

**STATE OF ALASKA DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF MINING, LAND AND WATER**

**LAND USE PERMIT APPLICATION**

AS 38.05.850

**Applicants must complete all sections of this application. In addition, applicants proposing:**

- the use of the uplands and non marine waters must also complete the Supplemental Questionnaire for Use of Uplands and Non Marine Waters accompanying this application;
- off-road travel must also complete the Supplemental Questionnaire for Off-Road Travel accompanying this application; and/or
- the use of tide and submerged lands must also complete the Supplemental Questionnaire for Use of Marine Waters accompanying this application.

**Other items that must accompany the completed application are:**

- a **(non-refundable) \$100 application filing fee;**
- a 1:250,000 or 1:63,360 scale USGS map showing the location of the proposed activity;
- additional items identified and required in any supplemental questionnaire(s) to this application; and
- additional pages if more space is necessary to answer the questions completely.

**Completed Land Use Permit Applications should be mailed to one of the following offices:**

**Public Information Center**  
550 W. 7<sup>th</sup> Ave, Suite 1260  
Anchorage, AK 99501  
(907) 269-8400

**Public Information Center**  
3700 Airport Way  
Fairbanks, AK 99709  
(907) 451-2705

**MLW Information Office**  
P.O. Box 111020  
Juneau, AK 99811-1020  
(907) 465-3400

LAS # **31011**

<b>Applicant Information:</b>			
Erik Obrien			03/07/1980
Applicant Name			Date of Birth
Efficient Coastal Resources		Erik Obrien	1035966
Doing Business As		Contact Person	EIN
1518 Hidden Lane, Anchorage AK 99501			obrien82@gmail.com
Mailing Address with City, State and Zip			Email Address
( )	( )	907-317-0428	
Home Phone	Work Phone	Cell Phone	FAX
If you are applying for a corporation, give the following information:			
Name, address and place of incorporation: _____			
Is the corporation qualified to do business in Alaska? <b>Yes.</b> If yes, provide name, address and phone number of resident agent: _____			
agent: Erik Obrien, 1518 Hidden Lane, Anchorage AK 99501			
<b>Type of User, Select one:</b> <input checked="" type="checkbox"/> Private non-commercial (personal use) <input type="checkbox"/> Commercial Recreation or Tourism			
<input type="checkbox"/> Public Non-profit including Federal, State, Municipal Government Agency <input type="checkbox"/> Other commercial or industrial			

<b>Duration of Project:</b> The proposed activity will require the use of state land for: <b>(Check one)</b>
<input type="checkbox"/> a single term of less than one year. <b>Beginning month:</b> _____ <b>Ending month:</b> _____
<input type="checkbox"/> a multi year term for up to 5 years. <b>Beginning year:</b> <u>2016</u> <b>Ending year:</b> <u>2021</u>
If multi year and seasonal, circle months of use in each year. <b>Jan., Feb., Mar., Apr., May, Oct., Nov., Dec.</b>

**Project Location**

Latitude/Longitude or UTM: Latitude 57°32.101 by Longitude 154°1.311 or

Section: 36, Township: 30 South, Range: 30 West, Meridian: Seward  
(The spaces below are to be used if the boundaries of the proposed project cross section lines.)

Section:, Township: , Range: , Meridian:

Section: . Township: . Range: . Meridian:

Proposed project will require the use of up to  acres. (Add additional sheets as necessary)

**Project Description** - Describe in detail your intended use of state land. (State land also includes all tide and submerged lands beneath coastal waters and all shorelands beneath other navigable water bodies of the state.) Discuss development and activities. (Attach additional pages as necessary.)

See attached Project Description

Should a portion of the permitted area be closed to the general public? **No**  **[X]**.

**Site Description** - Briefly describe the current condition of the proposed site of use, noting any trash, garbage, debris or signs of possible site contamination (If significant, we recommend you provide pictures to establish initial conditions):

Nearshore water

Are there improvements or materials on the site now? **No**  **[X]** **If yes**, briefly describe the improvements, their approximate value, and who owns them (We recommend you provide pictures of improvements):



**Environmental Risk / Hazardous Substances** - In the course of your proposed activity will you generate, use, store, transport, dispose of, or otherwise come in contact with toxic and/or hazardous materials, and/or hydrocarbons? No[X]

The types and volumes of fuel or other hazardous substances present or proposed: \_\_\_\_\_

The specific storage location(s): \_\_\_\_\_

The spill plan and prevention methods: \_\_\_\_\_





## Land Use Permit Application Supplemental Questionnaire for: Use of Marine Waters (Tide & Submerged Lands)

**Tidelands** are that portion of the intertidal zone below the elevation of mean high water. This elevation varies by location. Contact the nearest DNR regional office for assistance. **Submerged lands** are those below the lowest tidal elevation. The State of Alaska, with few exceptions, owns these lands out to 3 miles off shore. – If your activity includes the use of State tide and or submerged lands and the waters above them, answer the questions below and those applicable sections determined below. All site development details identified in this section must be represented graphically in the scaled drawings on Page 9 of the supplement.

Does the applicant own the directly adjacent, upland water front property? No If no, give name(s) and current address / phone # of that property owner.

Koniag Inc., 194 Alimaq Drive, Kodiak, Alaska 99615

Give names and current addresses / phone #s for both upland property owners on either side of the above water front property.\_\_\_\_  
Tom Panamaroff - (907) 261-4040

**Note:** You must obtain the upland owner's written permission for any use of uplands you do not own including for waste disposal, access to roads, waterlines, power lines, or shore ties above MHW, and you must provide a copy to DNR before a permit is issued. If not the immediately adjacent upland property owner, does the applicant have legal access across the uplands? Yes No Please explain.

There is no need to access the uplands.

Will your tideland use also involve any use of adjacent State owned uplands? Yes No (If yes, indicate uses and show on your development plan diagram.)  Shore tie  Waterline  Power line  Access to roads  Other Explain:

### Type of Use, Activity, Development (Answer All)

Will you be developing / using a Mooring Buoy system or anchoring a commercial or industrial use vessel for more than 14 days? Yes No ( If yes, please also answer all questions in **Part 1 on pg. 2 and Part 6 on pg. 8.**)

Will you be anchoring or mooring a commercial or industrial related floating facility that is or can be occupied, i.e. a float camp or floating lodge, a float house you rent, a seafood processor? Yes No (If yes, please answer all questions in **Part 2, pgs. 2, 3 and Part 6 on pg. 8.**)

Will you be anchoring or mooring your own personal use Float house? Yes No (If yes, please also answer all questions in **Part 2, pgs. 2, 3 and Part 6 on pg. 8.**)

Will you be placing non-occupied structures including but not limited to Piling, Dolphins, Fixed docks, Floating docks, or other floating structures? Yes No (If yes, please also answer all questions in **Part 3, pg. 3 and Part 6 on pg. 8.**)

**Type of Use, Activity, Development (continued)**

Are you seeking authorization to use or develop a Log Transfer Facility, a floating Log Storage area, or a Log Ship Loading site? Yes [ ] No [ ] (If yes, please also answer all questions in Part 4, pgs. 4, 5, 6 and Part 6 on pg. 8.)

Will you be placing fill or dredging material on a beach? Yes [ ] No [ ] (If yes, please also answer all questions in Part 5, pgs. 6, 7 and Part 6 on pg. 8.)

**Part 1. Anchoring vessels and mooring buoy systems**

Does the proposed use location include a known anchorage? Yes [ ] No [X] If yes, have alternative locations been considered to reduce impact to the anchorage? Yes [ ] List below. No [ ] If no, explain why.

Personal knowledge of the location \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

What type of vessel will use the site? [ ] Commercial Fish Tender/ Processor [ ] Log Ship [ ] General Cargo Ship [ ] Unoccupied Barge [ ] Fuel Barge [ ] Passenger Vessel [ ] Other: Skiff

Does the anchoring vessel require the ability to be able to occupy this site all year long? Yes [ ] No [X] If No, what months will the site be needed? From - October 15<sup>th</sup> to May 15<sup>th</sup>

What is the maximum swing radius of vessel at anchor? Length \_\_\_\_\_ feet (distance from anchor to the aft of the vessel)

Will the vessel require the placement of a mooring buoy system? Yes [ ] No [ ] Number of buoys: \_\_\_\_\_  
If placing buoys, fill out applicable parts of Part 3 to explain the anchoring system.

**Part 2. Floathouses and Commercial, Industrial Floating Lodges, Float camps, Caretaker Residences** (including seafood processors). An associated part of approving this type of use is The US Army Corps of Engineers (USACE) permit. Their general permit, GP 89-4N, for occupied floating facilities can be obtained you meet all conditions of GP 89-4N. Please obtain a copy of GP 89-4N from the Corps, review the conditions and indicate below if your facility will meet all of these conditions. This will help streamline the approval process.

Does your project meet all conditions for general permit GP 89-4N? Yes[X] No [ ]

If no, you must Contact USACE at 1-800-478-2712 and apply for an individual Corps of Engineers permit.

**Description of Facility** Note: The structures and dimensions must be shown on the development plan diagram

Float Dimensions: float 400 x 15 \_\_\_\_\_ Total float area 15,000 sq ft

Living quarters total area: \_\_\_\_\_ sq ft. Number of stories: \_\_\_\_\_ Maximum occupancy \_\_\_\_\_ persons

Describe other structures on floats, such as storage and generator sheds; give structure dimensions.

A4 Buoy,

Describe anchoring system and address all that apply: No. of anchors \_\_\_\_\_ 2 Type \_\_\_\_\_ 200 Weight \_\_\_\_\_

No. of Rock bolts \_\_\_\_\_ No. of Shore ties \_\_\_\_\_

Other methods \_\_\_\_\_  
\_\_\_\_\_



**Part 2. (continued)**

Grounding is prohibited. What is the water depth beneath the facility at extreme low tide 90 feet

How many feet of maximum draft does the floating facility have \_\_\_\_\_

Describe your potable Water Source: type, location, ownership of the source \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Wastewater System. Describe how you will handle human waste, black water, grey water \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Do you have an approved ADEC marine sanitation system Yes[ ] No[ ] Approval # \_\_\_\_\_

Describe how you will dispose of all solid waste including human waste and household garbage generated on facility \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Part 3. Non occupied structures - Piling, Dolphins, fixed docks, floating docks, or other floating structures.**

Select all boxes that apply for structures located below MHW and show all on the development plan diagram

Fixed pile-supported dock, wharf or landing (non-floating) - dimensions \_\_\_\_\_ x \_\_\_\_\_ feet No. of pilings \_\_\_\_\_

Ramp to floating dock - dimensions \_\_\_\_\_ x \_\_\_\_\_ feet

Boat haulout or non-floating ramp - dimensions \_\_\_\_\_ x \_\_\_\_\_ feet

Floating dock Dimensions \_\_\_\_\_ x \_\_\_\_\_ feet; \_\_\_\_\_ x \_\_\_\_\_ feet; \_\_\_\_\_ x \_\_\_\_\_ feet; \_\_\_\_\_ x \_\_\_\_\_ feet; \_\_\_\_\_ x \_\_\_\_\_ feet;

Floating breakwater - materials \_\_\_\_\_ Dimensions \_\_\_\_\_ x \_\_\_\_\_ feet

Other floating structures (e.g., net pens, gear storage float) - describe materials, structures, dimensions \_\_\_\_\_

Storage sheds or similar structures on docks - description \_\_\_\_\_ Dimensions \_\_\_\_\_ x \_\_\_\_\_

Bulkhead - type (log crib, sheet pile, etc) \_\_\_\_\_

Dimensions \_\_\_\_\_ x \_\_\_\_\_ Cubic Yards of Fill \_\_\_\_\_

Individual pilings not counted under fixed dock above. Number \_\_\_\_\_

Dolphins - Number \_\_\_\_\_ Number of piling per dolphin \_\_\_\_\_

Anchors- Number \_\_\_\_\_ Type \_\_\_\_\_ Weight \_\_\_\_\_

Rock bolts- Number \_\_\_\_\_

Shore ties- Number \_\_\_\_\_ Note: You must obtain the upland owner's permission to place shore ties above MHW before a permit is issued.

Note: Grounding is prohibited.

What is the water depth beneath the floating structures at extreme low tide? \_\_\_\_\_ feet

**Part 4. Temporary log transfer facility (LTF) including floating log storage area.**

Siting of an LTF which discharges wood into the marine waters must meet the 1985 Alaska Timber Task Force siting criteria guidelines and the criteria established under the US EPA's - NPDES general permit and the AK Dept of Environmental Conservation 401 certification.

What is the maximum length of time that you will need to use the facility \_\_\_\_\_ years.

What will be your seasonal periods of operation? \_\_\_\_\_

What is the total timber volume you need to transfer across this LTF? \_\_\_\_\_ mmbf.

How many total acres do you need for this facility? \_\_\_\_\_ acres.

Note: This acreage must include all improvements including the anchors and lines. It must include the area required for such items as log raft construction, off shore storage, associated barge and vessel moorage, and shoreties.

Does the associated transfer site require a log raft building area? Yes  No  If yes then:

How many boom logs \_\_\_\_\_ and anchors \_\_\_\_\_ and what is the total length of boom logs \_\_\_\_\_ feet, that you need for the rafting area?

Will the log rafts ground or be moored in water at depths less than 40 feet as measured from MLLW? Yes  No

What is the near shore depth \_\_\_\_\_ feet, and the offshore depth \_\_\_\_\_ feet, of the log rafting area as measured from MLLW (0.0' elevation)?

What nautical chart did you use for reference \_\_\_\_\_, please include a copy of this area of the chart with the attachments.

Will you need an associated in-water log storage area? Yes  No  If yes, then answer the set of questions in the **Floating Log Storage Area** section of **Part 4**.

Will you need an associated log ship moorage and loading area? Yes  No  If yes then complete Part 1 on page 2.

What kind of transfer facility do you propose to operate? (i.e. A-Frame letdown, slide ramp, drive down ramp, barge ramp)

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**Will you be transferring logs into the marine waters?**

**No, logs will never be discharged into the water, they will always be transported directly onto barges.**

**Yes - new facility.** The applicant must conduct a dive survey of the near shore area to document the pre-project underwater topography and habitat conditions that will be covered by the discharge of bark on to the likely one-acre zone of deposit. The initial dive survey must be done to guidelines established for bark monitoring by the USEPA and the Alaska Department of Environmental Conservation. A written report of findings including photographic documentation must be submitted prior to review and consideration of this application.

**Yes - existing facility.** Include a report of the last dive survey with attachments. The applicant / operator is responsible to conduct bark monitoring dive surveys, done to the guidelines established by the US EPA and the Alaska Department of Environmental Conservation to document the current extent of bark accumulation at the site. A written report of current monitoring findings must be submitted prior to review and consideration of this application.

**Is this an existing LTF that has been fully approved and used to transport timber in the past? Yes  No**   
If Yes, then answer the following set of questions. If No, you are finished with **Part 4**.

**Part 4. (continued)**

Was the facility constructed before 1985? Yes [ ] No [ ]

Is the facility currently authorized? Yes [ ] No [ ] If Yes, provide the Army Corp of Engineer's Permit Name and number (i.e. Mud bay 43) : \_\_\_\_\_ and attach a copy of it and all modifications.

What is the EPA - NPDES authorization number? \_\_\_\_\_ Date of approval \_\_\_\_\_ and who is the authorized operator: \_\_\_\_\_

When was the facility last actively used? \_\_\_\_\_ How long was it used for? \_\_\_\_\_  
How much volume was transferred? \_\_\_\_\_ mmbf

What type of log entry system is currently authorized? (i.e. A-Frame letdown, slide ramp, drive down ramp, barge ramp)

\_\_\_\_\_  
\_\_\_\_\_

Is there a tideland survey for the site? [ ]Yes [ ]No, ATS# \_\_\_\_\_

Does the existing facility require a physical modification? Yes [ ] No [ ] If yes, please submit your modification request to the USACE and include a copy with this application. Please briefly explain the modification.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Floating Log Storage Area**

Will the storage area be inside the permit area at the log transfer facility? Yes [ ] No [ ] If no, Will there be a separate tract or tracts? Yes [ ] No [ ] If yes how many tracts do you need? \_\_\_\_\_ and list below the acreage of each tract.

\_\_\_\_\_  
\_\_\_\_\_

How long do you need to use the storage area (s)? \_\_\_\_\_

How much volume will be moved thru this storage area? \_\_\_\_\_ mmbf.

How many log booms and anchors and what is the total length of the log boom perimeter that will be needed for storage?  
# of log booms \_\_\_\_\_, #of anchors \_\_\_\_\_ total length of all log booms \_\_\_\_\_ feet.

Will you be using shore ties? Yes [ ] No [ ] If yes how many? \_\_\_\_\_ and if you are not the upland owner have you received permission to place shore ties? Yes [ ] No [ ] If yes, provide a copy of this permission, if no, you need to obtain and provide this.

Will the log rafts ground or be moored in water at depths less than 40 feet as measured from MLLW? Yes [ ] No [ ]

What is the near shore depth and the offshore depth of the log storage area as measured from MLLW?  
Near shore depth \_\_\_\_\_ feet, Offshore depth \_\_\_\_\_ feet.

What nautical chart did you use for reference \_\_\_\_\_ . If possible please include a copy with the attachments.

**Part 4. (continued)**

If the log storage area is one which has been fully approved and used to store log rafts in the past then answer the following:

When was the site last actively used? \_\_\_\_\_ and for how long ? \_\_\_\_\_

If known, how much volume was stored here? \_\_\_\_\_ mmbf

Is the facility currently authorized? **Yes**[ ] **No**[ ] If yes, provide the Army Corp of Engineer's Permit Name and number (i.e. Mud bay 43) : \_\_\_\_\_ and attach a copy of the permit and all modifications

What is the DNR authorization number? \_\_\_\_\_

What is the EPA - NPDES authorization number? \_\_\_\_\_ Date of approval \_\_\_\_\_ and who is the authorized operator: \_\_\_\_\_

Has there been a recent dive survey completed? **Yes**[ ] **No**[ ] If yes, then include a copy of this report with the attachments.

Note: The applicant may have to conduct a dive survey of the log storage area to document the underwater topography and habitat that would be covered by the bark zone of deposit or to establish current bark accumulation levels. If required due to level of use, a bark monitoring dive survey must be done to guidelines established by the USEPA and the Alaska Department of Environmental Conservation to document the current conditions at the site

**Part 5. Use that involves dredging, placing fill material or altering beaches.**

NOTE: When altering the location of the line of mean high water on a beach by placing fill on or seaward of this line you need to be aware of the following. The line of mean high water (MHW) is the boundary where State (public) ownership of tide and submerged land begins. This boundary is an elevation contour on the beach and is determined by the tidal stage of MHW water elevation against the beach topography. This line is not fixed by a past survey of the upland property if that land survey shows a meandered boundary as is typically done. A meandered boundary is intended to be dynamic and move over time as natural forces affect the beach. Natural forces can either erode beach material or deposit material and as a result, the boundary can naturally move. Another natural way that boundaries can change is in tidal areas where glaciers have recently receded and the land is rebounding or uplifting over time. When any natural process is interrupted by the actions of man, such as placing material to stop erosion, the boundary line becomes fixed from that point on.

What is the elevation of the line of MHW at the proposed permit site? \_\_\_\_\_ feet

Are you proposing to alter the line of MHW in any manner? **Yes**[ ] **No**[ ] If yes, explain what you intend to do?

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**Placing fill material on a beach.**

What is the purpose of the fill? \_\_\_\_\_

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Is there an upland survey that has established a meandered boundary line? **Yes**[ ] **No**[ ] If yes, Survey # \_\_\_\_\_  
(if a subdivision survey please provide a legible copy) (ATS, ASLS, US Survey#)

**Part 5.** (continued)

Will heavy equipment be used below the mean high water line to alter the beach? **Yes** [ ] **No** [ ] If yes, explain

How many cubic yards of fill are you proposing to place at and below the line of MHW? \_\_\_\_\_ cubic yards

What are the dimensions of fill area below MHW elevation? \_\_\_\_\_

How many linear feet along the (beach) line of MHW will be covered with fill? \_\_\_\_\_ feet.

Is there more than one area along the beach which will be filled? **Yes** [ ] **No** [ ] Identify the location of each area on the development plan diagram.

Will any of the fill material come from State owned uplands or tide and submerged lands? **Yes** [ ] **No** [ ] If yes, then what is the source? \_\_\_\_\_ and how many cubic yards? \_\_\_\_\_.

If you are intending to limit beach fill to the area above the current line of MHW will any of the fill or associated retaining wall material including the toe of the fill or retaining wall extend beyond the line of MHW? **Yes** [ ] **No** [ ]

Is the adjacent upland property encumbered with a public easement along the waterfront boundary? **Yes** [ ] **No** [ ]

How will the fill affect public access along the beach? \_\_\_\_\_

**Excavation of materials from a beach.**

What is the purpose of the excavation? \_\_\_\_\_

How many linear feet along the beach will be affected? \_\_\_\_\_ feet

To what depth will you be excavating? \_\_\_\_\_ feet

How many cubic yards will be excavated from the area seaward of the line of MHW? \_\_\_\_\_ cubic yards and what will this excavated material be used for or where will it be disposed of? \_\_\_\_\_

**Part 6. Dismantle, Removal, Restoration Plan** – The permit will require that upon expiration, completion, or termination the site shall be vacated and all improvements and personal property removed. The site shall be left in a clean, safe condition acceptable to the Regional Manager. Your answers to the following questions will establish your proposed restoration plan.

**A.** Explain how you plan to dismantle and remove the improvements and restore the site to a clean, safe condition acceptable to the Regional Manager. **Note:** One acceptable alternative is returning the permit site to the condition that existed before the site was developed or used.

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**B.** If your project involves fill describe how it will be removed and where will it be removed to. How will you document that the original line of Mean High Water has been restored? (i.e. photo documentation, resurvey)

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**C.** If your project involves anchors and/or pilings how do you plan on removing them? Where is the nearest community that provides this type of removal equipment / service?

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**D.** Describe the disposal method and identify the disposal site or sites for structural components, solid wastes, and hazardous wastes.

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**E.** If components can be reused for other projects, such as anchors, identify where they would be stored? \_\_\_\_\_

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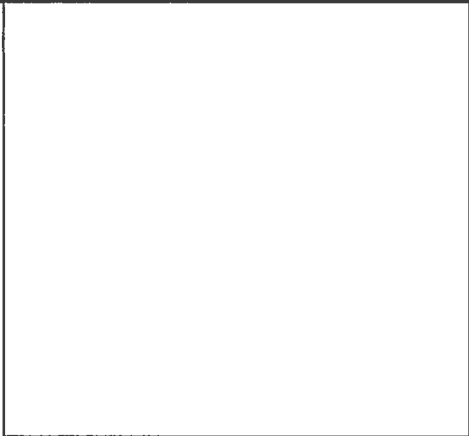
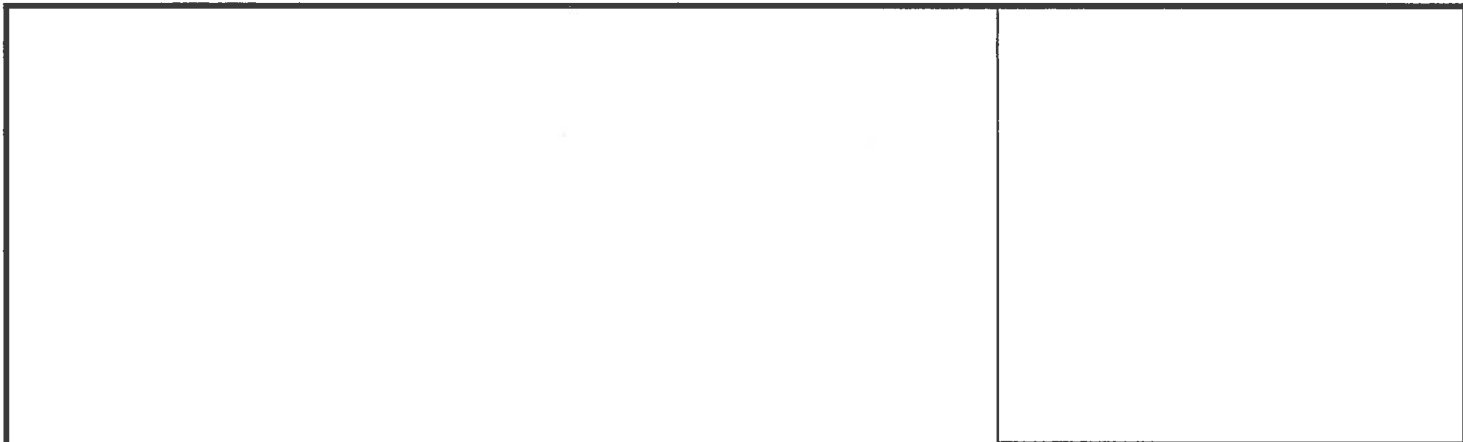
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**SITE DEVELOPMENT DIAGRAM**



**VICINITY MAP**

Date Prepared:	Applicant's Name:
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**ALASKA DEPARTMENT OF NATURAL RESOURCES  
DIV. OF MINING, LAND, WATER  
LAND USE PERMIT**

**SITE DEVELOPMENT DIAGRAM**

Sec.(s) \_\_\_\_\_ T. \_\_\_\_\_ S., R. \_\_\_\_\_ E., \_\_\_\_\_ M

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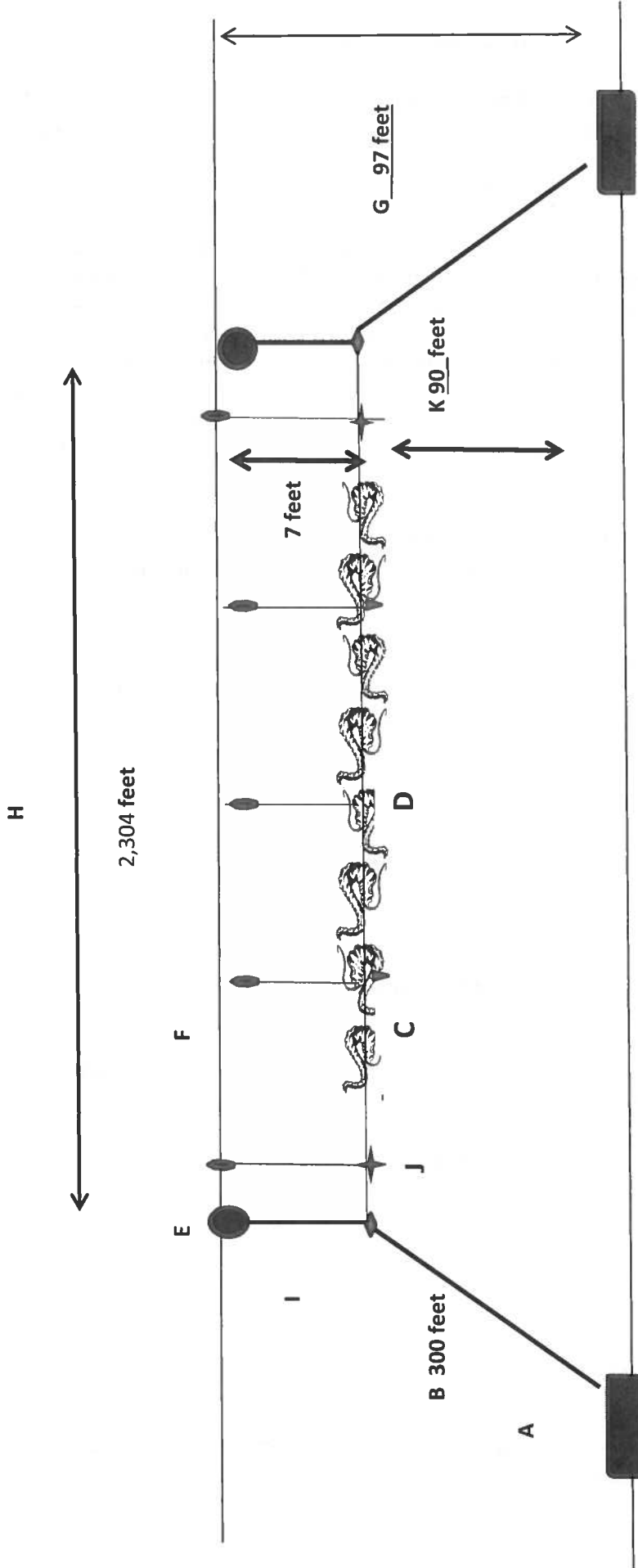
## Project Description

1. Operations Description: Erik O'Brien will deploy a sugar kelp growing operation on Kodiak Island. Initial research will test growing conditions using kelp collected on gear onsite or by using seeded spools obtained from an approved seed source. An estimated 34,560 pounds of sugar kelp is projected to be harvested each year from longlines.

The sugar kelp longline system is composed of anchors and a mooring buoy on each end, and a subsurface rope which hangs 7 feet from the ocean surface. The kelp spores are placed on a string which is wrapped around the subsurface longline rope and are maintained at a constant depth from the surface using a depth control dropper. The kelp spores are typically seeded onto the rope in late fall and harvest occurs late spring of the next year. The anchoring system for each longline is made up the anchor buoy, 300 ft of rope, and chain, and 200-pound Danforth anchors attached to each end of the longline. A scope ratio of roughly 3:1 will be used and be three fathoms out for each fathom deep. One anchor system will be attached to each end of the longline.

2. Site location: The operation will be located in Larsen Bay on Kodiak's west side, approximately one nautical mile from the community of Larsen Bay. Coordinates have been provided in the Alaska's Aquatic Farm Application.
3. Site dimensions, acres for each parcel: The site will start out as a single acre aquatic farm, sized 2,904 ft long by 15 ft wide, and consist of two 2,304-foot lines, 10 ft apart, and anchored in place in a submerged configuration with buoys, and anchors and a 300 ft length anchor line from buoy to the anchor.
4. Total acres of all parcels: Parcel 1 – 1 Acre.
5. Species you intend to farm: Sugar Kelp, *Saccharina latissima*
6. Culture Method: Submerged Long Line.
7. Gear (type, size, number, configuration, material, mesh size, and anchoring system): 4 - 200 pound Danforth, 4 – A4 buoys.
8. Equipment (type, size, number, configuration, material, and anchoring system): 5,808 feet of 5/8 inch polydac line for the longline.
9. Harvest equipment and method: Skiff, cut the kelp from the line.
10. Support Facilities (type, size, number, configuration, material, and anchoring):  
Not Applicable.
11. Access to and from site: Skiff.
12. Storage location of equipment and gear when not in use: Parcel 1 – Home in Larsen Bay.

Figure 1A. Cross-sectional view Alaskan Sugar Kelp Longline (not to scale)



- A. Mooring (200 lb. mushroom anchor or auger or granite block or 2000 lb. cement block)<sup>1</sup>
- B. Grower fill in anchor line length and materials (3/1 scope typical)
- C. 7/16 inch seeded kelp line 400 feet long and 7 feet below the surface
- D. 5-10 lb. cement weights or three holed bricks to keep kelp 7 feet below surface
- E. Surface mooring ball 18 inch diameter 100 lb. displacement
- F. 5/16 inch poly depth 7' control line (dropper) , 6x14 inch foam surface buoy and weight (D)
- G. Water depth at low tide

<sup>1</sup> Mooring detail to be filled out by grower in Figure 5.

- H. Longline section (2,304 feet)
- I. 7 feet ½ inch chain to shackle. J. Line holdfast K. Distance from kelp longline to bottom

Figure 1B. Plan view Alaskan Sugar Kelp Longline (*not to scale*)

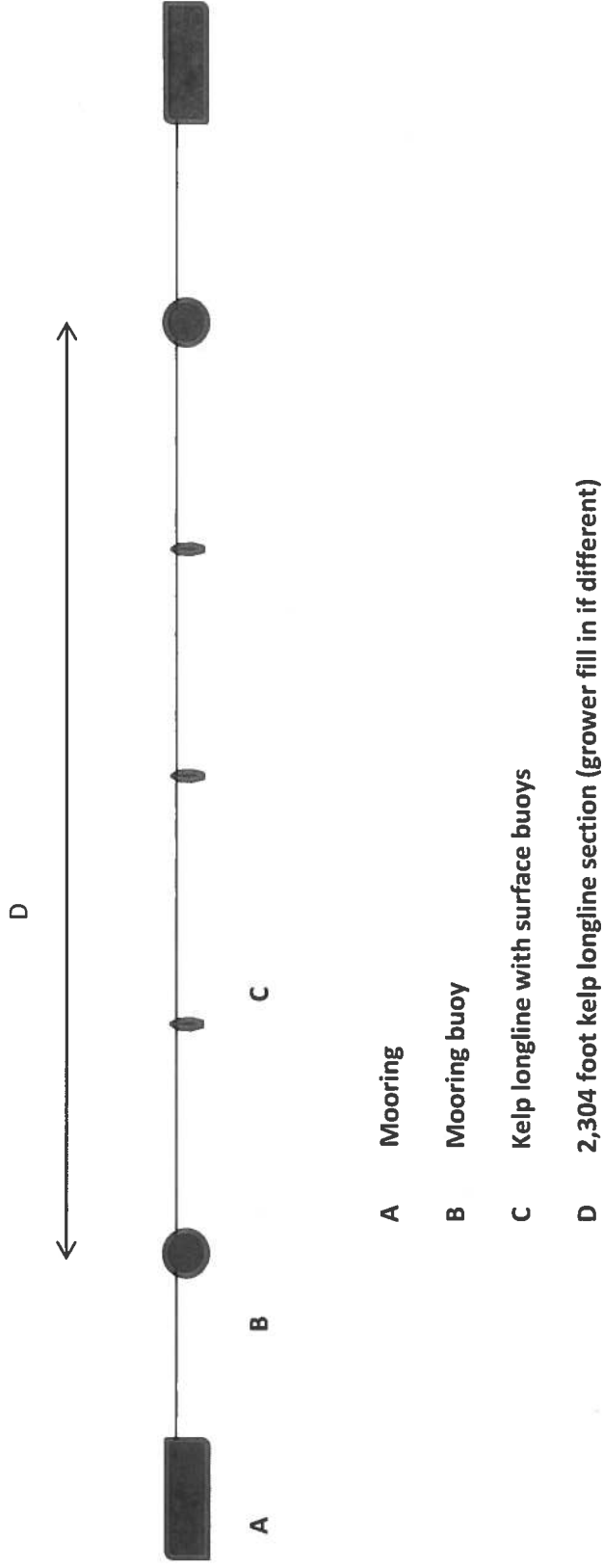
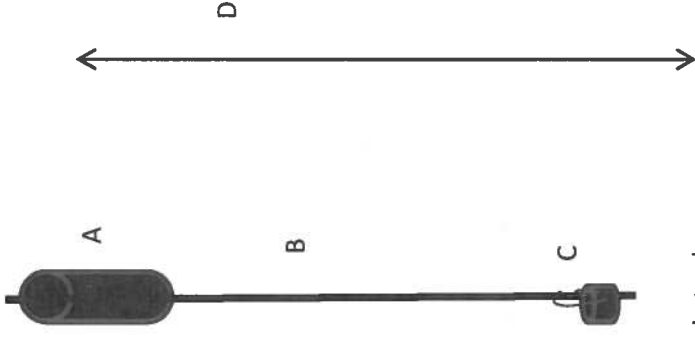


Figure 1c. Details on kelp depth control line dropper



- A. 6 x 14 inch lobster buoy
- B. 1 inch pvc pipe with a lobster spindle washer and figure 8 knot of 5/16 poly rope on each end
- C. 10 lb. cement weight from ½ gallon paint bucket with knotted 5/16 poly loop or 3-holed brick
- D. 7 foot length

Figure 1d. Site Plan

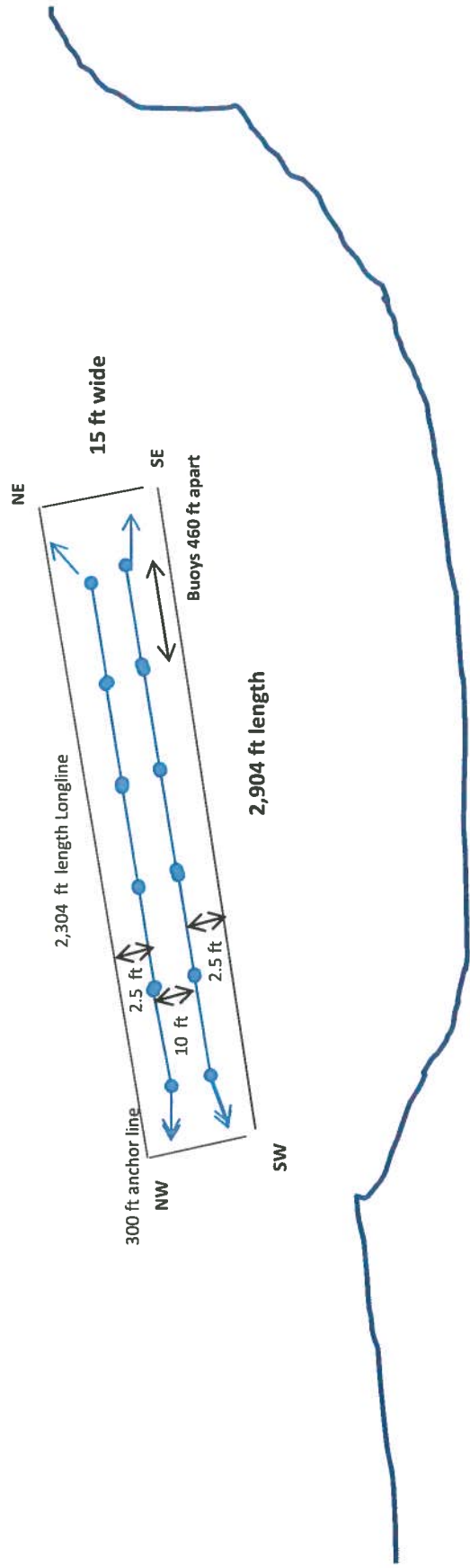


Figure 1 e. Anchor (Mooring) System

