

# MARINE MAMMAL MONITORING REPORT



## GUSTAVUS FERRY TERMINAL IMPROVEMENT PROJECT

*Final Plan Candidate 1 – 6/9/20*

Submitted by: Western Marine Construction, Inc.

Submitted to: Alaska Department of Transportation

## INTRODUCTION

### Purpose

Western Marine Construction, Inc. (WMC), was contracted by the Alaska Department of Transportation and Marine Facilities to reconfigure portions of the Gustavus Dock (Southeast Alaska; Icy Passage; Sec 19, T 40 S, R 59 E). This required repositioning and driving pilings, which produces above-water and underwater sounds considered potentially disturbing or harmful to certain marine species. Pursuant to the U.S. Marine Mammal Protection Act, the U.S. Department of Commerce (NMFS) developed harassment and injury limits for this project, for all cetaceans and pinnipeds known to occur in the area. These limits manifest as a set of zones within which harassment or injury could occur as a result of pile driving.

It was required that WMC hire and station observers onsite to monitor and record marine mammal presence during pile driving.

This report presents the results of observations on the distribution and abundance of marine mammals within NMFS harassment/injury boundaries during pile driving, March 9 – May 27, 2020 at the Gustavus Dock.

### Area Description

Icy Passage is a strait delimited by the Gustavus mainland to the north and Pleasant island to the South. The area is an integral part of the Larger Icy Strait, among the most productive waters in the world and the northern end of the Inside passage. Icy Passage provides a thoroughfare for transient marine mammals as well as occasional foraging sites for most of them. An attractor during this report period (early spring), especially for harbor seals, is the Salmon River estuary about 600m west of the Gustavus Dock. (**Figure 1**)

### Observers

WMC retained four marine mammal observers for the Gustavus project. They are Nat Drumheller, Greg Streveler, Nate Borson and Kathy Hocker (**Appendix I**)

## OBJECTIVES

These documents guided our work:

- 1) A Marine Mammal Monitoring Plan provided to WMC by HartCrowser, Inc. and given to us for initial guidance.
- 2) A submission by the U.S. Department of Commerce to the Federal Register, which sets injury (class A) and incidental or disturbance (Class B) “take” parameters for this project, and

prescribes general requirements for marine mammal monitoring. In cases of ambiguity, this document is considered controlling.

- 3) An incidental Harassment Authorization by NMFS, which further defines Class B take limits.

These documents define above-water and underwater sonic transmissions from pile driving as the source of impact to the subject species. Since energy signatures from use of vibratory and impact drivers differ, and individual species have unique sensitivities, Class A & B take zones vary accordingly (**Figure 2, Figure 3**).

Accordingly, there were two basic objectives of marine mammal observers' work. The first is to preclude driving that could result in a Class A take. The second is to provide a tally of incidental takes that occur as a result of driving activities.

Species monitored were humpback whale (*Megaptera novaeangliae*), Minke whale (*Balaenoptera acutorostrata*), killer whale (*Orcinus orca*), harbor porpoise (*Phocoena phocoena*), Dall's Porpoise (*Phocoenoides dalli*), Steller sea lion (*Eumetopias jubatus*), and harbor seal (*Phoca vitulina*).

## METHODS

Observations were made from the dock, with the observers moving from site to site as necessary for a good view and avoidance of construction activities. A polygon encompassing all observation sites is provided on a pictorial view of the dock along with the location of the base station (**Figure 1**). Coordinates of the base station were 58°23'20"N 135°43'49"W. Scopes, binoculars and the naked eye were used as appropriate.

For the initial days of the project, at least one observer was onsite and actively scoping the harassment and injury zones at any time that pile driving was occurring or potentially occurring. After that date, it was determined that two observers would be employed at all piledriving times.

Observations extended thirty minutes before and after every driving period, during which time all observations within the appropriate disturbance zone limits were noted on the form provided, by species, estimated distance from the pile being driven, and compass direction from the southwest corner of the dock (observers' central work station). If an individual was noted within five minutes of actual driving, it was considered a "take" the first time it was noted (where we were confident we were re-sighting an individual, it was counted as a take at most once per day).

If a significant portion of the disturbance zones was obscured by weather conditions, the portion was noted by the observer. This allowed a rough estimation of the number of animals actually present by extrapolation from the portion clearly visible.

Pile driving was to be shut down when a marine mammal approached the Level A zone for that species and type of driving. If a species of concern was noted approaching its respective injury zone, observers were to immediately halt all driving activities, until either the animal was seen to leave the injury zone or thirty minutes had passed since the last observation.

In addition, if visibility reduced to the class A limit for the most sensitive species (550m for impact driving or 20m for vibratory driving), observers halted pile driving. There was only one shutdown during the project, due to limited visibility, presented in **Table 4**.

Table 4: Shutdowns

REPORT #	START	END	DURATION	CAUSE	NOTES
23	04/14/20 09:36	04/14/20 11:35	1:59	Visibility	Fog

Observers were required by NMFS to record the daily start and end times for both driving types. Additionally, WMC requested that a daily tally of actual minutes of vibratory and Impact driving time be kept.

## RESULTS AND DISCUSSION

All marine mammal observational data are presented in Appendix II, **Table 6**. Each observation includes date, species, weather conditions, distance from driving activity (if it was occurring) compass bearing from the home station at the southwest corner of the dock, animal's activity, presence/type of driving activity, and whether and what type of take was observed.

### Class A takes

We observed no Class A takes for this project, for any species. Because observers were always stationed within 75 meters of project activities, and Class A take zones are very small (figures 3a and 3b), we are confident that no Class A takes occurred.

### Class B takes

We observed Class B takes for harbor seals, Steller sea lions, harbor porpoises, harbor seals, humpback whales, minke whales, and killer whales (**Table 1**). Because portions of Class B take zones extend to more than 2km from the observers' stations (**Figure 2**), some takes may have occurred without observation. Since viewing conditions were judged to be excellent or good during most observation periods, and the entirety of Class B zones were then within clear view, few such misses are thought to have occurred.

There were two periods of pile driving when viewing was judged to be inadequate for confident identification. For these, an estimate was constructed of the portion of zones that were adequately vs. inadequately viewed. Takes observed for each species during that period (from **Table 1**), along with the estimated adequate-visibility portions, were used to generate an extrapolated number of additional takes (**Table 2**). The adjusted take totals are given in **Table 3**.

Table 1: Observed Takes

	HARBOR SEAL	ORCA	SEA LION	MINKE	HARBOR PORPOISE	HUMPBACK	TOTAL
LEVEL B	83	13	38	4	3	2	143
LEVEL A	0	0	0	0	0	0	0
TOTAL	83	13	38	4	3	2	143

Table 1 summary. Detail in Appendix II, Table 1

Table 2: Additional Extrapolated Takes

	HARBOR SEAL	ORCA	SEA LION	MINKE	HARBOR PORPOISE	HUMPBACK	TOTAL
<b>LEVEL B</b>	2.9	0	0	0	0	0	2.9

Estimated additional takes are Level B, calculated from the percentage of the Level B harassment zone that was not visible during observed takes. Derivation is in Appendix II, Table 2.

Table 3: Estimated Total Takes

	HARBOR SEAL	ORCA	SEA LION	MINKE	HARBOR PORPOISE	HUMPBACK	TOTAL
<b>LEVEL B</b>	86	13	38	4	3	2	146
<b>LEVEL A</b>	0	0	0	0	0	0	0
<b>TOTAL</b>	86	13	38	4	3	2	146

Table 3 is the total estimated takes, summing observed takes from table 1 and extrapolated additional takes from table 2.

## Driving durations

Durations of daily driving periods and cumulative driving times are summarized in **Table 5**.

Table 5: Driving Periods and durations

DRIVING METHOD	DAYS	TOTAL HOURS	HOURS DRIVING
<b>IMPACT</b>	27	132:44	42:17
<b>VIBRATORY</b>	28	374:40	17:52

Table 5: summary of pile driving. Detail is in Appendix II

## Incidental observations

Observers are agreed that our methods do not allow us to draw any general conclusions about effects of pile-driving activities on the animals we observed. However, we did make some incidental observations that we felt should be included in this report.

- In general, marine mammals were considerably more frequently seen along the mainland shore of Icy Passage, where the project was located, than the Pleasant Island side. This may be due to the fact that the northern shoreline is highly estuarine, and may offer more food, such as sandlance, than does the steeper, rockier north shore of Pleasant Island—which also lacks major streams.
- On at least one occasion, a nearby humpback whale, minke whale or killer whale gave a sudden splash just as impact driving began. All these reactions were more than 1000m distance from the driving locus.

- Seals observed in the general vicinity of the dock (not within the shutdown zones) before pile driving periods appeared to become less evident after driving began.
  - Sea lions in “travel mode”—moving steadily in a given direction—seemed to pass by without noticeable deviation of course or behavior when driving was occurring. However, sea lions occasionally raised their heads high out of the water as driving started, as if startled or curious about the sound.
  - On one occasion, a sea lion approached the piledriving locus to within 5m of the 25m injury zone for that species during active impact driving. It showed considerable agitation but continued to circle the area at close range.
  - One significant sea lion attractant in the project area may have been the expectation of fish carcasses. In past summers, fishing boat operators have (illegally) fed sea lions from the dock. Observers for this project noted that as the floating dock sections were brought into place (and as the season progressed), some sea lions approached and lingered, observing the activity on the dock sections.
  - Sea otters occasionally remained within a few hundred meters of the dock during driving of both types.
  - A pair of habituated bald eagles often roosted on portions of the dock infrastructure during driving.
  - Gulls roosting on coastal margins sometimes moved farther to the periphery upon onset of impact driving.
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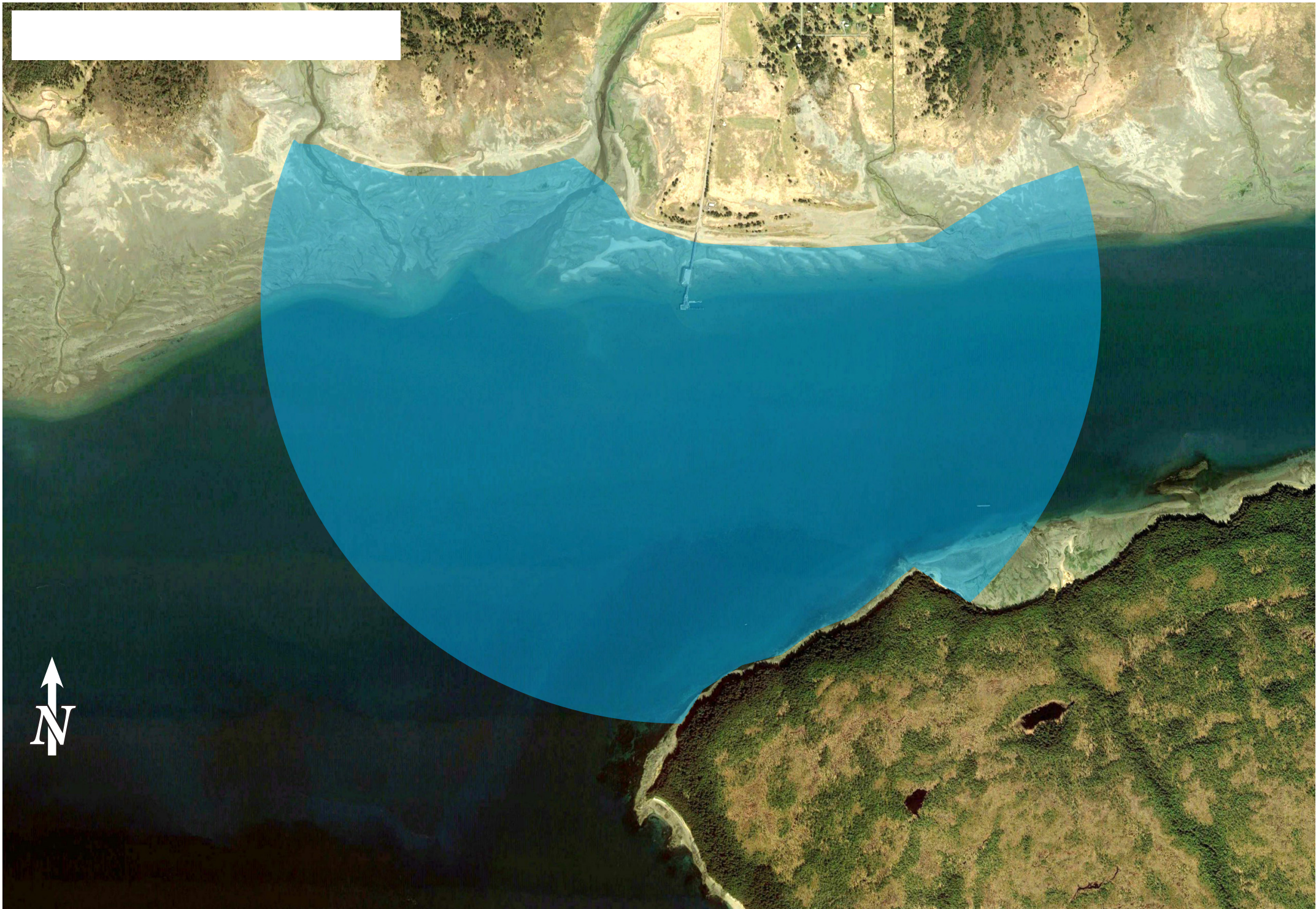
**Figure 1: Project Area and Observation Locations**

Monitors moved according to pile driving locations, to maximize view of monitoring zones.



Imagery from Google Earth

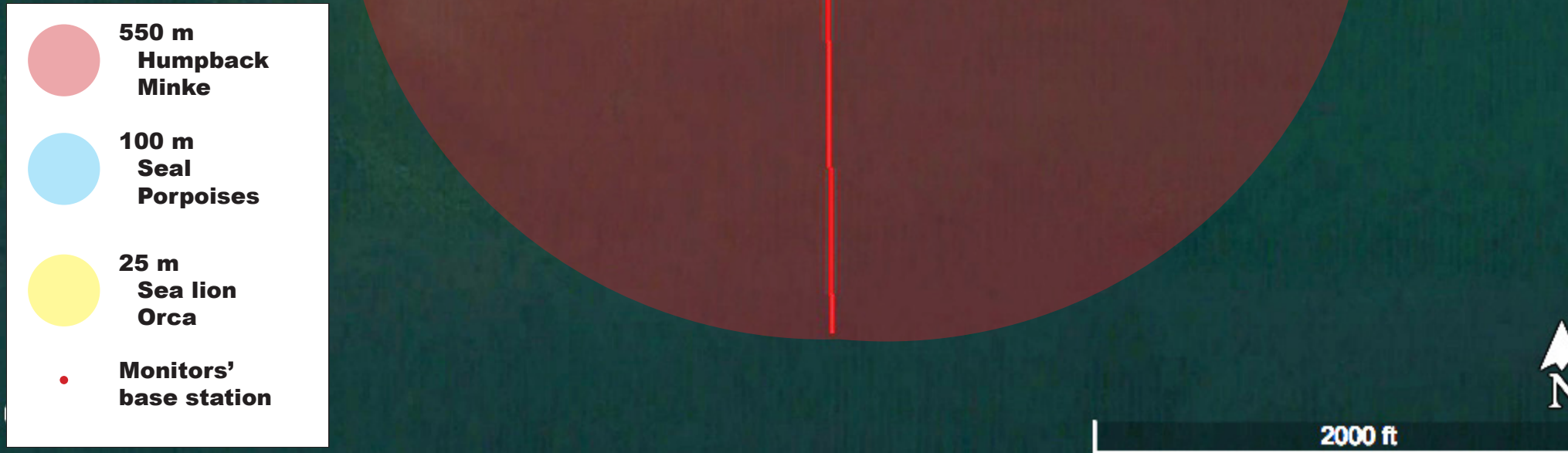






### Figure 3a: Impact Driving Shutdown Zones

Locations of shutdown zones varied according to locations of pile driving. This figure shows approximate total extent of all shutdown zones, for all pile driving locations.





### Figure 3b: Vibratory Driving Shutdown Zones

Locations of shutdown zones varied according to locations of pile driving. This figure shows approximate total extent of all shutdown zones, for all pile driving locations.



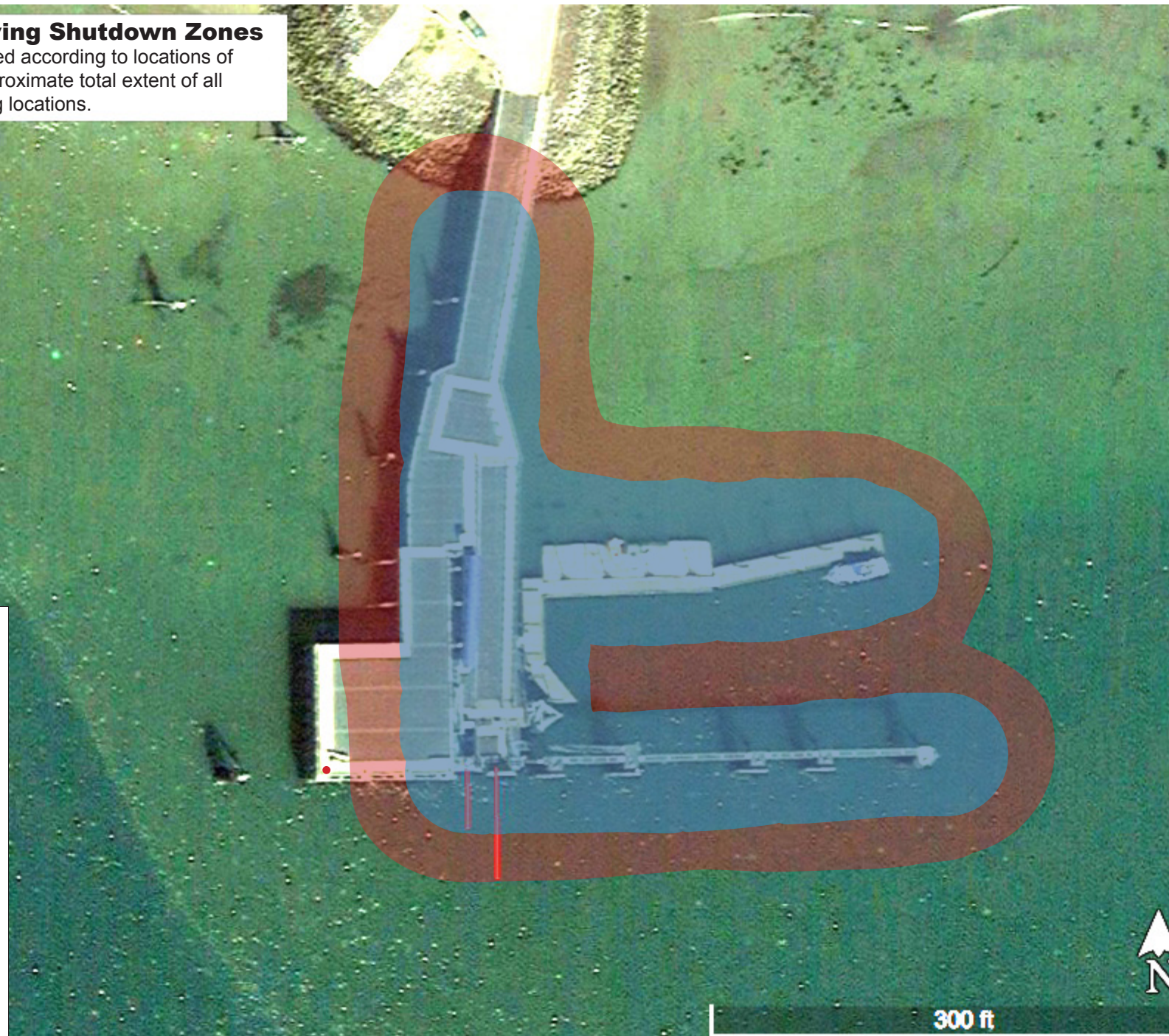
**20 m**  
**Humpback**  
**Minke**  
**Porpoises**



**10 m**  
**Seal**  
**Sea lion**  
**Orca**



**Monitors'**  
**base station**



## Appendix I Observer Qualifications

Nathaniel Drumheller (B.A., University of Washington) has lived in Gustavus 20 years. Work includes 13 field seasons in Glacier Bay as a National Park Service biological technician with 8 as a marine mammal observer.

Gregory Streveler (M.S., University of Wisconsin) is a former Park Service Supervisory Scientist and retired Natural Resources Consultant with 50 years' experience in Icy Strait natural history, including marine mammal observation.

Nathan Borson is an Information Technology Specialist with 15+ years' experience spotting and identifying Icy Strait marine mammals while guiding kayaking expeditions.

Katherine Hocker (B.S., Harvard; grad certificate, U.C. Santa Cruz) works as a self-employed naturalist and educator with extensive experience observing marine mammals in Southeast Alaska.

## APPENDIX II Data

This appendix contains printouts of data and analysis from workbook *Level of Takes*, derived from written observer reports like this sample:

#17

Date: 4/5/2020 MARINE MAMMAL OBSERVATION FORM Gustavus Dock - Project No. 68128/0003182

Obs #	Time	Weather	Species	# Seen	Distance/Direction	Behavior/Construction Activity	
1	0658	Exc.	H. Seal	1	1200m 100°	Floating/dove	other
2	0730	Exc.	H. Seal	1	800m 220°	Floating/dove	other
3	0742	Exc	H. Seal	1	1000m 270°	Floating/dove	Other
4	0820	Exc	H. Seal	1	120m 260°	Floating/dove	Other
5	0942	Exc	H. Seal	1	800m 300°	Floating, dove	Impact B
6	0950	Exc	H. Seal	1	1500m 240°	Floating, dove	Impact B
7A	1041	Exc	H. Seal	1	400m 290°	Swimming N	Impact B
7B	1105	Exc	H. Seal	1	400m 320°	Floating, dove	Impact-resight
8	1207	Exc	H. Seal	1	750m 200°	Floating, dove	Other

Start 0630 End 1530 Wind N5-W5 Cloud Cover 5% - 100% Precipitation 0

Page 1 of 1 Impact Driving Start Time 0913 End Time 1133 Vib Driving Start Time 1305 End Time 1457 Observer Streveler, Drumheller, Borson

elapsed 117 min impact 18 min vibratory hammer



## Report Metadata

One row for each day of observation, to include information common to all observations that day

Report #	Start	End	Duration	Wind	Cloud Cover	Precip	Observers	Pages	Notes
1	03/09/20 07:45	03/09/20 16:30	8:45	Variable N-SE	Cloudy	Light showers throughout day	ND		1
2	03/14/20 09:00	03/14/20 11:45	2:45	L	Clear		0 ND GS		1 Calm and sunny
3	03/17/20 12:30	03/17/20 16:35	4:05	L	Partly Cloudy		0 GS NB ND		1
4	03/18/20 07:30	03/18/20 18:00	10:30	L	100% L		ND GS NB		1 Data sheet includes when each observer was on duty.
5	03/19/20 07:00	03/19/20 12:45	5:45	L	Partly Cloudy		0 GS ND		1 Data sheet includes when each observer was on duty.
6	03/20/20 06:50	03/20/20 16:30	9:40	E 10 > SW 15-20 > M-SW	95%	Light mist	GS ND		1
7	03/21/20 07:05	03/21/20 17:00	9:55	SE 0-10	100%	Mist early > light to none	GS ND		1
8	03/23/20 06:45	03/23/20 17:55	11:10	NNE 20-25 > NE Mod	0%		0 GS ND		1 1' seas, E glare a.m.
9	03/24/20 12:30	03/24/20 17:05	4:35	SW 5 > SW L	0%		0 GS ND		1
10	03/25/20 07:45	03/25/20 14:10	6:25	ESE 0-10 > SE L > ESE M	95%		0 GS ND		1
11	03/26/20 09:15	03/26/20 17:45	8:30	SE 10 > E 10 > E Light	90%		0 GS ND		1
12	03/27/20 07:00	03/27/20 16:20	9:20	Light to none all day	100%	drizzle, fog, snow > light to moderate snow	GS ND		2 Poor visibility from ~11:00~13:00 no driving.
13	03/28/20 08:45	03/28/20 17:20	8:35	W 10 > N L	100%	none > light showers	GS ND NB		1
14	03/30/20 06:30	03/30/20 16:50	10:20	N-NE 20 > Moderate	40%		0 ND GS NB		1 1' seas
15	03/31/20 06:30	03/31/20 16:50	10:20	SSW 0-10 > S L	10%		0 ND GS NB		1
16	04/01/20 06:25	04/01/20 16:14	9:49	N 0-5 > SW 10	0%		0 ND GS		1 Observer break 09:30-12:00
17	04/05/20 06:30	04/05/20 15:30	9:00	N 5 > W 5	5% - 100%		0 ND GS NB		1
18	04/09/20 06:20	04/09/20 18:20	12:00	SE 15 > SW 20 > W 15	95% > 30%	Showers > none	ND GS NB		1
19	04/10/20 06:30	04/10/20 18:26	11:56	0 > SW-W 5-10	0%		0 ND GS NB		1
20	04/11/20 06:30	04/11/20 19:06	12:36	0 > light > SW 10	0%		0 ND GS NB KH		2
21	04/12/20 06:30	04/12/20 17:31	11:01	0 > SE 5 > SW 0-5	20% > 60% > 100%		0 ND GS NB KH		2
22	04/13/20 12:30	04/13/20 17:31	5:01	SE Light	100%	Light	ND KH		1
23	04/14/20 06:30	04/14/20 18:15	11:45	0 > SW Light	100% > partly cloudy	Mist early > 0	ND GS NB KH		2
24	04/15/20 06:30	04/15/20 18:13	11:43		0 100%, fog	drizzle	ND GS NB KH		1 Observer break 12:02-14:30

Level\_Of\_Takes.xlsx

25	04/16/20 06:30	04/16/20 15:48	9:18 0 > S Light	100%, fog	drizzle > 0	ND GS NB KH	2	Visibility @ 10:30 2000m to SE and N, ~1000 m to W. Slowly improved after 10:30, >2000m all directions by noon.
26	04/30/20 10:25	04/30/20 18:25	8:00 SE 20 Mod	100%	Occasional light rain	ND KH	1	
27	05/12/20 13:00	05/12/20 17:00	4:00 SW Mod	0		0 KH ND	1	
28	05/13/20 06:30	05/13/20 15:40	9:10 SW 0-10 > Mod	0 > mostly sunny		0 KH GS ND	1	Minke made 2 passes <= 100m from dock, 06:15-06:25. Observers off duty 09:15-11:00
29	05/15/20 15:00	05/15/20 17:30	2:30 SW 5-10	40%		0 KH GS	1	No driving
30	05/16/20 06:00	05/16/20 17:00	11:00 0 > SW Mod	5% > 10%		0 KH GS ND	2	
31	05/17/20 06:30	05/17/20 14:00	7:30 SW 5 > SW Mod	40% > 20%		0 KH GS ND	1	
32	05/18/20 06:30	05/18/20 11:00	4:30 SW Light	100%	Light	KH ND	1	
33	05/19/20 14:00	05/19/20 17:30	3:30 SW 20-25	100%	Heavy squalls	KH GS	1	
34	05/20/20 07:00	05/20/20 17:33	10:33 0 > Mod	100% > broken	Occasional drizzle > few showers	GS ND KH	2	
35	05/21/20 09:00	05/21/20 18:45	9:45 SW Light > SW Mod	90% > 80% > 20%		0 GS KH ND	2	
36	05/22/20 12:00	05/22/20 17:00	5:00 SW Light	50%		0 KH ND	1	
37	05/23/20 12:30	05/23/20 15:05	2:35 SE Light	100%	Light rain	GS ND	1	
38	05/24/20 14:00	05/24/20 17:31	3:31 SW Mod > SW Light	100%	Moderate > none	KH ND	2	
39	05/25/20 09:00	05/25/20 17:55	8:55 SW light > SW Mod	100% > 90-100%	Light showers > periods of rain	KH ND GS	2	Break 11:50-12:45. See notes on reverse of second sheet.
40	05/27/20 12:30	05/27/20 16:22	3:52 SW light	20%		0 KH ND	1	

Table 1: Observed Takes

See other sheets for estimated total takes, and all observations.

Takes	Column Labels							
Row Labels	Harbor Seal	Orca	Sea Lion	Minke	Harbor Porpoise	Humpback	Grand Total	
B	83	13	38		4	3	2	143
A	0	0	0		0	0	0	0
Grand Total	83	13	38		4	3	2	143

Stats for visible cells	Most recent 27-May-20 15:50	Total Obs 112	Total Takes 143	Min Distance 40
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Report #	Date	Take	Obs #	Species	# Seen	Distance (m Behavior	Hammer	Notes
1	09-March-20 00:00	A		Sea Lion		0		No takes this day. This record adds no data, but creates the (empty) row in the pivot table for Level A takes.
2	14-March-20 00:00		0					Driving but no takes this day
3	17-March-20 15:10	B		1 Sea Lion		2 200 Traveling	Vibratory	
4	18-March-20 08:50	B		3 Harbor Seal		1 1000 Floating	Vibratory	
4	18-March-20 11:20	B		6 Harbor Seal		1 300 Moving S	Vibratory	
4	18-March-20 13:15	B		8 Harbor Seal		1 700 Floating - River mouth	Vibratory	
4	18-March-20 13:58	B		9 Harbor Seal		1 500 Floating - dove	Vibratory	
5	19-March-20 00:00		0					Driving but no takes this day
6	20-March-20 00:00		0					Driving but no takes this day
7	21-March-20 16:05	B		8 Harbor Seal		1 800 Floating - dove	Vibratory	
8	23-March-20 14:01	B		7 Sea Lion		1 200 Swimming - W	Impact	
8	23-March-20 17:18	B		8 Harbor Seal		1 500 Floating - dove	Impact	
9	24-March-20 16:32	B	2A	Harbor Seal		1 1100 Floating - dove	Impact	
10	25-March-20 13:05	B		1 Harbor Seal		1 800 Swimming - E	Vibratory	
11	26-March-20 13:59	B	4B	Harbor Seal		1 1500 Floating - dove	Vibratory	
11	26-March-20 14:40	B		6 Harbor Seal		1 1200 Floating - dove	Impact	
12	27-March-20 08:55	B	3B	Harbor Seal		1 800 Loafing	Impact	
12	27-March-20 14:29	B	7C	Harbor Seal		1 400 Floating - dove	Impact	
12	27-March-20 14:36	B	6D	Harbor Seal		1 1000 Floating - dove	Impact	
12	27-March-20 14:36	B	7D	Harbor Seal		1 700 Floating - dove	Impact	
12	27-March-20 15:12	B	6E	Harbor Seal		1 1400 Floating - dove	Impact	



12	27-March-20 15:49 B	8A	Harbor Seal	4	1400 Resting - heads out	Impact	
13	28-March-20 09:57 B		5 Orca	3	1900 Moving fast - S	Vibratory	
13	28-March-20 11:00 B	7B	Harbor Seal	5	600 Floating	Vibratory	
13	28-March-20 15:15 B	9A	Harbor Seal	1	700 Floating - dove	Vibratory	
13	28-March-20 16:39 B	9B	Harbor Seal	2	1100 Resting - heads out	Vibratory	
14	30-March-20 09:57 B		3 Harbor Seal	1	350 Floating-dove	Impact	
14	30-March-20 10:40 B	4A	Sea Lion	1	500 Swimming west	Vibratory	
14	30-March-20 15:32 B		10 Harbor Seal	1	1000 Floating-diving	Vibratory	
15	31-March-20 13:55 B	7B	Harbor Seal	3	1900 Resting - heads out	Impact	
15	31-March-20 13:55 B		8 Harbor Seal	1	800 Head out-dove	Impact	
16	01-April-20 07:13 B		1 Harbor Seal	1	700 Floating	Vibratory	
16	01-April-20 08:50 B		2 Harbor Seal	1	1600 Hauled Out	Impact	
17	05-April-20 09:42 B		5 Harbor Seal	1	800 Floating-dove	Impact	
17	05-April-20 09:50 B		6 Harbor Seal	1	1500 Floating - dove	Impact	
17	05-April-20 10:41 B	7A	Harbor Seal	1	400 Swimming north	Impact	
18	09-April-20 14:03 B		5 Harbor Seal	1	300 Head out-dove	Impact	
18	09-April-20 16:53 B		6 Harbor Seal	1	1000 Head out-dove	Vibratory	
19	10-April-20 07:33 B		2 Harbor Seal	1	900 Head up	Impact	
19	10-April-20 07:41 B		3 Harbor Seal	1	1200 Floating	Impact	
19	10-April-20 07:51 B		4 Harbor Seal	1	900 Looking at dock.	Impact	
19	10-April-20 13:30 B		10 Harbor Seal	1	900 Bobbing	Vibratory	
19	10-April-20 13:47 B		11 Harbor Seal	1	250 Bobbing	Vibratory	
19	10-April-20 15:07 B		12 Harbor Seal	1	700 Floating - dove	Vibratory	
19	10-April-20 16:36 B		13 Harbor Seal	1	1000 Resting - head out	Vibratory	
20	11-April-20 10:01 B	5A	Harbor Seal	1	1000 Swimming	Vibratory	
20	11-April-20 13:16 B		9 Harbor Seal	1	400 Floating - dove	Vibratory	
20	11-April-20 17:55 B	11B	Harbor Seal	1	1700 Floating - dove	Impact	
21	12-April-20 11:06 B		6 Harbor Seal	1	1200 Head out	Vibratory	
21	12-April-20 12:00 B		7 Harbor Seal	1	800 Head out	Vibratory	
21	12-April-20 16:11 B		12 Harbor Seal	1	1750 Resting	Impact	
22	13-April-20 13:19 B	3B	Harbor Seal	1	450 Head out swimming NW	Impact	
22	13-April-20 13:36 B		4 Harbor Seal	1	1300 Head out swimming SE	Impact	
22	13-April-20 15:04 B	5B	Harbor Seal	1	100 Head out-dove going SW	Impact	Driving stopped 2 minutes prior to sighting in shut-down zone.

22	13-April-20 16:04	B	6B	Harbor Seal	1	900 Head out-dove	Impact	
22	13-April-20 16:30	B		8 Harbor Seal	1	700 Head out-dove	Impact	
22	13-April-20 16:55	B		9 Sea Lion	2	150 Heads out-dove going East	Vibratory	Did not see again. Likely same animals as sighting #1.
23	14-April-20 07:05	B		3 Harbor Seal	1	1600 Hauled out	Vibratory	
23	14-April-20 07:14	B	4A	Harbor Seal	1	800 Head up	Vibratory	
23	14-April-20 08:20	B		6 Sea Lion	1	250 Swimming slowly SE	Impact	
23	14-April-20 15:49	B		9 Harbor Seal	1	1500 Head out-resting	Vibratory	
23	14-April-20 15:59	B		10 Sea Lion	2	2000 Swimming SE	Impact	
23	14-April-20 16:36	B	11B	Harbor Seal	1	600 Head out-dove	Vibratory	
24	15-April-20 00:00		0					
25	16-April-20 10:16	B		1 Harbor Seal	1	550 Traveling east	Vibratory	
25	16-April-20 10:37	B		3 Harbor Seal	1	300 Head up	Impact	
25	16-April-20 10:38	B	4A	Harbor Seal	1	150 Traveling east	Impact	Possibly same animal as #3.
25	16-April-20 13:34	B		6 Orca	8	100 Traveling west, spread out.	Vibratory	Widely spaced. Closest was 100m from pile driving.
25	16-April-20 14:02	B	7B	Sea Lion	3	200 Generally traveling east, slowly	Vibratory	One was seen again about 80m from pile driving.
25	16-April-20 14:35	B	8B	Harbor Seal	2	1500 Resting heads up	Vibratory	
25	16-April-20 00:00	B		9 Sea Lion	1	1700 Traveling east	Vibratory	
26	30-April-20 00:00		0					
27	12-May-20 00:00		0					
28	13-May-20 15:09	B		8 Sea Lion	1	1400 Traveling west	Vibratory	
29	15-May-20 00:00		0					
30	16-May-20 07:04	B		4 Minke	1	1400 Feeding	Vibratory	
30	16-May-20 07:05	B		5 Sea Lion	1	1400 Traveling South	Vibratory	
30	16-May-20 07:05	B		6 Sea Lion	1	1800 Feeding	Vibratory	
30	16-May-20 07:21	B		7 Harbor Seal	1	800 Traveling west	Vibratory	
30	16-May-20 07:58	B		8 Harbor Seal	1	1900 Head up	Vibratory	
30	16-May-20 08:15	B		9 Harbor Seal	1	900 Floating/traveling east	Vibratory	
30	16-May-20 10:40	B		10 Harbor Porpoise	1	1700 up and down	Impact	
30	16-May-20 13:21	B		12 Sea Lion	1	1500 Traveling west	Vibratory	
30	16-May-20 15:07	B	13A	Minke	1	1800 Breach, ended up going west	Impact	

31	17-May-20 07:10 B	2A	Harbor Seal	1	700 Head up, dove	Impact	
31	17-May-20 07:37 B		3 Harbor Seal	1	1800 Head up	Impact	
32	18-May-20 09:39 B		7 Sea Lion	2	400 Traveling west	Impact	
32	18-May-20 10:31 B		8 Sea Lion	1	700 Head up, dove	Impact	
33	19-May-20 00:00	0					
34	20-May-20 13:34 B		10 Minke	1	1000 Traveling west	Impact	
34	20-May-20 13:53 B	8B	Harbor Seal	1	600 Head up, dove	Impact	
34	20-May-20 13:55 B		11 Sea Lion	1	500 Traveling west fast	Impact	
34	20-May-20 15:30 B		12 Sea Lion	1	600 Feeding	Impact	
35	21-May-20 12:19 B		6 Sea Lion	1	1800 Traveling west	Impact	
35	21-May-20 12:22 B		7 Harbor Seal	1	450 Head out	Impact	
35	21-May-20 12:36 B		8 Sea Lion	1	400 Feeding, generally going east	Impact	
35	21-May-20 12:45 B		9 Sea Lion	2	1000 Traveling west	Impact	
35	21-May-20 16:44 B	12B	Harbor Seal	1	250 Head up	Impact	
35	21-May-20 17:21 B	13A	Sea Lion	1	1300 Traveling west	Impact	
36	22-May-20 13:04 B	2B	Sea Lion	1	50 Surfaced one time 1 minute prior to pile driving. Did not see again.	Impact	
36	22-May-20 15:01 B	3B	Harbor Seal	1	150 Traveling West, generally	Impact	
37	23-May-20 13:30 B	5B	Harbor Seal	1	500 Head up	Impact	
37	23-May-20 13:34 B		6 Sea Lion	2	900 Heads up	Impact	
37	23-May-20 14:30 B	7C	Sea Lion	1	40 Closest approach. Circling around operation. See notes on data sheet.	Impact	
38	24-May-20 15:15 B	2C	Humpback	2	1500 Surfaced	Impact	Surfaced later at 15:35 feeding just beyond 2000m by Pleasant Island.
38	24-May-20 15:45 B		10 Sea Lion	1	1700 Traveling west	Impact	
38	24-May-20 15:15 B	9B	Orca	2	1200 Traveling east	Impact	
38	24-May-20 16:47 B		14 Harbor Porpoise	1	900 Traveling south	Impact	
38	24-May-20 16:27 B	13C	Sea Lion	2	50 Closest approach. Continued west past dock face.	Impact	See data sheet.



38	24-May-20 16:30 B	12B	Harbor Seal	1	400 Up off and on. Resting with head out.	Impact	
39	25-May-20 10:14 B	5B	Sea Lion	1	1500 Traveling west	Impact	
39	25-May-20 10:01 B	6A	Harbor Seal	1	250 Traveling north	Impact	
39	25-May-20 10:25 B	2C	Minke	1	1700 Traveling west	Impact	Seen at just over 2000m just prior to east and just after to west so decided it must have been in the zone at about this time and distance.
39	25-May-20 10:38 B		7 Sea Lion	1	100 Traveling southwest	Impact	
39	25-May-20 16:30 B	15,16	Harbor Seal	2	300 heads up	Impact	
40	27-May-20 13:26 B		4 Harbor Seal	1	1000 head up	Vibratory	
40	27-May-20 13:30 B		6 Harbor Seal	1	1800 Traveling east	Vibratory	
40	27-May-20 14:06 B	7A	Sea Lion	1	800 Slowly traveling east	Vibratory	
40	27-May-20 15:13 B	5B	Harbor Porpoise	1	1000 Surfacing	Vibratory	
40	27-May-20 15:50 B		9 Sea Lion	1	300 Traveling west	Vibratory	

Tables 1-3: Takes, Observed and Estimated Total

Includes observed takes plus extrapolated additional takes during periods of limited visibility

ADOT&PF must include extrapolation of the estimated takes by Level B harassment based on the number of observed exposures within the Level B harassment zone and the percentage of the Level B harassment zone that was not visible.  
From <<https://www.federalregister.gov/documents/2020/02/24/2020-03630/takes-of-marine-mammals-incident-to-specified-activities-taking-marine-mammals-incident-to-the>>

Table 1: Observed Takes

Row Labels	Harbor Seal	Orca	Sea Lion	Minke	Harbor Porpoise	Humpback	Grand Total
B	83	13	38	4	3	2	143
A	0	0	0	0	0	0	0
Grand Total	83	13	38	4	3	2	143

Table 2: Extrapolated Additional Takes

	Harbor Seal	Orca	Sea Lion	Minke	Harbor Porpoise	Humpback	Grand Total
Sum of Est. Add'l	2.9	0	0	0	0	0	2.9

All extrapolated takes are Level B; any Level A takes are observed, not extrapolated

Table 3: Estimated Total Takes summing the two tables above

	Harbor Seal	Orca	Sea Lion	Minke	Harbor Porpoise	Humpback	Grand Total
B	86	13	38	4	3	2	146
A	0	0	0	0	0	0	0
Grand Total	86	13	38	4	3	2	146

Invisible Zones

One row for each period and each species during which there was limited visibility and during which there were observed takes  
If there were no observed takes during a period of limited visibility, the extrapolation is also no takes.

Report #      Obs #      Visibl Visibility Visibility W    Visible area      % of total    Obs. Takes    Species      Est. Add'l

12	3b	1500	1500	1500
25	1	1000	1000	1000
Blank rows added to fill out pivot table				

5,137,838  
2,283,484

66.6%  
29.6%

1	Harbor Seal
1	Harbor Seal
0	Orca
0	Sea Lion
0	Minke
0	Harbor Porpo
0	Humpback

0.5  
2.4  
0.0  
0.0  
0.0  
0.0  
0.0





Extrapolated total takes *in table 3* were estimated by multiplying observed takes in the visible area by the ratio between the total take zone shown in green, and the visible area, during periods of limited visibility, excluding land from both areas.

Arc length of total take that is "land"	3,437 m
Perimeter of 2 km total take circle	12,583 m
Arc angle of excluded "land" wedge	98 degrees
"land wedge" percentage to exclude	27.3% from any circular visible area
Total take zone (green area on map)	7,717,571 square meters



Table 4: Shutdowns

Row Labels	Quantity	Time
Visibility	1	1:59
Grand Total	1	1:59

Report #	Start	End	Duration	Cause	Notes
23	04/14/20 09:36	04/14/20 11:35	1:59	Visibility	Fog

Table 5: Record of pile driving

One row per type of driving per day.

Total time in hours by type of driving

Method	Days	Total Hours	Hours Driving
Impact	27	132:44	42:17
Vibratory	28	374:40	17:52

Report #	Start	End	Interval	Driving	Hammer	Notes
1	03/09/20 08:20	03/09/20 16:00	7:40		Vibratory	Unknown minutes of actual driving
2	03/14/20 10:45	03/14/20 11:15	0:30	0:30	Vibratory	
3	03/17/20 13:00	03/17/20 16:05	3:05	02:20	Vibratory	
4	03/18/20 07:50	03/18/20 17:30	9:40	01:55	Vibratory	
5	03/19/20 07:50	03/19/20 12:15	4:25	00:50	Vibratory	
6	03/20/20 08:40	03/20/20 10:30	1:50	01:10	Impact	
6	03/20/20 07:50	03/20/20 16:00	8:10	01:05	Vibratory	
7	03/21/20 11:15	03/21/20 16:30	5:15	01:05	Vibratory	
8	03/23/20 08:00	03/23/20 13:57	5:57	00:35	Vibratory	
8	03/23/20 10:30	03/23/20 17:25	6:55	02:55	Impact	
9	03/24/20 13:10	03/24/20 16:32	3:22	00:25	Impact	
10	03/25/20 09:25	03/25/20 11:00	1:35	00:40	Vibratory	
11	03/26/20 10:55	03/26/20 17:15	6:20	03:00	Impact	
11	03/26/20 13:35	03/26/20 14:05	0:30	00:10	Vibratory	
12	03/27/20 09:00	03/27/20 15:50	6:50	02:05	Impact	Impact hammer broke down 15:50
13	03/28/20 09:35	03/28/20 16:50	7:15	01:05	Vibratory	
14	03/30/20 07:43	03/30/20 15:36	7:53	?	Vibratory	
14	03/30/20 08:20	03/30/20 15:36	7:16	?	Impact	
15	03/31/20 08:05	03/31/20 11:53	3:48	00:45	Vibratory	
15	03/31/20 13:51	03/31/20 16:18	2:27	01:08	Impact	
16	04/01/20 07:16	04/01/20 07:54	0:38	00:21	Vibratory	
16	04/01/20 08:27	04/01/20 08:57	0:30	00:22	Impact	
17	04/05/20 09:13	04/05/20 11:33	2:20	01:57	Impact	
17	04/05/20 13:05	04/05/20 14:57	1:52	00:18	Vibratory	
18	04/09/20 07:34	04/09/20 17:49	10:15	01:29	Impact	

18	04/09/20 13:06	04/09/20 17:08	4:02	00:38 Vibratory	
19	04/10/20 07:33	04/10/20 17:55	10:22	01:30 Impact	
19	04/10/20 13:34	04/10/20 17:15	3:41	00:36 Vibratory	
20	04/11/20 09:59	04/11/20 15:01	5:02	00:41 Vibratory	
20	04/11/20 15:44	04/11/20 18:36	2:52	02:25 Impact	
21	04/12/20 08:40	04/12/20 12:27	3:47	00:39 Vibratory	
21	04/12/20 14:48	04/12/20 17:01	2:13	01:44 Impact	
22	04/13/20 13:07	04/13/20 16:32	3:25	01:37 Impact	
22	04/13/20 15:35	04/13/20 17:01	1:26	00:11 Vibratory	
23	04/14/20 07:10	04/14/20 17:44	10:34	00:21 Vibratory	
23	04/14/20 08:32	04/14/20 17:14	8:42	01:15 Impact	
24	04/15/20 07:48	04/15/20 17:43	9:55	01:12 Impact	
24	04/15/20 10:45	04/15/20 17:11	6:26	00:18 Vibratory	
25	04/16/20 06:32	04/16/20 15:18	8:46	00:47 Vibratory	
25	04/16/20 07:34	04/16/20 11:06	3:32	00:47 Impact	
26	04/20/20 11:12	04/30/20 17:53	6:41	00:34 Vibratory	
27	05/12/20 15:36	05/12/20 16:29	0:53	00:11 Vibratory	
28	05/13/20 08:39	05/13/20 15:08	6:29	00:17 Vibratory	
30	05/16/20 07:03	05/16/20 13:34	6:31	00:44 Vibratory	
30	05/16/20 08:39	05/16/20 16:27	7:48	02:57 Impact	
31	05/17/20 07:15	05/17/20 10:41	3:26	00:57 Impact	
32	05/18/20 08:12	05/18/20 10:28	2:16	01:06 Impact	
33	05/19/20 16:03	05/19/20 16:57	0:54	00:49 Impact	
34	05/20/20 08:07	05/20/20 17:03	8:56	03:04 Impact	
35	05/21/20 10:52	05/21/20 18:12	7:20	03:21 Impact	Hammer not operating properly
36	05/22/20 13:05	05/22/20 15:45	2:40	00:59 Impact	Trouble getting hammer off piling
37	05/23/20 13:33	05/23/20 14:34	1:01	00:57 Impact	
38	05/24/20 15:15	05/24/20 17:01	1:46	01:05 Impact	
39	05/25/20 09:53	05/25/20 17:24	7:31	02:01 Impact	
40	05/27/20 13:23	05/27/20 15:32	2:09	00:16 Vibratory	

Table 6: ALL observations, including non-driving times

Stats for visible cells		Most recent 27-May-20 16:09		Total Obs 413	Total Seen 530	Min Distance 10	Highlighted cells = takes in limited visibility					
Report #	Obs #	Date	Wx	Species	# Seen	Distance (ft)	Direction	Behavior	Hammer	Take	Notes	
	1	1	09-March-20 11:57	Good	Harbor Seal	1	600	320	Resting, Dove, headed N	No		
	1	2	09-March-20 16:05	Good	Harbor Seal	1	800	170	Resting, Dove, headed W	No		
	2	1	14-March-20 09:20	Excellent	Harbor Seal	1	600	230	Resting, Dove	No		
	2	2	14-March-20 09:22	Excellent	Harbor Seal	1	800	140	Resting, Dove	No		
	2	3	14-March-20 10:10	Excellent	Harbor Seal	2	800	320	Resting	No		
	2 4a		14-March-20 10:22	Excellent	Harbor Seal	1	10	300	Traveling East, under dock	No	No shutdown (no driving)	
	2 4b		14-March-20 10:29	Excellent	Harbor Seal	1	400	90	Traveling East	No		
	2	5	14-March-20 11:40	Excellent	Harbor Seal	1	800	180	Resting, Dove	No		
	3	1	17-March-20 15:10	Excellent	Sea Lion	2	200	140	Traveling W/SW	Vibratory	B	Occasional vibing
	4	1	18-March-20 07:45	Excellent	Harbor Seal	1	1000	140	Floating	No		
	4	2	18-March-20 08:00	Excellent	Harbor Seal	1	800	210	Floating	No		Possible resight of 1
	4	3	18-March-20 08:50	Excellent	Harbor Seal	1	1000	170	Floating	Vibratory	B	Possible resight of 1 or 2
	4	4	18-March-20 09:40	Excellent	Harbor Seal	1	800	200	Floating	No		
	4	5	18-March-20 10:10	Excellent	Harbor Seal	1	800	120	Floating	No		
	4	6	18-March-20 11:20	Excellent	Harbor Seal	1	300	340	Moving S	Vibratory	B	Occasional vibing
	4	7	18-March-20 13:00	Excellent	Harbor Seal	1	700	80	Floating, dove	No		Lunch break
	4	8	18-March-20 13:15	Excellent	Harbor Seal	1	700	290	Floating	Vibratory	B	
	4	9	18-March-20 13:15	Excellent	Harbor Seal	1	500	230	Floating, dove	Vibratory	B	
	4	10	18-March-20 14:00	Excellent	Harbor Seal	1	800	150	Floating, dove	No		
	4	11	18-March-20 14:18	Excellent	Harbor Seal	1	1100	220	Floating, dove	No		
	4	12	18-March-20 15:04	Excellent	Harbor Seal	1	500	90	Floating, dove	No		
	4	13	18-March-20 16:23	Excellent	Harbor Seal	1	800	280	Floating, dove	No		
	4	14	18-March-20 17:00	Excellent	Harbor Seal	1	700	190	Floating, dove	No		
	4	15	18-March-20 17:50	Excellent	Harbor Seal	1	500	120	Floating, dove	No		
	5	1	19-March-20 07:15	Excellent	Harbor Seal	1	250	330	Slowly swimming NW	No		
	5 1a		19-March-20 07:26	Good E glare	Harbor Seal	1	200	340	Slowly swimming NW	No		
	5	2	19-March-20 08:30	Good E glare	Sea Lion	2	90	280	Swimming WSW	No		Just finished vibing. Additional notes on reverse of data sheet.
	6		20-March-20 16:30			1						No obs (sea otters only)



7	1	21-March-20 10:35	Excellent	Harbor Seal	1	1500	280 Floating, dove	No	
7	2	21-March-20 10:53	Excellent	Harbor Seal	1	1000	240 Swimming, Dove, headed SE	No	
7	3	21-March-20 11:40	Excellent	Harbor Seal	1	500	210 Swimming, Dove, headed SE	No	
7	4	21-March-20 12:01	Excellent	Sea Lion	1	200	280 Swimming, Dove, headed NW	No	Lunch
7	5	21-March-20 12:51	Excellent	Harbor Seal	1	80	310 Floating, dove	No	No shutdown
7	6	21-March-20 12:58	Excellent	Sea Lion	1	90	170 Swimming W	No	No shutdown
7	7	21-March-20 16:05	Excellent	Harbor Seal	1	800	160 Floating, dove	No	
7	8	21-March-20 16:05	Good	Harbor Seal	1	800	160 Floating, dove	Vibratory	B
8	1	23-March-20 07:43	Good	Sea Lion	1	500	150 Swimming WNW	No	Large animal
8	2	23-March-20 11:38	Good	Harbor Seal	1	750	340 Head up, dove	No	
8	3	23-March-20 11:45	Good	Sea Lion	1	600	100 Swimming W, dove	No	Not seen again
8	4	23-March-20 13:36	Good	Harbor Seal	1	700	150 Floating, dove	No	
8	5	23-March-20 13:41	Good	Harbor Seal	1	500	300 Floating, dove	No	
8	6	23-March-20 14:05	Good	Harbor Seal	1	1100	170 Floating, dove	No	
8	7	23-March-20 14:01	Good	Sea Lion	1	200	180 Swimming - W	Impact	B
8	8	23-March-20 17:18	Good	Harbor Seal	1	500	290 Floating, dove	Impact	B
8	9	23-March-20 17:34	Good	Harbor Seal	1	450	210 Floating, dove	No	
8 10a		23-March-20 17:48	Good	Sea Lion	1	75	290 Swimming W, dove	No	
8 10b		23-March-20 17:52	Good	Sea Lion	1	300	280 Feeding	No	
8	11	23-March-20 17:54	Good	Harbor Seal	1	120	280 Floating, dove	No	
9	1	24-March-20 14:45	Excellent	Harbor Seal	1	1800	160 Swimming E	No	
9 2a		24-March-20 16:32	Excellent	Harbor Seal	1	1100	290 Floating, dove	Impact	B
9 2b		24-March-20 16:58	Excellent	Harbor Seal	1	1000	290 Floating, dove	No	
10	1	25-March-20 10:05	Good	Harbor Seal	1	800	100 Swimming E	Vibratory	B
10	2	25-March-20 11:05	Good	Harbor Seal	1	750	310 Floating, dove	No	
10	3	25-March-20 11:51	Good	Harbor Seal	1	200	330 Floating, dove	No	
10	4	25-March-20 12:03	Good	Harbor Seal	1	1200	290 Floating, dove	No	
10	5	25-March-20 12:14	Good	Harbor Seal	1	1000	260 Floating, dove	No	
10 6a		25-March-20 12:52	Good	Harbor Seal	1	170	160 Floating, dove	No	
10	7	25-March-20 12:52	Good	Sea Lion	1	30	190 Swimming W, dove	No	
10 6b		25-March-20 12:52	Good	Harbor Seal	1	150	230 Floating, dove	No	
11	1	26-March-20 11:58	Good	Sea Lion	1	500	170 Swimming W	No	Young animal. Getting ready to
11	2	26-March-20 12:45	Excellent	Harbor Seal	1	700	320 Floating, dove	No	
11	3	26-March-20 13:27	Excellent	Harbor Seal	1	900	130 Floating, dove	No	

11	4a	26-March-20 13:49	Excellent	Harbor Seal	1	1300	110 Floating, dove	No		
11	4b	26-March-20 13:59	Excellent	Harbor Seal	1	1500	120 Floating, dove	Vibratory	B	
11	5	26-March-20 14:07	Excellent	Harbor Seal	1	1000	180 Floating, dove	No		
11	6	26-March-20 14:40	Excellent	Harbor Seal	1	1200	230 Floating, dove	Impact	B	
12	1	27-March-20 07:10	Good, light fog	Harbor Seal	1	400	200 Easing W	No		
12	2	27-March-20 07:20	Good, light fog	Harbor Seal	1	800	160 Easing E	No		
12	3	27-March-20 07:25	1000m visibility	Harbor Seal	1	700	320 In river amid feeding gulls	No		
12	3a	27-March-20 07:40	1500m visibility	Harbor Seal	1	700	320 In river amid feeding gulls	No		
12	3b	27-March-20 08:55	1500m visibility	Harbor Seal	1	800	290 Loafing	Impact	B	quit before driving, couldn't find after driving started.
12	4	27-March-20 13:27	Good	Harbor Seal	1	1200	130 Floating, dove	No		
12	5a	27-March-20 13:31	Good	Harbor Seal	1	500	300 Floating, dove	No		
12	6a	27-March-20 13:35	Good	Harbor Seal	1	300	70 Floating, dove	No		
12	6b	27-March-20 13:45	Good	Harbor Seal	1	200	90 Floating, dove	No		
12	6c	27-March-20 13:50	Good	Harbor Seal	1	170	140 Floating, dove	No		
12	5b	27-March-20 13:52	Good	Harbor Seal	1	700	330 Floating, dove	No		
12	7a	27-March-20 14:05	Good	Harbor Seal	1	300	290 Floating, dove	No		
12	7b	27-March-20 14:14	Good	Harbor Seal	1	600	290 Floating, dove	No		
12	7c	27-March-20 14:29	Good	Harbor Seal	1	400	290 Floating, dove	Impact	B	
12	6d?	27-March-20 14:36	Good	Harbor Seal	1	1000	290 Floating, dove	Impact	B	
12	7d	27-March-20 14:36	Good	Harbor Seal	1	700	280 Floating, dove	Impact	B	
12	6e?	27-March-20 15:12	Good	Harbor Seal	1	1400	280 Floating, dove	Impact	B	
12	8a	27-March-20 15:49	Good	Harbor Seal	4	1400	290 Head up, resting	Impact	B	
12	8b	27-March-20 16:15	Good	Harbor Seal	3	1400	290 Head up, resting	No		3 continue to rest
13	1	28-March-20 09:03	Excellent	Harbor Seal	1	600	320 Swimming S	No		
13	2	28-March-20 09:06	Excellent	Harbor Seal	1	1500	90 Floating	No		
13	3	28-March-20 09:08	Excellent	Minke Whale	1	1200	210 Swimming E	No		
13	3a	28-March-20 09:10	Excellent	Minke Whale	1	1800	100 Swimming E	No		
13	4	28-March-20 09:45	Excellent	Orca	2	2000	190 Milling on track of minke	No		Young males
13	5	28-March-20 09:57	Excellent	Orca	3	1900	140 Swimming E fast	Vibratory	B	7 total seen when outside
13	6	28-March-20 10:08	Excellent	Harbor Seal	1	600	240 Floating	No		
13	7	28-March-20 10:10	Excellent	Harbor Seal	5	700	270 Up and down	No		
13	7a	28-March-20 10:23	Excellent	Harbor Seal	5	500	300 Drifting E	No		
13	6a?	28-March-20 10:30	Excellent	Harbor Seal	1	600	240 Floating	No		

13 7b		28-March-20 11:00	Excellent	Harbor Seal	5	600	290 Floating	Vibratory	B
	8	28-March-20 13:10	Excellent	Sea Lion	1	1500	90 Swimming N	No	
13 9a		28-March-20 15:15	Good	Harbor Seal	1	700	310 Floating, dove	Vibratory	B
13 9b?		28-March-20 16:39	Good	Harbor Seal	2	1100	290 Head out, resting	Vibratory	B
14	1	30-March-20 06:45	Excellent	Harbor Seal	1	1200	290 Floating	No	
14	2	30-March-20 06:47	Excellent	Harbor Seal	1	700	300 Swimming S	No	
14	3	30-March-20 09:57	Good	Harbor Seal	1	350	40 Floating, dove	Impact	B
14 4a		30-March-20 10:40	Good	Sea Lion	1	500	170 Swimming W	Vibratory	B
14 4b?		30-March-20 11:14	Good	Sea Lion	1	1800	200 Feeding	No	
14	5	30-March-20 12:55	Good	Harbor Seal	1	500	60 Floating, dove	No	
14	6	30-March-20 13:05	Good	Harbor Seal	3	700	310 Floating, diving	No	
14	7	30-March-20 13:53	Good	Harbor Seal	4	500	310 Floating, diving	No	
14	8	30-March-20 13:54	Good	Harbor Seal	3	150	320 Floating, dove	No	
14	9	30-March-20 14:15	Good	Harbor Seal	1	1500	130 Floating, dove	No	
14	10	30-March-20 15:32	Good	Harbor Seal	1	1000	280 Floating, diving	Vibratory	B
15	1	31-March-20 06:58	Excellent	Harbor Seal	1	1800	170 Swimming W	No	
15	2	31-March-20 07:17	Excellent	Harbor Seal	2	700	320 Heads up	No	
15	3	31-March-20 07:30	Good, E glare	Harbor Seal	1	300	280 Swimming S	No	
15 3a		31-March-20 08:32	Excellent	Harbor Seal	1	900	270 Heads up	No	
15	4	31-March-20 09:25	Excellent	Harbor Seal	1	500	290 Heads up	No	
15	5	31-March-20 09:35	Excellent	Harbor Seal	1	200	320 Swimming E	No	
15	6	31-March-20 12:20	Excellent	Harbor Seal	1	1800	210 Floating, dove	No	
15 7a		31-March-20 13:40	Excellent	Harbor Seal	3	1900	280 Head up, resting	No	
15 7b		31-March-20 13:55	Excellent	Harbor Seal	3	1900	280 Head up, resting	Impact	B
15	8	31-March-20 13:55	Excellent	Harbor Seal	1	800	300 Head up, dove	Impact	B
16	1	01-April-20 07:13	Good, E glare	Harbor Seal	1	700	310 Floating	Vibratory	B
16	2	01-April-20 08:50	Good, E glare	Harbor Seal	1	1600	240 Hauled Out	Impact	B
16	3	01-April-20 15:30	Good	Harbor Seal	1	900	160 Swimming S	No	
17	1	05-April-20 06:58	Excellent	Harbor Seal	1	1200	100 Floating, dove	No	
17	2	05-April-20 07:30	Excellent	Harbor Seal	1	800	220 Floating, dove	No	
17	3	05-April-20 07:42	Excellent	Harbor Seal	1	1000	270 Floating, dove	No	
17	4	05-April-20 08:20	Excellent	Harbor Seal	1	120	260 Floating, dove	No	
17	5	05-April-20 09:42	Excellent	Harbor Seal	1	800	300 Floating, dove	Impact	B
17	6	05-April-20 09:50	Excellent	Harbor Seal	1	1500	240 Floating, dove	Impact	B

17 7a		05-April-20 10:41	Excellent	Harbor Seal	1	400	290 Swimming north	Impact	B	
17 7b		05-April-20 11:05	Excellent	Harbor Seal	1	400	320 Floating, dove	No		Impact driving, not counting
17	8	05-April-20 12:07	Excellent	Harbor Seal	1	750	200 Floating, dove	No		
18	1	09-April-20 07:00	Fair	Harbor Seal	1	300	80 Head up	No		
18	2	09-April-20 11:54	Good	Harbor Seal	1	150	30 Floating, diving	No		
18	3	09-April-20 12:30	Good	Orca	10	300 70-280	Hunting, traveling fast, widely	No		
18	4	09-April-20 12:52	Good	Sea Lion	1	100	90 Swimming N	No		
18	5	09-April-20 14:03	Fair	Harbor Seal	1	300	Head out-dove	Impact	B	
18	6	09-April-20 16:53	Fair	Harbor Seal	1	1000	Head out-dove	Vibratory	B	
19	1	10-April-20 06:54	Excellent	Harbor Seal	1	1900	150 Floating	No		
19	2	10-April-20 07:33	Good, glare	Harbor Seal	1	900	100 Head up	Impact	B	
19	3	10-April-20 07:41	Good, glare	Harbor Seal	1	1200	190 Floating	Impact	B	
19	4	10-April-20 07:51	Good, glare	Harbor Seal	1	900	80 Looking at dock.	Impact	B	Possible resight counted as take
19 5a		10-April-20 11:22	Excellent	Harbor Seal	1	1200	250 Head up, dove	No		
19	6	10-April-20 12:47	Excellent	Minke Whale	1	900	180 Swimming S	No		
19	7	10-April-20 12:03	Excellent	Harbor Seal	1	300	70 Head up, dove	No		
19 5b		10-April-20 12:10	Excellent	Harbor Seal	1	500	240 Head up, dove	No		
19	8	10-April-20 12:21	Excellent	Harbor Seal	1	600	290 Head up, dove	No		
19	9	10-April-20 12:22	Excellent	Harbor Seal	1	250	150 Head up, dove	No		
19	10	10-April-20 13:30	Excellent	Harbor Seal	1	900	100 Bobbing	Vibratory	B	
19	11	10-April-20 13:47	Excellent	Harbor Seal	1	250	260 Bobbing	Vibratory	B	
19	12	10-April-20 15:07	Excellent	Harbor Seal	1	700	320 Floating, dove	Vibratory	B	
19	13	10-April-20 16:36	Excellent	Harbor Seal	1	1000	300 Head out, resting	Vibratory	B	
20	1	11-April-20 06:40	Good, glare	Harbor Seal	1	900	270 Head up	No		
20	2	11-April-20 07:47	Good, E glare	Harbor Seal	1	1700	140 Swimming E	No		
20	3	11-April-20 08:01	Good, E glare	Harbor Seal	1	1000	110 Floating SW	No		
20	4	11-April-20 08:06	Excellent	Harbor Seal	1	900	200 Head up	No		Vibratory driving for 2 sec not counted as take
20 4a		11-April-20 08:31	Excellent	Harbor Seal	1	900	215 Floating	No		
20 4b		11-April-20 09:34	Excellent	Harbor Seal	1	400	185 Swimming W	No		
20	5	11-April-20 09:50	Excellent	Harbor Seal	1	1000	90 Floating	No		
20 5a		11-April-20 10:01	Excellent	Harbor Seal	1	1000	90 Swimming	Vibratory	B	
20	6	11-April-20 10:57	Excellent	Sea Lion	1	500	230 Swimming E	No		
20	7	11-April-20 11:01	Excellent	Harbor Seal	1	900	200 Floating, dove	No		

20	8	11-April-20 11:30	Excellent	Harbor Seal	1	500	150 Floating, dove	No		
20	9	11-April-20 13:16	Good	Harbor Seal	1	400	80 Floating, dove	Vibratory	B	
20 10a		11-April-20 15:09	Good	Harbor Seal	1	700	110 Floating, dove	No		
20 10b		11-April-20 15:37	Good	Harbor Seal	1	600	120 Floating, dove	No		
20 11a		11-April-20 15:57	Good	Harbor Seal	2	2200	290 Head up, floating	No		Impact driving, not counting as take due to distance
20 11b		11-April-20 17:55	Good	Harbor Seal	1	1700	300 Floating, dove	Impact	B	
20 11c		11-April-20 18:01	Good	Harbor Seal	1	2200	290 Resting	No		Impact driving, not counting as take due to distance
21	1	12-April-20 06:43	Good, E glare	Harbor Seal	1	250	360 Swimming E	No		
21 1a		12-April-20 06:51	Good, E glare	Harbor Seal	1	400	70 Floating	No		
21	2	12-April-20 09:14	Excellent	Sea Lion	2	250	280 Floating SW	No		
21	3	12-April-20 09:10	Excellent	Harbor Seal	1	500	280 Swimming E	No		
21 2a		12-April-20 09:16	Excellent	Sea Lion	1	300	110 Swimming E	No		
21 2b		12-April-20 09:30	Excellent	Sea Lion	1	1500	100 Swimming E	No		
21	4	12-April-20 10:27	Excellent	Harbor Seal	1	1200	120 Floating	No		
21	5	12-April-20 10:46	Excellent	Harbor Seal	1	1200	220 Head up	No		
21	6	12-April-20 11:06	Excellent	Harbor Seal	1	1200	210 Head up	Vibratory	B	
21	7	12-April-20 12:00	Excellent	Harbor Seal	1	800	220 Head up, dove	Vibratory	B	
21	8	12-April-20 12:48	Excellent	Harbor Seal	1	200	300 Head up, dove	No		
21	9	12-April-20 14:03	Excellent	Harbor Seal	1	1500	130 Head up, dove	No		
21	10	12-April-20 14:05	Excellent	Harbor Seal	1	1700	160 Head up, dove	No		
21	11	12-April-20 14:34	Excellent	Harbor Seal	1	600	80 Head up, dove	No		
21	12	12-April-20 16:11	Excellent	Harbor Seal	1	1750	280 Resting	Impact	B	
22	1	13-April-20 12:50	Good	Sea Lion	2	400	270 Floating, moving slowly N	No		
22	2	13-April-20 12:52	Good	Harbor Porpoise	1	500	160 Swimming multiple directions	No		
22 3a		13-April-20 13:14	Good	Harbor Seal	1	900	170 Head out, swimming W, dove	No		
22 3b		13-April-20 13:19	Good	Harbor Seal	1	450	230 Head out swimming NW	Impact	B	
22	4	13-April-20 13:36	Good	Harbor Seal	1	1300	210 Head out swimming SE	Impact	B	
22 5a		13-April-20 14:55	Excellent	Harbor Seal	1	400	80 Head up, dove, heading S	No		
22 5b		13-April-20 15:04	Excellent	Harbor Seal	1	100	70 Head out-dove going SW	Impact	B	Driving stopped 2 minutes prior to sighting in shut-down zone.
22 6a		13-April-20 15:43	Good	Harbor Seal	1	1000	290 Head up, dove	No		
22	7	13-April-20 15:55	Good	Harbor Seal	1	2000	130 Head up, dove	No		



22 6b		13-April-20 16:04 Good	Harbor Seal	1	900	290 Head out-dove	Impact	B	
22	8	13-April-20 16:30 Good	Harbor Seal	1	700	310 Head out-dove	Impact	B	
22	9	13-April-20 16:55 Good	Sea Lion	2	150	270 Heads out-dove going East	Vibratory	B	Did not see again. Likely same animals as sighting #1.
23	1	14-April-20 06:43 Fair, mist	Harbor Seal	1	800	240 Head up	No		
23	2	14-April-20 06:51 Excellent	Harbor Porpoise	1	800	270 Swimming SW	No		
23	3	14-April-20 07:05 Excellent	Harbor Seal	1	1600	290 Hauled out	Vibratory	B	
23 4a		14-April-20 07:14 Excellent	Harbor Seal	1	800	180 Head up	Vibratory	B	
23 4b		14-April-20 07:51 Excellent	Harbor Seal	1	200	290 Head up	No		
23	5	14-April-20 08:05 Excellent	Sea Lion	2	100-800	various Swimming E-W, circled dock	No		
23	6	14-April-20 08:20 Excellent	Sea Lion	1	250	90 Swimming slowly SE	Impact	B	
23	7	14-April-20 11:30 Good	Sea Lion	4	100	260 Swimming SE	No		Fog shutdown
23	8	14-April-20 14:55 Excellent	Harbor Seal	1	1000	160 Head up, dove	No		
23	9	14-April-20 15:49 Excellent	Harbor Seal	1	1500	280 Head out, resting	Vibratory	B	
23	10	14-April-20 15:59 Excellent	Sea Lion	2	2000	230 Swimming SE	Impact	B	
23 11a		14-April-20 16:30 Excellent	Harbor Seal	1	1500	100 Head up, dove	No		
23 11b		14-April-20 16:36 Excellent	Harbor Seal	1	600	110 Head up, dove	Vibratory	B	
24	1	15-April-20 10:17 Poor, fog	Harbor Seal	1	900	270 Head up	No		
25	1	16-April-20 10:16 Fair, fog	Harbor Seal	1	550	90 Swimming E	Vibratory	B	
25	2	16-April-20 10:25 Fair	Harbor Seal	1	200	250 Swimming W	No		
25	3	16-April-20 10:37 Fair	Harbor Seal	1	300	280 Head up	Impact	B	
25 4a		16-April-20 10:38 Good	Harbor Seal	1	150	170 Swimming E	Impact	B	Possibly same animal as #3.
25 4b		16-April-20 10:44 Good	Harbor Seal	1	600	90 Head up, dove	No		
25	5	16-April-20 12:17 Excellent	Harbor Seal	1	1800	280 Swimming N	No		
25	6	16-April-20 13:34 Excellent	Orca	8	100	170 Traveling west, spread out.	Vibratory	B	Widely spaced. Closest was 100m from pile driving.
25 7a		16-April-20 13:54 Excellent	Sea Lion	3	130	260 Swimming E slowly	No		
25 7b		16-April-20 14:02 Excellent	Sea Lion	3	200	280 Generally traveling east, slow	Vibratory	B	One was seen again about 80m from pile driving.
25 7c		16-April-20 14:05 Excellent	Sea Lion	1	80	110 Swimming E	No		Resight one of 3 not counted as
25 8a		16-April-20 14:15 Excellent	Harbor Seal	4	1500	280 Head up, resting	No		
25 8b		16-April-20 14:35 Excellent	Harbor Seal	2	1500	280 Head up, resting	Vibratory	B	2 of 4 resighted
25	9	16-April-20 15:06 Excellent	Sea Lion	1	1700	90 Traveling east	Vibratory	B	
26 1a		30-April-20 10:25 Good	Sea Lion	1	30	100 Head up, dove	No		

26	2	30-April-20 10:30	Good	Sea Lion	1	60	290 Head up, dove, swimming NM	No	
26 1b		30-April-20 10:42	Good	Sea Lion	1	15	90 Head up, dove, seen again far	No	
26	3	30-April-20 11:01	Good	Harbor Porpoise	2	300	270 Swimming N	No	
26 4a		30-April-20 13:00	Good	Harbor Porpoise	2	50	200 Swimming W	No	
26 4b		30-April-20 13:16	Good	Harbor Porpoise	2	500	250 Swimming multiple directions	No	
26 5a		30-April-20 15:03	Good	Sea Lion	1	100	270 Swimming E	No	
26 5b		30-April-20 15:09	Good	Sea Lion	1	200	100 Swimming E	No	
26	6	30-April-20 15:46	Good	Harbor Porpoise	1	60	180 Swimming E	No	
26	7	30-April-20 18:08	Good	Sea Lion	1	50	140 Swimming W	No	
27	1	12-May-20 13:08	Excellent	Sea Lion	1	1800	140 Swimming E	No	
27 2a		12-May-20 13:30	Excellent	Harbor Porpoise	2	1000	270 Milling	No	
27	3	12-May-20 13:33	Excellent	Harbor Seal	1	1700	130 Resting, Head Up, Dove	No	
27 2b		12-May-20 13:38	Excellent	Harbor Porpoise	2	500	250 Milling	No	
27 4a		12-May-20 14:07	Excellent	Minke Whale	1	150	210 Swimming W	No	
27 4b		12-May-20 14:09	Excellent	Minke Whale	1	250	180 Swimming E	No	Turned out there were two minke whales, so 4a & 4b could
27	5	12-May-20 14:11	Excellent	Sea Lion	1	200	140 Head up, dove, swimming E	No	
27	6	12-May-20 14:28	Excellent	Harbor Seal	1	1500	290 Head up, dove	No	
27 7a		12-May-20 14:43	Excellent	Minke Whale	1	1000	100 Swimming E, changing direction	No	Ended up further E
27 4c		12-May-20 14:47	Excellent	Minke Whale	1	200	130 Swimming E then W	No	
27 7b		12-May-20 15:56	Excellent	Minke Whale	1	1500	100 Swimming N, milling	No	
27 7c		12-May-20 16:13	Excellent	Minke Whale	1	1700	80 Lunge feeding	No	
28	1	13-May-20 07:48	Excellent	Sea Lion	1	600	130 Swimming SW	No	
28	2	13-May-20 08:24	Excellent	Harbor Seal	1	1200	140 Heads up	No	
28	3	13-May-20 09:02	Excellent	Sea Lion	1	150	160 Heads up	No	
28	4	13-May-20 11:27	Excellent	Sea Lion	1	250	280 Nose up	No	
28	5	13-May-20 13:14	Excellent	Sea Lion	1	1700	140 Swimming E	No	
28	6	13-May-20 13:17	Excellent	Sea Lion	1	600	170 Swimming W	No	
28	7	13-May-20 14:11	Excellent	Minke Whale	1	1700	100 Swimming SW	No	Saw again farther E
28	8	13-May-20 15:09	Good	Sea Lion	1	1400	100 Swimming W	Vibratory	B
29	1	15-May-20 15:10	Excellent	Minke Whale	1	60	180 Swimming SE slowly	No	
29	2	15-May-20 16:10	Excellent	Sea Lion	1	80	200 Swimming W	No	
29	3	15-May-20 16:46	Excellent	Harbor Seal	1	1500	160 Head up	No	
29 3a		15-May-20 16:50	Excellent	Harbor Seal	1	90	280 Head up	No	

30	1	16-May-20 06:25	Excellent	Harbor Seal	1	400	230 Head up	No	
30 1a		16-May-20 06:31	Excellent	Harbor Seal	1	1200	240 Floating	No	
30	2	16-May-20 06:41	Excellent	Minke Whale	1	700	120 Swimming SE	No	
30	3	16-May-20 06:55	Excellent	Harbor Seal	1	500	170 Floating W	No	
30	4	16-May-20 07:04	Excellent	Minke Whale	1	1400	100 Feeding	Vibratory	B
30	5	16-May-20 07:05	Excellent	Sea Lion	1	1400	110 Swimming S	Vibratory	B
30	6	16-May-20 07:05	Excellent	Sea Lion	1	1800	90 Feeding	Vibratory	B
30	7	16-May-20 07:21	Excellent	Harbor Seal	1	800	200 Swimming W	Vibratory	B
30	8	16-May-20 07:58	Excellent	Harbor Seal	1	1900	190 Head up	Vibratory	B
30	9	16-May-20 08:15	Excellent	Harbor Seal	1	900	150 Floating E	Vibratory	B
30 N/A		16-May-20 08:40	Excellent	Humpback whale	1	2500	210 Big splash	Impact	No take; outside impact zone. "~08:40 Humpback off W point of island made big spalsh when
30	10	16-May-20 10:40	Excellent	Harbor Porpoise	1	1700	190 Up and down	Impact	B
30	11	16-May-20 12:33	Excellent	Harbor Seal	1	150	290 Floating, dove	No	
30	12	16-May-20 13:21	Good	Sea Lion	1	1500	160 Swimming W	Vibratory	B
30 13a		16-May-20 15:07	Good	Minke Whale	1	1800	110 Breached, Swam W	Impact	B
30 13b		16-May-20 15:20	Good	Minke Whale	1	1900	200 Swimming W	Impact	No take (resighting)
30	14	16-May-20 16:36	Good	Sea Lion	1	100	190 Swimming W	No	
31	1	17-May-20 06:32	Excellent	Harbor Porpoise	1	1900	190 Swimming E	No	
31 3a		17-May-20 07:10	Excellent	Harbor Seal	1	700	310 Head up, dove	Impact	B
31	3	17-May-20 07:35	Excellent	Harbor Seal	1	1800	280 Head up	Impact	B
31 2b		17-May-20 07:36	Excellent	Harbor Seal	1	700	310 Head up	Impact	No take (resighting)
31	4	17-May-20 09:15	Good (chop, glar	Harbor Seal	1	250	320 Head up	No	
31 5a		17-May-20 11:08	Good	Minke Whale	1	400	90 Swimming N	No	
31 5b		17-May-20 11:11	Good	Minke Whale	1	90	120 Swimming SW	No	
31 5c		17-May-20 11:13	Good	Minke Whale	1	170	230 Swimming W	No	
31	6	17-May-20 11:30	Good	Sea Lion	5	250	110 Swimming SW	No	
31	7	17-May-20 11:46	Good	Sea Lion	2	150	160 Swimming W	No	
31	8	17-May-20 12:31	Good	Sea Lion	1	300	130 Feeding, went SW	No	
31	9	17-May-20 12:54	Good	Sea Lion	1	20	100 Swimming W inside dock	No	
32	1	18-May-20 06:40	Excellent	Minke Whale	1	100	260 Swimming NW	No	Seen again to W ~200m
32 2a		18-May-20 06:49	Excellent	Minke Whale	1	1800	100 Swimming N	No	
32 2b		18-May-20 07:15	Excellent	Minke Whale	1	1000	110 Swimming W	No	

32	3	18-May-20 07:16	Excellent	Sea Lion	1	1600	100 Feeding, swimming W	No		
32	4	18-May-20 07:29	Excellent	Sea Lion	2	150	190 Swimming W	No		spaced ~100m apart
32	5	18-May-20 08:01	Excellent	Sea Lion	1	50	140 Milling, head up	No		
32	6	18-May-20 09:18	Excellent	Harbor Seal	1	1800	160 Head up	No		
32	7	18-May-20 09:39	Excellent	Sea Lion	2	400	180 Swimming W	Impact	B	
32	8	18-May-20 10:31	Excellent	Sea Lion	1	700	280 Head up, dove	Impact	B	
33	1	19-May-20 14:32	Fair	Sea Lion	2	60	140 Looking around	No		Visibility ~1000m but no takes to extrapolate
33	2	19-May-20 14:59	Good	Sea Lion	1	125	140 Swimming W	No		
33	3	19-May-20 15:23	Good	Sea Lion	1	60	210 Swimming W	No		
33	4	19-May-20 15:53	Good	Sea Lion	1	1500	90 Head up	No		
34	1	20-May-20 07:10	Excellent	Harbor Seal	1	1500	200 Head up	No		
34	2	20-May-20 07:17	Excellent	Sea Lion	1	250	100 Swimming W	No		
34 2a		20-May-20 07:20	Excellent	Sea Lion	1	50	230 Drifting	No		
34	3	20-May-20 09:52	Excellent	Sea Lion	1	400	150 Swimming SW	No		
34	4	20-May-20 10:23	Excellent	Sea Lion	1	50	280 Milling around	No		
34	5	20-May-20 10:45	Excellent	Sea Lion	2	1300	90 Feeding, swimming W	No		
34 4a		20-May-20 10:55	Excellent	Sea Lion	1	50	280 Milling around	No		
34	6	20-May-20 11:12	Excellent	Sea Lion	1	700	190 Swimming W	No		
34	7	20-May-20 11:50	Good	Sea Lion	1	250	170 Swimming W	No		
34 8a		20-May-20 13:00	Good	Harbor Seal	1	600	80 Head up, dove	No		
34	9	20-May-20 13:06	Good	Harbor Seal	1	200	250 Head up, dove	No		
34	10	20-May-20 13:34	Good	Minke Whale	1	1000	180 Swimming W	Impact	B	
34 8b		20-May-20 13:53	Good	Harbor Seal	1	600	80 Head up, dove	Impact	B	
34	11	20-May-20 13:55	Good	Sea Lion	1	500	280 Swimming W fast	Impact	B	
34	12	20-May-20 15:30	Good	Sea Lion	1	600	80 Feeding	Impact	B	
35	1	21-May-20 09:00	Excellent	Sea Lion	1	300	290 Swimming W	No		Had gone by earlier from E
35 2a		21-May-20 09:09	Excellent	Harbor Seal	1	150	270 Head up	No		
35 2b		21-May-20 09:15	Excellent	Harbor Seal	1	400	290 Head up	No		
35	3	21-May-20 09:18	Excellent	Sea Lion	1	50	280 Milling, swam W	No		
35	4	21-May-20 10:00	Excellent	Harbor Seal	1	1000	180 Head up	No		
35 5a		21-May-20 10:25	Good	Sea Lion	1	1500	100 Swimming W	No		
35 5b		21-May-20 10:35	Good	Sea Lion	1	80	130 Swimming SW	No		Continued W 50m of dock face
35	6	21-May-20 12:19	Good	Sea Lion	1	1800	130 Swimming W	Impact	B	



35	7	21-May-20 12:22	Good	Harbor Seal	1	450	290 Head up	Impact	B	
35	8	21-May-20 12:36	Good	Sea Lion	1	400	270 Feeding, generally swimming	Impact	B	
35	9	21-May-20 12:45	Good	Sea Lion	9	1000	240 Swimming W	Impact	B	
35	10	21-May-20 13:10	Good	Harbor Seal	1	75	120 Head up, dove	No		
35	11	21-May-20 15:44	Good	Harbor Seal	1	130	170 Head up, dove	No		
35 12a		21-May-20 16:00	Good	Harbor Seal	1	400	70 Head up, dove	No		
35 12b		21-May-20 16:44	Good SW glare	Harbor Seal	1	250	70 Head up	Impact	B	
35 13a		21-May-20 17:21	Good	Sea Lion	1	1300	90 Swimming W	Impact	B	
35 13b		21-May-20 17:46	Good	Sea Lion	1	500	280 Swimming W	Impact		No take (resighting)
36	1	22-May-20 12:24	Excellent	Sea Lion	1	80	160 Swimming W	No		
36 2a		22-May-20 13:00	Excellent	Sea Lion	1	1000	90 Swimming W	Impact		5 min prior to impact. Counted resight as impact.
36 2b		22-May-20 13:04	Excellent	Sea Lion	1	50	20 Surfaced once	Impact	B	Did not see again 1 min prior to
36 3a		22-May-20 14:06	Excellent	Harbor Seal	1	500	70 Head up	No		
36	4	22-May-20 14:12	Excellent	Sea Lion	1	80	200 Swimming W	No		
36 3b		22-May-20 15:01	Excellent	Harbor Seal	1	150	330 Swimming W generally	Impact	B	
36 3c		22-May-20 15:40	Excellent	Harbor Seal	1	1200	290 Head up, resting	Impact		No take (resighting)
36 3d		22-May-20 16:54	Excellent	Harbor Seal	1	500	330 Head up	No		
37	1	23-May-20 12:31	Excellent	Sea Lion	2	600	240 Swimming W	No		
37	2	23-May-20 12:33	Excellent	Harbor Seal	1	1000	160 Head up	No		
37	3	23-May-20 12:36	Excellent	Sea Lion	1	800	180 Swimming W	No		
37	4	23-May-20 12:58	Excellent	Harbor Seal	1	1200	220 Floating	No		
37 5a		23-May-20 13:04	Excellent	Harbor Seal	1	700	270 Swimming N slowly	No		
37 5b		23-May-20 13:30	Excellent	Harbor Seal	1	500	240 Head up	Impact	B	
37	6	23-May-20 13:34	Excellent	Sea Lion	2	900	250 Head up	Impact	B	
37 7a		23-May-20 14:22	Excellent	Sea Lion	1	90	20 Surfaced, swam E, then S	Impact	B	Swam around the driving operation in a semi-circle, Out and E away from pile driving, back to inside of dock.
37 7b		23-May-20 14:26	Excellent	Sea Lion	1	50	160 Looked at dock, retraced rout	Impact		Then rapidly traveled away to E.
37 7c		23-May-20 14:30	Excellent	Sea Lion	1	40	30 Surfaced N of operation. Clos	Impact		No take (resighting)

37	8	23-May-20 14:40	Excellent	Sea Lion	1	25	20 Surfaced S of driving location	No		6 min after pile driving ended, then swam about the dock for 20 min, probably looking for fish carcasses. At 15:00 went away to W. Looked like a larger
38	1	24-May-20 14:02	Good	Harbor Seal	1	200	180 Head up	No		
38 2a		24-May-20 14:16	Good	Humpback whale	2	1500	240 Milling, slowly swimming NW	No		
38	3	24-May-20 14:28	Good	Sea Lion	2	80	180 Swimming W	No		
38	4	24-May-20 14:30	Good	Sea Lion	2	80	170 Swimming W	No		Second pair
38	5	24-May-20 14:29	Good	Sea Lion	1	30	80 Milling N of driving area	No		
38	6	24-May-20 14:37	Good	Sea Lion	1	120	160 Swimming W	No		
38	7	24-May-20 14:47	Good	Orca	7	2000	230 Swimming W, spread out	No		
38	8	24-May-20 14:51	Good	Sea Lion	1	100	250 Swimming W	No		
38 2b		24-May-20 14:55	Good	Humpback whale	2	200	230 Swimming SE, cow & calf - orc	No		200m closest approach to driving area, slowly swam SE past dock. Crew aware. No 4 more
38 9a		24-May-20 14:55	Good	Orca	4	600	260 Swimming generally W	No		
38 2c		24-May-20 15:12	Good	Humpback whale	2	1500	150 Surfaced	Impact	B	@15:35 feeding just beyond 2,000m by Pleasant Island. Resight, no add'l take.
38 2d		24-May-20 15:40	Excellent	Humpback whale	1	1800	140 Swimming W	Impact		
38	10	24-May-20 15:45	Excellent	Sea Lion	1	1700	140 Swimming W	Impact	B	
38 9b		24-May-20 15:15	Excellent	Orca	2	1200	220 Swimming E	Impact	B	
38	11	24-May-20 14:55	Excellent	Sea Lion	1	60	60 Milling, Swimming E	No		
38 12a		24-May-20 16:10	Excellent	Harbor Seal	1	400	70 Head up, resting	No		
38 13a		24-May-20 16:11	Excellent	Sea Lion	2	1500	90 Swimming W	No		
38	14	24-May-20 16:57	Excellent	Harbor Porpoise	1	900	260 Swimming S	Impact	B	
38 13b		24-May-20 16:26	Excellent	Sea Lion	2	200	60 Swam here, then S around dri	Impact	B	
38 13c		24-May-20 16:27	Excellent	Sea Lion	2	50	140 Swam W in front of dock after	Impact		Resight, no add'l take.
38 12b		24-May-20 16:30	Excellent	Harbor Seal	1	400	70 Resting, head up	Impact	B	
38	15	24-May-20 17:25	Excellent	Sea Lion	1	75	330 Head up, dove	No		
38	16	24-May-20 17:29	Excellent	Harbor Seal	1	70	170 Head up, dove	No		
39	1	25-May-20 09:01	Excellent	Harbor Seal	1	300	320 Floating, dove	No		
39 2a		25-May-20 09:05	Excellent	Minke Whale	1	1500	100 Surfaced once swimming W	No		
39	3	25-May-20 09:25	Good	Harbor Seal	1	800	110 Head up	No		

39	4	25-May-20 09:45	Excellent	Harbor Seal	1	1500	220 Head up	No		
39 5a		25-May-20 09:57	Excellent	Sea Lion	1	2000	100 Swimming S	Impact		Reported as take upon closer
39 6a		25-May-20 10:01	Excellent	Harbor Seal	1	250	270 Swimming N	Impact	B	
39 5b		25-May-20 10:14	Excellent	Sea Lion	1	1500	180 Swimming W	Impact	B	
39 2b		25-May-20 10:20	Excellent	Minke Whale	1	>2000	130 Surface active	Impact		Sighted again @10:30
39 2c		25-May-20 10:25	Excellent	Minke Whale	1	1700	140 Seen just beyond 2000m	Impact	B	Inferred, not actual obs
							twice, must have travelled			
							within 2000m between			
39	7	25-May-20 10:38	Excellent	Sea Lion	1	100	120 Swimming SW	Impact	B	
39 6b		25-May-20 10:56	Excellent	Harbor Seal	1	1000	290 Head up	Impact		Resight, no add'l take.
39	8	25-May-20 11:40	Excellent	Sea Lion	1	1000	110 Surfaced once	No		
39	9	25-May-20 13:10	Excellent	Sea Lion	1	70	190 Swimming W	No		
39	10	25-May-20 13:24	Good	Sea Lion	2	60	260 Swimming S	No		
39	11	25-May-20 13:29	Good	Sea Lion	1	1800	130 Lying on surface	No		
39	12	25-May-20 13:51	Good	Minke Whale	1	800	100 Swimming N	No		
39	13	25-May-20 14:21	Good	Harbor Porpoise	2	800	230 Feeding in ripline	No		
39	14	25-May-20 14:33	Good	Minke Whale	1	400	190 Swimming W	No		
39 15a		25-May-20 14:40	Good	Harbor Seal	1	100	300 Head up	No		
39 16a		25-May-20 14:59	Good	Harbor Seal	1	200	80 Head up	No		
39 15b		25-May-20 15:14	Good	Harbor Seal	1	100	180 Head up	No		
39 15c		25-May-20 15:16	Good	Harbor Seal	1	120	280 Head up	No		
39	17	25-May-20 15:22	Good	Sea Lion	1	60	180 Drifting W	No		
39 15+16		25-May-20 16:30	Excellent	Harbor Seal	2	300	280 Head up	Impact	B	
39 15+16		25-May-20 17:16	Excellent	Harbor Seal	1	400	280 Swimming E	Impact		
39	18	25-May-20 17:29	Excellent	Sea Lion	1	50	30 Head up	No		
39 19a		25-May-20 17:37	Excellent	Sea Lion	1	120	280 Swimming E, straight for dock	No		
39 19b		25-May-20 17:40	Excellent	Sea Lion	1	30	90 Swimming S	No		
40	1	27-May-20 12:36	Excellent	Harbor Porpoise	1	1500	100 Swimming N	No		
40	2	27-May-20 12:51	Excellent	Harbor Porpoise	1	75	280 Swimming NE	No		
40 3a		27-May-20 12:59	Excellent	Harbor Porpoise	2	1500	160 Swimming E	No		
40	4	27-May-20 13:26	Excellent	Harbor Seal	1	1000	290 Head up	Vibratory	B	
40 5a		27-May-20 13:17	Excellent	Harbor Porpoise	1	1200	170 Swimming E	No		
40	6	27-May-20 13:30	Excellent	Harbor Seal	1	1800	170 Swimming E	Vibratory	B	
40 3b		27-May-20 13:54	Excellent	Harbor Porpoise	2	500	140 Surfacing, swam Se	No		

40 7a		27-May-20 14:06	Excellent	Sea Lion	1	800	150 Swimming E slowly	Vibratory	B	Resight, no add'l take.
40 7b		27-May-20 14:10	Excellent	Sea Lion	1	900	140 Feeding	Vibratory		
40	8	27-May-20 14:50	Excellent	Minke Whale	1	1200	90 Swimming W	No		
40 5b		27-May-20 15:13	Excellent	Harbor Porpoise	1	1000	180 Surfacing, swam Se	Vibratory	B	
40	9	27-May-20 15:50	Excellent	Sea Lion	1	300	80 Swimming W	Vibratory	B	
40	10	27-May-20 16:09	Excellent	Harbor Seal	1	1800	180 Head up	No		