FINDING OF NO SIGNIFICANT IMPACT FOR THE ISSUANCE OF AN INCIDENTAL HARASSMENT AUTHORIZATION TO THE NATIONAL SCIENCE FOUNDATION (NSF) AND ADOPTION OF THE NATIONAL SCIENCE FOUNDATION INITIAL ENVIRONMENTAL EVALUATION

I. INTRODUCTION

The National Marine Fisheries Service (NMFS) received an application from the National Science Foundation (NSF) requesting authorization to take marine mammals incidental to an in-water construction project, which was analyzed in the National Science Foundation's (NSF's) 2021 Final Initial Environmental Evaluation (IEE), "*Initial Environmental Evaluation – Palmer Pier Replacement, Palmer Station, Antarctica 2021*" (Final IEE)."NMFS is required to review applications and, if appropriate, issue Incidental Take Authorizations[1] (ITAs) pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 et seq.). In addition, the National Environmental Policy Act (NEPA), 40 Code of Federal Regulations (CFR) Parts 1500 -1508[2], and National Oceanic and Atmospheric Administration (NOAA) policy and procedures[3] require all proposals for major federal actions be reviewed with respect to environmental consequences on the human environment. Therefore, the purposes of this document are twofold. First, this document explains NMFS' determination to adopt NSF's Final IEE for the NEPA review that NMFS is required to conduct for its consideration of whether to issue an Incidental Harassment Authorization (IHA) for NSF's Palmer Pier Replacement at Palmer Station, Antarctica in 2021-2022. Second, this document explains NMFS' rationale for its finding that issuance of the IHA for this survey will not significantly impact the quality of the human environment.

NMFS proposes to issue an IHA to NSF pursuant to Section 101(a)(5)(D) of the MMPA and 50 Code of Federal Regulations (CFR) Part 216. This IHA will be valid for one year from the date of issuance and authorizes the take, by Level A and/or Level B harassment, of small numbers of marine mammals incidental to NSF's Pier Replacement project at Palmer Station, Antarctica. NMFS' proposed action is a direct outcome of NSF's request for an IHA for conducting construction activities. Construction of the replacement pier and removal of the existing pier will require down-the-hole (DTH) pile installation and vibratory pile removal. Limited impact driving will occur only to proof piles after they have been installed. The pile driving and removal activities can result in take of marine mammals from sound in the water which results in behavioral harassment or, for some species, auditory injury.

Therefore, the action requires an authorization from NMFS for incidental taking pursuant to the MMPA. An authorization for incidental takings shall be granted if NMFS finds that the taking will be of small numbers, have a negligible impact[4] on the species or stock(s), and, where relevant, will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence

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[1] ITAs may be issued as either (1) regulations and the associated Letter of Authorization (LOA) or (2) an Incidental Harassment Authorization (IHA). LOAs may be issued for a maximum period of five years and IHAs may be issued for a maximum period of one year. Detailed information about the MMPA is available at *https://www.fisheries.noaa.gov/topic/laws-policies#marine-mammal-protection-act*.

[2] This FONSI is being prepared using the 1978 CEQ NEPA Regulations. NEPA reviews initiated prior to the effective date of the 2020 CEQ NEPA regulations may be conducted using the 1978 version of the regulations. The effective date of the 2020 CEQ NEPA Regulations was September 14, 2020. This review began on December 2, 2019 and the agency has decided to proceed under the 1978 regulations.

[3] NOAA Administrative Order (NAO) 216-6A "*Compliance with the National Environmental Policy Act, Executive Orders 12114, Environmental Effects Abroad of Major Federal Actions; 11988 and 13690, Floodplain Management; and 11990, Protection of Wetlands*" issued April 22, 2016 and the Companion Manual for NAO 216-6A "*Policy and Procedures for Implementing the National Environmental Policy Act and Related Authorities*" issued January 13, 2017.

[4] NMFS defines "negligible impact" as "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival." (50 CFR § 216.103)

uses. In addition, the IHA must set forth the permissible methods of taking, other means of effecting the least practicable adverse impact on the species or stock and its habitat, and requirements pertaining to the monitoring and reporting of such takings.

NMFS' issuance of this IHA allowing the taking of marine mammals, consistent with provisions under the MMPA and incidental to an applicant's lawful activities, is considered a major federal action. Therefore, NMFS conducted an environmental review of NSF's application and NSF's Final IEE and determined adopting this IEE and preparing a separate Finding of No Significant Impact (FONSI) is appropriate for NMFS' consideration to issue an IHA to NSF. This FONSI evaluates the context and intensity of the impacts on marine mammals associated with NMFS' consideration to issue this IHA to NSF and documents NMFS' determination to adopt NSF's Final IEE pursuant to 40 CFR 1506.3.

II. BACKGROUND

NSF is the federal agency that supports all fields of science and engineering (except medical sciences), and therefore, funds a variety of research projects across a wide range of scientific disciplines, scientific research, engineering and education in and about the polar regions. NSF does this through grants to researchers across the United States and cooperative agreements issued to colleges, universities, businesses, scientific research organizations, and other federal agencies throughout the United States and by providing polar facilities and operational support including Antarctic research stations. Details about NSF and their research programs at the Office of Polar Programs is available on the Internet at *https://www.nsf.gov/funding/programs.jsp?org=OPP*.

NSF has funded Antarctic-related research for over 50 years and identified the need to continue funding to enable scientists to collect data essential to understanding Antarctica and global physical and environmental systems. NSF funds research based on proposals reviewed under its merit review process and identified as program priorities. Information about NSF processes, procedures and outcomes, including the merit review process and results of NSF-funded research is available on the Internet at *https://www.nsf.gov/od/transparency/transparency.jsp*.

NSF is also responsible for environmental reviews of activities and research they propose to fund, including construction activities. NSF activities in Antarctica are conducted in accordance with applicable international and domestic agreements and laws including, but not limited to, the Antarctic Treaty of 1959 (Antarctic Treaty), the Protocol on Environmental Protection to the Antarctic Treaty (Protocol; Antarctic Treaty Secretariat [ATS] 1991), and the Antarctic Conservation Act, as amended by the Antarctic Science, Tourism, and Conservation Act of 1996, 16 United States Code (U.S.C.) § 2401 *et seq*. (ACA). The ACA implements the provisions of the Antarctic Treaty and the Protocol. The ACA conserves and protects the native mammals, birds, and plants of Antarctica and the ecosystems of which they are a part.

Article 8 and Annex 1 of the Protocol introduces and describes the Environmental Impact Assessment (EIA) process, providing categories of environmental impacts according to their significance. Potential impacts associated with the proposed activity are evaluated herein under an Initial Environmental Evaluation (IEE) in accordance with the requirements as set forth in the ACA regulations and the Protocol.

Accordingly, NMFS plans to adopt NSF's IEE, which is similar to an environmental assessment (EA), provided our independent evaluation of the document finds that it includes adequate information analyzing the effects on the human environment of issuing the IHA.

III. PROPOSED ACTION AND ALTERNATIVES SUMMARY

A. NSF's Proposed Action

NSF is proposing to construct a replacement pier at Palmer Station on Anvers Island, Antarctica for the United States Antarctic Program (USAP). The existing pier is severely deteriorated, and needs to be replaced as soon as possible. Construction of the replacement pier and removal of the existing pier will require DTH pile installation, and vibratory pile removal. Limited impact driving will occur only to proof piles after they have been installed. The proposed project is expected to take up to 89 days of in-water work and will include the installation of 52 piles and removal of 36 piles. Construction is expected to begin in February, 2022 and end in July, 2022. The pile driving and removal activities may result in behavioral harassment and auditory injury of marine mammals.

B. NMFS' Proposed Action

Sections 101(a)(5)(A) and (D) of the MMPA give NMFS the authority to authorize the incidental, but not intentional, take of small numbers of marine mammals by harassment, provided certain determinations are made and statutory and regulatory procedures are met. To authorize the incidental take of marine mammals, NMFS evaluates the best available scientific and commercial information to determine whether the take would have a negligible impact on marine mammal species or stocks, will be limited to small numbers of the relevant species or stocks' abundance, and whether the activity would have an unmitigable adverse impact on the availability of affected marine mammal species for subsistence use. NMFS cannot issue an ITA if it would result in more than a negligible impact on marine mammal species or stocks or would result in an unmitigable adverse impact on subsistence uses. NMFS must also prescribe the permissible methods of taking and other means of effecting the least practicable impact on the species or stocks of marine mammals and their habitat, paying particular attention to rookeries, mating grounds, and other areas of similar significance. Where applicable, NMFS must prescribe means of effecting the least practicable impact on the availability of the species or stocks of marine mammals for subsistence uses. ITAs will include additional requirements or conditions pertaining to monitoring and reporting.

Since NMFS' proposed action of issuing an IHA to NSF authorizes the take of marine mammals incidental to a subset of the activities analyzed in NSF's Final IEE, these components of NSF's proposed action are the subject of NMFS' proposed action. Therefore, NMFS' issuance of an IHA to NSF is a direct outcome of NSF's request for an IHA and will authorize take of marine mammals incidental to a subset of the activities analyzed in NSF's Final IEE and specified in the application submitted by NSF.

C. Alternatives Considered by NSF

NSF analyzed two alternatives in their Final IEE including their proposed or preferred action and the No Action alternative. These alternatives include NMFS' consideration to grant or deny permit

applications pursuant to the MMPA (*i.e.*, conducting the pile driving and removal activities with issuance of an associated IHA or not conducting the pile driving and removal activities and the IHA is not issued).

Under NSF's Proposed Action (Preferred Alternative, NSF would construct the replacement pier at Palmer Station. Detailed explanations concerning project objectives, protocols, equipment and locations are in Sections 1.0 and 2.0 of the Final IEE.

Under the "No Action" alternative, NSF would not construct the replacement pier at Palmer Station. The consideration and analysis of this alternative is included for presenting a comparative analysis to the action alternative, in accordance with 40 CFR 1502.14. Additional explanation concerning the No Action Alternative is in Section 3.1 of the 2021 Final IEE.

D. Alternatives Considered by NMFS

In accordance with NEPA and the 1978 CEQ Regulations, NMFS is also required to consider a reasonable range of alternatives to a Proposed Action. Since NMFS is adopting NSF's Final IEE, it reviewed this document to determine whether it met this requirement. NMFS determined NSF's analysis of alternatives in their Final IEE is adequate for purposes of NEPA and the CEQ regulations. However, based on the statutory framework explained in Section III, paragraph B above, NMFS considers two alternatives, a No Action alternative in which NMFS denies the NSF application and an action alternative in which it issues an IHA to NSF. Thus, the alternatives analysis in Section 5.0 in NSF's Final IEE supports NMFS' alternatives described below.

No Action Alternative: For NMFS, denial of an MMPA authorization constitutes the NMFS No Action alternative, which is consistent with our statutory obligation under the MMPA to grant or deny ITA requests and to prescribe mitigation, monitoring, and reporting with any authorizations. Under NMFS' No Action alternative, NMFS would not issue the IHA to NSF, and NMFS assumes NSF would not construct the replacement pier as described in their application and NSF's Final IEE. The No Action Alternative served as a baseline against which the impacts of the Preferred Alternative were compared and contrasted.

Action Alternative: NMFS issues the IHA to NSF authorizing take of marine mammals incidental to the subset of activities described under NSF's Preferred Alternative (Section 2.2 in the Final IEE), with the mitigation and monitoring in Section 5.6 of the Final IEE and in NMFS' *Federal Register* notice of proposed IHA under "Summary of Request" and "Description of Proposed Activity" and the "Proposed Mitigation" and "Proposed Monitoring and Reporting" sections.

IV. ENVIRONMENTAL REVIEW

NMFS independently reviewed NSF's Final IEE and concluded that impacts evaluated by NSF are substantially the same as the impacts of NMFS' issuance of an IHA for the take of marine mammals incidental to the construction of the replacement pier by NSF. In particular, the Final IEE contains an adequate evaluation of the direct, indirect, and cumulative impacts on marine mammals, including species listed under the Endangered Species Act (ESA) and the marine environment. The Final IEE also addresses NOAA's required components for adoption because it meets the requirements for an adequate EA under the 1978 CEQ regulations and NOAA policy and

procedures, and reflects comments and expert input provided by NMFS as a cooperating agency. For example, the Final IEE includes:

- a discussion of NSF's proposed action and purpose and need for the action and a discussion of the MMPA authorization process necessary to support implementation of the action;
- evaluation of a reasonable range of alternatives to the proposed action, including a no action alternative, and alternatives to mitigate adverse effects to marine mammals;
- a description of the affected environment including the status of all marine mammals species likely to be affected;
- a description of the environmental impacts of the proposed action and alternatives, including direct, indirect, and cumulative impacts on marine mammals and projected estimate of incidental take;
- identification and evaluation of reasonable mitigation measures to avoid or minimize adverse impacts to marine mammals; and
- a listing of agencies consulted.

As a result of this review, the NMFS has determined that it is not necessary to prepare a separate EA or environmental impact statement to issue an IHA to NSF and that the adoption of NSF's Final IEE is appropriate.

V. PUBLIC INVOLVEMENT

During the development of the Final IEE, public involvement was not required under the Antarctic Treaty Act and Protocols.

However, NMFS relied substantially on the public involvement process pursuant to the MMPA to develop and evaluate information relevant to an analysis under NEPA. NMFS made the IHA application and a draft of the proposed IHA available for public review and comment and, separately, published notice of the proposed IHA in the *Federal Register* on August 18, 2021 (86 FR 46199). NMFS alerted the public it intended to use the MMPA public review process for the proposed IHA to solicit relevant environmental information and provide the public an opportunity to submit comments. In addition, NMFS indicated that it believed it was appropriate to adopt NSF's Final IEE and made available a copy of NSF's draft IEE.

NMFS received comments in response to the publication of the proposed IHA. During the 30-day public comment period, NMFS received comments submitted by Ari Friedaender Ph.D., Institute of Marine Sciences, University of California, Santa Cruz. Dr. Friedlaender expressed concern that the best available scientific information was not used to estimate take and abundance of certain species. NMFS agreed, in part, with this assessment and utilized some of his recommended references in the *Federal Register* notice of issuance which resulted in increased take of humpback whales. The abundance estimate for fin whales was also reduced even though take estimates remained unchanged. As such the percentage of fin whale taken increased from 6.3 percent to 19.8 percent. Due to the change in project schedule from October/November, 2021 - April, 2022 to February, 2022 - July, 2022, NMFS asked NSF for additional observational data covering those additional months. Based on the data provided by NSF, NMFS increased authorized take of Antarctic fur seal, Southern elephant seal, leopard seal and Weddell seal. Dr. Friedlaender also questioned the efficacy of the required monitoring measures. In response, NMFS established a 1,000-m shutdown zone which is reduced from the zones described in the proposed IHA which extended out to Level A

harassment zones which, in some cases were 4 km from the project site. NMFS believes that 1,000 m is the maximum distance at which monitoring can be done effectively. NMFS has determined that the monitoring measures required in the IHA were the most practicable given the harsh environment and logistical challenges associated with construction activities occurring in Antarctica. Responses to the public comments will be available in the *Federal Register* Notice of Issuance of an IHA to NSF and can be viewed on NMFS's website: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities.*

VI. ANALYSIS SUMMARY

The environmental consequences to the marine environment and protected resources are important to the evaluation leading to the decision to issue any given ITA. In particular, because NMFS' action is specific to authorizing incidental take of marine mammals, the key factors relevant to, and considered in a decision to issue any given ITA, are related to NMFS' statutory obligations and authorities under the MMPA. The information in the following subsections discusses key factors considered in the analysis in the Final IEE along with the evaluation and reasons why the impacts of NMFS' issuance of an IHA to NSF will not significantly impact the quality of the human environment.

A. Environmental Consequences

In the Final IEE, NSF presented the baseline environmental conditions and impacts for affected resources in the survey area. The affected environment and environmental consequences are in Sections 4.0 and 5.0. Since the anticipated impacts of NMFS' issuance of an IHA to NSF are to marine mammals, which, if affected, will be through the introduction of sound into the marine environment during pile driving and removal activities, the analysis in the Final IEE specifically describes and addresses potential acoustic impacts to marine mammals, such as masking, stress, behavioral response, and auditory injury (Section 4.6 and Appendix B of the Final IEE). NSF assessed impacts to marine mammals through both acoustic exposure estimates and a qualitative assessment based on a review of literature primarily on acoustic impacts to marine mammals (Appendix B of the Final IEE).

B. Significance Evaluation

The 1978 CEQ Regulations state that the significance of an action be analyzed in terms of both "context" and "intensity" and lists ten criteria for intensity. The Companion Manual for NAO 216-6A requires consideration of CEQ's context and intensity criteria (40 CFR 1508.27(a) and 40 CFR 1508.27(b)) along with six additional factors for determining whether the impacts of a proposed action are significant. Each criterion is discussed below with respect to NMFS' issuance of an IHA to NSF and is considered individually as well as in combination with the others. In addition, NMFS relied on the analysis in the Final IEE, incorporating certain material by reference per 40 CFR 1502.21 in the evaluation discussed below. NSF's Final IEE and other information and documentation are available on NMFS' website: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities.*

1. Can the proposed action reasonably be expected to cause both beneficial and adverse impacts that overall may result in a significant effect, even if the effect will be beneficial?

NMFS' issuance of an IHA to NSF is not expected to cause either beneficial or adverse impacts resulting in any significant effects. NMFS is proposing to authorize take of marine mammals incidental to pile driving and removal activities at Palmer Station. Therefore, impacts from NMFS' proposed action are to marine mammals, which, if affected, would be through the introduction of sound into the marine environment during the pier replacement project. Pile driving and removal, which will introduce low-frequency noise into the water column, have the potential to behaviorally disturb marine mammals and, for some species, cause some auditory injury. In addition, noise can mask the detection or interpretation of important sounds (*e.g.*, foraging, mating). Marine mammal prey (*e.g.*, fish,squid) may also be impacted in some of the same ways. However, NMFS expects its action to have only limited, intermittent, localized impacts on marine mammals and their habitat, due to the fact that pile driving and removal is not continuous throughout the day, and would occur only during a portion of a single season. Further, marine mammals may not be continuously present within the action area when pile driving and removal may be occurring. Finally, the prescribed mitigation and monitoring requires activity shutdowns should marine mammals approach pile driving and removal activities. While NMFS predicts direct adverse effects to individuals may occur, population-level effects that would rise to the level of significance are not anticipated.

2. Can the proposed action reasonably be expected to significantly affect public health or safety?

The issuance of this IHA to NSF to authorize take of marine mammals is not likely to have the potential for this kind of effect because the proposed construction will take place in a small section of a remote coastal area and is unlikely to overlap with activities conducted by the public. NMFS only authorizes the take of marine mammal species associated with this construction action, which does not involve the public or expose the public directly (*e.g.*, chemicals, diseases) or indirectly (*e.g.*, food sources) to hazardous or toxic materials in a way that would be linked to the quality of the environment and well-being of humans.

3. Can the proposed action reasonably be expected to result in significant impacts to unique characteristics of the geographic area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?

Authorizing the harassment of marine mammals through this IHA has no foreseeable impact to unique characteristics of the geographic area, such as proximity to historic or cultural resources, parkland, prime farmlands, wetlands, or wild and scenic rivers. To the extent that the harassment authorized under the IHA impacts ecologically critical areas, this impact is not substantial. NMFS only anticipates marine mammals might be displaced temporarily and will not permanently vacate any areas, due to the harassment authorized in this IHA. NMFS expects natural processes and the environment to recover from any such displacement. Significant impacts are not expected; underwater noise associated with pile installation has no impact on physical habitat features and it will be temporary and localized. Individual ecological areas would be subject to noise only for limited duration during installation activities.

4. Are the proposed action's effects on the quality of the human environment likely to be highly controversial?

NMFS' action (*i.e.*, issuance of an IHA) and the underlying activity (*i.e.*, pile driving and removal associated with construction) is not controversial with respect to the effects on the quality of the human environment. NMFS has previously assessed and authorized incidental take of marine

mammals for pile driving and removal activities at numerous other locations. The effects of pile driving and removal on marine mammals are well-understood and dependent on species and context. The authorized effects include auditory threshold shift and behavioral reactions such as temporary avoidance, increased swim speeds, and cessation of vocalization or foraging behavior. The environmental effects of the proposed action are not disproportionate in type or scope from similar activities and NMFS has found the authorized take will not adversely affect the marine mammals species or stocks through effects on annual rates of recruitment or survival.

To allow other agencies and the public the opportunity to review and comment on the action, NMFS published a notice of the Proposed IHA in the *Federal Register* on August 18, 2021 (86 FR 46199). NMFS received a single comment letter from Ari Friedlaendar, Ph.D., and we fully considered these comments in preparing the IHA and this FONSI. These comments did not indicate that the proposed activities or the effects of the activities on the quality of the human environment were likely to be highly controversial. We have determined, based on the best available scientific literature, the limited duration of the project, and the low-level effects to marine mammals, that the issuance of an IHA would have a negligible impact on the affected species or stocks of marine mammals.

5. Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Some scientific uncertainties exist regarding the degree and manner in which anthropogenic noise, including noise produced by pile driving and removal, impacts marine mammals; however, the uncertainty is not substantial. There is a substantial body of peer-reviewed scientific literature regarding the impacts of noise on marine mammals and NMFS has issued ITAs authorizing the take of marine mammals incidental to similar activities with similar types of marine mammal impacts. NMFS has conducted NEPA analyses for those activities including reviewing, evaluating, and considering the results of mitigation and monitoring required for IHAs authorizing takes from similar noise-producing activities and NMFS does not expect the proposed action's effects on the human environment to be substantially different. NMFS expects any potential effects from the issuance of this IHA to be similar to prior analyzed activities, which are not likely to be highly uncertain or involve unique or unknown risks. Mitigation and monitoring methods have been evaluated in numerous prior environmental reviews and are expected to be effective in reducing adverse effects to marine mammals from exposure to pile driving and removal noise levels.

6. Can the proposed action reasonably be expected to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?

The issuance of this IHA to NSF cannot reasonably be expected to set a precedent for future actions with significant effects nor represent a decision in principle regarding future considerations. The issuance of an IHA to take marine mammals incidental to the pile installation activities is a routine process under the MMPA. To ensure compliance with statutory and regulatory standards, NMFS' actions under section 101(a)(5)(D) of the MMPA must be considered individually and be based on the best available information, which is continuously evolving. Issuance of an IHA to a specific individual or organization for a given activity does not guarantee or imply that NMFS will authorize others to conduct similar activities. Subsequent requests for ITAs will be evaluated upon their own merits relative to the criteria established in the MMPA and 50 CFR Part 216 on a case-by-case basis.

7. Is the proposed action related to other actions that when considered together will have individually insignificant but cumulatively significant impacts?

The Final IEE and the documents it references analyzed the impacts of the issuance of an IHA for the take of marine mammals incidental to pile installation activities in light of other human activities within the study area. Human activities are limited and consist mainly of commercial fishing of krill, ecological research, and tourism. Commercial krill fishing is unlikely to a have direct effect on cumulative impacts since the quantity of the commercial krill catch is a very small fraction of total krill availability. Ecological research is largely short-term and localized and unlikely to contribute to cumulative impacts. Cruise ships and yachts currently operate in the Palmer Basin, though visits to Palmer Station are limited by NSF (Section 4.2). Ships may contribute to short-term, transitory impacts in Arthur Harbor and the Palmer Basin, but are not anticipated to directly contribute to cumulative impacts.

After considering relevant activities in evaluating the potential for cumulatively significant impacts in the Final IEE, NMFS concluded that impacts of the pier replacement project, considered in context with NMFS's required mitigation, will not result in cumulatively significant impacts to marine mammals and their habitat when viewed collectively with other past, present, and reasonably foreseeable future actions.

8. Can the proposed action reasonably be expected to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources?

The effects of issuance of this IHA is limited to those occurring to marine mammals and their habitat; and, therefore, NMFS' proposed action is not expected to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places. Likewise, it is not expected to cause loss or destruction of significant scientific, cultural, or historical resources. The underlying pile driving and removal activities take place at Palmer Station where there are no such resources there; therefore, the chance of affecting such resources is so remote and unlikely as to be discountable.

9. Can the proposed action reasonably be expected to have a significant impact on endangered or threatened species, or their critical habitat as defined under the Endangered Species Act of 1973?

The proposed pile driving and removal activities may adversely affect the following marine mammal species listed as threatened or endangered under the Endangered Species Act (ESA; 16 U.S.C. 1531 *et seq.*): the sei whale, fin whale, blue whale, sperm whale, and Southern right whale. A Biological Opinion prepared pursuant to section 7 of the ESA concluded that NSF's project is not likely to jeopardize the continued existence of ESA-listed blue whales, fin whales, sei whales, Southern right whales, or sperm whales.

To reduce the potential for disturbance from the activities, NSF will implement several monitoring and mitigation measures for marine mammals (including ESA-listed species), which are enforceable through the final IHA and the Biological Opinion's Incidental Take Statement. Taking these measures into consideration, NMFS expects that the responses of marine mammals from the Preferred Alternative would primarily be in the form of temporary displacement from the area and/or short-term behavioral changes, as well as a limited amount of permanent threshold shift (PTS) in a small number of marine mammals, falling within the MMPA definition of "Level B

harassment" and "Level A harassment". NMFS does not anticipate that take by serious injury or mortality will occur, nor has NMFS authorized take by serious injury or mortality. NMFS' predicted estimates for Level A harassment for some species are likely overestimates of the injury that will occur, as NMFS expects that successful implementation of the required visual and acoustic mitigation measures will avoid Level A harassment in some instances. In addition, NMFS expects that some individuals will avoid the source at levels expected to result in injury. NMFS anticipates that any PTS incurred will be in the form of only a small degree of PTS, and not total deafness. Thus, NMFS expects that impacts will be at the lowest level practicable due to the incorporation of the proposed mitigation measures.

10. Can the proposed action reasonably be expected to threaten a violation of Federal, state, or local law or requirements imposed for environmental protection?

The issuance of this IHA to NSF will not violate any federal, state, or local laws for environmental protection. NMFS' compliance with environmental laws and regulations is based on NMFS' action and the nature of the applicant's activities. NMFS complied with the MMPA's requirements in issuing this IHA. NMFS also consulted under Section 7 of the ESA to determine if the issuance of this IHA will likely jeopardize the continued existence of listed species or result in destruction or an adverse modification of critical habitat. The consultation concluded that issuance of an IHA will not jeopardize any listed species or destroy or adversely modify critical habitat. NSF fulfilled their responsibilities under the MMPA for this action and will be required to obtain any additional federal, state and local permits necessary to carry out the proposed geophysical survey activities.

11. Can the proposed action reasonably be expected to adversely affect stocks of marine mammals as defined in the Marine Mammal Protection Act?

To assess potential impacts of the proposed action on marine mammal species or stocks, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. NSF calculated the estimated number of animals expected to be exposed to sound levels greater than 160 dB rms, which is the threshold for Level B harassment and Level A harassment as described in NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018). The numbers of marine mammals that NMFS proposes for authorized take will be considered small relative to the relevant populations.

Additionally, other qualitative factors were considered in the analysis, such as the temporal or spatial scale of the activities. The proposed activity is temporary and localized. Potential adverse effects on prey species will also be temporary and spatially limited. No serious injury or mortality is anticipated or authorized. Furthermore, alternate areas of similar habitat value for affected marine mammals will be available allowing animals to temporarily vacate the survey areas to avoid exposure to sound.

For these reasons, impacts resulting from this activity are not expected to adversely affect the marine mammal species or stocks as defined in the MMPA.

12. Can the proposed action reasonably be expected to adversely affect managed fish species?

We are not aware of any fish species that are being actively managed near the project area. Even if such species did occur in the area, authorizing harassment to marine mammals will not adversely affect managed fish species but the underlying activity (pile driving and removal) is expected to result in short-term, minor adverse impacts to some managed fish species. Individual fish may be directly impacted by noise from pile driving and removal; however, these impacts are expected to be limited to behavioral reactions such as temporary avoidance (*i.e.*, displacement).

13. Can the proposed action reasonably be expected to adversely affect essential fish habitat as defined under the Magnuson-Stevens Fishery Conservation and Management Act?

There is no designated essential fish habitat in Antarctica.

14. Can the proposed action reasonably be expected to adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems?

We do not expect our action to impact any vulnerable marine ecosystems, nor any aspects of biodiversity or functioning of marine ecosystems, in a significant manner, although there may be temporary disturbance and increased turbidity in the vicinity of pile driving and removal activities. As described elsewhere in this document and the Final IEE, the impact from our action is limited to impacts to marine mammals and their habitat, due to the potential increased noise levels into the marine environment during pile driving and removal activities. The scientific literature does indicate that impacts to the marine mammal habitat, in the form of effects to marine mammal prey species, is likely. Additional studies have shown that some fish and invertebrate species may experience displacement or behavioral changes as a result of acoustic exposure from pile driving and removal, such as temporary displacement or cessation in vocalization. However, any noise impact is expected to be limited to the duration of pile driving and removal. Thus, short-term minor adverse effects are likely to occur but are not expected to rise to the level of significance. As noted, we do not anticipate significant physical interactions from pile driving and removal on the environment, other than temporary disturbance and temporarily increased turbidity in the vicinity of pile driving and removal, and do not expect that noise from pile driving and removal will impact coastal ecosystems.

15. Can the proposed action reasonably be expected to adversely affect biodiversity or ecosystem functioning (e.g., benthic productivity, predator-prey relationships, etc.)?

NMFS does not expect the action to have a substantial impact on biodiversity or ecosystem functioning within the affected environment. The effects of our proposed action are expected to be limited to behavioral disturbance, masking, or stress. These effects are anticipated to be short term, minor, and localized. Any PTS incurred by marine mammals is expected to be minor (slight threshold shift). Some recent studies show potential impacts on zooplankton, which form the basis of many food webs, but while there is some scientific disagreement on impacts to zooplankton from this activity, those impacts are not expected to affect predator-prey relationships or otherwise impact any form of benthic productivity.

16. Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?

The proposed action of issuing the IHA is unlikely to result in the introduction or spread of a nonindigenous species. While NSF's project will result in increased vessel use during construction, leading to ballast water exchange, the vessels are primarily tugs or small work skiffs. Further, NSF

is required to adhere to the guidelines that have been developed by Antarctic Treaty Parties to prevent introduction of non-native species and also includes the handling, removal, and management of non-native species. Therefore, it is not likely that NMFS' issuance of the IHA will promote or result in the introduction or spread of invasive species at a level that will reach significance under NEPA.

VII. CONDITIONS – MITIGATION, MONITORING AND REPORTING

NMFS does not authorize the pile driving and removal activities proposed by NSF. However, NMFS does authorize the incidental take of marine mammals under its jurisdiction in connection with these activities and prescribes, where applicable, the methods of taking and other means of effecting the least practicable impact on the species and stocks and their habitats. NMFS' issuance of this IHA is thus conditioned upon reporting requirements and the implementation of mitigation and monitoring designed to reduce impacts to marine mammals to the level of least practicable impact. These conditions are summarized below and described in detail in the IHA, and include:

- Implementing shutdown zones;
- Employing "soft start" technique at the beginning of impact pile installation;
- Ceasing construction activities if a marine mammal comes within 10 m of operations;
- Ceasing pile driving activities if the shutdown zones are not visible due to poor environmental conditions;
- Stationing protected species observers (depending on activity type) at elevated locations offering best vantage points;
- Reporting all occurrences of marine mammal observations, locations relative to the pile activities, any behavior or behavioral reactions observed, any observed incidents of behavioral harassment, and any required shutdowns; and
- Submitting report to NMFS no more than 90 days after pile driving activities are complete.

VIII. DETERMINATION

Based on the information presented herein along with analysis in the Final IEE prepared by NSF and the application submitted by NSF, it is hereby determined the issuance of the IHA to NSF will not significantly impact the quality of the human environment. In addition, we have addressed all beneficial and adverse impacts of the action to reach the conclusion of no significant impacts. Accordingly, the preparation of an Environmental Impact Statement for this action is not necessary.

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