

Staff Report 46

APPLICANT:

Marine BioEnergy, Inc.

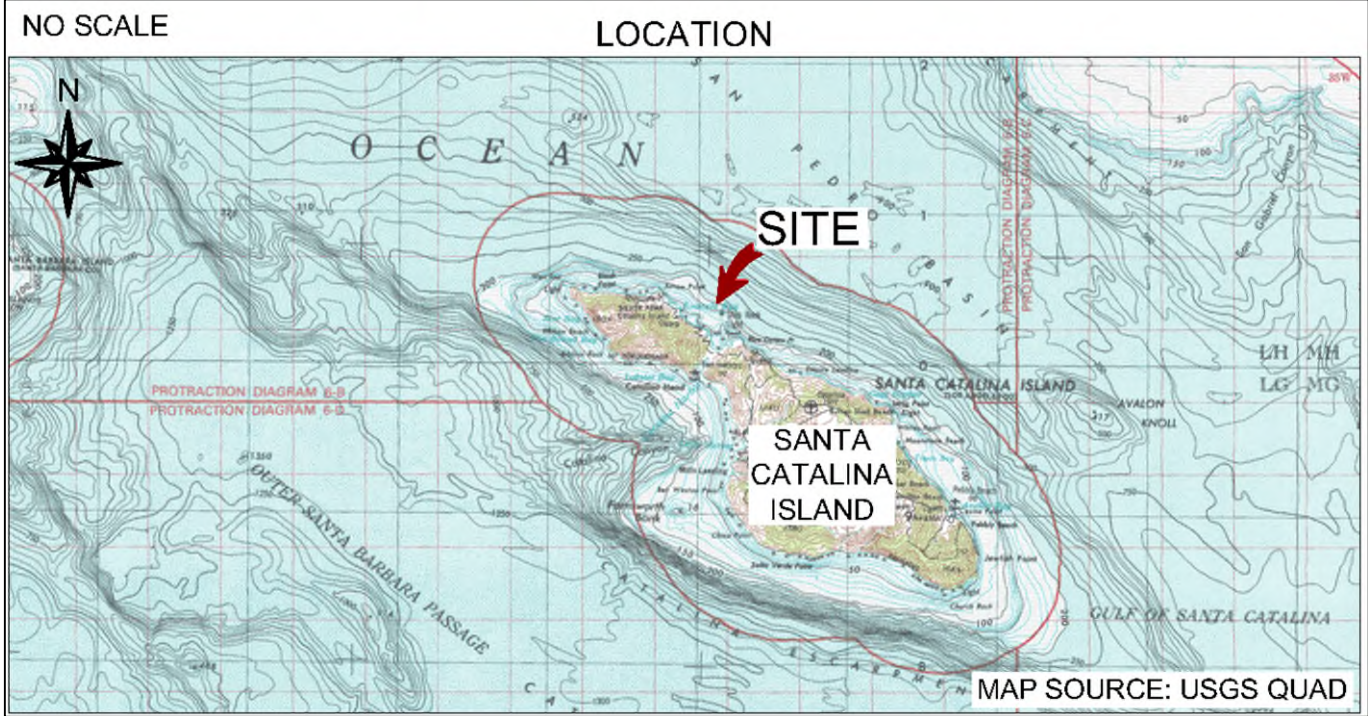
PROPOSED ACTION:

Issuance of a General Lease – Other.

AREA, LAND TYPE, AND LOCATION:

Sovereign land located in the Pacific Ocean, offshore of Howland's Landing, Santa Catalina Island, Los Angeles County (as shown in Figure 1).

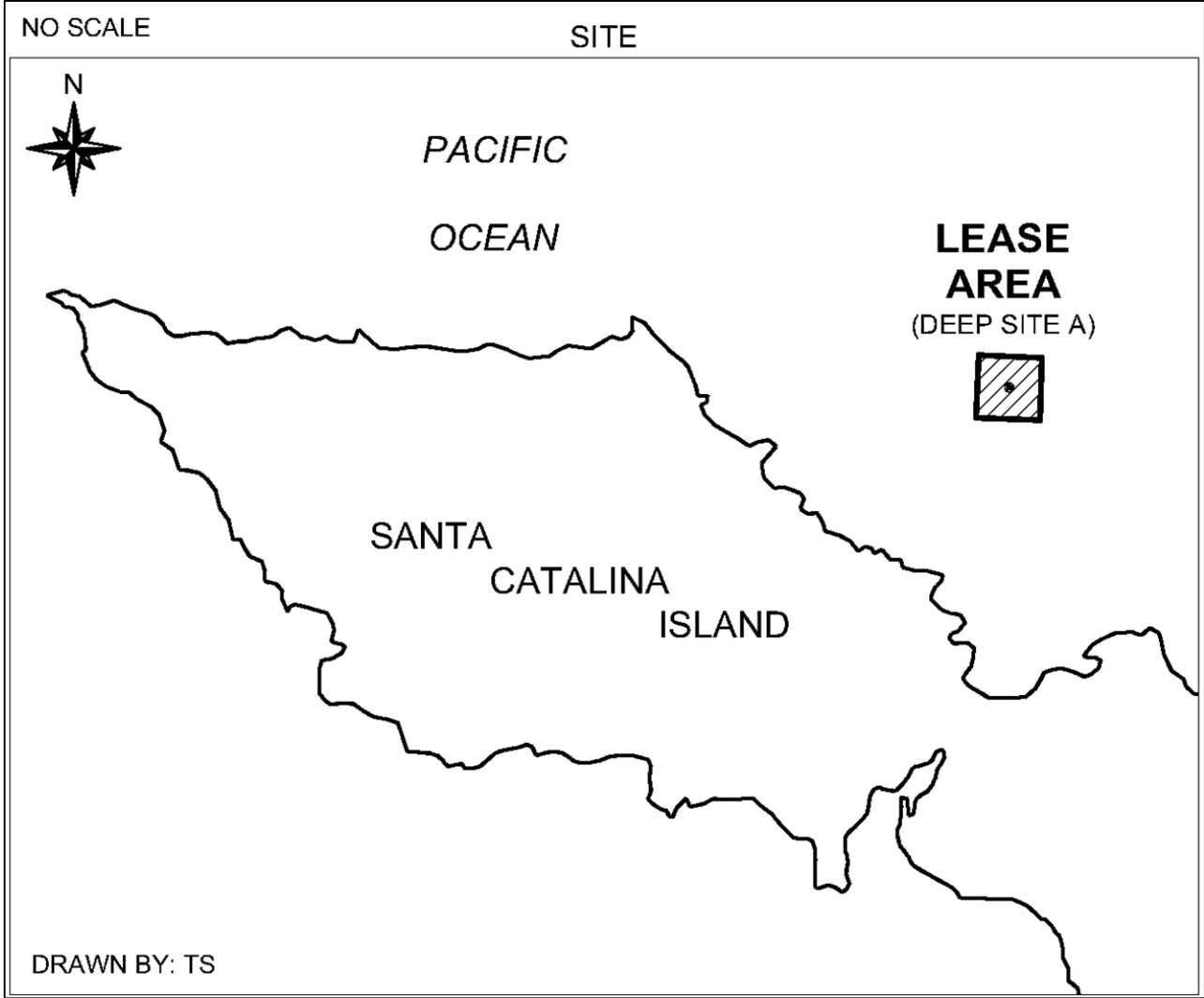
Figure 1. Location



AUTHORIZED USE:

Reinstallation and monitoring of a kelp elevator (as shown in Figure 2).

Figure 2. Site Map



NOTE: This depiction of the lease premises is based on unverified information provided by the Applicant or other parties and is not a waiver or limitation of any State interest in the subject or any other property.

TERM:

10 years, beginning April 20, 2025.

CONSIDERATION:

\$167 per year, with an annual Consumer Price Index adjustment.

SPECIFIC LEASE PROVISIONS:

- Lessee shall inspect the authorized kelp elevator no less than once per month to determine if any marine wildlife have become entangled in any component of the kelp elevator; if any lines or cultivation equipment have been broken, lost, or removed; that all components are in good working condition; and that any fishing gear or other marine debris that have collected on the kelp elevator are removed.
- Lessee shall conduct an inspection of the authorized kelp elevator when warranted by extraordinary circumstances including, but not limited to, collisions with watercraft, major storms, or tsunamis.
- Any observed wear or fatigue of any component of the authorized kelp elevator shall be immediately remedied.
- Lessee shall monitor tension and drag on the kelp elevator. In the event of an abnormal tension or drag value, Lessee shall immediately investigate the kelp elevator to ensure no animals have become entangled in any component of the kelp elevator.
- Lessee shall immediately report any observed incidents of marine mammals becoming entangled in any component of the authorized kelp elevator to the National Oceanic and Atmospheric Administration (NOAA) Fisheries regional Stranding Coordinator.
- Lessee shall immediately report any observed incidents of marine wildlife becoming entangled in any component of the authorized kelp elevator to Lessor. This includes, but is not limited to, sharks, sea turtles, seabirds, or marine mammals.
- Within 60 days of installation or removal of the authorized kelp elevator, Lessee shall provide Lessor with latitude and longitude coordinates for the location of the installed kelp elevator, accurate to at least five decimal places.
- No less than 14 days prior to any kelp elevator installation or removal activities, Lessee shall provide notification regarding such activities to the Commander of the United States Coast Guard, District 11, so that this information can be included in the Local Notice to Mariners.
- Prior to implementation of any experiment involving non-native, hybrid, or genetically engineered algae species, Lessee shall provide Lessor's staff a description of the proposed experiment that includes details regarding the

algae species proposed to be cultivated on the lease premises. Additionally, the Applicant shall not implement any experiment involving non-native, hybrid, or genetically engineered algae species without first receiving express written approval from Lessor's staff.

STAFF ANALYSIS AND RECOMMENDATION:

AUTHORITY:

Public Resources Code sections 6005, 6216, 6301, 6501.1, and 6503; California Code of Regulations, title 2, sections 2000 and 2003.

PUBLIC TRUST AND STATE'S BEST INTERESTS:

On April 20, 2017, the Commission authorized issuance of a General Lease – Other to Marine BioEnergy, Inc. for the placement and monitoring of up to four kelp elevators (research buoys) in the Pacific Ocean, offshore of Howland's Landing and Parson's Landing, Santa Catalina Island, Los Angeles County ([Item 70, April 20, 2017](#)).

This lease originally had a three-year term, and all the authorized improvements were to be removed upon completion of the research project for which they were being utilized. However, due to delays in the kelp elevator's deployment and other logistical problems, the Applicant needed to apply for a lease amendment to extend the lease term and to add an additional kelp elevator. Subsequently, on October 24, 2019, the Commission authorized an amendment of this lease to extend the lease term to eight years, authorize the installation of an additional kelp elevator, and revise the annual rent ([Item 50, October 24, 2019](#)). This lease will expire on April 19, 2025.

Now, the Applicant is applying for a General Lease – Other Use for reinstallation and monitoring of one kelp elevator located in the Pacific Ocean, offshore of Howland's Landing, Santa Catalina Island, Los Angeles County. Staff recommends issuance of a General Lease – Other to the Applicant, effective April 20, 2025.

Although the current lease and amendment authorized 5 kelp elevators in various locations offshore of Santa Catalina Island, the Applicant's research has demonstrated that only the area known as Deep Site A possesses the appropriate characteristics needed for continued use. Therefore, the proposed lease is for one kelp elevator located at Deep Site A. In keeping with the provisions of the current

lease, all of the previously authorized kelp elevators have been removed from State lands and are currently stored in a warehouse. Following issuance of the proposed lease, the Applicant's marine contractor will reinstall one kelp elevator at Deep Site A.

During the period in which the authorized kelp elevators were previously installed there were no observed or recorded incidents of marine wildlife becoming entangled in any component of the kelp elevators. Nevertheless, to ensure the continued safety of marine wildlife in the area, the proposed lease contains provisions requiring the Applicant to monitor the kelp elevator for abnormal drag or tension values that may indicate wildlife entanglement. Likewise, the proposed lease includes provisions requiring the Applicant to regularly inspect the kelp elevator to check for entangled wildlife, and to immediately report any observed incidents of wildlife entanglement to the Commission and the NOAA regional Stranding Coordinator.

The proposed kelp elevator will be used for scientific experiments that involve cultivating kelp, and potentially other species of algae, while raising and lowering the cultivated species within the water column throughout the cultivation process. This practice, known as depth-cycling, involves raising the kelp near the ocean's surface during the day so it can absorb sunlight and carbon dioxide for photosynthesis, and lowering the kelp to the nutrient-rich thermocline (beginning at approximately 60 meters below the surface) at night where it can more readily uptake necessary nutrients. The kelp elevator was specifically engineered for this purpose and consists of a marker buoy, a winch, a winch cable used to raise and lower a sliding tetrahedron boom to which kelp is attached, an anchor, an anchor line, and a 3D Doppler Profiler that measures water current velocity.

The Applicant's original research project utilized kelp elevators to test the efficacy of depth-cycling as a method of cultivating giant kelp, *Macrocystis pyrifera*, to determine if depth-cycling could be used to commercially farm kelp in the open ocean. Kelp farmed in this manner could be used, among other possibilities, to create biofuels or other petroleum replacement products, and could potentially be an important source of renewable energy. This research yielded notable breakthroughs that were published in May 2021 and concluded that kelp grown using the depth-cycling method produced four times more biomass than kelp grown without depth-cycling and supported further investigation of depth-cycling as an effective strategy for kelp farming.

Although the Applicant's depth-cycling experiments utilize kelp elevators, it should be noted that, per the Applicant, the eventual implementation of depth-cycling for commercial kelp farming would likely be accomplished via a different method, such as by towing long lines of kelp with drone submersibles. The Applicant has proposed that this method of implementation would allow areas of open ocean that cannot currently be used for kelp cultivation to become valuable resources for this type of mariculture. The subject kelp elevator and the experimental data it provides are simply the first step in demonstrating that depth-cycling could prove an effective method for commercial kelp cultivation.

Future experiments proposed by the Applicant include studying the efficacy of depth cycling on the previously studied kelp species (*Macrocystis pyrifera*) but starting with sporelings as opposed to the older juvenile specimens previously cultivated, and studying the efficacy of depth cycling on other native algae species such as *Asparagopsis taxiformis*, which can be used as a dietary supplement to reduce livestock methane emissions. These experiments have the potential to yield significant public benefits by providing insights that could make commercial kelp farming in the open ocean for the purposes of biofuel production more cost-effective, and could significantly increase the availability of methane-reducing feed for livestock. As such, installation of the proposed kelp elevator for the purposes of facilitating further scientific study is a water-dependent use that is consistent with the common law Public Trust Doctrine and could potentially lead to significant public benefits. Additionally, to minimize potential impacts to other Public Trust consistent uses in the region, the proposed kelp elevator will be installed in a location that avoids areas with sensitive environmental habitats, areas frequented for commercial or recreational fishing, and areas that experience heavy boat traffic.

The Applicant has also proposed studying the efficacy of depth cycling on sterile hybrids of *Macrocystis pyrifera* that are currently being developed from local, native sporophylls at the University of Southern California AltaSea Algal Laboratory. Utilizing depth-cycling to cultivate such species could dramatically increase the kelp biomass available for creating renewable fuels by allowing sterile kelp species to be cultivated in non-native habitats while attenuating the chances of introducing invasive kelp species to those habitats. However, to ensure that such experiments do not pose any threat of introducing invasive species into State waters, the proposed lease includes a provision that requires the Applicant to provide staff with a detailed description of any such experiment and the proposed experimental species prior to the experiment being implemented. The Applicant

will only be allowed to implement such an experiment if staff approves of it following review of the proposed experiment and species.

The proposed Lease does not alienate the State's fee simple interest or permanently impair public rights. The lease is limited to a 10-year term, does not grant the lessee exclusive rights to the lease premises, and will have no significant impact on Public Trust-consistent uses or resources in the area. Upon termination of the lease, the lessee may be required to remove any improvements from State land and restore the lease premises to their original condition. The proposed lease requires the lessee to indemnify the State for any liability incurred as a result of the lessee's activities thereon.

CLIMATE CHANGE:

Climate change impacts, including sea level rise, increased wave activity, and storm events may impact the proposed lease area, located offshore of Santa Catalina Island.

The California Ocean Protection Council updated the *State of California Sea-Level Rise Guidance* in 2018 to provide a synthesis of the best available science on sea level rise projections and rates. Commission staff evaluated the “high emissions,” “medium-high risk aversion” scenario to apply a conservative approach based on both current emission trajectories and the lease location and structures. The Los Angeles tide gauge was used for the projected sea level rise scenario for the lease area as listed in Table 1.

Table 1. Projected Sea Level Rise for Los Angeles

Year	Projection (feet)
2030	0.7
2040	1.2
2050	1.8
2100	6.7

Source: Table 28, [State of California Sea-Level Rise Guidance: 2018 Update](#)

Note: Projections are with respect to a 1991 to 2009 baseline.

As stated in the [Safeguarding California Plan: 2018 Update](#) (California Natural Resources Agency 2018), climate change is projected to increase the frequency and severity of natural disasters related to flooding, drought, and storms (especially when coupled with sea level rise). The combination of these conditions will likely result in increased wave run up, storm surge, and flooding in coastal areas. Climate change and sea level rise will further influence coastal areas by changing erosion

and sedimentation rates. Beaches and coastal landscapes will be exposed to increased wave force and run up, potentially resulting in greater beach erosion than previously experienced.

This increase in sea level combined with more frequent and stronger storm events will likely expose the lease area to higher risks. However, there are no permanent structures or facilities, and all temporary structures are located underwater except for the marker buoy. Shock absorbers located on the kelp elevator structure isolate the kelp boom (where kelp is attached) from buoy surface dynamics such as storm activity. Due to the temporary nature of the project and the nature of the activity itself, increased storm frequency and severity due to climate change would not affect the project.

Regular maintenance, as referenced in the lease, may reduce the likelihood of severe structural degradation or dislodgement. Pursuant to the proposed lease, the Applicant acknowledges that the lease premises are located in an area that may be subject to the effects of climate change, including sea level rise.

CONCLUSION:

For all the reasons above, staff believes approval of this lease will not substantially interfere with Public Trust needs at this location, at this time, and for the term of the lease; is consistent with the common law Public Trust Doctrine; and is in the best interests of the State.

OTHER PERTINENT INFORMATION:

1. Approval or denial of the application is a discretionary action by the Commission. Each time the Commission approves or rejects a use of sovereign land, it exercises legislatively delegated authority and responsibility as trustee of the State's Public Trust lands as authorized by law. If the Commission denies the application, the Applicant would not be allowed to reinstall one kelp elevator. The lessee has no right to a new lease or to renewal of any previous lease.
2. This action is consistent with the "Leading Climate Activism" and "Meeting Evolving Public Trust Needs" Strategic Focus Areas of the Commission's 2021-2025 Strategic Plan.
3. Staff recommend that the Commission find that this activity is exempt from the requirements of the California Environmental Quality Act (CEQA) as a categorically exempt project. The project is exempt under Class 6, Information

Collection; California Code of Regulations, title 2, section 2905, subdivision (e)(3).

Authority: Public Resources Code section 21084 and California Code of Regulations, title 14, section 15061 and California Code of Regulations, title 2, section 2905.

APPROVALS OBTAINED:

- U.S. Army Corps of Engineers
- California Coastal Commission
- Los Angeles Regional Water Quality Control Board

RECOMMENDED ACTION:

It is recommended that the Commission:

CEQA FINDING:

Find that the activity is exempt from the requirements of CEQA pursuant to California Code of Regulations, title 14, section 15061 as a categorically exempt project, Class 6, Information Collection; California Code of Regulations, title 2, section 2905, subdivision (e)(3).

PUBLIC TRUST AND STATE'S BEST INTERESTS:

Find that the proposed lease will not substantially interfere with Public Trust needs and values at this location, at this time, and for the term of the lease; is consistent with the common law Public Trust Doctrine; and is in the best interests of the State.

AUTHORIZATION:

1. Authorize issuance of a General Lease – Other to the Applicant beginning April 20, 2025, for a term of 10 years, for the reinstallation and monitoring of a kelp elevator; annual rent in the amount of \$167, with an annual Consumer Price Index adjustment; and liability insurance in an amount no less than \$1,000,000 per occurrence.

2. Authorize the Executive Officer or designee to replace Exhibits in the lease upon submission, review, and approval of coordinates detailing the final location of the improvements following installation.