



Memorandum

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CC: Sheyna Wisdom, Lindsey Saxon Kendall (Fairweather Science); Kate Lomac-MacNair (SAExploration)

FROM: John Hendrix, Lisa Parker, Marta Czarnecki (Apache Alaska Corporation)

RE: Monthly Report – September 1 – 30, 2012

1.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) issued Apache Alaska Corporation (APACHE) an Incidental Harassment Authorization (IHA) under the authority of section 101(a)(5)(D) of the Marine Mammal Protection Act (16 U.S.C. 1361 *et seq.*) to harass small numbers of marine mammals, by Level B harassment, incidental to three-dimensional (3D) seismic surveys in Cook Inlet (hereafter *Cook Inlet 3D Seismic Program*) from April 2012 through April 2013.

This monthly report presents information requested in the IHA and Incidental Take Statement (ITS) for this reporting time period of **September 1–30, 2012** and includes information on the seismic operations, marine mammal monitoring and mitigation measures implemented. This is the **final monthly report for the 2012 season** because all operations ceased on September 29. Protected Species Observer (PSO) Daily Reports which include details on the required information are not included in the monthly report because they were attached to the weekly reports previously submitted to NMFS.

SUMMARY OF SIGHTINGS

Table 1. Summary of the number of observations, shut downs and takes.

Marine Mammal Species	No. of Observations ¹	No. of Shut Downs	No. of Takes	No. of Cumulative Takes
Beluga Whale (<i>Delphinapterus leucas</i>)	20	0	0	0
Killer Whale (<i>Orcinus orca</i>)	0	0	0	0
Harbor Porpoise (<i>Phoca vitulina</i>)	8	1	3	4
Steller Sea Lion (<i>Eumatopia jubatus</i>)	0	0	0	0
Harbor Seal (<i>Phocoena phocoena</i>)	37	4	5	13

¹ Number of observations include animals visually observed (vessel, land, aerial) and acoustically detected

2.0 SUMMARY OF OPERATIONS

The following table summarizes the seismic operations over this reporting period. More details are found in the following text.

Table 2. Total number of slack tides and hours per airgun and vessel.

Source	No. of Slack Tides	No. of Hours
10 cui mitigation (<i>M/V Arctic Wolf</i>)	NA	88.1
10 cui mitigation (<i>M/V Peregrine Falcon</i>)	NA	66.1
440 cui ultra-shallow (<i>M/V Peregrine Falcon</i>)	18	32.9
2400 cui (<i>M/V Arctic Wolf</i>)	68	142.0
2400 cui (<i>M/V Peregrine Falcon</i>)	12	20.3

Operations moved easterly, along the eastern side of central Cook Inlet near the Nikiski/Kenai area (Figure 1). Ten vessels operated for the *Cook Inlet 3D Seismic Program* during the month of September including *M/V Arctic Wolf*, *M/V Peregrine Falcon*, *M/V Miss Diane*, *M/V Mark Stevens*, *M/V Maxime*, *M/V Dreamcatcher*, *M/V Norseman I*, *M/V Side Winder*, *M/V Sleeprobber* and *M/V My Marie* (Table 3). On September 3rd the *M/V Sleeprobber* arrived at the project area and on September 19th the *M/V Side Winder* left the project area. Vessel-based PSOs were stationed on the *M/V Arctic Wolf*, *M/V Peregrine Falcon* (source vessels) and *M/V Dreamcatcher* (mitigation vessel). During seismic activity, the vessels traveled at speeds between 4-5 knots. As identified in the IHA application, marine seismic data are only acquired during low and high slack tides (approximately 2-3 hours over the tide). There are approximately 4 slack tides in a 24-hour period. Over the course of this reporting period, airguns operated for a total of approximately 195.2 hours. The 2400 cui airgun array operated from *Arctic Wolf* during 68 slack tides, for a total of approximately 142.0 hours. The *Peregrine Falcon* operated the 2400 cui airgun array during 12 slack tides for a total of approximately 20.3 hours. The *Peregrine Falcon* also operated the 440 cui airgun during 18 slack tides for a total of approximately 32.9 hours. The mitigation gun was used on 20 different days. The *Arctic Wolf* and the *Peregrine Falcon* operated the mitigation gun for approximately 88.1 and 66.1 hours, respectively. During September, operations were delayed due to mitigation measures for a total of 0.1 hours, with a cumulative time of 64.8 hours for the duration of the project. The mitigation vessel, the *Dreamcatcher*, was generally stationed to the north or south of the project area (opposite of the land-based observation station) for acoustic and visual monitoring for near-shore marine mammal movement during all periods of seismic operations. On September 24, the *Peregrine Falcon* completed seismic operations. The *Arctic Wolf* continued to operate until September 29, when all operations ceased for the 2012 season. All vessels began transiting toward Anchorage on September 30.

The monitoring team consisted of two PSOs on the *Arctic Wolf*, two PSOs on the *Peregrine Falcon*, two PSOs on the *Dreamcatcher*, two or three PSOs at the land-based station (OSK Bluff Site) and aerial overflights with one or two PSOs. All PSOs operate on a 4-hour shift to avoid fatigue and only during daytime operations.

A radio-telemetered passive acoustic monitoring (PAM) buoy has not been redeployed. The PAM buoy remains in Anchorage for maintenance and re-evaluation. Thus, an over-the-side (OTS) hydrophone was deployed from the *Dreamcatcher* during all nighttime operations (at minimum) with the engines off (but generators still on) for passive acoustic monitoring. The *Dreamcatcher* is positioned to the north or south of the seismic acquisition patch (opposite of the land-based observation station). Two acoustic technicians monitored for acoustic detections of marine mammals during all nighttime operations in 4-hour shifts. The reported detection range of small vessels on this hydrophone with the engines off was approximately 3 km.

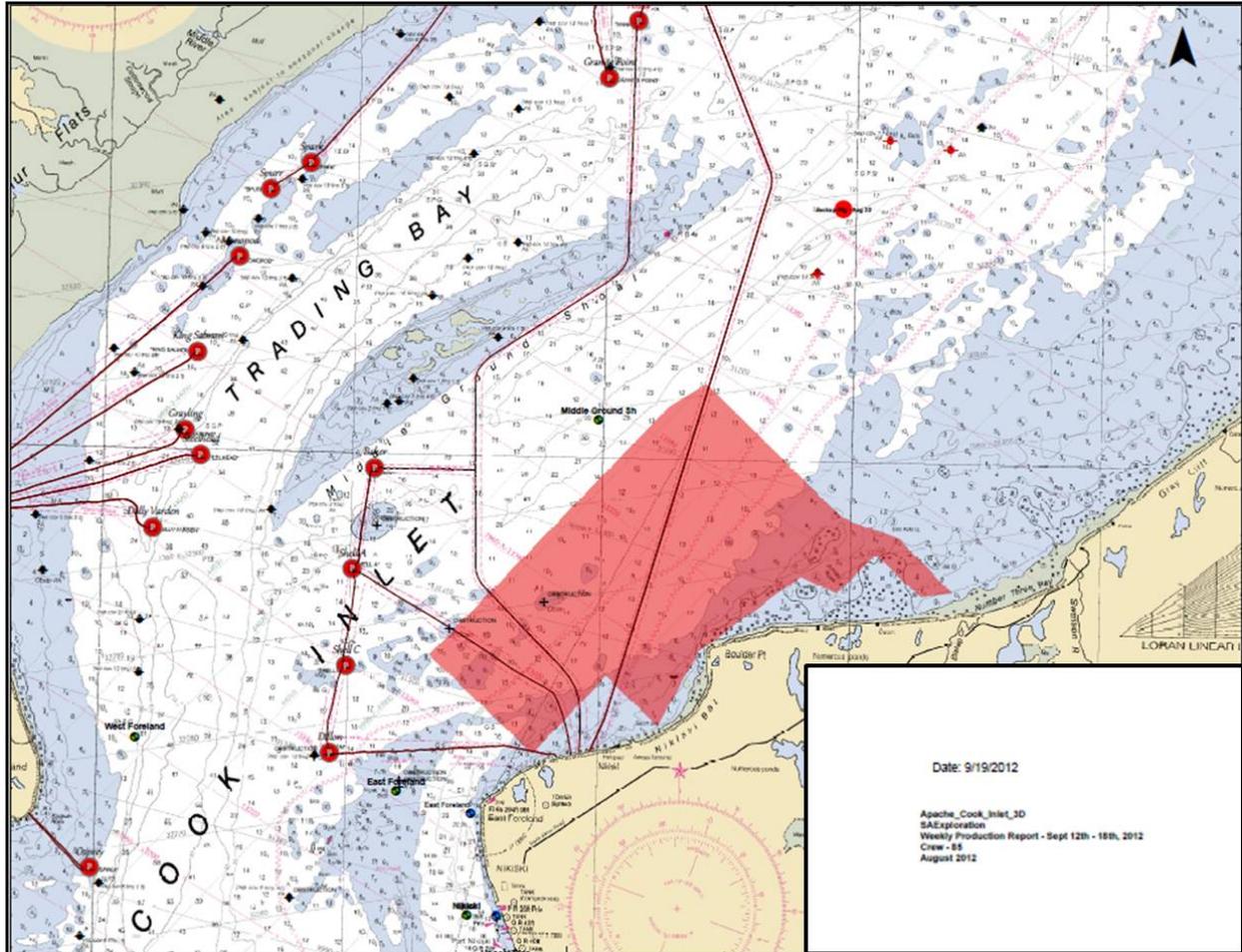


Figure 1. Operations moved easterly, along the eastern side of central Cook Inlet near the Nikiski/Kenai area (red polygon).

Table 3. Vessels operating for the Cook Inlet 3D Seismic Program.

Vessel	Vessel Purpose	Size	Documentation No.	Call Sign	Gross Tonnage
<i>M/V Arctic Wolf</i>	Source vessel	41 m x 9 m (135 ft x 30 ft)	687450	-	251
<i>M/V Peregrine Falcon</i>	Source vessel	26 m x 6 m (85 ft x 24 ft)	950245	WCZ6285	131
<i>M/V Miss Diane</i>	Node vessel	26 m x 6 m (85 ft x 20 ft)	1210779	WAV0779	53
<i>M/V Mark Stevens</i>	Node vessel	26 m x 6.7 m (85 ft x 22 ft)	1238385	WCZ-7941	81
<i>M/V Maxime</i>	Transfer vessel	21 m x 4.9 m (70 ft x 16 ft)	1196716	WAV6716	48
<i>M/V Dreamcatcher</i>	Mitigation vessel	26 m x 7.1 m (85 ft x 23 ft)	963070	WBN5411	100
<i>M/V Norseman I</i>	Housing Management	33 m x 8.5 m (108 ft x 28 ft)	553713	WDC-6817	197
<i>M/V Side Winder</i> ¹	Side scan sonar	11 m x 4 m (36.8 ft x 14 ft)	1091516	WCZ-6262	16
<i>M/V Sleeprobber</i> ²	Crew/Equipment Transport	-	-	-	-
<i>M/V My Marie</i> ³	Crew/Equipment Transport	-	-	-	-

¹The *M/V Side Winder* left the project area on September 19th.

²The *M/V Sleeprobber* arrived at the project area on September 3rd

³The *M/V My Marie* arrived at the project area on August 16th

3.0 MONITORING EFFORT

A total of 858.4 hours of monitoring effort took place from September 1-30, 2012 including visual vessel- and land-based (455.1 and 111.6 hours, respectively), passive acoustic monitoring (275.5 hours) and aerial surveys (16.2 hours; Table 3). The PSOs watched for marine mammals prior to and during seismic activity to monitor the 160 dB zone (9.5km). Opportunistic observations took place when applicable from the mitigation vessel and days when seismic activity did not take place.

Table 3. Total number of hours of monitoring per method.

Monitoring Method	Total No. of Hours
Visual Vessel-based	455.1
Visual Land-based	111.6
Passive Acoustic Monitoring	275.5
Aerial Survey	16.2
Total	858.4

3.1 Environmental Conditions

In general, the environmental conditions were conducive to appropriately monitor marine mammals during seismic operations. The sea state ranged from 0 to 4 with an occasional 5 or 6 on the Beaufort Sea State scale.

3.2 Marine Mammal Observations

A total of 65 marine mammal observations and 245 estimated individual animals were observed from September 1-30, 2012 using visual vessel- and land-based, acoustic and aerial survey methods. Details on the species sightings are described below and found in the “PSO Daily Reports.”

Visual Vessel- and Land-based Observations

Three marine mammal species were visually observed from vessel- or land-based stations during this month’s monitoring effort including the beluga whale, harbor porpoise and harbor seal (Table 4).

Table 4. Total of individuals and sighting per species from vessel- and land-based stations

Species	Estimated No. of Individuals Observed	No. of Sightings
Beluga Whale	25	5
Harbor Porpoise	12	8
Harbor Seal	69	36
Total	106	49

Beluga Whale

A total of approximately 25 beluga whales were observed on five different occasions. Belugas were observed swimming, traveling, milling and foraging.

Harbor Porpoise

A total of 12 harbor porpoise were observed on eight different occasions. Harbor porpoise were observed swimming, traveling, porpoising, and diving.

Harbor Seal

A total of 69 harbor seals were observed on 36 different occasions. Harbor seals were observed at the surface, swimming, traveling, diving, sinking and looking toward the vessels.

Acoustic Observations

No marine mammals were acoustically detected during this month’s monitoring effort.

Aerial Observations

Two species of marine mammals were observed during aerial surveys including the beluga whale and harbor seal (Table 5).

Table 5. Total of individuals and sighting per species from aerial surveys

Species	Estimated No. of Individuals Observed	No. of Sightings
Beluga Whale	~138	16
Harbor Seal	~1	1
Total	139	17

Beluga Whale

A total of approximately 138 individual beluga whales were observed on 16 different occasions during aerial surveys. Many of these individuals were likely resighted on several occasions. Beluga whales were observed surfacing, swimming, traveling and milling near the McArthur, Beluga, Theodore, Ivan and Susitna Rivers.

Harbor Seal

On September 12 during an aerial survey, one harbor seal was observed looking toward the aircraft near Middle River.

3.3 Marine Mammal Takes

During the month of September, there were eight Level B takes including three harbor porpoise and five harbor seals (Table 6). No other marine mammal species were taken during this time period. No cetaceans or pinnipeds were exposed to 180 or 190 dB, respectively. Harbor porpoise Level B takes occurred on September 1 at 8:09 and September 13 at 11:54 and 16:14. Harbor seal Level B takes occurred on September 14 at 16:49 and 19:04, September 18 at 18:44 and September 20 at 14:25 and 14:48. Details on these events are found below in Table 7 and the “PSO Daily Reports.”

Table 6. Number of marine mammal takes

Species	No. of Takes	Cumulative Level of Takes
Beluga whale	0	0
Killer whale	0	0
Harbor porpoise	3	4
Steller sea lion	0	0
Harbor seal	5	13

Table 7. Details on the Level B takes.

Date	Time	Species	No.	Behavior	Distance from Source Vessel (AW/PF)	Airgun Volume (AW/PF)
9/1/12	8:09	Harbor porpoise	1	Swim	2.6 km/3.2 km	2400 cui/240 cui
9/13/12	11:54	Harbor porpoise	1	Swim, travel, dive	8 km/1.4 km	2400 cui/0
9/13/12	16:14	Harbor porpoise	1	Porpoise	3.5 km/2.6 km	150cui/440 cui
9/14/12	16:49	Harbor seal	1	Surface, travel, sink	1.2 km/NA	1200 cui/0
9/14/12	19:04	Harbor seal	1	Swim	5.7 km/NA	1950 cui/0
9/18/12	18:44	Harbor seal	1	Swim, look, dive	6.4 km/1.2 km	150 cui/70cui
9/20/12	14:25	Harbor seal	1	Look, swim, travel, sink	3.91 km/600 m	300 cui/140 cui
9/20/12	14:48	Harbor seal	1	Swim, look, sink	5.9 km/7.1 km	2400 cui/440 cui

3.4 Implementation of Mitigation Measures

Mitigation measures that were implemented during the month of September include delay clearing safety zone (2), shut downs (1) and power downs (1; Table 8). There were no shut downs followed by a power down. Ramp up procedures also took place when initiating operations. Marine mammal monitoring (visual, acoustic and aerial) of the safety radii (monitoring zone extends 9.5 km) was ongoing throughout the month. Passive acoustic monitoring using an OTS hydrophone occurred at minimum at night during seismic operations. NMFS’s vessel operation and marine mammal viewing guidelines to minimize vessel and aircraft impacts were continually implemented. Airguns were discharged at depths greater than 2 m (~ 6.6 ft). Details on the implemented mitigation measures are described in the “PSO Daily Reports.”

Table 8. Number of implemented mitigation measures per species.

Species	Delay Clearing Safety Zone	Shut Down	Shut Down/Power Down	Power Down	None	Total
Beluga Whale	0	0	0	1	19	20
Killer Whale	0	0	0	0	0	0
Harbor Porpoise	1	1	0	0	6	8
Steller Sea Lion	0	0	0	0	0	0
Harbor Seal	1	0	0	0	36	37
Total	2	1	0	1	61	65

Aerial Survey

Aerial surveys continued to occur daily during the month of September. Aerial surveys were conducted with *Rediske Air* from a twin-engine Islander fixed-wing aircraft in Nikiski. The flight route typically departed from Nikiski, traveled across the inlet to the Susitna River, south to the McArthur River, transiting within 1 mile of the shoreline, followed by 2-4 transects spaced approximately 2 km apart over the project area and then returned to Nikiski (Figure 3).



Figure 3. Aerial surveys departed from Nikiski, traveled across the inlet to the Susitna River, south to the McArthur River and over the project area before returning to Nikiski (red polygon). Land-based observation took place at the OSK Bluff Site.

3.5 Implementation of Conservation Recommendations

The conservation recommendations described in the Biological Opinion issued by NMFS were not stated as a condition, but rather designed to minimize adverse effects to the Cook Inlet beluga whale from in-water noise generated by the airguns during the *Cook Inlet 3D Seismic Program*. At this time APACHE has not implemented any of the conservation recommendations suggested by NMFS. If any of the conservation recommendations are implemented, NMFS will be notified and the effectiveness of the recommendation will be reported.