and Atmospheric Administration will collect and analyze passive acoustic data in the California Current Ecosystem to improve understanding of the distribution of protected cetacean (whale, dolphin, and porpoise) species, including in the vicinity of wind energy Call Areas offshore northern and central California. It will employ a novel method of using drifting acoustic recorders, allowing for data to be collected over larger spatial and temporal scales compared to traditional methods. The findings will assist BOEM in assessing potential impacts and overall acoustic contribution of BOEM-regulated activities.
Study Profile: https://www.boem.gov/PC-20-04

- ***Ongoing (2021–2023)* — A Vulnerability Index to Scale Effects of Offshore Renewable Energy on Marine Mammals and Sea Turtles of the U.S. West Coast (VIMMS)**

This study by Southall Environmental Associates (SEA), Inc. will develop a vulnerability index based on the best available data and expert elicitation for marine mammals and sea turtles that occur offshore central and northern California, Oregon, and Washington. This index will assist in scaling the effects and prioritizing which of these species need to be considered in assessments of risk from offshore renewable energy infrastructure. It will develop a visual representation of the levels of concern for relevant species or species groups, which will also inform the selection of renewable energy sites.
Study Profile: https://www.boem.gov/pc-21-04

- ***Ongoing (2019–2022)* — Development of Computer Simulations to Assess Entanglement Risk to Whales and Leatherback Sea Turtles in Offshore Floating Wind Turbine Moorings, Cables, and Associated Derelict Fishing Gear Offshore California**

This study, in partnership with the National Oceanic and Atmospheric Administration's National Centers for Coastal Ocean Science, has developed morphologically and behaviorally accurate 3-D computer models of protected whale species (fin and humpback) and leatherback sea turtles. Two offshore floating wind mooring systems are currently under digital development. The whale and mooring system models will be integrated into simulations to visualize various potential interaction scenarios, including with associated derelict fishing gear. These simulations will assist BOEM in assessing the risk and potential severity of entanglement, and potentially identify mitigation measures to reduce any risk.
Study Profile: https://www.boem.gov/pr-19-ent-profile/
Infographic: https://www.boem.gov/PR-19-ENT-Infographic

- ***Completed (2021)* — Pacific Marine Assessment Partnership for Protected Species (PacMAPPS) – California Current**

This study was a partnership between BOEM, the National Marine Fisheries Service, and the U.S. Navy to conduct shipboard surveys of marine mammals, seabirds, and, to the extent possible, sea turtles in the Pacific. The data collected during a 2018 survey of the California Current Ecosystem (Baja California, California, Oregon, and Washington) will help BOEM evaluate potential effects of proposed energy activities on protected species, that includes an ecosystem-level context, including in areas of interest for renewable energy development (California, Oregon) and for conventional energy decommissioning (California).
Report (BOEM 2021-013): https://espis.boem.gov/final%20reports/BOEM_2021-013.pdf

- ***Completed (2021)* — Data Synthesis and High-resolution Predictive Modeling of Marine Bird Spatial Distributions on the Pacific OCS**

This study by the National Oceanic and Atmospheric Administration and U.S. Geological Survey synthesized 50 years of seabird survey data off California, Oregon, and Washington, and combined it with information about environmental and oceanographic conditions to predict

the occurrence and abundance of seabirds at sea. The resulting predictive maps of seabird distributions will provide critical information for renewable energy siting and evaluation of potential environmental effects of management actions and project approvals.
Report (BOEM 2021-014): https://www.boem.gov/BOEM_2021-014

- ***Completed (2020)* — Cross-Shelf Habitat Suitability Modeling**

This study by the National Oceanic and Atmospheric Administration and Oregon State University created new habitat suitability models for deep water corals, sponges, and soft-sediment macrofaunal species offshore the U.S. West Coast. These habitat suitability models extend across the continental shelf and out to 1200 meter depth. This study included field validations and comparisons with previous models, and improves the predictive capabilities of important seafloor habitats and benthic communities.
First Report (BOEM 2020-008): https://espis.boem.gov/final%20reports/BOEM_2020-008.pdf
Second Report (BOEM 2020-021): https://espis.boem.gov/final%20reports/BOEM_2020-021.pdf

- ***Completed (2020)* — Seabird and Marine Mammal Surveys off the Northern California, Oregon and Washington Coasts**

This study by the U.S. Geological Survey and U.S. Fish and Wildlife Service provided up-to-date information on the types, distribution, abundance, seasonal variation, and habitat use of marine mammals and seabirds along the northern California, Oregon, and Washington coasts. Aerial surveys using state-of-the-art technology focused on the most likely areas of OCS renewable energy development. Additional work determined ecosystem connections and species-habitat associations.
First Report (BOEM 2014-003): https://espis.boem.gov/final%20reports/5427.pdf
Second Report (BOEM 2020-012): https://espis.boem.gov/final%20reports/BOEM_2020-012.pdf
Webinar: https://www.boem.gov/Science-Exchange-1/

- ***Completed (2018)* — Humpback Whale Encounter with Offshore Wind Mooring Lines and Inter-Array Cables**

This study by the U.S. Department of Energy/Pacific Northwest National Laboratory compiled information about whale movements (e.g., dive depths and swimming speed) and created a three-dimensional video animation of how whales may move through a hypothetical offshore floating wind farm. This visual simulation will help characterize the risk of whale encounters with mooring lines and electrical cables used in offshore floating wind projects.
Report (BOEM 2018-065): https://www.boem.gov/BOEM-2018-065/
Video Animation: https://www.boem.gov/Humpback-Whales-Floating-Wind/

- ***Completed (2016)* — Using Ongoing Activities as Surrogates to Predict Potential Ecological Impacts from Marine Renewable Energy**

BOEM and the U.S. Department of Energy partnered on this study to identify and analyze data from ongoing projects and activities (surrogates) with stressors and receptors similar to those expected from marine renewable energy projects. Two reports examined potential impacts of electromagnetic fields from operating power cables, and one examined mooring configurations of offshore surrogates such as aquaculture facilities and oceanographic buoys as fish attracting devices.
First Report (BOEM 2015-021): https://www.boem.gov/2015-021/
Second Report (BOEM 2015-042): https://www.boem.gov/2015-042/
Third Report (BOEM 2016-041): https://www.boem.gov/2016-041/

- ***Completed (2014)* — Survey of Benthic Communities Near Potential Renewable Energy Sites Offshore the Pacific Northwest**

This study by Oregon State University provided baseline information about the seafloor environment and the types and distribution of benthic invertebrates in areas of potential renewable energy development on the Washington, Oregon, and northern California OCS.

Knowledge of species-habitat relationships will allow for prediction of seafloor communities beyond those sampled in this study.
Report (BOEM 2014-662):
Volume 1: https://espis.boem.gov/final%20reports/5453.pdf
Volume 2: https://espis.boem.gov/final%20reports/5454.pdf
Webinar: https://www.boem.gov/Science-Exchange-4/

- **Ongoing (2020-2023) — Offshore Acoustic Bat Study along the California Coastline**

This study by the the U.S. Geological Survey will expand monitoring of seasonal bat migration activities offshore and along the coast of California, and will produce regional datasets. It will quantify the extent and seasonality of bat activity in the nearshore area of the California coast and increase BOEM's understanding of the temporal and spatial distribution of bats in the area to evaluate the potential effects of offshore wind energy development on them.
Study Profile: *https://www.boem.gov/PC-19-03-profile*

- **Ongoing (2020–2023) — ADRIFT: Spatial and Temporal Distribution of Cetaceans in the California Current Ecosystem Using Drifting Archival Passive Acoustic Monitoring**

This study by the National Oceanic and Atmospheric Administration will collect and analyze passive acoustic data in the California Current Ecosystem to improve understanding of the distribution of protected cetacean (whale, dolphin, and porpoise) species, including in the vicinity of wind energy Call Areas offshore northern and central California. It will employ a novel method of using drifting acoustic recorders, allowing for data to be collected over larger spatial and temporal scales compared to traditional methods. The findings will assist BOEM in assessing potential impacts and overall acoustic contribution of BOEM-regulated activities.
Study Profile: *https://www.boem.gov/PC-20-04*

Section 30233 Diking, filling or dredging; continued movement of sediment and nutrients
(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities….
(7) Nature study, aquaculture, or similar resource dependent activities.

Vessel anchoring, coring, and collection of bottom samples associated with geotechnical surveys and benthic sampling could cause localized seafloor disturbance temporarily increasing turbidity and reducing water clarity by resuspension of sediments into the water column. Collection of bottom samples is estimated to impact up to $10m^2$ (108 ft^2) per sample, although the core or grab sample extraction area may be much smaller. Short-term and localized resuspension of seafloor sediment into the water column is not expected to result in any lasting impact to water or sediment quality in either the WEA or along any projected transmission cable route. Upon cessation of the sampling, suspended sediment would immediately begin to settle to the seafloor with water quality promptly returning to ambient conditions.

Anchoring, installation, and decommissioning of meteorological buoys results in a greater disturbance to the seafloor than benthic sampling, consequently impacting water quality over a

larger area. Three metocean buoys may be installed in the Morro Bay WEA. Deep ocean moorings have operated without failure for more than 10 years (National Data Buoy Center 2012). Typically, a buoy is held in place with a gravity anchor, which is one solid circular weight, with an estimated footprint on the seafloor of 0.55 square meter (m^2; 6 ft^2). Estimating a safety clearance of 500 m (1,640 ft) at the sea surface, BOEM estimates a total of 0.79 km^2 (0.30 mi^2) circular exclusion zone per floating turbine. In 2020, Pacific Northwest National Laboratories (PNNL) installed two LiDAR buoys off California that had a boat shaped hull and were moored with a solid cast iron anchor weighing approximately 4,990 kg (11,000 lbs) with a 2.3 m^2 footprint on the seafloor. The mooring line was comprised of at least 6 feet of chain, jacketed wire, nylon rope, polypropylene rope and subsurface floats to keep the mooring line taut to semi-taut. The mooring line was approximately 1,200 m long in the Morro Bay WEA (PNNL 2019). To see more information about current buoy use in the Pacific, please go here - *https://www.pnnl.gov/news-media/offshore-wind-research-buoys-float-californias-waters.*

To assist the CCC's evaluation of fill analysis from metocean buoys, Table 8 represents a maximum mooring scenario. This scenario was created from metocean FLiDAR buoy deployment California WEAs described from PNNL (2019) but with additional considerations to provide a conservative estimate of a potential maximal scenario. Doubling the anchor radius of known metocean buoys to increase the area from 2.3 m^2 to 9.3 m^2 conservatively estimates fill. Typically, a buoy is held in place with a gravity anchor, which is one solid circular weight, but sometimes in depths over 1000 m, the weight is distributed into two separate anchors each with 6 feet of chain joining at the transition to one nylon cord (Thomson and Emery 2014). Maximum chain sweep area was estimated by tripling the current 1.8 m (6 ft) of chain used to 5.5 m (18 ft). Additional types of anchors are not currently used, but could be used, to anchor metocean buoys. Embedded anchors 'dig in' to the seafloor and come in many shapes and sizes with more common names listed as suction, drag, or pile anchors (Figure 5; Randolph and Gourvenec 2011). Some embedded anchors such as grapnels or plows embed in the sediment by dragging along the seafloor. Other embedded anchors such as helix or pile anchors are installed with the aid of hydraulic mechanisms that screw or dig the anchor through soil. All types of embedded anchors disturb the surrounding sediments when being positioned into the seafloor.

Table 8 Maximum mooring scenario area for solid weight or embedded anchors of metocean buoys. Up to 3 metocean buoys can be deployed. If each buoy was placed with 2 anchors, that would total 6 potential anchoring events in 3 distinct locations within the Morro Bay WEA. Maximum anchor size was estimated conservatively by doubling the area of existing metocean buoy anchors deployed in the WEAs. Maximum chain sweep area was estimated by tripling the current 1.8 m (6 ft) of chain used to 5.5 m (18 ft). Areas in squared meters $m^2$and squared feet ft^2.

Seafloor Footprint	**Area m^2 (ft^2) of 1 anchor**	**Area m^2 (ft^2) of 6 anchors**
Anchor	0.5 to 9.3 (6 to 100)	3 to 55.8 (32.3 to 601)
Chain sweep and/or anchor placement	10.5 to 95 (113 to 1023)	63 to 570 (678 to 6135)

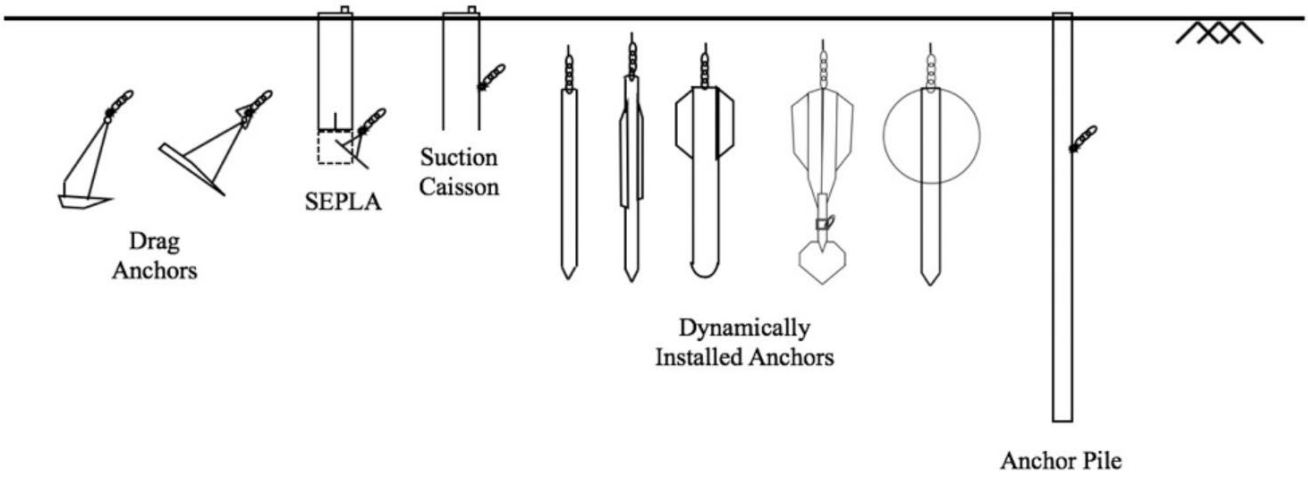

Figure 4 Illustration of some types of embedded anchors that are not typically used for installations of metocean buoys. Illustration credit Randolph and Gourvenec (2011).

A temporary resuspension of sediments into the water column would be expected during the one-day met buoy anchoring, installation, and decommissioning activities. This projected short-term duration would result in no lasting impact to water or sediment quality with ambient conditions likely throughout the operation and following decommissioning of the buoys. In the unlikely event of recovering lost equipment, seafloor disturbance and the resultant resuspension of sediments into the water column would be expected during the recovery operation. Transient and localized resuspension of sediment would temporarily impact water quality, but a return to ambient conditions would be expected immediately following the termination of the recovery operation. A discussion of typical mitigation measures for the protected marine mammals can be found in the Morro Bay EA in appendix D.

For additional information about BOEM's review of this issue in the EA, please see section 2.2.4.9 as well as sections 3.3.2 and 3.4.2 as described in Table 2 for impacts to water quality and habitats.

Once a COP has been submitted by a lessee, the anchoring methods proposed which may include diking, filling, or dredging of open coastal waters will be reviewed by BOEM. BOEM will review the proposed plan submitted by the lease holder for anchoring wind turbines and laying transmission cables and will apply mitigation appropriate measures to minimize adverse environmental effects.

In order to be able to make informed decisions regarding a submitted COP, BOEM is working to complete studies relating to this issue. See the following for more information:

- **Completed (2020) - Comparison of Environmental Effects from Different Offshore Wind Turbine Foundations**

The development of the offshore wind industry along the Atlantic coast of the United States has raised concern from the public and throughout New England and the mid-Atlantic, about the potential effects of offshore wind foundations on the marine environment. This white paper provides a summary of currently available science that addresses potential effects of offshore wind foundations on the marine environment and provides a comparison of different foundation types. This summary has been developed to provide information to stakeholders who are concerned about the effect of foundations on marine resources and to explain which foundations are suitable to use under certain conditions.
(Report BOEM 2020-041)

Report: *https://www.boem.gov/sites/default/files/documents/environment/Wind-Turbine-Foundations-White%20Paper-Final-White-Paper.pdf*

- **Completed (2019) - DOI Partnership - Distinguishing between Human and Natural Causes of Changes in Nearshore Ecosystems Using Long-term Data from DOI Monitoring Programs**

Monitoring and predicting the potential impacts of outer continental shelf (OCS) energy production on nearshore ecosystems requires an ability to distinguish between changes caused by natural processes and those caused by human activities. The ability to distinguish such changes in turn requires long-term, spatially extensive data to describe natural patterns of temporal and spatial variation in species abundances and the environmental factors that influence them. This is particularly true for giant kelp forests, which are highly productive and diverse ecosystems in temperate regions that fluctuate greatly in space and time. These systems are highly valued for the milieu of goods and services they provide to society and there is general interest in minimizing anthropogenic activities that adversely affect them. The purpose of this project was to partner with agencies in the Department of the Interior (DOI) to document, integrate and analyze data produced from long-term kelp forest monitoring programs to improve our understanding of the causes and consequences of change in these iconic ecosystems.
(BOEM Report 2019-063)
Report: *https://www.boem.gov/sites/default/files/documents/regions/pacific-ocs-region/environmental-science/BOEM-2019-063.pdf*

- **Ongoing (2021) — California Deepwater Investigations and Groundtruthing (Cal DIG) I**

This study by the U.S. Geological Survey was a partnership with BOEM, National Oceanic and Atmospheric Administration, and Monterey Bay Aquarium Research Institute. Together they completed eight cruises collecting geophysical, geotechnical, and video data offshore central California in water depths of 400 to 1500 meters. Surveys looked at pockmarks, microdepressions, Santa Lucia Bank, and multiple sand channels. The results include regional geohazards interpretations, habitat classifications, and the first regional characterization of benthic biological communities at these depths. Findings will inform decisions about potential wind turbine siting and future site-specific geohazard and biological analyses in the region.
First Report (BOEM 2021-037): *https://espis.boem.gov/final%20reports/BOEM_2021-037.pdf*;
Second Report (BOEM 2021-044): *https://espis.boem.gov/final%20reports/BOEM_2021-044.pdf; https://doi.org/10.5066/P9DE639J; https://doi.org/10.5066/P9E2OP35*
Third Report (USGS Open-File Report and BOEM 2021-045): in press but data release available at *https://doi.org/10.5066/P9QQZ27U*

Section 30231 Biological productivity; water quality
The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Analysis and Comment:

The Clean Water Act (CWA) is the principal law governing pollution control and water quality of the United States' waterways and is primarily overseen by the U.S. Coast Guard (USCG)

and the Environmental Protection Agency (EPA). The CWA establishes conditions and permitting for discharges of pollutants into the waters of the United States under the National Pollution Discharge Elimination System (NPDES) and gave the Environmental Protection Agency (EPA) the authority to implement pollution control programs such as setting wastewater standards for industry and set water quality standards for all contaminants in surface waters. Regulations governing the NPDES program are contained in 40 CFR Part 122.

Routine activities associated with post-lease site characterization and assessment activities for this Proposed Action impacting coastal and marine waters within the Exclusive Economic Zone of the United States of America (*see* United Nations Convention on the Laws of the Seas, Part V Exclusive Economic Zone, Article 57) and sediment quality include vessel discharges (including bilge and ballast water, and sanitary waste under an EPA issued NPDES permit) geotechnical and benthic sampling, and installation and decommissioning of meteorological buoys. Oil and petroleum hydrocarbon spills are non-routine events that could impact water quality.

The ecosystem here is defined as the soft and hard substrates and includes a few meters of the water column immediately above the seabed. The WEA seabed is entirely comprised of upper slope habitats between 900 m and 1300 m (2,953 ft and 4,265 ft). Interpretted seafloor features (geoforms) and associated groups of biological communities were collected from remote sensing and ROV surveys. Within the larger study region, soft sediments (sand, mud) cover most of the area. Outcrops of hard substrate are found on steeper slope areas, more frequently along the outer edge of the Santa Lucia Bank to the south of the Morro Bay WEA. Within the Morro Bay WEA, the western deep portion is more likely to have some mixed and hard substrate. Most of this area was mapped in 2017-2019 and interpretations are availble from USGS (*https://doi.org/10.5066/P9QQZ27U*).

A few areas were examined with video via ROV (Kuhnz et al. 2021). Depth and substrate type are key structuring processes for invertebrate communities. For example, sediments on the continental shelf generally consist of sandy habitats nearshore and are dominated by filter-feeding organisms. Progressively deeper environments of silt and clay sediments follow, along with an increase in deposit feeders. At the shelf break, where the continental slope begins, the sediment becomes completely silt and clay (e.g. mud). There are three distinct community groups, called biotas, associated within the soft sediments of the Morro Bay WEA. Of note is that species community groups were similar in and out of pockmark features. The larger invertebrates species inhabiting the WEA seabed include echinoderms (e.g. sea cucumbers, sea stars, brittle stars, urchins, and crinoids), cnidarians (e.g. sea pens and anemones), and a variety of crustaceans, molluscs, brachiopods, and sponges. Invertebrate prey serve as a forage base for larger piscine predators, some of which are commercially harvested, and include a variety of flatfishes (e.g., Dover and rex sole), thornyheads, sablefish, and hagfishes. Structure-forming invertebrates such as corals and sponges provide both habitat and food for other species. At all depths, fish assemblages at rock outcrops consist primarily of rockfishes (Sebastes spp). Within the WEA, thornyheads (Sebastalobus spp.) dominate. Special habitats in the region include bacterial mats, submarine canyons, and pockmark fields. No chemosynthetic communities were obseved in the WEA. For citations *see* EA Marine and coastal habitats and associated biotic assemblages section 3.4.

Vessel anchoring, coring, and collection of bottom samples associated with geotechnical surveys and benthic sampling could cause localized seafloor disturbance temporarily increasing turbidity and reducing water clarity by resuspension of sediments into the water

column. Collection of bottom samples is estimated to impact up to 10m^2 (108 ft^2) per sample, although the core or grab sample extraction area may be much smaller. Short-term and localized resuspension of seafloor sediment into the water column is not expected to result in any lasting impact to water or sediment quality in either the WEA or along any projected transmission cable route. Upon cessation of the sampling, suspended sediment would immediately begin to settle to the seafloor with water quality promptly returning to ambient conditions.

Anchoring, installation, and decommission of meteorological buoys results in a greater disturbance to the seafloor than benthic sampling, consequently impacting water quality over a larger area. Anchors for boat-shaped and discus-shaped buoys have a footprint of about 0.55 m^2 (6 ft^2). A temporary resuspension of sediments into the water column would be expected during the one-day met buoy anchoring, installation, and decommissioning activities. This projected short-term duration would result in no lasting impact to water or sediment quality with ambient conditions likely throughout the operation and following decommissioning of the buoys. In the unlikely event of recovering lost equipment, seafloor disturbance and the resultant resuspension of sediments into the water column would be expected during the recovery operation. Transient and localized resuspension of sediment would temporarily impact water quality, but a return to ambient conditions would be expected immediately following the termination of the recovery operation.

Impacts to water quality from vessel discharges, sediment disturbance from geotechnical surveys, benthic sampling, met buoy installation/decommissioning, recovery of lost equipment, and oil spills in coastal and marine water quality would be minor, with any impacts being small in magnitude, highly localized, and short-term.

For additional information about BOEM's review of this issue in the EA, please see sections 3.3 and 4.2 as described in Table 2.

Potential impacts to water quality caused by offshore wind energy development will be reviewed once a COP has been submitted by a lessee. Activities that would be analyzed include anchoring of floating wind turbines and laying transmission cables and their potential to cause turbidity that may disrupt sediment and cause it to enter the water column. The analysis will consider the nature and duration of potential impacts.

BOEM has begun work on this issue and completed studies to find out what these impacts might be and how to combat them. See the following for more information:

- **Completed (2016) - Determining the Infrastructure Needs to Support Offshore Floating Wind and Marine Hydrokinetic Facilities on the Pacific West Coast and Hawaii**

As the offshore renewable industry continues to develop and grow, the capabilities of established port facilities on the Pacific west coast of the United States (U.S.) and the Hawaiian islands of Oahu, Maui, and Kauai need to be assessed as to their ability to support the expanding offshore floating wind (OFW) and marine hydrokinetic industries (MHK). The Pacific Coast is characterized by rapidly increasing water depths that exceed the feasible limits of fixed platforms on the outer continental shelf (OCS) making the west coast more suitable to floating wind technology. This study shall assess current infrastructure requirements and projected changes to port facilities that may be required to support the OFW and MHK industry for Pacific west coast harbors and ports. The assessment of the

infrastructure and available support facilities, vessels, and equipment necessary to support offshore renewable energy activities will aid in the environmental reviews and evaluations that will be required of future projects. Information obtained from this study and identified in this report will aid in the development of mitigation measures designed and initiated to minimize effects from offshore renewable energy activities to ensure environmentally safe and sound operations. Understanding the infrastructure needs of the offshore renewable industry will help to identify the port-related requirements for OFW and MHK development and assess the utilization of the available marine equipment and facilities along the U.S. West Coast. (Report BOEM 2016-011)
Report: *https://www.boem.gov/BOEM-2016-011/*

- **Completed (2021) — California Deepwater Investigations and Groundtruthing (Cal DIG) I**

This study by the U.S. Geological Survey was a partnership with BOEM, National Oceanic and Atmospheric Administration, and Monterey Bay Aquarium Research Institute. Together they completed eight cruises collecting geophysical, geotechnical, and video data offshore central California in water depths of 400 to 1500 meters. Surveys looked at pockmarks, microdepressions, Santa Lucia Bank, and multiple sand channels. The results include regional geohazards interpretations, habitat classifications, and the first regional characterization of benthic biological communities at these depths. Findings will inform decisions about potential wind turbine siting and future site-specific geohazard and biological analyses in the region.
First Report (BOEM 2021-037): *https://espis.boem.gov/final%20reports/BOEM_2021-037.pdf*;
Second Report (BOEM 2021-044): *https://espis.boem.gov/final%20reports/BOEM_2021-044.pdf*; *https://doi.org/10.5066/P9DE639J; https://doi.org/10.5066/P9E2OP35*
Third Report (USGS Open-File Report and BOEM 2021-045): in press but data release available at *https://doi.org/10.5066/P9QQZ27U*

Section 30234 Commercial fishing and recreational boating facilities
Facilities serving the commercial fishing and recreational boating industries shall be protected and, where feasible, upgraded. Existing commercial fishing and recreational boating harbor space shall not be reduced unless the demand for those facilities no longer exists or adequate substitute space has been provided. Proposed recreational boating facilities shall, where feasible, be designed and located in such a fashion as not to interfere with the needs of the commercial fishing industry.

BOEM assumes that during the site assessment and site characterization stages, a lessee will stage from the Port of Morro Bay, which is approximately 32.2 kilometers (km; 20 miles (mi)) east of the Morro Bay WEA.

BOEM has identified the Port of Morro Bay (BOEM 2016b) as a deep-water port with the potential to be a Quick Reaction Port (a port that is within 2 hours by boat to the project site). Site characterization survey vessels used to offshore the west coast range from vessels 36' feet long that make day trips (e.g., the US Geological Survey Research Vessel *Parke Snavely*) to vessels that are 211 feet and collect data for weeks at a time (e.g., *EV Nautilus*). Work to deploy and retrieve meteorological buoys offshore the west coast will use approximately 70-100-foot-long vessels, along with secondary smaller 6-15-foot zodiac boats. Larger vessels are less likely to be used. If used, larger vessels are more likely to depart from larger ports such as the Port of Los Angeles, Port of Long Beach, or the San Francisco Port Complex.

Onshore activity (fabrication, staging, or launching of crew/cargo vessels) related to the installation of buoys is expected to use existing ports that can support this activity. Because

buoy transport and deployment does not require the extensive large-scale infrastructure that would be required for construction of a full-scale offshore floating wind energy facility, there will be a much greater availability of port facilities for placing metocean buoys into service.

BOEM does not anticipate any effects to harbor space availability during site assessment and site characterization. The expectation is that daily vessel transit would occur at one of the shore bases identified or at other established ports, which have established transiting routes for ingress and egress in the coastal areas and existing vessel traffic.

For additional information about BOEM's review of this issue in the EA, please see sections 2.2.2, 2.2.4.10, 3.7, 3.9, and 4.2 as described in Table 2.

If a COP is submitted by a lessee, the siting, construction, and operation of wind turbines in the leased areas will be evaluated by BOEM. BOEM will review how these activities may affect commercial fishing and recreational boating facilities and analyze potential concerns. If a COP is submitted, consideration of the effects on commercial fishing and recreational boating facilities would be reviewed.

In order to be able to make informed decisions regarding a submitted COP, BOEM has plans to initiate new studies and completed one study relating to this issue:

- ***Completed (2016) —*** **Determining the Infrastructure Needs to Support Offshore Floating Wind and Marine Hydrokinetic Facilities on the Pacific West Coast and Hawaii**

This study by ICF International evaluated the current infrastructure and vessel requirements and capabilities existing on the Pacific West Coast of the U.S. and the Hawaiian islands of Oahu, Maui, and Kauai to support the burgeoning offshore renewable energy industry. Understanding the infrastructure needs of the offshore renewable industry will help to identify the port-related requirements for offshore floating wind development and marine hydrokinetic industries and assess the utilization of the available marine equipment and facilities along the U.S. West Coast.
Report (BOEM 2016-011): https://espis.boem.gov/final%20reports/5503.pdf

Section 30234.5 Economic, commercial, and recreational importance of fishing
The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.

Analysis and Comment:

The impact analysis for ascertaining space-use conflicts with commercial fishing considered the vessels used for site assessment and characterization activities, as well as with marine shipping, and marine protected areas. Potential effects to commercial fishing from the Proposed Action are expected to be temporary in duration (five years or less), and primarily associated with the data collection buoy(s). Sablefish and Dungeness crab dominate the value of landings at Morro Bay, and Dungeness crab and two species of nearshore rockfishes are most important at Port San Luis. Fishing effort and economic productivity reflect biological productivity and is highest in shallower waters near the coast, generally declining as depth increases (EA section 3.7). Within the WEA, bottom trawling for Pacific Coast groundfishes shows the greatest activity (EA section 3.7). Fishing activities increase within the likely transit zone between ports and offshore areas. Lessees will develop a SAP including measures to minimize adverse effects from their site characterization and assessment activities.

Many of the region's important fishing grounds are in depths less than 500 m (1,640 ft) so a buoy within the WEA (500 m to 1,100 m (1,640 ft to 3,609 ft) depth) decreases conflict with the fishing industry due to its offshore location. At the end of the 5-year term data collection instrumentation will be decommissioned and large marine debris objects removed so any space use conflicts will be eliminated. Similar buoys deployed offshore the west coast are deployed for one year. BOEM is analyzing a 5-year deployment in order to conservatively estimate potential impacts.

Vessel operators are required to comply with pollution regulations outlined in 33 CFR § 151.51-77 so only accidental loss of trash and debris is anticipated Other fisheries operating within the WEA may also be affected by buoy emplacement, but the impact is expected to be minimal because the relative effort for these non-trawl fisheries has historically been low, and the deployment and retrieval of other gears may have more maneuverability compared to trawls. For a detailed review of the fisheries in the area, please see Morro Bay EA. To enhance navigational safety, lessees will develop a SAP that will include site-specific measures to mitigate navigational concerns, which could become terms and conditions of SAP approval. Such measures would include items such as a Local Notice to Mariners, vessel traffic corridors, lighting specifications, incident contingency plans, or other appropriate measures.

BOEM and the State have engaged in robust stakeholder engagement activities in support of a potential renewable energy lease sale. As mentioned in the Background section above, the renewable energy Task Force includes members from Federal, State, and local agencies, as well as federally-recognized tribes and provides critical information to the assessment of potential renewable energy development offshore California and to BOEM's decision-making process for leasing areas of the outer continental shelf and permitting offshore renewable energy projects. Between February 2017 and September 2018, BOEM and the State held 12 meetings with California tribes and 67 meetings with elected officials, commercial fishing community, mariners, academics and environmental groups, and the public, summarized in this Outreach Summary Report found here - *https://www.boem.gov/renewable-energy/state-activities/offshore-wind-outreach-addendum*.

Between October 2018 and December 2020, BOEM and the State continued to engage with and receive input from tribal governments, local, State, and Federal agencies, stakeholders, and the public, holding 14 meetings (Outreach Summary Report Addendum found here - *https://www.boem.gov/renewable-energy/state-activities/offshore-wind-outreach-addendum*).

Since summer of 2021 BOEM and the State of California have continued to engage with tribes, non-governmental organizations, and fishing groups many times virtually. In late 2021 BOEM and the State of California met in person with several Chumash Tribes and the Salinan Tribe of Monterey, San Luis Obispo Counties. BOEM and the State of California met in person with small fishing groups at three locations on the central coast also in late 2021. BOEM also presented and received comments from the Pacific Fisheries Management Council.

For additional information about BOEM's review of this issue in the EA, please see section 4.1 as described in Table 2.

California Department of Fish and Wildlife (CDFW) landing receipts (also known as "fish tickets") provide spatially explicit information (Miller et al. 2017). Fishing effort and economic

productivity reflect biological productivity and is highest in shallower waters near the coast, generally declining as depth increases (Miller et al. 2017). Within the Morro Bay WEA, bottom trawling for Pacific Coast groundfishes shows the greatest activity. Within the likely transit zone between ports and offshore areas, fishing activity occurs for most of the other targeted species.

Vessel monitoring system (VMS) data describe the relative offshore distributions of commercial fishing activity for many important fisheries. BOEM funded the development of VMS data for the west coast and provisional VMS data of all vessels and selected fisheries are available on Data Basin website (*https://caoffshorewind.databasin.org/datasets/2884e26d19c54691baa7589228ac985a/*). Within the WEA, bottom trawling for Pacific Coast groundfishes shows the greatest activity and within the likely transit zone between ports and offshore areas, fishing activity occurs for most of the other targeted species.

Data collection buoys and vessel traffic associated with the Proposed Action may generate space-use conflicts and interfere with fishing operations by (1) creating areas no longer accessible as fishing grounds, (2) reducing fishing efficiency, and/or (3) causing economic losses associated with gear entanglement. Data collection buoys emplaced within leases may inadvertently be spatially incompatible with nearby fishing operations, particularly for bottom trawling, due to the challenge of navigating and deploying/retrieving fishing gear near fixed structures.

Site characterization and assessment activities will include marine vessels mobilizing and transiting from ports to the WEA, which may reduce efficiency of fishing operations due to time delays associated with congestion or avoidance. Marine vessels may accidentally damage fishing gear (e.g., by cutting trap floats) or release marine debris which could cause entanglement or interfere with other fishing operations. However, the Morro Bay Port Complex and its nearshore waters host a variety of marine operations and numerous fishers, so the expected increase in activity from vessels related to surveys will be small compared to the overall level of effort. Further, buoys are likely to be located in depths where fishing activity is relatively lower, as described above. Any effects during the SAP phase would be short in duration and temporary in nature.

For additional information about BOEM's review of this issue in the EA, please see sections 3.7, 3.8, 3.9, 3.12, 4.2, and 4.3 as described in Table 2.

If a COP is submitted by a lessee, the siting, construction, and operation of wind turbines in the leased areas will be evaluated by BOEM. BOEM will review how these activities may affect recreation and tourism and analyze potential concerns including increased allisions, light pollution, entanglement or loss/damage of fishing gear, navigation hazards including transmission cable infrastructure, hydrodynamic disturbance, local migration disturbance, and space-use conflicts. If a COP is submitted, consideration of the effects on recreation and tourism through fish aggregation, habitat conversion, or other factors of proposed offshore wind development would be reviewed.

In order to be able to make informed decisions regarding a submitted COP, BOEM is working to complete studies relating to this issue, including:

- ***Ongoing (2019–2022) —*** **Development of Computer Simulations to Assess Entanglement Risk to Whales and Leatherback Sea Turtles in Offshore Floating**

Wind Turbine Moorings, Cables, and Associated Derelict Fishing Gear Offshore California

This study, in partnership with the National Oceanic and Atmospheric Administration's National Centers for Coastal Ocean Science, has developed morphologically and behaviorally accurate 3-D computer models of protected whale species (fin and humpback) and leatherback sea turtles. Two offshore floating wind mooring systems are currently under digital development. The whale and mooring system models will be integrated into simulations to visualize various potential interaction scenarios, including considering associated derelict fishing gear. These simulations will assist BOEM in assessing the risk and potential severity of entanglement, and potentially identify mitigation measures to reduce any risk.
Study Profile: https://www.boem.gov/pr-19-ent-profile/
Infographic: https://www.boem.gov/PR-19-ENT-Infographic

- ***Completed (2010) —*** **Pacific Coast Fisheries GIS Resource Database**

This study by the U.S. Geological Survey compiled marine fisheries and coastal spatial data from various wildlife agencies in California, Oregon, and Washington and integrated it into a single, comprehensive GIS-based system. The database includes information about Pacific Coast fish, fisheries, and active fishing, as well as southern California seabirds and marine mammals.
Database: https://www.usgs.gov/centers/werc/science/pacific-coast-fisheries-gis-resource-database

- ***Ongoing (2021–2023) —*** **Using Outcomes from Marine Protected Area Implementation to Infer Potential Socioeconomic Consequences of Offshore Energy Development to Commercial Fisheries**

This study by the University of California, Santa Barbara will describe the detectable socioeconomic consequences experienced by the commercial fishing industry due to the implementation of formal or de facto marine protected areas (MPAs) in California. This information will inform impact analyses of prospective offshore energy projects and decommissioning decisions.
Study Profile: https://www.boem.gov/pc-21-02

- ***Completed (2012) —*** **Identification of Outer Continental Shelf Renewable Energy Space-Use Conflicts and Analysis of Potential Mitigation Measures**

This study by Industrial Economics, incorporated captured baseline space-use information on the Atlantic and Pacific Coasts; the Pacific study area included Federal waters offshore Washington, Oregon, and northern California. It collected data on more than a dozen space uses (including commercial fishing and shipping), identified potential and known conflicts that may arise with renewable energy development, and provided insights on potential mitigation and avoidance measures.
Report (BOEM 2012-083): https://espis.boem.gov/final%20reports/5203.pdf

ARTICLE 5 LAND RESOURCES

Section 30244 Archaeological or paleontological resources
Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

Analysis and Comment:

Bottom-disturbing activities have the potential to affect historic properties. However, existing regulatory measures, information generated for a lessee's initial site characterization activities, and the unanticipated discoveries requirement make the potential for bottom-disturbing activities (e.g., coring, anchoring, installation of meteorological buoys) to have an adverse effect (i.e., cause significant impact or damage) on historic properties very low. Visual impacts on onshore cultural resources from meteorological structures and vessel traffic associated with surveys and structure construction are expected to be negligible and temporary in nature.

Historic properties are defined as any pre-contact period or historic period district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) (54 USC § 300308). This can also include properties of traditional religious and cultural importance to a Tribe that meet criteria for inclusion in the NRHP (54 USC § 302706). Both site characterization (i.e., HRG survey and geotechnical exploration) and site assessment activities (i.e., installation of meteorological buoys) have the potential to affect historic properties. Construction activities associated with the placement of site assessment structures that disturb the ocean bottom have the potential to affect historic properties on or under the seabed. Vessel traffic associated with surveys and construction, although indistinguishable from existing ocean vessel traffic could, at times, be visible from coastal areas, potentially impacting historic properties onshore. Similarly, although indistinguishable from other lighted structures on the OCS, some meteorological buoys might be visible from historic properties onshore.

Site characterization activities include shallow hazards assessments, and geological, geotechnical, archaeological, and biological surveys, and may include installation, operation, and decommissioning of data collection buoys. HRG surveys do not impact the seafloor and therefore have no ability to impact cultural resources. Geotechnical testing and sediment sampling does impact the bottom and, therefore, does have the ability to impact cultural resources. However, if the Lessee conducts HRG surveys prior to conducting geotechnical/sediment sampling, the Lessee may avoid impacts on historic properties by relocating the sampling activities away from potential cultural resources. Therefore, BOEM would require the Lessee to conduct HRG surveys prior to conducting geotechnical/sediment sampling, and, when a potential historic property is identified, the Lessee will be required to avoid it.

The State of California has an obligation to consult with all California Native American tribes regardless of Federal recognition. As part of that effort, the California Energy Commission has taken the lead on providing information to, and gathering initial input from, both Federally recognized and non- recognized tribes in California on offshore wind planning efforts. In the end of 2021 BOEM and the State of California were able to meet in person with members of Chumash and the Salinan Tribes.

Initial outreach activities focused on tribes with current and/or ancestral territories along the coast. The State hosted five regional informational meetings between November 21, 2016 and May 18, 2017 and a sixth webinar informational meeting for all California tribes on June 30, 2017. Subsequent to the informational meetings, the Governor's Tribal Advisor and the Energy Commission formed a State Tribal Offshore Renewable Energy Working Group (Working Group) to gain input from Federally and non-Federally recognized tribes, inform the California offshore renewable energy planning efforts, and simplify the exchange of information between the State and tribes. The Working Group held its first webinar meeting on June 30, 2017 and a second on September 5, 2018.

Engagement with Tribal governments between October 2018 and January 2022 occurred as bi-lateral meetings between BOEM and individual Tribes; as joint meetings among the CEC other State agencies, BOEM, and Tribes on the North Coast and Central Coast, and as a multi-Tribe Section 106 consultation webinar with BOEM. Input received during several Tribal meetings included expressions of key interests, concerns, and recommendations for offshore wind development in California.

Although site assessment activities have the potential to affect cultural resources either on or below the seabed or on land, existing regulatory measures, coupled with the information generated for a Lessee's initial site characterization activities and presented in the Lessee's SAP, make the potential for bottom-disturbing activities (e.g., anchoring, installation of meteorological buoys) to cause damage to cultural resources very low.

For additional information about BOEM's review of this issue in the EA, please see sections 3.10, 3.12, and 4 as described in Table 2.

In order to make certain that all archaeological or paleontological resources are properly identified and that mitigation measures can be appropriately determined and applied, please see the studies listed below for more information about BOEM's efforts to inform COP decision-making:

- ***Ongoing (2021–2024) — West Coast Tribal Cultural Landscapes***

This study by the Udall Foundation's John S. McCain III National Center for Environmental Conflict Resolution will develop cultural landscape assessments for several West Coast Tribal Nations with ties to areas of potential renewable energy development offshore California and Oregon. It will improve understanding about cultural and archaeological resources and places of importance and assist in assessing potential impacts of offshore renewable energy development.
Study Profile: https://www.boem.gov/pc-21-01

- ***Completed (2013) — Inventory and Analysis of Coastal and Submerged Archaeological Site Occurrence on the Pacific OCS***

This study by ICF International assessed the potential for submerged prehistoric sites on the California, Oregon, and Washington Outer Continental Shelf (OCS), and identified coastal properties and significant coastal cultural resources subject to potential visual impacts from offshore energy development. It also produced a proprietary inventory of known, reported, and potential historic shipwrecks.
Report (BOEM 2013-0115): https://espis.boem.gov/final%20reports/5357.pdf

- ***Completed (2014) — Renewable Energy Visual Evaluations***

This study by the University of Arkansas and Argonne National Laboratory developed a GIS-based landscape-visualization tool to assess the potential viewshed effects from offshore renewable energy facilities. Visualizations included wind energy structures, lighting, and meteorological conditions.
Journal Article: https://blmwyomingvisual.anl.gov/docs/EnvPractice_Offshore%20Wind%20Turbine%20Visibility%20and%20Visual%20Impact%20Threshold%20Distances.pdfWebinar: https://www.boem.gov/Science-Exchange-5/

- ***Completed (2017) — Characterizing Tribal Cultural Landscapes***

This study by the National Oceanic and Atmospheric Administration used three case studies from Native American communities in California, Oregon, and Washington. It developed a methodology and process that may help all coastal tribes determine significant archaeological and cultural resources. This information will likely be important to future consideration of marine renewable energy projects.

Guidance Document (BOEM 2015-047): *https://www.boem.gov/2015-047/*
Report (BOEM 2017-001):
Volume I: *https://www.boem.gov/BOEM-2017-001-Volume-1/*
Volume II: *https://www.boem.gov/BOEM-2017-001-Volume-2/*
Webinar: *https://www.boem.gov/Science-Exchange-8/*

- **Completed (2021) — Archaeological and Biological Assessment of Submerged Landforms off the Pacific Coast of California and Oregon, USA**

To better understand the potential for submerged pre-contact archaeological sites on the Pacific OCS, researchers from San Diego State University and a variety of other academic and government institutions employed terrestrial analogues, paleoshoreline mapping, sediment coring, ground-truthing techniques, and biological assessments to explore potential intact submerged geological landforms offshore California's Northern Channel Islands and central Oregon. This study produced a large dataset and a GIS-based model to predict where intact submerged landforms features may be located on the Pacific OCS.
Report: in press

ARTICLE 6 DEVELOPMENT

Section 30251 Scenic and visual qualities
The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural landforms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.

Analysis and Comment:

Installation of meteorological buoys would likely not be visible from shore based on the low profile of the structure; distance from shore; and earth curvature, waves, and atmosphere. Visual impacts to onshore cultural resources would be limited and temporary in nature and would consist predominately of vessel traffic, which most likely also would not be distinguishable from existing vessel traffic.

Changes in coastal viewsheds could impact Tribes for whom unobstructed coastal views hold important cultural and spiritual significance. However, at the lease issuance and site assessment and characterization phase, visual impacts on coastal viewsheds are not anticipated. The Morro Bay WEA is over 32 km (20 mi) from shore, and the metocean buoy(s) are not expected to be noticeably visible from shore.

A visual resource impact assessment of installed wind turbines would be included in analyses of specific COP(s) should lease holders choose to submit a COP. Lighting schemes designed to minimize visual impacts would be submitted with any potential COP submissions and would be reviewed by BOEM.

For additional information about BOEM's review of this issue in the EA, please see section 3.12 as described in Table 2.

In order to make certain that all lighting issues are properly identified and that mitigation

measures can be appropriately determined and applied, please see the studies listed below for more information about BOEM's efforts to inform COP decision-making:

- **Completed (2021) - BOEM 2021-032 Assessment of Seascape, Landscape, and Visual Impacts of Offshore Wind Energy Developments on the Outer Continental Shelf of the United States**

As the United States begins large-scale deployment of offshore wind energy facilities, an important challenge for developers and regulators is the assessment of potential seascape, landscape, and visual impacts on important coastal scenic, historic, and recreational resources; Native American tribal properties and treasured seascapes; commercial interests dependent on tourism; and the private property of coastal residents. This document describes the methodology for seascape, landscape, and visual impact assessment (SLVIA) that the U.S. Department of the Interior (DOI) Bureau of Ocean Energy Management (BOEM) uses to identify the potential impacts of offshore wind energy developments in Federal waters on the Outer Continental Shelf (OCS) of the United States. This methodology document describes what is considered in the SLVIAs submitted by offshore wind project developers to BOEM and how decisions about expected impacts of offshore wind developments are made. This SLVIA methodology applies to any offshore wind energy development proposed for the OCS and considered by BOEM, as directed by the Energy Policy Act of 2005 and in compliance with the Outer Continental Shelf Lands Act and the National Environmental Policy Act of 1969 (NEPA).
(*https://www.boem.gov/environment/environmental-studies/boem-2021-032*)

- **Completed (2013) - BOEM 2013-0116 Evaluation of Lighting Schemes for Offshore Wind Facilities and Impacts to Local Environments**

Given BOEM's authority under the Energy Policy Act of 2005 (EPAct), and the various considerations under the OCS Lands Act and NEPA, BOEM needs to garner a better understanding of the potential impacts to the environment from the development of offshore renewable energy projects, and to identify specific mitigation measures that can be taken to reduce or avoid such impacts. The ESS Project Team, comprised of ESS Group, Inc. (ESS), GL Garrad Hassan America Inc. (GL GH), Curry and Kerlinger LLC (C&K), and Mote Marine Laboratory (MML), was selected to conduct a review of regulations and lighting schemes currently in use and evaluate how proposed lighting schemes for offshore wind facilities may impact local environments and offshore waters as a desktop study, literature review and synthesis.
(*https://espis.boem.gov/final%20reports/5298.pdf*)

- **Completed (2016) - BOEM 2016-002 Development of Guidance for Lighting of Offshore Wind Turbines Beyond 12 Nautical Miles**

In fulfilling its jurisdictional responsibilities under the Energy Policy Act of 2005, the Outer Continental Shelf Lands Act, and the National Environmental Policy Act, the Department of the Interior's Bureau of Ocean Energy Management (BOEM) is actively involved in evaluating potential environmental impacts related to the development and operation of offshore renewable energy. The lighting of offshore wind facilities is a primary concern for avian resources, important for aviation and navigational safety, and also of concern for visual impacts to onshore areas adjacent to renewable energy development.
(*https://www.boem.gov/offshore-lighting-guidance/*)

- **Completed (2013) — Inventory and Analysis of Coastal and Submerged Archaeological Site Occurrence on the Pacific OCS**

This study by ICF International assessed the potential for submerged prehistoric sites on the California, Oregon, and Washington Outer Continental Shelf (OCS), and identified coastal properties and significant coastal cultural resources subject to potential visual impacts from offshore energy development. It also produced a proprietary inventory of known, reported, and potential historic shipwrecks. Report (BOEM 2013-0115):

https://espis.boem.gov/final%20reports/5357.pdf

- **Completed (2014) — Renewable Energy Visual Evaluations This study by the University of Arkansas and Argonne National Laboratory**

This study developed a GIS-based landscape-visualization tool to assess the potential viewshed effects from offshore renewable energy facilities. Visualizations included wind energy structures, lighting, and meteorological conditions.
Journal Article: https://blmwyomingvisual.anl.gov/docs/EnvPractice_Offshore%20Wind%20Turbine%20Visibility%20and%20Visual%20Impact%20Threshold%20Distances.pdf
Webinar: https://www.boem.gov/Science-Exchange-5/

Section 30253 Minimization of adverse impacts
New development shall:

(3) Be consistent with requirements imposed by an air pollution control district or the State Air Resources Control Board as to each particular development….

Analysis and Comment

The Federal and State attainment status of San Luis Obispo County is found at 40 CFR § 81.305. the County of San Luis Obispo is in attainment for all NAAQS and California Ambient Air Quality Standards (CAAQS), with the exception of the State 24-hour particulate matter PM standard (NCUAQMD, 1995). Because San Luis Obispo County has no stationary sources of air pollution on the corresponding OCS, it has not been designated as an Onshore Corresponding Area (OCA). Therefore, the U.S. Environmental Protection Agency (EPA) maintains jurisdiction over air quality management on the OCS offshore the County of San Luis Obispo, in accordance with Section 328 of the Clean Air Act.

The factors associated with this post-lease site assessment and site characterization activities that can potentially produce adverse impacts on air quality are primary contaminants emitted. These include carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), fine particulate matter ($PM_{2.5}$), marine diesel, lube oils, and greenhouse gases.

Carbon monoxide, nitrogen dioxide, sulfur dioxide, and particulate matter are criteria pollutants that are regulated under the NAAQS, which are health-based standards. Marine diesel and lube oils may contain HAPs, primarily benzene, and have adverse human health effects. They are also hydrocarbons, which, if volatilized, become precursors of photochemical smog (i.e., ozone, which is another NAAQS contaminant). Nitrogen dioxide, in the presence of sunlight, also becomes an ozone precursor. The primary Green House Gas (GHG) emitted is carbon dioxide. GHGs, in contrast to the other contaminants have a global, rather than local, impact. Carbon dioxide traps heat in the atmosphere and creates adverse impacts such as climate change, ocean acidification, and sea level rise.

BOEM requires all appropriate Federal, State, and local air quality regulations be followed by obtaining appropriate permits, adhering to all applicable laws and regulations, and engaging in mitigation measures when air quality issues are found to be relevant.

For additional information about BOEM's review of this issue in the EA, please see section 3.2 as described in Table 2.

Once a COP has been submitted by a lessee, BOEM will review potential impacts to air

quality of offshore wind energy development. BOEM depends upon the EPA's air quality districts for the state of California to determine effects upon air quality. For more information on the EPA's plans for the State of California, please visit the EPA's website here - https://www.epa.gov/sips-ca

RELATION OF BOEM LEASING ACTIVITIES TO CERTIFIED LOCAL COASTAL PLAN FOR THE COUNTY OF SAN LUIS OBISPO

This section summarizes the policies in the County of San Luis Obispo Coastal Plan Policies LCP document) and related Area Plans for the North Coast, San Luis Bay Coastal, the Estero, and the South County areas. These policy documents are relevant to BOEM leasing activities and reasonably foreseeable effects from SAPs and site characterization activities.

County of San Luis Obispo Coastal Plan Policies

The San Luis Obispo Coastal Plan Policies LCP document (Plan Policies) discusses policies applicable to the entire county and within offshore State waters, with occasional references to park lands, followed by more specific recommendations and policies. This CD evaluates BOEM's proposed lease sale which will provide leaseholders an exclusive right of use for the area purchased. While no further action can be taken on the lease without the submittal of additional plans such as a Site Assessment Plan (SAP), BOEM has determined to review through the SAP stage in order to consider the foreseeable effects of the lease sale.

The relevant sections found within the Plan Policies are:

Chapter Four of the Plan Policies document deals with Energy & Industrial Development. Page 4-1 of the County of San Luis Obispo Coastal Plan Policies document deals with Economic Development. Page 4-1 states "Energy development in the coastal zone is permitted based on Coastal Act Section 30001.2 which states: The Legislature further finds and declares that, notwithstanding the fact electrical generating facilities, refineries, and coastal-dependent developments… may have significant adverse effects on coastal resources or coastal access, it may be necessary to locate such development in the coastal zone in order to ensure that inland as well as coastal resources are preserved and that orderly economic development proceeds within the state." The document goes on to furthers state in policy 12 on page 4-11 states that "solar, wind, or wave-resources or plants which could provide energy on a decentralized basis--for local, small-scale use instead of regional or out-of-the-area use. These facilities may have lesser environmental consequences than major power plant sitings." Policy 15 on page 4-12 further states that "The county should encourage the development of small-scale power generating facilities that may have substantially less environmental, social and economic impacts. Such facilities could provide energy for local use, and may include those using solar, wind, wave and other low-technology and low capital intensive methods." The lease sale supports the goal of the County of San Luis Obispo to become an energy exporter.

While Chapter Four of the Plan Policies document deals with traditional energy development rather than renewable energy projects, it does address solar, wind, other renewable energy as a potential energy source within the County of San Luis Obispo.

Chapter Five of the Plan Policies document addresses issues relating to Commercial Fishing & Recreational Boating. Page 5-6 states that "Commercial fishing and recreational boating shall be protected and where feasible upgraded."

The issuance of a lease only grants the lessee the exclusive right to submit to BOEM a SAP and COP proposing development of the leasehold; the lease does not, by itself, authorize any activity within the lease area. After lease issuance, a lessee would conduct surveys and, if authorized to do so pursuant to an approved SAP, install meteorological measurement devices to characterize the site's weather conditions and to assess the wind resources in the proposed lease area. A lessee would collect this information to determine whether the site is suitable for commercial development and, if so, submit a COP with its project-specific design parameters for BOEM's review. Per the data found in Table 6 above, the number of metocean buoys is expected to not exceed three and will be in place for a maximum of five years. Potential impacts to commercial fishing from site assessment and characterization activities are expected to be minor and temporary in duration, and primarily associated with a spatial incompatibility around the data collection buoy(s) and interactions with Project vessels, which is comparatively small in size when compared to the full extent of available fishing grounds. Further, BOEM directs lessees to incorporate best management practices, particularly with regard to vessel use, which will minimize interaction with commercial fishing.

Per Policy 3 on page 6-6 and BOEM's regulations at 30 CFR § 585.902, lease holders must restore the environment to its original state upon completion of activities and include "[m]itigation measures to protect archaeological and sensitive biological features during removal activities." If the Lessee conducts HRG surveys prior to conducting geotechnical/sediment sampling, the Lessee may avoid decommissioning impacts on historic properties by relocating the sampling activities away from potential cultural resources. Therefore, BOEM would require the Lessee to conduct HRG surveys prior to conducting geotechnical/sediment sampling, and, when a potential historic property is identified, the Lessee will be required to avoid it.

Policy 13 on page 6-9, which states that, "[a]ll diking, dredging and filling activities shall conform to the provisions of Section 30233, 30411 and 30607.1 of the Coastal Act. These policies establish the appropriate uses, criteria for evaluation of a project and requirements for restoration or replacement." BOEM discusses the relevant portions of these Sections above in the Enforceable Policies Section 30233 Diking, filling or dredging; continued movement of sediment and nutrients.

Policy further goes on to state that "[a]llowable activities within open coastal waters, wetlands (with the exception of Morro Bay and the Santa Maria River mouth), estuaries and lakes include:

> a. New or expanded port, energy, and coastal dependent industrial facilities, including commercial fishing facilities.

The anchoring of metocean buoys during the reasonably foreseeable SAP phase of development could be considered an act of diking, dredging, or filling. Due to this fact, BOEM has considered this in the EA.

Anchoring, installation, and decommission of meteorological buoys results in a seafloor disturbance footprint to the seafloor of about 0.55 m^2 (6 ft^2). A temporary resuspension of sediments into the water column would be expected during the one-day met buoy anchoring, installation, and decommissioning activities. This projected short-term duration would result in no lasting impact to water or sediment quality with ambient conditions likely throughout the operation and following decommissioning of the buoys.

Chapter 10 of the Plan Policies document deals with issues relating to Visual and Scenic Resources. Policy 1 on page 10-9 states that "[u]nique and attractive features of the landscape, including but not limited to unusual landforms, scenic vistas and sensitive habitats are to be preserved protected, and in visually degraded areas restored where feasible." BOEM does not expect any effects to visual resources during the leasing phase of development. During the reasonably foreseeable SAP phase of development, visual impacts on onshore cultural resources from meteorological structures and vessel traffic associated with surveys and structure construction are expected to be negligible and temporary in nature. For a further discussion of the studies BOEM is undertaking to inform the future COP phase of development, see the discussion in the Enforceable Policies Section 30251 Scenic and visual qualities above.

Policy 2 on page 10-9 states that "[p]ermitted development shall be sited so as to protect views to and along the ocean and scenic coastal areas. Wherever possible, site selection for new development is to emphasize locations not visible from major public view corridors." The Morro Bay WEA is located 20 miles offshore the coast of the County of San Luis Obispo. This means that effects to onshore visual resources is likely to be minimal. BOEM further requires lease holders follow the "Guidelines for Lighting and Marking of Structures Supporting Renewable Energy Development." For a further discussion of studies that will information that will inform the future COP phase of development, please see the Enforceable Policies Section 30251 Scenic and visual qualities.

Chapter 11 of the Plan Policies document deals with issues relating to Hazards. Policy 1 on page 11-2 states that "[a]ll new development proposed within areas subject to natural hazards from geologic or flood conditions (including beach erosion) shall be located and designed to minimize risks to human life and property." BOEM does not anticipate any potential hazards that would impact the Morro Bay WEA. Reasonably foreseeable non-routine and low-probability events and hazards that could occur during site characterization and site assessment related activities include the following: (1) allisions and collisions between the site assessment structures or associated vessels and other marine vessels or marine life; (2) spills from collisions or fuel spills resulting from generator refueling; and (3) recovery of lost survey equipment. For further discussion of such non-routine incidents, please see the Enforceable Policies Section 30230 Marine resources; maintenance above.

Chapter 12 of the Plan Policies document deals with issues relating to Archaeology. Policy 1 on page 12-2 states that "[t]he county shall provide for the protection of both known and potential archaeological resources. All available measures, including purchase, tax relief, purchase of development rights, etc., shall be explored at the time of a development proposal to avoid development on important archaeological sites. Where these measures are not feasible and development will adversely affect identified archaeological or paleontological resources, adequate mitigation shall be required." BOEM also strives to support the protection of potential archaeological resources via regulations at 30 CFR § 585.610(b) during the SAP phase of development.

Further, BOEM or the leaseholder would alert the appropriate parties if any additional archaeological or paleontological resources were found to be present in the offshore waters during the future SAP phase. 30 CFR § 585.802 guides leaseholders as to "[w]hat must I do if I discover potential archaeological resources while conducting my approved activities?" BOEM's guidance instructs leaseholders that "[i]f you, your subcontractors, or any agent acting on your behalf discovers a potential archaeological resource while conducting

construction activities, or any other activity related to your project, you must: (1) Immediately halt all seafloor-disturbing activities within the area of the discovery; (2) Notify BOEM of the discovery within 72 hours; and (3) Keep the location of the discovery confidential and not take any action that may adversely affect the archaeological resource until we have made an evaluation and instructed you on how to proceed." This is very similar to Policy 6 of the Plan Policies document found on page 12-4, which states that "[w]here substantial archaeological resources are discovered during construction of new development, or through non-permit related activities (such as repair and maintenance of public works projects) all activities shall cease until a qualified archaeologist knowledgeable in the Chumash culture can determine the significance of the resource and submit alternative mitigation measures." BOEM's regulations should ameliorate any potential impacts site characterization activities might have on archaeological and paleontological resources. A thorough review of BOEM's expectations regarding culturally significant material in the lease sale area can be found in the EA (Historic Properties Section 3.10).

Chapter 13 of the Plan Policies document deals with issues relating to Air Quality. Policy 1 found on page 13-2 states that "[t]he county will provide adequate administration and enforcement of air quality programs and regulations to be consistent with the county's Air Pollution Control District and the State Air Resources Control Board." BOEM similarly requires lease holders to follow the EPA's air quality regulations in regulations found at 30 CFR § 585.659(a)(2). BOEM does not anticipate significant air quality issues during the leasing and SAP phases of development. For additional information about BOEM's understanding of this situation, please see the Enforceable Policies in Section 30231 Biological productivity; water quality above.

The Plan Policies document encourages renewable energy development and proliferation within the County of San Luis Obispo. This CD proposes the sale of leases for the development of renewable energy post-lease site assessment and site characterization activities offshore San Luis Obispo County within federal waters and a forward-thinking look at the reasonably foreseeable SAP and site characterization foreseeable effects. Consistency with the Area Plans for the North Coast, San Luis Bay Coastal, the Estero, and the South County areas are discussed below.

<u>North Coast Area Plan</u>

The North Coast Area Plan is a subset of the County of San Luis Obispo Planning & Building General Plan for the northern coast of San Luis Obispo County. There are five Area Plans in the County of San Luis Obispo. These are areas directly connected to the coastline which set forth their own rules for bringing new development to these coastal areas. The majority of the Area Plans address onshore issues. However, there are sections that could apply to the offshore environment. The North Coast Area Plan has polices that might affect the lease sale and reasonably foreseeable SAP activities in three areas. All site characterization and site assessment activities would be taking place in Federal waters, offshore. These areas of the North Coast Area Plan are:

1. Chapter 2 Section E. Economy
2. Chapter 3 Section 13 Air Quality
3. Chapter 8 Section E. 4 Management Objectives and Programs.

In Chapter 2 Section E. Economy, the North Coast Area Plan states the goals and objectives for the San Simeon Acres and Cambria areas. "Promote a strong, diverse and viable local economy by:

> 1. Pursuing planning policies that balance economic, environmental and social needs of coastal areas."

Per BOEM's regulations at 30 CFR § 585.610-613, BOEM strives to balance each of these issues within the confines of the SAP. Per § 585.611(b), BOEM requires information about (1) Hazards, (2) Water Quality, (3) Biological Resources, (4) Threatened or Endangered Species, (5) Sensitive biological resources or habitats, (6) Archaeological Resources, and (7) Social and Economic Conditions, (8) Coastal and Marine Uses, (9) Consistency Certification, and (10) Other Resources, Conditions, and Activities during the SAP phase of development. This information, along with other information required per the above- mentioned regulations, is used in determining if a lease holders SAP will be approved. A high-level review of the socio-economic effects of site assessment and characterization surveys from wind energy development within the Morro Bay WEA, please see the EA (Socioeconomics Section 3.9).

In Chapter 3 Section 13 Air Quality on page 3-13 Air Quality, the North Coast Area Plan states the goal of continuing the success the County of San Luis Obispo has achieved in reducing their ozone levels. The Plan states that "[o]zone air quality appears to be improving countywide over the past ten years, which suggests that ongoing industrial and vehicular pollution controls are accomplishing their intended goals." The Plan further states that "In San Luis Obispo County, the primary sources of reactive organic gas are motor vehicles, organic solvents, the petroleum industry, and pesticides. The primary sources of NOx are motor vehicles and fuel combustion by utilities, the petroleum industry, and other sources." The addition of wind energy renewable energy production to the offshore environment of County of San Luis Obispo would help alleviate some of the air quality issues created by energy generation within the area. For a detailed review of the potential effects to Air Quality from the development of wind energy within the Morro Bay WEA, please see the EA (Air Quality section 3.2).

In Chapter 8 Section E. 4 on page 8-11 the North Coast Area Plan states that "[e]xisting access areas must be maintained in order to provide for public safety and protection of sensitive coastal resources. Existing accessways that are significantly degraded because of overuse, or lack of funding to provide maintenance, should be rehabilitated, or re-routed."

BOEM does not anticipate any issues relating to access to the sea during the leasing or reasonably foreseeable SAP phase of development. SAP and site assessment activities will take place 20 miles offshore, in waters that are under the Federal jurisdiction. For further discussion of issues relating to access to the sea, see the Enforceable Policies section Section 30211 Development not to interfere with access above.

<u>San Luis Bay Coastal Area Plan</u>

The San Luis Bay Coastal Area Plan is a subset of the Plan Policies document. The majority of the Area Plans address onshore issues. However, there are sections that would apply to the offshore environment. The San Luis Bay Coastal Area Plan has five areas in which the lease sale and forward-thinking foreseeable effects of SAPs and site characterization activities. These areas are:

1. Chapter 6 G. Rural Area Programs 3. Rural Lands
2. Chapter 8 Visual and Scenic Resources 1. Waterfront Character
3. Chapter 8 Sensitive Resource Areas 9. Site Planning
4. Chapter 8 Aquatic and Terrestrial Habitats 1. Marine Environments
5. Chapter 8 Archaeology 1. Cultural Resources

Viewshed Protection on page 6-16 addresses issues relating to the scenic and visual qualities of the San Luis Bay Area Plan areas. Section 30251 of the California enforceable policies states that "[t]he scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural landforms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting." Further, Chapter 8 Visual and Scenic Resources 1. Waterfront Character on page 8-13 states that developers should "[p]rotect scenic qualities including the time-honored character of Port San Luis and compatibility with surrounding uses and views."

The proposed lease sales and subsequent forward-thinking SAP analysis would occur approximately 32 km (20 mi) offshore and the post-lease site assessment and site characterization activities have little potential to effect visual resources and any impacts that do occur will be short in duration and temporary in nature. The EA uses the 2019 Pacific Northwest National Laboratory (PNNL) LiDAR (light detection and ranging) buoy deployments to the Humboldt and Morro Bay WEAs as a proxy for the type of vessel activity anticipated: PNNL used a 100-ft marine vessel to tow the LiDAR buoy from Morro Bay to the Morro Bay WEA where they lowered the 11,000 lb anchor, 1650 m mooring line, and attached the buoy and then traveled back to Morro Bay in one day. PNNL planned for 3 vessel trips for a 12-month deployment (deployment, mid-year maintenance, recovery). The buoy had a 1250 m watch circle and lighting is temporary in nature and indistinguishable from vessel traffic.

Chapter 8 Sensitive Resource Areas 9. Site planning – Development Plan Projects on page 8-6 states that "[p]rojects requiring Development Plan approval are to concentrate proposed uses in the least sensitive portions of properties. Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade such areas and shall be compatible with the continuance of such habitat areas." The proposed lease sales and subsequent forward-thinking SAP analysis would occur approximately 20 miles offshore and the post-lease site assessment and site characterization activities have little potential to effect visual resources and will be short in duration and temporary in nature.

Chapter 8 Aquatic and Terrestrial Habitats 1. Marine Environments on page 8-12 states that "[m]arine resources shall be maintained, enhanced, and where feasible restored. New development within the marine environment shall sustain the biological productivity of coastal waters and maintain healthy populations of all species of marine organisms adequate for long term commercial, recreational, scientific, and educational purposes." BOEM Regulations at 30 CFR §§ 585.800-803 which outlines BOEM's requirements that lease holders must comply with for safety and environmental management. During the reasonably foreseeable SAP phase of development, BOEM's regulations at 30 CFR §§ 585.610-612 state what must be

included in the SAP, including biological surveys and information about biological resources, threatened and endangered species, and sensitive biological resources or habitats, and Coastal Zone Management Act (CZMA) consistency. Testing programs under a SAP or site characterization activity might come into contact with environmentally sensitive habitats. 30 CFR § § 585.801 guides "[h]ow must I conduct my approved activities to protect marine mammals, threatened and endangered species, and designated critical habitat?" during forward-thinking approved SAP activities. These detailed instructions guide leaseholders on appropriate consultations under the Endangered Species Act (ESA), including consideration of critical habitats. For more information about mitigation measures concerning marine mammal species for site characterization and assessment activities, see the EA Appendix D.

Chapter 8 Archaeology 1. Cultural Resources on page 8-13 states that "[i]ncorporate into decisions implementation measures that conserve cultural and historical resources in development of affected Port properties." BOEM or the leaseholder would alert the appropriate parties if any additional archaeological or paleontological resources were found to be present in the offshore waters during the future SAP phase. 30 CFR § 585.802 guides leaseholders as to "[w]hat must I do if I discover potential archaeological resources while conducting my approved activities?" BOEM's guidance instructs leaseholders that "[i]f you, your subcontractors, or any agent acting on your behalf discovers a potential archaeological resource while conducting construction activities, or any other activity related to your project, you must: (1) Immediately halt all seafloor-disturbing activities within the area of the discovery; (2) Notify BOEM of the discovery within 72 hours; and (3) Keep the location of the discovery confidential and not take any action that may adversely affect the archaeological resource until we have made an evaluation and instructed you on how to proceed." This should ameliorate any potential impacts SAP and site characterization activities might have on archaeological and paleontological resources.

BOEM's expectations regarding culturally significant material in the lease sale area can be found in the EA (Historic Properties section 3.10).

Estero Area Plan

The Estero Area Plan is a subset of the Plan Policies document. The majority of the Area Plans address onshore issues. However, there are sections that would apply to the offshore environment. The Estero Area Plan has five areas in which the lease sale and forward-thinking foreseeable effects of SAPs and site characterization activities. These areas are:

1. Chapter 2 I. C. 1 Goals and Policies
2. Chapter 3 M. Air Quality
3. Chapter 4 C. 1. Marine Resources Policy
4. Chapter 5 VII. A. Harbor
5. Chapter 6 III. E. Sensitive Resource Areas

Chapter 2 I. C. 1 Goals and Policies on page 2-4 states that the Estero area wants to "[e]ncourage economic development that will generate local employment for residents, create an adequate supply of goods and services locally, help generate revenues to fund needed public services and facilities, and make the area more economically self-sufficient."

Chapter 3 M. Air Quality states on page 3-22 that "The California Clean Air Act requires that non-attainment areas reduce their air pollution emissions by at least five percent per year, or

15 percent averaged over three years, from 1987 baseline levels. The law further requires the local Air Pollution Control District to adopt a plan to demonstrate how the required reductions will be achieved." BOEM's regulations at 30 CFR § 585.610(a)(12) requires air quality information be submitted with a SAP. Further § 585.659 provides guidance on what is required regarding air quality during the submission of a SAP, COP, or General Activities Plan (GAP). For the State of California, air quality permits are issued under EPA regulations at 40 CFR part 55 found *here*.

Chapter 4 C. 1. Marine Resources policy on page 4-2 states that "Make every effort to secure permanent protection and management of the county's significant marine resources using programs and legislation such as the national estuary, state and national marine sanctuary program, and other methods." BOEM Regulations at 30 CFR §§ 585.800-803 outlines BOEM's requirements that lease holders must comply with for safety and environmental management. During the reasonably foreseeable SAP phase of development, BOEM's regulations at 30 CFR §§ 585.610-612 state what must be included in the SAP, including biological surveys and information about biological resources, threatened and endangered species, and sensitive biological resources or habitats, and Coastal Zone Management Act (CZMA) consistency.

Chapter 5 VII. A. Harbor on page 5-12 states that "The Morro Bay harbor supports commercial fishing, and recreational boating. It is the only developed harbor of refuge between Santa Barbara and Monterey." BOEM recognizes the concerns about potential vessel traffic, commercial and recreational fishing, and recreational boating multiple space use conflicts. The lease sale is unlikely to affect recreational boating use. Although site assessment activities would result in a slight increase in vessel traffic to the Morro Bay WEA and surrounding areas, the total vessel traffic associated with site characterization surveys and site assessment activities would be at most a couple of vessel trips per day on the heaviest days of operations. The generation of trash and debris is also a concern with site assessment and characterization activities, but the small numbers of vessel trips along with compliance with Federal regulations would minimize potential impacts.

Regarding vessel traffic, BOEM assumes lessees would likely survey the entire proposed lease area during a 5-year site assessment term. BOEM also assumes that during the site characterization and site assessment stages, lessees will likely stage from the Port of Morro Bay, approximately 32.2 km (20 mi) east of the Morro Bay WEA. Vessel trips are anticipated for both site characterization and site assessment activities. The EA (Section 2, Table 2-3) assumes the number of vessel trips would amount to no more than 500 total 10-hour survey days or 180 total 24-hour survey days throughout the five-year assessment period.

The EA (Section 1.2.1) uses the 2019 Pacific Northwest National Laboratory (PNNL) LiDAR (light detection and ranging) buoy deployments to the Humboldt and Morro Bay WEAs as a proxy for the type of vessel activity anticipated. PNNL used a 100-ft marine vessel to tow the LiDAR buoy from and to the Morro Bay WEA where they lowered the anchor, mooring line, and attached the buoy and then traveled back to Morro Bay in one day. PNNL planned for 3 vessel trips for a 12-month deployment (deployment, mid-year maintenance, recovery).

The majority of commercial vessels that traverse the Morro Bay WEA carry automated identification system (AIS) transmitters. BOEM conducted a review of 2011 and 2017 AIS vessel information provided to BOEM from the USCG. AIS vessel traffic information is available online through Data Basin: *https://databasin.org/maps/new#datasets=422db447c151412d918a3085b31429f8*.

BOEM analyzed AIS trackline and density data within the WEA. Vessel traffic patterns moved closer to shore between 2011 and 2017 with changes to air quality regulations for vessels within 24 nautical miles from shore. More vessels traversed the Morro Bay WEA in 2017 than in 2011. The majority of AIS vessels traveling through the Morro Bay WEA were cargo ships.

The impact analysis for ascertaining space-use conflicts with commercial fishing considered the vessels used for site assessment and characterization activities, as well as with marine shipping, and marine protected areas. Potential effects to commercial fishing from SAP activities are expected to be temporary in duration (five years or less), and primarily associated with the data collection buoy(s). Sablefish and Dungeness crab dominate the value of landings at Morro Bay, and Dungeness crab and two species of nearshore rockfishes are most important at Port San Luis. Fishing effort and economic productivity reflect biological productivity and is highest in shallower waters near the coast, generally declining as depth increases (EA section 3, Miller et al. 2017). Within the WEA, bottom trawling for Pacific Coast groundfishes shows the greatest activity (EA section 3). Fishing activities increase within the likely transit zone between ports and offshore areas. Lessees will develop a SAP including measures to minimize adverse effects from their site characterization and assessment activities.

Many of the region's important fishing grounds are in depths less than 500 m (1,640 ft), so a buoy location within the WEA (500 m to 1,100 m (1,640 ft to 3,609 ft) depth) does avoid the higher densities of fishing activities due to its offshore location. The deeper waters of the WEA mean the buoy could have a maximum 2.5 mi (4000 m) diameter of travel in a circle from the mooring center point. At the end of the 5-year term data collection instrumentation will be decommissioned and large marine debris objects removed. Similar buoys deployed on offshore the west coast are deployed for one year. BOEM is analyzing a 5-year deployment in order to conservatively estimate potential impacts. For more information on these topics, see the section on enforceable policies above.

Chapter 6 III. E. 1. on page 6-6 Sensitive Resource Areas (SRAs) states that "concerns include maintaining open views of the shoreline and ocean" and "[t]he purpose of the SRA standards for this area to protect views of the shoreline, bay and the ocean, and to protect marine mammals and sensitive plants. This is supported by VI. B. Other Sensitive Habitats on page 6-20 which states "The county should work closely with public agencies and conservation organizations to protect and manage sensitive resources."

The proposed lease sales and subsequent forward-thinking SAP analysis would occur approximately 32 km (20 mi) offshore and the post-lease site assessment and site characterization activities have little potential to effect visual resources and any impacts that do occur will be short in duration and temporary in nature. The EA uses the 2019 Pacific Northwest National Laboratory (PNNL) LiDAR (light detection and ranging) buoy deployments to the Humboldt and Morro Bay WEAs as a proxy for the type of vessel activity anticipated: PNNL used a 100-ft marine vessel to tow the LiDAR buoy, at 5 knots, from Morro Bay to the Morro WEA where they lowered the anchor, mooring line, and attached the buoy and then traveled back to Morro Bay in one day. PNNL planned for 3 vessel trips for a 12-month deployment (deployment, mid-year maintenance, recovery). Buoy lighting is temporary in nature and indistinguishable from vessel traffic.

BOEM Regulations at 30 CFR §§ 585.800-803 which outlines BOEM's requirements that lease holders must comply with for safety and environmental management. During the

reasonably foreseeable SAP phase of development, BOEM's regulations at 30 CFR §§ 585.610-612 state what must be included in the SAP, including biological surveys and information about biological resources, threatened and endangered species, and sensitive biological resources or habitats, and Coastal Zone Management Act (CZMA) consistency. Testing programs under a SAP or site characterization activity might come into contact with environmentally sensitive habitats. 30 CFR § § 585.801 guides "[h]ow must I conduct my approved activities to protect marine mammals, threatened and endangered species, and designated critical habitat?" during forward-thinking approved SAP activities. These detailed instructions guide leaseholders on appropriate consultations under the Endangered Species Act (ESA), including consideration of critical habitats. For more information about typical mitigation measures for protected marine mammal species, see the EA Appendix D.

South County Area Plan

The South County Area Plan is a subset of the Plan Policies document. The majority of the Area Plans address onshore issues. However, there are sections that would apply to the offshore environment. The South County Area Plan has five areas in which the lease sale and forward-thinking foreseeable effects of SAPs and site characterization activities. These areas are:

1. Chapter 8 Planning Area Standards
2. Chapter 8 12. Archaeological Resource Preservation

Chapter 8 Planning Area Standards states that "[t]hese standards apply to the planning and development of new land uses and must be satisfied for a new land use permit to be approved, and for a newly constructed project to be used. All standards listed in this area plan may not affect the entire planning area. Most apply to specific communities or rural locations." None of the standards in the South County Area Plan specifically apply to the offshore environment in Federal waters. However, issues such as vessel traffic in the offshore environment and viewshed issues may arise during the SAP phase of development.

Regarding vessel traffic, BOEM assumes lessees would likely survey the entire proposed lease area during a 5-year site assessment term. BOEM also assumes that during the site characterization and site assessment stages, lessees will likely stage from the Port of Morro Bay, approximately 32.2 km (20 mi) east of the Morro Bay WEA. Vessel trips are anticipated for both site characterization and site assessment activities. The EA (Section 2; Table 2-3) assumes the number of vessel trips would amount to a maximum of 873 total 10-hour survey days or 555 total 24-hour survey days throughout the five-year assessment period. Number of surveys are conservative estimates, meaning the highest possible number of trips is assumed even though it is unlikely this many trips will take place. For instance avian, marine mammal and sea turtle surveys are most likely to occur at the same time, from the same vessel.

The proposed lease sales and subsequent forward-thinking SAP analysis would occur approximately 32 km (20 mi) offshore and the post-lease site assessment and site characterization activities have little potential to effect visual resources and any impacts that do occur will be short in duration and temporary in nature. The EA uses the 2019 Pacific Northwest National Laboratory (PNNL) LiDAR (light detection and ranging) buoy deployments to the Humboldt and Morro Bay WEAs as a proxy for the type of vessel activity anticipated: PNNL used a 100-ft Marine Vessel to tow the LiDAR buoy, at 5 knots, from Morro Bay to the

Morro WEA where they lowered the anchor, mooring line, and attached the buoy and then traveled back to Morro Bay in one day. PNNL planned for 3 vessel trips for a 12-month deployment (deployment, mid-year maintenance, recovery). Buoy lighting is temporary in nature and indistinguishable from vessel traffic.

Chapter 8 12. Archaeological Resource Preservation on page 8-10 states that archaeological resources should be preserved. BOEM or the leaseholder would alert the appropriate parties if any additional archaeological or paleontological resources were found to be present in the offshore waters during the future SAP phase. 30 CFR § 585.802 guides leaseholders as to "[w]hat must I do if I discover potential archaeological resources while conducting my approved activities?" BOEM's guidance instructs leaseholders that "[i]f you, your subcontractors, or any agent acting on your behalf discovers a potential archaeological resource while conducting construction activities, or any other activity related to your project, you must: (1) Immediately halt all seafloor-disturbing activities within the area of the discovery; (2) Notify BOEM of the discovery within 72 hours; and (3) Keep the location of the discovery confidential and not take any action that may adversely affect the archaeological resource until we have made an evaluation and instructed you on how to proceed." This should ameliorate any potential impacts SAP and site characterization activities might have on archaeological and paleontological resources.

Links and References

Arent, Douglas et al. (2012), Improved Offshore Wind Resource Assessment in Global Stabilization Scenarios. NREL/TP- 6A20-55049. https://www.nrel.gov/docs/fy13osti/55049.pdf

Bureau of Ocean Energy Management (2021), Guidelines for Lighting and Marking of Structures Supporting Renewable Energy Development, https://www.boem.gov/sites/default/files/documents/renewable-energy/2021-Lighting-and-Marking-Guidelines.pdf

Bureau of Ocean Energy Management (2012, January), Commercial wind lease issuance and site characterization activities on the Atlantic outer continental shelf offshore New Jersey, Delaware, Maryland, and Virginia: Final environmental assessment, OCS EIS/EA BOEM 2012-003, http://www.boem.gov/Renewable-Energy-Program/Smart-from-the-Start/Index.aspx

Bureau of Ocean Energy Management and the Intergovernmental Renewable Energy Task Force (2021, December 20), California Offshore Wind Energy Gateway: In Support of the Intergovernmental Renewable Energy Task Force, https://caoffshorewind.databasin.org/

Bureau of Ocean Energy Management and the State of California (2018), *Outreach Summary Report: California Offshore Wind Energy Planning,* https://www.boem.gov/California-Outreach-Summary-Report/

California Department of Fish and Wildlife (2021, December 20) Final California Commercial Landings, https://www.wildlife.ca.gov/Fishing/Commercial/Landings

California Independent System Operator (2021, December 20), http://www.caiso.com/Pages/default.aspx

California Energy Commission (2021, December 20) 2018 Total System Electrical Generation, https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2019-total-system-electric-generation/2018.

California Independent System Operator (2016), Fast Facts: What the Duck curve tells us about managing a green grid. Folsom, CA, https://www.caiso.com/documents/flexibleresourceshelprenewables_fastfacts.pdf

County of San Luis Obispo (2021, February 25), Planning & Building, Coastal Plan Policy, https://www.slocounty.ca.gov/Departments/Planning-Building/Forms-Documents/Plans-and-Elements/Elements/Coastal-Plan-Policy.aspx

"Fact Sheet: Biden Administration Opens Pacific Coast to New Jobs and Clean Energy Production with Offshore Wind Development." *The White House*, The United States Government, 25 May 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/05/25/fact-sheet-biden-administration-opens-pacific-coast-to-new-jobs-and-clean-energy-production-with-offshore-wind-development/.

Kuhnz LA, Gilbane L, Cochrane G, Paull CK (2021), California Deepwater Investigations and Groundtruthing (Cal DIG) I, Volume 1: Biological Site Characterization Offshore Morro Bay, Camarillo (CA): US Department of the Interior, Bureau of Ocean Energy Management, OCS Study BOEM 2021-037. 72 p., https://espis.boem.gov/final%20reports/BOEM_2021-037.pdf

Miller R, Field J, Santora J, Monk M, Kosaka R, Thomson C (2017), Spatial valuation of California marine fisheries as an ecosystem service. Canadian Journal of Fisheries and Aquatic Sciences. 74(11):1732–1748, *https://www.researchgate.net/publication/312601999_Spatial_valuation_of_California_marine_fisheries_as_an_ecosystem_service*

Randolph M and Gourvenec S (2011), Offshore Geotechnical Engineering, CRC Press 530 p, ISBN-10: 0415477441, ISBN-13: 978-0415477444, *https://www.amazon.com/Offshore-Geotechnical-Engineering-Mark-Randolph/dp/0415477441*

Thomson RE and Emery WJ (2014), Data Analysis Methods in Physical Oceanography (Third edition), Elsevier, Chpt 1, Pages 1-186, *https://doi.org/10.1016/B978-0-12-387782-6.00001-6*

The 100 Percent Clean Energy Act of 2018, California Senate Bill No. 100, 2018, *https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100*

The Wind Power (2021, December 20), Databases and Reports, *https://www.thewindpower.net/index.php*

United States Census Bureau (2021, December 20), United States Census Information, *https://data.census.gov/cedsci/*

United States Energy Information Administration (2022, February 25), California State Energy Profile, *https://www.eia.gov/state/print.php?sid=CA*