Request for an Incidental Harassment Authorization

Skagway Gateway Initiative Project

Skagway, Alaska

Prepared for

Municipality of Skagway

April 12, 2016

19081-00

HARTCROWSER

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APPENDIX A

Marine Mammal Monitoring Plan, Skagway Gateway Initiative Project

1.0 DESCRIPTION OF THE ACTIVITY

1.1 Introduction

The Municipality of Skagway (MOS) proposes to redevelop the Skagway Ore Terminal (Ore Terminal) in Skagway, Alaska, including demolition of existing in- and overwater infrastructure, environmental and navigational dredging, and construction of new shoreline infrastructure (Figure 1 and Sheets 1–8). The Gateway Intermodal Dock Redevelopment Reconstruction Project and Legacy Harbor Contaminant Mitigation Program (Project) will facilitate ongoing and new industrial operations, accommodate a wider variety of vessels, and improve environmental conditions in Skagway Harbor.

The Project will be phased, with the first phase completed in 2016 to 2017. Scheduling of subsequent phases will depend on funding, as well as the needs of Skagway Harbor property owners, users, and lessees. The purpose of this summary is to provide a complete Project description of the proposed construction activities that may impact marine mammals.

The project's timing and duration, and specific types of activities (such as pile driving and dredging) may result in the incidental taking by acoustical harassment (Level B take) of marine mammals protected under the Marine Mammal Protection Act (MMPA). The MOS is requesting an Incidental Harassment Authorization (IHA) for seven marine mammal species: harbor seal (*Phoca viutlina*), Steller sea lion (*Eumetopias jubatus*), harbor porpoise (*Phocoena phocoena*), Dall's porpoise (*Phocoenoides dalli*), killer whale (*Orcinus orca*), humpback whale (*Megaptera novaeangliae*), and minke whale (*Balaenoptera acutorostra*) that may occur in the vicinity of the project. The 14 specific items required for this application, as set out by 50 CFR 216.104, Submission of Requests, are provided in Sections 1 through 14 of this application.

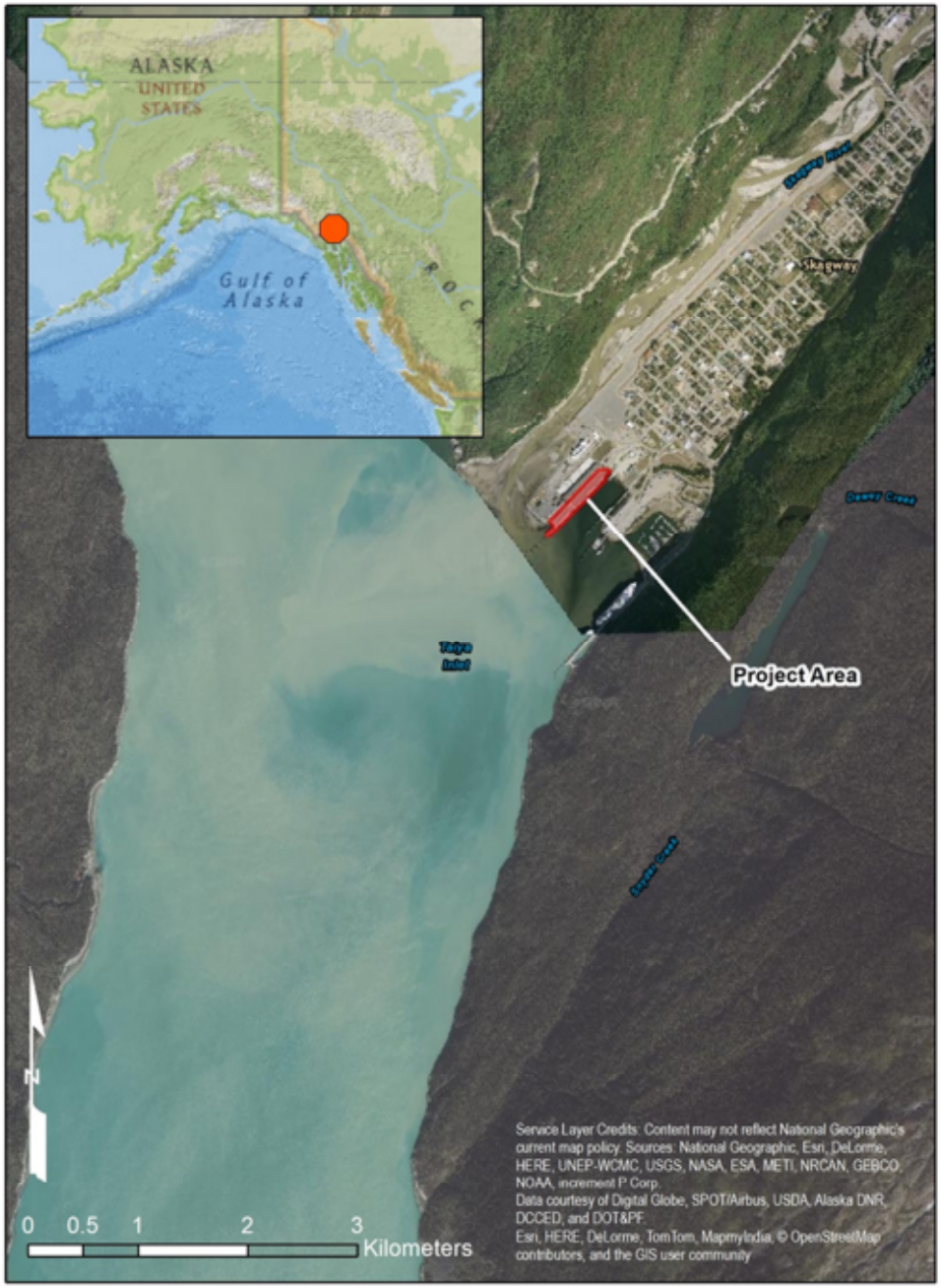

Figure 1 – Site vicinity map

1.2 Proposed Action

The Proposed Action is consistent with the permit application package for Phase 1 of the Project that has been provided to USACE. Phase 1 includes the following:

- Demolition of existing in- and overwater infrastructure including in-water removal of timber, steel, and concrete piling.

- Mechanical dredging of and upland beneficial reuse or disposal of contaminated sediments in the Skagway Ore Terminal basin (Terminal basin) of Skagway Harbor. No in-water disposal of sediments is proposed.

- Construction of new infrastructure including a bulkhead wall at the northern end of the Terminal basin, a wharf structure at the western edge of the Ore Terminal, an ore loader and supporting infrastructure, seven new or refurbished moorage dolphins and associated catwalks, and a concrete floating dock and associated gangways (or an additional three moorage dolphins and catwalks, depending on funding). Development of this new infrastructure involves a combination of in-water, over-water, and upland work.

Specific details of the Project Action are provided in Section 1.3, Project Elements.

1.3 Project Elements

1.3.1 Demolition Actions

Existing structures to be demolished include the eastern extent of the timber pier, the ore loader and concrete and steel foundation, fuel infrastructure (timber dock and piping), the concrete AML pier, and up to five concrete and steel moorage dolphins. A summary of the demolition elements of the project and pile to be removed is provided in Table 1.

Table 1 – Summary of Project Demolition

Component	Number of Creosote-treated Piles to be Removed	Number of Steel Piles to be Removed
Timber Pier	400	50
Ore Loader	0	50
AML Pier	0	15
Fuel Infrastructure	0	4
Moorage Dolphins[2]	0	0
Total	**400**	**119**

The existing infrastructure will be demolished using land- or water-based (i.e., barge-mounted) heavy equipment and demolition of this infrastructure will generally occur as follows: above-water infrastructure, including concrete pads, timber decking, pile caps, utilities, and piping, will be removed. Then timber piles will be extracted entirely or broken off at the mudline if extraction is not practical. The timber piles will be removed as both a source control measure (i.e., through removal of creosote-treated timber piles) and as a necessary step to perform environmental dredging in this area.

The contractor will be required to implement Best Management Practices (BMPs) to minimize environmental impacts from demolition.

In total, demolition actions are expected to take 39 days to complete.

1.3.2 Dredging Actions

Dredging is proposed over approximately 40 days during the winter between mid-January and early March 2017. The vertical and horizontal boundaries of the proposed dredging were designed to remove impacted sediments (i.e., sediments with metals and/or polycyclic aromatic hydrocarbon (PAH) concentrations exceeding the sediment cleanup objectives [SCOs]). The SCOs were chosen to be the cleanup objective level based on discussions in the April 13, 2015, meeting between Bruce Wanstall (ADEC), Dr. Chad Gubala (MOS), and Derek Koellmann (Anchor QEA). The current estimated dredge volume (including a 1-foot over-dredge to account for equipment tolerances) and the associated approximate surface area, pending final design and geotechnical and structural considerations, are shown in Tables 2 and 3. The volume of potentially contaminated material subject to dredging and treatment or disposal in an approved hazardous waste facility is estimated to be 17,300 cubic yards.

Concentrations of four metals and four polycyclic aromatic hydrocarbons (PAHs) exceeded sediment cleanup objectives (SCOs), as follows:

Metals	SCOs	Maximum Sediment Concentration (mg/kg)
Cadmium	5.1	16.4
Lead	450	10,000
Mercury	0.41	6.6
Zinc	410	12,300

Polycyclic Aromatic Hydrocarbons	SCOs	Maximum Sediment Concentrations (µg/kg)
Benzo(a)anthracene	1,300	1,830
Chrysene	1,400	2,650
Pyrene	2,600	4,090
Total Benzofluoranthenes	3,200	3,300

Analyses have shown that sediments in the proposed dredge prism will need to be disposed of at an upland facility.

While handling these materials, Best Management Practices (BMPs) will be employed to prevent/minimize exposure of marine mammals to the mentioned contaminants of concern. The BMPs for this purpose are:

- Turbidity and other water quality parameters will be monitored to ensure construction activities are in compliance with ADEC standards.
- Appropriate BMPs will be employed to minimize sediment resuspension, loss, and turbidity generation during dredging. BMPs may include, but are not limited to, the following:
    - Eliminating multiple bites while the bucket is on the seafloor;
    - Use of a floating partial height silt curtain;

- Prioritization of removal of the most highly impacted areas first, then moving to less impacted areas, also taking into account phasing for the demolition and construction of new elements to keep the terminal operational during construction;
- No stockpiling of dredged material on the seafloor; and
- No seafloor leveling by dragging the bucket or other device.

The dredge prism of potentially contaminated sediment occupies approximately 41,000 square feet (0.004 square kilometers), adjacent to the Ore Dock (Sheet 4). Physical resuspension of sediments would occur during dredging and would produce localized impacts to water quality in the form of elevated turbidity plumes that would last from a few minutes to several hours. Associated contaminants are expected to be tightly bound to the sediment matrix. Because of the relatively small dredge prism, these plumes would be limited to the immediate vicinity of the Ore Dock and this portion of Skagway Harbor. There is the potential for pinnipeds to be exposed to increased turbidity during dredge operations within Skagway Harbor. However, exposure to resuspended contaminants is expected to be low since sediments would not be ingested and contaminants would be tightly bound to them.

There will be no direct effects to marine mammals within the project area due to dredging activities, and no additional take is requested for these activities, based on the following.

- The dredge footprint will be relatively small, limiting the size of the dredge plume to portions of Skagway Harbor near the Ore Dock.
- BMPs will be implemented, limiting turbidity.
- The turbidity plume will be temporary.
- There will be no direct exposure mechanism to marine mammals.
- A 200- meter exclusion zone will be enforced for all marine mammals, except for harbor seals during dredge operations. A 10-meter exclusion zone will be enforced for harbor seals during dredge activities.
- Activities will occur during the winter dredge period when few pinnipeds have been observed in the area (see Section 4.1.2)

Similarly, long-term effects to marine mammals are expected to be positive since the dredging will remove over 17,000 cubic yards of sediment that are contaminated above regulatory cleanup levels, thus eliminating this contaminant source to both marine mammals and their potential prey.

An additional 9,000 cubic yards of uncontaminated material may be dredged for the installation of the floating dock. Pending the outcome of a treatability study, dredged sediments will either be beneficially reused in upland areas or transported to a suitable upland landfill at the discretion of the Alaska Department of Environmental Conservation (ADEC).

Table 2 – Contaminated Dredge Material Approximate Volumes

Project Component	Total Volume[1] (cubic yards)
Contaminated Dredge Material Removed[2]	17,300

Notes:
[1] All volumes include defined over-dredge allowances.
[2] Contaminated dredged materials will be disposed of in upland areas. No in-water disposal is proposed.

Table 3 – Residual Dredge Material Approximate Volume

Project Component	Total Area (square feet)
Environmental Dredge Footprint	41,000
Environmental Dredge Slope Surface Area	21,245
Total Surface Area	**62,245**

All dredging will be performed using up to a 7–cubic-yard clamshell bucket. Use of an environmental bucket was considered, but was deemed infeasible given the nature and composition of the sediments to be dredged. The sediment consists of dense gravelly sand, with increased gravel content at depth. This lithology is difficult to penetrate and discussions with multiple dredging contractors confirmed that the use of an environmental bucket would likely be ineffective in removing these materials. As noted in the demolitions section, specific overwater structures are planned to be demolished prior to the start of dredging.

In total, dredging actions are expected to take 40 days to complete.

1.3.3 New Infrastructure Actions

Construction of new in- and overwater infrastructure is proposed, including a bulkhead wall, wharf structure, and ore loader. In addition, either a concrete floating dock or additional moorage dolphins connected by a catwalk will be constructed. This decision will be made pending available funding—for the purposes of this IHA application, a worst-case scenario of potential project impacts was considered (i.e., the concrete floating dock).

A new wharf structure is proposed at the harbor, including a wharf bulkhead wall and an associated pier. A summary of the proposed new infrastructure is presented in Tables 4 and 5.

Table 4 – Over-water Cover and Fill from New Structures[1]

Project Component	In- or Overwater Cover (square feet)	In-water Fill (cubic yards)	No. of Piles
Wharf Structure at Ore Dock			
Wharf Bulkhead Wall	0	150–300	0
AML Pier and Ramp	4,158	0	40
Ore Loader and Foundation			
Ore Loader Foundation	2,500	0	50
Ore Loader Access Platform[2]	600	0	8
Moorage Dolphins (7) and Catwalk	5,175	0	70
Fuel Infrastructure	1,800	0	17
Concrete Floating Dock Structure[2]			
Concrete Floating Dock	20,000	0	21
Transfer Bridge[1]	2,850	0	0
Pedestrian Platform[1]	550	0	3
Pedestrian Gangway	1,200	0	0
Additional Moorage Dolphins (3) and Catwalk[2]	2,475	0	30
Total – Concrete Floating Dock Option	**38,833**	**150–300**	**209**

Notes:
[1] All areas are in square feet unless otherwise noted.
[2] Includes only the over- or in-water area; project upland areas are not included.

Table 5 – Number of New Steel Piles

Project Component	Pile Size and Number					Area of Sea Floor Impacts (square feet)
	24-inch	36-inch	48-inch	60-inch	Total	
AML Bulkhead Wall	0	0	0	0	0	0
Wharf Structure at Ore Dock	16	20	4	0	40	241.9
Ore Loader and Foundation	0	58	0	0	58	410.0
Moorage Dolphins and Catwalk	0	70	0	0	70	494.8
Fuel Infrastructure	0	17	0	0	17	120.2
Concrete Floating Dock Structure	3	14	0	7	21	245.8
Total – Concrete Floating Dock Option	**19**	**179**	**4**	**7**	**209**	**1,512.7**

The proposed wharf bulkhead wall will be constructed of steel sheet pile constructed in the form of a rectangle of approximately 220 by 75 feet (16,500 square feet). The top of the walls will be approximately 30 feet above mean lower low water (MLLW) (13.3 feet above mean higher high water [MHHW], and the future bottom of the walls at a depth of +4 feet MLLW. The structure will be filled with 2,000 to 4,000 cubic yards of suitable dredged material (again pending the outcome of the treatability study), of which 150 to 300 cubic yards will be placed below MHHW. The ground surface where fill will be placed is primarily above MHHW. Only fill placed in the southeastern corner of the

structure will be within the intertidal zone and this fill will only occur in an approximately 2,500-square-foot area. The steel sheet pile will be installed using a vibratory and/or impact hammer. A majority of the sheet pile will be installed above MHHW, but during low tide (in the dry). Approximately 160 linear feet of sheet pile may be installed below MHHW. Installation is expected to take eight days.

The proposed 65-foot by 30-foot AML pier will join the new wharf structure and be supported on steel piles. Piles will be installed with a vibratory and/or impact hammer.

A new ore loader is proposed in the harbor, including a loader, foundation, and access platform. The proposed ore loader foundation will be supported by steel piles. The ore loader configuration has not yet been identified but will require a throughput of 2,000 to 2,500 tons per hour of copper concentrate. The ore loader could be a swing-arm, retractable, or fixed-arm loader.

A new fuel manifold and fuel lines will be constructed on a pier extending from the ore loader platform infrastructure. The proposed fuel pier will be supported by steel piles.

Additionally, a concrete dock and up to 10 moorage dolphins will be installed depending on funding. If the concrete floating dock option is selected, it will be a 400-foot by 50-foot concrete structure supported by seven 60-inch-diameter piles and fourteen 36-inch-diameter piles and located at the southern end of the project area. If the moorage dolphin option is selected, as many as 10 new moorage dolphins may be constructed. Each dolphin will consist of 10 small-diameter steel piles. For the purposes of the IHA analysis, a worst-case pile installation scenario is assumed for this element of the project (i.e., the concrete floating dock), which includes installation of fourteen 36-inch-diameter steel piles and seven 60-inch-diameter piles, which have much greater zones of influence. This assumption provides a conservative estimate of potential project impacts.

In total, new infrastructure actions are expected to take 152 days to complete.

1.4 Pile Driving and Removal Activities and Waterborne Noise

Installation of new pilings is expected to take 73 days of the total new infrastructure timeframe. Piles will be installed with a vibratory driver to the extent feasible. Impact driving will then be used to install piles that cannot be completely installed with a vibratory hammer and also for proofing of piles. A total of 35 minutes of vibratory driving per pile is anticipated, as well as 10 minutes of impact driving per pile with an impact hammer. A bubble curtain will be used to mitigate noise effects when impact driving for all plumb piles. A hard, composite-reinforced, plastic cushion will be used in addition to built-in pile caps as a further noise mitigating measure during impact pile driving.

As discussed, the proposed project has two elements involving noise production that may impact marine mammals: vibratory pile driving/pile removal and impact pile driving. Each of these elements generates in-water and in-air noise.

The area of impacts of the proposed action encompasses the injury and behavioral disturbance zones for marine mammals exposed to waterborne noises generated by pile driving (Figures 2 and 3). The National Marine Fisheries Service (NMFS) is in the process of developing waterborne noise guidelines for determining sound thresholds for the injury and disturbance of marine mammals. These thresholds are:

- 180 dB re: 1 µPa rms (decibels referenced to 1 micropascal root mean square) as the level at which cetaceans experience Level A injury for pulsed sound (impact pile driving);
- 190 dB rms as the level at which pinnipeds experience Level A injury for pulsed sound (impact pile driving);
- 160 dB rms as the level all marine mammals experience Level B (behavioral) harassment for pulsed sound (impact pile driving); and
- 120 dB rms as the level all marine mammals experience Level B harassment for continuous sound (vibratory pile driving).

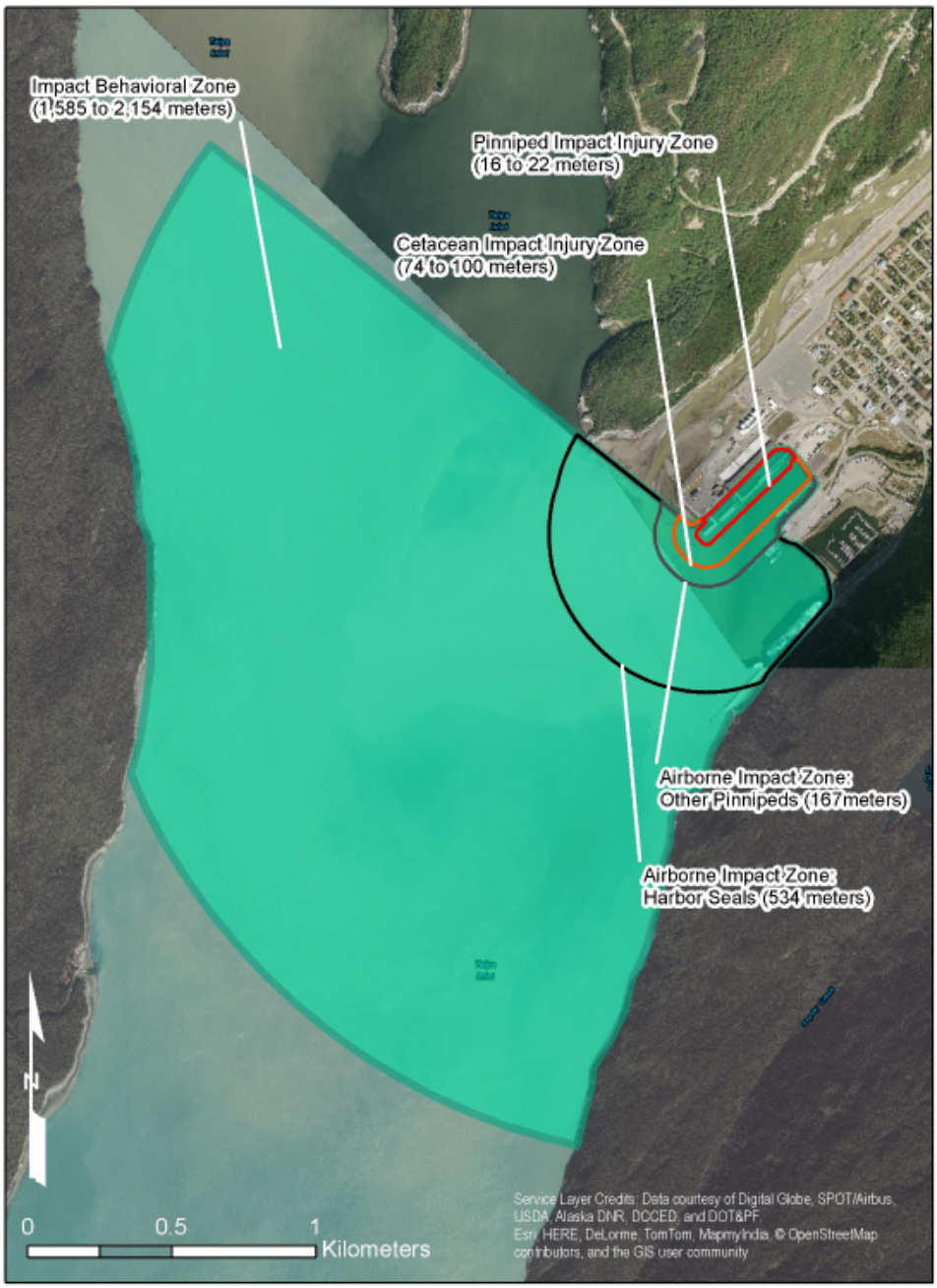

Figure 2 – Marine mammal impact pile driving (unmitigated) behavioral and injury zones

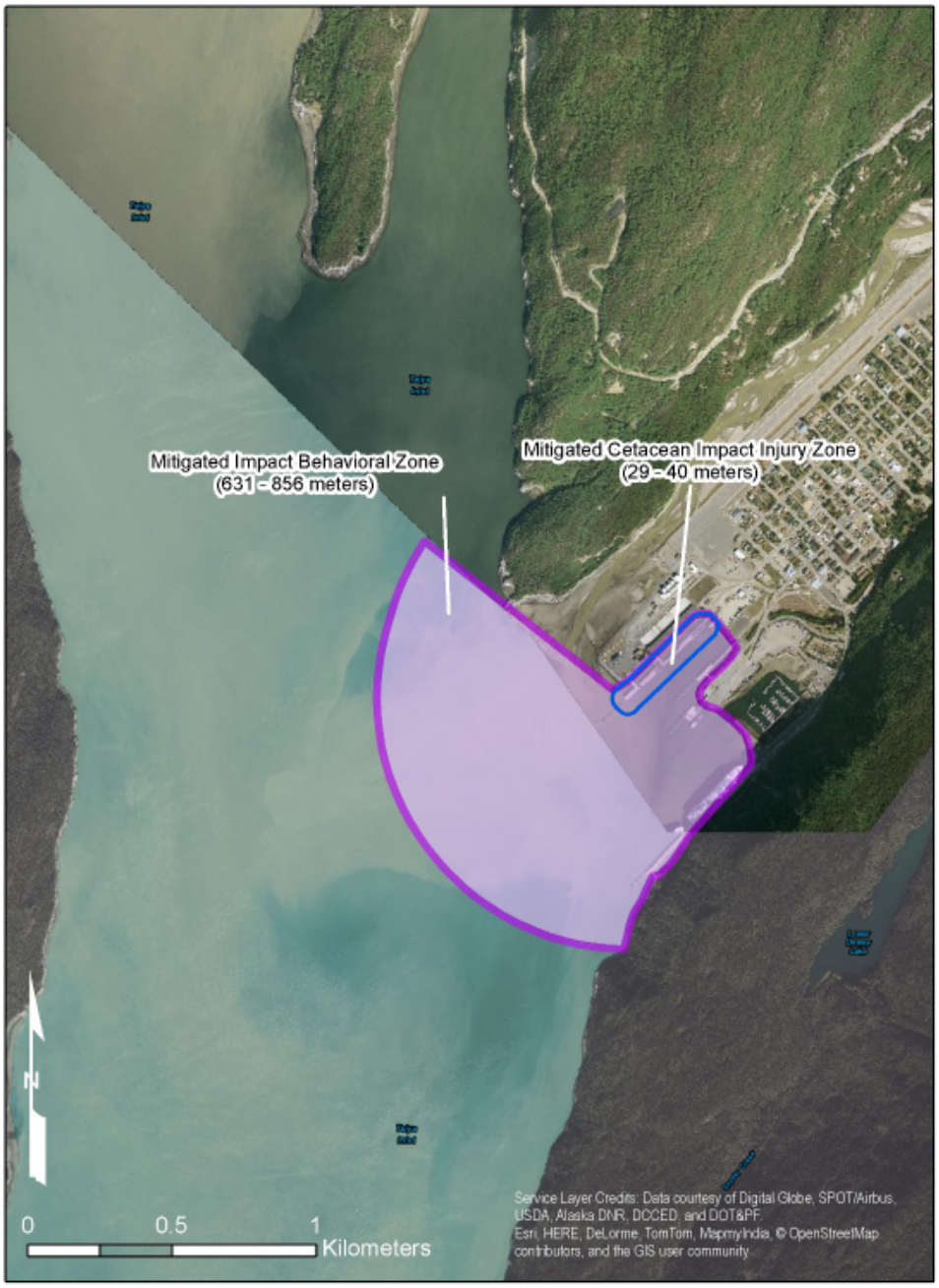

Figure 3 – Marine mammal impact pile driving behavioral and injury zones using a bubble curtain (mitigated)

In addition, NMFS has established an impact-driving, in-air noise disturbance threshold of 90 dB rms for harbor seals and 100 dB rms for all other pinnipeds. This represents in-air disturbance zones ranging from 167 to 534 meters, which are well inside of the impact-driving underwater disturbance zones (631 to 2,154 meters; Figures 2 and 3). Therefore, both in-air and underwater behavioral effects from impact pile driving will be captured within the underwater behavioral zones. There are no in-air thresholds for cetaceans.

The Washington State Department of Transportation (WSDOT) and California Department of Transportation have compiled acoustic monitoring data for various pile-driving projects within their respective states (WSDOT unpublished; ICF Jones & Stokes and Illingworth and Rodkin 2009, updated in 2012). Upon review of these datasets, it was determined that driving moderate-sized steel piles with a vibratory pile driver will generate sound pressure levels (SPLs) of 185 dB Peak and 170 dB RMS (ICF Jones & Stokes and Illingworth and Rodkin 2009, updated in 2012). Noise levels from pile removal activities are on the order of 150 dB rms.

This project proposes to use 24-, 36-, 48-, and 60-inch-diameter steel piles for most project support components (see Table 5 for details) and the sound levels selected to calculate impact zones range from 150–185 dBs (Table 6). Impact zones were then calculated using the NOAA Practical Spreading Loss Model. Table 7 and Figures 2 through 5 show the behavioral disturbance and injury zones based on the calculated sound levels. For continuous noise (vibratory driver), the topography of Taiya Inlet will prevent underwater sound above the 120 dB criterion from exiting the inlet (Figure 4). A bubble curtain will be used while impact pile driving plumb piles; therefore, sound levels have been calculated based on a decrease in noise level of 6 dB rms while using a bubble curtain (Table 8 and Figure 5). The term “mitigated” is used for results with bubble curtain use. It should be noted that a composite pile cap will be used for all impact driving, so behavioral/injury estimates for impact pile driving should be interpreted conservatively. Table 9 shows the impact zones, in square kilometers, for all noise levels.

Table 6 – Sound Levels Generated by Project Activities

Noise Type	Pile Size (inches)	Sound Pressure (dB re: 1 µPa)		
		Peak	Root Mean Square	Sound Exposure Level
Waterborne Noise				
Impact	24	207	194	178
	36	210	193	183
	48	210	195	185
Vibratory	60	183	170	180
Vibratory Removal of timber piles[1]	12	-	150	-
Airborne Noise				
Impact	-	-	110	-
Vibratory	-	-	97	-

Notes:
[1] Measurements taken at 16 meters for timber piles. Nearly 80 percent of all piles to be removed are timber piles; approximately 20 percent are 12-inch steel piles where sound pressures for vibratory installation are used as a proxy for pile removal.

Table 7 – Impact Zones for Marine Mammals during Pile Driving

Pile Driver Type	Pile Size (inches)	Waterborne Noise (meters)			
		Marine Mammal Disturbance (160 dB)	Cetacean Injury (180 dB)	Pinniped Injury (190 dB)	Continuous Noise Disturbance
Impact	24	1,848	86	18	-
	36	1,585	74	16	-
	48	2,154	100	22	-
Vibratory	60	-	-	-	100,000
Vibratory Removal	12	-	-	-	1,600

Table 8 – Impact Zones for Marine Mammals for Impact Pile Driving With a Bubble Curtain

Pile Driver Type	Pile Size (inches)	Distance to Criterion (meters)		
		Waterborne Noise		
		Marine Mammal Disturbance (160 dB)	Cetacean Injury (180 dB)	Pinniped Injury (190 dB)
Impact	24	736	34	< Threshold
	36	631	29	< Threshold
	48	856	46	< Threshold

Table 9 – Area of Impact Zones for Marine Mammals

Pile Driver Type	Pile Size (inches)	Area of Impact (square kilometers)			
		Marine Mammal Disturbance (160 dB)	Cetacean Injury (180 dB)	Pinniped Injury (190 dB)	Continuous Noise Disturbance
Impact, unmitigated	24	3.93	0.072	0.031	-
Impact, mitigated	24	0.89	0.040	-	-
Impact, unmitigated	36	3.00	0.064	0.029	-
Impact, mitigated	36	0.72	0.037	-	-
Impact, unmitigated	48	4.96	0.082	0.033	-
Impact, mitigated	48	1.11	0.043	-	-
Vibratory	60	-	-	-	21.0
Vibratory Removal	12	-	-	-	3.05

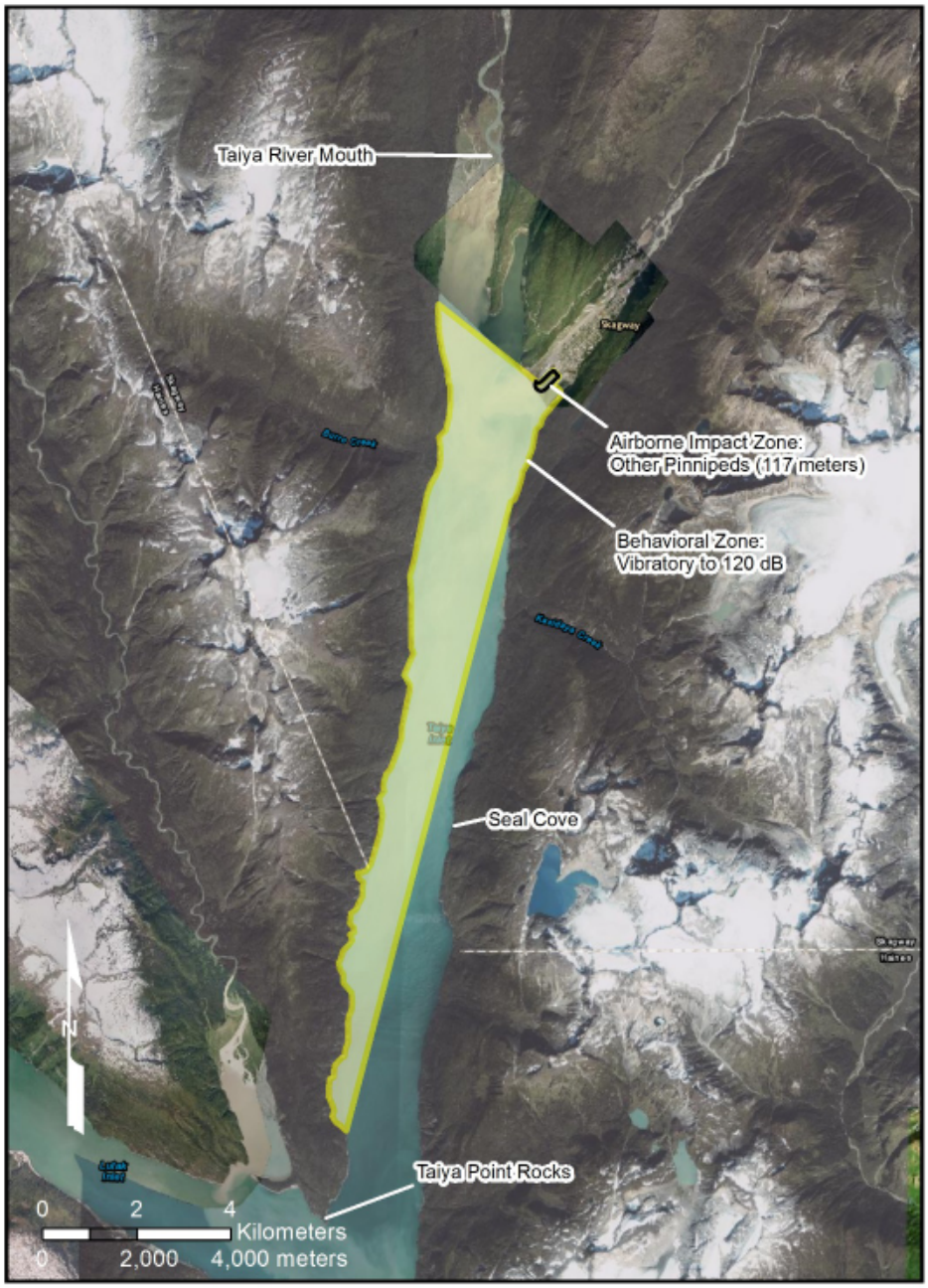

Figure 4 – Marine mammal disturbance zones for vibratory driving – Behavioral Zone of 17 km

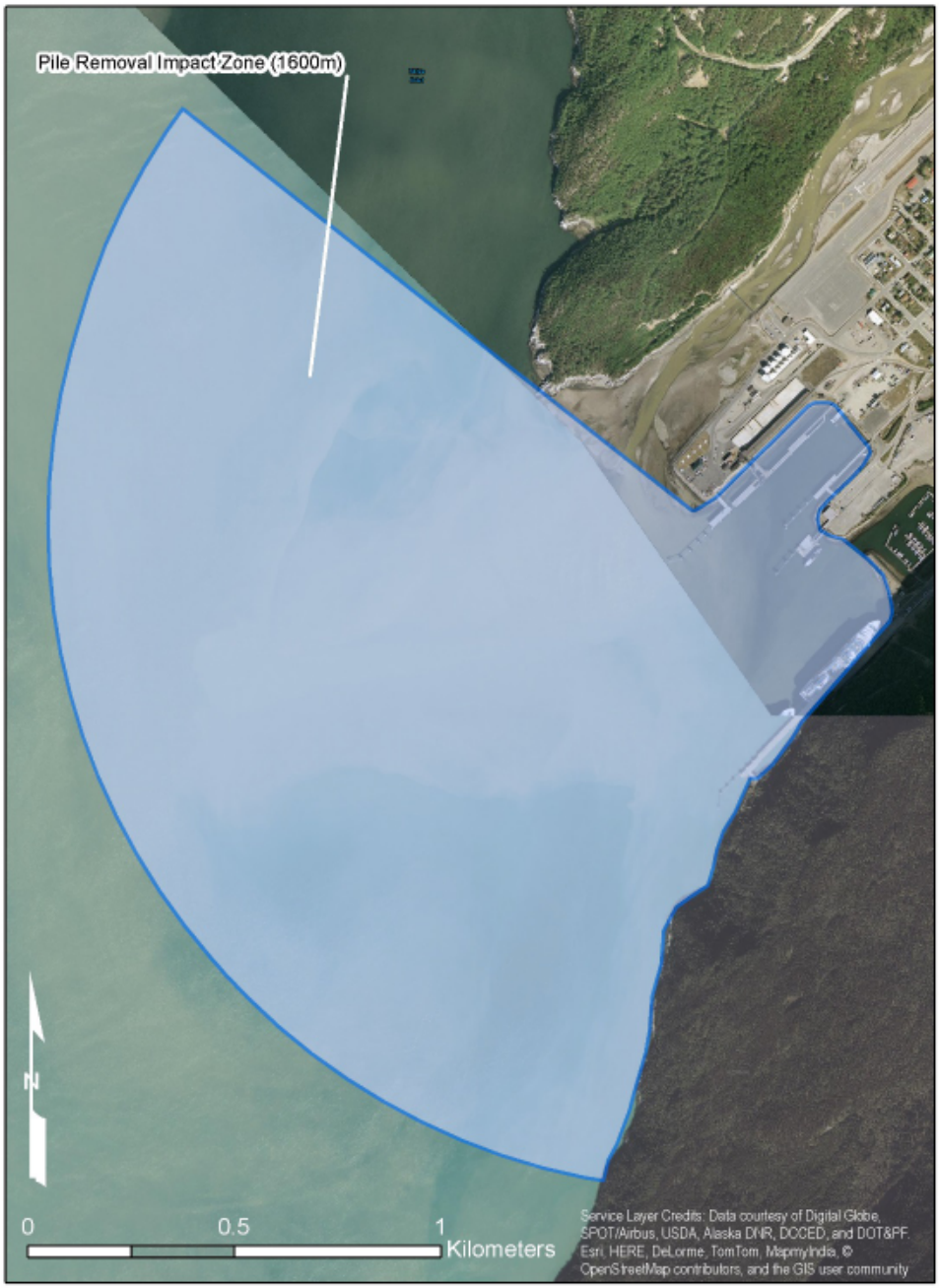

Figure 5 – Marine mammal disturbance zone for vibratory pile removal

2.0 DATES, DURATION, AND SPECIFIED GEOGRAPHIC REGION

2.1 Dates

Project activities are proposed to begin during summer 2016, with pile driving occurring from the end of July to the beginning of October 2016 and again in March 2017. Pile removal will occur in July 2016

and December 2016 to January 2017. Dredging will occur from January through the beginning of March 2017.

2.2 Duration

Pile driving is estimated to occur for a total of about 155 hours over the course of approximately 73 days in 2016 and 2017. As reported, both vibratory and impact hammers are expected to be used. To allow contractor flexibility during construction, it is expected that both vibratory and impact driving will occur each day during the 73-day pile-driving period. Demolition and pile removal is estimated to occur for a total of about 117 hours over the course of approximately 39 days in 2016 and 2017. It is expected that pile removal could occur over the entire 39 day demolition period. The pile-driving schedule is presented in Table 10.

Dredging is estimated to occur for a total of about 400 hours over 40 days during the winter of 2017 (mid-January through early March).

Table 10 – Pile Driving and Removal Schedule

Date	Construction Activities	No. of Plumb Piles	No. of Batter Piles	No. Piles Removed	Total Days of Pile Driving/ Removal
7/5 – 7/22/2016	Pile Removal/ Demolition	--	--	187	14
7/25 – 10/14/2016	Impact/Vibratory Driving	126	59	--	60
12/12/2016 – 1/13/2017	Pile Removal/ Demolition	--	--	332	25
3/14 – 3/30/2017	Floating Dock Pile Driving	10	14	--	13
TOTALS		**136**	**73**	**519**	**112**

2.3 Region of Activity

The proposed activities will occur at the Skagway Ore Terminal located in Skagway Harbor, Alaska, on the Taiya Inlet/Lynn Canal water body (Figure 1). Skagway Harbor is located at the southwestern end of the 2.5-mile-long Skagway River valley. The Skagway River empties into Taiya Inlet at the head of Lynn Canal, the northernmost fjord on the Inside Passage of the south coast of Alaska. Pullen Creek empties into the inlet on the southeast side of the valley.

3.0 SPECIES AND NUMBERS OF MARINE MAMMALS IN THE ACTIVITY AREA

3.1 Species

For the purpose of this IHA, the region of activity is defined as Taiya Inlet as impacts from the project are not anticipated to extend beyond the inlet and adjacent Lynn Canal. There are seven marine

mammal species documented in the waters of Taiya Inlet/Lynn Canal (Dahlheim et al. 2009; Allen and Angliss 2014; Muto and Angliss 2015; K. Gross, Never Monday Charters, personal communication; R. Ford, Taiya Inlet Watershed Council, personal communication; Table 11). One of the species, harbor seal, is known to consistently occur near the Skagway Ore Terminal. Moderate to high abundances of Steller sea lions are also known to seasonally occupy the inlet. Sporadic and infrequent occurrences of humpback whales have been observed within Taiya Inlet, sometimes close to Skagway, during non-winter months. The remaining four species may occur in Taiya Inlet/Lynn Canal, but infrequently and farther from the ore terminal. These species include harbor porpoise, Dall's porpoise, killer whale, and minke whale.

Table 11 – Marine Mammal Species Potentially Present in Region of Activity

Common Name	Scientific Name	Stock Abundance Estimate[1]	ESA Status	MMPA Status	Frequency of Occurence[2]
Harbor seal	*Phoca vitulina*	9,478	Not listed	Not Strategic, Non-depleted	Likely
Steller sea lion	*Eumetopias jubatus*	49,497 (western stock) 60,131 (eastern stock)	Endangered Not listed	Strategic, Depleted	Likely
Harbor porpoise	*Phocoena phocoena*	11,146	Not listed	Strategic, Non-depleted	Infrequent
Humpback whale	*Megaptera novaeangliae*	10,252	Endangered	Strategic, Depleted	Infrequent
Killer whale	*Orcinus orca*	2,347 (Alaska residents) 261 (Northern residents) 587 (Gulf, Aleutian, Bering transients) 243 (West Coast transients)	Not listed	Strategic, Non-depleted	Infrequent
Dall's porpoise	*Phocoenoides dalli*	Unknown	Not listed	Not Strategic, Non-depleted	Rare
Minke whale	*Balaenoptera acutorostra*	Unknown	Not listed	Not Strategic	Rare

Notes:

[1] NMFS marine mammal stock assessment reports at: http://www.nmfs.noaa.gov/pr/sars/species.htm.

[2] Rare: Few confirmed sightings, or the distribution of the species is near enough to the area that the species could occur there. Infrequent: Confirmed, but irregular sightings. Likely: Confirmed and regular sightings of the species in the area at least seasonally.

Two additional species, Pacific white-sided dolphin and gray whale have been listed on the NMFS MMPA mapper (NMFS 2014). Gray whale sightings in this portion of Southeast Alaska are very rare; there have only been eight sightings since 1997 (J. Neilson, National Park Service, personal communication). None of these sightings were in Taiya Inlet/Lynn Canal. Therefore, exposure of the gray whale to project impacts is considered unlikely and take is not requested for this species. The range of Pacific white-sided dolphin is also suggested to overlap with the action area as portrayed on the NMFS MMPA mapper, but no sightings have been documented in the project vicinity (K. Gross, Never Monday Charters, personal communication; R. Ford, Taiya Inlet Watershed Council, personal communication; Dahlheim et al. 2009). Therefore, exposure of the Pacific white-sided dolphin to project impacts is considered unlikely and take is not requested for this species.

Harbor seals are the most common marine mammal species in Taiya Inlet, with haulouts at Seal Cove, located about 6 miles from the project area, and near the mouth of the Taiya River located about three miles from the project area. Seals are most abundant during the hooligan (*Thaleichtys pacificus*) spawning run, an anadromous species of forage fish that spawns in the Taiya and Skagway rivers (K. Gross, Never Monday Charters, personal communication) during April and May. Seal numbers can be over 100 during the run, but decline shortly after (K. Gross, Never Monday Charters, personal communication; R. Ford, Taiya Inlet Watershed Council, personal communication).

Steller sea lions are less common in Taiya Inlet, but two to three dozen haul out on Taiya Point Rocks at the southern tip of Taiya Inlet during the hooligan spawning run (K. Gross, Never Monday Charters, personal communication; R. Ford, Taiya Inlet Watershed Council, personal communication). Taiya Point rocks are located about 12 miles from Skagway just outside of the continuous noise behavioral impact zone. Major long-term haul outs are present in upper Lynn Canal at Gran Point near Haines, and Met Point and Benjamin Island near Juneau within the canal. Large numbers are present at Benjamin Point during the winter; counts range from 252 to 707 animals. The highest number of animals during the summer months have been observed at Gran Point (Fritz et al. 2015).

There are confirmed sightings of harbor porpoise, humpback whale, orca, and minke whale within Taiya inlet. Opportunistic sightings of marine mammals by charter boats operating out of Skagway, provide the following estimates for each spring/summer season:

- Harbor porpoise can be common but not abundant in Taiya Inlet; approximately 30 animals total in groups of two or three from spring through fall.
- Typically 15 to 20 killer whales have been observed in Taiya Inlet four to five times a year from early spring through fall.
- Humpback whale are present in Taiya Inlet off and on with four to five whales often observed near Skagway from spring through fall.
- Dall's porpoise are occasional visitors to Taiya Inlet; a few individuals have been found during early spring and late fall.
- Minke whales are relatively rare in Taiya Inlet; only one was observed in the inlet in 2015.

The following sections discuss the species from Table 11 and their numbers in Southeast Alaska and Icy Strait.

3.2 Numbers

By most measures the populations of marine mammals that utilize Taiya Inlet are healthy and increasing. Populations of humpback whales using Taiya Inlet, Lynn Canal, and surrounding areas are increasing by 5.1 percent per year (Hendrix et al. 2012). Steller sea lion abundance, as indicated by haul out numbers, have shown steady populations in Lynn Canal (Fritz et al. 2015).

3.2.1 Harbor Seal

Harbor seals occurring in Taiya Inlet/Lynn Canal belong to the Lynn Canal/Stephens Passage (LC/SP) harbor seal stock. The current abundance estimate for this stock is 9,478 (Allen and Angliss 2014), based on aerial survey data. The minimum population estimate is 8,605. The five-year trend for LC/SP harbor seals is estimated at a slight decline of 176 animals per year. Possible reasons for the slight decline have not been reported (Muto and Angliss 2015).

3.2.2 Steller Sea Lion

Steller sea lions occurring in Taiya Inlet/Lynn Canal could belong to either the western or eastern United States stock.

The current total population estimate for the western stock in Alaska is estimated at 49,497 based on 2014 survey results. To get this estimate, pups were counted during the breeding season, and the number of births were estimated from the pup count. Because of uncertainties regarding the use of pup data, this estimate is also considered the minimum population estimate. During the 1980s, counts of the western stock declined approximately 15 percent per year, which prompted the listing under the Endangered Species Act. Survey data in 2002 and subsequent surveys suggest that the overall decline stopped between 2000 and 2002. Trend data collected through 2014 suggest there is strong evidence that the population has increased between 2000 and 2014; however, there are also strong regional differences across the range in Alaska (Muto and Angliss 2015).

The current total population estimate for the eastern stock of Steller sea lions is estimated at 60,131 based on counts made between 2009 and 2013 (Allen and Angliss 2014). To get this estimate, pups were counted during the breeding season, and the number of births was estimated from the pup count. The minimum eastern stock population estimate is 36,551 (Allen and Angliss 2014). The best available information indicates the eastern stock of Steller sea lion increased at a rate of 4.18 percent per year (90 percent confidence bounds of 3.71 to 4.62 percent per year) between 1979 and 2010 based on an analysis of pup counts in California, Oregon, British Columbia, and Southeast Alaska.

3.2.3 Harbor Porpoise

There are three harbor porpoise stocks in Alaska including the Southeast Alaska stock, Gulf of Alaska stock, and the Bering Sea stock. Only the Southeast Alaska stock occurs in the project vicinity. Harbor porpoise numbers for the Southeast Alaska stock are estimated at 11,146 animals (Allen and Angliss 2014). Abundance estimates for harbor porpoise occupying the inland waters of Southeast Alaska were 1,081 in 2012. However, this number may be biased low due to survey methodology (Allen and Angliss 2014).

3.2.4 Humpback Whale

The central North Pacific stock of humpback whales occur in the project area. Estimates of this stock are determined by winter surveys in Hawaiian waters. The best estimate of abundance from Hawaii-based surveys is estimated to be 10,252 (Muto and Angliss 2015). Using this estimate, the minimum

estimate for the central North Pacific humpback whale stock is 9,896 (Muto and Angliss 2015). Systematic whale surveys are not undertaken in the Taiya/Lynn Canal area.

3.2.5 Killer Whale

Killer whales occurring in Taiya Inlet/Lynn Canal could belong to one of four different stocks: Eastern North Pacific Alaska residents (Alaska residents); Eastern North Pacific Northern residents (Northern residents); Gulf of Alaska, Aleutian Islands, and Bering Sea transients (Gulf of Alaska transients); or West Coast transients. The Northern resident stock is a transboundary stock, and includes killer whales that frequent British Columbia, Canada, and southeastern Alaska (Allen and Angliss 2014). Photo-identification studies since 1970 have catalogued every individual belonging to the Northern resident stock and in 2010 the population was composed of three clans representing a total of 261 whales. Because this population has been studied for such a long time, the estimated population size of 261 animals can serve as a minimum count of the population. Observations of the numbers of killer whales in Taiya Inlet at any one time would also suggest that a resident stock infrequently enters the inlet.

In recent years, a small number of the Gulf of Alaska transients (identified by genetics and association) have been seen in southeastern Alaska; previously only West Coast transients had been seen in southeastern Alaska (Allen and Angliss 2014). Therefore, the Gulf of Alaska transient stock occupies a range that includes southeastern Alaska. Photo-identification studies have identified 587 individual whales in this stock.

The West Coast transient stock includes animals that occur in California, Oregon, Washington, British Columbia, and southeastern Alaska. Analysis of photographic data identifies 243 individual transient killer whales (Allen and Angliss 2014).

3.2.6 Dall's Porpoise

There are no reliable abundance data for the Alaska stock of Dall's porpoise. Surveys for the Alaska stock of Dall's porpoise are more than 21 years old (Allen and Angliss 2014). A population estimate from 1987 to 1991 was 83,400. Since the abundance estimate is based on data older than eight years, the current minimum population number is considered unknown.

3.2.7 Minke Whale

The Alaska stock of minke whales occurs in Southeast Alaska. At this time, it is not possible to produce a reliable estimate of minimum abundance for this wide ranging stock. No estimates have been made for the number of minke whales in the entire North Pacific. Surveys of the Bering Sea and of an area ranging from Kenai Fjords in the Gulf of Alaska to the central Aleutian Islands estimate 1,003 and 1,233 animals, respectively (Allen and Angliss 2014).

4.0 AFFECTED SPECIES STATUS AND DISTRIBUTION

This section includes information on each species' stock status and distribution (including seasonal information if available). No systematic marine mammal surveys have been conducted in Taiya Inlet, but Dalheim et al. (2009) conducted cetacean line transect surveys of most of the inland waters of

Southeast Alaska between 1991 and 2007. Spring, summer, and fall surveys were conducted with a total of 484 survey days logged. Surveys of Taiya inlet were conducted during each seasonal period (Figure 6).

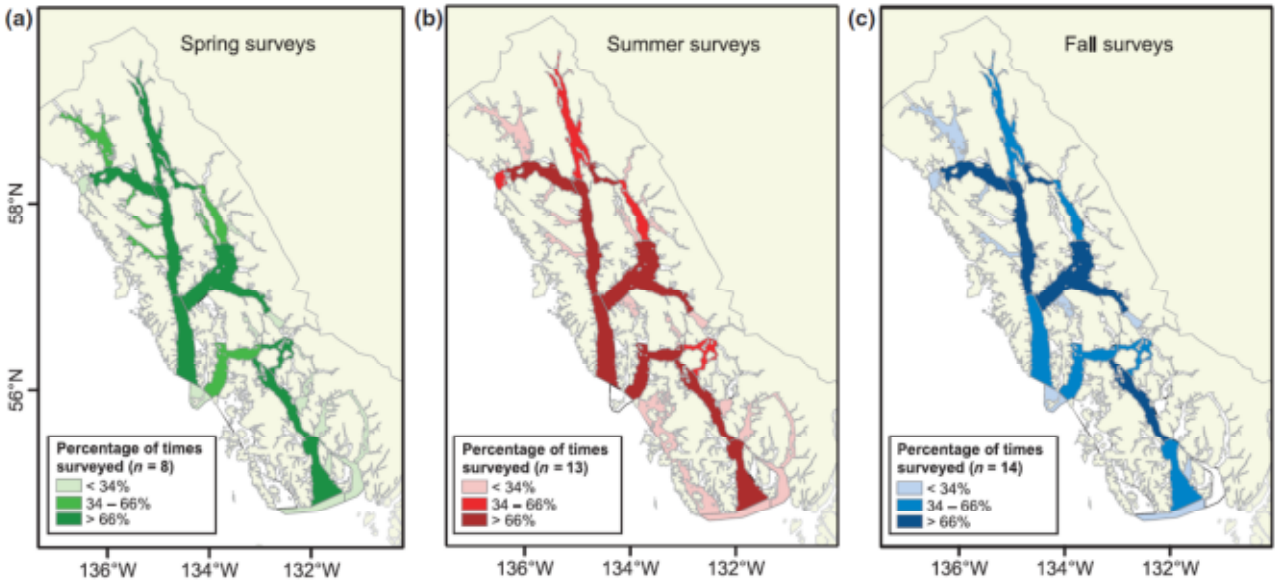

Figure 6 – Survey effort by season: (a) spring, (b) summer, and (c) fall in Southeast Alaska by Dalheim et al. (2009) from 1991 to 2007

During this multi-year survey, no cetaceans were reported in Taiya Inlet, but consistent and frequent sightings of humpback whale, Dall's porpoise, and harbor porpoise were made in Lynn Canal as far north as Haines, Alaska. Frequent sightings in Lynn Canal were observed during all three survey periods. Resident and transient killer whales were observed with less frequency, but encounters in Lynn Canal were made during all seasons. These data are consistent with observations by local observers in Taiya Inlet that cetacean sightings are less frequent or occasional within the inlet.

No systematic pinniped survey data were identified for Taiya Inlet, but the National Marine Mammal Laboratory of NOAA Fisheries maintains a multi-year data base of Steller sea lion counts (Fritz et al. 2015). This database contains annual survey counts for sea lion pups, juveniles and adults, and the movements of branded animals. Several long-term haulout areas are located in Lynn Canal between Haines and Juneau, and counts show seasonal preferences (Figure 7). No long-term haulouts were identified in Taiya Inlet, but local observers have found sea lions on Taiya Point Rocks at the southern tip of Taiya Inlet for a few weeks per year.

Similarly, no specific abundance data have been identified for harbor seals, but seals within the project and action areas belong to the Lynn Canal/Stephens Passage stock. The stock is genetically distinct and believed to be year-round residents, so it is possible to calculate animal densities within this geographical area.

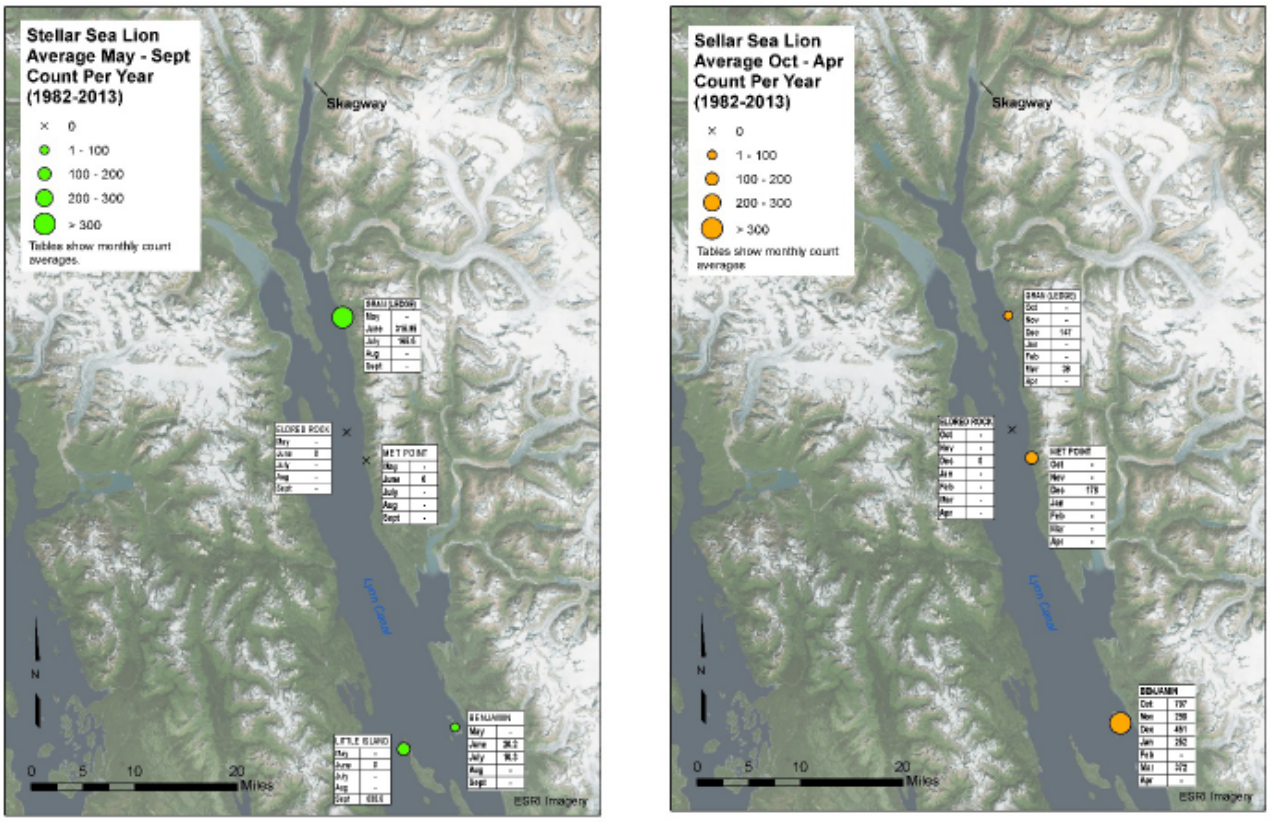

Figure 7 – Seasonal abundance of Steller sea lions on long-term haul out sites in Lynn Canal (Fritz et al. 2015)

4.1 Harbor Seal

4.1.1 Status

Harbor seals are not listed as depleted under the MMPA and they are not listed under the Endangered Species Act (ESA). The Lynn Canal/Stephens stock of harbor seals is not classified as a strategic stock (Muto and Angliss 2015).

4.1.2 Distribution

Harbor seals inhabit coastal and estuarine waters off Baja California; north along the western coasts of the United States, British Columbia, and Southeast Alaska; west through the Gulf of Alaska and Aleutian Islands; and in the Bering Sea north to Cape Newenham and the Pribilof Islands. They haul out on rocks, reefs, beaches, and drifting glacial ice, and feed in marine, estuarine, and occasionally fresh waters (Allen and Angliss 204). There are no documented long-term haulout sites for harbor seals in Taiya Inlet; however, seasonal haulouts are present within 5 miles of the project area at Seal Cove and

at the mouth of the Taiya River. During the spring run of hooligan in April and May, 20 to over 100 individual animals have been observed in these areas, with animals within inner Taiya Inlet actively feeding. After the spawning run, much lower numbers of harbor seals are present. Local observers have found that very few, if any, harbors seals are present during the winter (R. Ford, Taiya Inlet Watershed Council, personal communication; K Gross, Never Monday Charters, Personal communication).

Harbor seals within the Lynn Canal/Stephens Passage stock have maintained a steady to slightly declining population over the past five years. The latest stock assessment analysis indicates that there is a 71 percent probability that the stock has declined by 1.8 percent over this period (Muto and Angliss 2015). Using seal stock assessment data from within the Lynn Canal/Stephens Passage stock, the calculated density of this stock is 1.7 animals per square kilometer (total population divided by total area). This density was applied to the area within the behavioral impact zone for vibratory driving (21 square kilometers, which includes most of Taiya Inlet) for a total of 36 animals in the whole of Taiya Inlet. This is consistent with local observations which estimate local abundances between 12 and 20 animals outside of the hooligan spawning period. These animals are mostly on haulouts in the vicinity of Seal Cove, swimming in areas near the waterfront, and hauled out at the mouth of the Taiya River (Figure 4). Proposed pile driving will occur in March, and in July through October, avoiding the hooligan spawning run and the period of maximum local abundance of harbor seals.

For the purposes of our analysis, the estimated number of local animals within the behavioral zones for impact pile driving (2,154 meters), pile removal (1,600 meters), and mitigated impact pile driving (631–856 meters) is eight animals (one half of the mean range within the lower inlet). This estimate is based on the conservative assumption that about half of the animals hauled out at Seal Cove and the Taiya River mouth may be transiting through the behavioral impact zones for impact pile driving and pile removal at any given time during the summer and winter. The haulouts themselves are outside of the behavioral impact zones, located 3 to 6 miles from the project area. It is estimated that two harbor seals may be present in the small injury zone for impact pile driving (22 meters from the driven pile) during the summer. No exposure to the injury zone is expected during the winter when abundance is low. Because of the small size of the injury zone, it is expected that the marine mammal monitoring program will prevent injury take in this zone. Based on calculated density estimates, all 36 animals will be exposed to the continuous noise behavioral zone, which includes most of Taiya Inlet.

No exposure to turbidity plumes associated with dredging is expected since all dredging activities will occur during the winter (mid-January through early March) when few if any harbor seals have been locally observed in the harbor area.

4.2 Steller Sea Lion

4.2.1 Status

The eastern United States stock of Steller sea lion is currently not listed as “threatened” under the ESA. As a result, this stock is not classified as a strategic stock. The western United States stock of Steller sea lion is currently listed as “endangered” under the ESA, and therefore designated as “depleted” under

the MMPA. Genetic data indicates that most sea lions in the project area are composed of the eastern stock; however a significant percentage of the western stock resides in Southeast Alaska. Therefore, to be conservative, animals potentially affected by the project are assumed to be part of the strategic stock unless evidence is provided otherwise.

4.2.2 Distribution

Steller sea lions range along the North Pacific Rim from northern Japan to California, with centers of abundance and distribution in the Gulf of Alaska and Aleutian Islands. Large numbers of individuals disperse widely outside of the breeding season (late May to early July), thus potentially intermixing with animals from other areas, probably to access seasonally important prey resources (Allen and Angliss 2014).

There are several long-term Steller sea lion haulouts in Lynn Canal but none occur in Taiya Inlet. The nearest long-term Steller sea lion haulout is located at Gran Point, in the vicinity of Haines approximately 20 miles south of Skagway. Other year-round haulouts in Lynn Canal are present at Met Point, Benjamin Island, and Little Island, closer to Juneau (Fritz et al. 2015; Figure 7). A seasonal haulout site is located on Taiya Point rocks at the southern tip of Taiya Inlet. An estimate of 25 to 40 animals use this haulout for about three weeks during the hooligan run, during which they frequent the inlet (Figure 4). However, most animals leave the inlet shortly after the hooligan run and are scarce after about the first week in June. Sea lions are rarely observed in the inlet during the winter (R. Ford, Taiya Inlet Watershed Council, personal communication; K Gross, Never Monday Charters, Personal communication). This is consistent with the National Marine Mammal Laboratory database (Fritz et al. 2015), which has identified the largest number of Lynn Canal sea lions during the fall and winter months at Benjamin Island in the lower reaches of the canal (Figure 7). Both the long-term and seasonal haulouts would be considered critical habitat for the species, but are outside of the construction impact zones.

Taiya Point Rocks are located approximately 12 miles south of Skagway and 1.3 miles outside of the continuous noise vibratory behavioral impact zone (Figure 4). Given that sea lion presence in Taiya Inlet occurs during the hooligan run, during which no pile driving will occur, and the nearest haulout site is outside of the behavioral impact zone, it is expected that Steller sea lion exposure to pile driving will be low. This has been confirmed by local observers, who have reported one to three sea lions in Taiya Inlet outside of the hooligan spawning run. Others, however, have observed sea lions in greater numbers in nearby Lutak Inlet in the fall during salmon runs, and at the Gran Point haulout near Haines. These observations and data suggest that it is reasonable to expect more sea lions to travel into Taiya Inlet. None have been observed during the winter (K. Gross, Never Monday Charters, personal communication).

For the purpose of this assessment, it is assumed that 16 Steller sea lions will be present within Taiya Inlet during any given time while pile driving and pile removal operations are occurring in the summer and fall (half of the mean found on Taiya Rocks during the hooligan run). Exposure to pile-driving and removal activities during the winter is not expected to occur. No Steller sea lions are expected to be

exposed to the small injury zone near the facility. If any do appear, the marine mammal monitoring program would effectively prevent take.

No exposure to turbidity plumes associated with dredging is expected since all dredging activities will occur during the winter (mid-January through early March) when sea lions have not been locally observed in the harbor area.

4.3 Harbor Porpoise

4.3.1 Status

Harbor porpoise are not designated as "depleted" under the MMPA or listed as "threatened" or "endangered" under the ESA (Allen and Angliss 2014). Because the abundance estimates are 12 years old and the frequency of incidental mortality in commercial fisheries is not known, the Southeast Alaska stock of harbor porpoise is classified as a strategic stock.

4.3.2 Distribution

Harbor porpoise primarily frequent coastal waters, and in the Gulf of Alaska and Southeast Alaska, they occur most frequently in waters less than 100 meters (Dahlheim et al. 2009). Within the inland waters of Southeast Alaska, the harbor porpoise distribution is clumped, with greatest densities observed in the Glacier Bay/Icy Strait region, and near Zarembo and Wrangell Islands and the adjacent waters of Sumner Strait (Allen and Angliss 2014). In Lynn Canal, observations were less frequent, primarily in lower Lynn Canal from Chatham Strait to Juneau. The species has been observed as far north as Haines during the summer (Dahlheim et al. 2009). This is somewhat inconsistent with local observations. Encounters of small groups of two or three animals have been reported by local vessel charters in Taiya Inlet. Observations have been frequent, but not on a daily basis (K. Gross, Never Monday Charters, personal communication). The mean group size of harbor porpoise in Southeast Alaska is estimated at two individuals (Dahlheim et al. 2009). For the purposes of this analysis it is estimated that two harbor porpoises will be present in Taiya Inlet, but because observations do not occur daily, we estimate their presence within the inlet at three out of four days during the year. Potential exposure would therefore occur for 75 percent of the pile-driving/removal period.

4.4 Humpback Whale

4.4.1 Status

The humpback whale is listed as "endangered" under the ESA, and therefore designated as "depleted" under the MMPA. As a result, the central North Pacific stock of humpback whale is classified as a strategic stock.

4.4.2 Distribution

Humpback whales are the most commonly observed baleen whale in the area and surrounding Southeast Alaska, particularly during spring and summer months. Humpback whales in Alaska, although not limited to these areas, return to specific feeding locations such as Frederick Sound,

Chatham Strait, North Pass, Sitka Sound, Glacier Bay, Point Adolphus, and Prince William Sound, as well as other similar coastal areas (Wing and Krieger 1983). In Lynn Canal they have been observed in the spring and fall from Haines to Juneau. Scientific surveys have not documented the species within Taiya Inlet (Dahlheim et al. 2009). The humpback whale population in Southeast Alaska appears to be increasing with estimates of 547 animals in the mid-1980s (Angliss and Outlaw 2005) and 961 animals in 2000 (Straley et al. 2002).

Local observers have reported humpback whales in Taiya Inlet, sometimes fairly close to the Skagway waterfront. In 2015, only one whale was observed for a few weeks close to Skagway. On average, four to five individuals may occur near the town during the spring hooligan run, after which, only a few individuals are observed on and off through the summer. No pile driving will occur during the spring hooligan run. For the purpose of this analysis, it is estimated that two humpback whales will be present over two 3-week periods during the summer.

4.5 Killer Whale

4.5.1 Status

Killer whales occurring in Taiya Inlet could belong to one of three different stocks: Eastern North Pacific Northern residents stock (Northern residents); Gulf of Alaska, Aleutian Islands, and Bering Sea transient stock (Gulf of Alaska transients); or West Coast transient stock. These three stocks are not designated as “depleted” under the MMPA or listed as “threatened” or “endangered” under the ESA (Allen and Angliss 2014). Therefore, all three stocks of killer whales are not classified as a strategic stock.

4.5.2 Distribution

Killer whales are found throughout the North Pacific. Along the west coast of North America killer whales occur along the entire Alaskan coast, in British Columbia and Washington inland waterways, and along the outer coasts of Washington, Oregon, and California (Allen and Angliss 2014). Seasonal and year-round occurrence has been noted for killer whales throughout Alaska and in the intracoastal waterways of British Columbia and Washington State, where whales have been labeled as “resident,” “transient,” and “offshore” type killer whales based on aspects of morphology, ecology, genetics, and behavior.

Resident and transient killer whales have been documented in the middle to lower reaches of Lynn Canal, but not within the upper reaches or in Taiya Inlet (Dahlheim et al. 2009). Two resident pods identified as AF and AG pods were frequently encountered throughout Icy Strait, Lynn Canal, Stephens Passage, Frederick Sound and upper Chatham Strait (Dahlheim et al. 2009). The seasonality of resident killer whales could not be investigated statistically owing to low encounter rates. Mean group size of resident whales did not vary significantly among seasons and ranged from 19 to 33 individuals. Transient killer whales were found in all major waterways, including Lynn Canal in open-strait environments, near-shore waters, protected bays and inlets, and in ice-laden waters near tidewater glaciers (Dahlheim et al. 2009). Dahlheim et al. (2009) found that transient killer whale mean group

size ranged from four to six individuals in Southeast Alaska. Transient killer whale numbers were highest in summer, with lower numbers observed in spring and fall.

Local observations indicate that resident pods occasionally enter Taiya Inlet, usually a group of 15 to 20 animals. These animals are typically observed only a few times a year. In 2015 a resident pod was only observed in Taiya Inlet twice, remaining for one to four days per visit. Based on these observations, we estimate that a resident pod of 15 animals enter the inlet on two occasions during the summer, remaining in the inlet for two days per visit.

4.6 Dall's Porpoise

4.6.1 Status

Dall's porpoise are not designated as "depleted" under the MMPA or listed as "threatened" or "endangered" under the ESA. The Alaska stock of Dall's porpoise is not classified as a strategic stock.

4.6.2 Distribution

Dall's porpoise are widely distributed across the entire North Pacific Ocean. Throughout most of the eastern North Pacific they are present during all months of the year, although there may be seasonal onshore-offshore movements along the west coast of the continental United States and winter movements of populations out of Prince William Sound and areas in the Gulf of Alaska and Bering Sea (Allen and Angliss 2014).

Dahlheim et al (2009) found Dall's porpoise throughout Southeast Alaska, with concentrations of animals consistently found in Lynn Canal, Stephens Passage, Icy Strait, upper Chatham Strait, Frederick Sound, and Clarence Strait. Local observers have observed only three to six Dall's porpoises in Taiya Inlet during the early spring and late fall. Observations have been occasional to sporadic, not occurring daily. The species has not been observed near the waterfront, and no animals have been observed during the summer or winter (K. Gross, Never Monday Charters, personal communication). This is consistent with Dahlheim et al. (2009), who have only documented this species in Lynn Canal as far north as Haines, Alaska, about 15 miles south of Skagway and 5 miles south of the continuous noise behavioral impact zone. The mean group size of Dall's porpoise in Southeast Alaska is estimated at three individuals (Dahlheim et al. 2009). For the purposes of this analysis, we estimate that three animals will be present in outer Taiya Inlet for the latter half of the summer pile-driving period (30 days between September 1 and October 14). Since observations during the fall have been occasional, we also assume a presence in the inlet every other day, for a total of 15 days of exposure.

4.7 Minke Whale

4.7.1 Status

Minke whales are not designated as "depleted" under the MMPA or listed as "threatened" or "endangered" under the ESA. Because minke whales are considered common in the waters off Alaska

and because the number of human-related removals is currently thought to be minimal, this stock is presumed to not be a strategic stock (Allen and Angliss 2014).

4.7.2 Distribution

In the North Pacific minke whales occur from the Bering and Chukchi Seas south to near the Equator (Allen and Angliss 2014). Dahlheim et al. (2009) found minke whales were scattered throughout inland waters from Glacier Bay and Icy Strait to Clarence Strait, with concentrations near the entrance of Glacier Bay. All but one encounter consisted of single animals, and thus mean group size was not calculated. Although sightings of minke whales were infrequent over the 17-year study period (n = 31), minke whales were encountered during all seasons, with a few animals recorded each year. Local observers encountered only one minke whale in Taiya inlet over the past five years. For the purpose of this analysis, minke whales are not expected to be exposed to pile driving noise from the project.

5.0 TYPE OF INCIDENTAL TAKE REQUESTED

The MOS requests the issuance of an IHA pursuant to Section 101(a)(5) of the MMPA for incidental take by Level B acoustical harassment of seven species. Incidental take may result from exposure to underwater noise during the planned Skagway Gateway Initiative Project during the period of July 2016 through April 2017.

The activities outlined in Section 1.0 have the potential to take marine mammals by exposure to underwater sound. Take will potentially result from the following specific aspects of the proposed project: waterborne noise from impact pile driving and vibratory pile driving (pile installation and removal). With the exception of harbor seals, it is anticipated that all of the marine mammals that enter the disturbance zones (Figures 2–5) will be subject to Level B harassment and exposed to pile driving noise only briefly as they are transiting the area (i.e., no injury or mortality expected).

Only harbor seals and possibly Steller sea lions are expected to forage in the disturbance zone with any frequency and could be exposed multiple times during the project. Because of the habituated behavior of pinnipeds in the work area, there is also the potential for these two species to occupy areas within the small injury zone (22 meters). However, these animals will be protected from exposure to the injury zone by the marine mammal monitoring program which will shut down pile driving before they enter. No Level A take is requested for the pinnipeds or any other marine mammals.

The exposure periods of each species of marine mammal to various noise inducing in-water activities are presented in Table 12.

Table 12 – Potential Exposure of Marine Mammals During In-water Work Activities

Species (# animals exposed)	Level A Injury	Level B Behavioral Disturbance		
	Waterborne Impact Pile Driving Injury Zone	Impact Pile Driving Behavioral Zone	Vibratory Pile Removal	Vibratory Pile Driving
Harbor Seal (36 animals)	No exposure because of small injury zones[1]	Local population exposure over 73 days	Local population exposure over 39 days	Taiya Inlet population exposure over 73 days
Steller Sea Lion (16 animals)	No exposure because of small injury zones[1]	Local population exposure over 73 days	Local population exposure over 14 days (summer removal period)	Taiya Inlet population exposure over 73 days
Humpback Whale (2 animals)	None[2]	A total of two 21-day periods over the course of summer/fall pile removal and driving with vibratory driver		
Harbor Porpoise (2 animals)	None[2]	Exposure expected over 75% of pile driving/removal period	Exposure expected over 75% of pile driving/removal period	Transient population exposure over 84 days
Killer Whale (15 animals)	None[2]	One resident pod exposed over a 4-day period		
Dall's Porpoise (3 animals)	None	No exposure expected within disturbance zones close to waterfront	No exposure expected within disturbance zones close to waterfront	Transient population exposure over 15 days
Minke Whale	None[3]			

Notes:
[1] Minimal exposure to Level A injury and airborne disturbance will occur because small injury zones can be effectively monitored during marine mammal monitoring program
[2] Highly unlikely that whales will enter the small injury zone near existing facility
[3] Though present in Southeast Alaska, this species is rarely observed in Taiya Inlet by local observers and not observed in scientific surveys

6.0 TAKE ESTIMATES FOR MARINE MAMMALS

This section summarizes potential incidental take of marine mammals during Skagway Ore Terminal improvements described in Section 1.0 of this IHA application. Incidental take is estimated for each species by estimating the likelihood of a marine mammal being present within an injury or disturbance zone during pile driving activities.

Due to the expected impact and vibratory pile driving sound levels, this IHA application requests incidental take authorization by Level B acoustical harassment for harbor seals, Steller sea lions, harbor porpoise, humpback whales, killer whales, and Dall's porpoise. With the exception of harbor seals and Steller sea lions, it is anticipated that all of the marine mammals that enter a Level B acoustical disturbance zone will be exposed to pile driving noise only briefly as they are transiting the area. Only harbor seals and possibly Steller sea lions are expected to forage in the Skagway project area with any frequency and could be exposed multiple times during a project.

6.1 Estimated Duration of Pile Driving and Removal

The pile driving schedule is presented in Section 2 and Table 10. Pile driving is estimated to occur for a total of about 155 hours during the summer and winter over a 73-day period 60 days during the summer (2016) and 13 days during the winter (2016–2017). Pile removal is estimated to occur for a total of about 117 hours over a 39-day period during the summer and winter (14 days during the summer of 2016 and 25 days during the winter of 2016–2017).

6.2 Estimated Duration of Dredging Activities

As stated in Section 2.0, dredging is estimated to occur for a total of about 400 hours over 40 days during the winter in 2017.

6.3 Estimated Zones of Influence/Zones of Exclusion

The distances to the acoustic thresholds for Level B (harassment) take for vibratory and impact pile driving, and Level A (injury) take for impact installation are presented in Section 1.3. The zones of influence were calculated from these distances and are summarized in Table 7. These distances include in-air disturbance zones that will be limited to harbor seals and Steller sea lions.

6.4 Estimated Incidental Takes

Incidental take is estimated for each species by estimating the likelihood of a marine mammal being present within the disturbance zone during active pile driving. Expected marine mammal presence is determined by past observations and general abundance near the Skagway Ore Terminal during the construction window. The take requests for this IHA were estimated using local marine mammal data sets (e.g., National Marine Mammal Laboratory databases; Dahlheim et al. 2009) and observations from local Skagway charter operators and watershed steward programs. All haulout and observation data available are summarized in Section 4.0. Project duration is presented in Section 2.0. Distances to the NMFS thresholds for Level A Injury and Level B harassment are presented in Section 1.0. The calculation for marine mammal exposures is estimated by the following two equations:

Level B Exposure estimate = N (number of animals) × no. of days of noise generating activities

Level A Exposure estimate = N (number of animals) × no. of days that an injury zone is estimated to occur for each activity

Most species will be present only occasionally. It is assumed that take requests will include multiple harassments of the same individuals, particularly with harbor seals.

6.4.1 Harbor Seal

Based on density estimates from the Lynn Canal/Stephens Passage stock and observations from local observers, 36 harbor seals are estimated to occur within Taiya Inlet and will therefore be exposed to the continuous noise vibratory impact zone (see Section 4.1.2). Based on observations of harbor seals on seasonal haul outs 3 to 6 miles from the Skagway waterfront, eight of these seals will transit through behavioral impact zones closer to the project area. Two or fewer of these animals may approach the small injury zone of 22 meters, and will be protected from injury by the marine mammal monitoring program. Since in-air disturbance estimates are below the underwater estimate, and assuming an animal can be taken once per day, the underwater exposure injury estimate will account for all in-air disturbance. Using these numbers, the following number of harbor seals are estimated to be present in the injury and disturbance zones:

- Underwater exposure to behavioral pile removal zone: 8 animals × 14 days of pile driving/removal during the summer and fall = 112
- Underwater exposure to continuous noise behavioral zone: 36 animals × 60 days of continuous noise pile activity during the summer/fall = 2,160

The MOS is requesting authorization for 2,272 Level B acoustical harassment takes of harbor seals.

6.4.2 Steller Sea Lion

Based on observations of local boat charter captains and watershed stewards, Steller sea lions can be abundant, but only during the local hooligan spawning run (April/May). Afterwards, the animals are relatively scarce in Taiya Inlet but may occupy the area in the fall during salmon runs. Additionally, the primary seasonal haulout is present on the Taiya Point rocks, which is outside of the continuous noise disturbance zone for vibratory driving. Based on local observations during the period outside of the hooligan spawning run, this analysis estimates that 16 Steller sea lions could be present during pile driving and removal operations during the summer and fall (see Section 4.2.2). No exposure to the impact pile driving injury zone and impact pile driving airborne disturbance zone is expected based on the few animals that are present during the pile driving period and the small size of these zones. The injury and airborne disturbance zones can be effectively monitored during the marine mammal monitoring program and prevent exposure and take. Using these numbers the following number of Steller sea lions are estimated to be present in the Level B disturbance zones:

- Underwater exposure to behavioral pile removal zone (summer): 16 animals × 14 days of pile removal activity = 224
- Underwater exposure to behavioral continuous noise zone (summer and fall): 16 animals × 60 days of pile driving activity = 960

The MOS is requesting authorization for 1,184 Level B acoustical harassment takes. Given the low numbers of sea lions estimated to be present in Taiya Inlet, it is expected that the great majority of the exposures will be to the same individual animals.

6.4.3 Harbor Porpoise

Based on observations of local boat charter captains and watershed stewards, transient populations of harbor porpoise are frequently encountered in small numbers in Taiya Inlet, but not on a daily basis. Therefore, they could potentially transit through both the continuous noise and impact disturbance zones during the entire pile driving/removal period. They would not be expected to occupy Skagway Harbor and be exposed to the injury zone or dredging. For this analysis we take a conservative estimate and assume that two harbor porpoise could be present in outer Taiya Inlet for 75 percent of the pile-driving period. Using this number, the following number of harbor porpoise are estimated to be present in the disturbance zone:

- Underwater exposure estimate: 2 animals × 84 days of pile driving activity = 168

The MOS is requesting authorization for 168 Level B acoustical harassment takes of harbor porpoise.

6.4.4 Humpback Whale

Based on observations of local boat charter captains and watershed stewards, humpback whales occasionally enter Taiya Inlet and often come within a mile of the Skagway waterfront from spring through fall. Most observations occur during the hooligan run in April and May with sporadic occurrences during other periods. Since the species has not been observed during winter months, it is not expected to pile driving activities in March or pile-removal activities in December and January. For this analysis we conservatively estimate that two humpback whales could be present during two 3-week periods over the course of the summer within the pile-driving disturbance zones. Using this number, the following number of humpback whales is estimated to be present in the disturbance zone:

- Underwater exposure estimate: 2 animals × 42 days of pile activity = 84

The MOS is requesting authorization for 84 Level B acoustical harassment takes of humpback whales.

6.4.5 Killer Whale

Based on observations of local boat charter captains and watershed stewards, the probability of killer whales occurring in Taiya Inlet is low, but resident pods have been observed infrequently. For this analysis we estimate that a resident pod of 15 killer whales will enter Taiya Inlet twice a year remaining within the inlet for two days per visit. Using this number, the following number of killer whales is estimated to be present within disturbance zones:

- Underwater exposure estimate: 15 animals × 4 days of pile driving activities = 60

The MOS is requesting authorization for 60 Level B acoustical harassment takes of killer whales.

6.4.6 Dall's Porpoise

Based on observations of local boat charter captains and watershed stewards, transient populations of Dall's porpoise are infrequently encountered in small numbers during the spring and fall within Taiya

Inlet. They have not been documented near Skagway close to town nor have they been observed during the winter (see Section 4.6.2). Therefore, they could potentially transit through the continuous noise disturbance zone during vibratory pile driving but are likely not affected by intermittent noise generated from impact pile driving or pile removal due to their relatively small zones of effect. For this analysis we take a conservative estimate and assume that three Dall's porpoise could be present in outer Taiya Inlet during the latter half of the summer pile driving period. Since animals are only occasionally seen, we assume they are present during this period on every other day, for a total of 15 days of exposure from September 1 through October 14). Using this number, the following number of Dall's porpoise are estimated to be present in the disturbance zone:

- Underwater exposure estimate: 3 animals × 15 days of vibratory pile driving activities = 45

The MOS is requesting authorization for 45 Level B acoustical harassment takes of Dall's porpoise.

6.4.7 Minke Whale

Based on observations of local marine mammal specialists, the possibility of minke whales occurring in Taiya Inlet is rare. This, along with scientific survey data showing that this species has not been documented within the Inlet, indicates that there is little risk of exposure to waterborne noise from the project. No authorization for take is requested for minke whale.

The total number of takes for which Level B acoustical harassment authorization is requested is presented in Table 13.

Table 13 – Summary of Acoustical Injury and Harassment Take Requests

Species	Level A Injury Takes	Level B Harassment Takes
Harbor seal (pile driving and removal)	0	2,272
Steller sea lion (pile driving and removal)	0	1,184
Harbor porpoise	0	168
Humpback whale	0	84
Killer whale	0	60
Dall's porpoise	0	45
Minke whale	0	0

7.0 ANTICIPATED IMPACT OF THE ACTIVITY

Level B harassment take requests, and the percentage of each stock that may be temporarily disturbed, is summarized in Table 14. Take requests are assumed to include multiple harassments of the same individual(s), resulting in estimates of Take Request Percent of Stock that are high compared to actual take that will occur. This is the case with the harbor seal. The total population estimate in the Lynn Canal/Stephens Passage stock is 9,478 animals over 1.37 million acres of area. This is a density of 36 animals within Taiya Inlet. The largest Level B harassment Zone within the inlet occupies 21.0 square kilometers, which represents less than 0.4 percent of the total geographical area occupied by the stock. The great majority of these exposures will be to the same animals that have habituated to

pile driving and pile removal activities within the inlet and the general port activities associated with the Skagway waterfront. Similarly, the estimate of Steller sea lions that enter Taiya Inlet outside of the hooligan spawning run is quite low, but these few animals will be exposed to waterborne noise disturbances over 60 days of pile driving during the summer.

Table 14 – Level B Acoustical Harassment Take Request Percent of Total Stock

Species	Stock Size	Take Request	Take Request Percent of Stock
Harbor seal harassment Take	9,478	2,272	24.0
Steller sea lion	49,497 (western stock in Alaska) 60,131 (eastern stock)	1,184	2.4 (Western Stock)[1] 2.0 (Eastern Stock)[2]
Harbor porpoise	11,146	168	1.5
Humpback whale	10,252	84	0.82
Killer whale	243 (W Coast transient)	60	24.7
Dall's porpoise	Unknown	45	--
Minke whale	Unknown	0	0

1 – Percent Take assumes no Eastern Distinct Population Take

2 – Percent Take assumes no Western Distinct Population Take

If incidental takes occur, it is most often expected to result in short-term changes in behavior and potential temporary hearing threshold shifts. These takes would be unlikely to have any impact on stock recruitment or survival, and therefore would have a negligible impact on the stocks of these species. No mortality and only limited injury to harbor seals is expected to occur as a result of project activities.

Taiya Inlet does not include any major pinniped haulouts or breeding grounds and is not known as an important feeding ground for cetaceans. Impacts to habitat over existing conditions are negligible and temporary resulting in no permanent impact to marine mammals. The monitoring plan will prevent injury takes to harbor seals and Steller sea lions that may habituate to areas of human activity along the Skagway waterfront. The proposed construction schedule of two weeks in March and mid to late-summer will avoid the hooligan spawning run when the abundance of seal, sea lion, and humpback whales are highest in the inlet. This will minimize the number of takes by conducting work when few marine mammals are present and greatly limit the amount of potential take from either injury or behavioral modification.

Most of the marine mammal species potentially impacted have a low take request as a percent of the stock. While the resident killer whale take request and percentage of stock affected appears high, in reality 60 resident killer whale individuals will not be temporarily harassed. Instead, it is assumed that there will be a relatively short period of takes of a smaller number of individuals. We make this assumption because resident pods are known to occasionally frequent Taiya Inlet. It is possible that all or part of these pods will enter the Level 2 disturbance zone once or twice during the course of the project. Therefore, we can conservatively estimate that, because of the gregarious nature of killer whales, a single pod of resident (15–20) killer whales may occur in the Level 2 disturbance zone once

or twice during the course of the project. We are also conservatively assuming these residents belong to the Northern resident stock, not the larger Alaska resident stock, which has a population estimate of 2,347 individuals.

As reported, a small number of harbor seals, most of which reside in Taiya Inlet year-round, will be exposed to vibratory pile driving and removal for nearly 4 months, bringing the individual takes to a level of over 24 percent of the stock population. Given that the Taiya Inlet area represents less than 0.4 percent of the total stock area, however, broader impacts to this stock are highly unlikely. In addition, marine mammal monitoring for the project can provide an early alert in the unlikely event that cumulative exposure of seals residing in the area is leading to adverse behavioral or physical effects.

8.0 ANTICIPATED IMPACTS ON SUBSISTENCE USES

Subsistence harvest of harbor seals and Steller sea lions by Alaska Natives is authorized under the MMPA. The proposed Project will occur near but not overlap the subsistence area used by the villages of Hoonah and Angoon (Wolfe et al. 2013). Harbor seals and Steller sea lions are available for subsistence harvest in this area (Wolfe et al. 2013). There are no harvest quotas for other non-listed marine mammals found there. The Alaska Department of Fish and Game (Wolfe et al. 2013) has regularly conducted surveys of harbor seal and sea lion subsistence harvest in Alaska. Since proposed work at the Project site will only cause temporary, non-lethal disturbance of marine mammals, we anticipate no impacts to subsistence harvest of marine mammals in the region.

9.0 ANTICIPATED IMPACTS ON HABITAT

9.1 Introduction

Construction activities will have temporary impacts on marine mammal habitat through increases in in-water and in-air sound from pile driving and dredging. Other potential temporary impacts are on water quality (increases in turbidity levels) and on prey species distribution. Best management practices (BMPs) and minimization practices used by the MOS to minimize potential environmental effects from project activities are outlined in Section 11.0 Mitigation Measures.

9.2 In-air Noise Disturbance to Haulouts

In-air noise from pile driving (impact and vibratory) and pile removal are estimated to reach the behavioral thresholds at 534 feet and 117 feet, respectively, for harbor seals. In-air noise from impact pile driving is estimated to reach the behavioral threshold at 167 feet for all other pinnipeds. No documented haulout sites are within the in-air disturbance threshold distances for harbor seals. Instead haul out sites are quite distant from the project area: harbor seals have been known to haul out at Taiya Point Rocks (approximately 11 miles from Skagway), Seal Cove (approximately 6 miles from Skagway) and near the Taiya River mouth (approximately 2 miles from Skagway; K. Gross, Never Monday Charters, personal communication). Although there is no critical habitat designated within the action area, Steller sea lions are known to haul out on the on Taiya Point Rocks, south of Mud Bay Point, and at Point Sherman (K. Gross, Never Monday Charters, personal communication). These

areas, all outside of construction activities, would be considered critical habitat. Therefore, disturbance to hauled out pinnipeds is not anticipated during these construction activities, except when surfacing during swimming within the threshold distances.

9.3 Underwater Noise Disturbance

Ambient background levels at the Skagway Ore Terminal have not been collected, but Laughlin (2014) has collected background noise levels at several ferry terminals in Puget Sound, Washington. These levels ranged from 107 to 141 dB rms and have been used to predict a waterborne background level of 120 dB rms at the Skagway facility. This level is consistent with waterborne background levels collected at other developed facilities within Puget Sound.

There are several short-term and long-term effects noise exposure may have on marine mammals, including impaired foraging efficiency and potential effects of noise on movements of prey, harmful physiological conditions, energetic expenditures, and temporary or permanent hearing threshold shifts due to chronic stress from noise (Southall et al. 2007). A small injury zone is predicted for cetaceans exposed to underwater noise from impact pile driving. This zone ranges from 74 to 100 meters from the project area; however, it is unlikely that cetaceans will approach within 100 meters of an active harbor, or will approach undetected by marine mammal observers during construction. Underwater noise from impact pile driving while using a bubble curtain is estimated to cause injury to cetaceans at 29 to 40 meters from the project area, which again makes any such exposure very unlikely.

The composite mitigated disturbance zone for impact pile driving for all marine mammals is 631 to 856 meters from the project area. If a bubble curtain is not used, underwater noise is estimated to cause injury to cetaceans at 74 to 100 meters (2.5 times greater) and disturbance at 1,585 to 2,154 meters for all marine mammals. Underwater noise in excess of disturbance thresholds from pile removal is estimated to extend for 1,600 meters from the pile for all marine mammals. These distances are great enough to assume that behavioral disturbance will occur, at least for those species likely to be within this distance of project construction. Any such effects from waterborne noise on marine mammals are expected to be short-term and limited to the 73 days when pile driving would occur and 39 days when pile removal would occur. Adherence to Anchorage Fish and Wildlife Field Office (AFWFO) Pile Driving Observer Protocols (AFWFO 2012) will reduce any potential noise disturbance to these species.

Construction activities, in the form of increased in-water noise, have the potential to adversely affect forage fish and juvenile salmonids in the project area. Hooligan (*Thaleichtys pacificus*), Pacific herring (*Clupea pallasii*), capelin (*Mallotus catervarius*), and other forage fish species are part of the prey base for many marine mammals including seals, sea lions, and baleen whales. Adult salmon are a part of the prey base for Steller sea lions, harbor seals, and killer whales. Forage fish and salmonids may alter their normal behavior as a result of pile driving activities. Inwater construction timing has been planned to avoid major spawning and migration times. In addition, prior studies indicate that it is unlikely that fish will suffer injury from in-water noise produced by activities like the pile driving, pile removal, or dredging activities planned for this project (Ruggerone et al. 2008). After pile driving is completed habitat use and function will return to pre-construction levels.

9.4 Water and Sediment Quality

Short-term turbidity is a water quality effect of most in-water work, including pile driving, pile removal, and dredging. The MOS must comply with state water quality standards during these operations by limiting the extent of turbidity to the immediate project area.

Because of the potential contamination and relatively silty nature of sediments in subtidal areas, several turbidity reducing and containment practices will be implemented to reduce turbidity plume size and duration. Despite these practices, turbidity may be increased above background levels within the immediate vicinity of construction activities and could exceed turbidity criteria for state water quality standards (18 AAC 70). Because of local currents and tidal action as well as best management practices, any potential water quality exceedances are expected to be temporary and highly localized. The local currents will disperse suspended sediments from pile driving and dredging operations at a moderate to rapid rate depending on tidal stage. Fish and marine mammals in the Taiya Inlet/Lynn Canal region are routinely exposed to substantial levels of suspended sediment from glacial sources. During dredging, suspension of anoxic sediment may result in reduced dissolved oxygen (DO) in the water column as the sediments oxidize, but any reduction in DO above background is expected to be limited in extent and temporary in nature. Based on a review of four studies on the effects of dredging on DO levels, LaSalle (1988) showed little or no measurable reduction in DO around dredging operations.

Physical resuspension of contaminated sediments will occur during dredging and has the potential to release these contaminants into the water column and potentially cause acute or chronic toxicological effects on ESA-listed species that may be present during dredge activities. Sediments within the proposed dredge footprint at the Skagway Harbor have been recently sampled and tested in accordance with the ADEC-approved Sampling and Analysis Plan (see Section 1.0, Description of the Activity, above; Anchor QEA 2014). The Sediment Cleanup Objectives (SCOs) were selected as cleanup levels for the Ore Dock sediments (Anchor QEA 2015). The SCOs are conservative marine sediment cleanup levels from the Washington Sediment Management Standards (SMS; Chapter 173-204 Washington Administrative Code [WAC], 2013 revision). The SCO is a long-term sediment quality goal and represents the lower end of the range of chemical concentrations used to establish a sediment cleanup level (WAC 173-204-560(3)).

Sediment chemistry data show levels of sediment contamination that may cause low, chronic, long-term ecological effects to benthic habitats, but would not likely cause acute, toxic effects within the water column. Polycyclic aromatic hydrocarbons (PAHs) and metals strongly bind to the sediments and would have a low bioavailability within the surrounding water column. Resuspension of sediments contaminated with these substances at the levels found would have a low risk of exposure to marine mammals. Best management practices will be instituted to limit exposure pathways in areas where dredge materials are being handled. Given the sediment concentrations observed and the low level of bioavailability for most of the substances and the effort taken to limit/prevent exposure, effects on marine mammals would be negligible.

Short-term effects on marine mammal species may occur if petroleum or other contaminants accidentally spill into Taiya Inlet from machinery or vessels during terminal construction activities. Assuming normal construction and vessel activities, discharges of petroleum hydrocarbons are expected to be small and are not expected to result in high concentrations of contamination within the surface waters. Management measures will be implemented to minimize the risk of fuel spills and other potential sources of contamination. An approved spill response plan including provisions for on-site containment equipment (including a boom) will be developed prior to any construction activities. Spill prevention and spill response procedures will be maintained throughout construction activities (18 AAC 70). Therefore, short-term adverse effects on marine mammals from accidental spill are expected to be unlikely, and biologically of limited significance and duration if they should occur.

Construction activities, in the form of increased turbidity, have the potential to adversely affect forage fish and juvenile salmonid outmigratory routes in the project area. Both herring and salmon form a significant prey base for Steller sea lions, and herring is a primary prey of humpback whales. Increased turbidity is expected to occur in the immediate vicinity (on the order of 10 feet or less) of construction activities. However, suspended sediments and particulates are expected to dissipate quickly within a single tidal cycle. Given the limited area affected and high tidal dilution rates any effects on forage fish and salmon are expected to be minor or negligible.

9.5 Passage Obstructions

Pile driving, pile removal, and dredging at the Skagway Ore Terminal are not likely to obstruct movements of marine mammals. Pile work at Skagway will occur close to shore, leaving all of Taiya Inlet/Lynn Canal for marine mammals to pass. A construction barge will be used during the project. Vessel strikes are also unlikely for the proposed project. Construction vessels maneuvering in the construction area will be limited to a speed of 5 knots or less.

9.6 Conclusions Regarding Impacts on Habitat

The most likely effects on marine mammal habitat from the proposed project will be temporary, short-duration noise and water and sediment quality effects. The direct loss of habitat available to marine mammals during construction due to noise, water quality impacts, sediment quality impacts, and construction activity is expected to be minimal or possibly an overall net benefit due to reductions of contaminants entering the local foodweb.

For the most part, any adverse effects on prey species during project construction will be short-term. Given the numbers of fish and other prey species in Taiya Inlet/Lynn Canal, the short-term nature of effects on fish species and the mitigation measures to protect fish during construction (use of a vibratory hammer when possible; BMPs; ramp-up procedures), the proposed project is not expected to have measurable effects on the distribution or abundance of potential marine mammal prey species.

10.0 ANTICIPATED EFFECTS OF HABITAT IMPACTS ON MARINE MAMMALS

The proposed project will occur within the existing Skagway Ore Terminal operational footprint and is not expected to result in a significant permanent loss or modification of habitat for marine mammals or their food sources. The most likely effects on marine mammal habitat for the proposed project will be temporary, short duration in-air and in-water noise, temporary prey (fish) disturbance, and localized, temporary water quality effects. The direct loss of habitat available to marine mammals during construction due to noise, water quality impacts and construction activity is expected to be minimal. These temporary impacts have been discussed in detail in Section 9.0, Anticipated Impacts on Habitat.

11.0 MITIGATION MEASURES

The exposures outlined in Section 6.0 represent a conservative maximum expected number of marine mammals that could be exposed to acoustic sources reaching Level B harassment levels. The MOS proposes to employ a number of mitigation measures, discussed below, in an effort to minimize the number of marine mammals potentially affected. Marine mammal monitoring and mitigation measures are summarized below and presented in detail in the Skagway Gateway Initiative Project Marine Mammal Monitoring Plan (Appendix A).

11.1 Mitigation for Pile Driving Activities

The modeling results for the monitoring zones discussed in Section 9.0 were used to develop mitigation measures for pile driving/removal activities during construction of the Skagway Gateway Initiative Project. Monitoring will start 15 minutes prior to any noise-generating activities and extend through 30 minutes after completion of the activity. While the monitoring zones vary between the different diameter piles and types of installation methods, the MOS is proposing to establish mitigation zones for the maximum zone of influence for all pile driving, pile removal, and dredging activities conducted during construction of the Skagway Gateway Initiative Project. To limit the amount of waterborne noise, a vibratory hammer will be used for initial driving, followed by an impact hammer to finish installation if needed, and to proof piles to required load-bearing capacity. Additionally, a bubble curtain will be used when impact driving plumb piles as a way of decreasing noise associated with pile driving.

11.1.1 Monitoring Take and Shutdown Procedures

Impact Pile Driving. During impact pile driving, the monitoring (disturbance) zone will include all areas where the underwater sound pressure levels are anticipated to equal the marine mammal disturbance criterion (160 dB isopleth). The combined impact monitoring zone for marine mammals is a maximum of 856 meters (using a bubble curtain) or 2,154 meters (no bubble curtain) from the pile with an injury zone (180 dB and 190 dB isopleth) maximum of 22 meters and 100 meters from the pile. The following monitoring methods will be implemented during impact pile-driving operations.

- If any cetaceans or pinnipeds are observed approaching or are in the disturbance zone, pile driving activities will be allowed to continue and a take will be tallied against the allowed take authorized by the IHA. If the number of takes has reached 75 percent of those authorized by the IHA, the disturbance zone will be treated as an injury zone, and pile driving will be halted when incursion by a marine mammal is evident. This will continue until a new take authorization can be negotiated with NMFS or until the noise-generating portions of the project are completed.

- If any cetaceans or pinnipeds are observed approaching or are in the injury zone, impact pile-driving activities will be immediately halted. The observer will immediately radio to alert the contractor, requiring an immediate "all-stop." Impact pile-driving activities will resume when the animal has voluntarily left the injury zone or 15 minutes have passed without re-sighting the animal in the disturbance zone. Observers will continue to monitor the animal after it has left the injury zone, if it is visible.

Vibratory Pile Driving. During vibratory pile driving, the monitoring (disturbance) zone will include all areas where the underwater sound pressure levels are anticipated to equal the marine mammal disturbance criterion (120 dB isopleth [background]). The combined vibratory monitoring zone for marine mammals is 100,000 meters from the pile. In practice this will require monitoring of nearly the entire inlet. The following monitoring methods will be implemented during vibratory pile-driving operations.

- If any cetaceans or pinnipeds are observed approaching or are in the disturbance zone, vibratory pile-driving activities will be allowed to continue and a take will be tallied against the allowed take authorized by the IHA. Data will be taken on the location, behavior, and disposition of the mammal as long as the mammal is within the harassment zone.

- If the number of takes reaches 75 percent of the total authorized by the IHA, any cetaceans or pinnipeds observed within or imminently entering the disturbance zone will result in an immediate halt to active pile-driving activities. The observer will immediately radio to alert the contractor, requiring an immediate "all-stop." Vibratory pile-driving activities will resume when the animal has voluntarily left the disturbance zone or 15 minutes have passed without re-sighting the animal in the zone. Observers will continue to monitor the animal after it has left the disturbance zone. This will continue until a new take authorization can be negotiated with NMFS or until the noise-generating portions of the project are completed.

Vibratory Pile Removal. During vibratory pile removal, the monitoring (disturbance) zone will include all areas where the underwater sound pressure levels are anticipated to equal the marine mammal disturbance criterion (120 dB isopleth [background]). The vibratory monitoring zone for marine mammals is 1,600 meters from the pile.

- If any cetaceans or pinnipeds are observed in or approaching in the disturbance zone, vibratory pile removal activities will be allowed to continue and a take will be tallied against the allowed take authorized by the IHA. Data will be taken on the location, behavior, and disposition of the mammal as long as the mammal is within the harassment zone.

- If the number of takes reaches 75 percent of the total authorized by the IHA, any cetaceans or pinnipeds observed within or imminently entering the disturbance zone will result in an immediate halt to active pile driving activities. The observer will immediately radio to alert the contractor, requiring an immediate "all-stop." Vibratory pile removal activities will resume when the animal has voluntarily left the disturbance zone or 15 minutes have passed without re-sighting the animal in the zone. Observers will continue to monitor the animal after it has left the disturbance zone. This will continue until a new take authorization can be negotiated with NMFS or until the noise-generating portions of the project are completed.

11.1.2 Visual Monitoring Requirements and Protocol

Monitoring will be conducted by qualified, trained marine mammal observers. An observer is a biologist with prior training and experience in conducting marine mammal monitoring or surveys, and who has the ability to identify marine mammal species and describe relevant behaviors that may occur in proximity to in-water construction activities. A trained observer will be placed at the best vantage point(s) practicable to monitor for marine mammals and to implement shutdown/delay procedures, when applicable, by calling for the shutdown to the hammer or dredge operator.

- Monitoring will begin 15 minutes prior to pile driving/removal, will continue through completion of these activities, and for 30 minutes after completion of each day's activity. This will help ensure that all marine mammals in the monitoring zone are documented and that no marine mammals are present in the injury zone. Construction activities will only commence once observers have declared the shutdown zone (i.e., the injury zone and the disturbance zone[s], if cumulative take is approaching IHA authorization) clear of marine mammals. The behavior of marine mammals observed in the project area will be monitored and documented to the extent practicable.

- If a marine mammal approaches/enters the shutdown zone during the course of construction activities, activities will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone (i.e., the injury zone and the disturbance zone[s], if cumulative take is approaching IHA authorization), or after 30 minutes have passed without detection of the animal.

11.1.3 Timing and Daylight Restrictions

All in-water work will be limited to periods determined appropriate by participating state and federal agencies to avoid potential adverse effects on listed marine mammal species and their prey. For this project, no in-water work is planned during the hooligan migration period. Pile driving/removal and dredging will be conducted during daylight hours (sunrise to sunset) to help ensure that marine mammal observers have acceptable surveying conditions.

11.1.4 Soft Start

The use of a soft-start procedure is believed to provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. Soft-start techniques for impact and vibratory pile driving will be conducted in accordance with AFWFO (2012) Observer Protocols which will allow marine mammals present in the

disturbance zones to avoid the area before Level A injury occurs. For impact pile driving, contractors will be required to provide an initial set of strikes from the hammer at 40 percent energy, each strike followed by no less than a 30-second waiting period. This procedure will be conducted a total of three times before impact pile driving begins. For vibratory driving, the hammer will be activated for 15 seconds at reduced energy followed by a 1-minute waiting period. This procedure will be conducted a total of three times before vibratory driving begins.

12.0 ARCTIC PLAN OF COOPERATION

Not applicable. The proposed activity will take place in the waters adjacent to Skagway in Southeast Alaska. Skagway is located south of 60° N, the latitude NMFS regulations consider Arctic waters. No activities will take place in or near a traditional Arctic subsistence hunting area. Therefore, there are no relevant subsistence uses of marine mammals implicated by this action.

13.0 MONITORING AND REPORTING

13.1 Monitoring Plan

The MOS and Hart Crowser developed a detailed Marine Mammal Monitoring Plan for this project. The monitoring plan is summarized in Section 11.1 and provided in Appendix A. The Marine Mammal Monitoring Plan will be implemented during all in-water pile-driving, pile removal, and dredging activities.

13.2 Reporting

A monitoring report of observations and analyses will be prepared to document general compliance and that projected related takes do not exceed those authorized by NOAA Fisheries/NMFS through this application process.

Observers will collect marine mammal and other observations 15 minutes before, during, and 30 minutes after pile-driving activities, including, at minimum:

- General data.
  - Date and time of activity.
  - Water conditions (e.g., sea state).
  - Weather conditions (e.g., precipitation, percent glare, visibility).
- Specific pile-driving data.
  - Description of the pile-driving activities including the size and type of pile.
  - The installation methods used for each pile and the duration each method was used per pile.
  - Impact or vibratory hammer force used to drive piles (based on specifications for the type of hammer used).
- Pre-activity and during activity observational data.

- Date and time survey is initiated and terminated.
- Description of any observable marine mammal behavior within monitoring zones or in the immediate area surrounding the monitoring zones, including the following:
    - Distance from animal to pile-driving sound source.
    - Reason why shutdown implemented.
    - If a shutdown was implemented, behavioral reactions noted and if they occurred before or after implementation of the shutdown.
    - If a shutdown is implemented, the distance from animal to sound source at the time of the shutdown.
    - Distance to the animal from the source during soft start.
- Times when pile driving or other in-water construction is delayed due to weather conditions, presence of marine mammals within shutdown zones, etc.
- Actions performed to minimize impacts to marine mammals.

- Post-activity processing of data.
    - Results, which include the detections of marine mammals, the species and numbers observed, sighting rates and distances, behavioral reactions within and outside of safety zones.
    - Refined exposure estimate based on the number of marine mammals observed during the course of construction.

14.0 SUGGESTED MEANS OF COORDINATION

In-water and in-air noise generated by vibratory and impact pile driving, pile removal, and dredging at the Skagway Ore Terminal are the primary issue of concern to local marine mammals during this project. Potential impacts on marine mammals have been studied, with the results used to establish the noise criteria for evaluating take.

The MOS plans to coordinate with NMFS and whale-watching charters (when appropriate) to gather information on the location of marine mammals prior to initiating pile driving. Marine mammal monitoring will be conducted to collect information on the presence of marine mammals within the disturbance and injury zones for this project. All of this information will be shared with NMFS after the conclusion of the project.

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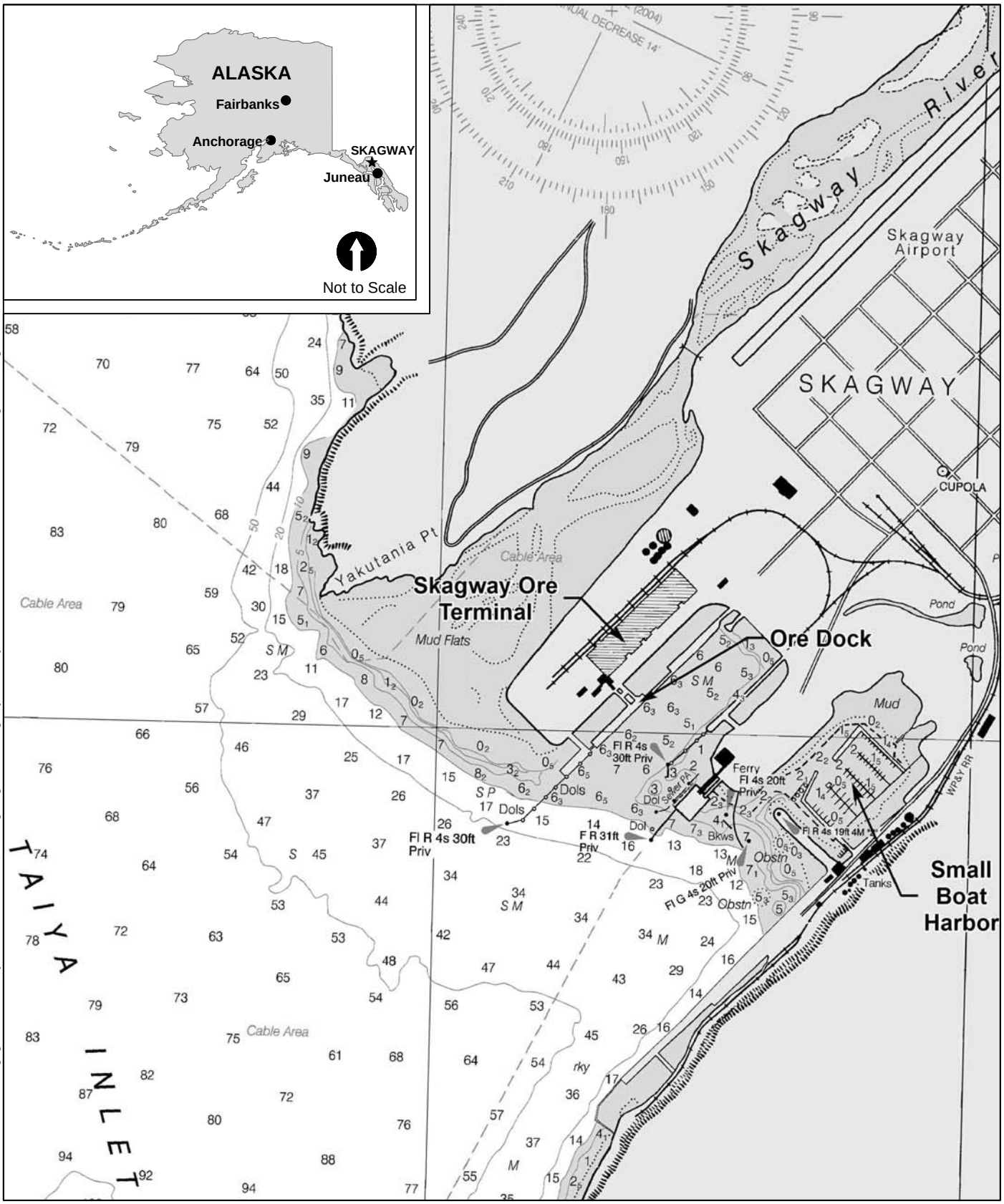
SHEETS



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Jun 04, 2015 10:47am tgriga

Figure 1 **Vicinity Map**

APPLICANT: Municipality of Skagway
FILE NO. POA-XXX-XXXX
WATERWAY: Taiya Inlet
PROPOSED ACTIVITY: Skagway Gateway Initiative Project
SEC. 14 **T.** 28 South **R.** 59 East, Copper River Meridian
LAT: 59° 27' 1.2" N **LONG:** 135° 19' 22.5" W
SHEET: 1 of 8 **DATE:** 6/5/15

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Scale in Feet

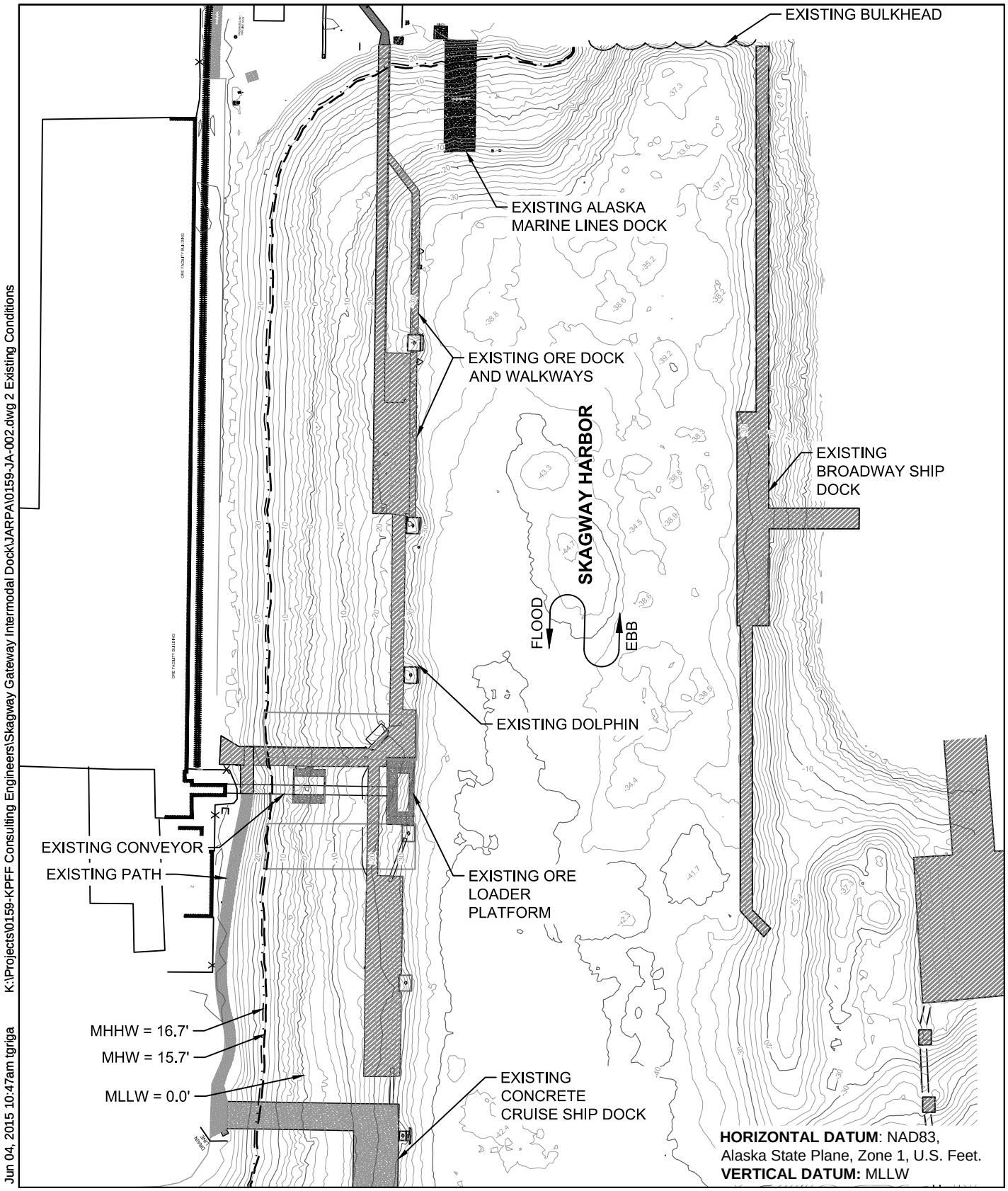

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Figure 2 **Existing Conditions**

APPLICANT: Municipality of Skagway
FILE NO. POA-XXX-XXXX
WATERWAY: Taiya Inlet
PROPOSED ACTIVITY: Skagway Gateway Initiative Project
SEC. 14 **T.** 28 South **R.** 59 East, Copper River Meridian
LAT: 59° 27' 1.2" N **LONG:** 135° 19' 22.5" W
SHEET: 2 of 8 **DATE:** 6/5/15

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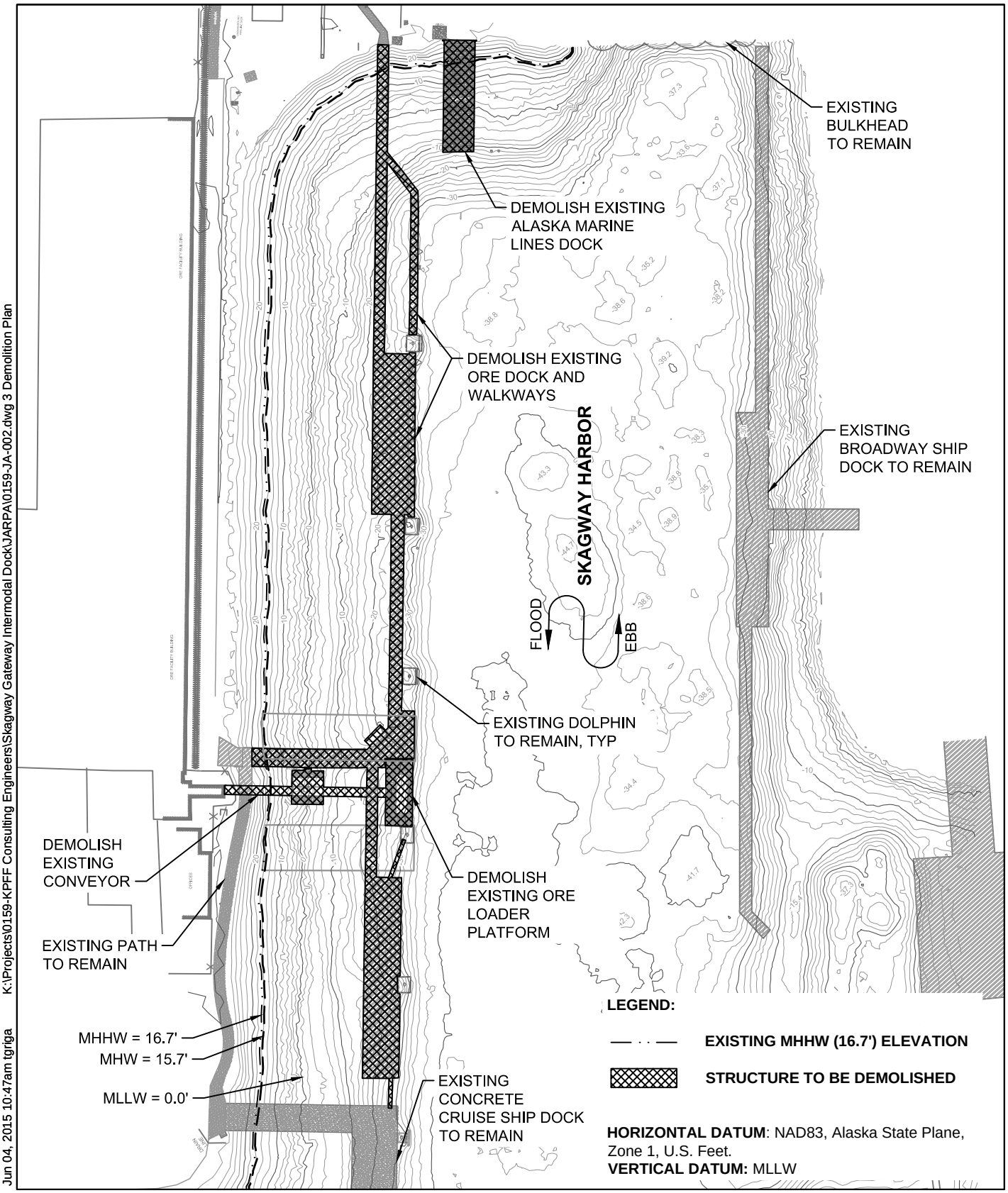

K:\Projects\0159-KPFF Consulting Engineers\Skagway Gateway Intermodal Dock\JARPA\0159-JA-002.dwg 3 Demolition Plan

Jun 04, 2015 10:47am tgriga

Figure 3 **Demolition Plan**

APPLICANT: Municipality of Skagway
FILE NO. POA-XXX-XXXX
WATERWAY: Taiya Inlet
PROPOSED ACTIVITY: Skagway Gateway Initiative Project
SEC. 14 **T.** 28 South **R.** 59 East, Copper River Meridian
LAT: 59° 27' 1.2" N **LONG:** 135° 19' 22.5" W
SHEET: 3 of 8 **DATE:** 6/5/15

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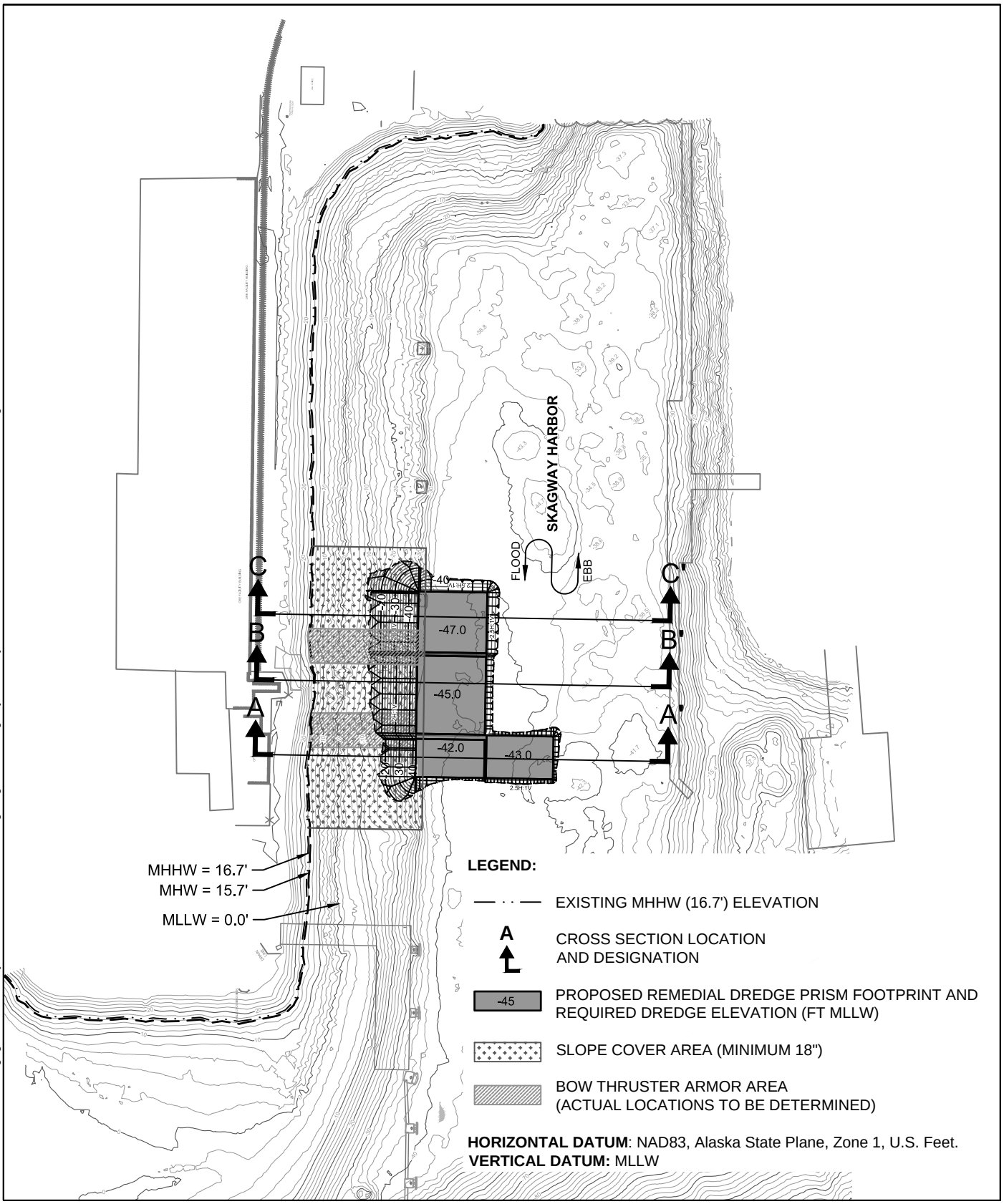

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Figure 4 **Remedial Plan**

APPLICANT: Municipality of Skagway
FILE NO. POA-XXX-XXXX
WATERWAY: Taiya Inlet
PROPOSED ACTIVITY: Skagway Gateway Initiative Project
SEC. 14 **T.** 28 South **R.** 59 East, Copper River Meridian
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SHEET: 4 of 8 **DATE:** 6/5/15

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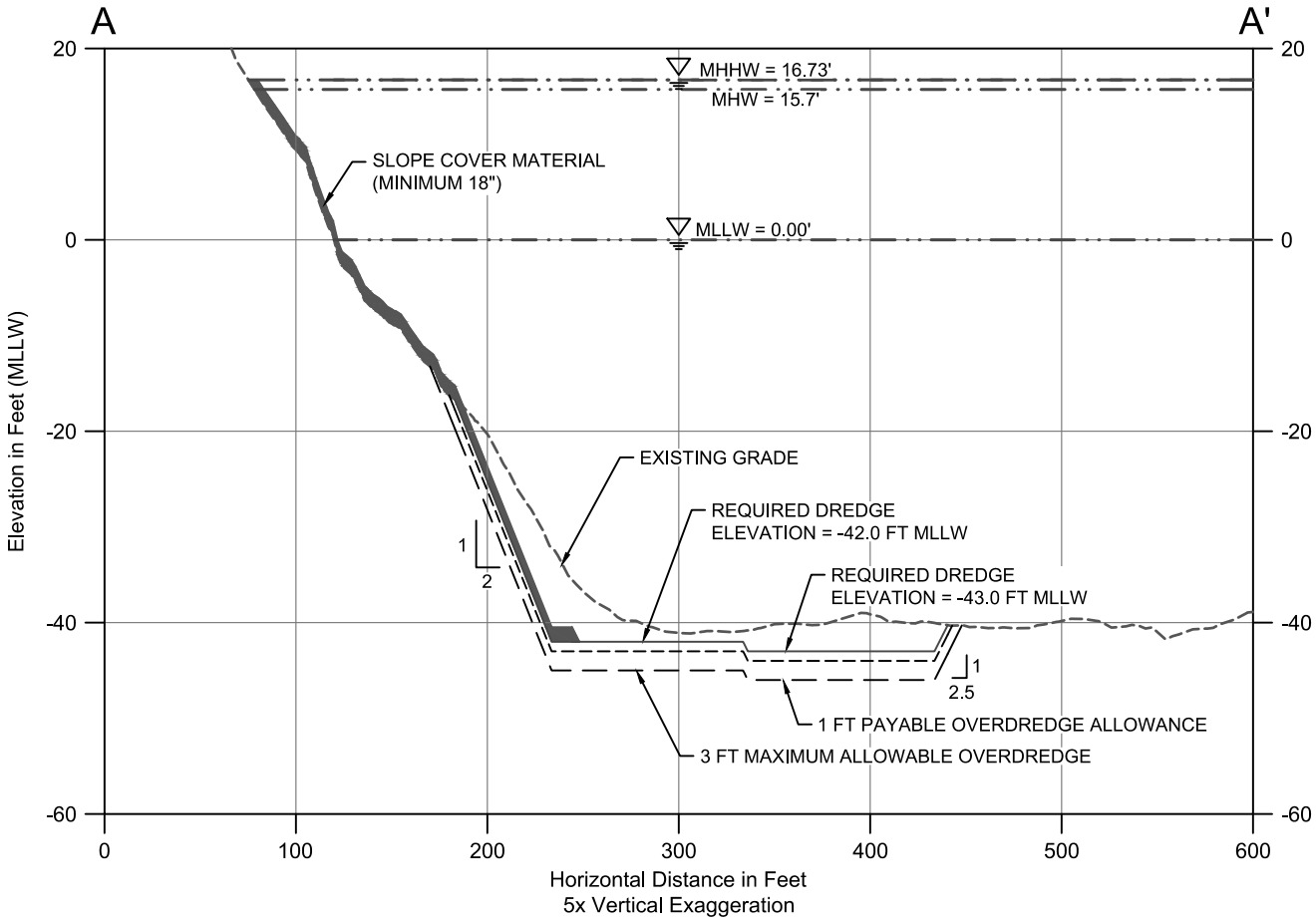

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Figure 5 **Remedial Cross Section A-A'**

APPLICANT: Municipality of Skagway
FILE NO. POA-XXX-XXXX
WATERWAY: Taiya Inlet
PROPOSED ACTIVITY: Skagway Gateway Initiative Project
SEC. 14 **T.** 28 South **R.** 59 East, Copper River Meridian
LAT: 59° 27' 1.2" N **LONG:** 135° 19' 22.5" W
SHEET: 5 of 8 **DATE:** 6/5/15

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Scale in Feet

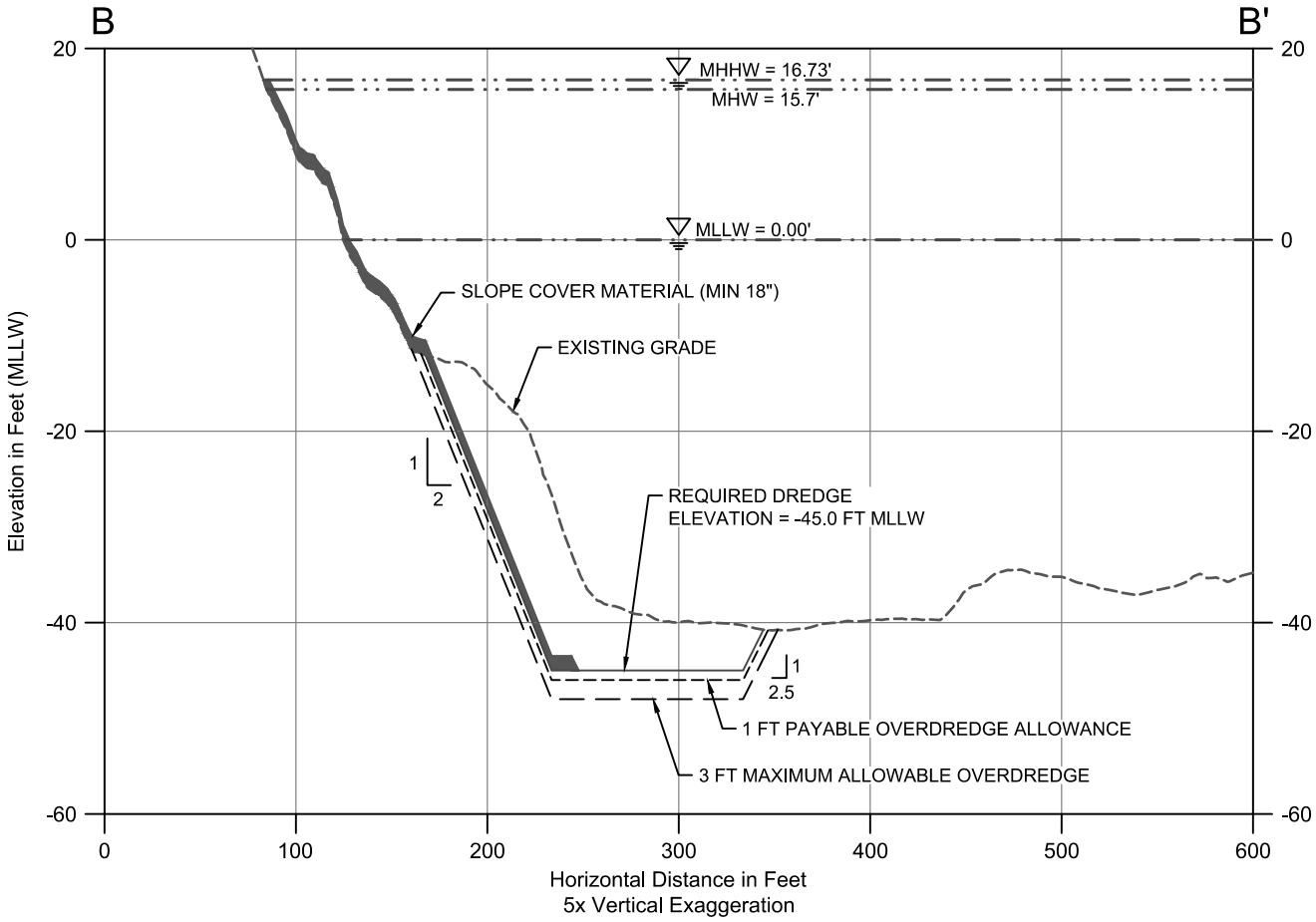

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Figure 6 **Remedial Cross Section B-B'**

APPLICANT: Municipality of Skagway
FILE NO. POA-XXX-XXXX
WATERWAY: Taiya Inlet
PROPOSED ACTIVITY: Skagway Gateway Initiative Project
SEC. 14 **T.** 28 South **R.** 59 East, Copper River Meridian
LAT: 59° 27' 1.2" N **LONG:** 135° 19' 22.5" W
SHEET: 6 of 8 **DATE:** 6/5/15

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Scale in Feet

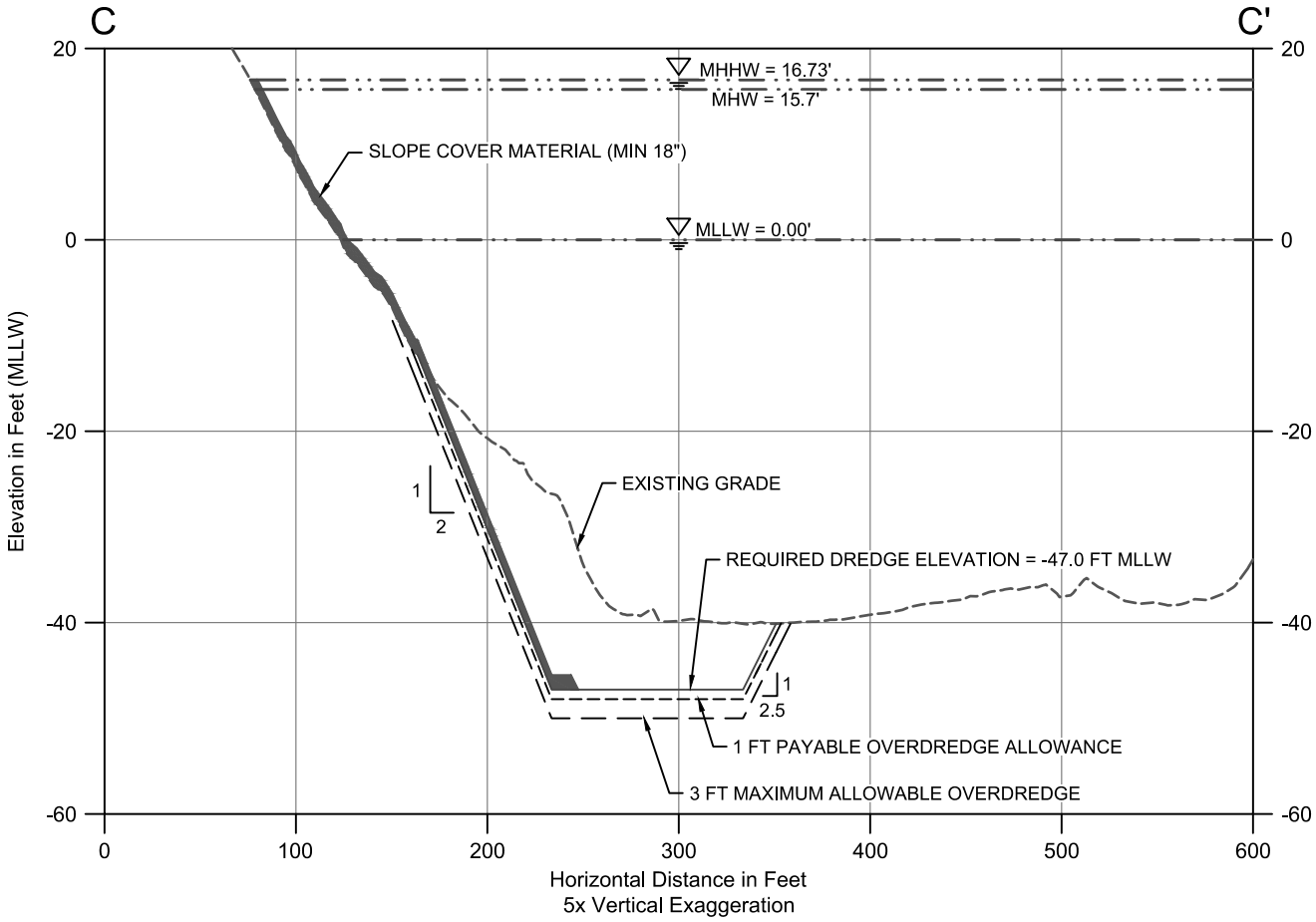

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Figure 7 **Remedial Cross Section C-C'**

APPLICANT: Municipality of Skagway
FILE NO. POA-XXX-XXXX
WATERWAY: Taiya Inlet
PROPOSED ACTIVITY: Skagway Gateway Initiative Project
SEC. 14 **T.** 28 South **R.** 59 East, Copper River Meridian
LAT: 59° 27' 1.2" N **LONG:** 135° 19' 22.5" W
SHEET: 7 of 8 **DATE:** 6/5/15

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Scale in Feet

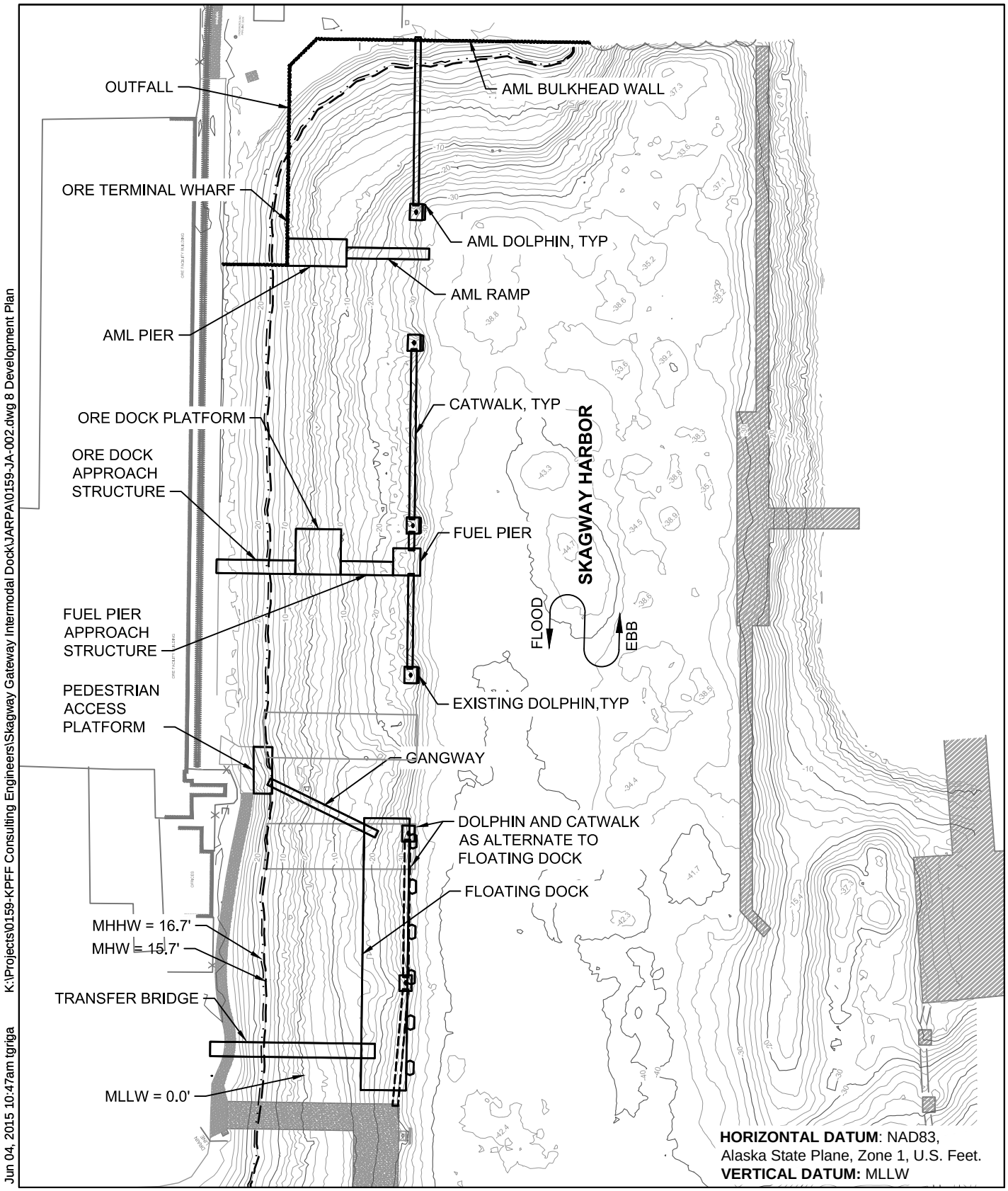

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Figure 8 **Development Plan**

APPLICANT: Municipality of Skagway
FILE NO. POA-XXX-XXXX
WATERWAY: Taiya Inlet
PROPOSED ACTIVITY: Skagway Gateway Initiative Project
SEC. 14 **T.** 28 South **R.** 59 East, Copper River Meridian
LAT: 59° 27' 1.2" N **LONG:** 135° 19' 22.5" W
SHEET: 8 of 8 **DATE:** 6/5/15

0 150
Scale in Feet

APPENDIX A

Marine Mammal Monitoring Plan, Skagway Gateway Improvements Project

Marine Mammal Monitoring Plan

Skagway Gateway Initiative Project

Skagway, Alaska

Prepared for

Municipality of Skagway

April 12, 2016

19081-00

HARTCROWSER

Marine Mammal Monitoring Plan

Skagway Gateway Initiative Project

Skagway, Alaska

Prepared for

Municipality of Skagway

April 12, 2016
19081-00

Prepared by

Hart Crowser, Inc. & KPFF Consulting Engineers

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APPENDIX A

Marine Mammal Observation Record Form

1.0 INTRODUCTION

The Municipality of Skagway (MOS) proposes to redevelop the Skagway Ore Terminal (Ore Terminal) in Skagway, Alaska, including demolition of existing in- and over-water infrastructure, environmental dredging, and construction of new shoreline infrastructure. The Gateway Intermodal Dock Redevelopment Reconstruction Project and Legacy Harbor Contaminant Mitigation Program (Project) will facilitate ongoing and new ore loading operations, accommodate a wider variety of vessels, and improve environmental conditions in Skagway Harbor. The MOS is proposing to complete the first phase of the Project (Phase 1) during the 2016–2017 construction season.

Phase 1 of the Project includes the following:

- Demolition of existing in- and over-water infrastructure;
- Dredging and beneficial reuse or disposal of contaminated sediments in the Skagway Ore Terminal basin (Terminal basin) of Skagway Harbor; and
- Construction of new structures.

Future phases of the Project, if implemented, may include extension of the wharf structure or other improvements.

Phase 1 will result in significant improvements to the environmental conditions in Skagway Harbor through the cleanup of contaminated sediments and removal of existing creosote-treated structures.

Hart Crowser prepared an Incidental Harassment Authorization application (IHA; Hart Crowser 2015) for the MOS to assess the potential effects of the proposed rehabilitation on marine mammals in the project area. The biological assessment (BA) concluded that waterborne noise from pile-driving activities has the potential to cause injury or adverse behavioral effects to marine mammal species. This marine mammal monitoring plan has been prepared to fulfill NOAA Fisheries requirements to monitor for marine mammals in the defined area of potential waterborne sound effects and to document take and track it against any NMFS approved allocations.

The proposed Project has the potential to impact marine mammal species protected under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA) that occur in nearshore areas of Taiya Inlet (Table 1).

Table 1 – Marine Mammal Species Likely to Occur near the Project Area

Common Name	Scientific Name
Humpback whale	*Megaptera novaeangliae*
Killer whale	*Orcinus orca*
Minke whale	*Balaenoptera acutorostrata*
Dall's porpoise	*Phocoenoides dalli*
Harbor porpoise	*Phocoena phocoena*
Harbor seal	*Phoca vitulina*
Steller sea lion	*Eumetopias jubatus*

Note: Sperm whales, though present in the region, are not likely to occur near the project area and warrant no further mention.

2.0 PROJECT DESCRIPTION

2.1 Project Location

The Project is located in Section 26 and 35, T 30 S, R 59 E, Copper River Meridian; United States Geological Survey Quad Map Skagway B-1; Latitude 59.45 degrees North (N), Longitude 135.31 degrees West (W) (Figure 1).

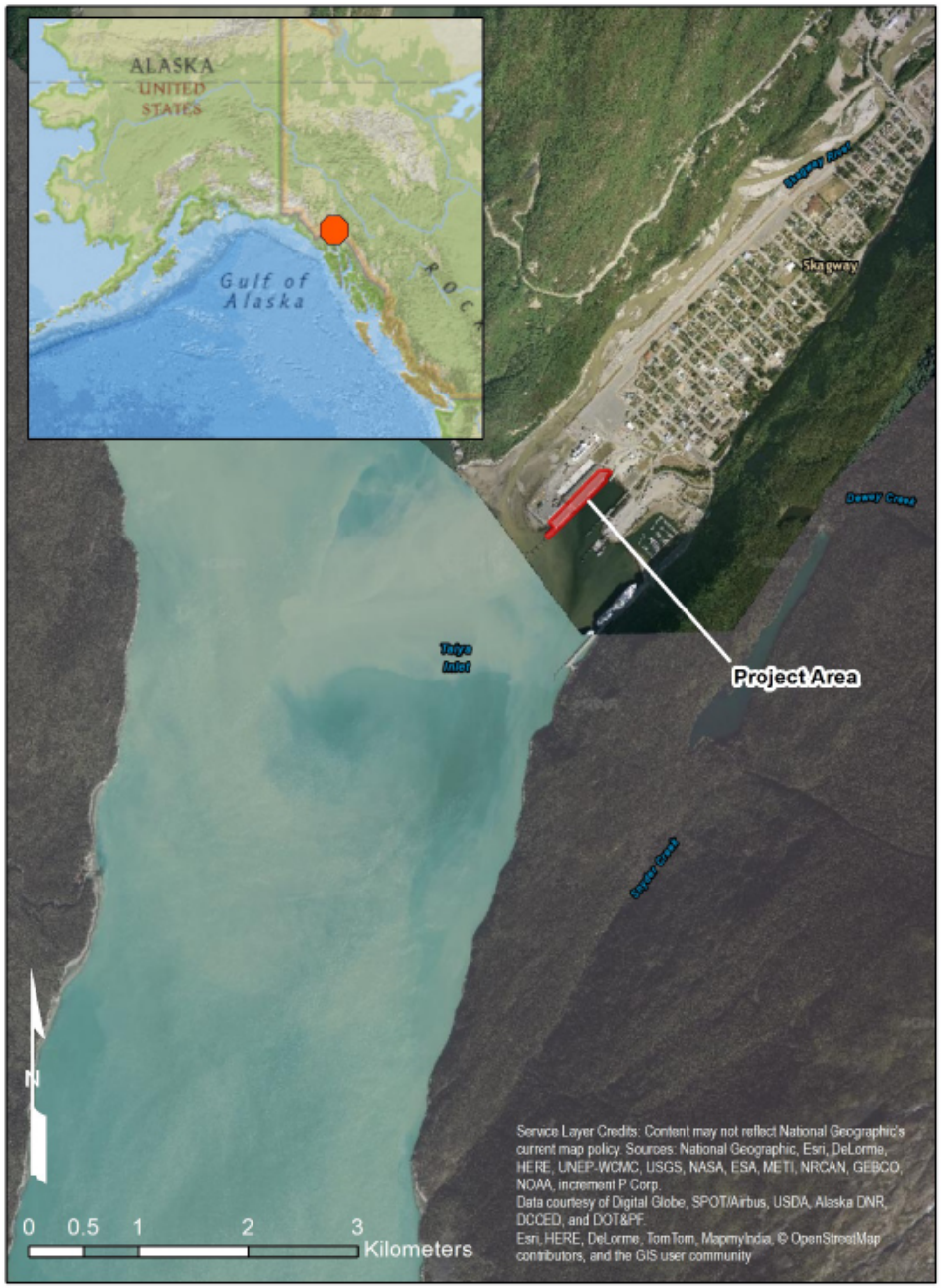

Figure 1 – Skagway vicinity map

2.2 Project Description

Project components that may affect ESA- and MMPA-protected marine mammals include waterborne and airborne noise generated by impact and vibratory pile driving. Additional construction details of these activities are presented below.

2.2.1 Pile-driving Equipment

Contractors on previous southeast Alaska projects have typically driven piles using the following equipment

- Diesel Impact Hammers: APE various models, energy 74,419 to 248,063 foot-pounds (ft-lbs); and
- Vibratory Hammers: APE various models, drive force 170 to 445 tons.

Similar equipment may be used for the proposed Project; however, equipment selection is subject to the discretion of the contractor performing the installation.

2.2.2 Demolition of Existing Structures

Existing structures to be demolished include the eastern extent of the timber pier, the ore loader and concrete and steel foundation, fuel infrastructure (timber dock and piping), the concrete Alaska Marine Lines (AML) pier, and up to five concrete and steel moorage dolphins (Sheets 1 and 2). The existing infrastructure will be demolished using heavy, land- or water-based (i.e., from a barge) equipment. The contractor will be required to implement best management practices (BMPs) to minimize environmental impacts from demolition.

Demolition of this infrastructure will generally occur as follows. Above-water infrastructure, including concrete pads, timber decking, pile caps, utilities, and piping will be removed. Timber piles will then be extracted entirely using a vibratory hammer or broken off at the mudline if extraction is not practical. The timber piles will be removed as both a source control measure (i.e., through removal of creosote-treated timber piles) and as a necessary step to perform environmental dredging in this area. Table 2 shows the total number of piles to be removed during demolition.

Table 2 – Number of Piles to be Removed via Demolition

Component	Number of Creosote-treated Piles to be Removed	Number of Steel Piles to be Removed
Timber Pier	400	50
Ore Loader	0	50
AML Pier	0	15
Fuel Infrastructure	0	4
Moorage Dolphins[2]	0	0
Total	**400**	**119**

In total, demolition actions are expected to take 48 days to complete. Removal of the existing piling is expected to take 18 days of the total demolition timeframe, one-third of which will occur in summer 2016 and two-thirds of which will occur in winter 2017.

2.2.3 Dredging Actions

The vertical and horizontal boundaries of the proposed dredging were designed to remove impacted sediments (i.e., sediments with metals and/or polycyclic aromatic hydrocarbon (PAH) concentrations exceeding the sediment cleanup objectives [SCOs]). The SCOs were chosen to be the cleanup objective level based on discussions in the April 13, 2015, meeting between Bruce Wanstall (ADEC), Dr. Chad Gubala (MOS), and Derek Koellmann (Anchor QEA). The current estimated dredge volume (including a 1-foot over-dredge to account for equipment tolerances) and associated approximate surface area, pending final design and geotechnical and structural considerations, is shown in Tables 3 and 4. The estimated contaminated material planned to be removed is 17,300 cubic yards. An additional 9,000 cubic yards of uncontaminated material may be dredged for the installation of the floating dock. Pending the outcome of a treatability study, dredged sediments will either be beneficially reused in upland areas or transported to a suitable upland landfill at the discretion of ADEC.

Table 3 – Environmental Dredge Material Approximate Volumes

Project Component	Total[1] (cubic yards)
Contaminated Dredge Material Removed[2]	17,300

Notes:
1. All volumes include defined over-dredge allowances.
2. Contaminated dredged materials will be disposed of in upland areas. No in-water disposal is proposed.

Table 4 – Environmental Dredge Material Approximate Surface Area

Project Component	Total[1] (square feet)
Environmental Dredge Footprint	41,000
Environmental Dredge Slope Surface Area	21,245
Total Surface Area	**62,245**

Note:
1. All areas include defined over-dredge allowances.

All dredging will be performed using up-to a seven-cubic-yard clamshell bucket. Use of an environmental bucket was considered; however, the nature and composition of the sediments to be dredged do not lend themselves to dredging using and environmental bucket. The sediment consists of dense gravelly sand, with increased gravel content at depth. This lithology is difficult to penetrate and discussions with multiple dredging contractors confirmed that the use of an environmental bucket would likely be ineffective in removing these materials. As noted in the demolitions section, specific overwater structures are planned to be demolished prior to the start of dredging.

In total, dredging actions are expected to take 40 days to complete.

2.2.4 Pile Installation

Construction of new in- and overwater infrastructure is proposed, including the AML bulkhead wall, wharf structure, and ore loader. In addition, either a concrete floating dock or additional moorage

dolphins connected by a catwalk will be constructed. Whether the concrete floating dock or moorage dolphins and catwalk are constructed depends on available funding. All piles will be installed using a vibratory and/or impact hammer. Piles to be installed are summarized in Table 5.

Table 5 – Piles to Be Installed

Project Component	Pile Size and Number					Square Footage of Sea floor Impacts
	24-inch	36-inch	48-inch	60-inch	Total	
AML Bulkhead Wall	0	0	0	0	0	0
Wharf Structure at Ore Dock	16	20	4	0	40	241.9
Ore Loader and Foundation	0	58	0	0	58	410.0
Moorage Dolphins and Catwalk	0	70	0	0	70	494.8
Fuel Infrastructure	0	17	0	0	17	120.2
Concrete Floating Dock Structure	3	14	0	7	21	245.8
Total, Concrete Floating Dock Option	**19**	**179**	**4**	**7**	**209**	**1,512.7**

2.2.4.1 AML Bulkhead Wall

The proposed new AML bulkhead wall will be constructed at the northern end of the harbor. The wall will be 350 feet long and constructed of steel sheet pile. The top of the wall will be at approximately 30 feet above mean lower low water (MLLW), and the future bottom of the wall at a depth of –4 feet MLLW. The ground surface where fill will be placed behind the new bulkhead wall is entirely above mean higher high water (MHHW). Therefore, this project component includes no placement of fill in the intertidal or subtidal zone. Sheet pile will be installed using a vibratory and/or impact hammer.

2.2.4.2 Wharf Structure at Ore Dock

A new wharf structure is proposed at the harbor, including a wharf bulkhead wall, an associated AML pier, and an AML ramp.

The proposed wharf bulkhead wall will be constructed of steel sheet pile walls in the form of a rectangle of approximately 220 by 75 feet (16,500 square feet). The top of the walls will be at approximately 30 feet above MLLW, and the future bottom of the walls at a depth of –4 feet MLLW. The structure will be filled with 2,000 to 4,000 cubic yards of suitable dredged material, of which 150 to 300 cubic yards will be placed below MHHW. The ground surface where fill will be placed is primarily above MHHW. Only fill placed in the southeastern corner of the structure will be within the intertidal zone. The steel sheet pile will be installed using a vibratory and/or impact hammer.

The proposed AML pier will be a steel and concrete structure abutting the new wharf structure. The pier will be 65 by 30 feet, supported by twenty 36-inch-diameter steel piles. Finished height will be 30 feet above MLLW. Piles will be installed with a vibratory and/or impact hammer.

The proposed AML ramp will be a steel ramp of 96 by 23 feet supported by four 48-inch-diameter steel guide piles and sixteen 24-inch-diameter steel piles. Finished height will be 30 feet above MLLW. The ramp will be installed by crane.

2.2.4.3 Ore Loader Foundation

A new ore loader is proposed in the harbor, including a loader, foundation, and access platform.

The proposed ore loader foundation will be a steel and concrete structure, 50 by 50 feet and supported by fifty 36-inch-diameter steel piles. Finished height will be 30 feet above MLLW. Piles will be installed with a vibratory and/or impact hammer.

The proposed access platform will connect the ore loader to the Ore Terminal uplands. It will be a steel and concrete structure, 90 by 15 feet, and supported by twenty 36-inch-diameter steel piles. Finished height will be 30 feet above MLLW. Only the eastern 40 feet of length and eight piles will be over the intertidal or subtidal zones (the remainder will be above and tied into the uplands). Piles will be installed with a vibratory and/or impact hammer.

2.2.4.4 Concrete Floating Dock

The concrete dock and seven moorage dolphins (see Section 2.2.4.5) or up to 10 moorage dolphins will be installed depending on funding.

A concrete floating dock is proposed for the southern end of the project area, including the dock, a transfer bridge, a pile-supported pedestrian platform, and a pedestrian gangway.

The proposed floating dock will be a 300-by-50-foot concrete structure supported by seven 60-inch-diameter piles and fourteen 36-inch-diameter piles. The finished height will vary with the tide; the dock will have approximately 7 feet of freeboard above the waterline. Piles will be installed with a vibratory and/or impact hammer.

The proposed transfer bridge will be a 200-by-19-foot steel structure supported by a concrete abutment founded on ten 24-inch-diameter piles placed above the intertidal zone. The top of the ramp will be 30 feet above MLLW and the bottom of the ramp will be supported by the floating dock. Only the eastern 150 feet of length will be over the intertidal or subtidal zones (the remainder will be above and tied into the uplands). The ramp will be installed by crane.

The proposed pedestrian platform will be a 25-by-55-foot concrete structure, placed adjacent to the existing timber walkway that will remain after the ore dock demolition. Finished height will be 30 feet above MLLW. The pedestrian platform will be supported on six 24-inch diameter steel piles. Only the eastern 10 feet and three piles of this structure will be over the intertidal or subtidal zones (the remainder will be above and tied into the uplands).

The proposed pedestrian gangway will be a 150-by-8-foot steel structure that spans between the pedestrian platform and the concrete floating dock. The top of the ramp will be 30 feet above MLLW

and the bottom of the ramp will be supported by the floating dock. The full length of the pedestrian gangway will be over the intertidal or subtidal zones. It will be installed by crane.

2.2.4.5 Moorage Dolphins and Catwalk

As many as 10 new moorage dolphins may be constructed, along with connecting catwalks, located as follows:

- Up to two dolphins and a catwalk 200 by 6 feet extending from the AML bulkhead wall toward the AML ramp;
- Up to five dolphins and a catwalk 400 by 6 feet extending north and south from the ore loader; and
- Up to three dolphins and a catwalk 300 by 6 feet north of the existing concrete pier, if the concrete floating dock is not constructed.

Each dolphin will consist of a 15-foot-square steel and concrete superstructure atop ten 36-inch steel piles.

Each catwalk will be a 6-foot-wide steel structure, supported by the dolphins. Finished height will be 30 feet above MLLW. Dolphins will be installed by vibratory and/or impact hammer, and the catwalk will be installed by crane.

2.2.4.6 Fuel Infrastructure

A new fuel manifold and fuel lines will be constructed on a pier extending from the ore loader platform infrastructure. The proposed fuel pier will be a steel and concrete structure. The approach pier will be 60 by 15 feet, supported by eight 36 inch-diameter steel piles. The fuel pier will be 30 by 30 feet supported by nine 36 inch-diameter steel piles. Finished height will be 30 feet above MLLW. Piles will be installed with a vibratory and/or impact hammer.

2.3 Construction Schedule

The Project will be constructed in a manner so as not to disrupt existing operations throughout construction. The Ore Dock is the lifeblood of Skagway and connecting communities in Canada, and the ability to transport goods across this dock must be maintained throughout construction. To maintain operations, the demolition and construction will occur in a phased approach. It is anticipated that the sequence of construction will generally occur in the following manner:

1. Demolish the northern timber dock structure.
2. Construct Phase 1 of the sheet pile wall wharf, which includes approximately 275 feet of wharf construction at the northern section of the waterway, including backfill behind the new sheet pile wall.
3. Begin dredging of sediments in front of the existing ore loader.

4. Construct new AML pier, ore loader platform, and fuel intake piping and its supporting structure.
5. Demolish existing AML pier.
6. Decommission existing ore loader and fuel intake pipes.
7. Complete dredging.
8. Place slope cover material.

The Project is expected to begin once all approvals and permits have been received. In-water work will adhere to allowable in-water work windows (if applicable) to minimize impacts to marine mammals as identified by applicable agencies. Project activities are proposed to begin during summer 2016, with pile driving occurring from the end of July to the beginning of October 2016 and again in March of 2017. Pile removal will occur in July 2016 and December 2016 to January 2017. Dredging will occur from January through the beginning of March 2017.

2.4 Impact Avoidance, Minimization Measures, and Conservation Measures

Conservation measures and best management practices will be employed during pile driving to avoid or minimize potential adverse impacts to the aquatic environment. The following conservation measures and general BMPs will be implemented:

- To avoid harm to humpback whales, Steller sea lions, and other protected marine mammals, marine mammal observation areas for heavy equipment use and pile-driving activities will be implemented as described below.
- The contractor shall be responsible for the preparation of a Spill Prevention, Control, and Countermeasure (SPCC) Plan to be used for the duration of the Project. The SPCC Plan shall be submitted to the Project Engineer prior to the commencement of any construction activities. A copy of the SPCC Plan, and any updates, will be maintained at the work site by the contractor.
- Marine mammal monitoring will only be conducted during daylight hours.
- To minimize take of marine mammals that may be in the project area from pile-driving activities, soft-start ramp-up procedures will be implemented as discussed below in Sections 4.2.1 and 4.3.1.
- The following pile removal BMPs adapted from US Environmental Protection Agency guidance and Washington Department of Natural Resources will also be employed for pile removal:
    - The contractor will initially vibrate the pile to break the friction bond between pile and soil.
    - To help minimize turbidity, the contractor will engage the vibrator to the minimum extent required to initiate vertical pile movement, and will disengage the vibrator once the pile has been mobilized and is moving upward.
    - The piles will be removed in a single, slow, continuous motion to the extent possible.

- Pile cutoff will be an acceptable alternative where vibratory extraction or pulling is not feasible as described below. In addition, if a pile is broken or breaks during vibratory extraction, the contractor will employ the following methods:
    - A chain will be used if practicable to attempt to entirely remove the broken pile.
    - If the entire pile cannot be removed, the pile will be cut at the mudline.
- Upon removal from the substrate, the pile will be moved expeditiously from the water to a barge, and then offloaded for disposal or recycling if possible.

3.0 PREDICTED WATERBORNE NOISE AND ACTION AREA

3.1 Interim Criteria and Predicted Waterborne Noise

As discussed, the proposed Project has three elements involving noise production that may impact marine mammals: vibratory hammer pile driving and pile removal, impact hammer pile driving, and dredging. Each of these elements generates in-water noise and in-air noise.

The area of impacts of the proposed action encompasses the injury and behavioral disturbance zones for marine mammals exposed to waterborne noises generated by pile driving (Figures 2 and 3). The National Marine Fisheries Service (NMFS) is in the process of developing waterborne noise guidelines for determining sound thresholds for the injury and disturbance of marine mammals. These thresholds are:

- 180 dB re: 1 µPa rms (decibels referenced to 1 micropascal root mean square) as the level at which cetaceans experience Level A injury for pulsed sound (impact pile driving);
- 190 dB rms as the level at which pinnipeds experience Level A injury for pulsed sound (impact pile driving);
- 160 dB rms as the level all marine mammals experience Level B (behavioral) harassment for pulsed sound (impact pile driving); and
- 120 dB rms as the level all marine mammals experience Level B harassment for continuous sound (vibratory pile driving).

In addition, NMFS has established an in-air noise disturbance threshold of 90 dB rms for harbor seals and 100 dB rms for all other pinnipeds. There are no in-air thresholds for cetaceans.

The Washington State Department of Transportation (WSDOT) and California Department of Transportation have compiled acoustic monitoring data for various pile-driving projects within their respective states (WSDOT unpublished; ICF Jones & Stokes and Illingworth and Rodkin 2009, updated in 2012). Upon review of these datasets, it was determined that driving moderate-sized steel piles with a vibratory pile driver will generate SPLs of 180 dB Peak and 170 dB rms (ICF Jones & Stokes and Illingworth and Rodkin 2009, updated in 2012). Noise from pile removal activities is on the order of 150 dB rms and noise from dredging activities is on order of 154 dB rms. This Project proposes to use

24-, 36-, 48-, and 60-inch-diameter steel piles for most project support components. The sound levels selected to calculate impact zones are as follows in Table 6.

Table 6 – Sound Levels Generated by Project Activities

Noise Type	Pile Size (inches)	Sound Pressure (dB re: 1 µPa)		
		Peak	Root Mean Square	Sound Exposure Level
Waterborne Noise				
Impact	24	207	194	178
	36	210	193	183
	48	210	195	185
Vibratory	60	195	180	180
Vibratory Removal of timber piles	12	-	150	-
Dredging	-	-	154	-
Airborne Noise				
Impact	-	-	110	-
Vibratory	-	-	97	-

3.2 Action Area

Increased noise from construction activities may result in avoidance of the project area by ESA-listed Steller sea lions, humpback whales, and other marine mammals. Of these activities, pile driving is expected to result in the greatest waterborne noise levels. Waterborne sound pressure levels (SPL) released by impact pile driving have been shown or predicted to cause injuries to fish, sea birds, and marine mammals in the immediate vicinity of such activities, with possible behavior-altering sound levels emanating for hundreds of meters (Table 7). Proposed pile driving at the Project will include vibratory driving 60-, 48-, 36-, and 24-inch-diameter steel piles with limited proofing. Figures 2 through 5 show the behavioral disturbance and injury zones based on the calculated sound levels. A composite pile cap will be used to dampen the pile-driving energy to reduce effects to marine mammals in the area during impact pile driving. In addition, a bubble curtain will be used while impact pile driving plumb piles (referred to as “mitigated” below); therefore sound levels have been calculated based on a 6 dB rms decrease in noise level while using a bubble curtain (Table 8 and Figure 3). Table 9 shows the impact zones, in square kilometers (km^2), for all noise levels.

Table 7 – Impact Zones for Marine Mammals during Pile Driving and Dredging

Pile Driver Type	Pile Size (inches)	Distance to Criterion (meters)					
		Waterborne Noise				Airborne Noise	
		Marine Mammal Disturbance (160 dB)	Cetacean Injury (180 dB)	Pinniped Injury (190 dB)	Continuous Noise Disturbance	Harbor Seal (90 dB)	Other Pinnipeds (100 dB)
Impact	24	1,848	86	18	-	537	167
	36	1,585	74	16	-		
	48	2,154	100	22	-		
Vibratory	60	-	-	-	100,000	117	< Threshold
Vibratory Removal	12	-	-	-	1,600	-	-

Table 8– Impact Zones for Marine Mammals for Impact Pile Driving With a Bubble Curtain

Pile Driver Type	Pile Size (inches)	Distance to Criterion (meters)		
		Waterborne Noise		
		Marine Mammal Disturbance (160 dB)	Cetacean Injury (180 dB)	Pinniped Injury (190 dB)
Impact	24	736	34	< Threshold
	36	631	29	< Threshold
	48	856	40	< Threshold

Table 9 – Area of Impact Zones for Marine Mammals

Pile Driver Type	Pile Size (inches)	Area of Impact (square kilometers)			
		Marine Mammal Disturbance (160 dB)	Cetacean Injury (180 dB)	Pinniped Injury (190 dB)	Continuous Noise Disturbance
Impact, unmitigated	24	3.93	0.072	0.031	-
Impact, mitigated	24	0.89	0.040	-	-
Impact, unmitigated	36	3.00	0.064	0.029	-
Impact, mitigated	36	0.72	0.037	-	-
Impact, unmitigated	48	4.96	0.082	0.033	-
Impact, mitigated	48	1.11	0.043	-	-
Vibratory	60	-	-	-	21.0
Vibratory Removal	12	-	-	-	3.05

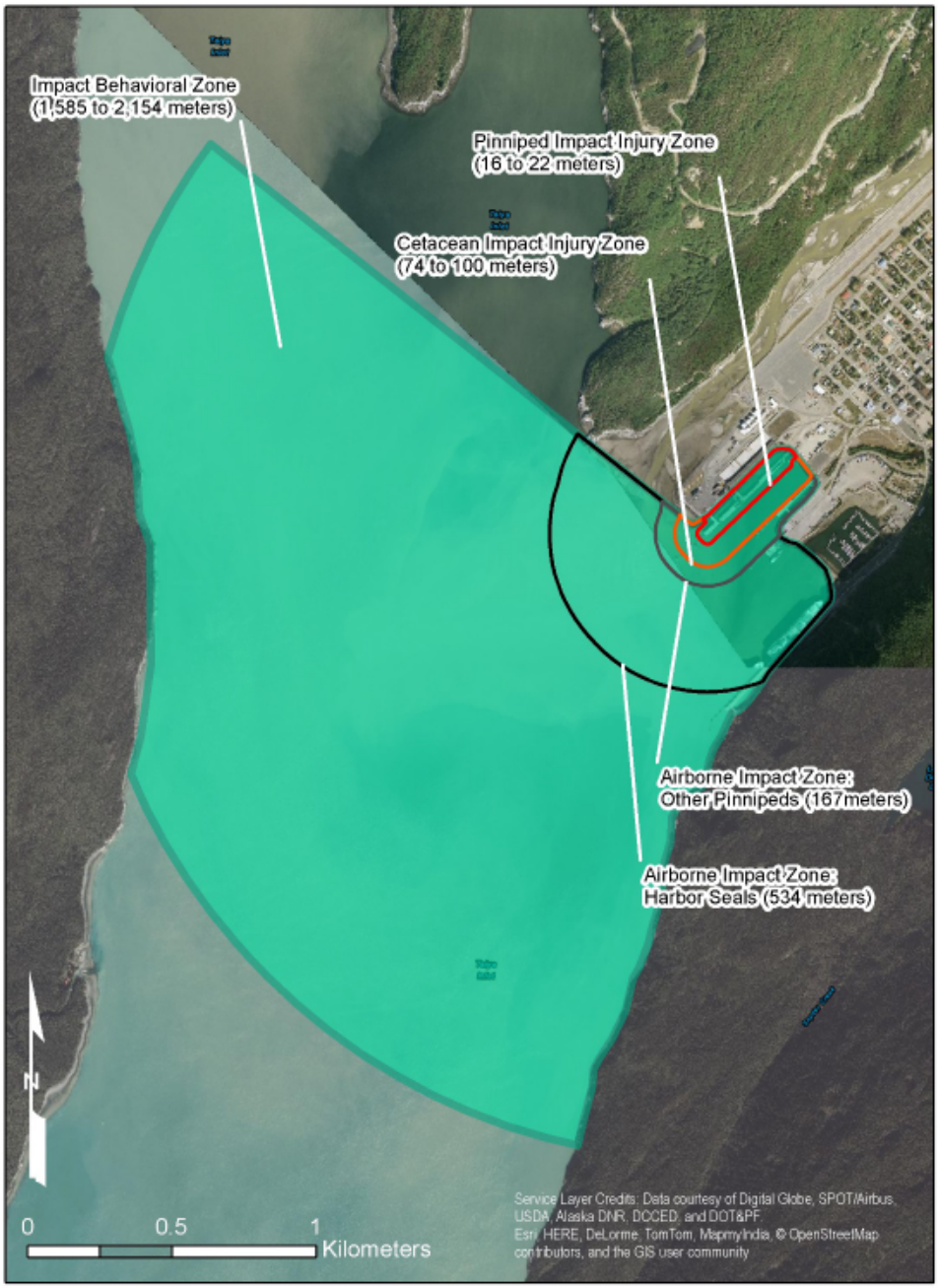

Figure 2 – Marine mammal impact pile driving behavioral and injury zones

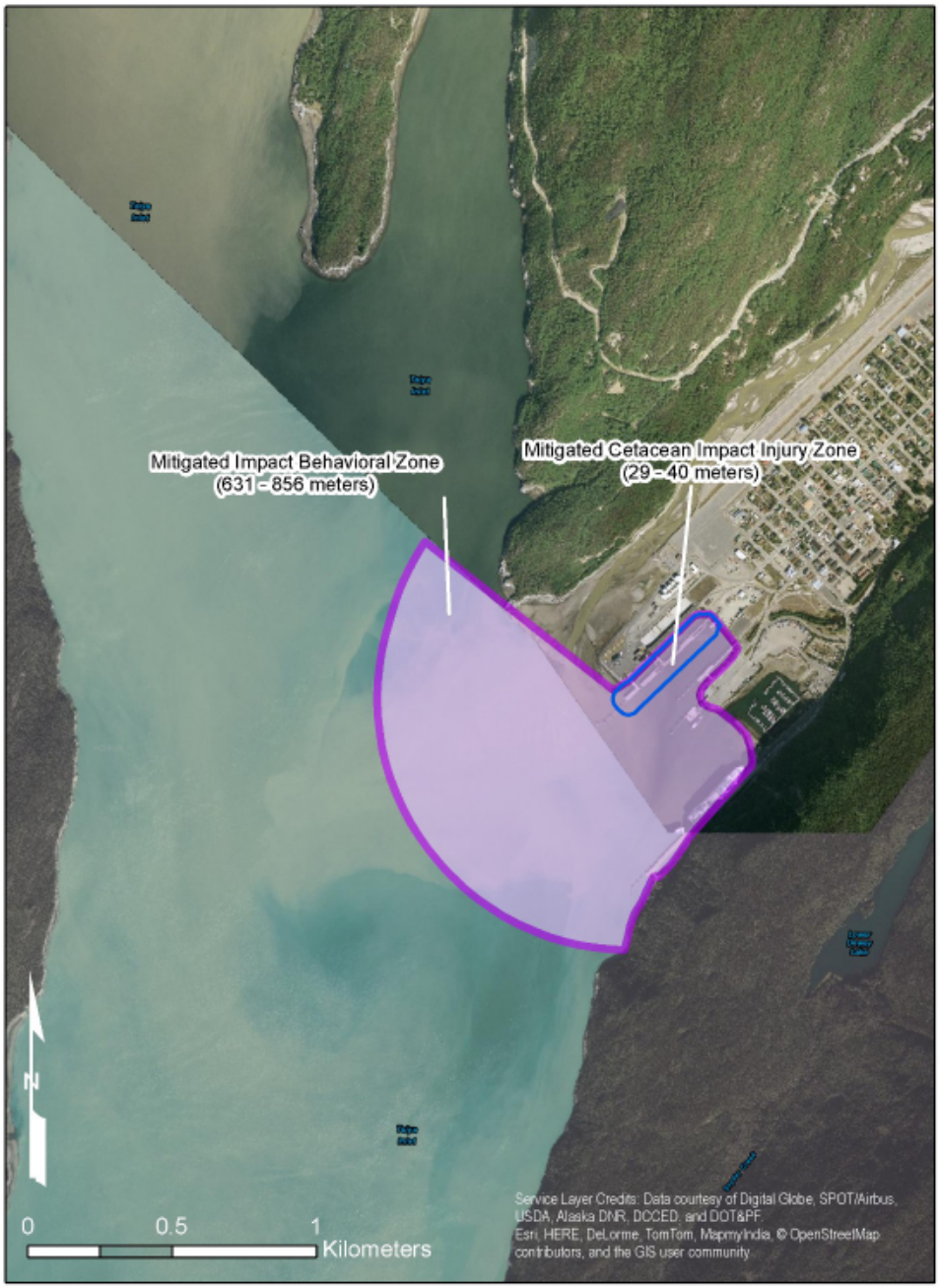

Figure 3 – Marine mammal impact pile driving behavioral and injury zones using a bubble curtain (mitigated)

Additionally, for heavy equipment movement (barges and tugs) and use (clam shell dredging), a 200-meter exclusion zone will be enforced for all marine mammals, except for harbor seals. A 10-meter exclusion zone will be enforced for harbor seals during heavy equipment movement and dredging activities.

4.0 MONITORING PROTOCOL

The following section provides the protocol for marine mammal observers at the project site and procedures to minimize impacts to marine mammals that approach or enter the potential disturbance zones (Figures 2–5). It is anticipated that two marine mammal observers will be required to monitor the action area during pile driving. One of the observers will be designated a monitoring lead observer responsible for alerting the construction crews when it is appropriate to begin pile driving and when there are work stoppages due to marine mammal proximity to or presence within injury or disturbance zones.

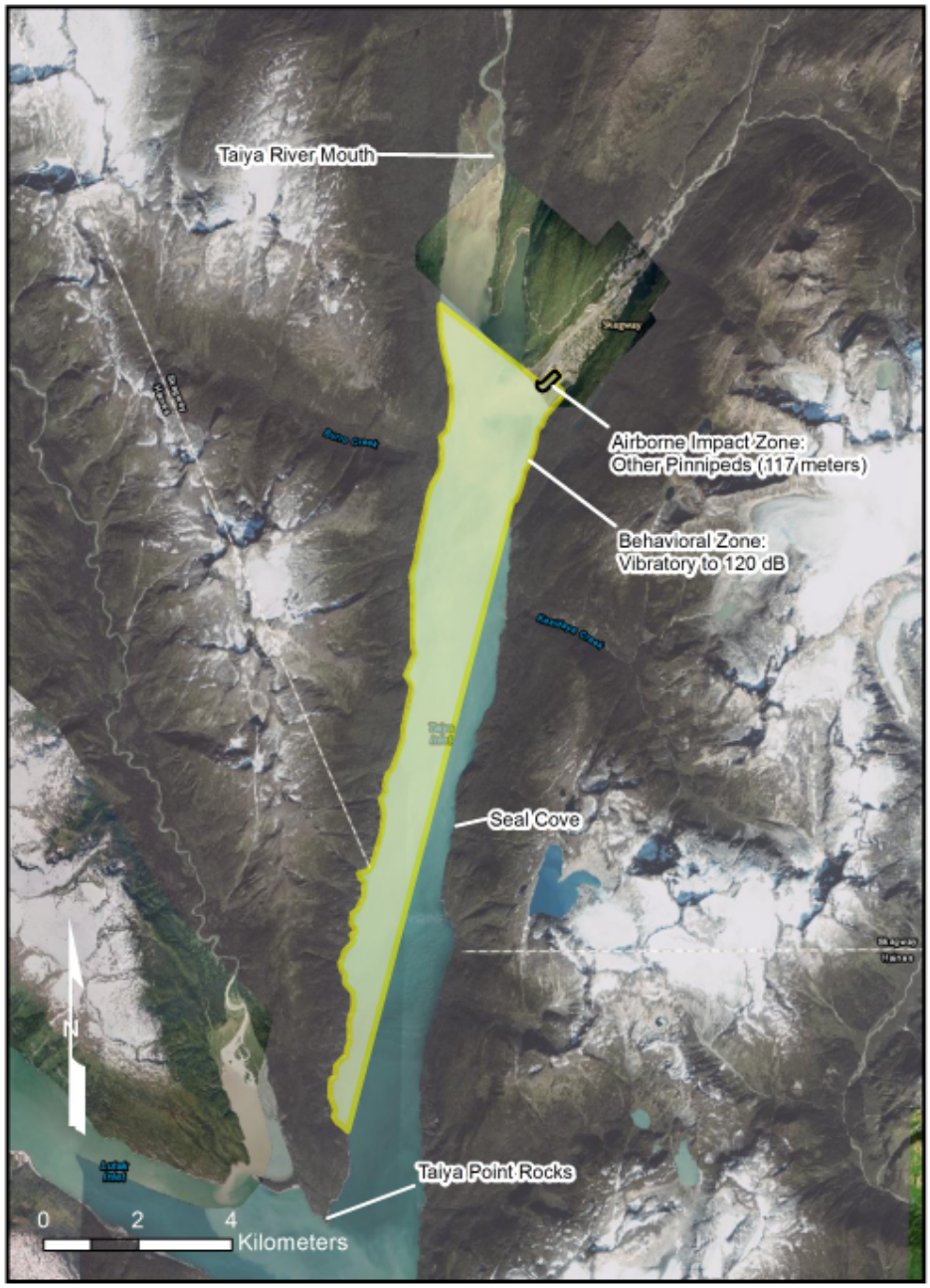

Figure 4 – Marine mammal disturbance zones for vibratory driving- Behavioral Zone of 17 km

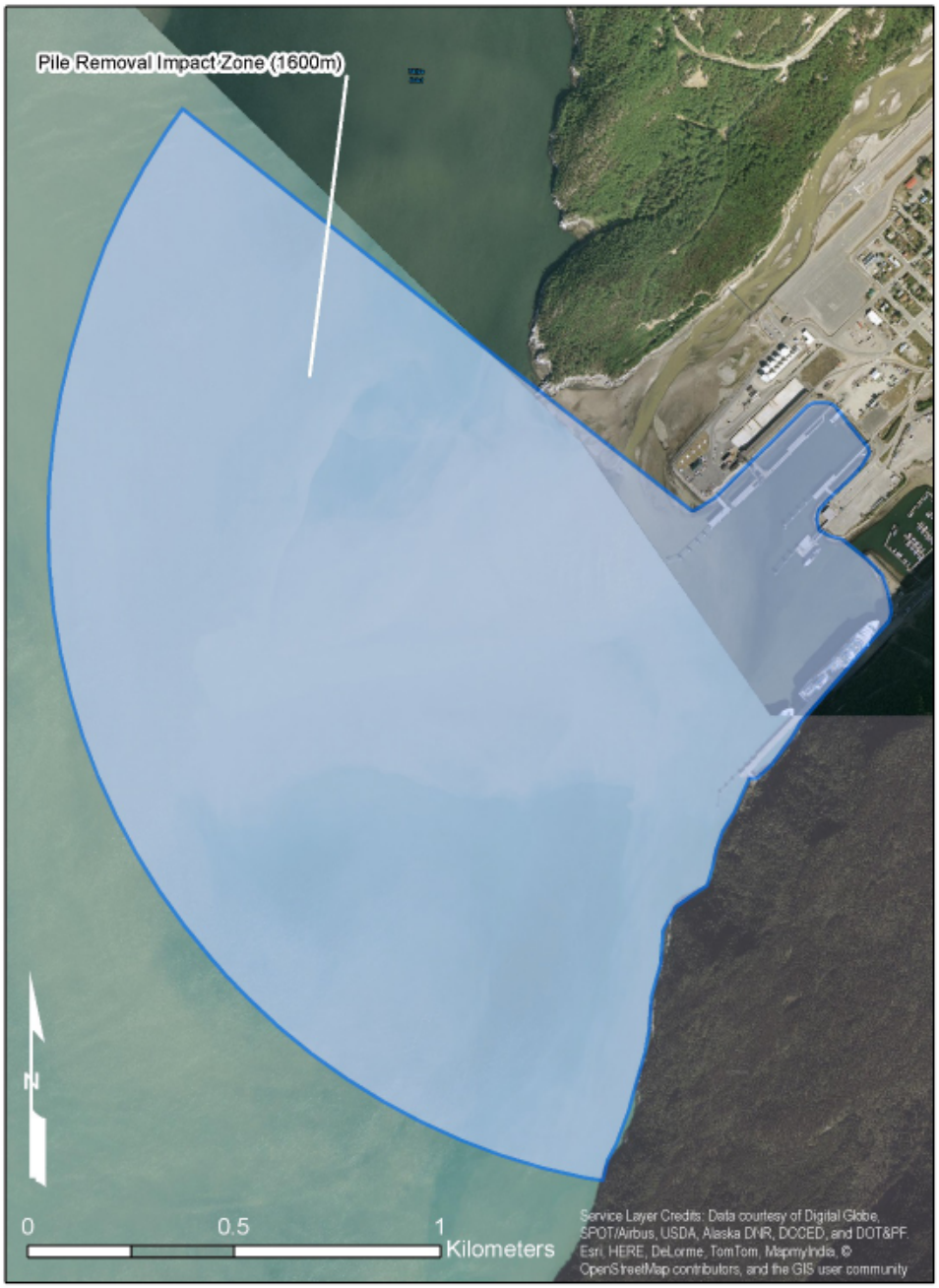

Figure 5 – Marine mammal disturbance zone for vibratory pile removal

4.1 Impact Pile Driving

4.1.1 Monitoring Protocol for Marine Mammals during Impact Pile Driving

During impact driving of steel piles, two qualified observers will monitor the injury and disturbance zones. Establishing a monitoring station on or near the pile-driving barge will provide the land-based observer with an unobstructed view of the injury zone during impact pile driving. A second land-based observer should be positioned with a clear view of the entire behavioral disturbance zone, and will monitor the zone with binoculars and a spotting scope. The following survey methods will be implemented during impact pile-driving operations.

- Monitoring will begin 15 minutes prior to impact pile driving. This will ensure that all marine mammals in the monitoring zone are documented and that no marine mammals are present in the injury zone.
- If observations have confirmed that no marine mammals are in the injury zone, the lead observer will instruct the contractor to initiate the ramp-up procedure for impact pile driving. This procedure consists of providing an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 1-minute waiting period, then two subsequent three strike sets.
- If no pile driving has occurred for 30 minutes, the initiation procedure will be repeated.
- When a marine mammal is observed, its location will be determined using a rangefinder to verify distance and a GPS or compass to verify heading.
- If any cetaceans or pinnipeds are observed approaching the disturbance zone, pile-driving activities will be allowed to continue and a take will be tallied against the allowed take authorized by the IHA. If the number of takes reaches 75 percent of the authorized amount the disturbance zone will be treated as an injury zone, and pile driving will be halted for any time when incursion by a marine mammal or presence in the disturbance zone is evident. This will continue until a new take authorization can be negotiated with NMFS or the noise-generating portions of the Project are completed.
- If any cetaceans or pinnipeds are observed approaching or in the injury zone, impact pile-driving activities will be immediately halted. The observer will immediately radio to alert the contractor, requiring an immediate “all-stop.” Impact pile-driving activities will not resume until the animal has voluntarily left the injury zone or 15 minutes have passed without re-sighting the animal in the zone. Observers will continue to monitor the animal after it has left the injury zone, if visible.
- All observations of marine mammals will be documented on the Marine Mammal Observation Record Form (Appendix A) or an approved, digitized version.
- Observers will search continuously for marine mammals with the naked eye and with the aid of rangefinder binoculars and/or spotting scopes.

- Monitoring will continue for 30 minutes after pile driving is completed for the day.

In the event of fog or unacceptable weather conditions that make it difficult to accurately spot marine mammals, impact pile driving will cease and will not resume until conditions in the monitoring zone return to acceptable levels.

4.1.2 Marine Mammal Observer Locations for Impact Pile Driving

In order to effectively monitor the impact pile-driving injury and behavioral disturbance zones, the marine mammal observers will be positioned at the best practical vantage points. The monitoring position for the lead observer will likely be on the pile-driving derrick or nearby, since the injury zones for impact pile driving are relatively close to the pile. The second observer will be placed on a platform that provides a full view of the behavioral disturbance zone. Actual locations may vary based on pile-driving activities and the locations of the piles and driving equipment.

The monitoring position of the observers will be identified with the following characteristics:

1. Unobstructed view of pile being driven;
1. Unobstructed view of all water within the injury and/or behavioral disturbance zones;
2. Clear view of pile-driving operator or construction foreman in the event of radio failure (lead biologist); and
3. Safe distance from pile-driving activities in the construction area.

4.2 Vibratory Driving and Demolition

4.2.1 Monitoring Protocol for Vibratory Driving

Generally, two qualified observers will monitor the disturbance zones during vibratory pile-driving activities. One observer will be positioned on or near the pile-driving barge as described in Section 4.3.2. The second observer will monitor from a vessel transecting the behavioral disturbance zone. The following survey methods will be implemented during vibratory pile-driving operations.

- Monitoring will begin 15 minutes prior to vibratory pile driving. This will allow time to document marine mammals in the monitoring zone.
- When all marine mammals in the disturbance zone have been documented, the lead observer will instruct the contractor to initiate the ramp-up procedure for vibratory pile driving. This procedure consists of initiating the vibratory hammer for 15 seconds at reduced energy followed by a 1-minute waiting period. This procedure will be repeated for a total of three sequences before vibratory pile driving begins.
- If no pile driving has occurred for 30 minutes, the initiation procedure will be repeated.
- When a marine mammal is observed, its location will be determined using a rangefinder to verify distance and a GPS or compass to verify heading.

- If any cetaceans or pinnipeds are observed approaching or in the disturbance zone, vibratory pile-driving activities will be allowed to continue and a take will be tallied against the allowed take authorized by the IHA. Data will be taken on the location, behavior, and disposition of the mammal as long as the mammal is within the harassment zone.

- If the number of takes exceeds 75 percent of those authorized by the IHA vibratory pile-driving activities will be immediately halted if any cetaceans or pinnipeds are observed within the disturbance zone, or if entry into the zone is imminent,. The observer will immediately radio to alert the contractor, requiring an immediate "all-stop." Vibratory pile-driving activities will resume when the animal has voluntarily left the disturbance zone or 15 minutes have passed without re-sighting the animal in the zone. Observers will continue to monitor the animal after it has left the disturbance zone. This will continue until a new take authorization can be negotiated with NMFS or the noise generating portions of the Project are completed.

- All observations of marine mammals will be documented in the Marine Mammal Observation Record Form or an approved, digitized version (Appendix A).

- Observers will search continuously for marine mammals with the naked eye and with the aid of binoculars and/or spotting scopes.

- Monitoring will continue for 30 minutes after pile driving is completed for the day.

In the event of fog or unacceptable weather conditions that make it difficult to accurately spot marine mammals, vibratory pile driving will cease and will not resume until conditions in the monitoring zone return to acceptable levels.

4.2.2 Observer Location for Vibratory Driving

The monitoring position for the lead observer will likely be on the pile-driving barge or nearby. The second observer will monitor from a vessel transecting the behavioral disturbance zone. Actual locations may vary based on pile-driving activities and the locations of the piles and driving equipment.

The monitoring position of the observers will be identified with the following characteristics:

1. Unobstructed view of pile being driven;
2. Unobstructed view of all water within the behavioral disturbance zone (second observer);
3. Clear view of pile-driving operator or construction foreman in the event of radio failure (lead observer); and
4. Safe distance from pile-driving activities in the construction area.

4.3 Dredging and Heavy Equipment Movement

4.3.1 Monitoring Protocol for Physical Injury from Heavy Equipment

One qualified observer will monitor a 200-meter exclusion zone to prevent physical injury from equipment use or movement (e.g., any construction activity other than pile driving), except for harbor seals. . A 10-meter exclusion zone will be enforced for harbor seals during these activities. This includes movement of construction barges, movement of large vessels (e.g., tub boats), and active clamshell dredging. This is a precautionary step to prevent vessel strike and other detrimental contact with marine mammals located in the area of active construction activity. The following survey methods will be implemented during heavy equipment operations that could be hazardous to marine mammals.

- Monitoring will begin 15 minutes prior to heavy equipment use or movement. This will ensure that all marine mammals in the area are documented and that no marine mammals are present in the exclusion zone.
- When a marine mammal is observed, its location will be determined using a rangefinder to verify distance and a GPS or compass to verify heading.
- If any cetaceans or pinnipeds are observed approaching the exclusion zone, heavy equipment activities will be immediately halted. The observer will immediately radio to alert the contractor, requiring an immediate “all-stop.” Observers will continue to monitor the animal after it has left the injury zone, if visible.
- All observations of marine mammals will be documented on the Marine Mammal Observation Record Form (Appendix A) or an approved, digitized version.
- Observers will search continuously for marine mammals with the naked eye and with the aid of rangefinder binoculars and/or spotting scopes.
- Monitoring will continue for 30 minutes after heavy equipment use is completed for the day.

In the event of fog or unacceptable weather conditions that make it difficult to accurately spot marine mammals, impact pile driving will cease and will not resume until conditions in the monitoring zone return to acceptable levels.

4.3.2 Marine Mammal Observer Location for Dredging and Heavy Equipment Movement

In order to effectively monitor the exclusion zone, the marine mammal observer will be placed on a platform that provides a full view of the exclusion zone. Actual locations may vary based on equipment activities.

The monitoring position of the observers will be identified with the following characteristics:

1. Unobstructed view of all water within the exclusion zone;
2. Clear view of equipment operator or construction foreman in the event of radio failure (lead biologist); and
3. Safe distance from heavy equipment activities in the construction area.

4.4 Qualifications for Marine Mammal Observers

The following list includes minimum qualifications for Marine Mammal Observers.

1. Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance. Use of spotting scopes, binoculars, and a rangefinder may be necessary to correctly identify the target and its location relative to the monitoring zones.
2. Advanced education in biological science, wildlife management, mammology, or related fields (Bachelor's degree or higher is preferred).
3. Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience).
4. Experience or training in the field identification of marine mammals (cetaceans and pinnipeds).
5. Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations.
6. Writing skills sufficient to prepare a report of observations that would include such information as the number and type of marine mammals observed; the behavior of marine mammals in the project area during construction; dates and times when observations were conducted; dates and times when in-water construction activities were conducted; dates and times when marine mammals were present at or within the defined disturbance or injury zones; dates and times when in-water construction activities were suspended to avoid incidental harassment by disturbance or injury from construction noise; etc.
7. Ability to communicate orally, by radio, or in person with project personnel to provide real-time information on marine mammals observed in the area as necessary.

4.5 Equipment for Marine Mammal Observers

The following equipment will be available to ensure adequate coverage of the pile-driving monitoring area:

- Hearing protection, steel-toed shoes, personal flotation device (PFD), and hardhat for observers (other protective gear may be required at the discretion of the construction contractor's health and safety plan);
- Portable radio to communicate with the contractor;
- Cellular phone with contact information for NOAA Fisheries and the pile installation contractor;

- Red and green signal flags to use as a back-up to radio communication;
- Daily tide and current tables for the action area;
- Stopwatch or time-keeping device;
- Binoculars;
- Spotting Scope;
- Rangefinder;
- GPS and compass;
- NOAA Fisheries-approved Marine Mammal Observation Record Form (Appendix A) on non-bleeding, waterproof paper, and/or a digitized version;
- Copy of this Marine Mammal Monitoring Plan; and
- Clipboard and pencils.

5.0 INTERAGENCY NOTIFICATION

5.1 Marine Mammal Notifications

If observers find an injured, sick, or dead marine mammal, they shall notify NOAA Fisheries immediately at 1-877-925-7773 with a description of the animal, location, date, time, photo (if possible), and any observed behaviors (if alive).

6.0 MONITORING REPORT

6.1 Monitoring Report of Marine Mammal Observations

A monitoring report of observations and analysis will be prepared for submission to NOAA Fisheries. The report should include, at minimum, such information as the number, type, and location of marine mammals observed; the behavior of marine mammals in the area of potential sound effects during construction; dates and times when observations and in-water construction activities were conducted; dates and times when in-water construction activities were suspended because of marine mammals; and total number of takes with comparison to authorized take per the IHA.

7.0 REFERENCES

ICF Jones & Stokes and Illingworth and Rodkin 2009. Technical guidance and mitigation of hydroacoustic effects of pile driving on fish. Prepared for the California Department of Transportation, Sacramento, California. Updated 2012.

Hart Crowser 2016. Request for an Incidental Harassment Authorization, Skagway Gateway Initiative Project. Prepared for the Municipality of Skagway. March 9, 2016.

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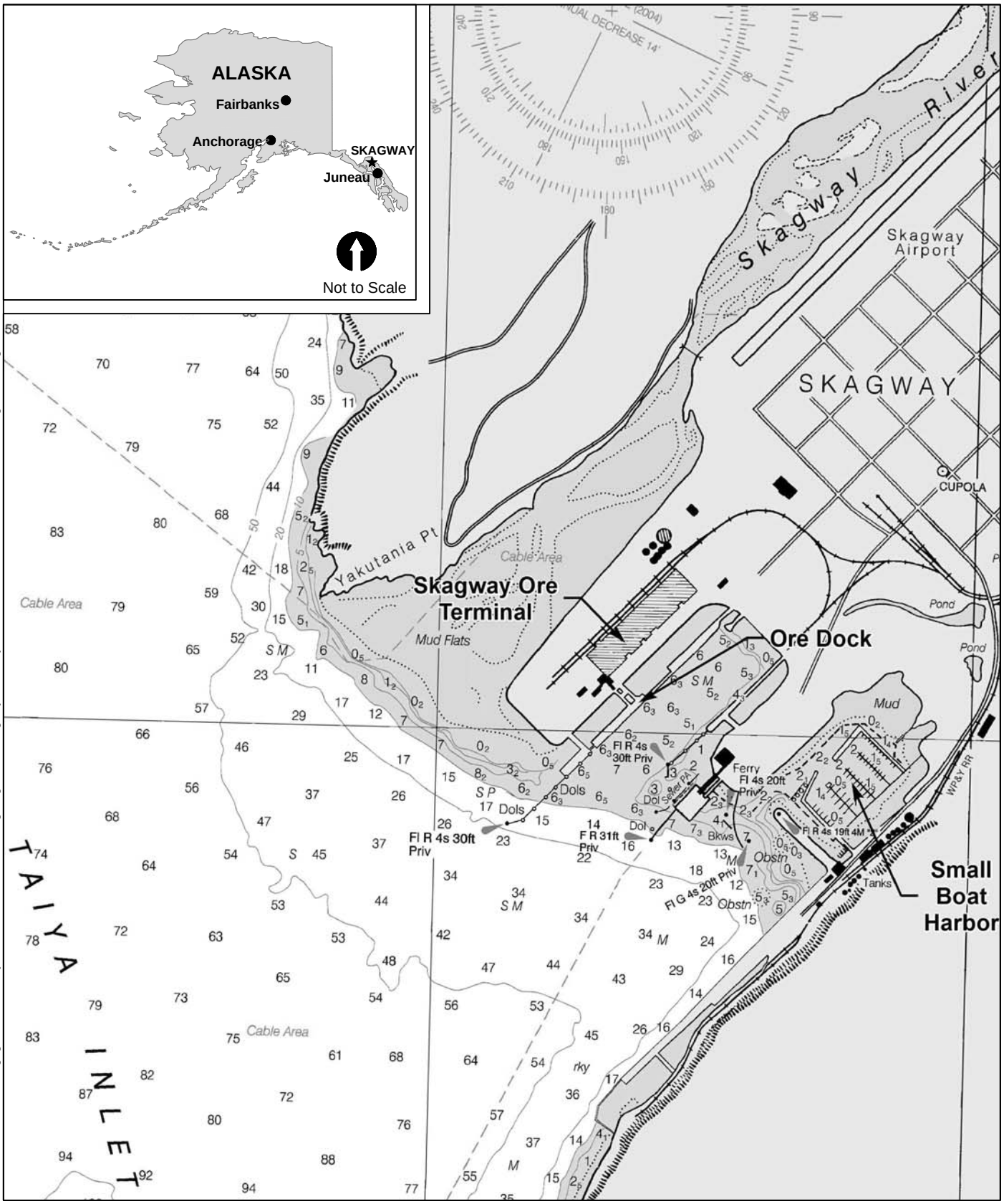
SHEETS



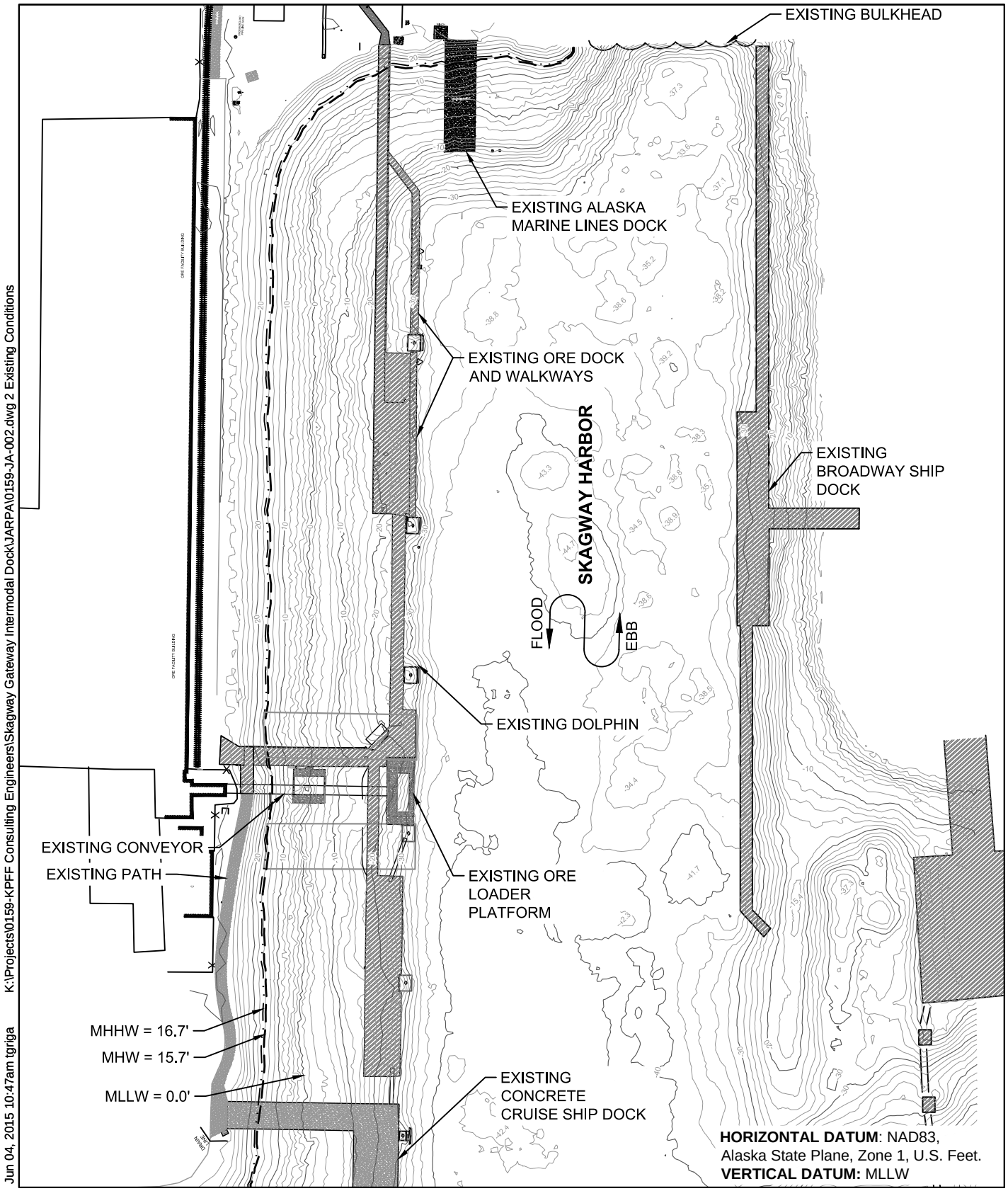
K:\Projects\0159-KPFF Consulting Engineers\Skagway Gateway Intermodal Dock\JARPA\0159-JA-001.dwg 1 Existing Conditions

Jun 04, 2015 10:47am tgriga

Figure 1 **Vicinity Map**

APPLICANT: Municipality of Skagway
FILE NO. POA-XXX-XXXX
WATERWAY: Taiya Inlet
PROPOSED ACTIVITY: Skagway Gateway Initiative Project
SEC. 14 **T.** 28 South **R.** 59 East, Copper River Meridian
LAT: 59° 27' 1.2" N **LONG:** 135° 19' 22.5" W
SHEET: 1 of 8 **DATE:** 6/5/15

0 800
Scale in Feet



Jun 04, 2015 10:47am tgriga K:\Projects\0159-KPFF Consulting Engineers\Skagway Gateway Intermodal Dock\JARPA\0159-JA-002.dwg 2 Existing Conditions

Figure 2 **Existing Conditions**

APPLICANT: Municipality of Skagway
FILE NO. POA-XXX-XXXX
WATERWAY: Taiya Inlet
PROPOSED ACTIVITY: Skagway Gateway Initiative Project
SEC. 14 **T.** 28 South **R.** 59 East, Copper River Meridian
LAT: 59° 27' 1.2" N **LONG:** 135° 19' 22.5" W
SHEET: 2 of 8 **DATE:** 6/5/15

0 150
Scale in Feet

APPENDIX A
Marine Mammal Observation Record Form

APPENDIX A

Example Data Sheet

Marine Mammal Observation Record Form										Observer(s):			Date:
Boat Name/Location:				Time Effort Initiated:									
				Time Effort Completed:						Page _____ of _____ Pages			
Project Name	**Sighting #**	**Sighting Time**	**Latitude**	**Longitude**	**Species**	**# of Anim**	**Dist/Dir to Anim**	**Beh Type(s)**	**Const Type**	**Dist to Pile**	**Weath Cond**	**Beauf**	**Notes**