

# Application for Incidental Harassment Authorization for Harbor Activities Related to Delta IV/EELV

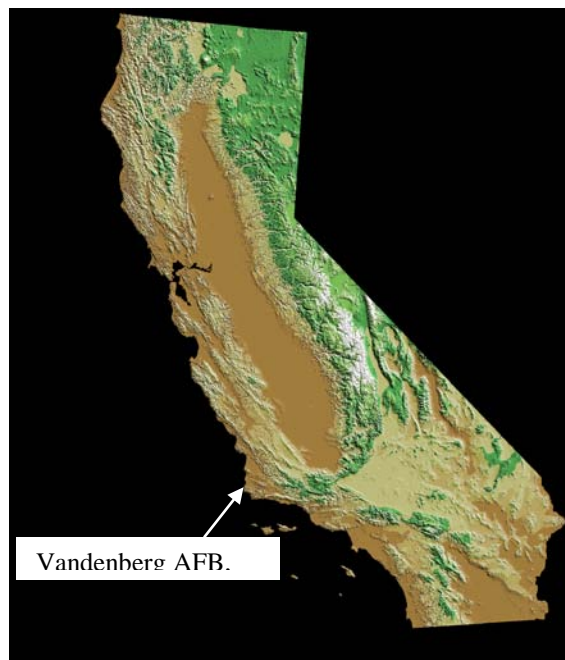
## 1. Delta IV/EELV Activities Affecting Marine Mammals

An Incidental Harassment Authorization (IHA) is requested to allow the unavoidable incidental takes of marine mammals resulting from Delta Mariner operations, cargo unloading activities, Vandenberg Air Force Base (VAFB) harbor maintenance dredging. These activities are in support of Delta IV/EELV launch activity from Space Launch Complex 6 (SLC-6) at VAFB (Figure 1-1).

All activities covered by the IHA will take place in or near the VAFB harbor. Marine mammals that are typically present in the area are the Pacific harbor seal and, less frequently, the California sea lion. Harbor seals haul out on the rocks outside the harbor breakwater, approximately 200 yards from the dock. Typically the seals only use this haul-out area when tides are +1 foot Mean Sea Level (MSL) or lower. At higher tides, the flat rocks where the seals prefer to haul out are awash or submerged.

Sea lions were observed to be hauling out on the breakwater during wharf construction that took place in June-July 2002. This is not a common occurrence, and may have been due to fish schooling in the area. (ENSR, 2002a)

Figure 1-1 Vandenberg AFB, California.



The Delta IV/EELV launch vehicle is comprised of a common booster core (CBC), an upper stage, and a payload fairing. The size of the CBC requires it to be transported to the launch site by a specially

designed vessel, the Delta Mariner. The Delta Mariner will dock at the harbor on south Vandenberg Air Force Base (VAFB). To allow safe operation of the Delta Mariner within the harbor, maintenance dredging is required on a periodic basis.

All activities discussed in this request have been discussed in the documents required for NEPA compliance:

- Final Environmental Impact Statement (FEIS) for the Evolved Expendable Launch Vehicle (EELV) Program - April 1998 (Record of Decision - June 1998)
- Final Supplemental EIS (provides analysis of larger solid rocket motors) - March 2000 (Record of Decision - May 2000)
- Final Environmental Assessment for Harbor Activities Associated with the Delta IV Program at VAFB - July 2001 (Finding of No Significant Impact August 2001)
- Biological Opinion for the EELV Program at VAFB, Santa Barbara County (1-8-99-F-27)

All noise measurements specified in this document were obtained in air and expressed as A-Weighted decibels (dBA).

## **1.1 Delta Mariner Operations**

The Delta Mariner was specially designed to transport the oversized Delta IV/EELV launch vehicle components. The vessel is 312 ft. in length and 84 ft. wide. It has an all steel welded hull built for ocean-going service. It is a roll-on, roll-off, self-propelled ship with a totally enclosed, watertight cargo area, superstructure forward, and a stern ramp. The vessel is capable of operating at an 8-foot draft.

Vessel speed reduces to 1.5 to 2 knots once the vessel is within 3 miles of the harbor. The vessel will enter the harbor stern first, approaching the wharf and dolphins at less than 0.75 knot. At least one tugboat will always accompany the Delta Mariner during visits to the VAFB harbor. The vessel will enter the harbor during daylight hours at high tide. Departure will occur under the same conditions.

Delta Mariner associated noise sources are ventilating propellers used for maneuvering vessel into position and the sound the cargo bay door makes when making contact with the dock ramp (no actual measurements have been taken outside the vessel).

## **1.2 Harbor Maintenance Dredging**

Dredging the harbor involves considerable activity and the use of noisy, heavy equipment. The noise levels expected from the dredging and other construction equipment, as well as the background noise measured at the dock area, are presented in Table 1.2-1. Noise intensity decreases proportional to the square root of the distance from the source. A dredging crane at the end of the dock producing 88 dBA of noise would still be quite noisy (approximately 72 dBA) at

the nearest beach or the end of the breakwater, roughly 250 feet away (Figure 1.2-1). Thus, an animal hauled out on the beach or breakwater could hear the dredge quite clearly.

**Figure 1.2-1 Harbor Dredge Area and Harbor Seal Haulout Location**



**Table 1.2-1 Noise Levels of Heavy Equipment**

Type of Equipment	Range of Typical Noise Levels (dBA) at 50 feet	Range of Max. Noise Level (dBA) at 250 ft.
Backhoe	84-93	70-79
Water Truck (3,000 gallons)	81-84	67-70
Clamshell Dredge	75-88	61-74
Roll-off truck transporter	82-95	68-81
EPT	56-82*	43-68
Ambient background noise at harbor.	35-48**	

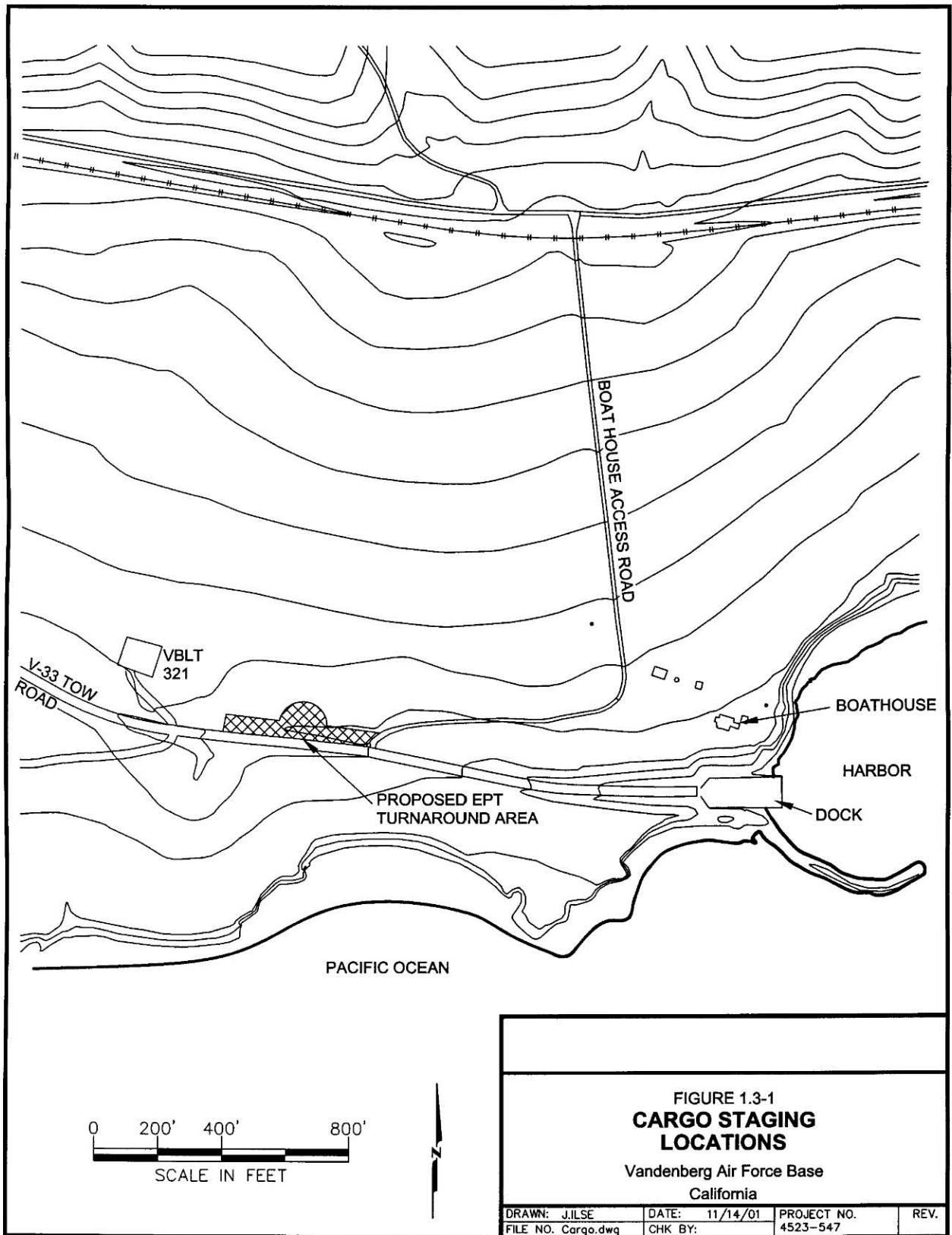
\* Noise level measured within 20 feet from the engine exhaust (Acentech, 1998).  
 \*\* Noise level measured at the dock by Acentech (1998) approximately 250 feet from the beach.  
 Source of Noise Levels: Acentech, 1998; EPA, 1971.

### 1.3 Cargo Movement Activities

The common booster cores (CBC) are 16.4 feet in diameter and between 161-170 feet in length. The CBC sits 9 feet above the ground while seated in the transportation cradle/pallets. It is unfueled in its transportation configuration. The removal of the CBC from the Delta Mariner is accomplished using an Elevating Platform Transporter (EPT). The EPT is powered by a diesel

engine manufactured by Daimler-Chrysler AG (Mercedes), model OM442A, 340HP. The EPT produces approximately 85 dBA, measured less than 20 feet from the engine exhaust, when the engine is running at mid speed. Prior to movement, the EPT operator sounds the horn to alert personnel in close proximity to the EPT that it is about to operate. The EPT operation procedure requires two short beeps of the horn (approx. 1/3 sec. each) prior to starting the ignition. Sound level measurements for the horn ranged from 84-112 dBA at 25 feet away and 62-70 dBA at 200 feet away. The highest measurement was taken from the side of the vehicle where the horn is mounted.

Cargo unloading is limited to periods of high tide. It takes approximately 2.0 hours to remove the first CBC from the cargo bay and 6.0 hours to remove a complement of three CBCs. It will take up to 2 additional hours to remove remaining cargo which may consist of two upper stages, one set of fairings, and one payload attach fitting. The total of 10 hours includes time required to move the flight hardware to the staging area (Figure 1.3-1). Flight hardware items, other than the CBCs, are packaged in containers equipped with retractable casters and tow bars. These containers will be towed off the vessel by a standard diesel truck tractor that generates approximately 87 dBA (measured 50 feet away) in the operational mode. Noise from the ground support equipment will be muted while inside the cargo bay and will be audible to marine mammals only during the time the equipment is in the harbor area.



## **2. Dates, Durations, and Affected Geographical Regions**

With approximately 153 square miles of mostly undeveloped land and approximately 35 miles of coastline, VAFB is the largest remaining area of relatively undisturbed coastal habitat in south-central California (Halliburton NUS, 1993).

West Ocean Avenue bisects VAFB into two main areas, informally known as North Base and South Base. West Ocean Avenue extends westbound from the city of Lompoc to a public beach on the Pacific coast known as Surf Beach. All activities described in this application will take place at the VAFB harbor, located on South Base, approximately 1.43 miles south of Pt. Arguello. See Figure 2.1.

Maintenance dredging, vessel operations and cargo offloading will be performed periodically as required for launch support.

### **2.1 Delta Mariner Operations**

The maximum number of Delta Mariner visits is limited to four per year. The first hardware delivery occurred in January 2003. Another delivery occurred in September 2004. There were no deliveries in 2007 or 2008. Flight hardware was delivered to the harbor in September of 2009 and June of 2010.

A fully-loaded vessel can be offloaded in 10 hours; however, the Delta Mariner may need to leave the dock and return at another time due to tide and wind extremes that may halt the removal of cargo. The Mariner cannot remain during periods of low tide due to the shallowness of the harbor. The EPT cannot move the CBC if wind gusts exceed 25 mph.

Baseline marine mammal monitoring was performed prior to the September 2004 delivery. A copy of the monitoring report was submitted with last year's IHA renewal. The CBC delivery was accomplished during a 4 hour window of high tide, therefore no monitoring was done during the actual delivery operation. There were no deliveries made and no monitoring performed in 2008. Flight hardware deliveries and monitoring reports were conducted and submitted in November of 2009 and July of 2010. The next delivery is scheduled for October of 2011.

### **2.2 Cargo Movement Activities**

Described above in Section 2.1.

### 2.3 Harbor Maintenance Dredging

Dredging-related activities are expected to last less than 3 weeks, but could last up to five weeks, including set-up and tear-down activities in the water and on shore. Dredging may proceed 24 hours per day in order to complete the job as quickly as possible and minimize the disruptive effect on the local animals; however, dredging is normally conducted in the daylight.

Sedimentation surveys that have been done since the initial dredging indicate that maintenance dredging could be required annually, or even twice per year, depending on the hardware delivery schedule. Up to 5000 cubic yards of sediment are expected to be removed from the harbor during each maintenance dredging. A survey will occur several months prior to each Delta Mariner visit to assess whether the harbor can be safely navigated. The area to be dredged is shown in Figure 1.2-1. The environmental impacts of the dredging were assessed in the Harbor Activities EA (ENSR, 2001a).

### 3. Species and Numbers of Affected Marine Mammals

Marine mammals present on and around the VAFB coastline and the Northern Channel Islands include twenty-nine species of cetaceans and six species of pinnipeds. Because they are not typically found in the near vicinity of the harbor, cetaceans are not expected to be impacted by the harbor area activities. Pinnipeds that may be affected by this action include Pacific harbor seals (*Phoca vitulina richardsi*) and California sea lions (*Zalophus californianus*). Northern elephant seals (*Mirounga angustirostris*) may occur on VAFB, but do not haul out in the harbor area. Northern fur seals (*Callorhinus ursinus*), Guadalupe fur seals (*Arctocephalus townsendi*), and Stellar sea lions (*Eumetopias jubatus*) also occur along the California coast and Northern Channel Islands but are not likely to be found on VAFB.

The harbor seal is the only species that regularly hauls out near the south VAFB harbor area. See Figure 1.2-1. Although California sea lions have been observed hauling out on the breakwater, this is thought to be an atypical occurrence. California sea lions occasionally use Rocky Point as a haulout, which is approximately 1 mile north of the harbor area (Thorson, 2001). Northern elephant seals and other pinnipeds are unlikely to be present.

During the initial dredging of the VAFB Harbor, harbor seals were the only pinniped species present. The greatest number of harbor seals present during the dredging was 23, averaging 7 seals per observation period over the duration of the activity (ENSR, 2001b). During the wharf modification activity in June-July 2002, the number of harbor seals hauling out increased to a maximum of 43 animals, with an average of 21 seals hauled out during periods when tides were at or below +1 foot MSL. California sea lions also hauled out in small numbers (up to 6 individuals) on the breakwater during the wharf modification (ENSR, 2002a). Sea lions had not regularly used the breakwater as a haul-out prior to that time, and have not been observed there since. Their presence was possibly due to fish schooling in the area. No sea lions were observed in the area during the second dredging event in December 2002. During the December 2002 dredging, harbor seals were only present on 2 of the 10 days of harbor activity, with a maximum of 19 on one day. No dredging was performed in 2003, 2004, 2005, 2006, 2007, 2008 or 2010. Dredging was conducted in July of 2009. Dredging may occur in June or July of 2011.

The beaches and rocks in the vicinity of the harbor are only used for haulout purposes. No breeding, molting, or mating occurs there.

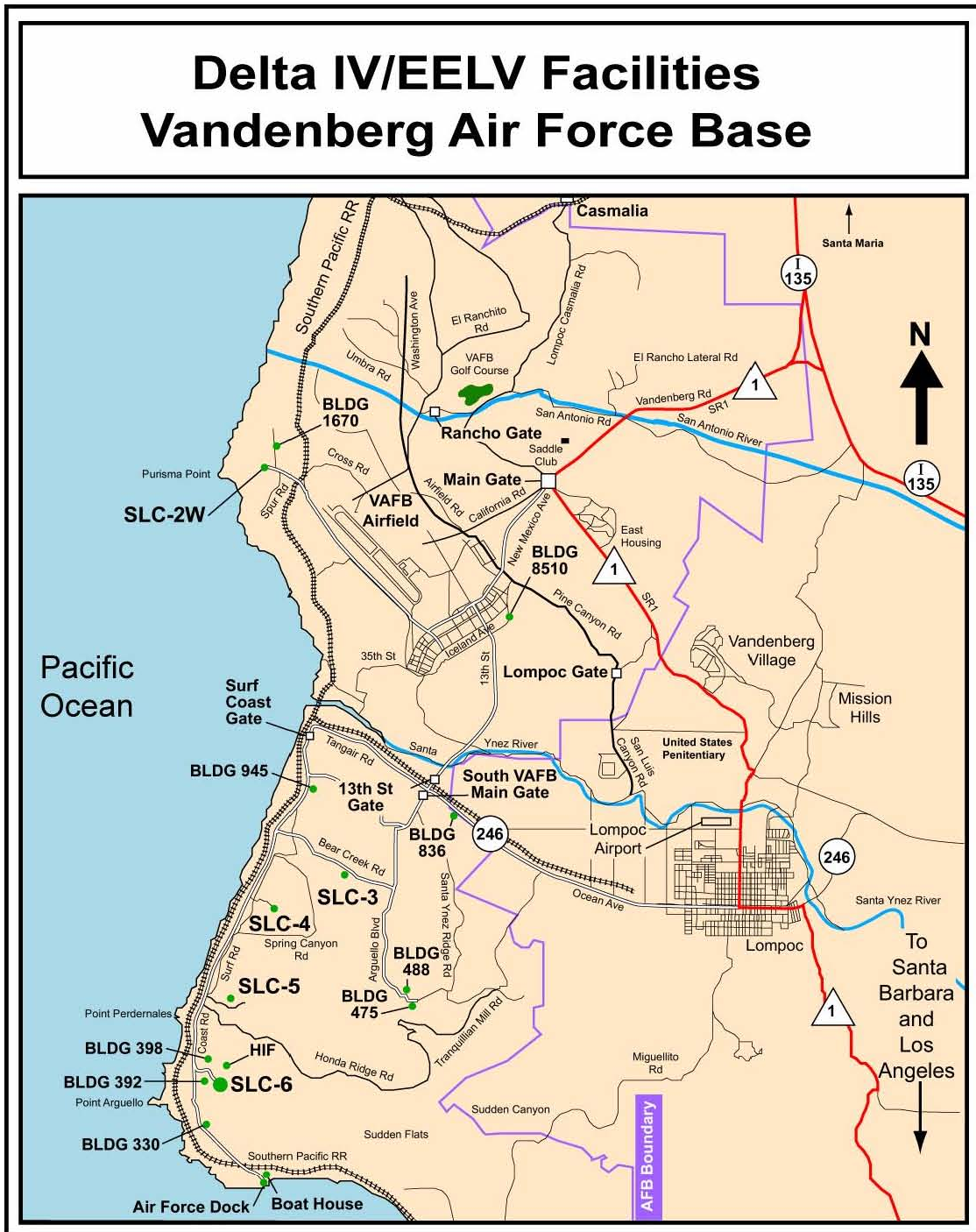


Figure 2.1 Vandenberg Air Force Base



#### **4. Status and Seasonal Distribution of Affected Marine Mammals**

Pacific Harbor Seal: The Pacific harbor seal ranges along the west coast of North America from the central Bering Sea off Alaska to Baja California. It is not listed as “endangered” or “threatened” under the Endangered Species Act, nor as “depleted” under the Marine Mammal Protection Act.

Pacific harbor seals inhabit the entire coast of California, including the offshore islands, forming small stable populations, although they are declining on San Miguel Island. This species is non-migratory, but local movements of short to moderate distances occur in relation to breeding activities and abundance of food resources (CDFG, 1990). They breed along the California coast between March and June, occurring in the greatest numbers on land in late spring and early summer during the molt. The preferred breeding habitat of the Pacific harbor seal includes offshore rocks, sandy beaches, gravelly or rocky beaches, and estuarine mud flats (NOAA-NWFSC TM-28, 1997). Molting does not cause Pacific harbor seals to break from their foraging routine although they spend about 20% more time on shore (SRS, 2001). The molt lasts approximately six weeks and is completed before September. Between autumn and winter, Pacific harbor seals adopt a semi-pelagic life and spend less time on land, but remain close to shore while at sea.

On the coastlines of VAFB, Pacific harbor seals have been observed near Purisma Point (north VAFB), and on south VAFB at Point Arguello, at the mouth of Oil Well Canyon, in the area surrounding Rocky Point, and near the boathouse breakwater (NMFS, 1995). On north VAFB harbor seals primarily use the offshore rocky area near Spur Rd. and Purisma Point Reef. The main haul out area on south VAFB is a 0.93 mile area of sand/cobblestone coves and rocky ledges from Harbor Seal Beach to South Rocky Point (SRS, 2001). The Rocky Point area has been used as a harbor seal breeding habitat and is approximately 1.0 mile north of the harbor (SRS, 2000). Harbor seals have been reported to haul out on the coast at Sudden Ranch, approximately 0.5 miles south of the harbor.

The Pacific harbor seal population in California is growing at a rate of 3.5% annually but the south VAFB population has been increasing at a rate of 12.9% annually between 1997 and 2001 (SRS, 2001). The minimum estimated harbor seal population in California is 30,293 (NMFS, 2002). The mainland and Channel Islands support an estimated 5,300 harbor seals (Gilardi *et al.*, 1999). The population of harbor seals on San Miguel Island has been decreasing recently, possibly due to competition for haulout areas with the more aggressive California sea lions and northern elephant seals. The estimated VAFB population is 1,118 with up to 500 Pacific harbor seals hauled out at any given time on south VAFB (Thorson, 2001).

California Sea Lion: The California sea lion ranges from British Columbia south to Mexico. It is not listed as “endangered” or “threatened” under the Endangered Species Act, nor as “depleted” under the Marine Mammal Protection Act.

During the breeding season, the majority of individuals are found in southern California and Mexico. Rookery sites in southern California are limited to San Miguel Island and to the more southerly Channel Islands of San Nicolas, Santa Barbara, and San Clemente (NOAA-NWFSC

TM-28, 1997). Rocky ledges and sandy beaches on offshore islands are the preferred rookery habitat. Breeding season begins in mid-May. Mating occurs within 10 days of arrival at the rookeries (NMML, 2001). The California sea lion molts gradually over several months during late summer and fall. Since the molt is not catastrophic, the California sea lion can enter the water to feed.

The minimum population size of the U.S. stock of California sea lions is 109,854. Since 1983, the population has been growing at a rate of 6.2% annually (NMFS, 2002). Between 1985 and 1987, population data indicated that most of the individuals on the Northern Channel Islands were on San Miguel Island, with a population ranging from 2,235 to over 17,000. In 1994, at the Channel Island breeding rookeries, an estimated 81,000 sea lions were present (Gilardi, *et al.*, 1999). There are annual migratory movements. In the spring, males migrate southward to breeding rookeries in the Channel Islands and Mexico, and then migrate northward in late summer following breeding season. Females do not appear to migrate but remain near breeding rookeries (CDFG, 1990). The greatest population on land occurs in September and October during the post-breeding dispersal although many of those sea lions, particularly juveniles and sub-adult and adult males, may move north away from the Channel Islands.

The largest concentrations of California sea lions in the vicinity of VAFB occur at Lion Rock, a prominent feature 0.4 miles southeast of Point Sal (Tetra Tech, 1997). This area is approximately 1.5 miles north of the VAFB boundary. At least 100 sea lions can be observed during any season at this site (Roest, 1995). The Point Arguello beaches and rocky ledges of South Rocky Point on south VAFB are haulout areas that may occasionally be used by the California sea lion (Engineering Science, Inc. and Sea World Research Institute, 1988). Each year, small groups of sea lions have been observed heading south along the Vandenberg AFB coastline in April and May (Tetra Tech, 1997). Starting in August, large groups of sea lions can be seen moving north, in groups varying in size from 25 to more than 300 (Roest, 1995). This concurs with previously established migration patterns (Reeves *et al.*, 1992; Roest, 1995). Hauled out juvenile seal lions, along with harbor seals, can be observed along the South Base sites in July, August and September (Tetra Tech, 1997). Starving and exhausted subadult sea lions are fairly common on central California beaches during the months of July and August (Roest, 1995).

Northern elephant seal: The Northern elephant seal is found from Alaska to Baja California, where they come ashore to breed, give birth and molt, mostly on offshore islands. There has been no verified breeding of northern elephant seals on VAFB or offshore islets, however some areas of the shoreline are regularly used as haul-outs by juvenile and sub-adult elephant seals, primarily immature males. There are no verified records of elephant seals on VAFB prior to 1998. A maximum of 188 elephant seals were counted in 2004, however the majority of individual counts have recorded less than 10 individuals (188 is considered to be an extreme data point).

## **5. Type and Method of Incidental Take Authorization Requested**

United Launch Alliance requests an Incidental Harassment Authorization allowing only the unintentional incidental harassment of marine mammals in the harbor area. Activities in the

harbor area may elicit a head alert in nearby harbor seals and sea lions, or cause them to approach the water or flush into the water.

## 6. Number and Frequency of Marine Mammals Potentially Affected

The principal form of incidental take resulting from the Delta IV/EELV harbor activities is expected to be infrequent, incidental, and unintentional harassment of pinnipeds resulting from noise and visual activity generated by the short term operations of recurring maintenance dredging, Delta Mariner operations, and cargo movement. Pinniped mortality is extremely unlikely. Other than periods of elevated noise and visual activity due to the aforementioned activities, no temporary or permanent habitat modifications would occur. No animals would be approached or handled by humans.

Estimates of the numbers of marine mammals that might be affected are based on consideration of the number of marine mammals that could be disturbed appreciably by approximately 43 days of operations. ULA bases these estimates on historical pinniped survey counts from 2001 to 2009 and calculated takes by multiplying the average of the maximum abundance by 43 days. Thus, ULA requests an IHA to incidentally harass approximately 1,075 Pacific harbor seals (25 animals by 43 days), 86 California sea lions (2 animals by 43 days), and 43 northern fur seals (1 animals by 43 days).

### Requested Incidental Take of Marine Mammals

Species	Estimate of Incidental Take
Pacific harbor seal ( <i>Phoca vitulina</i> ) .....	1,075
California sea lion ( <i>Zalophus californianus</i> ) .....	86
Northern elephant seals ( <i>Mirounga angustirostris</i> ).....	43

Historical Monitoring	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Pacific Harbor Seals	23	43	0	0	0	0	22	22	28	14
California Sea Lions	0	6	0	0	0	0	0	0	2	0
Northern Elephant Seals	0	0	0	1	0	0	0	0	0	0

Previous monitoring efforts have yielded limited gender and age data for harbor seals. Reproductive condition is dependent on how near to the breeding season harbor activities occur. The nearest pupping sites occur north of the harbor area at Rocky Point approximately 1 mile away. The maximum number of harbor seals present during the wharf modification was 43 and averaged 25 per day when tidal conditions were favorable for hauling out (ENSR, 2002a). Harbor seals were present in somewhat smaller numbers during the dredging events in September 2001 and December 2002.

The maximum number of sea lions present during the wharf modification was 6, with daily counts ranging from 1 to 6 animals (ENSR, 2002a). Monitoring of the wharf construction began on 28 May 2002 and ended when construction completed on 30 July 2002. The initial observation of sea

lions on the breakwater occurred on 27 June, and they were present on a daily basis thereafter, until the construction was complete. Presence of sea lions was not affected by the tide levels. No sea lions were present during the dredging events in September 2001 or December 2002.

Northern elephant seals could also be subjected to level B harassment. Although VAFB normally averages fewer than 10 individuals during the relatively rare periods when elephant seals are present, the number of affected individuals could potentially be higher.

## **7. Potential Impacts of the Project on Marine Mammals**

The maintenance dredging events are relatively short in duration. Vessel operations and cargo off load operations would occur a maximum of three times per year and are also short in duration. The affected mammals are highly mobile. Thus, potential impacts are expected to be short-term and any animals frightened away from the area by the noise and activity should return after the completion of each task. Due to the sporadic nature and short duration of the activities, no cumulative impacts to marine mammals are expected.

Monitoring of harbor seals and sea lions during two previous dredging events and wharf modification activities showed that they responded to sudden noises or unexpected visual stimuli with a head alert initially and occasionally would flush from the haul-out. Sea lions appeared to be much less sensitive to disturbance, even when they were close to the activity. Visual events that invoked harbor seal responses included the crane boom swinging suddenly, and shadows caused by equipment that was backlit during nighttime dredging activities. The seals and sea lions continued to frequent the harbor area during the construction activities despite the presence of noise and activity.

On the coast of VAFB, the Delta IV/EELV harbor activities will mainly affect Pacific harbor seals, California sea lions and Northern elephant seals, as other pinniped species are known to haul out at these mainland coastal sites only infrequently and in small numbers.

### **Impact on Marine Mammal Availability for Subsistence**

There is no subsistence hunting of marine mammals in the project area; therefore, activities at VAFB Harbor would therefore not be expected to impact marine mammal availability for subsistence.

## **8. Anticipated Impact on Marine Mammal Habitat**

There will be no loss of habitat resulting from the Delta IV/EELV related harbor activities over the period covered by the requested Incidental Harassment Authorization. Harbor seals are known to use offshore rocks, rocky ledges and sandy beaches between South Rocky Point and the boat dock area. (SRS, 2000).

As indicated in Section 1 of this application, impacts to marine mammal habitat will be limited to occasional brief periods of noise and visual activity presenting a temporary impact to harbor seals and sea lions in the South VAFB harbor area. These activities will not result in loss of habitat.

### **9. Anticipated Impact of Habitat Modification on Marine Mammal Stocks**

There will be no loss of habitat resulting from Delta IV/EELV related harbor activities; therefore, there would be no impact from habitat loss to marine mammal populations.

### **10. Mitigation Measures**

Since there will be no long-term or cumulative impacts to marine mammal habitat, there will be no anticipated requirement for mitigation with respect to habitat. Harbor activities described in Section 1 will have no impact on breeding, molting or pupping because those pinniped activities do not occur in the vicinity of the harbor area.

There will be an effort to keep construction noises constant while pinnipeds are hauled out on the rocks to reduce the chances of disturbing the animals by having loud noises following a lull. Whenever possible, the construction crews will gradually increase noise levels of their activities to avoid startling the animals. Lights will be turned on before dusk for any operations expected to continue after dark and will remain on the entire night, to avoid startling the animals at night. The vessel will only enter the harbor when the tide is too high to allow the harbor seals to haul out on the rocks.

### **11. Arctic Subsistence Plan of Cooperation**

These activities do not take place in or near any traditional Arctic subsistence hunting area; therefore, a cooperation plan is not required.

### **13. Monitoring and Reporting**

United Launch Alliance will notify the NMFS 2 weeks prior to the initiation of each activity discussed in Section 1.

Monitoring will be conducted by a sufficient number of biologically-trained, on-site individual(s), approved in advance by the National Marine Fisheries Service Southwest Regional Office. Monitoring for any given harbor activity will consist of the following:

- Prior to each day's activities, conduct baseline observations on the number, type(s), location(s), and behavior of marine mammals in the project area.
- Conduct and record observations of harbor seals in the vicinity of the harbor for the duration of the activity occurring when tides are low enough for harbor seals to haul out (+ 2 ft. MSL, or less).

- If sea lions haul out in the harbor vicinity, observations on sea lions will be conducted and recorded for the duration of the activity, regardless of tidal conditions.
- After each day's activities, conduct observations of pinniped haul-outs in the project area and record information on the number, type(s), location(s), and behavior of marine mammals.
- During nighttime activities, the harbor area will be lit and the monitor will observe animals using a night vision scope.

A report will be submitted at the frequency specified by NMFS. This report will include the following:

- Date, time, and duration of activity;
- Weather;
- Tide state;
- Composition (species, gender, and age class) and locations of haul-out group(s);
- Horizontal visibility;
- Results of the monitoring program:
  - number and species of pinnipeds present on haulout(s) prior to start of activity and behavioral patterns.
  - number and species of pinnipeds that may have been harassed as noted by the number of pinnipeds estimated to have entered the water as a result of noise related to the activity.
  - brief description of any activity/action that causes animal(s) to flush;
  - length of time(s) pinnipeds remained off the haulout or rookery.
  - noted behavioral modifications by pinnipeds that were likely the result of the activity in the harbor.

#### **14. Planned Research and Learning Activities**

All information collected by the biological monitor will be provided to environmental personnel at VAFB for incorporation in their research activities.

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