18 December 2019

Ms. Jolie Harrison, Chief
Permits and Conservation Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3225

Dear Ms. Harrison:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the application submitted by Jordan Cove Energy Project, LP (JCEP) under section 101(a)(5)(D) of the Marine Mammal Protection Act (the MMPA). JCEP is seeking authorization to take small numbers of marine mammals by harassment incidental to pile driving associated with construction of the Jordan Cove Liquefied Natural Gas (LNG) facility and ancillary activities in Coos Bay, Oregon, during a one-year period. The Commission also has reviewed the National Marine Fisheries Service's (NMFS) 18 November 2019 notice (84 Fed. Reg. 63618) requesting comments on its proposal to issue the authorization, subject to certain conditions.

JCEP has proposed to use pile driving for (1) construction of the LNG terminal marine slip, (2) widening of the TransPacific Parkway (TPP)/U.S. 101 intersection, and (3) construction of a bridge across Coos Bay to access dredge disposal sites (APCO Sites 1 and 2). For the LNG terminal, JCEP would install six 24-in pipe piles and 1,982 sheet piles using a vibratory hammer. The piles would be installed 'in-the-dry' behind an earthen berm barrier. For the widening of the TPP/U.S. 101 intersection, JCEP would install 311 sheet piles using a vibratory hammer and 1,150 14-in timber piles and 36 24-in pipe piles using both a vibratory and impact hammer[1]. The timber piles would be installed behind a cofferdam, and the pipe piles would be installed using a bubble curtain. For construction of the bridge, JCEP would install 33 24-in pipe piles using a vibratory hammer. Pile driving would begin 1 October 2020 and would occur over 230 days[2].

NMFS preliminarily has determined that, at most, the proposed activities could cause Level B harassment of small numbers of seven marine mammal species. NMFS anticipates that any impact on the affected species and stocks would be negligible. NMFS also does not anticipate any take of marine mammals by death or serious injury and believes that the potential for disturbance will be at the least practicable level because of the proposed mitigation measures. The proposed mitigation, monitoring, and reporting measures include—

[1] Based on restrictions by Oregon Department of Fish and Wildlife (ODFW), the use of impact hammers would be limited to 1 October through 15 February to protect salmonids.
[2] JCEP has estimated a total of 327 pile-driving days (as indicated in Table 3 of the *Federal Register* notice), some of which may occur concurrently but in different areas.

- using a bubble curtain and implementing various measures;
- conducting *in-situ* sound source and sound propagation measurements of the various types of piles and installation methods and adjusting the Level A and B harassment zones[3], as necessary;
- ceasing operations if a marine mammal comes within 10 m of heavy machinery during in-water construction activities (other than pile driving);
- using standard pre-clearance, soft-start, delay, and shut-down procedures;
- requiring at least two protected species observers (PSOs) to monitor the Level A and B harassment zones at each site for 30 minutes before, during, and for 30 minutes after all pile-driving activities;
- using delay and shut-down procedures if a species for which taking has not been authorized, or for which authorized numbers of takes have been met, approaches or is observed within the Level B harassment zone;
- reporting injured and dead marine mammals to the Office of Protected Resources and the West Coast Stranding Coordinator using NMFS's phased approach and suspending activities, if appropriate; and
- submitting comprehensive draft and final acoustic and marine mammal monitoring reports to NMFS, including all PSO datasheets and/or raw sightings data.

Extents of the Level A and B harassment zones

Sheet piles—For piles driven in water, JCEP used source level data from California Department of Transportation (Caltrans 2015) and assumed practical spreading loss[4] to estimate the extents of the Level A[5] and B harassment zones. For piles driven in water-laden sediments but *out of water*, JCEP contracted JASCO Applied Sciences (JASCO) to conduct more sophisticated modeling to estimate the extent to which sound would propagate through the sediment at the water's edge and into the water column. Deveaux and MacGillvary (2017)[6] used source level data[7] from *in-water* vibratory installation of sheet piles at Berth 23 at the Port of Oakland as referenced in Caltrans (2015) to inform its modeling. The Commission finds that approach reasonable. However, JCEP used different source level data for vibratory installation of sheet piles *in the water*. It is not clear why different source levels were used, particularly given that both source levels originated from *in-water* vibratory installation of sheet piles.

For in-water vibratory installation of sheet piles, JCEP cited Caltrans (2015) for the 160-dB re 1 μPa at 10 m source level, which appears to have originated from Table I.2-2 in that document. The source level for in-water vibratory installation of sheet piles at Berth 23, which had informed Deveaux and MacGillvary (2017) and was used for out-of-water vibratory installation, was 163 dB re 1 μPa at 10 m (Table I.2-3, Caltrans 2015). Table I.2-3 also included source levels of 162 and 163 dB re 1 μPa at 10 m at Berth 30 and 35/37, respectively, for in-water vibratory installation of sheet piles

[3] Identified by NMFS as shut-down and monitoring zones, respectively.
[4] 15logR.
[5] As well as weighting factor adjustments and operational parameters.
[6] i.e., JASCO.
[7] Spectra data were parsed into source levels at each one-third octave band.

during other Port of Oakland projects (Caltrans 2015). In addition, source levels associated with vibratory installation of sheet piles are known to be greater than source levels for vibratory installation of timber piles (see Caltrans 2015 and Department of the Navy 2015). In this instance, JCEP assumed that the source level for vibratory installation of timber piles was 162 dB re 1 μPa at 10 m, which is less than the 160-dB re 1 μPa at 10 m source level it used for in-water vibratory installation of sheet piles. Thus, JCEP and in turn NMFS underestimated the source level for in-water vibratory installation of sheet piles and ultimately the extents of the Level A and B harassment zones, as well as the numbers of takes. For all of these reasons, the Commission recommends that NMFS (1) use 163 rather than 160 dB re 1 μPa at 10 m as the source level for vibratory installation of sheet piles at TPP/U.S. 101 intersection, (2) revise the Level A[8] and B[9] harassment zones accordingly, and (3) re-estimate the numbers of takes of harbor seals[10].

24-in pipe piles—NMFS indicated that 24-in piles would be installed using both a vibratory hammer and impact hammer[11] at TPP/U.S. 101 intersection and installed using a vibratory hammer and tested with an impact hammer[12] at APCO Sites 1 and 2 (84 Fed. Reg. 63623). However, Tables 2, 3, 8, 9, 10 and 13 in the *Federal Register* notice specify that impact pile driving would occur only at TPP/U.S. 101 intersection[13]. If there is a possibility that impact driving may be necessary to install the 24-in piles at APCO Sites 1 and 2, the Commission recommends that NMFS estimate the extents of the Level A harassment zones[14] and revise the various tables accordingly in the *Federal Register* notice and the final incidental harassment authorization.

Further, NMFS based the extents of the Level A harassment zones for vibratory installation of 24-in piles on 30 minutes of activity on a given day. Vibratory installation of 24-in piles would occur for only 30 minutes at APCO Sites 1 and 2, but it could occur for up to 80 minutes at TPP/U.S. 101 intersection (Table 3, 84 Fed. Reg. 63624). As such, the Level A harassment zones have been underestimated. The Commission recommends that NMFS recalculate the Level A harassment zones[15] to account for the maximum time that vibratory installation could occur on a given day and revise Tables 9 and 10 in the *Federal Register* notice accordingly. And, although the Level A harassment zones for APCO Sites 1 and 2[16] were less than the zones for TPP/U.S. 101 intersection, NMFS included shut-down zones for the former[17] that are greater than the zones for the latter[18]. Given that the revised Level A harassment zones for TPP/U.S. 101 intersection are the

[8] Resulting in Level A harassment zones of 13.1 m for low-frequency (LF) cetaceans, 1.2 m for mid-frequency (MF) cetaceans, 22.6 m for high-frequency (HF) cetaceans, 9.3 m for phocids, and 0.6 m for otariids.
[9] Resulting in a Level B harassment zone of 7,356 m.
[10] Harbor seals were the only species for which JCEP and NMFS used the ensonified areas to estimate the numbers of takes.
[11] And a bubble curtain would be used.
[12] To ensure they have been set properly. A bubble curtain would be used as well.
[13] The shut-down zones in the draft incidental harassment authorization for APCO Sites 1 and 2 are based on vibratory not impact pile driving.
[14] If impact installation of 24-in piles at APCO Sites 1 and 2 would involve fewer strikes than was used to inform the Level A harassment zones for TPP/U.S. 101 intersection. Otherwise, NMFS could conservatively apply the Level A harassment zones for TPP/U.S. 101 intersection to APCO Sites 1 and 2.
[15] Resulting in Level A harassment zones of 15.3 m for LF cetaceans, 1.4 m for MF cetaceans, 22.6 m for HF cetaceans, 9.3 m for phocids, and 0.7 m for otariids.
[16] Based on the Level A harassment zones being the smallest of all the three vibratory pile-driving scenarios, see Table 10 in the notice.
[17] 10 and 25 m.
[18] 10 and 30 m.

greatest of the three scenarios, it would be prudent to include the larger shut-down zones for vibratory installation of 24-in pipe piles at TPP/U.S. 101 intersection as well.

Finally, JCEP assumed that the Level B harassment zones as modeled by JASCO for vibratory installation of sheet piles would be sufficient for vibratory installation of pipe piles. JCEP indicated in its application that the spectra of 36-in pipe piles and sheet piles were similar, with the primary difference being that for the 36-inch pile, the peak of approximately 148 dB was present at about 25 Hz, whereas the highest peak of approximately 148 dB for the sheet pile occurred at 940 Hz. JCEP also stated that sheet piles did produce some peaks below 100 Hz, but the magnitude was approximately 10 dB lower. It is unclear why JCEP attempted to compare spectra of 36-in piles to sheet piles rather than spectra of the 24-in piles that would be driven. But it is clear that the spectra are not similar if the peak source level for pipe piles occurs at 15 one-third octave bands less than sheet piles. In addition, Deveaux and MacGillvary (2017) indicated that the highest source level was 174.2 dB re 1 µPa at 10 m at the 1-kHz octave band (Table 2), which is much greater than 148 dB. The source level for sheet piles at 25 Hz was in fact 149.7 dB re 1 µPa at 10 m (Table 2 in Deveaux and MacGillvary 2017), which is greater than the highest peak of 148 dB at 940 Hz referenced. JCEP's supposition that the spectra are similar is unfounded and the source levels that it referenced do not match what was actually used by Deveaux and MacGillvary (2017).

Moreover, JCEP indicated that overall source levels, in both root-mean-square sound pressure level and sound exposure level, for sheet piles were slightly higher than the 36-in pipe piles. It is not clear how overall source levels associated with vibratory installation of 36-in pipe piles would be less than sheet piles. JCEP assumed that the source level associated with vibratory installation of 24-in pipe piles was 165 dB re 1 µPa at 10 m, while it assumed that vibratory installation of sheet piles was 160 dB re 1 µPa at 10 m based on Caltrans (2015; Table 8 on 84 Fed. Reg. 63637). That fact alone would disprove the assumption that the source levels from vibratory installation of 36-in piles, which are larger than 24-in piles, would be comparable to or slightly higher than sheet piles. Department of the Navy (2015) indicated that the source levels from 36-in piles range from 166 to 167 dB re 1 µPa at 10 m. The issue may be that JCEP used 36-in pile source level data from the Philadelphia Naval Shipyard (Illingworth & Rodkin, Inc. 2015) that are lower than other locations[19] rather than more representative 36-in piles. For all of these reasons, it is prudent that *in-situ* measurements be taken to verify the extents of the Level B harassment zones and that NMFS finalize its recommended proxy source levels. Therefore, the Commission recommends that NMFS finish reviewing and finalize its recommended proxy source levels for both impact and vibratory installation of the various pile types and sizes. If the proxy source levels for impact pile driving are finalized prior to vibratory pile driving and removal, they should be made available to action proponents and the public at that time and should not be retained until the vibratory source levels are finalized.

Bubble curtain efficacy and *in-situ* measurements

The Commission has commented several times on the assumptions used by NMFS regarding the efficacy of bubble curtains, and advises that its 2 December 2019 letter be reviewed in conjunction with this letter. NMFS has adopted a standard 7-dB source level reduction when bubble

[19] The measured source levels were 10 to 20 dB less than those measured elsewhere. Illingworth & Rodkin, Inc. (2015) has not been used by NMFS for proxy source levels for other authorizations.

curtains are to be used during impact pile driving. Although variability in attenuation levels can result from differences in device design and site and environmental conditions and from difficulties in properly installing and operating sound attenuation devices, bubble curtains that are placed immediately around the pile do not achieve consistent reductions in sound levels because they cannot attenuate ground-borne sound[20]. That is, appreciable attenuation is not observed for the sound that resonates through the ground into the far field or for low-frequency sound in general.

In this instance, JCEP indicated in its application that the Commission has supported use of the 7-dB source level reduction. Specifically, JCEP noted that recent guidance from Caltrans and the Commission (Molnar 2018) indicates that an attenuation factor of 7 dB is a reasonable assumption for a properly operating bubble curtain system. The Commission is unaware of what guidance was conveyed in Molnar (2018) or who Molnar is. The Commission's 8 May 2018 letter on Caltrans' project at the San Francisco-Oakland Bay Bridge explicitly stated that the Commission did *not* support use of such a factor and that NMFS refrain from using a source level reduction factor for sound attenuation device implementation during impact pile driving for all relevant incidental take authorizations.

The Commission included a similar recommendation in its 6 November 2019 letter that NMFS refrain from using a source level reduction factor until such time that it consults with various experts regarding the appropriate source level reduction factor to use to minimize far-field effects on marine mammals. In its response, NMFS indicated that it would evaluate the appropriateness of using an alternative source level reduction factor for sound attenuation device implementation during pile driving for all relevant incidental take authorizations *as more data become available* and contact experts as appropriate (84 Fed. Reg. 64834). NMFS is in possession of the relevant data that refute the appropriateness of the 7-dB source level reduction. However, NMFS again indicated that, at approximately 10 m, Austin et al. (2016) measured reductions in mean source levels for impact pile driving of 10 dB (or higher) when comparing two piles driven using a hydraulic hammer with and without a bubble curtain (84 Fed. Reg. 64834). Knowingly choosing a few references or individual piles that show an appreciable near-field reduction stands in stark contrast to the plethora of data compiled by NMFS that shows attenuated and unattenuated median source levels measured in the field differ by only 1 to 6 dB at 10 m. Thus, a 7-dB source level reduction factor is unsubstantiated by the data currently available.

If the currently available data show that a 7-dB reduction is unsubstantiated at 10 m, that reduction would never persist in the far field at distances of 100 m or more. NMFS did acknowledge that at distances farther away from a pile (e.g., 1 km), a variety of factors can influence the measured sound level (including transmission loss, benthic type, pile location, etc.; 84 Fed. Reg. 64834). However, it did not include frequency or ground-borne refraction in the list of factors that influence far-field sound levels.

Although it is unclear why NMFS is not consulting with the relevant experts, including acousticians at the University of Washington-Applied Physics Laboratory (UW-APL), to resolve this issue, it is clear that NMFS is not basing its use of the 7-dB source level reduction factor on best available science, particularly since it has the necessary data in hand to address this issue. As such,

[20] Bubble curtains also attenuate high-frequency rather than low-frequency sound.

the Commission recommends that NMFS (1) consult with acousticians, including those at UW-APL, regarding the appropriate source level reduction factor to use to minimize near-field (<100 m) and far-field (>100 m) effects on marine mammals[21] or (2) use the data NMFS has compiled regarding source level reductions at 10 m for near-field effects and assume no source level reduction for far-field effects for all relevant incidental take authorizations.

Since JCEP plans to conduct *in-situ* monitoring of the various pile types and installation methods, it would be prudent to collect data during impact installation with and without bubble curtains to help NMFS address this persistent issue. JCEP indicated in its acoustic monitoring plan that it would report the various metrics with and without attenuation, if applicable. JCEP plans to monitor six piles that are to be installed with an impact hammer. If JCEP is not required by ODFW to use a bubble curtain at all times, it should monitor impact pile driving of three piles with and three piles without the bubble curtain.

In addition, JCEP indicated that it would place the far-field hydrophone for all measurements at mid-column depth, at a distance at least 20 times the source depth or 50 m from each pile being monitored, whichever is greater, in waters at least 5 m deep based on NMFS (2012). It appears that JCEP misinterpreted NMFS (2012) and NMFS did not identify the misunderstanding. NMFS (2012) indicated that the hydrophone should be "placed at least 20 times the source depth from the source measurement". The 'source depth' is the depth of water in which the pile is driven. The mid-column depth of the hydrophone (i.e., 2.5 m) is not considered the source depth, it is the 'receiver depth'. NMFS (2012) also indicated that the hydrophone should be placed at depths greater than 5 m. JCEP's presumed 2.5-m minimum depth would be insufficient. It is imperative that the far-field hydrophone be placed sufficiently in the far field to obtain the relevant ground-borne sound during impact and vibratory pile driving, particularly when assessing the efficacy of the bubble curtain. 50 m is not sufficient. The Commission therefore recommends that NMFS strongly encourage JCEP to collect *in-situ* data during impact pile driving of half the piles with and half without use of the bubble curtain and require JCEP to position the far-field hydrophone at least 5 m in depth and at least 100 m or 20 times the source depth away from the pile, whichever is greater.

Harbor seal takes

The number of estimated Level B harassment takes of harbor seals has been underestimated. To estimate takes, NMFS calculated two seasonal densities of harbor seals, one for spring/summer and one for fall/winter. NMFS calculated the spring/summer density based on 333 seals observed on the four main haul-out sites (Clam Island, Pigeon Point, Coos Port, and South Slough) in Coos Bay during an aerial survey conducted by the Oregon Department of Fish and Wildlife in June 2014. NMFS then divided the seal count by 55.28 km^2, which is the entire area of the Coos Bay estuary[22]. This resulted in an unrealistically low density of 6.2 seals/km^2. NMFS calculated the fall/winter density based on 167 seals observed at two of the four haul-out sites (Clam Island and Pigeon Point) during an aerial survey conducted by AECOM in November 2018 (AECOM 2018). That study estimated a maximum density of 11.1 seals/km^2, based on the survey area of 15.09 km^2. However, NMFS again used the entire area of Coos Bay to derive a fall/winter density of 3.0 seals/km^2, which

[21] Which also includes Level A harassment in some instances.
[22] https://www.coastalatlas.net/index.php/component/jumi/estuaries?view=application&e=14

is also unrealistically low. In both cases, a correction factor to account for animals in water and not counted was available (Huber et al. 2001) but was not applied.

It is not clear why the fall/winter density estimate generated by AECOM (2018) was not used as the basis for estimating takes since NMFS recently proposed to use the same density in the same area for the U.S. Army Corps of Engineers proposed authorization (84 Fed. Reg. 56797). It was considered best available science a little over one month ago and surely NMFS would consider it as such now. This is especially perplexing given that the winter AECOM surveys (and previous surveys conducted by AECOM in July 2017; AECOM 2017) were conducted specifically for the purpose of collecting data on the use of Coos Bay by marine mammals in advance of constructing the Jordan Cove LNG facility. NMFS did not use the 1.53 haul-out correction factor[23] from Huber et al. (2001) to adjust the spring/summer haul-out count[24], stating that those data were collected during times with higher abundance than the rest of the season (84 Fed. Reg. 63639). NMFS postulated that the unadjusted spring/summer haul-out count is likely more representative of long-term abundance. Those suppositions are incorrect for multiple reasons.

First, the greatest number of harbor seals was observed during the May not June 2014 survey, when 352 seals were observed at Clam Island, Pigeon Point, and Coos Port[25]. South Slough was obstructed by fog, otherwise the number of seals would have been even greater. Second, NMFS routinely uses haul-out correction factors to adjust the haul-out counts for its abundance estimates as part of its stock assessment reports[26], which represent best available science regarding the number of animals in each population or stock. It is true that greater numbers of harbor seals are observed hauled out during May and June. But that is due to animals giving birth and moulting. As noted by NMFS in the *Federal Register* notice (84 Fed. Reg. 63628), harbor seals are resident in most bays and estuaries along the Oregon coast and remain close to their regular haul-out sites, usually within 10 to 20 km of the sites. In months other than May and June, harbor seals do not leave the area. In fact, they are at greater risk of being disturbed by construction activities during the remainder of the year, because greater numbers of them are in the water.

To account for the fact that takes were underestimated during vibratory pile driving at the LNG terminal, NMFS implemented JCEP's 'movement method'. NMFS indicated that it typically relies on a standard calculation in which the number of takes is based on the ensonified area x density x number of pile-driving days and the method is suitable for activities other than those at the LNG terminal, because such activities would be limited in duration or would occur in areas where harbor seals are not expected to traverse frequently (84 Fed. Reg. 63640). However, NMFS routinely uses the above-referenced method to calculate nearly all of its take estimates for harbor seals[27], including in this instance when the Level B harassment zone does not encompass the haul-out sites[28].

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[23] Which is based on the average of the haul-out correction factors from both inland and coastal haul-out sites in Oregon and Washington.
[24] It made no reference as to why it did not use the correction factor for the fall/winter density.
[25] NMFS made no mention of why it chose to use the lesser number of 333 seals to inform its spring/summer density or why it chose not to use JCEP's proposed average count of 342.5 seals.
[26] https://www.fisheries.noaa.gov/webdam/download/76004329
[27] Unless densities are not available.
[28] In those instances, NMFS generally uses the actual haul-out counts.

NMFS further indicated that its standard calculation method is not directly applicable for estimating harbor seal takes during vibratory pile driving at the LNG terminal because (1) vibratory driving at the terminal may be occurring for several hours per day, (2) Coos Bay is narrow and Level B harassment thresholds are expected to be exceeded across the width of Coos Bay at the terminal, and (3) many harbor seals that haul out at Clam Island, and to a lesser extent the other haul-out sites in Coos Bay, likely swim past the LNG terminal work zone throughout the day (84 Fed. Reg. 63640). Because of these factors, individual animals are expected to move into the Level B harassment zone throughout the day as active vibratory driving is occurring at the LNG terminal, and harbor seal take would be underestimated without accounting for the movement of animals (84 Fed. Reg. 63640). The first two factors apply to essentially all authorizations involving vibratory pile driving and a 'movement method' similar to JCEP's[29] has yet to be used. Furthermore, the third factor could be resolved easily with more appropriate densities, similar to those originally proposed by USACE. More appropriate densities would yield a more realistic number of takes that would account for the animals that are expected to move into or merely occur in the Level B harassment zone.

In addition to NMFS's lack of justification for employing JCEP's movement method, the Commission questions the validity of the inputs for that method. JCEP used a current speed of 1.4 km/hour to approximate the drift of a harbor seal, which NMFS indicated also could be considered a slow swim speed and likely representative for animals milling around an estuary to which they are resident (84 Fed. Reg. 63640). JCEP multiplied the density by the ensonified area and then added the density multiplied by current speed, channel width, and number of minutes of pile driving per day[30] to determine the number of seals taken per day at the LNG terminal. Regarding the current speed as a proxy for harbor seal swim speed, NMFS acknowledged that seals are active swimmers and do not drift with the current but then indicated that the purpose of the movement method was *not* to characterize actual *movement* but to estimate how many seals may pass into a given Level B harassment zone throughout the day (84 Fed. Reg. 63640). Movement models, including traditional ones that use animats, are intended to determine how many seals occur in a given Level B harassment zone on a given day. If that was NMFS's and JCEP's objective, then JCEP should have contracted JASCO to implement its animal movement model in addition to conducting sound propagation modeling. NMFS further stipulated that the movement method is designed to model the possibility seals may come within the Level B harassment zone in greater probability than a single snapshot in time during a given day (84 Fed. Reg. 63640). JCEP's simple movement method does not account for any estimate of the probability of occurrence, and movement models[31] generally result in similar takes to a standard area x density method[32] (or the single snapshot in time), as they are both based on the same underlying density.

Additionally, NMFS indicated that the current drift speed of 1.4 km/hour was in the range of harbor seal swim speeds of 1 to 4 km/hour based on Table B-2 in Department of the Navy (2017; 84 Fed. Reg. 63640). NMFS attempted to justify the assumed low speed based on the swim speeds from Department of the Navy (2017), which were derived primarily from tagging data during dives and bouts of foraging when animals are likely lunging for prey and moving quickly (84 Fed.

[29] Which is not animat modeling.
[30] In km/min, km, and min/day, respectively.
[31] Those that use animats.
[32] When both are based on a step-function threshold and not a dose-response threshold.

Reg. 63640). Thus, NMFS reasoned that the lower end of the swim speed range is representative of average swim speeds and is more representative of seals crossing the Level B harassment zones and being resident to Coos Bay (84 Fed. Reg. 63640). Regarding swim speeds noted in Department of the Navy (2017), section B-2.4 omitted the marine mammal dive information details and references for harbor seals. But, the swim speed of harbor seals was noted in section B-2.4.19 for Hawaiian monk seals. Specifically, Department of the Navy (2017) stated that swim speeds have not been reported for Hawaiian monk seals, therefore, a value of 9 km/hour for harbor seals based on Lesage et al. (1999) was used. It appears that the reference to a maximum of 4 km/hour in Department of the Navy (2017) is an error. Lesage et al. (1999) indicated that swim speeds ranged from 1.4 to more than 11 km/hr during all aspects of harbor seal diving (e.g., bottom time and during descent and ascent; Table 5). The main types of foraging dives (Type 1 and 3[33]) also comprise 72 percent of traveling dives (Lesage et al. 1999), so the supposition that the dive data were based on animals solely foraging and not conducting other activities is incorrect. As such, the tag data and associated swim speeds are representative of the types of behavior that harbor seals would exhibit in Coos Bay and assuming the lowest end of the range of swim speeds is not representative of average swim speeds. Using the current drift speed is inappropriate and would result in an underestimation of takes.

Two other limitations of the JCEP's movement method include the assumption that seals move in a straight line and that they move across the 1.1-km channel[34] rather than along the 1.9-km portion of the ensonified channel. Seals do not move in a straight line. In estuarine environments, they often mill around the same areas, particularly when foraging. Seals also tend to move along channels and rivers, again when searching for prey or more importantly when traveling to and from haul-out sites—their main direction of travel is not across the channel. The haul-out sites are up and down the channel of the LNG terminal. Thus, the inputs to the movement model, if it were otherwise appropriate to use, are not correct.

For all of these reasons, NMFS should refrain from using JCEP's movement method and revise its harbor seal density estimates. The fall/winter density estimate should be increased to 16.0 seals/km^2 based on (1) the AECOM (2018) density of 11.1 seals/km^2 consistent with the density proposed for USACE's activities in winter and (2) the haul-out correction factor of 1.44 for Umpqua River, Oregon, from Huber et al. (2001). For spring/summer, NMFS proposed to use a harbor seal density that generally was twice that observed in fall/winter[35], which would result in a spring/summer density of 32.0 seals/km^2. To account for the greater number of harbor seals that have the potential to occur within the Level B harassment zones on any given day and to minimize unnecessary delays in completing the activities should the authorized takes be met, the Commission recommends that NMFS (1) use a density of (a) 16.0 seals/km^2 rather than 3 seals/km^2 for fall/winter and (b) 32.0 seals/km^2 rather than 6.0 seals/km^2 for spring and summer, (2) refrain from using JCEP's movement model, and (3) recalculate the number of Level B harassment takes of harbor seals accordingly.

[33] Type 2 dives included some feeding, but they also were associated with traveling and movements near haul-out sites, including primarily stationary diving. Type 4 dives were recorded mostly during movements near haul-out sites, and Type 5 dives were only occasionally associated with successful foraging or with stationary diving and may represent resting or food-processing dives.

[34] Resulting in fewer takes.

[35] As indicated by NMFS's estimated densities of 3.0 seals/km^2 in the fall/winter and 6.2 seals/km^2 in the spring/summer (see Table 11 in the *Federal Register* notice).

Other pinniped takes

NMFS estimated that one California sea lion and one Steller sea lion would be taken on each day of pile driving. However, NMFS used a total of 230 pile driving days as the basis for its estimate, which is the number of calendar days that pile driving would occur, rather than 327 days, which is the total number of days that pile driving would occur at each of the three project sites (164 days at the LNG terminal, 154 days at the TPP/U.S. 101 intersection, and 9 days at the APCO Sites 1 and 2). The take estimates should be revised based on the total number of days pile driving is expected to occur at the project sites combined.

NMFS also underestimated the number of California sea lions that may occur in the project area. Opportunistic data collected by AECOM in May 2017 resulted in eight sea lions observed in 6 groups (AECOM 2017). Those sightings indicate the potential for at least two and potentially three sea lions to occur in the project area on any given day. The Commission recommends that NMFS revise its estimated takes of California sea lions to at least 654 and its estimated takes of Steller sea lions to at least 327.

Mitigation, monitoring, and reporting requirements

Although included in the draft incidental harassment authorization, the mitigation and monitoring measures are scant in the *Federal Register* notice. Some standard measures were omitted in the notice including specifics regarding shut-down and delay procedures for pile driving, shut-down procedures for non-pile driving activities, clearance times, and ceasing activities if takes are met or species for which takes have not been authorized are observed; while other standard measures were mentioned briefly but were not described in detail. This is not consistent with any of the other recent proposed authorizations involving construction activities (e.g., 84 Fed. Reg. 56799, 59789, 64866, 65129). Those authorizations included the pertinent detailed information, as well as some of the standard template language that NMFS routinely includes.

In addition, neither the *Federal Register* notice nor the draft authorization restricted activities to daylight hours only[36] or required JCEP to keep a running tally of total takes, both observed takes and those extrapolated to the extents of the Level B harassment zones. NMFS indicated to the Commission that JCEP would not be conducting its pile-driving activities at night and would be keeping a running tally of both observed and extrapolated takes, but did not specify whether those measures would be included explicitly in the final authorization. In addition, the standard measure to delay or cease pile driving if PSOs cannot monitor the entirety of the shut-down zone due to low-visibility conditions was omitted from both the *Federal Register* notice and the draft authorization. Further, NMFS did not include in the draft authorization the number of PSOs required to monitor at a given time.

As the Commission recently stated in its 29 November 2019 letter, many of the issues regarding inclusion of consistent conditions and measures recur in the numerous proposed authorizations. Many could be addressed preemptively if NMFS's templates for both *Federal Register* notices and draft authorizations were amended accordingly and used consistently. As such, the Commission recommends that NMFS (1) update and use its various templates for *Federal Register*

[36] See the Commission's recent 29 November 2019 letter detailing this matter.

notices and draft authorizations and (2) conduct a more thorough review of the notices, draft authorizations, and final authorizations to ensure accuracy, completeness, and consistency. The Commission also recommends that NMFS (1) specify, in the *Federal Register* for the authorization issuance and the final authorization, that JCEP would be required to (a) conduct its activities during daylight hours only, (b) keep a running tally of both observed and extrapolated takes, and (c) delay or cease pile driving if PSOs cannot observe the entirety of the shut-down zone due to low-visibility conditions, and (2) specify in section 5(a) of the final authorization that two PSOs would be required to monitor at each site when pile-driving activities occur.

Finally, for the acoustic monitoring requirements, NMFS did not require JCEP to report the number of strikes per pile or strikes per day, pulse durations associated with impact pile driving, or the spectra for all pile types and installation methods in the draft incidental harassment authorization. These are considered minimum requirements similar to the others that were included in the draft authorization. As such, the Commission recommends that NMFS require that JCEP report (1) the number of strikes per pile or strikes per day in section 5(d)(ii) and (2) pulse durations associated with impact pile driving and the spectra for all pile types and installation methods in section 5(d)(iii) of the final authorization.

Proposed one-year authorization renewals

NMFS has indicated that it may issue a second one-year incidental harassment authorization renewal for this and other future authorizations if various criteria are met and after an expedited public comment period of 15 days. NMFS informed the Commission that the renewal would be issued as a one-time opportunity, after which time a new authorization application would be required. NMFS also has included such verbiage in its response to comments regarding renewals. Specifically, NMFS indicated that it had modified the language for future proposed incidental harassment authorizations to clarify that all authorizations, including renewal authorizations, are valid for no more than one year and that the agency will consider *only one renewal* for a project at this time (e.g., 84 Fed Reg. 36892 from 30 July 2019). However, NMFS has yet to stipulate that a renewal is a one-time opportunity in any *Federal Register* notice requesting comments on the possibility of a renewal, on its webpage detailing the renewal process[37], or in any draft or final authorization that includes a term and condition for a renewal (including section 8 of JCEP's draft authorization). It is unclear why this issue has yet to be resolved, given that NMFS has been including the possibility of issuing renewals in its proposed authorizations for nearly two years.

In addition, the Commission commented in its 22 November 2019 letter that NMFS was not ensuring that the renewal requirements had been met prior to proposing to issue a renewal or following its renewal process[38]. Furthermore, the Commission and various other entities (e.g., 84 Fed. Reg. 31035 and 52466) have asserted and continue to affirm that the renewal process is inconsistent with the statutory requirements under section 101(a)(5)(D) of the MMPA. As such, the Commission recommends that NMFS refrain from issuing renewals for any authorization and instead use its abbreviated *Federal Register* notice process. That process is similarly expeditious and

[37] https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-harassment-authorization-renewals
[38] As part of that process, NMFS indicated it would contact directly all commenters on the original authorization to inform them of the opportunity to submit any additional comments on the proposed renewal authorization. The Commission has yet to be contacted for any renewal. It is unknown whether other commenters have been contacted.

fulfills NMFS's intent to maximize efficiencies. If NMFS chooses to continue proposing to issue renewals, the Commission recommends that it (1) stipulate that a renewal is a one-time opportunity in all *Federal Register* notices requesting comments on the possibility of a renewal, on its webpage detailing the renewal process, and in all draft and final authorizations that include a term and condition for a renewal, (2) ensure that action proponents have met all renewal requirements prior to proposing to issue a renewal in the *Federal Register*, and (3) follow its own renewal process of informing all commenters on the original authorization of the opportunity to submit additional comments on the proposed renewal.

Please contact me if you have questions regarding the Commission's recommendations.

Sincerely,

Peter O. Thomas, Ph.D.,
Executive Director

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