Appendix C

Comments on the Draft EIS and Responses

Appendix C COMMENTS ON THE DRAFT EIS AND RESPONSES

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8/3/2016 Regulations.gov - Comment

FA1

regulations.gov
Your Voice in Federal Decision-Making

Comment Submitted by Brandon Howard

The is a Comment on the **Coast Guard** (USCG) Notice: Deepwater Port License Application: Delfin LNG LLC, Delfin LNG Deepwater Port

For related information, Open Docket Folder

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Due Aug 29 2016, at 11:59 PM ET

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Submitter Name:
Brandon Howard

Comment

FA1-1 Staff of NOAA's National Marine Fisheries Service NMFS have reviewed the Draft Environmental Impact Statement (DEIS) for the Delfin LNG LLC deepwater port license application transmitted for our review by your letter dated July 8, 2016. Based on our review of the DEIS, NMFS believes the document adequately evaluates potential project impacts to marine fishery resources, as well as to wetlands and waterbottoms categorized as essential fish habitat (EFH) under provisions of the Magnuson-Stevens Fishery Conservation and Management Act. As such, NMFS has no revisions to recommend to the DEIS.

FA1-2 Additionally, NMFS concurs with the conclusion of the appended EFH Assessment that project implementation will not result in a substantial adverse effect to EFH or federally managed fishery species. Therefore, NMFS has no EFH conservation recommendations to provide on the authorization of the project. Unless the project is revised, further coordination pursuant to requirements of the Magnuson-Stevens Fishery Conservation and Management Act is unnecessary for this project.

http://www.regulations.gov/document?D=USCG-2015-0472-0090 1/1

FEDERAL AGENCIES

FA1 NOAA National Marine Fisheries Service

FA1-1 Thank you for your comment. Text has been added to Section 4.4 of the final EIS to reflect the receipt of the NOAA Fisheries EFH concurrence letter. Essential Fish Habitat (EFH) is also addressed in Appendix E.

FA1-2 Thank you for your comment. Text has been added to Section 4.4 of the final EIS to reflect the receipt of the NOAA Fisheries EFH concurrence letter. EFH is also addressed in Appendix E.

FA2 U.S. Fish and Wildlife Service

FA2

United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

August 10, 2016

Ms. Yvette M. Fields
Director, Office of Deepwater Ports and Offshore Activities
U.S. Department of Transportation
Maritime Administration
Southeast Federal Center
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Ms. Fields:

Please reference your July 14, 2016, letter requesting the U. S. Fish and Wildlife Service's Louisiana Ecological Services Office (Service) concurrence with your determination that the proposed Delfin LNG LLC Deepwater Port project (USCG-2015-0472) is not likely to adversely affect (NLAA) federally listed threatened/endangered species or their critical habitat. That letter directs the Service to Section 4.3.1 (Offshore Threatened and Endangered Species) and Section 4.12.1 (Onshore Threatened and Endangered Species) of the Delfin LNG Draft Environmental Impact Statement (DEIS). The Service has reviewed this information, and offers the following comments in accordance with provisions of the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). Those comments relating to federally listed species and their critical habitat apply to the Service's jurisdictional area (i.e., onshore area) within the proposed project site.

FA2-1

Piping Plover

The piping plover is a small (7 inches long), pale, sand-colored shorebird that winters in coastal Louisiana and may be present for 8 to 10 months annually. Piping plovers arrive from their northern breeding grounds as early as late July and remain until late March or April. They feed on polychaete marine worms, various crustaceans, insects and their larvae, and bivalve mollusks that they peck from the top of or just beneath the sand. Piping plovers forage on intertidal beaches, mudflats, sand flats, algal flats, and wash-over passes with no or very sparse emergent vegetation. They roost in unvegetated or sparsely vegetated areas, which may have debris, detritus, or micro-topographic relief offering refuge to plovers from high winds and cold weather. They also forage and roost in wrack (i.e., seaweed or other marine vegetation) deposited on beaches. In most areas, wintering piping plovers are dependent on a mosaic of sites distributed throughout the landscape, because the suitability of a particular site for foraging or roosting is dependent on local weather and tidal conditions. Plovers move among sites as environmental conditions change, and studies have indicated that they generally remain within a 2-mile area. Major threats to this species include the loss and degradation of habitat due to development, disturbance by humans and pets, and predation.

On July 10, 2001, the Service designated critical habitat for wintering piping plovers (Federal Register Volume 66, No. 132); a map of the seven critical habitat units in Louisiana can be found at

FA2-1 Thank you for your comment. The information regarding piping plover is included in Sections 3.3.8 and 3.12.5.1 of the final EIS.

FA2 U.S Fish and Wildlife Service (cont'd)

FA2-1 (con't) http://criticalhabitat.fws.gov/crithab. Their designated critical habitat identifies specific areas that are essential to the conservation of the species. The primary constituent elements for piping plover wintering habitat are those habitat components that support foraging, roosting, and sheltering and the physical features necessary for maintaining the natural processes that support those habitat components. Constituent elements are found in geologically dynamic coastal areas that contain intertidal beaches and flats (between annual low tide and annual high tide), and associated dune systems and flats above annual high tide. Important components (or primary constituent elements) of intertidal flats include sand and/or mud flats with no or very sparse emergent vegetation. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting plovers.

FA2-2 Red Knot

The red knot is a medium-sized shorebird about 9 to 11 inches (23 to 28 centimeters) in length with a proportionately small head, small eyes, short neck, and short legs. The black bill tapers steadily from a relatively thick base to a relatively fine tip; bill length is not much longer than head length. Legs are typically dark gray to black, but sometimes greenish in juveniles or older birds in non-breeding plumage. Non-breeding plumage is dusky gray above and whitish below. The red knot breeds in the central Canadian arctic but is found in Louisiana during spring and fall migrations and the winter months (generally September through May).

During migration and on their wintering grounds, red knots forage along sandy beaches, tidal mudflats, salt marshes, and peat banks. Observations along the Texas coast indicate that red knots forage on beaches, oyster reefs, and exposed bay bottoms, and they roost on high sand flats, reefs, and other sites protected from high tides.

FA2-3 Sea Turtles

There are five species of federally listed threatened or endangered sea turtles that forage in the near shore waters, bays, and estuaries of Louisiana. The National Marine Fisheries Service (NMFS) is responsible for aquatic marine threatened or endangered species that occur in the marine environment. Please contact Eric Hawk (727/824-5312) at the NMFS Regional Office in St. Petersburg, Florida, for information concerning those species in the marine environment.

When sea turtles leave the marine environment and come onshore to nest, the Service is responsible for those species. Two species, the threatened loggerhead sea turtle (*Caretta caretta*) and the endangered Kemp's ridley sea turtle (*Lepidochelys kempii*) could potentially nest in Louisiana during the summer months (i.e., May through November). Historical records indicate that loggerheads nested on the Chandeleur Islands and recent data indicate rare nesting attempts along Fourchon Beach in Lafourche Parish. The Kemp's ridley is known to nest in coastal Texas and Alabama; thus, nesting attempts could possibly occur in Louisiana as that species achieves recovery. The primary threats to nesting beaches include coastal development and construction, placement of erosion control structures and other barriers to nesting, beachfront lighting, vehicular and pedestrian traffic, sand extraction, beach erosion, beach nourishment, beach pollution, removal of native vegetation, and planting of non-native vegetation (USFWS 2007).

FA2-4 According to the DEIS, the proposed Delfin LNG Port would reuse and repurpose two existing offshore natural gas pipelines: the former UTOS pipeline, and the High Island Offshore System (HIOS) pipeline, to transmit natural gas sourced from the onshore interstate pipeline grid to the

FA2-2 Thank you for your comment. This information regarding red knot is included in Sections 3.3.8 and 3.12.5.1 of the final EIS.

FA2-3 Thank you for your comment. This information regarding sea turtles is included in Section 3.3.5.2 of the final EIS.

FA2-4 Thank you for your comment. Text has been added to Section 4.12.1 of the final EIS to reflect the USFWS concurrence letter.

FA2 U.S Fish and Wildlife Service (cont'd)

FA2

FA2-4 (con't) offshore deepwater port. The proposed onshore location activities would be comprised of activating the formerly abandoned UTOS pipeline, constructing new connecting pipelines, a compressor station, and associated metering and regulation facilities. The majority of those proposed activities would be within the Midstream Partners L.P. (PSI) Cameron Meadows Gas Plant and adjacent Transcontinental Gas Pipeline, LLC (Transco) Station 44 areas. The new connecting pipelines would consist of a 0.25-mile, 42-inch-diameter pipeline to connect the UTOS line to the new meter station and twin 0.6-mile, 30-inch diameter pipelines connecting the Transco Station 44 to the new compressor station site. Table 3.12-4 on page 3-102 of the DEIS states that those proposed onshore location activities would impact 19.36 acres. According to that table, those 19.36 acres consist of 2.04 acres of coastal dune shrub thicket, 0.90 acres of scrub/shrub swamp, 2.30 acres of intermediate marsh, and the remaining 14.12 acres are classified as industrial and maintained herbaceous areas. Therefore, it appears that the required habitat conditions to support piping plovers, red knots, nesting loggerhead sea turtles, and nesting Kemp's ridley sea turtles do not exist within the proposed project area. The proposed project area also lacks the primary constituent elements that comprise piping plover critical habitat. Based on this information, the Service concurs with your determination that the proposed onshore activities are not likely to adversely affect those federally listed species. No further ESA consultation will be necessary for this project unless there are changes in the scope or location affecting species' habitats previously addressed.

We appreciate the opportunity to provide comments during the early planning stages of proposed project. If you need further assistance please contact Joshua Marceaux (337/774-5923) of this office.

Sincerely,

Brad S. Rieck
Acting Supervisor
Louisiana Ecological Services Office

cc: OEPC, Washington, DC (Attn: Shawn Alam)
FWS, Arlington, VA (BCPA/ERT; Attn: Stephanie Nash)
EPA, Dallas, TX
NMFS, Baton Rouge, LA
FWS, Atlanta, GA (Attn: Christine Willis)
USACE, Regulatory Functions Branch, New Orleans, LA
LDWF, Natural Heritage Program, Baton Rouge, LA
LADNR, CMD, Baton Rouge, LA

3

FA2

Literature Cited

USFWS. 2007. Loggerhead sea turtle (*Caretta caretta*) 5 year review: summary and evaluation. Jacksonville, FL.

4

FA3 Department of the Interior

FA3

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
1001 Indian School Road NW, Suite 348
Albuquerque, New Mexico 87104

ER 16/0383
File 9043.1

August 25, 2016

VIA ELECTRONIC MAIL ONLY

Melissa Perera
Environmental Protection Specialist
U.S. Coast Guard
2703 Martin Luther King Jr Avenue, SE
Washington, DC 20593-7509

Dear Ms. Perera:

The U.S. Department of the Interior (Department) has reviewed the Draft Environmental Impact Statement (DEIS) for the Port Delfin Deepwater Port Application (USCG Docket Number USCG-2015-0472). In this regard, we are providing the following comments for your use as you prepare the final document in accordance with provisions of the Migratory Bird Treaty Act (MBTA) (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.).

Project Description

According to the DEIS, the proposed Delfin LNG project would consist of both onshore and offshore facilities. The proposed onshore location activities would be comprised of activating the formerly abandoned U-T offshore system (UTOS) pipeline, constructing new connecting pipelines, a compressor station, and associated metering and regulation facilities. The majority of those proposed activities would be within the Midstream Partners L.P. (PSI) Cameron Meadows Gas Plant and adjacent Transcontinental Gas Pipeline, LLC (Transco) Station 44 areas. The new connecting pipelines would consist of a 0.25-mile, 42-inch-diameter pipeline to connect the UTOS line to the new meter station and twin 0.6-mile, 30-inch diameter pipelines connecting the Transco Station 44 to the new compressor station site. Those proposed onshore location activities would impact approximately 19.4 acres. The DEIS classifies the majority of those acres as industrial and maintained herbaceous areas. The proposed offshore location activities would consist of constructing a deepwater port approximately 37.4 to 40.8 nautical miles from the coast in Federal waters of the Gulf of Mexico, in water depths ranging from approximately 64 to 72 feet (ft). The proposed Port would reuse and repurpose two existing offshore natural gas pipelines: the former UTOS pipeline, and the High Island Offshore System (HIOS) pipeline,

FA3

to transmit natural gas sourced from the onshore interstate pipeline grid to the offshore deepwater port. Additional offshore location activities would consist of four semi-permanently moored floating liquefied natural gas vessels (FLNGVs), four disconnectable tower yoke mooring systems (TYMS), four pipeline riser components, four service vessel mooring points, four 30-inch-diameter pipeline laterals each approximately 6,400 ft in length, and one 700-ft 42-inch-diameter bypass around existing West Cameron block 167 offshore manifold platform (WC 167) to connect the HIOS and UTOS pipelines.

Migratory Birds

FA3-1 The DEIS adequately addresses concerns regarding migratory birds and lighting. However, as proposed, the Delfin LNG proposal would have a flare system. Gas flaring occurs at liquefied natural gas (LNG) facilities, and other industrial plants and oil rigs, during plant start up and shutdown events as well as during unplanned pressure release events. The flame emitted to burn off flammable gas during a flaring event can attract birds especially at night. Nighttime attraction of lighting during inclement weather has proved to be a key liability for birds, and being that LNG facilities are located along the Gulf shoreline within the direct migratory path of neotropical songbirds that threat could be even more pronounced. In September 2013, approximately 7,500 migrating songbirds were attracted to and killed by a flare at a LNG terminal in Saint John, New Brunswick, Canada. This event occurred during a foggy, low cloud cover, early fall evening along important migratory routes for songbirds (Jenny Mandel, E&E reporter, October 11, 2013). Similar incidents have occurred at flares on offshore oil and gas installations.

The Migratory Bird Treaty Act prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the U.S. Department of the Interior. While the Act has no provision for allowing unauthorized take, the Department of the Interior realizes that some birds may be harmed or killed as a result of collision with structures and flare stacks even when reasonable measures to protect birds are implemented. The Fish and Wildlife Service's Office of Law Enforcement (LE) carries out its mission to protect migratory birds through investigations and enforcement, as well as by fostering relationships with individuals, companies, and industries that have taken effective steps to minimize their impacts on migratory birds, and by encouraging others to enact such programs. As such, LE focuses its resources on investigating and prosecuting individuals and entities that take migratory birds without regard for their actions or without effort to implement Fish and Wildlife Service recommendations/conservation measures. The following guidance has been developed to assist with the design and operation of gas flare structures to avoid and minimize impacts to migratory birds.

FA3-2 The conservation recommendations provided below are discretionary activities to minimize or avoid adverse effects of a proposed action on migratory birds and should be discussed in the Final EIS. They should in no way impede any emergency actions.

Conservation Measures

1. To minimize the potential impacts to migrating birds during a flare event:
   a. avoid flaring at night,
   b. avoid flaring during low visibility (i.e., fog, storm event),

FA3 Department of the Interior (cont'd)

FA3-1 USCG issued a data gap to Delfin LNG regarding the recommended conservation and mitigation measures identified by US DOI. In response, Delfin LNG agreed to make maximum use of the BMPs identified by US DOI to minimize potential harm to migratory birds resulting from operation of the Delfin LNG Project. Additional BMPs and text have been added to Section 4.3.1.3 of the final EIS and Appendix G.

FA3-2 See response to comment FA3-1.

FA3

c. avoid flaring during peak spring (mid-March through April) and fall (September and October) migrations depending on the location; and,
d. lighting around the facility and on the flare stacks should follow FWS communication tower guidance,
http://www.fws.gov/migratorybirds/pdf/management/usfwscommunicationtowerguidance.pdf

FA3-3 2. Mortality of birds perching on flare stacks results from direct incineration or by inhalation of the toxic gas if the flare igniter fails to work properly. Consideration should be given to installing anti-perching devices on flare stacks to prevent raptors and other birds from using them as perch sites. Open vent stack equipment, such as heater-treaters, separators, and dehydrator units, should be designed and constructed to prevent birds and bats from entering or nesting in or on such units, and to the extent practical, to discourage birds from perching on the stacks. Installing cone-shaped mesh covers on all open vents is one suggested method. Flat mesh covers are not expected to discourage perching and are not acceptable. < http://www.fws.gov/mountain-prairie/contaminants/contaminants1f.html >

FA3-4 3. Consideration should be given to implementing an audible system (e.g., frightening device) that could also aid in deterring birds from the area during a flare event. Per the U.S. Department of Agriculture, Prevention and Control of Wildlife Damage (1994), useful frightening devices include broadcasted alarm and distress calls, pyrotechnics, exploders, and other miscellaneous auditory and visual frightening devices. No single technique can be depended upon to solve the problem. Numerous techniques must be integrated into a frightening program, and qualified knowledgeable personnel should be involved in the deterrent activities <http://icwdm.org/Handbook/birds/bird_e19.pdf>.

Migration Monitoring

FA3-5 Bird migration projections should be actively monitored, and maintenance activities (flaring events) should be planned to avoid peak migration periods and adverse weather conditions as much as possible. We recommend coordinating with the U.S. Geological Survey (USGS), Radar Technology Program to develop a monitoring plan to determine peak migration events in the area and how birds may be using the areas around the facility. Please contact, Wylie Barrow, Research Wildlife Biologist with USGS (barroww@usgs.gov, 337-266-8668).

Survey Plan

FA3-6 During all flaring events, surveys similar to those conducted for communication towers should be conducted to determine if bird mortality has occurred. Please refer to the "Briefing Paper on the Need for Research into the Cumulative Impacts of Communication Towers on Migratory Birds and Other Wildlife in the United States" (attachment) for examples of sampling methods. Survey plans should be reviewed by the Fish and Wildlife Service prior to implementation, and survey results should be provided to the Fish and Wildlife Service upon request.

Coordination

Should a mortality event occur, please contact Gary Poen, LE Regional Zone Officer, 337/591-4442.

FA3 Department of the Interior (cont'd)

FA3-3 See response to comment FA3-1.

FA3-4 See response to comment FA3-1.

FA3-5 See response to comment FA3-1.

FA3-6 See response to comment FA3-1.

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FA3 Department of the Interior (cont'd)

FA3

We appreciate the opportunity to provide comments regarding this document. Should you have any questions, please contact Joshua Marceaux, Fish and Wildlife Biologist, U.S. Fish and Wildlife Service, Southwest Louisiana National Wildlife Refuge Complex, at (337) 774-5923.

Thank you for the opportunity to review this document.

Sincerely,

Stephen R. Spencer, PhD
Regional Environmental Officer

Attachment - Briefing Paper on the Need for Research into the Cumulative Impacts of Communication Towers on Migratory Birds and Other Wildlife in the United States

FA3

Briefing Paper on the Need for Research into the Cumulative Impacts of Communication Towers on Migratory Birds and Other Wildlife in the United States
Division of Migratory Bird Management (DMBM), U.S. Fish & Wildlife Service – for Public Release

LAST UPDATED: April 17, 2009 [Comm Tower Research Needs Public Briefing-2-409.doc]

ISSUE: The number of communication towers including radio, television, cellular, microwave, emergency broadcast, national defense, and paging towers has grown exponentially in the U.S. over the past decade. These towers present health and safety challenges for humans, but they are also a growing impact to populations of migratory birds, 4-5 million of which are conservatively estimated to die each year in tower and guy-wire collisions (Manville 2005, 2009). Virtually unknown, however, are the potential effects of non-ionizing, non-thermal tower radiation on avifauna, including at extremely low radiation levels, far below maximum safe[1] exposure levels previously determined for humans.

This briefing paper addresses the need to cumulatively assess the impacts of communication towers on migratory birds both from collisions and radiation, especially neotropical migratory songbirds that are most impacted (Shire *et al.* 2000). The paper discusses some suggested research protocols needed to conduct a nationwide cumulative impacts analysis that would assess effects of tower collisions and radiation on avifauna and on other wildlife pollinators including bats and bees.

BACKGROUND

Light Attraction to Birds in Inclement Weather

Beginning with the earliest reported bird-tower kill in the U.S. (in September 1948 at a 137-m [450-ft] radio tower in Baltimore, MD [Aronoff 1949]), the nighttime attraction of lighting during inclement weather has proved to be a key liability for birds. However, much of the past research focused on carcass collections that were not necessarily correlated to nighttime lighting or to weather events. For example, the first long-term study of the impact of a television tower on birds began in 1955 by the Tall Timbers Research Station in FL. After the first 25 years of the study, 42,384 birds representing 189 species were tallied (Crawford and Engstrom 2001). Kemper (1996) reported collecting more than 12,000 birds killed in inclement weather on one night at a television tower in Eau Clair, WI. Manville (2005, 2007) provided additional details of documented bird-tower collision studies in the U.S., especially in regard to lighting and weather events.

Recently, Gehring *et al.* (2006, 2009) reported where red, steady-burning lights were extinguished allowing only flashing or strobe lights to persist on towers, the lighting change-out resulted in up to a 71% reduction in avian collision mortality at towers in MI. In a short-term

[1] "Safe" levels were based on thermal heating standards, now inapplicable. The standards are nearly 25 years out of date, and the EPA office tasked to direct the human safety issues was eliminated due to budget cuts in the early 1980s. Furthermore, the standards in place do not address the potential effects of radiation on wildlife. No government agency currently monitors the rising background levels of electromagnetic radiation (EMF). Current safety standards assume that non-ionizing radiation is safe if the power is too weak to heat living tissue. However, since the 1980s, growing amounts of published research are showing adverse effects on both humans and wildlife far below a thermal threshold – usually referred to as "non-thermal effects," especially under conditions of long-term, low-level exposure (DiCarlo *et al.* 2002, Levitt and Morrow 2007).

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FA3 Department of the Interior (cont'd)

FA3

study, Evans *et al.* (2007) looked at lighting attraction at ground level in complete cloud cover, but found that neither red, steady-burning nor red flashing lights induced bird aggregation. They hypothesized that the disorientation to red light only occurs if birds are actively using magnetoreception and the red light creates an imbalance in the magnetoreception mechanism. Additional studies are underway to better understand the mechanisms of lighting attraction.

Published research protocols developed to count and estimate bird-tower kills have been developed (*e.g.,* Avery *et al.* 1978, Manville 2002, Derby *et al.* 2002, and Gehring *et al.* 2009) and will be briefly reviewed below for use in future cumulative effects assessments for both collision and radiation studies.

Potential Radiation Impacts to Birds

In 2002, T. Litovitz (Catholic University, pers. comm.; DiCarlo *et al.* 2002) raised troubling concerns about the impacts of low-level, non-thermal radiation from the standard 915 MHz cell phone frequency on domestic chicken embryos under laboratory conditions. Litovitz noted deformities, including some deaths of the embryos subjected to hypoxic conditions under extremely low radiation doses[2].

Preliminary research on wild birds at cellular phone tower sites in Valladolid, Spain, showed strong negative correlations between levels of tower-emitted microwave radiation and bird breeding, nesting, and roosting in the vicinity of the electromagnetic fields (Balmori 2003). Birds had historically been documented to roost and nest in these areas. House Sparrows, White Storks, Rock Doves, Magpies, Collared Doves, and other species exhibited nest and site abandonment, plumage deterioration, locomotion problems, and even death among some birds found close to cellular phone antennas. Balmori did not observe these symptoms prior to construction of the cell phone towers. Balmori (2004, 2005) noted that the White Stork appeared most heavily impacted by the tower radiation during the 2002-2004 nesting season in Spain. Manville (2005) reported Balmori's (2003) preliminary results, and raised concerns of similar events in the U.S.

Everaert and Bauwens (2007) found strong negative correlations between the amount of radiation presence (both in the 900 and 1800 MHz frequency bands) and the presence of male House Sparrows. In areas with high electric field strength values, fewer House Sparrow males were observed. Everaert and Bauwens' preliminary conclusion, long-term exposure to higher radiation levels was affecting bird abundance or bird behavior in this species. Balmori and Hallberg (2007) reported similar declines in House Sparrows directly correlated with levels of electromagnetic radiation in Valladolid, Spain.

Of concern to DMBM are the potential impacts of radiation on bird populations. Beason and Semm (2002) tested neural responses of Zebra Finches to 900 MHz radiation under laboratory conditions and showed that 76% of the neurons responded by 3.5-times more firings. No studies have yet been conducted in the U.S. on radiation impacts to wild bird populations. Magnetite, a mineral highly sensitive to electromagnetic frequencies (EMFs), has been discovered in human, bird, and fish brains. It has been suggested that radio frequency radiation (RF) may be acting as an attractant to birds since their eye, beak and brain tissues are loaded with magnetite, a mineral highly sensitive to magnetic fields that birds use for navigation (Ritz *et al.* 2004, R. Beason cited in Levitt and Morrow 2007). Communication tower radiation in the U.S. may already be impacting breeding and migrating populations of birds, bees, and other wildlife, based on research conducted in Europe. It is therefore important to gain a far better understanding of the

[2] *i.e.,* doses as low as 1/10,000 below the allowable "safe" level of radiation (T. Litovitz 2002 pers comm.; DiCarlo *et al.* 2002).

FA3

suspected impacts of radiation on birds and other wildlife, particularly if those suspected impacts are having effects on species at the population level.

Potential Radiation Effects on Other Pollinators

Radiation has also been implicated in effects on domestic honeybees, pollinators whose numbers have recently been declining due to "colony collapse disorder" (CCD) by 60% at U.S. West Coast apiaries and 70% along the East Coast (Cane and Tepedino 2001). CCD is being documented in Greece, Italy, Germany, Portugal, Spain, and Switzerland. One theory regarding bee declines proposes that radiation from mobile phone antennas is interfering with bee navigational systems. Studies performed in Europe have documented navigational disorientation, lower honey production, and decreased bee survivorship (Harst *et al.* 2006, Kimmel *et al.* 2006, Bowling 2007). This research needs further replication and scientific review, including in North America. Because pollinators, including birds, bees, and bats, play a fundamental role in food security (33% of our fruits and vegetables would not exist without pollinators visiting flowers [Kevan and Phillips 2001]), as pollinator numbers decline, the price of groceries goes up.

Harst *et al.* (2006) performed a pilot study on honeybees testing the effects of non-thermal, high frequency electromagnetic radiation on beehive weight and flight return behavior. They found that of 28 unexposed bees released 800 m (2,616 ft) from each of 2 hives, 16 and 17 bees returned in 28 and 32 minutes, respectively, to hives. At the 1900 MHz continuously-exposed hives, 6 bees returned to 1 hive in 38 minutes while no bees returned to the other hive. In exposed hives, bees constructed 21% fewer cells in the hive frames after 9 days than those unexposed. Harst *et al.* selected honeybees for study since they are good bio-indicators of environmental health and possibly of "electrosmog." Because of some concerns raised regarding the methods used to conduct the Harst *et al.*(2006) study, specifically the placement of the antenna where bees could contact it (*i.e.,* potentially a bias), the experimental methods need to be redesigned and the studies retested to better elucidate and fine tune the impacts of radiation. The results, while preliminary however, are troubling. Kimmel *et al.* (2006) performed field experiments on honeybees under conditions nearly identical to the Harst *et al.* (2006) protocol except that bees were stunned with CO_2 and released simultaneously 500 m (1,635 ft) from the hives. However, in one of their experimental groups, they shielded the radiation source and antenna in a reed and clay box to address potential biases raised in the Harst *et al.* study. Sixteen total hives were tested, 8 of which were irradiated. After 45 minutes when the observations were terminated, 39.7% of the non-irradiated bees had returned to their hives while only 7.3% of the irradiated bees had.

RESEARCH DISCUSSION

If communication tower collisions are killing 4-5 million or more birds per year in the U.S. due to collisions, what impact – if any – might radiation have on avifauna? Bees? Other wildlife? We simply do not know. In 2000, the Communication Tower Working Group (chaired by DMBM/Manville) developed a nationwide tower research protocol that would assess cumulative impacts from tower collisions nationwide, suggesting the use of some 250 towers of different height, lighting, and support categories. The preliminary cost estimate for a 3-year study was $15 million. No funding was ever acquired and the collision study has not yet been conducted.

The proposed 2000 study was to focus on the collision impacts of communication towers to birds during spring and fall migrations, but the same types of mortality monitoring could be conducted during the late spring/summer breeding seasons, looking particularly for evidence of injury and death to breeding birds in close proximity to communication towers. Radiation levels would need to be measured at the tower sites and nests adjacent to the towers during nesting activity, and bird behavior would also need to be monitored throughout the breeding season. Laboratory necropsies

FA3 Department of the Interior (cont'd)

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would need to be performed on birds and other wildlife suspected of impacts from radiation to better understand what caused their deaths and to verify that they did not die from blunt force trauma from tower or wire collisions. Pre-construction studies should be performed to assess habitat use by breeding and resident avifauna. Post-construction studies should assess site abandonment, development of deformities, injuries, and deaths. A careful review of the protocols developed by Balmori (2004, 2005), Balmori and Hallberg (2007), Everaert and Bauwens (2007), and others is critical because similar studies should be performed in the U.S.

METHODS FOR ASSESSING AVIAN COLLISION MORTALITY

Methods for Assessing Tall Tower Mortality

Bird strike mortality studies at "tall"[3] communication towers conducted previous to research performed by Avery *et al.* (1978) indicated that most dead birds were found within 60 m (197 ft) of the central communication tower structure. Avery *et al.* assessed songbird mortality at a 369-m (1,210-ft) Omega Loran U.S. Coast Guard tower in ND. Based on daily monitoring during 3 fall and 2 spring migration seasons, 63% of the birds they found dead or injured at this tower were within 92 m (300 ft) of the tower. Avery *et al*. placed tagged bird carcasses (*e.g.*, House Sparrows and European Starlings) in catchment nets and on non-netted habitats (*e.g.,* gravel pads, roads, and marshy plots) to assess persistence and scavenging/predation loss. They completely examined the inner 46-m (150-ft) radius of the tower (concentric circle designated "A") for bird carcasses, including both the areas covered with catchment nets and the non-netted areas. Placing tagged carcasses in random search plots, which are then found or not found and/or removed or not removed, helps determine biases (Erickson *et al.* 1999). However, there are inherent problems associated with using tagged bird carcasses, including the attraction of predators, cost, availability, and adequate sample size (D. Strickland, WEST Inc., pers. comm.).

In addition to the total area assessed during this study (168 ha [415 ac]), for the remainder of the search area, Avery *et al.*(1978) divided the habitat into concentric circles of radii 92 m (designated "B"; 303 ft) , 183 m (C; 600 ft), and 731 m (D; 2,398 ft), respectively. Two compass lines (north-south and east-west) divided B, C, and D into 12 substrata beyond the inner core. In each of the substratum, 2 net catchment sampling plots, 12.4 m (41 ft) on a side, were randomly selected. Nylon netting suspended on steel frames 1.5 m (5 ft) high, with the net's center anchored to the ground, was utilized. See Manville (2002) beyond for additional net details.

Sampling nets were demonstrated by Avery *et al.*(1978) to be highly effective in preventing losses to scavengers and predators; none of 33 of the test birds placed in nets during the Avery *et al.* study were taken during the first night, but 12 of 69 test birds placed on non-netted gravel sampling plots were taken during the same period. During the Avery *et al.* study, dead bird searches were made daily at dawn during the peak of songbird migration. In a study at a Tallahassee, FL, television tower – where sampling nets were not used – scavenging was considerably higher; only 10 of 157 birds were left undisturbed after one night (*i.e.,* 93.6% scavenging; Crawford 1971).

Homan *et al.* (2001) placed carcasses of House Sparrows in dense vegetation, comparing searcher efficiencies of humans and canines. The dogs received no special training in carcass searching.

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3 hereafter, towers greater than 61 m (199 ft) above ground level (AGL), generally guyed, and always lit at night.

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Thirty-six trials were conducted in 5 x 40–m (16 x 131-ft) study plots. Humans found 45% of the carcasses while dogs found 92%. The ratio of recovered to missed carcasses was approximately 12:1 for dogs and 1:1 for humans, making dogs much more efficient in finding carcasses. Searcher efficiencies were not improved but remained similar when testing residual cover (April searches) versus new growth cover (August searches). Because the protocol in the Homan *et al.* study improved quantitative and qualitative assessments, it provides considerable promise for the research initiatives being proposed in this briefing paper.

Arnett (2006) further tested the dog-search protocols of Homan *et al.* (2001) and others, assessing the abilities of dog-handler teams to recover dead bats at 2 commercial wind turbine facilities. Dogs found 71% of the bats placed during searcher-efficiency trials at Mountaineer, WV, and 81% of those at Meyersdale, PA, while human searchers found only 42% and 14% of the carcasses, respectively. Both dogs and humans found a high proportion of the trial bats within 10 m (33 ft) of the turbine tower, usually in open ground (88% and 75%, respectively). During a 6-day fatality search trial at 5 Mountaineer turbines, dog-handler teams found 45 carcasses while human searchers during the same period found only 19 (42%). As vegetation height and density increased, humans found fewer carcasses while dog-handler team searcher efficiencies remained high. Arnett's (2006) study further reinforces the hypothesis that use of dogs greatly improves efficiencies in finding dead bats very similar to what Homan *et al.* (2001) found for locating passerines. Dog use should be given serious consideration in conducting bird and bat mortality studies at telecommunications towers.

From 2003 through 2005, Gehring *et al.* (2006, 2009) studied 24 tall communication towers in MI. They used flagged, straight-line transects, each technician walking at a rate of 45-60 m (147-196 ft) per minute and searching for carcasses within 5 m (16 ft) on either side of each transect, as suggested by Erickson *et al.* (2003). The transects covered a circular area under each tower with a radius equal to 90% the height of the tower. The straight line transects were much easier to navigate than were circular transects (J. Gehring, Michigan Natural Features Inventory, pers. comm.). Due to dense vegetation, observer fatigue, human error, scavenging by predators, and crippling loss of birds and bats that may have escaped the detection area, Gehring *et al.* tested each technician's observer detection rate and rate of carcass removal. Ten bird carcasses of predominately Brown-headed Cowbirds, with painted plumage to simulate fall song bird migration plumage, were placed once each field season within each study plot to assess observer efficiencies. Likewise, 10-15 predominately Brown-headed Cowbirds were placed by each technician at the edge of designated tower search area to monitor the daily removal of carcasses by scavengers. These carcasses were not painted to avoid placing any foreign scent on them. No catchment nets were used in this study.

Methods for Assessing Short Tower Mortality

Manville (2002) developed a protocol for the U.S. Forest Service (USFS) to study the effects of cellular telecommunications towers on birds and bats, recommending use of elevated catchment nets for a Coconino, Kaibab, and Prescott National Forest study in AZ. Modifying the Avery *et al.* (1978) search protocol, Manville suggested use of 1.9-cm (0.75-in) mesh knitted polyethylene nets, 15 x 15 m (50 x 50 ft) in size, suspended 1.5 m (5 ft) above ground, with 8 gauge monofilament nylon line attached around the periphery of the entire net, supported with 2-m-long (6.5-ft) steel angle posts driven into the ground and spaced every 2-3 m (7-10 ft) apart. He recommended pulling the center of each net close to the ground, securing with monofilament to a cinder block, thus creating a downslope gradient from the edge of the net to its center so a carcass landing in the net would tend not to be blown from the netting edge to the ground by a strong wind. He did not recommend using a wooden lip on the net's edges as Avery *et al.* (1978) had suggested. Materials for each net were estimated to cost $320 (Avery and Beason 2000).

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Manville (2002) postulated that use of elevated catchment nets would make finding dead birds killed by tower strikes more reliable, especially under variable habitat conditions (*e.g.*, unsuitable substrate for searching, tall grass, shrubs, roots, boulders, or trees). Manville recommended breaking down the tower's circumference into 3, 120° arcs, then breaking the study plot into 2 concentric circles. The radius of the first circle from the tower's center was 30 m (100 ft) and nets were to be randomly deployed to cover 24% of the total area of that concentric circle, 1 net randomly placed in each 120° arc. For the second concentric circle (30-60 m in radius from the center [100-197 ft]), nets were placed randomly in 8% of the total area, 1 net randomly placed in each of the 3 arcs.

Manville (2002) did not recommend using tagged bird carcasses in the AZ study because he believed that double sampling would address sampling efficiency biases. Double sampling involves (1) net sampling, allowing for an estimate of the number of carcasses that fall beneath each tower and are relatively unbiased for searcher efficiency and carcass removal, and (2) ground sampling where biases are inherent. For short towers, he recommended the entire area the radius of the tower height be completely searched (including under the nets) at dawn each day during the migration season and once weekly during the breeding season. Net sampling allows for adjustment of the ground sampling estimates that would correct for carcass removal and searcher efficiency bias based on the relative difference of the number of carcasses found using the 2 sampling methods at each communication tower studied.

Manville (2002) indicated that the probability of catching a bird in a net would change with increased distance from the tower (*i.e.*, birds my fly or be carried by the wind for a distance before dying). He suggested that if there is a bias because birds tend to die greater than 30 m (100 ft) from a short tower, probabilities can be determined by searching strip transects that radiate from a tower. He recommended using a transect 1.5- 2 times the height of the tower, 15 m (50 ft) wide, placed on a randomly selected compass line. Carcass searches within the transect should help to estimate the area that should be sampled by nets, develop a correction factor outside the radius of the area sampled by the nets, and improve the correction factor for ground surveys conducted exclusive of the net surveys. Manville suggested this transect survey be conducted at least once per week, preferably in the early morning hours, during both migration and breeding seasons. With the recent use of trained dogs to detect and locate dead and injured birds and bats, where dogs have been shown to be at least 50% more effective in finding carcasses, dog use should be considered a viable monitoring alternative (E. Arnett, Bat Conservation International, pers. comm., Homan *et al.* 2001, Arnett 2006).

Derby *et al.* (2002) modified the Manville (2002) protocol to conduct the cellular telecommunications tower study in AZ for the USFS. There, 6 of the 7 cell towers were surrounded by 3-m (10 ft) walls, 29 m (95-ft) long on each side. The walled square was divided into 4 equal blocks, and within 1 of these blocks a 12 x 12-m (40 x 40-ft) nylon mesh net was randomly placed based on net specifications recommended by Manville (2002) but placed > 3 m (10 ft) above the ground to allow company personnel to perform maintenance on the sites. Outside the walled compounds, Derby *et al.* used 4, 6 x 6-m (20 x 20-ft) nets, 3 of the nets randomly set outside the wall to a distance of 30.5 m (100 ft) from the tower, and the 4th net randomly placed in the band from 31 to 61 m (100-200 ft) from the tower. Inside the walled compound the entire area was searched by walking transects 6 m (20 ft) apart (3 m [10 ft] search width). The surveys were performed at dawn 4 times per week during peak songbird migration.

Derby *et al.* (2002) also recommended using straight line transects, 4 oriented perpendicular to the walls, and 4 diagonal from the corners of the wall – representing the "spokes of a wheel."

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Each transect was 61 m (200 ft) long, and 6-m (20 ft) wide. Because the Derby *et al.* protocol also used double sampling, no tagged carcasses were used in their study.

Both Manville (2002) and Derby *et al.* (2002) recommended daily searches of all electrical wiring to assess for electrocution and wire collision mortality.

Homan *et al.* (2001) used Labrador retrievers and a Chesapeake Bay retriever to search 6 plots, 5 x 40 m (16 x 131 ft) in size, delineated by flagging, to detect 8 thawed House Sparrow carcasses randomly thrown in each of the plots from 1 m (3 ft) outside the plot, allowing the human or human-dog team to search each plot for 10 minutes. Dogs were kept on 5-m (16-ft) leashes during searches. Humans were active searchers when using the dogs. Searches were not conducted during steady rain or when winds were ≥ 32 km/hr (20 mph). The technique with leashed dogs could easily be used to survey both tall and short tower plots, based on the protocols previously recommended. With the dogs confined to leashes, additional training would be unnecessary.

Arnett (2006) used 2 trained chocolate Labrador retrievers to locate test bat carcasses of different species and in different stages of decomposition at commercial wind turbine facilities on the Appalachian Mountain front in PA and WV. His dogs were trained in basic obedience, "quartering" (*i.e.,* systematically searching back and forth in a 10-m-wide [33 ft] transect), and blind retrieval handling skills. The dogs were trained with dead bats 7 days prior to field trials. When a dog found a test bat, the dog was rewarded with a food treat if it performed the task of finding the bat, sitting or stopping movement when given a whistle command to do so, and leaving the carcass undisturbed. Arnett walked the transect lines at a rate similar to that of humans (*i.e.,* approximately 13-25 m/min [43-82 ft/min]) while the dogs were allowed to quarter the entire width of the transect (5 m [16 ft] on either side of the center line). While this technique was tested on bats, it also shows great promise for use on birds. Dogs would require additional training, but unlike the Homan *et al.* (2001) technique, they would not need to be leashed. The Arnette technique also shows great promise for use at both tall and short communication towers to locate dead birds and bats.

METHODS FOR ASSESSING RADIATION IMPACTS TO BIRDS

Methods for Assessing Radiation Impacts at Tall Towers

At present, radiation studies at tall towers in Europe have not yet been conducted since the impacts to birds and other wildlife have been documented at short, cellular communication towers. The methods suggested below for short tower radiation studies should also be applicable to future tall tower radiation studies.

Methods for Assessing Radiation Impacts at Short Towers

Balmori (2005) selected 60 nests of White Storks in Valladolid, Spain, to monitor breeding success, visiting each nest from May to June 2003, taking care to select nests with similar characteristics located on rooftops. Tree nests were not studied. Nests were selected based on very high (N=30) or very low (N=30) exposure levels of electromagnetic radiation, depending on the distances nests were located from the cell towers. Thirty nests were within 200 m (656 ft) of the towers, while the remaining 30 were located > 300 m (981 ft) beyond any tower. Chick productivity was closely observed. Electric field intensities (radiofrequencies and microwave radiation) were measured using a unidirectional antenna and portable broadband electric field meter set at 10% sensitivity. Between February 2003 and June 2004, 25 visits were made to nests located within 100 m (327 ft) of 1 or several cell phone towers to observe bird behavior. The

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visits were made during all phases of breeding, from nest construction until Stork fledging. RFs and EMFs were also measured at all nest sites using a unidirectional antenna and field meter.

Balmori and Hallberg (2007) studied the urban decline of House Sparrows in Valladolid, Spain, since this species is in significant decline in the United Kingdom and western Europe, and because it usually lives in urban environments, where electromagnetic contamination is higher. They felt it would be a good biological indicator for detecting the effects of radiation. Forty visits, approximately 1 per month were made between October 2002 and May 2006, and were performed at each of 30 point transect locations (*i.e.,* point counts, the protocol recommended by Bibby *et al.* 2000) between 7 a.m. and 10:00 a.m. by the same ornithologist following the same protocol. At each transect site, all sparrows heard and seen were counted, without differentiating birds by sex and age, and radio frequencies and levels of microwave radiation were recorded using a unidirectional antenna and a portable broadband electric field meter set at 10% sensitivity. Bird densities from each point were calculated based on the number of sparrows per hectare.

Everaert and Bauwens (2007) counted male House Sparrows during the breeding season at 150 point locations (Bibby *et al.* 2000) in 6 residential districts in Belgium, each point location situated at variable distances (mean= 352 m [1,151 ft]; range= 91- 903 m [298- 2,953 ft]) from nearby cell phone antenna towers. Point counts were conducted for 5 minutes, all male House Sparrows heard singing or visible within 30 m (98 ft) were counted, counts occurred between 7 a.m. and 11:00 a.m. when males were most active, and counts were conducted only during favorable weather conditions. Electric field strengths at 900 MHz and 1800 MHz were measured for 2 minutes at each frequency using a portable calibrated high-frequency spectrum analyzer with a calibrated EMC directional antenna. To measure maximum radiation values, the EMC antenna was rotated in all directions.

METHODS FOR ASSESSING RADIATION IMPACTS TO BEES

Methods for Assessing Radiation Impacts to Bees

Harst *et al.* (2006) exposed 4 beehives to 1900 MHz radiation from an antenna placed at the bottom of each hive immediately under the honeycombs, while they left 4 hives unexposed. Each of the 8 colonies contained approximately 8,000 bees. They were set up in a row, with a block of 4 hives equipped with DECT (Digital European Cordless Telecommunications) stations on the bottom of each hive. Metal lattices were installed between the exposed hives to avoid possible effects to the non-exposed control group. The average transmitting power per station was 10 mW, with peak power at 250 mW. The sending signal was frequency modulated and pulsed with a pulsing frequency of 100 Hz. A transparent 10 cm (4 in) plastic tube with a diameter of 4 cm (1.6 in) was mounted at the entrance of each hive to collect single bees and watch them return later to the hives. Twenty-five bees from each hive were randomly selected, stunned in a cooling box, marked with a marker dot on the thorax, and released 800 m (2,616 ft) away from the hives. All marked bees were released simultaneously and were timed from the moment of their release. Return times were noted as the bees each entered the plastic tubes, with the observation lasting 45 minutes. Any bees returning after 45 minutes were disregarded. Bees were able to touch the radiation sending antenna within the hive. Some have asserted that the antenna placement may have resulted in a behavioral bias in regard to bee response, raising a legitimate concern about the methods used to test bee response to radiation in this experiment.

Harst *et al.* (2006) also studied the effects of radiation on bee building behavior using the protocol discussed above. They photographically documented change in honeycomb area, and measured development of honeycomb weight for each hive. Sixteen colonies were selected for

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this experiment, 8 of which were irradiated, all aligned in a row. At the beginning of the experiment, the empty honeycomb frames were weighed, the hives were filled with bees (400 g [14 ounces]), and provided 250 ml (0.26 quart) food. Bees were fed 2 more times during the 9-day experiment. The honeycombs were photographed each day. The placement of the sending antenna, as previously suggested, may have altered bee behavior and hive productivity.

Kimmel *et al.* (2006) tested 16 bee colonies, 8 of which were irradiated. The experiment was nearly identical to that utilized by Harst *et al.* (2006) except that the sending antenna in 1 experimental group was shielded in a reed and clay box to address concerns about behavioral biases raised in the Harst *et al.* study. Bees were paralyzed using CO_2 instead of cold and were simultaneously released 500 m (1,635 ft) from the hives instead of 800 m (2,616 ft).

RESEARCH RECOMMENDATIONS FOR ASSESSING AVIAN COLLISION IMPACTS

Tall Tower Collision Research Recommendations

We recommend using either the Avery *et al.* (1978) or the Gehring *et al.* (2006, 2009) protocol for tall tower collision studies, depending on the feasibility and availability of catchment nets and dead bird carcasses. Avery *et al.* provided the opportunity to use catchment nets, testing searcher efficiency and carcass removal by placing test carcasses on site (in nets and on the ground). The protocol presumes that the majority of carcasses will be found within a certain distance of the tower's base. The protocol has particular utility for studying very tall towers, especially where terrain around the structures is highly variable and difficult to traverse. It can be used as a standing protocol, or modified as a hybrid based on combining other techniques suggested within this paper such as the use of dogs (Homan *et al.* 2001, Arnett 2006). Dogs have tremendous promise for both tall and short tower studies. If trained hunting dogs are used, then the Arnett (2006) protocol is an excellent tool since the dogs can be used off-leash. However, if untrained hunting dogs are available, then the Homan *et al.* (2001) protocol using leashed dogs is an excellent option.

Gehring *et al.* (2006, 2009) also successfully assessed mortality at tall towers, but catchment nets were not deployed in this study. Due in part to timing, budget constraints, and number of towers studied, this protocol has significant utility where many towers need to be studied. It could also be modified by using trained dogs or incorporating catchment nets.

The statistical designs for both short and tall tower studies – both for assessing collisions and radiation impacts, should be worked out with qualified biometricians. Both the USFWS and the USGS/Biological Resources Discipline (BRD) have well qualified statistical expertise. They should be consulted early in the development of a proposed study.

In both short and tall tower studies, data collection must include all of the following: time of day each tower is examined, time spent searching each site, time since the last search, and weather conditions, particularly inclement weather. Weather data should include the previous night's temperature, wind, cloud cover (clear if < 10% cover, partly cloudy 10-90% cover, or overcast > 90% cover), barometric pressure, rainfall, fog, obscuration, and other relevant weather conditions (Derby *et al.* 2002).

When bird and bat carcasses, and injured vertebrates are found, regardless of the sampling method, data must include tower identification number, name of species (if known), date of collection, closest transect, distance from the tower, azimuth to the tower, exact mapped location (GPS coordinates are very helpful), estimated number of days since death/injury, body condition,

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probable cause of death, and evidence of scavenging. The carcass is to be collected, numbered, and saved to be used in other investigations (Gehring *et al.* 2009) for which a Federal and possibly state salvage permit will be required (Manville 2002).

Short Tower Collision Research Recommendations

Depending on the availability and utility of catchment nets and the layout of the tower site, we recommend using either the Manville (2002), the Derby *et al.* (2002), Homan *et al.* (2001), or the Arnett (2006) protocols – the latter 2 with greatly improved searcher efficiency, or a hybrid of these methodologies. Manville (2002) suggested using elevated catchment nets, but due to double sampling, he did not recommend using tagged bird carcasses. He also recommended using random transects to adjust for biases.

Derby *et al.* (2002) modified the Manville (2002) protocol, specifically in regard to challenges created by the tower study site in AZ. A randomly-placed catchment net was used within the walled enclosure of each of the sites, and the entire area within the walled compound (ground and net) was searched. Four randomly placed catchment nets were also utilized beyond the walls. Due to double sampling, no tagged bird carcasses were utilized. The protocol could be used as a free-standing technique but should be searched daily during the entire peak of bird migration.

RESEARCH RECOMMENDATIONS FOR ASSESSING RADIATION IMPACTS TO BIRDS

Tall Tower Radiation Research Recommendations

For both short and tall tower studies, any nests close to a tower should be noted, with its GPS coordinates recorded. Breeding, nest success, and survivorship should be monitored, where possible. How birds use their habitats for breeding and residence should be noted, including any issues of site abandonment, egg and clutch failure, development of deformities, injuries, and deaths.

For both short and tall tower studies, where birds appear to be injured or killed by radiation, proximity of the bird/carcass to known nest or roost sites and towers should be noted. Radiation levels at the tower, carcass site, and the nest site should be recorded. Any abnormal behaviors should also be described. Laboratory necropsies should be performed on birds and other wildlife suspected of impacts from radiation to better understand what caused their deaths and to verify that they did not die from blunt force trauma due to collisions. Tower and ambient radiation should be measured using equipment and techniques suggested by Harst *et al.* (2006) and Kimmel *et al.* (2006), or variations of equipment and methods available in the U.S. See the methods section of this paper for specifics.

Where carcass counts need to be assessed at specific tall towers, we suggest using the tall tower collision mortality protocols, discussed above in the methods section of this paper.

Short Tower Radiation Research Recommendations

Depending on the avian species being studied, we recommend using the Balmori (2005) protocol for assessing potential impacts to colonial nesting species such as herons and egrets. Where passerines are to be studied, we suggest the use of the Everaert and Bauwens (2007) and Balmori and Hallberg (2007) protocols for assessing potential impacts. Refer to the methods section above for specific details.

Where carcass counts need to be made at specific short towers, we recommend using the short tower collision mortality protocols, discussed above in the methods section.

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RESEARCH RECOMMENDATIONS FOR ASSESSING RADIATION IMPACTS TO BEES

Bees and other pollinators also deserve close scrutiny from the potential impacts of radiation, and their study should be included as part of the overall research effort suggested in this paper. In addition to testing and validating the protocol and results from the Kimmel *et al.* (2006) study (see background and methods sections above), which we recommend be performed at multiple locations in the U.S., bee behavior, hive productivity, and bee survivorship need to be field-tested at both tall and short towers in the U.S. Variations on the protocols used by Harst *et al.* (2006) and Kimmel *et al.* (2006) could easily be developed to field-test potential radiation impacts on bee navigation, flight behaviors, hive productivity, and bee survivorship around both short and tall towers. However, any research protocol developed to assess potential insect impacts – and for that matter, impacts to birds, bats, and other wildlife, must attempt to eliminate extraneous variables that may bias study results. These include everything from antenna placement in the Harst *et al.* (2006) study, to the impacts of diseases, parasites, weather and climatic events, pesticides, contaminants, and other mortality factors on insects and other wildlife. Fine-turning a research protocol must include the combined efforts of trained entomologists, research radiation specialists, ornithologists, wildlife biologists, and biometricians.

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FA4 U.S. Environmental Protection Agency

FA4

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

August 29, 2016

Mr. Roddy Bachman
United States Coast Guard
Deepwater Ports Standards Division
Room 1210
2100 Second Street, SW
Washington, DC 20593

Ms. Yvette Fields
Maritime Administration
Office of Deepwater Ports and Offshore Activities
1200 New Jersey Avenue SE, W23-323 (MAR-530)
Washington, DC 20590

Dear Mr. Bachman and Ms. Fields:

In accordance with our responsibilities under Section 309 of the Clean Air Act (CAA), the National Environmental Policy Act (NEPA), and the Council on Environmental Quality (CEQ) regulations for implementing NEPA, the U.S. Environmental Protection Agency (EPA) Region 6 office in Dallas, Texas, has completed its review of the Maritime Administration (MARAD) and U.S. Coast Guard (USCG) Draft Environmental Impact Statement (DEIS) for the Delfin Liquefied Natural Gas (LNG) Deepwater Port License Project (Delfin LNG). The purpose of the Delfin LNG project is to own, construct, and operate a deepwater port for the liquefaction and export of LNG in Federal waters off the coast of Cameron Parish, Louisiana.

FA4-1 When a Draft EIS does not identify a preferred alternative, the EPA reviews and rates each alternative. This proved difficult for the Delfin LNG project because, other than the proposed project, the alternatives discussed in the EIS were not discrete alternatives but potential combinations of activities that could result in dozens of alternatives. Since most of the impacts from the various potential alternatives are similar, EPA rates the Draft EIS as "Environmental Concerns – Insufficient Information" (EC-2). The EPA's Rating System Criteria can be found at http:/www.epa.gov/compliance/nepa/comments/ratings.html. EPA's review identified a number
FA4-2 of potential adverse impacts to protected species. In addition, we request additional information
FA4-3 regarding environmental justice communities, noise, indirect effects, greenhouse gas emissions, and protected species to strengthen the document. EPA recommends that these issues be addressed in the Final EIS. We have enclosed detailed comments which clarify our concerns.

FA4-1 After additional discussion with USEPA, it has been determined that no further action is required at this time. The selection of a preferred alternative will be made in the Record of Decision as discussed in Section 2.4 of the final EIS.

FA4-2 Thank you for your comment.

FA4-3 Thank you for your comment.

FA4 U.S. Environmental Protection Agency (cont'd)

FA4

EPA appreciates the opportunity to review the Draft EIS. Please send our office one copy of the Final EIS when it is electronically filed with the Office of Federal Activities. If you have any questions or concerns, I can be reached at 214-665-8565, or contact Keith Hayden, of my staff, at hayden.keith@epa.gov or 214-665-2133.

Sincerely,

Robert Houston
Chief, Special Projects
Section

Enclosures

FA4 U.S. Environmental Protection Agency (cont'd)

FA4

DETAILED COMMENTS ON THE
U.S. COAST GUARD AND MARITIME ADMINISTRATION
DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE DELFIN LNG DEEPWATER PORT LICENSE PROJECT

BACKGROUND: Delfin LNG is proposing to construct, own, operate and eventually decommission a deepwater port in the Gulf of Mexico to liquefy domestically sourced natural gas for export. The proposed Delfin LNG project would be located in Federal waters within the Outer Continental Shelf (OCS) West Cameron Area, West Addition Protraction Area (Gulf of Mexico) approximately 37.4 to 40.8 nautical miles off the coast of Cameron Parish, Louisiana. The Delfin LNG deepwater port would consist of four semi-permanently moored Floating Liquefied Natural Gas Vessels (FLNGVs), two existing offshore natural gas pipelines, and four new 30-inch diameter pipeline laterals. In addition, a 700-foot 42-inch diameter new pipeline would be constructed to bypass a platform at WC lease block 167. The LNG would be stored onboard the FLNGV's and transferred via ship-to-ship transfer to properly certified LNG tankers. Each of the FLNGVs would be semi-permanently moored to four new tower yoke mooring systems (TYMS). The onshore components of the Delfin LNG deepwater port will consist of constructing and operating a new natural gas compressor station, gas supply header and a metering station at an existing gas facility.

ALTERNATIVES

FA4-4 Alternatives Analysis; page 2-30:

Table 2.3-1 has a list of alternatives and whether they were considered in detail or dismissed from further consideration. The individual alternatives are not discrete, as is typical in most Environmental Impact Statements (EIS), but are composed of different pipeline routes, mooring systems, port designs, anchoring methods, cooling media, and onshore facility locations. Other than the proposed project, none of these different routes, systems, etc. are logically packaged together into discrete alternatives. Also, the compatibility of each of the alternatives systems, routes, or locations is not discussed. For instance, some pipeline routes may only be feasible with specific onshore facility locations, or certain mooring systems may only work with a one type of anchoring method. This makes analyzing the alternatives difficult.

Recommendation: EPA recommends USCG and MARAD analyze the various components of all the alternatives and package them into logical, discrete alternatives.

FA4-5 Alternatives Analysis; page 2-50:

Section 2.4 of the Draft EIS describes the USCG and MARAD rationale for not selecting a preferred alternative at this time. The Draft EIS states "the Secretary will defer identification of the agency's preferred alternative until a decision is made to approve or deny a deepwater port License. If the License is approved, the Secretary will indicate the agency's preferred alternative

1

FA4-4 After additional discussion with USEPA, it has been determined that consolidation of alternatives into discrete projects is no longer a concern.

FA4-5 See response to comment FA4-1.

FA4 U.S. Environmental Protection Agency (cont'd)

FA4

in its Record of Decision issued under the DWPA." Although not typical, an agency does not have to select a preferred alternative in the Draft EIS. However, an agency cannot wait until the record of decision (ROD) to identify the preferred alternative unless another law prohibits the expression of a preferred alternative. If there is a law governing the decision to not select a preferred alternative in this instance, it is not mentioned in the Draft EIS. Furthermore, not selecting a preferred alternative would deprive the public the opportunity to comment on the preferred alternative.

Recommendation: EPA recommends selecting a preferred alternative for the Final EIS.

FA4-6 Alternatives Analysis; page 4-25:

Section 4.2.4.3 discusses different cooling media and says "use of seawater as the primary cooling media is not the preferred cooling system alternative." There are only 2 types of cooling media alternatives analyzed in the Draft EIS. If one type is not preferred, then by default you are declaring the other alternative as the preferred alternative.

Recommendation: Please clarify if a preferred cooling media alternative has been identified.

FA4-7 Alternatives Analysis; page 4-25, 4-86:

The alternatives analysis and comparison is vague and lacks information. Other than the proposed alternative, there isn't any quantitative description or comparison of alternatives. For instance, page 4-25 says "Use of alternative deepwater port designs may influence the duration or extent of impacts on water resources during construction, operation, and decommissioning. Water usage would be dependent on the type of specific systems that would be selected for each alternative, as well as the number and type of support vessels required for operations. Installation of a fixed platform-based unit would result in additional seafloor disturbance. Other alterative deepwater port designs would result in similar impacts on water resources."

The previous sentence does not describe how, or in what way, port designs may influence duration and extent of impacts on water resources. There is no description of the amount of water use of each system or a description of support vessels. There is only the statement that a fixed platform unit would result in additional seafloor disturbance but it doesn't say how much more. Instead of an actual assessment of alternatives and determination of associated impacts there are statements that one alternative has less/greater impacts than another.

Recommendation: While it helps to know which alternatives are the most or least impactful to resources; it falls short of qualifying as an alternatives analysis and determining impacts. EPA recommends USCG and MARAD replace all instances of vague comparisons of impacts to resources with quantitative analysis that can be used to draw conclusions. For instance, when describing impacts to the seafloor it helps to have acreages. When discussing noise, only minimal information is conveyed in knowing one alternative is louder than the other. It would more useful to know the decibel level of the two noises to make a comparison. If specific impacts cannot be determined, EPA recommends estimating a range of impacts that are possible.

2

FA4-6 Delfin LNG is proposing use of the air-cooled system as the cooling media; however, both cooling media alternatives are carried through for analysis of impacts by resource in Section 4. Text in section 4 has been updated to identify the applicant's proposed alternative, rather than the "preferred alternative".

FA4-7 Added siting requirements for Fixed Platform-Based Unit to Section 2. That is the only other deepwater port design unit carried forward for additional analysis in Section 4. Table 2.3-2 compares the two deepwater port design alternatives by resource.

FA4 U.S. Environmental Protection Agency (cont'd)

FA4

CONSULTATION AND COORDINATION

FA4-8

Table 1.5-1, on page 1-12, lists the consultations and permits that must be completed or obtained. The opinions of resource agencies tasked with the duty to carry out consultation are important and should be included in the FEIS. Without these opinions, interested parties are not able to fully assess the impacts of the project.

Recommendation: EPA recommends that the following consultation be completed and added to the table: FEMA – Executive Order (EO) 11988 – Many project components will be built inside FEMA designated 100-year flood zones. Development inside a floodplain still requires consultation with FEMA or a designated county Floodplain Administrator. Also, please follow all recommendation made by consultation or permitting agencies.

FA4-9

State Historic Preservation Officer (SHPO) consultation; page 4-179:

The northern portion of the Delfin Onshore Facility (DOF) has artifacts that may be eligible for National Register of Historic Places (NRHP). The Draft EIS says if avoidance isn't possible, then a Memorandum of Understanding (MOU) would need to be developed. It should be determined as quickly as possible if avoidance is possible. USCG or MARAD should make a determination if the site is eligible and submit to the SHPO for concurrence. If eligible, then an avoidance plan should be put in place. If this is not possible then an MOU needs to be developed immediately, not later, and put in the Final EIS.

Recommendation: EPA recommends determining if the site is eligible for inclusion on the NRHP, and developing an avoidance plan. If this is not possible, then an MOU should be developed.

IMPACTS

FA4-10

Cumulative Impacts; page ES-4:

The Draft EIS discussed purchasing a building from the Johnson Bayou Recreation District and constructing the District a new building at a different location. Delfin LNG would also construct a new warehouse. The new warehouse and construction of a new building for the Recreation District were not discussed in other sections of the Draft EIS.

Recommendation: Disclose the impacts tied to the construction of a new building for the recreation district and construction of a new warehouse for Delfin LNG.

FA4-11

Potential Impacts; page 2-12:

Section 2.2.9 says that project construction wouldn't require any new pipe yards or laydown areas. This contradicts information on page 2-17 that states "Prior to construction, all aboveground facility footprints and required additional temporary workspace would be cleared of any large obstacles such as trees, boulders, logs, etc. Timber and other suitable vegetative

3

FA4-8 USCG issued a data gap to Delfin LNG regarding construction within the FEMA 100-year flood zones and the status of coordination/outreach with FEMA and/or the designated county Floodplain Administrator. Table 1.5-1 includes information regarding the Floodplain Development Authorization Permit which would fulfill Delfin LNG's obligations under EO 11988. Executive Order 11988 is addressed in Section 4.11.4.

FA4-9 FERC issued a data gap to Delfin LNG regarding potential cultural resource sites at the proposed DOF. Delfin LNG has submitted to the SHPO a request for determination regarding the need for additional cultural resources survey of the right-of-way, and has provided an avoidance plan that would be implemented to protect Site 16CM84. Text in Section 4.14.1 has been edited.

FA4-10 USCG issued two data gaps to Delfin LNG regarding the current status of negotiations with the Johnson Bayou Recreation District on the sale of the Community Center and construction of a new building. Delfin LNG responded that no specific location has been selected although they continue to actively engage with the Johnson Bayou Recreation District. The new location would be located on an approximately 1-2 acre parcel. Additional information regarding the re-use of the Community Center has been added to Section 2.2.8.2 of the final EIS.

FA4-11 Text has been clarified as recommended.

FA4

debris would be chipped and utilized as mulch for erosion control or disposed of per landowner requirements or in accordance with applicable local regulations. Once large obstacles are removed from the construction workspace, the site would be graded to create a level working surface to allow the safe passage of construction equipment."

Recommendation: Please clarify if there will be temporary or permanent land clearing, grading, or landscape modification that is outside of the impact assessment footprint associated with the DOF. If so, include a robust discussion of the impacts of habitat modification.

FA4-12 Impacts to protected species; page 4-39, 4-46, 4-61:

The Draft EIS states use of thrusters may result in a Level A taking of sea turtles and marine mammals since noise levels will exceed level A acoustic thresholds. The EIS states this effect will be mitigated, but does not offer any specifics as to how this will occur. Pile driving noise is expected to result in level A take for sea turtles and marine mammals protected under the marine mammal protection act (MMPA). The use of LNGC's will have operational noise that will result in long-term, moderate, and direct adverse impacts and will result in level A take on MMPA species and level B take on sea turtles.

The Draft EIS states that "hundreds of thousands" of birds die every year as a result of marine lighting. The EIS states that mitigation measures will be used to reduce the incidence of migratory bird treaty act (MBTA) species dying as a result of marine lighting. The Draft EIS does not say how many fewer birds will die, if there's an acceptable number of birds that can be killed each year, or how the effects from mitigation will be measured.

Recommendation: Follow all recommendation made by federal and state consulting agencies regarding protection of species. Clarify how these effects are expected to be mitigated, and explain how the mitigation will be monitored. Explain what will occur if the mitigation does not have the desired effect. EPA recommends all consultations for protected species be completed prior to the release of the Final EIS.

CLIMATE

FA4-13 Greenhouse Gas Emissions:

The DEIS included a helpful discussion of the greenhouse gas (GHG) emissions associated with construction, operation and decommissioning of the project, but did not include estimates of the GHG emissions associated with the production, transport, and combustion of the natural gas proposed to be exported. Because of the global nature of climate change, even where the ultimate end use of the natural gas occurs outside the U.S., these additional GHG emissions attributable to the project would affect the U.S. Because of these impacts, it is appropriate and consistent with NEPA and CEQ regulations to consider and disclose the emissions levels in NEPA analyses.

DOE has issued two documents that are helpful in assessing the GHG emissions implications of the project. They are the "Addendum to Environmental Review Documents

4

FA4-12 Text has been revised to clarify that all recommendation made by federal and state consulting agencies regarding protection of species would be followed. As discussed in Sections 4.3.4.1 and 4.3.10, BMP-15 addresses the measures Delfin LNG will implement to reduce impacts to birds due to lighting.

FA4-13 After additional discussion with USEPA, it has been determined that no further action is required at this time.

FA4 U.S. Environmental Protection Agency (cont'd)

FA4

FA4-13 (con't) Concerning Exports of Natural Gas from the United States."[1] and NETL's report, entitled "Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States."[2] Together, these reports provide a helpful overview of GHG emissions from all stages of a project, from production through transmission and combustion. The NETL report includes comparative analysis of GHG emissions associated with other domestic fuel sources and LNG exports as they relate to other possible fuel sources in receiving regions. This information can help decision makers review foreseeable GHG emissions associated with the increased production and export of natural gas compared to other possible fuels. EPA recommends that both DOE reports be considered as part of the decision making process for this project and incorporated by reference in the final EIS. In addition, we recommend that you consider adapting DOE's analysis to more specifically consider the GHG implications of projects.

Lastly, EPA recommends that USCG and MARAD follow the approach outlined by the CEQ's Guidance[3] regarding the analysis of GHG emissions and climate change.

FA4-14 **ENVIRONMENTAL JUSTICE**

- EPA recommends that the USCG determine the cumulative impacts that the project will have on overburdened communities. For example, if the Environmental Justice community/population is already having health issues due to high level of air pollutants, determine if the project will have an adverse impact on the air quality in that area.
- EPA, with the Interagency Working Group on Environmental Justice, has issued Promising Practices for EJ Methodologies in NEPA Reviews. *See* https://www.epa.gov/environmentaljustice/ej-iwg-promising-practices-ej-methodologies-nepa-reviews. We recommend that the USCG consider and apply, as appropriate, these considerations.

GENERAL COMMENTS

FA4-15
- There are several areas within Chapter 3 of the Draft EIS which state the project will need a NPDES permit issued by the U.S. Army Corps of Engineers. The EPA is responsible for issuing NPDES permits in offshore waters. Please correct the typo throughout the EIS.

[1] Draft Addendum to Environmental Review Documents Concerning Exports of Natural Gas from the United States. DOE. (http://energy.gov/sites/prod/files/2014/05/f16/Addendum_0.pdf).
[2] Life Cycle Greenhouse Gas Perspective on Exporting Liquefied Natural Gas from the United States. DOE/NETL-2014/1649 (http://energy.gov/fe/life-cycle-greenhouse-gas-perspective-exporting-liquefied-natural-gas-united-states).
[3] *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*. August 1, 2016 (https://ceq.doe.gov/current_developments/ceq_guidance_nepa-ghg-climate_final_guidance.html).

5

FA4-14 As stated in Section 3.18.6.6 of the final EIS, the cities of Lake Charles, Louisiana and Port Arthur, Texas have racial minority populations that are meaningfully greater than the states of Louisiana and Texas; therefore, these cities could be considered environmental justice communities. Regarding air quality for any potentially overburdened communities near the Project, section 3.16.5.2 of the final EIS evaluates existing air quality in the vicinity of the proposed DOF. Cameron Parish is designated as attainment or unclassifiable for all NAAQS, and recent background ambient monitoring data in Table 3.16-1 confirms compliance with all NAAQS. Section 4.16.2.2 summarizes the results of air quality dispersion modeling for the DOF, which demonstrates that the Project will not contribute significantly to any violation of the NAAQS.

FA4-15 Typo has been corrected throughout the final EIS.

STATE AGENCIES

SA1 State of Louisiana Department of Natural Resources

JOHN BEL EDWARDS
GOVERNOR

SA1
THOMAS F. HARRIS
SECRETARY

State of Louisiana

DEPARTMENT OF NATURAL RESOURCES

OFFICE OF COASTAL MANAGEMENT

August 3, 2016

Daniel P. Werner, Chief Operating Officer
Delfin LNG LLC
1100 Louisiana Street, Suite 3550
Houston, TX 77002
Via email: d.werner@fairwoodlng.com

RE: **C20150057,** Coastal Zone Consistency
Delfin LNG LLC
United States Coast Guard
Federal License or Permit
Delfin LNG Offshore Terminal
Offshore, Louisiana

Dear Mr. Werner:

SA1-1 The above referenced project has been reviewed for consistency with the approved Louisiana Coastal Resources Program (LCRP) as required by Section 307 of the Coastal Zone Management Act of 1972, as amended. The project, as proposed in the application, is consistent with the LCRP. However, if any changes are made to the plans before or during construction and operation of the facility, a modification request must be submitted for consistency review.

If you have any questions concerning this determination please contact Jim Bondy of the Consistency Section at (225) 342-3870 or James.Bondy@la.gov.

Sincerely yours,

/S/ Don Haydel
Acting Administrator
Interagency Affairs/Field Services Division

DH/SK/jab

cc: C. E. Boreland, USCG
Roddy Bachman, USCG
Yvette M. Fields, MARAD
Linden Houston, MARAD
Janine Cefalu, FERC
Martin Mayer, COE-NOD
Dave Butler, LDWF
Rod Pierce, OCM FI
Kara Bonsall, Cameron Parish
Bill Daughdrill, Delfin LNG
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SA1-1 Thank you for your comment. Text has been added to section 4.11.2 to reflect the LDNR Office of Coastal Management consistency determination letter.

COMPANIES AND ORGANIZATIONS

CO1 The Center for Biological Diversity

CO1

CENTER for BIOLOGICAL DIVERSITY Because life is good.

Via Regulations.gov and Electronic Mail

August 29, 2016

Yvette M. Fields, Director,
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RE: **Delfin LNG Deepwater Port License Application Draft Environmental Impact Statement, Docket No. USCG-2015-0472**

Dear Ms. Fields and Mr. Bachman:

The Center for Biological Diversity (the "Center") submits the following comments to the Maritime Administration and the U.S. Coast Guard (collectively, "MARAD") on the Draft Environmental Impact Statement ("EIS") for the Deepwater Port License Application of Delfin LNG, LLC (the "Proposed Project").[1] If authorized, the Proposed Project would be the first offshore floating LNG export facility in the United States, and would export the equivalent of over 657 billion standard cubic feet per year of natural gas in the form of LNG for at least 20 years. The tremendous environmental and climate impacts and risks associated with the Proposed Project demonstrate that it is not in the national interest or consistent with national policy goals. The Center therefore urges MARAD to adopt the no-action alternative and deny the license application.

CO1-1

At the very least, MARAD must substantially revise its Draft EIS and reissue the document for public comment. MARAD's Draft EIS fails to adequately define the purpose and need for the Proposed Project; fails to take a "hard look" at the impacts of its proposal by failing to adequately consider the harms from wastewater discharges, air pollution, noise, ship strikes,

[1] 80 Fed. Reg. 46,157 (July 15, 2016).

Alaska · Arizona · California · Florida · Minnesota · Nevada · New Mexico · New York · Oregon · Vermont · Washington, DC
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Phone: 510-844-7100 x 337 · Fax: 510-844-7150 · kmonsell@biologicaldiversity.org

CO1-1 Thank you for your comment.

CO1

CO1

and accidents; fails to consider a reasonable range of alternatives; and fails to adequately consider cumulative impacts or impacts to environmental justice communities. The Draft EIS also fails to consider the impacts from the attendant increase in natural gas drilling and the use of inherently dangerous practices such as fracking; and fails to analyze the societal costs of greenhouse gas emissions from the Proposed Project. In short, the Draft EIS is woefully inadequate and fails to comply with the National Environmental Policy Act ("NEPA").

CO1-2

CO1-3

In addition, the Draft EIS makes clear that MARAD cannot approve the Proposed Project unless and until formal Section 7 consultation under the Endangered Species Act ("ESA") is completed.[2] Such action is necessary to ensure that MARAD's approval of the Proposed Project will not jeopardize the continued existence of any threatened or endangered species or adversely modify their critical habitat.[3]

CO1-4

I. MARAD Should Reject the License Application Because it is Not in the National Interest or Consistent with National Policy Goals

The Deepwater Port Act authorizes the construction and operation of deepwater ports, but only if MARAD finds that construction and operation of the port is "in the national interest" and consistent with "national policy goals" including "environmental quality."[4] Any proposed project that does not meet these standards must be denied.[5]

The Center strongly believes that the Proposed Project's construction and operation, including the export of U.S. natural gas abroad, is *not* in the "national interest" and would be *inconsistent* with "national policy goals," including "environmental quality" and efforts to combat climate change. As described in more detail below, the Proposed Project will: (1) increase natural gas drilling in the United States, including the use of dangerous, controversial, and inadequately-regulated onshore and offshore hydraulic fracturing or "fracking" methods; (2) harm wildlife and habitat and diminish air and water quality; (3) increase global warming due to emissions from wells, the energy intensive process of liquefying natural gas, and the ultimate use of the product; and (4) cause an increase in domestic gas prices for American homeowners. MARAD should therefore deny the license application.

A. The Proposed Project is Inconsistent With the National Interest and National Policy Goals of Combating Dangerous Climate Change

Climate change, driven primarily by the combustion of fossil fuels, poses a severe and immediate threat to the health, welfare, ecosystems, and economy of the United States and the world. Numerous authoritative scientific assessments have established that climate change is causing grave harms to human society and natural systems, and these threats are becoming increasingly dangerous. The Intergovernmental Panel on Climate Change ("IPCC"), in its 2014 Fifth Assessment Report, stated that: "Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The

[2] 16 U.S.C. § 1536
[3] *Id.* § 1536(a)(2).
[4] 33 U.S.C. § 1503(c)(3).
[5] *See id.*; 33 C.F.R. § 148.710(a)(1).

CO1 The Center for Biological Diversity (cont'd)

CO1-2 Thank you for your comment.

CO1-3 Thank you for your comment.

CO1-4 Thank you for your comment.

CO1

CO1-4 (con't)

atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased" and that "[r]ecent climate changes have had widespread impacts on human and natural systems."[6] The 2014 Third National Climate Assessment, prepared by a panel of non-governmental experts and reviewed by the National Academy of Sciences and multiple federal agencies similarly stated: "That the planet has warmed is 'unequivocal,' and is corroborated though multiple lines of evidence, as is the conclusion that the causes are very likely human in origin"[7] and "[i]mpacts related to climate change are already evident in many regions and are expected to become increasingly disruptive across the nation throughout this century and beyond."[8] The United States National Research Council similarly concluded that: "[c]limate change is occurring, is caused largely by human activities, and poses significant risks for—and in many cases is already affecting—a broad range of human and natural systems."[9]

And in finding that climate change endangers public health and welfare, the U.S. Environmental Protection Agency acknowledged the overwhelming evidence of the documented and projected effects of climate change upon the nation:[10]

Effects on air quality: "The evidence concerning adverse air quality impacts provides strong and clear support for an endangerment finding. Increases in ambient ozone are expected to occur over broad areas of the country, and they are expected to increase serious adverse health effects in large population areas that are and may continue to be in nonattainment. The evaluation of the potential risks associated with increases in ozone in attainment areas also supports such a finding."

Effects on health from increased temperatures: "The impact on mortality and morbidity associated with increases in average temperatures, which increase the likelihood of heat waves, also provides support for a public health endangerment finding."

Increased chance of extreme weather events: "The evidence concerning how human induced climate change may alter extreme weather events also clearly supports a finding of endangerment, given the serious adverse impacts that can result from such events and the increase in risk, even if small, of the occurrence and intensity of events such as hurricanes and floods. Additionally, public health is expected to be adversely affected by an increase in the severity of coastal storm events due to rising sea levels.

Impacts to water resources: "Water resources across large areas of the country are at serious risk from climate change, with effects on water supplies, water quality, and adverse

[6] IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.
[7] Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: Climate Change Impacts in the United States: The Third National Climate Assessment (U.S. Global Change Research Program), doi:10.7930/J0Z31WJ2 at 61 (quoting IPCC, 2007: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change Cambridge University Press).
[8] Third National Climate Assessment at 10.
[9] National Research Council, Advancing the Science of Climate Change (2010), available at www nap.edu. at 2.
[10] EPA, Final Endangerment Finding, 74 Fed. Reg. 66,496 (Dec. 15, 2009).

CO1

CO1-4 (con't)

effects from extreme events such as floods and droughts. Even areas of the country where an increase in water flow is projected could face water resource problems from the supply and water quality problems associated with temperature increases and precipitation variability, as well as the increased risk of serious adverse effects from extreme events, such as floods and drought. The severity of risks and impacts is likely to increase over time with accumulating greenhouse gas concentrations and associated temperature increases."

Impacts from sea level rise: "The most serious potential adverse effects are the increased risk of storm surge and flooding in coastal areas from sea level rise and more intense storms. Observed sea level rise is already increasing the risk of storm surge and flooding in some coastal areas. The conclusion in the assessment literature that there is the potential for hurricanes to become more intense (and even some evidence that Atlantic hurricanes have already become more intense) reinforces the judgment that coastal communities are now endangered by human-induced climate change, and may face substantially greater risk in the future. Even if there is a low probability of raising the destructive power of hurricanes, this threat is enough to support a finding that coastal communities are endangered by greenhouse gas air pollution. In addition, coastal areas face other adverse impacts from sea level rise such as land loss due to inundation, erosion, wetland submergence, and habitat loss. The increased risk associated with these adverse impacts also endangers public welfare, with an increasing risk of greater adverse impacts in the future."

Impacts to energy, infrastructure, and settlements: "Changes in extreme weather events threaten energy, transportation, and water resource infrastructure. Vulnerabilities of industry, infrastructure, and settlements to climate change are generally greater in high-risk locations, particularly coastal and riverine areas, and areas whose economies are closely linked with climate-sensitive resources. Climate change will likely interact with and possibly exacerbate ongoing environmental change and environmental pressures in settlements, particularly in Alaska where indigenous communities are facing major environmental and cultural impacts on their historic lifestyles."

Impacts to wildlife: "Over the 21st century, changes in climate will cause some species to shift north and to higher elevations and fundamentally rearrange U.S. ecosystems. Differential capacities for range shifts and constraints from development, habitat fragmentation, invasive species, and broken ecological connections will likely alter ecosystem structure, function, and services, leading to predominantly negative consequences for biodiversity and the provision of ecosystem goods and services."

The IPCC's Fifth Assessment Report on Climate Change Impacts, Adaptation, and Vulnerability similarly summarizes the state of scientific research on foreseeable impacts to marine systems and reaches the following conclusions:

> Due to projected climate change by the mid-21st century and beyond, global marine-species redistribution and marine-biodiversity reduction in sensitive regions will challenge the sustained provision of fisheries productivity and other ecosystem services (*high confidence*). Spatial shifts of marine species due to projected warming will cause high-latitude invasions and high local-extinction

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CO1-4 (con't)

rates in the tropics and semi-enclosed seas (*medium confidence*). Species richness and fisheries catch potential are projected to increase, on average, at mid and high latitudes (*high confidence*) and decrease at tropical latitudes (*medium confidence*). . . . The progressive expansion of oxygen minimum zones and anoxic "dead zones" is projected to further constrain fish habitat. Open-ocean net primary production is projected to redistribute and, by 2100, fall globally under all RCP scenarios. Climate change adds to the threats of over-fishing and other non-climatic stressors, thus complicating marine management regimes (*high confidence*).

For medium- to high-emission scenarios (RCP 4.5, 6.0, and 8.5), ocean acidification poses substantial risks to marine ecosystems, especially polar ecosystems and coral reefs, associated with impacts on the physiology, behavior, and population dynamics of individual species from phytoplankton to animals (*medium to high confidence*). Highly calcified mollusks, echinoderms, and reef-building corals are more sensitive than crustaceans (*high confidence*) and fishes (*low confidence*), with potentially detrimental consequences for fisheries and livelihoods. . . . Ocean acidification acts together with other global changes (e.g. warming, decreasing oxygen levels) and with local changes (e.g. pollution, eutrophication) (*high confidence*). Simultaneous drivers, such as warming and ocean acidification, can lead to interactive, complex, and amplified impacts for species and ecosystems.[11]

In recognition of these threats, the Paris Agreement—adopted by nearly 200 countries, including the United States, on December 12, 2015—codifies the international, scientific consensus that climate change is an "*urgent and potentially irreversible threat to human societies and the planet* and thus requires the widest possible cooperation by all countries."[12] Accordingly, the Paris Agreement commits all signatories to hold the long-term global average temperature "to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels."[13] Immediate and aggressive greenhouse gas emissions reductions are necessary to keep warming below a 1.5° or 2°C rise above pre-industrial levels.[14]

Put simply, there is only a finite amount of carbon dioxide ("CO2") that can be released into the atmosphere without rendering the goal of meeting the 1.5°C (or even a 2°C) target virtually impossible. Globally, proven fossil fuel reserves, let alone additional recoverable

[11] IPCC, 2014: Summary for Policymakers 17, in: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1-32.
[12] Paris Agreement, Decision, Art. 4(3); Recitals.
[13] *Id.*, Art. 2 (emphasis added).
[14] *See e.g.*, EPA, Endangerment Finding, 74 Fed. Reg. 66,496, (Dec. 15, 2009) (detailing the detrimental effects of climate change); The Third National Climate Assessment (same).

CO1

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resources,[15] if extracted and burned, would release enough CO2 to exceed this limit several times over.[16] Consequently, the vast majority of fossil fuels must remain in the ground.

Yet, as explained in further detail below, numerous reports demonstrate that new exports of LNG will lead to an increase in drilling and fracking for natural gas. In fact, these reports demonstrate that 60 to nearly 90 percent of the LNG to be exported will be supplied by increases in domestic production.[17]

Increased production of natural gas has and will continue to increase greenhouse gas ("GHG") emissions, including methane. Methane is a massively more potent GHG than carbon dioxide and is released at all stages of the exploration, extraction, refinement, liquidification, transportation, and burning processes of natural gas. One 2014 study showed that, while the use of natural gas may rise by as much as 170 percent by 2050, this rise alone will only reduce carbon dioxide emissions by, at most, 11 percent.[18] In fact, the majority of projection models used in the study found up to *a 7 percent increase* in human "climate forcing" with the increased use of natural gas.[19] This study concluded that increased market penetration of natural gas was not an alternative to, or means of, climate change mitigation.[20]

Nevertheless, MARAD's analysis does not discuss induced drilling; life-cycle GHG emissions for the natural gas that will be transported, liquefied, and burned as a result of the Proposed Project; or how its proposal can possibly be consistent with the Paris Agreement or efforts to limit warming to 1.5°C or 2°C to avert the worst impacts of climate change. Indeed, MARAD's analysis wholly fails to consider whether the Proposed Project is in the national interest and consistent with national policy goals in the context of climate change and the need to rapidly transition to clean, sustainable energy. Such a failure clearly violates the hard look requirements of NEPA.

B. The Proposed Project Will Negatively Impact the Nation's Economic Interests

Exporting natural gas will have negative impacts on the country's economy for multiple reasons. The U.S. Energy Information Administration ("EIA"), for example, has projected that an increase in natural gas exports would cause a 4 to 11 percent increase in domestic natural gas prices.[21] This would cause an increase of at least $7 billion of costs for residential, commercial, and industrial consumers per year by 2020 and up to $14 billion per year by 2040.[22]

[15] *See* Whitney, Gene *et al.*, Cong. Research Serv., R40872, U.S. Fossil Fuel Resources: Terminology, Reporting and Summary 4-5 (2010).
[16] *See, e.g.*, IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change at 64 & Table 2.2 [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)] at 63-64 & Table 2.2.
[17] EIA, Effect of Increased Natural Gas Exports on Domestic Energy Markets, p.6, 11 (Jan. 19, 2012); EIA, Effect of Increased Natural Gas Exports on U.S. Energy Markets, p. 12 (Oct. 2014); Application of Delfin LNG LLC For Long-Term Authorization to Export LNG to Non-Free Trade Agreement Countries (Nov. 12, 2013) at 20.
[18] See Haewon McJeon, et al., Limited Impact on Decadale-Scale Climate Change From Increased Use of Natural Gas, 514 NATURE 482, 482 (Oct. 23, 2014).
[19] *Id.*
[20] *Id.*
[21] See Allison Cassady, Potential Consumer Price Impacts of Efforts to Rapidly Expand Exports of Liquified Natural Gas, Issues, Energy and Environment, AMERICANPROGRESS.ORG (Jan. 27, 2015)

CO1 The Center for Biological Diversity (cont'd)

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CO1-4 (con't)

Further, responding to the effects of climate change—increased storm damages, sea level rise, drought, crop failure, flooding, increased wildfires—has already cost the federal government a significant amount of money. For example, in his recent fiscal year 2016 budget proposal, President Obama cited direct costs of $300 billion over the past decade due to extreme weather and wildfires alone.[23] Specifically, $176 billion was spent on domestic disaster response and relief; $24 billion on flood insurance; $61 billion on crop insurance; and $34 billion on wildfire management.[24] These numbers are expected to rise dramatically over the coming years. In a review of a number of scientific studies, the Government Accountability Office found a predicted increase of 14 to 47 percent in inflation-adjusted U.S. hurricane losses alone by 2040.[25] By 2100, losses are projected to rise up to 110 percent.[26] And these costs could be amplified by a major event or a series of major events "affect[ing] the solvency of an industry, municipality, or State."[27] MARAD should therefore deny Delfin LNG's license application.

CO1-5

II. MARAD's Draft EIS Fails to Comply with NEPA

MARAD's Draft EIS fails to comply with NEPA in several respects. The Draft EIS fails to properly define the purpose and need for the Proposed Project; fails to examine a reasonable range of alternatives to the Proposed Project; fails to adequately consider the direct, indirect, and cumulative impacts from wastewater discharges, air pollution, noise, ship strikes, and accidents; fails to consider the myriad harmful impacts from induced natural gas production; fails to analyze the societal costs of the greenhouse gas emissions to be emitted during construction and operation of the Proposed Project; and fails to adequately analyze the cumulative impacts or impacts to environmental justice communities. Accordingly, MARAD must substantially revise the Draft EIS and reissue a draft document for public review and comment. Its failure to do so would be a clear violation of NEPA.

A. MARAD's Purpose and Need is Too Narrow

NEPA's implementing regulations provide that an environmental document must specify the underlying purpose and need to which the agency is responding in proposing the alternative including the proposed action.[28] This purpose and need inquiry is crucial for a sufficient environmental analysis because "[t]he stated goal of a project necessarily dictates the range of 'reasonable' alternatives."[29] Thus, "an agency cannot define its objectives in unreasonably narrow terms" without violating NEPA.[30] Accordingly, an agency must exercise independent

https://www.americanprogress.org/issues/green/report/2015/01/27/105441/potential-consumer-price-impacts-ofefforts-to-rapidly-expand-exports-of-liquefied-natural-gas/.
[22] *See id.*
[23] See Office of the President, Budget of the United States Government, Fiscal Year 2016 353 (Feb. 2, 2015) http://www.whitehouse.gov/sites/default/files/omb/budget/fy2016/assets/ap_24_climate_risk.pdf.
[24] *Id.*
[25] *Id.* at 354.
[26] *Id.*
[27] *Id.*
[28] 40 C.F.R. § 1502.13.
[29] *Carmel-by-the-Sea v. U.S. Dep't of Transp.*, 123 F.3d 1142, 1155 (9th Cir. 1997).
[30] *Id.*; *see also* 40 C.F.R. § 1502.5 (analysis must "not be used to rationalize or justify decisions already made").

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CO1-5 Thank you for your comment. The final EIS addresses the topics of concern in the following sections:

- Purpose and need: Section 1.2;
- Alternatives: Section 2.3 and throughout Section 4;
- Socioeconomics: Section 4.18;
- Cumulative impacts: Section 6; and
- Greenhouse gas: Sections 4.9.5 and 4.16.5.

Regarding the comment on induced natural gas production, please see text in Section 1.4.

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judgment in defining the purpose and need of a project and cannot rely exclusively on the statements and opinions of the applicant.[31]

CO1-6

The statement of purpose and need in MARAD's Draft EIS is entirely inadequate. Instead of exercising its own independent judgment as to the reasons for the proposal, MARAD simply repeats Delfin LNG's definition of the purpose and need of the project as building the facility as proposed in order to export LNG abroad. Adopting such an unreasonably narrow purpose and need rigs the analysis in the applicant's favor because MARAD necessarily considered an unreasonably narrow range of reasonable alternatives. Moreover, it suggests that MARAD defined the purpose and need in such a manner in order to rationalize its pre-determined decision to grant Delfin LNG's deepwater port license. In other words, such a narrow definition of purpose and need leaves the preferred alternative—granting the license as requested—as the only method for achieving the stated goals.

As the federal agency charged with ensuring the protection of the marine and coastal environment from harms associated with deepwater ports, MARAD instead should have focused its purpose and need inquiry on objectives that comport with its duties under the Deepwater Port Act, rather than on the interests of the applicant.[32] This is particularly true given that Congress established the Deepwater Port Act to promote the establishment of *import* facilities, not *export* facilities.[33]

B. MARAD's Draft EIS Fails to Take a Hard Look at the Impacts of the Proposed Project on the Marine and Coastal Environment

While MARAD's Draft EIS acknowledges potential harmful impacts from the Proposed Project, including air pollution, water pollution, noise, ship strikes, and accidents, the Draft EIS fails to take a hard look at the impacts of those threats on the marine and coastal environment.

CO1-7

1. *The Draft EIS Fails to Take a Hard Look at Harmful Impacts from Air Pollution*

The Proposed Project will emit harmful carbon monoxide, NOx, volatile organic chemicals ("VOCs"), SOx, particulate matter (PM10 and PM2.5), and hydrogen sulfide pollution. These emissions will harm the environment by increasing the formation of ground level ozone. VOCs and NOx contribute to the formation of ground-level ozone, also referred to as smog. Smog pollution harms the respiratory system and has been linked to premature death, heart failure, chronic respiratory damage, and premature aging of the lungs.[34] Smog may also

[31] *See Simmons v. U.S. Army Corps of Eng'rs*, 120 F.3d 664, 669 (7th Cir. 1997) ("an agency cannot restrict its analysis to those alternative means by which a particular applicant can reach his goals. . . [an agency] has the duty under NEPA to exercise a degree of skepticism in dealing with self-serving statements from a prime beneficiary of the project").
[32] *See Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1991) (observing that "agencies must look hard at the factors relevant to the definition of purpose," including the views of Congress in authorizing the agency to act, and define goals accordingly).
[33] *See* 33 U.S.C. § 1501(a)(5).
[34] EPA, *Proposed New Source Performance Standards and Amendments to the National Emissions Standards for Hazardous Air Pollutants for the Oil and Natural Gas Industry: Regulatory Impact Analysis*, 4-25 (July 2011),

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CO1 The Center for Biological Diversity (cont'd)

CO1-6 Thank you for your comment. Purpose and need has been adequately addressed in Section 1.2. The licensing process and statutory considerations are outlined in Section 1.1.

CO1-7 The final EIS does evaluate air quality impacts for both the offshore and onshore components of the proposed Project. This evaluation includes not only those air emissions that will be subject to EPA air permitting, but also air emissions from non-stationary sources that will not be included in an air permit. Focusing in particular on the offshore component, Section 4.9 quantifies offshore air pollutant emissions during construction, operation, and decommissioning, including emissions from marine vessels during both construction and operation. Section 4.9.2.2 presents results of air dispersion modeling for operation of the offshore facility, including emissions from LNGCs visiting the port, and tugboats used to assist LNGCs during maneuvering. This modeling also included potential emissions from existing nearby offshore platforms. The modeling results demonstrate that offshore operating emissions will comply with all NAAQS established for protection of the environment and human health. As discussed in section 4.16, onshore emissions of NOx, CO, SO2, PM10, PM2.5, VOCs and CO2e from construction and operation of the DOF were also evaluated, and found to comply with all NAAQS.

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CO1-7 (con't)

exacerbate existing respiratory illnesses, such as asthma and emphysema, or cause chest pain, coughing, throat irritation and congestion. Significant ozone pollution also damages plants and ecosystems.[35] Ozone also contributes substantially to global climate change over the short term. According to a recent study by the United Nations Environment Programme, behind carbon dioxide and methane, ozone is now the third most significant contributor to human-caused climate change.[36]

PM causes a wide variety of health and environmental impacts. PM has been linked to respiratory and cardiovascular problems, including coughing, painful breathing, aggravated asthma attacks, chronic bronchitis, decreased lung function, heart attacks, and premature death. Sensitive populations, include the elderly, children, and people with existing heart or lung problems, are most at risk from PM pollution. PM also reduces visibility,[37] and may damage important cultural resources.[38] Black carbon, a component of PM emitted by combustion sources such as flares and older diesel engines, also warms the climate and thus contributes to climate change.[39]

LNG tankers and the security vessels that accompany them are required to run their engines during the entire cargo loading cycle, spewing exhaust and air pollutants that would impact surrounding communities. LNG tankers emit substantial amounts of air pollutants, including SOx, NOx, and PM that can cause serious human health impacts.[40] Environmental impacts of these pollutants are also serious and include nitrogen nutrient loading, acidification, smog caused by NOx and other precursor gases, and changes in visibility.[41] Ships also emit substantial amounts of greenhouse gases. Marine shipping was responsible for 3.6 percent of the United States' black carbon emissions in 2002,[42] and shipping is responsible for all black carbon released over the oceans.[43] All of these pollutants contribute to the ongoing and increasing impacts of global climate change and ocean acidification.

While MARAD admits that the Proposed Project will generate air pollution from ships, operation of the facility, and other sources, it largely ignores the impacts to water quality, marine life, and human health that will result from such pollution because air emissions are regulated by

http://www.epa.gov/ttnecas1/regdata/RIAs/oilnaturalgasfinalria.pdf; Jerrett *et al.*, *Long-Term Ozone Exposure and Mortality*, New England Journal of Medicine (Mar. 12, 2009).

[35] *Id.*

[36] *Id. See also* United Nations Environment Programme and World Meteorological Organization, (2011): *Integrated Assessment of Black Carbon and Tropospheric Ozone: Summary for Decision Makers* at 7, available at http://www.unep.org/dewa/Portals/67/pdf/Black_Carbon.pdf.

[37] EPA, *Visibility – Basic Information*, https://www.epa.gov/visibility/visibility-basic-information.

[38] *See* EPA, Particulate Matter, Health West Tavaputs EIS, at 3-19.

[39] UNEP Report at 6; IPCC (2007) at Section 2.4.4.3.

[40] *See* Proposal to Designate an Emission Control Area of Nitrogen Oxides, Sulphur Oxides and Particulate Matter, International Maritime Organization, Marine Environment Protection Committee, Submitted by the United States and Canada (Apr. 2009).

[41] *Id.*

[42] Battye, W. and K. Boyer. Methods for Improving Global Inventories of Black Carbon and Organic Carbon Particulates, Report No. 68-D-98-046. Prepared for U.S. EPA by EC/R Inc. (2002), http://www.epa.gov/ttn/chief/conference/ei11/ghg/battye.pdf.

[43] Reddy, M. Shekar and O. Boucher. Climate impact of black carbon emitted from energy consumption in the world's regions. *Geophysical Research Letters* 34: L11802 (2006).

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CO1-7 (con't) the Clean Air Act. But NEPA clearly obligates MARAD to look at *all* environmental impacts, and an agency cannot excuse itself from its NEPA hard look duty because a "facility operates pursuant to a. . . permit" or because the impacts have been discussed in a non-NEPA document.[44]

CO1-8

2. The Draft EIS Fails to Take a Hard Look at the Impacts from Water Pollution

Ballast water is taken on by vessels to increase the water draft, change the trim, regulate the stability, or maintain stress loads within acceptable operational limits. This may lead to the unintentional transportation of non-native invasive species ("NIS"), which can be released into ports when ballast water is discharged. In cases where these species invade ecosystems, they may alter aquatic and marine ecosystems and biodiversity, impact commercial and recreational fisheries, cause infrastructure damage, contribute to potential risks to human health, and generally create detrimental economic impacts.[45]

According to the U.S. Coast Guard, ballast water discharge is a major pathway for NIS introduction from vessels operating in or entering waters of the United States. Studies have shown that the rate of NIS introductions to waters of the United States is an increasing problem.[46] Ballast water could transport invasive species, facilitate movement of pathogens, or increase the incidence of harmful algal blooms, which can kill marine mammals.[47] The introduction and establishment of organisms into a new environment is so complex and full of variability and uncertainty that it has been compared to a game of "ecological roulette."[48] Furthermore, introduced NIS have been cited as the second largest threat to endangered species after habitat loss.[49] Therefore, the increased ship traffic associated with the Proposed Project could pose a threat to the several threatened and endangered species in the region.

These impacts may be exacerbated by climate change. Increasing winter water temperatures in the mid and high latitudes can provide more favorable conditions for invasive species to become established. This can be compounded by greater competitive advantage of introduced species compared to native species.

In addition, the Proposed Project would involve the intake of roughly 12 million gallons of seawater per day.[50] MARAD acknowledges that this could result in the death or injury of several marine species, including jelly fish and plankton, but fails to take a hard look at the impacts of the intake on these species. For example, the Draft EIS wholly fails to quantify the

[44] *S. Fork Band of W. Shoshone v. U.S. Dep't of Interior*, 588 F.3d 718, 726 (9th Cir. 2009).
[45] *See* Programmatic Environmental Assessment for Ballast Water Management Program for United States Waters. U.S. Department of Homeland Security, USCG, Washington, DC.
[46] Ruiz, G. M., et al., 2000, Global Spread of Microorganisms by Ship, *Nature* 408: 49–50.
[47] Gulland, F.M.D., and A.J. Hall, 2007, Is marine mammal health deteriorating? Trends in the global reporting of marine mammal disease, *Ecohealth* 4:135–50.
[48] Carlton, J. T. and J. B. Geller, 1993, Ecological Roulette: The Global Transport of Nonindigenous Marine Organisms, *Science*, 261: 78–82.
[49] Wilcove, D. S., and L. Y. Chen., 1998, Management Costs for Endangered Species, *Conservation Biology* 12(6): 1405–7.
[50] Draft EIS at 4-12.

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CO1 The Center for Biological Diversity (cont'd)

CO1-8 Thank you for your comment. Please refer to section 4.3.6.2. Most oceangoing vessels carry marine organisms within their ballast tanks and encrusted on their hulls. However, ballast water discharge is regulated by the USCG under the National Invasive Species Act and related regulations; LNGCs are not unique in carrying nonindigenous organisms. LNGCs would be required to meet CFR Title 46, Chapter I, Subchapter Q, Part 162 that addresses requirements for BWMS to be installed onboard vessels for the purpose of complying with the ballast water discharge standard of 33 CFR part 151, subparts C and D.

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CO1-8 (con't) amount of animals to be injured or killed, and instead conclusory states that intake and entrapment will have minor impacts on the species to be affected.[51]

CO1-9 Moreover, MARAD acknowledges that routine discharges during operation of the offshore facility could raise seawater temperature by 1°F within 100 meters of the source of the discharge.[52] Despite the fact MARAD notes that such increases in temperature represents a moderate adverse impact on the environment, MARAD fails to disclose what these impacts will be, or analyze the impacts of repeated and multiple discharges at the same time that could increase temperature even further. Similarly, MARAD should analyze the impacts of wastewater discharges that will contribute to nutrient loading, such as the discharges of black water, particularly considering the contribution to harmful algae blooms that plague the Gulf.[53]

Nevertheless, MARAD dismisses the impacts of these sources of water pollution because the discharges will be regulated by Clean Water Act permits. Such dismissal, and the resulting failure to actually examine impacts of the discharges on the marine environment, violates NEPA.

3. The Draft EIS Fails to Take a Hard Look at the Impacts from Noise Pollution

CO1-10 The Proposed Project will substantially increase the amount of ship-related noise in the water, posing a risk of harm to marine mammals and other wildlife. Sound is the key sense for whales and other cetaceans to find their way around, detect predators, find food, and communicate. The sound frequency range within which whales communicate and echolocate corresponds to the frequency range of ship noise. Ships hundreds and even thousands of miles away interfere with the acoustic space of these animals. With more ship traffic, the ability for whales and other cetaceans to communicate, search for prey, and avoid predators will be compromised.

Oceans are much louder today than they were a century ago, primarily due to increased anthropogenic noise.[54] Ocean noise pollution, predominantly from large shipping vessels, has created an "omnipresent hum" in our ocean.[55] Large commercial shipping vessels are the primary source of anthropogenic low-frequency sound contributing to ambient (background) noise in the ocean. The greatest source of human-caused marine noise by far is ship propeller cavitation—the

[51] *Id.* at 4-75.
[52] *Id.*
[53] Anderson, D. M., et al. 2014. Understanding interannual, decadal level variability in paralytic shellfish poisoning toxicity in the Gulf of Maine: The HAB Index. Deep Sea Research Part II: Topical Studies in Oceanography 103:264–276; Kirkley, K. S., J. E. Madl, C. Duncan, F. M. Gulland, and R. B. Tjalkens. 2014. Domoic acid-induced seizures in California sea lions (Zalophus californianus) are associated with neuroinflammatory brain injury. Aquatic Toxicology 156:259–268; Jensen, S.-K., J.-P. Lacaze, G. Hermann, J. Kershaw, A. Brownlow, A. Turner, and A. Hall. 2015. Detection and effects of harmful algal toxins in Scottish harbour seals and potential links to population decline. Toxicon 97:1–14.
[54] *Phase 1-CetSound*, NOAA, http://cetsound.noaa.gov/cetsound.
[55] For example, tests conducted near San Nicolas Island, one of the Channel Islands just south of the Channel Islands National Marine Sanctuary, indicate that ambient noise pollution in that area has increased by 10-12 decibels over the past 40 years. McDonald *et al.* suggest that this increase, potentially reflected throughout the Northeast Pacific, is most likely due to changes in commercial shipping. McDonald, M.A., Hildebrand, J. and Wiggins, S.M., 2006, Increases in deep ocean ambient noise in the Northeast Pacific west of San Nicolas Island, California, *Journal of the Acoustical Society America*, 120(2): 711-718.

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CO1 The Center for Biological Diversity (cont'd)

CO1-9 Thank you for your comment. Please refer to Section 4.2.2.2.

CO1-10 Thank you for your comment. Please refer to sections 4.3.1 and 4.3.3.

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CO1-10 (con't)

sound poorly designed propellers make as they spin through the water.[56] Cavitation accounts for as much as 85 percent of human caused noise in the world's oceans.[57] Cavitation may also increase due to hull designs that create non-homogenous wake fields behind ships.[58] And even well-designed propellers and hulls may begin to cavitate if they are not regularly cleaned and smoothed.[59] Another significant source of anthropogenic marine noise is on-board machinery, especially diesel engines.[60] Other onboard machines may also cause vibrations that migrate underwater.[61] Finally, ship noise increases at higher speeds, as this increases the degree and volume of cavitation and onboard machine sounds.[62]

Because very loud low-frequency sound can travel great distances in the deep ocean, increasing noise affects areas far beyond the source of the noise.[63] MARAD's analysis must account for these far-reaching impacts, which pose a severe threat to marine mammals.

The National Oceanic and Atmospheric Administration ("NOAA") has recently begun mapping marine noise levels using its SoundMap and CetMap mapping tools.[64] These maps show that human-caused cumulative and ambient ocean noise pollution has increased ambient sound levels significantly in the Pacific and Atlantic Oceans, as well as the Arctic.[65] NOAA has recognized the threat to ocean species posed by increased anthropogenic ocean noise levels.[66] NOAA has stated:

> Rising noise levels can negatively impact ocean animals and ecosystems in complex ways. Higher noise levels can reduce the ability of animals to communicate with potential mates, other group members, their offspring, or feeding partners. Noise can reduce an ocean animal's ability to hear environmental cues that are vital for survival, including those key to avoiding predators, finding food, and navigation among preferred habitats.
>
> NOAA's approach to managing ocean noise aims to reduce negative physical and behavioral impacts to trust species, as well as conserve the quality of acoustic habitats.[67]

[56] Joseph J. Cox, *Evolving Noise Reduction Requirements in the Marine Environment*, MARINE MAMMAL COMM'N: CONGRESSIONAL BRIEFING ON OCEAN NOISE, at 12 (2014); GUIDELINES FOR THE REDUCTION OF UNDERWATER NOISE FROM COMMERCIAL SHIPPING TO ADDRESS ADVERSE IMPACTS ON MARINE LIFE, INT'L MARITIME ORGANIZATION 1-2 (2014) (definition of cavitation).
[57] Joseph J. Cox, *Evolving Noise* at 12.
[58] IMO Guidelines at 4.
[59] *Id.* at 5.
[60] *Id.* at 4.
[61] *Id.*
[62] *Id.* at 5.
[63] Hildebrand, J. 2005. Impacts of anthropogenic sound, *In: Marine Mammal Research: Conservation Beyond Crisis. Edited by:* J.E. Reynolds III, W.F. Perrin, R.R. Reeves, S. Montgomery and T.J. Ragen. Johns Hopkins University Press, Baltimore, Maryland, pp. 101-124.
[64] *See*, NOAA, Phase 1- Cetsound, http://cetsound noaa.gov/cetsound.
[65] *Id.*
[66] *See* NOAA, Phase 2-NOAA's Ocean Noise Strategy, http://cetsound noaa.gov/ons; MMC, *Congressional Briefing on Marine Mammal Health and Stranding*, Sept. 24, 2014, http://www mmc.gov/wp-content/uploads/CapitolHill_BriefingSummary.pdf.
[67] NOAA, *Underwater Noise and Marine Life*, http://cetsound.noaa.gov/index.

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CO1-10 (con't)

Marine mammals use different song, chirp, and whistle frequencies for a variety of purposes, including echolocation for feeding, long-distance communication, environmental imaging, individual identification, and breeding.[68] Odontocetes, or toothed mammals such as dolphins and killer whales, produce broad-spectrum clicks and whistles that can range between 1 and 200 kilohertz (kHz).[69] Mysticites, or baleen whales, have much lower-frequency calls, ranging between 0.2 and 10 kHz.[70]

Anthropogenic noise pollution can mask marine mammal communications at almost all frequencies these mammals use.[71] "Masking" is a "reduction in an animal's ability to detect relevant sounds in the presence of other sounds."[72] Ambient ship noise can cover important frequencies these animals use for more complex communications. NOAA has recognized that this masking may affect marine mammal survival and reproduction by decreasing these animals' ability to "[a]ttract mates, [d]efend territories or resources, [e]stablish social relationships, [c]oordinate feeding, [i]nteract with parents, or offspring, [and] [a]void predators or threats."[73] Studies have also found that chronic exposure to boat traffic and noise can cause whales to reduce their time spent feeding.[74]

In addition to masking effects, marine mammals have displayed a suite of stress-related responses from increased ambient and local noise levels. These include "rapid swimming away from [] ship[s] for distances up to 80 km; changes in surfacing, breathing, and diving patterns; changes in group composition; and changes in vocalizations."[75] Some avoidance responses to localized marine sounds may even lead to individual or mass strandings.[76]

Current scientific literature establishes that behavioral disruption can occur at very low received noise levels for some sensitive species. For example, a low-frequency, high-amplitude fish mapping device was recently found to silence humpback whales at a distance of 200

[68] Jason Gedamke, *Ocean Sound & Ocean Noise: Increasing Knowledge Through Research Partnerships*, NOAA 2 (2014), *available at* http://cetsound.noaa.gov/Assets/cetsound/documents/MMC%20Annual%20Meeting%20Intro.pdf; Clark, C.W. et al., *Acoustic Masking in Marine Ecosystems as a Function of Anthropogenic Sound Sources*, Mar. Ecol. Prog. Ser. Vol. 395:201-222, 2009, doi: 10.3354/meps08402.
[69] OCEAN NOISE AND MARINE MAMMALS, NAT'L RES. COUNCIL 41-42 (2003), *available at* http://www.nap.edu/openbook.php?record_id=10564&page=R1.
[70] *Id.* at 42.
[71] *See, e.g.*, Hildebrand, J.A., *Impacts of Anthropogenic Sound, in* MARINE MAMMAL RESEARCH: CONSERVATION BEYOND CRISIS (Reynolds, J.E. III et al., eds. 2006); Weilgart, L., 2007, The Impacts of Anthropogenic Ocean Noise on Cetaceans and Implications for Management, 85 CANADIAN J. ZOOLOGY 1091-1116 (2007).
[72] OCEAN NOISE AND MARINE MAMMALS, *supra* note 23, at 96.
[73] Jason Gedamke, at 2; Clark, C.W. *et al.*, at *3.
[74] *See* Williams, R. D., et al., 2006, Estimating relative energetic costs of human disturbance to killer whales (*Orcinus orca*), *Biological Conservation*, 133: 301-311.
[75] OCEAN NOISE AND MARINE MAMMALS, *supra* note 23, at 94.
[76] *Id.* at 132; BRANDON L. SOUTHALL ET AL., FINAL REPORT OF THE INDEPENDENT SCIENTIFIC REVIEW PANEL INVESTIGATING POTENTIAL CONTRIBUTING FACTORS TO A 2008 MASS STRANDING OF MELON-HEADED WHALES 3 (*PEPONOCEPHALA ELECTRA*) IN ANTSOHIHY, MADAGASCAR, INT'L WHALING COMM'N 4 (2013).

CO1

CO1-10 (con't)

kilometers, where received levels ranged from 88 dB to 110 dB.[77] New science shows that at least some baleen whales are susceptible to sound at low-received levels with adverse behavioral impacts that interfere with essential life functions.[78] Bowhead whales migrating through the Beaufort Sea have shown almost complete avoidance of seismic airgun received levels at 120 dB to 130 dB and below.[79]

Pile driving produces some of the loudest anthropogenic high-intensity sounds in the marine environment.[80] Modeling showed that pile driving could mask strong bottlenose dolphin vocalizations as far as 10-15 km from the source.[81] Harbor porpoises have been observed to engage in avoidance responses 50 miles from a loud noise source, a result that is consistent with both captive and wild animal studies showing porpoises abandoning habitat in response to pulsed sounds at very low received levels, well below 120 dB.[82]

And in a noise exposure study using a captive beluga whale, increased levels of stress hormones were documented.[83] Stress due to noise can lead to long-term health problems, and may pose increased health risks for populations by weakening the immune system and potentially affecting fertility, growth rates and mortality.[84]

Louder anthropogenic sounds may also lead to temporary or permanent hearing loss in marine mammals.[85] Hearing loss reduces the range in which communication can occur, interferes with foraging efforts and increases vulnerability to predators. Hearing loss may also change behaviors with respect to migration and mating and it may cause animals to strand, which is often fatal. For marine mammals such as whales and dolphins that rely heavily on their acoustic senses, both permanent and temporary hearing loss should be regarded as a serious threat.[86]

[77] Risch, D., Corkeron, P.J., Ellison, W.T., and van Parijs, S.M., Changes in humpback whale song occurrence in response to an acoustic source 200 km away, *PLoS ONE* 7(1): e29741. doi:10.1371/journal.pone.0029741 (2012).
[78] Goldbogen, Jeremy 2013. Blue Whale Respond to Simulated Mid-frequency Military Sonar, Proceedings of the Royal Society B 280: 20130657 (2013).
[79] Miller, G.W., Elliot, R.E., Koski, W.R., Moulton, V.D., and Richardson W.J., Whales, *in* Richardson, W.J. (ed.), Marine Mammal and Acoustical Monitoring of Western Geophysical's Open-Water Seismic Program in the Alaskan Beaufort Sea, 1998 (1999); Richardson, W.J., Miller, G.W., and Greene Jr., C.R., Displacement of migrating bowhead whales by sounds from seismic surveys in shallow waters of the Beaufort Sea, *Journal of the Acoustical Society of America* 106:2281 (1999).
[80] Gedamke, J., Gales, N., and Frydman, S., Assessing risk of baleen whale hearing loss from seismic surveys: The effect of uncertainty and individual variation, Journal of the Acoustical Society of America 129: 496-506 (2011).
[81] David, J.A. Likely sensitivity of bottlenose dolphins to pile-driving noise, *Water and Environment Journal* 20:48-54 (2006).
[82] *See, e.g.*, Bain, D.E., and Williams, R., Long-range effects of airgun noise on marine mammals: responses as a function of received sound level and distance (2006) (IWC Sci. Comm. Doc. IWC/SC/58/E35).
[83] Romano, T.A. *et al.*, 2004, Anthropogenic sound and marine mammal health: measures of the nervous and immune systems before and after intense sound exposure, *Canadian Journal of Aquatic Science*, 61: 1124-1134.
[84] *Id.*
[85] Kastak, D. et al., 2008, *Noise-Induced Permanent Threshold Shift in a Harbor Seal*, 123 J. ACOUSTICAL SOC'Y OF AM. 2986; Kujawa, S.G. & Liberman, M.C., 2009, *Adding Insult to Injury: Cochlear Nerve Degeneration After "Temporary" Noise-Induced Hearing Loss*, 29 J. NEUROSCIENCE 14,077.
[86] Hildebrand, J., 2005, Impacts of anthropogenic sound, *In: Marine Mammal Research: Conservation Beyond Crisis. Edited by:* J.E. Reynolds III, W.F. Perrin, R.R. Reeves, S. Montgomery and T.J. Ragen. Johns Hopkins University Press, Baltimore, Maryland, pp. 101-124.

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CO1

CO1-10 (con't)

Recent research reveals that chronic stress in North Atlantic right whales is associated with exposure to low frequency noise from ship traffic.[87] Specifically, "the adverse consequences of chronic stress often include long-term reductions in fertility and decreases in reproductive behavior; increased rates of miscarriages; increased vulnerability to diseases and parasites; muscle wasting; disruptions in carbohydrate metabolism; circulatory diseases; and permanent cognitive impairment."[88] These findings have lead researchers to conclude that "over the long term, chronic stress itself can reduce reproduction, negatively affect health, and even kill outright."[89]

Furthermore, noise impacts to marine mammals are predicted to increase with global climate change, wherein the absorption of carbon dioxide by the ocean could create noisier oceans.[90] When GHGs react in the ocean, it lowers pH, creating more acidic waters. The more acidic the water, the less that sound waves are absorbed. Researchers predict that ocean acidification will reduce the intrinsic ability of surface seawater to absorb sound at frequencies important to marine mammals by 40% and that sounds will travel 70% further by 2050 because of increased carbon dioxide acidifying our oceans.[91] A louder ocean will negatively affect cetaceans that rely on sound to navigate, communicate, find food, and avoid predators.

While the Draft EIS acknowledges that the Proposed Project will increase noise, it fails to take a hard look at the impacts of increased noise on the marine environment, and marine mammals in particular. For example, the Draft EIS does not take a hard look at the impacts from pile driving during construction, saying that any impacts that exceed a certain threshold will be analyzed later.[92] But pile driving is certainly a reasonably foreseeable activity under the Proposed Project, and NEPA requires MARAD to conduct that analysis now. MARAD cannot wait until after the pile driving is conducted, or other noise is generated, to analyze the impacts on sperm whales and other marine mammals.[93] Doing so turns the entire concept of NEPA on its head. Similarly, MARAD cannot dismiss analysis of any impacts to marine mammals by simply stating the animals in the area are mobile and can avoid the noise by swimming away—displacement is itself an impact that must be analyzed.[94] And the information above demonstrates that marine mammals may be impacted by sound at levels below the harassment parameters established by the National Marine Fisheries Service. Accordingly, MARAD must also analyze impacts at levels lower that 160 decibels.

4. The Draft EIS Fails to Take a Hard Look at the Impacts from Ship Strikes

CO1-11

MARAD's Draft EIS acknowledges that ship strikes are a risk of the Proposed Project.

[87] Rolland, R, S. Parks, K. Hunt, M. Castellote, P. Corkeron, D. Nowacek, S. Wasser, and S. Kraus. 2012. Evidence that ship noise increases stress in right whales. Proceedings of the Royal Society B. February 8, 2012.
[88] *Id.*
[89] *Id.*
[90] Hester, K. C., *et al.*, 2008, Unanticipated consequences of ocean acidification: A noisier ocean at lower pH. *Geophysical Research Letters*, 35:31
[91] *Id.*
[92] Draft EIS at ES-13; 4-36.
[93] *Id.* at 4-36.
[94] *See, e.g., id.* at 4-39.

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CO1 The Center for Biological Diversity (cont'd)

CO1-11 Thank you for your comment. Please refer to sections 4.3.1 and 4.3.3.

CO1 The Center for Biological Diversity (cont'd)

CO1

CO1-11 (con't)

The Draft EIS acknowledges that the Proposed Project will result in upwards of 160 LNG vessel visits per year and 365 support vessel round trips per year. Every vessel trip increases the risk of ship strikes, particularly the large vessels that will be used for construction and operation of the Proposed Project. But MARAD's Draft EIS dismisses the import of ship strikes by claiming that the increase in vessel traffic from the Proposed Project will be minor compared to the rest of the traffic that already occurs in the Gulf of Mexico. This is improper.

Ship strikes involving large vessels are the "principal source of severe injuries to whales."[95] Most ship strikes to large whales result in death.[96] Ship strike-related mortality is a documented threat to endangered sperm whales, as well as other cetaceans found in the Gulf of Mexico.[97] Ship strikes also affect ESA-listed sea turtles in the Gulf of Mexico. Like cetaceans, sea turtles cannot breathe under water and must regularly ascent to the surface for air, which makes them "highly susceptible to vessel collisions."[98] Commercial vessels are thus major hazards to sea turtles, particularly in shipping lanes and during peak tourism months when millions of recreational boaters congregate in coastal areas. Among sea turtles found stranded and dead on Florida beaches, collisions with boats is the most common identifiable source of trauma.[99] Injuries from propellers include amputated flippers, fractured shells, brain injuries and broken bones.[100] These injuries, if they do not result in immediate death, can increase stress, which ultimately affect a sea turtle's ability to forage, migrate, escape from predators and reproduce.

MARAD should quantify the risk of ship strikes that will result from the Proposed Project and implement mandatory measures to reduce the risk of such ship strikes, such as requiring ships to slow down to 10 nautical miles when operating throughout U.S. waters of the Gulf of Mexico.[101]

5. The Draft EIS Fails to Take a Hard Look at the Impacts from Accidents

CO1-12

MARAD acknowledges that accidents in the form of spills during vessel or pipeline transport vessels could occur, but fails to take a hard look at the impacts of such accidents because the transportation is regulated and by claiming they are unlikely.

[95] Laist, D.W., Knowlton, A.R., Mead, J.G., Collet, A.S. and Podesta, M., 2001, Collisions between ships and whales, *Marine Mammal Science,* 17(1): 35-75.
[96] Jensen, A.S. and Silber, G.K., 2004, Large Whale Ship Strike Database. U.S. Department of Commerce, *NOAA Technical Memorandum*. NMFS-OPR-25.
[97] Waring, et al., U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2012, Mar. 2013, http://www nmfs.noaa.gov/pr/sars/pdf/ao2012.pdf.
[98] NMFS, Final Environmental Impact Statement, Right Whale Ship Speed Reduction, Aug. 2008, http://www nmfs.noaa.gov/pr/pdfs/shipstrike/feis.pdf; NOAA Fisheries, Threats to Sea Turtles, http://www nmfs.noaa.gov/pr/species/turtles/threats htm.
[99] Florida Fish and Wildlife Research Institute. 2008. Long-term monitoring program reveals a continuing loggerhead decline, increases in green turtle and leatherback nesting, http://research.myfwc.com/features/view_article.asp?id=27537.
[100] Mote Marine Laboratory. 2008. Sea Turtle Hospital. http://www mote.org/index.php?src=gendocs&link=Sea+Turtle+Rehabilitation+Hospital&category=Animal+Care+Programs.
[101] *See* 73 Fed. Reg. 60,173 (Oct. 10, 2008); 78 Fed. Reg. 73,726 (Dec. 9, 2013); codified at 50 C.F.R. § 224.105 (ship speed limit in certain areas along the U.S. East Coast to protect North Atlantic right whales).

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CO1-12 Floodplains and flooding are discussed in Section 4.11.4 of the final EIS. Additional text regarding climate change has been added to Section 4.9.5.4 of the final EIS.

CO1

CO1-12 (con't)

A review of records of the federal Pipeline and Hazardous Materials Safety Administration, which maintains a database of all U.S. pipelines, demonstrates that transport of oil and gas carries a significant risk of environmental and public safety impacts. Nationally, there were nearly 8,000 significant incidents with U.S. pipelines, involving death, injury, and economic and environmental damage between 1986 and 2013—more than 300 per year.[102] Incidents classified as "significant" are those resulting in death or injury, had damages more than $50,000, spilled more than five barrels of highly volatile substances or 50 barrels of other liquid, or where the liquid exploded or burned.[103] And offshore spills occur as a matter of course in the Gulf of Mexico. For example, in 2015, an offshore natural gas pipeline in Gulf of Mexico ruptured, causing a fire that injured two workers.[104] And in 2016, nearly 90,000 gallons of oil leaked from a flow line that created an oil sheen in the Gulf of Mexico that was two by 13 miles wide.[105]

In fact, the U.S. Department of Transportation found that offshore pipelines can be more vulnerable than onshore pipelines. They have a greater vulnerability to severe weather conditions than onshore pipelines, especially during hurricane events. And massive wave action can alter the pipeline stability, causing gradual displacement, especially in small diameter pipelines.[106] Offshore pipelines can also face more corrosion than onshore pipelines due to higher temperature and pressure conditions that occur during the laying of these pipelines.[107]

In addition, aging poses risks of corrosion, erosion and fatigue stress to subsea pipelines.[108] Subsea pipeline corrosion appears to accelerate over time,[109] and can act synergistically with fatigue stress to increase the rate of crack propagation.[110] Marine environments are especially known to produce significant corrosion on steel surfaces, and when a steel structure is at or beyond its elastic limit, the rate of corrosion increases 10-15 percent.[111] One offshore pipeline study found that after 20 years the annual probability of pipeline failure increases rapidly, with values in the range of 0.1 to 1.0, which equates to a probability of failure

[102] The Center for Biological Diversity, *America's Dangerous Pipelines*, http://www.biologicaldiversity.org/campaigns/americas_dangerous_pipelines/.
[103] *Id.*
[104] AP, 2 crew members injured after pipline ruptures in Gulf, Aug. 27, 2015.
[105] *See e.g.*, Terry Wade, Reuters, Shell Shuts Wells Near Oil Spill off Louisiana, May 12, 2016.
[106] U.S. Department of Transportation: Federal Highway Administration. Impacts of Climate Change and Variability on Transportation Systems and Infrastructure: The Gulf Coast Study, Phase 2. 2015.
[107] Keuter, J. (2014). In-line Inspection of Pipes Using Corrosion Resistant Alloys (CRA). Rosen Technology and Research Center GmbH, Rosen Group, Germany; Standard Oil Company (1981) Drilling fluid bypass for marine riser. U.S. Grant. US4291772 A.
[108] Petroleum Safety Authority Norway. 2006. Material Risk – Ageing offshore installations. Prepared by Det Norske Veritas on request from Petroleum Safety Authority Norway.
[109] Mohd, M.H. and J.K. Paik. 2013. Investigation of the corrosion progress characteristics offshore oil well tubes. Corrosion Science 67:130-141.
[110] PSA Norway 2006.
[111] Mohd, M.H. and J.K. Paik. 2013. Investigation of the corrosion progress characteristics of offshore subsea oil well tubes. Corrosion Science 67: 130-141; A. Igor, R.E. Melchers. 2011. Pitting corrosion in pipeline steel weld zones, Corrosion Science 53: 4026–4032; R.E. Melchers, M. Ahammed, R. Jeffrey, G. Simundic. 2010. Statistical characterization of surfaces of corroded steel plates. Mar. Struct. 23: 274–287.

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CO1

CO1-12 (con't)

of 10 percent to 100 percent per year.[112] Another study covering 1996-2010 found that accident incident rates, including spills, increased significantly with the age of infrastructure.[113] This is a significant concern for the Proposed Project, since Delfin LNG will be using existing offshore pipelines installed in 1978—nearly 40 years ago.[114]

Consistent with these findings, a report published in 2010 found that the number of spills from offshore rigs and pipelines between 2000 and 2009 *more than quadrupled* the rate of spills in prior decades.[115] In particular, from the early 1970s through the 1990s, offshore rigs and pipelines averaged about four spills per year of at least 2,100 gallons. The average annual total skyrocketed to more than 17 from 2000 to 2009, and averaged 22 per year from 2005 to 2009 alone.[116] And the number of spills, as well as the quantity spilled, grew significantly worse even when taking increased production in account.[117]

Federal data show that new pipelines also carry a high risk of spills, mostly because of faulty design or construction.[118] These data indicate there are more oil spills in the first two years of pipeline's life than in the next seven years combined.[119] This is a significant concern given that the Proposed Project will involve the construction of new pipelines.

Similarly, while MARAD's Draft EIS states that the offshore facility will be designed to withstand a 1,000-year storm, MARAD's Draft EIS fails to acknowledge the fact that the risk of accidents will increase in the face of climate change and increasingly severe storms, or analyze the impacts of that increased risk. Such failures are highlighted by the fact that Louisiana is currently still suffering the effects of massive flooding, the *eighth* flood considered to be a once-in-every-500-years event to have taken place in the United States in little over 12 months; and the flooding was so bad in some parts of the state that it is considered a 1,000-year storm.[120]

CO1-13

C. MARAD's Draft EIS Fails to Examine a Reasonable Range of Alternatives or Properly Analyze the No-Action Alternative

NEPA requires a "detailed statement" of "alternatives to the proposed action."[121] The purpose of this section is "to insist that no major federal project should be undertaken without

[112] Bea, R., C. Smith, B. Smith, J. Rosenmoeller, T. Beuker, and B. Brown. 2002. Real-time Reliability Assessment & Management of Marine Pipelines. 21st International Conference on Offshore Mechanics & Arctic Engineering. ASME.
[113] Muehlenbachs, et al. 2013. The impact of water depth on safety and environmental performance in offshore oil and gas production. Energy Policy 55:699-705.
[114] *See* Draft EIS at 2-2.
[115] Alan Levin, Oil Spills Escalated in this Decade, USA Today, June 8, 2010, available at http://usatoday30.usatoday.com/news/nation/2010-06-07-oil-spill-mess_N htm.
[116] *Id.*
[117] *Id.*
[118] Richard Stover, PhD, *Review of the US Department of Transportation Report The State of the National Pipeline Infrastructure*, Aug. 2013, *available at* http://www.icogitate.com/~oildrop/PHMSA_report_analysis.pdf.
[119] *Id.*
[120] See e.g., Oliver Milman, Disasters like Louisiana floods will worsen as planet warms, scientists warn, The Guardian, Aug. 16, 2016, https://www.theguardian.com/environment/2016/aug/16/louisiana-flooding-natural-disaster-weather-climate-change
[121] 42 U.S.C. § 4332(2)(c).

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CO1 The Center for Biological Diversity (cont'd)

CO1-13 The No-Action Alternative is discussed in Section 2.3.10. See response to comment FA4-1.

CO1

CO1-13 (con't)

intense consideration of other more ecologically sound courses of action, including shelving the entire project, or of accomplishing the same result by entirely different means."[122] In this way, the analysis of alternatives is the "heart of the environmental impact statement."[123] Notably, the alternatives must include "reasonable alternatives not within the jurisdiction of the lead agency," and must include "appropriate mitigation measures not already included in the proposed action or alternatives."[124] But MARAD's Draft EIS fails to analyze a reasonable range of alternatives, or properly analyze the no-action alternative.

MARAD failed to consider several alternatives. For example, MARAD failed to consider:

(1) whether exports should move forward in smaller quantities or a slower time table to mitigate the domestic economic and environmental impacts associated with large export volumes or rapid export schedules;
(2) an alternative that would limit the number of floating liquefied natural gas vessels to be constructed and operated to reduce environmental impacts;
(3) an alternative that would prohibit the use of gas extracting using unconventional well stimulation techniques like fracking and acidizing to mitigate the harmful environmental impacts associated with induced production;
(4) whether alternative offshore sites exist that are not located within ESA-designated critical habitat for loggerhead sea turtles;
(5) limiting the number of LNG vessel trips per year to reduce air pollution, water pollution, noise and the risk of ship strikes; or
(6) an alternative that would require LNG vessels and supply vessels to travel at no more than 10 nautical miles while in the Gulf of Mexico EEZ to reduce the risk of ship strikes, air pollution and noise.

The failure to consider these alternatives constitutes a violation of NEPA.

CO1-14

In addition, MARAD's analysis of the no-action alternative is inadequate. In analyzing the impacts, MARAD notes that if the Proposed Project was not constructed, "the international demand for natural gas would not be met and international customers may seek other projects, either here in the United States or elsewhere, to satisfy the demand."[125] In other words, the no-action alternative encompasses the same potential impacts as a decision to deny the license application. But this approach "avoid[s] the task actually facing [MARAD]. In assuming that, no matter what, the proposed activities would surely occur, [MARAD is] neglecting to consider what would be a true 'no action' alternative."[126]

Additionally, this assumption ignores the fact that the United States has committed, along with nearly 200 other countries, to avoid the worst effects of climate change by limiting warming to 2 °C or less, and that science tells us that we must limit the supply of fossil fuels if we are to

[122] *Environmental Defense Fund* v. *Corps of Engineers*, 492 F.2d 1123, 1135 (5th Cir. 1974).
[123] 40 C.F.R. § 1502.14.
[124] *Id.*
[125] Draft EIS at 2-49.
[126] *Conservation Council of Hawaii v. NMFS*, 97 F. Supp. 3d 1210, 1236 (D. Haw. 2015).

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CO1 The Center for Biological Diversity (cont'd)

CO1-14 Thank you for your comment. The No-Action Alternative is discussed in Section 2.3.10.

CO1

CO1-14 (con't)

meet this commitment. This clearly necessitates a change in policy, since under a business-as-usual approach, the world would warm to over 5 °C by the end of the century.[127] MARAD's failure to address these issues in its Draft EIS is arbitrary and capricious.

CO1-15

D. MARAD's Draft EIS Fails to Analyze the Impacts of Induced Production

MARAD's Draft EIS fails to analyze the impacts of induced production, including fracking. In evaluating the environmental impacts of the proposed action, NEPA requires MARAD to consider and describe the direct and indirect impacts.[128] These impacts are distinct from one another. Direct effects are "caused by the action and occur at the same time and place."[129] Indirect effects are caused by the action but, "are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effect on air and water and other natural systems, including ecosystems."[130] Induced production from the Proposed Project and the attendant impacts from this induced production are precisely the kind of indirect effects that MARAD must consider in analyzing the impacts of its leasing proposal.

1. MARAD Must Consider the Impacts of Induced Production

In its Draft EIS, MARAD rejects consideration of induced production, including fracking. MARAD rejects such consideration by claiming it does not have jurisdiction over such issues; and that it cannot estimate how much gas will come from existing production versus new production, or where and when that production will occur.[131] These arguments are unreasonable and violate NEPA for two primary reasons. First, the fact that MARAD does not regulate gas drilling or fracking does not remove the impacts of these activities from the scope of required review in its Draft EIS. Indeed, NEPA specifically requires agencies to consider the impacts of proposed actions, regardless of whether they have jurisdiction over the effects.[132]

Second, the argument that MARAD cannot precisely determine the source of natural gas, or where and when induced production could occur is a red herring. NEPA specifically requires "reasonable forecasting," which includes the consideration of "reasonably foreseeable future actions. . . even if they are not specific proposals."[133] Moreover, "[b]ecause speculation is . . . implicit in NEPA," agencies may not "shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as crystal ball inquiry."[134]

[127] *See* Oil Change International, *The EIA's oil forecast is a climate disaster, why does Obama use it to justify drilling?* at 4 (Aug. 27, 2015), *available at* http://priceofoil.org/2015/08/27/the-eias-oil-forecast-is-a-climate-disaster-why-does-obama-use-it-to-justify-drilling/ (describing the warming effect of emissions from EIA's business-as-usual scenario compared to other scenarios that assume carbon reductions to meet climate goals).
[128] 40 C.F.R §§ 1502.16, 1508.7, 1508.8; *Northern Plains Resource Council v. Surface Transportation Board*, 668 F.3d 1067, 1072-73 (9th Cir. 2011).
[129] 40 C.F.R. § 1508.8(a).
[130] *Id.* § 1508.8(b).
[131] Draft EIS at 1-10.
[132] *See e.g., Save Our Sonoran v. Flowers*, 408 F.3d 1113, 1122 (9th Cir. 2005).
[133] *N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1079 (9th Cir. 2011).
[134] *Id.*

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CO1 The Center for Biological Diversity (cont'd)

CO1-15 Thank you for your comment. Section 1.4 discusses the scope of the final EIS with respect to induced production of natural gas.

CO1

CO1-15 (con't)

There are available tools that measure how much induced production will occur, and where this additional production will occur. The EIA and Delfin LNG itself agree that LNG exports will induce additional production in the United States.[135] Studies suggest that production increases closely correspond with the volume of exported gas. For example, the EIA, in a study of effects of U.S. exports commissioned by the Department of Energy, estimated that the majority of exported gas would come from increased production, primarily from shale gas.[136] Specifically, the EIA predicts that about 61 to 84 percent of the volume of LNG exported would be supplied by increases in domestic production and that "about three quarters of this increased production is from shale sources."[137] And in its application to the Department of Energy, Delfin LNG relied upon a report by ICF International concluding that up to 88 percent of LNG export volumes will be offset by increasing natural gas production.[138]

Applying these predictions to Delfin LNG's request to export 657.5 Bscf/y means that the proposal would result in at least 401.1 and upwards of 578.6 Bscf/y of increased production in North America, including at least 300.8 and upwards of 434 Bscf/y of shale gas production. And both the EIA and the Department of Energy have more precise tools to estimate how U.S. production will change in response to Delfin LNG's proposed exports, including models that are built on detailed state-by-state reports of gas production curves across the country that can predict localized impacts of LNG exports.[139]

For example, Delfin LNG itself has previously explained that the most likely source of gas for the proposed exports are nearby fields in Texas and Louisiana.[140] And the EIA's National Energy Modeling System models energy use through a series of interlocking modules that represent different energy sectors on geographic levels.[141] Notably, the "Natural Gas Transmission and Distribution" module models the relationship between U.S. and Canadian gas production, consumption, and trade.[142] For each region, the module links supply and demand annually, taking transmission costs into account, in order to project how demand will be met by the transmission system.

[135] *See e.g.*, Oregon LNG U.S. Department of Energy Application at 24 ("the demand induced by . . . exports will spur production" in the U.S.) (OLNG DOE Application).
[136] EIA, Effect of Increased Natural Gas Exports on Domestic Energy Markets, p.6, 11 (Jan. 19, 2012); EIA, Effect of Increased Natural Gas Exports on U.S. Energy Markets, p. 12 (Oct. 2014), available at http://www.eia.gov/analysis/requests/fe/pdf/lng.pdf.
[137] *Id.*
[138] Application of Delfin LNG LLC For Long-Term Authorization to Export LNG to Non-Free Trade Agreement Countries (Nov. 12, 2013) at 20.
[139] EIA, Model Documentation: Natural Gas Transmission and Distribution Module of the National Energy Modeling System, 15-16 (2013); http://www.eia.gov/forecasts/aeo/nems/documentation/ngtdm/pdf/m062(2013).pdf; EIA, Documentation of the Oil and Gas Supply Module, 2-2 (2012), available at http://www.eia.gov/forecasts/aeo/assumptions/pdf/oil_gas.pdf
[140] Application of Delfin LNG LLC For Long-Term Authorization to Export LNG to Non-Free Trade Agreement Countries (Nov. 12, 2013) at 7.
[141] EIA, The National Energy Modeling System: An Overview, 1-2 (2009), available at https://www.eia.gov/forecasts/aeo/nems/overview/pdf/0581(2009).pdf.
[142] EIA, Model Documentation: Natural Gas Transmission and Distribution Module of the National Energy Modeling System, 15-16 (2012).

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CO1

CO1-15 (con't)

Another module, the EIA's "Oil and Gas Supply", is built on detailed state-by-state reports of gas production across the country, and models individual regions and how production responds to demand across the country.[143] As the EIA explains, the supply module "includes a comprehensive assessment method for determining the relative economics of various prospects based on future financial considerations, the nature of the undiscovered and discovered resources, prevailing risk factors, and the available technologies. The model evaluates the economics of future exploration and development from the perspective of an operator making an investment decision."[144] In this way, the model can estimate future production based on existing information. MARAD could use these models to estimate impacts of induced production.

CO1-16

2. *Induced Production Will Cause a Variety of Harmful Impacts*

Conventional oil and gas development and production has a myriad of detrimental impacts that are widespread and well-documented.[145] These impacts include increased air pollution, increased noise pollution, habitat destruction, increased truck and vessel traffic, increased risk of oil spills, and increased climate change impacts.

For example, oil and gas operations emit VOCs, NOx, SOx, hydrogen sulfide, and PM. Oil and natural gas operations also emit listed hazardous air pollutants in significant quantities, and also contribute to cancer risks and other acute public health problems.[146] Natural gas emissions are generally about 84 percent methane.[147] Methane is a potent greenhouse gas that contributes substantially to global climate change. Its global warming potential is approximately 34 times that of carbon dioxide over a 100 year time frame and at least 86 times that of carbon dioxide over a 20 year time frame.[148] While the exact amount is not clear, the U.S. Environmental Protection Agency has estimated that "oil and gas systems are the largest human-made source of methane emissions and account for 37 percent of methane emissions in the United States and is expected to be one of the most rapidly growing sources of anthropogenic methane emissions in the coming decades."[149]

[143] EIA, Documentation of the Oil and Gas Supply Module.
[144] *Id.* at 2-3.
[145] *See e.g.*, BOEM, Environmental Impact Statement for Outer Continental Shelf Oil and Gas Leases in the Gulf of Mexico from 2017–2022, Apr. 22, 2016.
[146] EPA, Regulatory Impact Analysis: Final New Source Performance Standards and Amendments to the National Emission Standards for Hazardous Air Pollutants for the Oil and Natural Gas Industry 4-13 to 4-14 (Apr. 2012), Document ID No. EPA-HQ-OAR-2010-0505-4544; Colborn et al., An Exploratory Study of Air Quality Near Natural Gas Operations, Human and Ecological Risk Assessment: An International Journal, Vol. 20, Iss. 1, 2014, pp. 21-22.
[147] Power, Thomas, The Local Impacts of Natural Gas Development in Valle Vidal, New Mexico, University of Montana (2005).
[148] Intergovernmental Panel on Climate Change, Chapter 8: Anthropogenic and Natural Radiative Forcing in Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Table 8.7 (2013); Howarth, Robert, et al., Methane and the greenhouse-gas footprint of natural gas from shale formations, Climactic Change (Mar. 31, 2011); Shindell, Drew, Improved Attribution of Climate Forcing to Emissions, 326 Science 716 (2009).
[149] U.S. Environmental Protection Agency, National Gas STAR Program, Basic Information, Major Methane Emission Sources and Opportunities to Reduce Methane Emissions, July 2016, https://www3.epa.gov/gasstar/basic-information/; *see also* Petron, Gabrielle, et al., Hydrocarbon emissions characterization in the Colorado Front Range: A pilot study, 117 Journal of Geophysical Research (2012); Institutional Investors Group on Climate Change

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CO1 The Center for Biological Diversity (cont'd)

CO1-16 Thank you for your comment. See response to comment CO1-15.

CO1

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Oil and gas development also increases noise pollution that can interfere with important biological functions of marine mammals including feeding, mating and rearing young.[150] Oil and gas development also increases vessel traffic, which increases the risk of ship strikes that can kill or injure endangered whales and sea turtles. Ship strike-related mortality is a documented threat to endangered populations of fin, humpback, blue, and sperm whales. And a recent report cites collision with ships as a reason blue whales have not recovered.[151]

Increased drilling also increases the risk of oil spills. Oil spills have a wide array of lethal and sublethal impacts on marine species and terrestrial species, both immediate and long-term.[152] Direct impacts to wildlife from exposure to oil include behavioral alteration, suppressed growth, induced or inhibited enzyme systems, reduced immunity to disease and parasites, lesions, tainted flesh and chronic mortality.[153] Oil destroys the water-proofing and insulating properties of feathers and fur of birds and mammals, respectively, thereby compromising their buoyancy and ability to thermoregulate.[154]

Induced production will also lead to habitat destruction. Oil and gas development creates a network of well pads, roads, pipelines, and other infrastructure that lead to direct habitat loss and fragmentation, as well as displacement of wildlife from these areas due to increased human disturbance. Habitat loss can occur as a result of a reduction in the total area of the habitat, the decrease of the interior-to-edge ratio, isolation of one habitat fragment from another, breaking up of one habitat into several smaller patches of habitat, and decreasing the average size of a habitat patch. New research has revealed the extent of this habitat loss. For example, in the western United States, the amount of high-quality habitat for the pronghorn has shrunk drastically due to oil and gas development.[155] Another study of 250 drilling pads on the Marcellus shale of Pennsylvania showed that, while an average of 8.8 acres of forest had been cleared for each fracking drilling pad, each drilling station actually affected 30 acres of forest, impacting area-sensitive species.[156]

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et al, Controlling Fugitive Methane Emissions in the Oil and Gas Sector (2012), available at http://www.ceres.org/files/methane-emissions/investor-joint-statement-on-methane-emissions.

[150] NOAA, *Underwater Noise and Marine Life*, http://cetsound noaa.gov/index; Jason Gedamke, *Ocean Sound & Ocean Noise: Increasing Knowledge Through Research Partnerships*, NOAA 2 (2014); Clark, C.W,. *Acoustic Masking in Marine Ecosystems as a Function of Anthropogenic Sound Sources*; Gedamke, J., Gales, N., and Frydman, S., Assessing risk of baleen whale hearing loss from seismic surveys; David, J.A. Likely sensitivity of bottlenose dolphins to pile-driving noise.

[151] Virginia Morrell, Blue whales being struck by ships, Science Magazine, Jul. 23, 2014, http://www.sciencemag.org/news/2014/07/blue-whales-being-struck-ships.

[152] Peterson, C. H., S. D. Rice, J. W. Short, D. Esler, J. L. Bodkin, B. E. Ballachey, and D. B. Irons. 2003. Long-term ecosystem response to the Exxon Valdez oil spill. Science 302:2082-2086; Venn-Watson, S. *et al.* Adrenal Gland and Lung Lesions in Gulf of Mexico Common Bottlenose Dolphins (Tursiops truncatus) Found Dead following the Deepwater Horizon Oil Spill. *PLoS ONE* 10, e0126538 (2015).

[153] Holdway, D. A. 2002. The acute and chronic effects of wastes associated with offshore oil and gas production on temperate and tropical marine ecological processes. Marine Pollution Bulletin 44:185-203.

[154] Jenssen, B. M. 1994. Review Article: Effects of oil pollution, chemically treated oil, and cleaning on the thermal balance of birds. Environmental Pollution 86:207-215; Peterson et al. 2003.

[155] Beckmann, J.P. et al. Human-mediated shifts in animal habitat use: Sequential changes in pronghorn use of a natural gas field in Greater Yellowstone, 147 Biological Conservation 1:222 (2012).

[156] N. Johnson, Pennsylvania Energy Impacts Assessment: Report 1: Marcellus Shale Natural Gas and Wind, NATURE CONSERVANCY (2010); *see also* C. Weller, et al., Fragmenting Our Lands: The Ecological Footprint from Oil and Gas Development, THE WILDERNESS SOCIETY (2002).

CO1

CO1-16 (con't)

In addition, birds are vulnerable to disorientation from oil and gas operations that increase light pollution. Artificial light attracts birds at night and disrupts their normal foraging and breeding activities in several ways.[157] In a phenomenon called light entrapment, seabirds continually circle lights and flares on vessels and energy platforms, instead of foraging or visiting their nests, which can lead to exhaustion and mortality.[158] Seabirds also frequently collide with lights or structures around lights causing injury or mortality, or on lighted platforms where they are vulnerable to injury, oiling or other feather contamination, and exhaustion.[159]

Increased drilling and production will also increase greenhouse gas emissions and exacerbate climate change. MARAD's Draft EIS must fully analyze the impacts of increased development on GHG emissions and climate change. The final CEQ Guidance on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA provides clear direction for MARAD to conduct a lifecycle GHG analysis because the modeling and tools to conduct this type of analysis are readily available to the agency.[160]

MARAD's failure to quantify and analyze the impacts from induced oil and gas drilling, including the life-cycle greenhouse gas emissions, that could result from the Proposed Project violates NEPA.

CO1-17

3. *Induced Production Will Increase the Use of Fracking and Acidizing*

Moreover, as part of its analysis of induced production, MARAD must consider the impacts of unconventional well stimulation treatments like fracking and acidizing which cause environmental damages beyond those of conventional oil and gas development. Fracking and acidizing produce water and air pollution, increase the risk of earthquakes and oil spills, and prolong the life of aging infrastructure and our use of dirty fossil fuels.

Water contamination is a significant risk of fracking because of the hundreds of chemicals used in fracking fluid. For example, a peer-reviewed study that examined fracking fluid products determined that more than 75 percent of the chemicals could affect the skin, eyes, and other sensory organs, and the respiratory and gastrointestinal systems; approximately 40 to 50 percent could affect the brain/nervous system, immune system, cardiovascular system, and the kidneys; 37 percent could affect the endocrine system; and 25 percent could cause cancer and mutations.[161] In addition to posing a significant health and safety risk to humans, fracking

[157] Montevecchi, W. 2005. Influences of artificial light on marine birds. In C. Rich and T. Longcore, editors. *Ecological Consequences of Artificial Night Lighting*. Washington, D.C: Island Press, 94-113.
[158] Wiese, F. K., W. A. Montevecchi, G. K. Davoren, F. Huettmann, A. W. Diamond, and J. Linke. 2001. Seabirds at risk around offshore oil platforms in the North-west Atlantic. *Marine Pollution Bulletin* 42:1285-1290.
[159] Wiese et al. 2001; Black, A. 2005. Light induced seabird mortality on vessels operating in the Southern Ocean: incidents and mitigation measures. *Antarctic Science* 17:67-68.; Le Corre, M., A. Ollivier, S. Ribes, and P. Jouventin. 2002. Light-induced mortality of petrels: a 4-year study from Réunion Island (Indian Ocean). *Biological Conservation* 105:93-102.
[160] *Id.*
[161] Colborn, Theo, et al. 2011. Natural Gas Operations for a Public Health Perspective, 17 Human and Ecological Risk Assessment 1039; Elliot, E.G. et al. 2016. A systematic evaluation of chemicals in hydraulic –fracturing fluids and wastewater for reproductive and developmental toxicity. Journal of Exposure Science and Environmental Epidemiology 1–10.

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CO1 The Center for Biological Diversity (cont'd)

CO1-17 Thank you for your comment. See response to comment CO1-15.

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chemicals can kill or harm a wide variety of marine life. Scientific research has indicated that 40 percent of the chemicals used in fracking can harm aquatic animals and other wildlife.[162]

Another recent study found that oil companies use dozens of extremely hazardous chemicals to acidize wells. Specifically, the study found that almost 200 different chemicals have been used and that at least 28 of these substances are F-graded hazardous chemicals—carcinogens, mutagens, reproductive toxins, developmental toxins, endocrine disruptors or high acute toxicity chemicals.[163] Hydrofluoric acid, for example, is acutely toxic, and exposure to fumes or very short-term contact with its liquid form can cause severe burns. The study notes that acidizing chemicals can make up as much as 18 percent of the fluid used in these procedures.[164] Further, each acidization can use as much as hundreds of thousands of pounds of some chemicals.[165]

Wastewater injection—a way oil companies dispose of wastewaters generated by fracking—can result in leaks and contamination through the loss of well casing integrity. Studies have shown that 30 percent of offshore oil wells in the Gulf of Mexico experienced well casing damage in the first five years after drilling, and damage increased over time to 50 percent after 20 years.[166] Well stimulation can increase the risk of well casing damage.[167] For example, a recent scientific study found that older wells can become pathways for fluid migration, and that the high injection pressures used in fracking can "increase this risk significantly."[168] For this same reason, fracking can also increase the risk of oil and other spills. This disposal method can also result in the contamination of drinking water.[169]

Air pollution from fracking and acidizing is also well documented.[170] Pollutants released during fracking pose serious health risks, including carcinogenicity and endocrine disruption.[171]

[162] CCST. 2014. Advanced Well Stimulation Technologies in California: An Independent Review of Scientific and Technical Information. August 28, 2014; Christopher D. Kassotis, et al. 2015. Endocrine-Disrupting Activity of Hydraulic Fracturing Chemicals and Adverse Health Outcomes After Prenatal Exposure in Male Mice. Endocrinology. 156(12):4458-73. DOI: 10.1210/en.2015-1375.
[163] Khadeeja Abdullah, Timothy Malloy, Michael K. Stenstrom & I. H. (Mel) Suffet. 2016. Toxicity of acidization fluids used in California oil exploration, Toxicological & Environmental Chemistry.
[164] *Id.*
[165] *Id.*
[166] Vengosh, A. et al. 2014. A critical review of the risks to water resources from unconventional shale gas development and hydraulic fracturing in the United States. Environmental Science & Technology 48:8334-8348; Davies, R.J. et al. 2014. Oil and gas wells and their integrity: Implications for shale and unconventional resource exploitation. Marine and Petroleum Geology 56:239-254.
[167] Davies, et al. 2014; U.S. EPA, Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources, External Review Draft (June 2015) at 6-11.
[168] California Council on Science and Technology. 2015. An Independent Scientific Assessment of Well Stimulation in California, Volume II. Potential Environmental Impacts of Hydraulic Fracturing and Acid Stimulations, 20 July, at 39.
[169] Dominic C. DiGiulio and Robert B. Jackson. 2016. Impact to Underground Sources of Drinking Water and Domestic Wells from Production Well Stimulation and Completion Practices in the Pavillion, Wyoming, Field. Environmental Science and Technology. DOI: 10.1021/acs.est.5b04970.
[170] Colborn, T. et al. 2012. An exploratory study of air quality near natural gas operations; McKenzie, L. et al. 2012. Human health risk assessment of air emissions from development of unconventional natural gas resources. Sci Total Environ 424:79-87.
[171] Colborn, T. et al. 2011; McKenzie, L. et al. 2014; Food and Water Watch. 2012. Fracking: The New Global Water Crisis, March 7, 2012.

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VOCs emitted during offshore fracking include the "BTEX compounds"—benzene, toluene, ethyl benzene and xylene—which Congress has declared hazardous air pollutants.[172] Many of these VOCs are associated with serious short-term and long-term effects to the respiratory, nervous and circulatory systems.[173] Additionally, VOCs create ground-level ozone, or smog, which can contribute to asthma,[174] premature death, stroke, heart attack and low birth weight. Benzene is also a known carcinogen,[175] and has been documented in people living within a 10-mile radius of fracked wells in Colorado,[176] raising concerns about residents living within 10 miles of offshore drilling operations in California.

Offshore fracking can also result in airborne crystalline silica dust. While the most common exposure to silica dust is in workers close to silica sand, there are documented cases of silica dust exposure and resultant harms suffered in neighboring communities.[177] Silica quartz, commonly used in offshore frack jobs, can create dangerous health problems, including cancer and silicosis.[178]

Offshore fracking and acidizing also emit GHGs and contribute to climate disruption, particularly due to methane leakage.[179] For example, new research shows methane leakage from some wells may be as high at 17.3 percent.[180] Moreover, new research has shown that unconventional wells are up to 2.7 times more likely than a conventional well to have a cement or casing impairment, which can lead to methane leaks.[181]

[172] 42 U.S.C. § 7412(b).
[173] Colborn, T. et al. 2011.
[174] Jerrett, M. et al. 2009.
[175] Gilman, J.B. et al. 2010. VOCs in the Greater Los Angeles Basin: Characterizing the gas-phase chemical evolution of air masses via multi-platform measurements during CalNEX, www.esrl noaa.gov/csd/projects/calnex/meetings/datawkshpMay2011/monday/Gilman.pdf.
[176] Reutman, S.R. et al. 2002. Evidence of reproductive endocrine effects in women with occupational fuel and solvent exposures. Environ Health Perspectives 110:805-811; McKenzie, L. et al. 2014.
[177] Mayer, S. 2010. Industrial dust plagues northwest residents. Bakersfield Californian, 26 December 2010, at http://www.bakersfield.com/news/2010/12/27/industrial-dust-plagues-northwest-residents html; *Bhagia*, L.J. 2012. Non-occupational exposure to silica dust. Indian Journal of Occupational & Environmental Medicine 16:3; Schenker, M.B., et al. 2009. Pneumoconiosis from agricultural dust exposure among young California farmworkers. Environ. Health Perspectives 117:6.
[178] Wisconsin Department of Natural Resources. 2011. Report to Natural Resources Board: Silica Study; Raizner, J. 2013. Offshore Fracking Injuries. Oil and Gas Monitor, 13 September 2013, at www.oilgasmonitor.com/offshore-fracking-injuries/5919/.
[179] Zavala-Araiza, D. et al. 2015. Reconciling divergent estimates of oil and gas methane emissions. PNAS 112: 15597-15602; Karion, A. et al. 2013. Methane emissions estimate from airborne measurements over a western United States natural gas field. Geophysical Research Letters 40: 4393-4397; Peischl, J. et al. 2013. Quantifying sources of methane using light alkanes in the Los Angeles basin, California. Journal of Geophysical Research: Atmospheres 118: 1-17; Pétron Tollefson, J. 2013. Methane leaks erode green credentials of natural gas: losses of up to 9% show need for broader data on US gas industry's environmental impact. Nature 493: 12; Howarth, R.W. et al. 2011. Methane and the greenhouse-gas footprint of natural gas from shale formations. Climatic Change 106: 679-69.
[180] Caulton, Dana R. et al., Toward a Better Understanding and Quantification of Methane Emissions from Shale Gas Development, 111 Proc. Natl. Acad. Sciences 17 (2014); Schneising, Oliver, et al. 2014. Remote Sensing of Fugitive Methane Emissions from Oil and Gas Production in North American Tight Geologic Formations, Earth's Future 2, doi:10.1002/2014EF000265; Allen, D. T. et al. 2013. Measurements of Methane Emissions at Natural Gas Production Sites in the United States, 110 Proc. Natl. Acad. Sci. 44.
[181] Ingraffea, Anthony R, et al. 2014. Assessment and Risk Analysis of Casing and Cement Impairment in Oil and Gas Wells in Pennsylvania, 2000 – 2012, 111 Proc. Natl. Acad. Sciences 30.

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In addition, new studies have drawn a strong connection between the recent rise in fracking wastewater injection and increased earthquake rates.[182] For example, the USGS has recognized that wastewater disposal from fracking is a "contributing factor" to the six-fold increase in the number of earthquakes in Oklahoma.[183] Another recent study also found that wastewater injection is responsible for the dramatic rise in the number of earthquakes in Colorado and New Mexico since 2001.[184] Wastewater injection has been scientifically linked to earthquakes of magnitude three and greater in at least seven states: Arkansas,[185] Colorado,[186] Ohio,[187] Oklahoma,[188] Texas,[189] New Mexico,[190] and California.[191]

But it is not just wastewater injection that can lead to earthquakes. The practice of fracking itself has been found to contribute directly to seismic events.[192] Even if the earthquakes that fracking directly generates are small, fracking could be contributing to increased stress in faults that leaves those faults more susceptible to otherwise naturally triggered earthquakes of a greater magnitude.[193] MARAD's Draft EIS ignores these impacts, in violation of NEPA. s

CO1-18

E. MARAD's Draft EIS Fails to Quantify and Analyze the Social Costs of Greenhouse Gas Emissions and Other Pollutants from the Proposed Project

Even if MARAD does not quantify and analyze the negative impacts of induced production, it must still analyze the impacts of the pollutants to be emitted during construction and operation of the Proposed Project. MARAD should also quantify and analyze the impacts of the GHG emissions from consumption of the LNG to be exported.[194]

[182] Van de Elst, Nicholas J. et al. 2013. Enhanced Remote Earthquake Triggering at Fluid-Injection Sites in the Midwestern United States, 341 *Science* 164.
[183] Sumy, D. F., *et al.* 2014. Observations of static Coulomb stress triggering of the November 2011 *M*5.7 Oklahoma earthquake sequence, *J. Geophys. Res. Solid Earth,* 119, 1904–1923, DOI:10.1002/2013JB010612; USGS, Record Number of Oklahoma Tremors Raises Possibility of Damaging Earthquakes, May 2, 2014.
[184] Justin L. Rubinstein, et al. 2014. The 2001 – Present Induced Earthquake Sequence in the Raton Basin of Northern New Mexico and Southern Colorado. *Bulletin of the Seismological Society of America*, 2014 DOI: 10.1785/0120140009.
[185] E&E News, USGS, Okla. warn of more drilling-related earthquakes in State, Mike Soraghan. Oct. 25, 2013.
[186] *Id.*
[187] Ohio Dept. of Nat. Resources (2012) *Executive Summary: Preliminary Report on the Northstar 1 Class II Injection Well and the Seismic Events in the Youngstown, Ohio Area*; Fountain, Henry, Disposal halted at well after new quake in Ohio, *New York Times*, Jan. 1, 2012.
[188] Holland, Austin, Examination of possibly induced seismicity from hydraulic fracturing in the Eola Field, Garvin County, Oklahoma, Oklahoma Geological Survey Open-File Report OF1-2011 (2011).
[189] Frohlich, Cliff (2012) Two-year survey comparing earthquake activity and injection-well locations in the Barnett Shale, Texas. *Proceedings of the National Academy of Sciences*. Vol 109. No. 35.
[190] Rubinstein, J. L, et al. 2012.
[191] T. H. W. Goebel, et al. 2016. Wastewater disposal and earthquake swarm activity at the southern end of the Central Valley, California, Geophysical Research Letters. Vol. 43, Issue 3. Pages 1092–1099.
[192] Van der Elst, 2013; BC Oil & Gas Commission, Industry Bulletin: 2015-32, Dec. 15, 2015, https://www.bcogc.ca/node/12951/download.
[193] Van der Elst, et al. 2013.
[194] *See e.g.*, EPA, GHG Equivalencies Calculator – Calculations and References, https://www.epa.gov/energy/ghg-equivalencies-calculator-calculations-and-references

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CO1 The Center for Biological Diversity (cont'd)

CO1-18 In keeping with previous agency guidance, while the existence of upstream natural gas production and pipeline transport facilities are "reasonably foreseeable," the actual scope and extent of greenhouse gas (GHG) emissions from these upstream activities are themselves not reasonably foreseeable, due to factors beyond the control of the proposed Project. GHG-related impacts are discussed, within appropriate scope, in the final EIS. Please refer to Sections 1.4 and 4.9.5.

CO1

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MARAD's Draft EIS quantifies some of the air pollution that will be caused by construction and operation of the Proposed Project,[195] but that analysis is limited. For example, MARAD's analysis inexplicably fails to quantify the emissions, including GHG emissions, of LNG vessels outside of 10 nautical miles from the safety zone. But the impacts from the emissions of LNG vessels are reasonably foreseeable. The fact that MARAD might not know exactly where the vessels will travel does not excuse it from conducting a full analysis of the emissions from LNG vessels, as NEPA specifically requires "reasonable forecasting."[196] The failure to quantify the full range of impacts associated with the Proposed Project constitutes a violation of NEPA.

Moreover, MARAD fails to analyze the negative impacts the pollutants, including GHGs, to be generated by the project. In its Draft EIS, MARAD quantifies the purported economic benefits of its proposal, such as job creation.[197] But MARAD wholly fails to quantify the negative impacts that would result, and the attendant societal and environmental costs of such emissions. This is despite a readily available tool to analyze the costs of the greenhouse gas emissions generated by MARAD's proposal—the social cost of carbon. The social cost of carbon was developed by the Interagency Working Group on Social Cost of Carbon, which was convened by the Council of Economic Advisers and the Office of Management and Budget. As explained in the Working Group's report:

> The purpose of the "social cost of carbon" (SCC) estimates presented here is to allow agencies to incorporate the social benefits of reducing carbon dioxide (CO_2) emissions into cost-benefit analyses of regulatory actions that impact cumulative global emissions. The SCC is an estimate of the monetized damages associated with an incremental increase in carbon emissions in a given year. It is intended to include (but is not limited to) changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change.[198]

The working group presents values for social costs from 2015 to 2050, ranging from $11 to $212 (in 2007 dollars per metric ton of CO_2).[199] The SCC demonstrates that the benefits of reducing carbon pollution are significant. For example, the proposed rules for reducing power plant carbon emissions calculated the climate benefits and health co-benefits to be $15.6 to $88 billion in 2020 and $32.3 to $151 billion in 2030.[200] However, recent studies have demonstrated

[195] Draft EIS at 4-134 to 4-138.
[196] N. Plains Res. Council, Inc. v. Surface Transp. Bd., 668 F.3d 1067, 1079 (9th Cir. 2011).
[197] *See e.g.*, Draft EIS at 4-209.
[198] Interagency Working Group on Social Cost of Carbon, United States Government, Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis - Under Executive Order 12866, May 2013, https://www.whitehouse.gov/sites/default/files/omb/inforeg/social_cost_of_carbon_for_ria_2013_update.pdf.
[199] Interagency Working Group on Social Cost of Carbon, United States Government, Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 at 2-3 (July 2015 revision), https://www.whitehouse.gov/sites/default/files/omb/inforeg/scc-tsd-final-july-2015.pdf.
[200] EPA, Regulatory Impact Analysis Technical Document EPA-452/R-14-002 (June 2014).

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that the numeric value assigned to the social cost of carbon vastly underestimates the true cost.[201] The social cost of carbon is therefore a minimum value.

Other analytical tools exist to evaluate the cost of methane emissions.[202] The Environmental Protection Agency has peer-reviewed and employed such a tool in its "Regulatory Impact Analysis of the Proposed Emission Standards for New and Modified Sources in the Oil and Natural Gas Sector."[203]

MARAD's quantification of the purported economic benefits of its proposal while assigning zero value to the social and environmental costs of GHG emissions and other pollutants is both disingenuous and unlawful under NEPA. Similarly, MARAD's failure to estimate the GHG emissions from consumption of the LNG to be exported also violates NEPA.

CO1-19

F. MARAD's Draft EIS Cumulative Impacts Analysis is Inadequate

In evaluating the environmental impacts of the proposed action, NEPA requires MARAD to consider and describe the direct, indirect, and cumulative impacts.[204] Cumulative impacts are those impacts that "result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."[205] MARAD's Draft EIS fails to adequately consider the indirect and cumulative impacts of its proposal to adopt the preferred alternative and allow the construction of the first floating LNG export facility in federal waters.

Specifically, MARAD fails to actually analyze the impacts of the proposed action in light of other activities affecting the Gulf of Mexico because those activities generate more impacts, such as more air emissions or vessel traffic than the Proposed Project.[206] But NEPA requires agencies to consider *all* the significant impacts of their actions; it does not excuse consideration of one impact simply because another impact may be more significant.

Moreover, the purported cumulative impacts analysis consists of little less than a list of activities in the area, such as other LNG processing facilities, vessel traffic, and offshore oil and gas drilling.[207] But a cumulative impacts analysis "must be more than perfunctory; it must

[201] F. Ackerman & E. Stanton, Climate Risks and Carbon Prices: Revising the Social Cost of Carbon, in Economics, vol. 6 (Apr. 4, 2012) (the social cost of carbon could be almost $900/tCO2 in 2010, rising to $1,500/tCO2 in 2050).
[202] Marten A.L., Kopits K.A., Griffiths C.W., Newbold S.C., Wolverton A. 2015. "Incremental CH4 and N2O mitigation benefits consistent with the US Government's SC-CO2 estimates," Climate Policy 15(2):272-298.
[203] USEPA, Social Cost of Carbon, available at http://www3.epa.gov/climatechange/EPAactivities/economics/scc html (noting application of social cost of methane supported by peer review); USEPA, Regulatory Impact Analysis of the Proposed Emission Standards for New and Modified Sources in the Oil and Natural Gas Sector, Ch. 4, available at http://www3.epa.gov/airquality/oilandgas/pdfs/og_prop_ria_081815.pdf.
[204] 40 C.F.R §§ 1502.16, 1508.7, 1508.8; *Northern Plains Resource Council v. Surface Transportation Board*, 668 F.3d 1067, 1072-73 (9th Cir. 2011).
[205] 40 C.F.R. § 1508.7.
[206] *See e.g.*, Draft EIS at 6-21 to 6-22.
[207] *See e.g. id.* at 6-4 to 6-14.

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CO1 The Center for Biological Diversity (cont'd)

CO1-19 Vessel traffic and air quality are addressed in Sections 6.2.7 and 6.2.8 of the final EIS.

As stated in Section 4.3.1.1 of the final EIS, increased vessel traffic would add a minor increase in traffic to the Sabine Safety and Calcasieu Safety Fairways.

As shown in Sections 4.9.1 and 4.9.2 of the final EIS, the proposed Port's incremental contribution to air quality impacts in the Project vicinity would be below the significant impact levels established by USEPA in its guidance for implementation of the NAAQS. A dispersion modeling analysis was performed by Delfin LNG, including cumulative impacts from nearby existing facilities from nitrogen dioxide and particulate matter less than 2.5 microns (or PM2.5) emissions, and determined that air quality impacts from operation of the proposed DOF would remain in compliance with all applicable air quality standards.

CO1

CO1-19 (con't)

provide a useful analysis of the cumulative impacts of past, present, and future projects."[208] MARAD's list of categories of activities and their impacts fails to constitute a "quantified assessment of their [other projects] combined environmental impacts," and "objective quantification of the impacts" from other existing and proposed activities in the region, as required by NEPA.[209]

CO1-20

G. MARAD Failed to Adequately Consider Environmental Justice Issues

MARAD's proposal raises significant environmental justice issues. But MARAD's Draft EIS fails to adequately address these significant impacts, or adequately analyze the social and environmental costs of its proposal in light of those impacts.

On February 11, 1994, President Clinton issued Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations." The Executive Order makes it the responsibility of each Federal agency to "make achieving environmental justice part of its mission in identify and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Accompanying this order was a Presidential Memorandum stating that "each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by [NEPA]." The CEQ has also issued guidance on incorporating environmental justice considerations in the NEPA process.[210] The guidance states in part:

> Early and meaningful public participation in the federal agency decision making process is a paramount goal of NEPA. CEQ's regulations require agencies to make diligent efforts to involve the public throughout the NEPA process. Participation of low-income populations, minority populations, or tribal populations may require adaptive or innovative approaches to overcome linguistic, institutional, cultural, economic, historical, or other potential barriers to effective participation in the decision-making processes of Federal agencies under customary NEPA procedures.[211]

States bordering the Gulf of Mexico are home to a variety of onshore oil and gas infrastructure that support oil and gas activities, including refineries. Toxic pollution from these refineries and petrochemical facilities disproportionately impact low-income neighborhoods and communities of color. For example, Port Arthur, Texas is home to two facilities that refine more than 900,000 barrels of crude per day.[212] The Environmental Protection Agency's Toxics Release Inventory places Jefferson County, where Port Arthur is located, among the worst in the nation for emissions of chemicals known to cause cancer, birth defects, and reproductive disorders.

[208] *Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 994 (9th Cir. 2004).
[209] *Great Basin Mine Watch v. Hankins*, 456 F.3d 955, 971-974 (9th Cir. 2006).
[210] CEQ, Environmental Justice: Guidance Under the National Environmental Policy Act, http://energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/G-CEQ-EJGuidance.pdf.
[211] *Id.* at 13.
[212] *See e.g.*, NRDC, Port Arthur, Texas: American Sacrifice Zone, Aug. 26, 2013, http://archive.onearth.org/articles/2013/08/if-built-the-keystone-xl-pipeline-will-end-in-one-toxic-town.

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CO1 The Center for Biological Diversity (cont'd)

CO1-20 The cities of Lake Charles, Louisiana and Port Arthur, Texas have racial minority populations that are meaningfully greater than the states of Louisiana and Texas; therefore, these cities could be considered environmental justice communities. As discussed in Section 4.18.9, "Potential onshore impacts during construction, operation, and decommissioning would be limited to viewscape alterations; however, given the existing viewscape is currently populated with oil and gas infrastructure, impacts are expected to be negligible. Overall, the proposed Port is not expected to have disproportionate impacts on minority or low-income communities compared with other communities nearby."

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CO1-20 (con't)

Data collected by the Texas Cancer Registry indicates that cancer rates among African Americans in Jefferson County are roughly 15% higher than they are for the average Texan, and the mortality rate from cancer is more than 40% higher.[213]

Moreover, many of these communities are also on the frontlines of climate change, with severe storms like Hurricane Katrina displacing people. And coastal areas in Louisiana are eroding at the rate of a football field an hour, meaning the area is losing important buffers to the impacts of hurricanes, and the impacts of such storms on frontline communities are only going to intensify in the future. Additionally, scientists say that at current rates, coastal erosion and sea level rise will lead to nearly all of Southeast Louisiana being under water by 2100, leading to the displacement of even more communities.[214]

MARAD's proposal will exacerbate all these impacts by leading to more drilling, which will lead to more toxic air pollution and greenhouse gas emissions. MARAD's quantification of the purported economic benefits of the Proposed Project while assigning zero value to the social and environmental costs, and its failure to adequately describe and quantify these negative impacts, do not comply with its duty to disclose the environmental justice implications of the Proposed Project.

MARAD's analysis of the cumulative impacts of its proposal on environmental justice communities is inadequate for the same reason. Indeed, MARAD seems to dismiss the import of the additional air pollution that could result from its proposal on Gulf communities because there is already significant oil and gas-related infrastructure in the Gulf states. This approach undercuts the entire purpose of a cumulative impacts analysis and efforts to inform and engage environmental justice communities.

CO1-21

IV. MARAD Must Comply with its Consultation Obligations Under the Endangered Species Act Prior to Approving the Proposed Project

Approval of the Proposed Project would also require consultation under Section 7 of the ESA. In enacting the ESA, Congress recognized that certain species "have been so depleted in numbers that they are in danger of or threatened with extinction."[215] Accordingly, a primary purpose of the ESA is "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, [and] to provide a program for the conservation of such . . . species."[216]

[213] *See also*, O'Rourke, et al., JUST OIL? THE DISTRIBUTION OF ENVIRONMENTAL AND SOCIAL IMPACTS OF OIL PRODUCTION AND CONSUMPTION, Annu. Rev. . Resour. 2003. 28:587–617, doi: 10.1146/annurev.energy.28.050302.105617; Environmental Integrity Project, Breakdowns in Air Quality, Apr. 27, 2016; Earthjusitce, Community Impact Report: The Toll of Refineries on Fenceline Communities, Oct. 2014; Southwest Workers Union, The Oil Industry in the Gulf of Mexico: A history of Environmental injustices, Aug. 2003; Environmental Integrity Project, ACCIDENT PRONE: Malfunctions and "Abnormal" Emission Events at Refineries, Chemical Plants, and Natural Gas Facilities in Texas, 2009-2011, July 18, 2012.
[214] Bob Marshall, Losing Ground: Southeast Louisiana is Disappearing Quickly, Scientific American, Aug. 28, 2014, http://www.scientificamerican.com/article/losing-ground-southeast-louisiana-is-disappearing-quickly/.
[215] 16 U.S.C. § 1531(a)(2).
[216] *Id.* § 1531(b).

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CO1 The Center for Biological Diversity (cont'd)

CO1-21 Thank you for your comment. See response to comment CO1-3.

CO1 The Center for Biological Diversity (cont'd)

CO1

CO1-21 (con't)

To reach these goals, Section 9 of the ESA prohibits any person, including any federal agency, from "taking" any endangered species without proper authorization through a valid incidental take permit.[217] The term "take" is statutorily defined broadly as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."[218] The definition of "harm" has been defined broadly by regulation as "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering."[219] Courts have found federal agencies liable for take of listed species where agency authorized activities resulted in the killing or harming of ESA-listed species.[220]

Additionally, Section 7(a)(2) of the ESA requires federal agencies to "insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or result in the destruction or adverse modification of [the critical] habitat of such species."[221] "Action" is broadly defined to include "all activities or programs of any kind authorized, funded, or carried out, in whole or in part" by federal agencies and include granting permits and licenses, as well as actions that may directly or indirectly cause modifications to the land, water, or air.[222]

To facilitate compliance with Section 7(a)(2), an "agency shall . . . request" from the Services information regarding whether any listed species "may be present" in a proposed action area, and if so, the "agency shall conduct a biological assessment" to identify species likely to be affected.[223] The agency must then initiate formal consultation with the Services if a proposed action "may affect" any of those listed species.[224]

After formal consultation, the Services issue a biological opinion to determine whether the agency action is likely to "jeopardize" any species' existence. If so, the opinion may specify reasonable and prudent alternatives ("RPAs") that avoid jeopardy.[225] If the Services conclude that the action or the RPAs will not cause jeopardy, the Services will issue an incidental take statement ("ITS") that specifies "the impact, i.e., the amount or extent, of . . . incidental taking" that may occur.[226] When those listed species are marine mammals, the take must first be authorized pursuant to the MMPA, and the ITS must include any additional measures necessary

[217] 16 U.S.C. § 1538(a)(1)(B); *see also* 50 C.F.R. § 17.31(a) (extending the "take" prohibition to threatened species managed by the U.S. Fish and Wildlife Service)..
[218] 16 U.S.C. § 1532(19).
[219] 50 C.F.R. § 17.3; *see also Babbitt v. Sweet Home Ch. Of Communities for a Great Oregon*, 515 U.S. 687 (1995) (upholding regulatory definition of harm).
[220] *See e.g., Defenders of Wildlife v. Envtl. Prot. Agency*, 882 F.2d 1294, 1300-01 (8th Cir. 1989); *Strahan v. Coxe*, 127 F.3d 155, 163 (1st Cir. 1997).
[221] 16 U.S.C. § 1536(a)(2); 50 C.F.R. § 402.14(a).
[222] 50 C.F.R. § 402.02.
[223] 16 U.S.C. § 1536(c).
[224] . 50 C.F.R. § 402.14(a); 51 Fed. Reg. 19,926 (June 3, 1986) ("may affect" broadly includes "[a]ny possible effect, whether beneficial, benign, adverse or of an undetermined character").
[225] 16 U.S.C. § 1536(b); 50 C.F.R. § 402.14(h)(3).
[226] 50 C.F.R. § 402.14(h)(3).

CO1

CO1-21 (con't)

to comply with the MMPA take authorization. *Id.* The take of a listed species in compliance with the terms of a valid ITS is not prohibited under Section 9 of the ESA.[227]

MARAD's Draft EIS admits that the Proposed Project will result in numerous impacts to ESA-listed species. The Draft EIS further admits that some of these impacts—specifically, vessel traffic and accidental releases of fuel, oil and other chemicals—could result in "major adverse impacts" to listed marine species.[228] MARAD's Draft EIS also admits that construction of the facility will result in noise that will exceed the National Marine Fisheries Service's Level A and Level B harassment levels for marine mammals. In other words, construction of the facility has the potential to injure marine mammals or disturb marine mammals by disrupting behavioral patterns, including, migration, breathing, nursing, breeding, feeding, or sheltering.[229]

Yet, MARAD's Draft EIS states that the agency has determined construction and operation of the Proposed Project is not likely to adversely affect any listed marine species.[230] Such a determination is clearly arbitrary and capricious. While the Draft EIS contains a series of "Best Management Practices" that will supposedly be adopted by Delfin LNG, these measures largely just require Delfin LNG to get permits and comply with federal law, which cannot be mitigation measures. Moreover, the measures are not binding, certain and effective and thus cannot be used to conclude adverse impacts have been adequately mitigated.[231] MARAD cannot approve the Proposed Project unless and until formal Section 7 consultation is complete and any measures required to mitigate the harm to listed species or their critical habitat are including as binding conditions of the Proposed Project.

V. Conclusion

The tremendous environmental and climate impacts and risks associated with the Proposed Project demonstrate that the Proposed Project is not in the national interest or consistent with national policy goals. The Center therefore urges MARAD to adopt the no-action alternative and deny the license application.

At the very least, MARAD must substantially revise and reissue its Draft EIS for public review and comment given the numerous deficiencies in the document. The Draft EIS fails to comply with NEPA in several respects: it fails to adequately define the purpose and need for the Proposed Project; fails to take a "hard look" at the impacts of the Proposed Project by failing to adequately consider the harms from wastewater discharges, air pollution, noise, ship strikes, and accidents; fails to consider a reasonable range of alternatives; fails to adequately consider cumulative impacts or impacts to environmental justice communities; fails to consider the impacts from induced production and the use of inherently dangerous practices such as fracking;

[227] 16 U.S.C. §§ 1536(b)(4), (o)(2); 50 C.F.R. § 402.14(i)(5).
[228] Draft EIS at ES-9.
[229] *See* 16 U.S.C. § 1362(18) (defining Level A and Level B harassment).
[230] *Id.*
[231] *See e.g., NWF v. NMFS*, 481 F.3d 1224, 1240-41 (9th Cir. 2007) (NMFS can't rely on future mitigation "without more solid guarantees that they will actually occur;" they need "specific and binding plans" rather than a "general commitment"); *Southwest Ctr. for Biological Diversity v. Bartel*, 470 F.Supp.2d 1118, 1141, 1144-46 (S.D.Cal. 2006) (assurances in HCP violate ESA because "they lock-in ineffective, unstudied, and inadequate mitigation for the vernal pool species for fifty years. The ESA requires useful mitigation.").

CO1 The Center for Biological Diversity (cont'd)

CO1

and fails to analyze the social costs of GHG emissions from the Proposed Project. Further, MARAD cannot approve the Proposed Project unless and until formal ESA Section 7 consultation is complete.

Sincerely.

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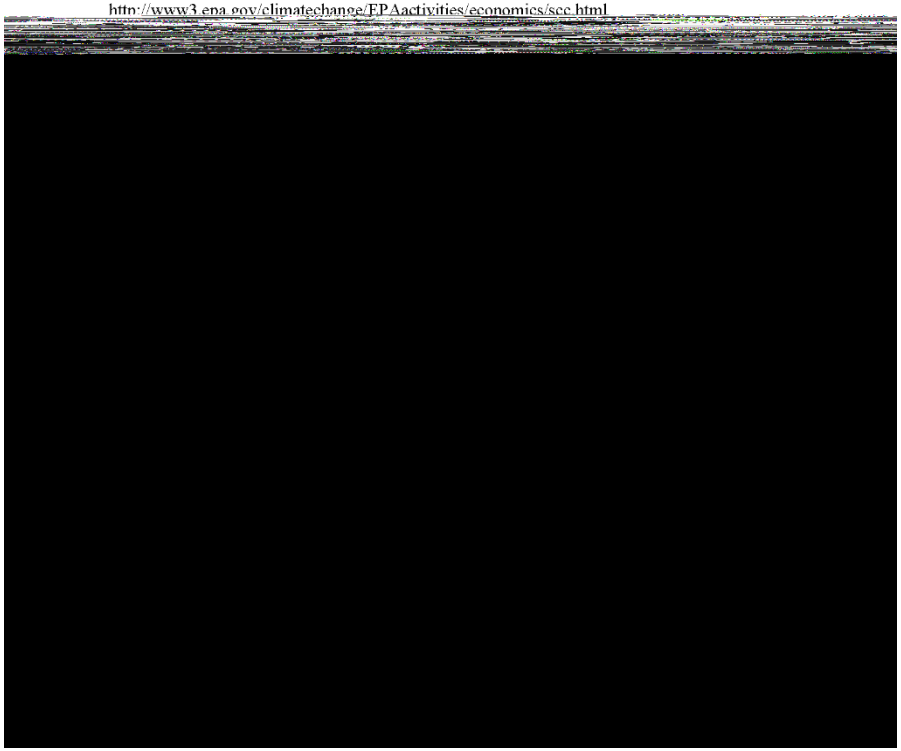

CO2 American Petroleum Institute (cont'd)

CO2

CO2-1 (con't)

trillion cubic feet. Importantly, using today's technology, approximately 1,400 Tcf of natural gas is recoverable at a current break-even Henry Hub price of $4/MMBtu or less in the United States and Canada (in real terms), a 66 percent increase over 2010 estimates.[4] As technology continues to advance in unconventional drilling, recoverable gas estimates will continue to grow.

Increased LNG exports will have domestic benefits for the United States, including jobs created by the construction and operation of the facilities themselves. For instance, the Delfin LNG project has the potential to employ 200 workers during the construction phase of the project, and each floating liquefied natural gas vessel will need to be manned by 50-100 mariners, crew, engineers, and operators.[5] Completion of the Delfin facility would also increase demand for domestic natural gas production, adding American jobs, boosting domestic GDP, increasing government revenues and helping reduce the trade deficit.

CO2-2

In addition to the economic benefits of LNG exports, natural gas also advances environmental goals. The increased use of natural gas in electricity generation accounted for 31% of total GHG reductions between 2005 and 2013.[6] Natural gas is the cleanest burning fossil fuel and exporting U.S. LNG would help reduce global greenhouse gas emissions (GHG). ICF International estimates that GHG emissions from exported LNG would be 43 to 52 percent lower than if coal was being used.[7] Further, DOE's own study concluded that U.S. exported LNG used for electricity generation in Asia and Europe has lower life-cycle GHG emissions than power generation from other Asian and European regional fossil fuels.[8] Encouraging the use of natural gas around the world will have an important effect on our climate change goals.

III. Scope of NEPA Review

CO2-3

API also believes the scope of the DEIS is appropriately tailored to mitigate the environmental impacts of construction and operation of the Delfin LNG Project. Specifically, API believes that the DEIS is fully compliant with MARAD's responsibilities under the National Environmental Policy Act (NEPA), and that a final EIS need not consider either the alleged impacts of supposed "induced" upstream natural gas production to meet increased export demand, or the impacts of "downstream" combustion or other use of natural gas once it is shipped, re-gasified, and put to use in any number of ways in any number of export destinations. API has already provided extensive comment and analysis to FERC and the U.S. Department of Energy[9] (DOE) on the proper scope of NEPA review for LNG export facilities and related DOE export authorizations, respectively, and we encourage the Commission to review these comments when finalizing the EIS. In sum, because MARAD is not the legal cause of upstream natural gas production or downstream consumption of gas, it is not required under NEPA to consider alleged or actual impacts of these activities.[10] Moreover, environmental impacts of upstream natural gas production

[4] IHS, "Shale Gas Reloaded: The Evolving View of North American Natural Gas Resources and Costs." February 2016, http://press.ihs.com/press-release/north-americas-unconventional-natural-gas-resource-base-continues-expand-volume-and-de.
[5] "The Project," Delfin LNG, accessed August 25, 2016, http://www.delfinlng.com.
[6] EIA. 2014. U.S. Energy-Related Carbon Dioxide Emissions, 2013, http://www.eia.gov/environment/emissions/carbon/.
[7] ICF International, "Lifecycle GHG Emissions from LNG Exports," February 2014, 1.
[8] U.S. Department of Energy, "Life Cycle Greenhouse Gas perspective on Exporting Liquefied Natural Gas form the United States," May 29, 2014, 9.
[9] *See, e.g.*, American Petroleum Institute, "2012 LNG Export Study – Reply Comments of the American Petroleum Institute," February 25, 3013, http://www.api.org/~/media/files/policy/lng-exports/api-reply-comments-doe-2012-lng-export-study-2013.pdf.
[10] *See, e.g., Sierra Club v. FERC*, D.C. Cir. No. 14-1249 (June 28, 2016); *Sierra Club v. FERC*, D.C. Cir. No. 14-1275 (June 28, 2016); *EarthReports, Inc. v. FERC*, D.C. Cir. No. 15-1127 (July 15, 2016) (upholding FERC NEPA reviews for LNG export facilities and rejecting arguments that FERC, as lead environmental review agency, was required to assess greenhouse gas emissions or other environmental impacts beyond the footprint of the facility).

CO2-2 Thank you for your comment.

CO2-3 Thank you for your comment.

CO2 American Petroleum Institute (cont'd)

CO2

energy API
AMERICAN PETROLEUM INSTITUTE

CO2-3 (con't) are already extensively regulated by numerous federal and state agencies (and are the subject of hundreds of consensus-based industry standards).

CO2-4 DOE has also reviewed and analyzed downstream impacts of LNG exports, concluding that on a lifecycle basis, increased exports will lower global GHG emissions.[11] API concurs with DOE's analysis. If MARAD elects to further assess greenhouse gas emissions related to the Delfin LNG Project under the Council on Environmental Quality's (CEQ) recently-finalized, non-binding "Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews"[12], we encourage the agency to adopt DOE's analysis by reference. Because the Guidance "[a]dvises agencies to use available information … instead of undertaking new research," it would be out of step with CEQ's recent direction to agencies to begin a new assessment, which is not required by NEPA in the context of LNG export facility construction (*see* n.10 *supra*), and which could unfairly delay the development of the Delfin LNG Project at this late stage in the NEPA review process.

IV. Conclusion

CO2-5 In order to take advantage of the numerous opportunities that LNG exports provide our nation, proper facility permitting must occur without delay in order to boost the competitiveness of the U.S. in this growing market. Enabling U.S. facilities to come online sooner will ensure the U.S. a competitive advantage in serving expected global LNG demand. For the above stated reasons, API writes in support of the Delfin LNG Project. This abundant, affordable supply can support significant demand growth across several sectors of the economy including power generation, manufacturing, and transportation. The U.S. can increase our natural gas exports and continue to take advantage of this abundant, affordable resource domestically. Approving LNG exports from the Delfin LNG Project and other export facilities will strengthen our economic growth and environmental goals. Thank you for your consideration in this matter. API is available to address any questions or concerns that MARAD may have.

Sincerely,

Marty Durbin
Executive Director, Market Development
American Petroleum Institute

[11] U.S. Department of Energy, "Life Cycle Greenhouse Gas perspective on Exporting Liquefied Natural Gas form the United States," May 29, 2014, 9.
[12] *See* 81 Fed. Reg. 51,866 (Aug. 5, 2016).

1220 L Street, NW • Washington, DC 20005-4070 • www.api.org

CO2-4 Thank you for your comment.

CO2-5 Thank you for your comment.

IND1

From: Jean Public
To: Bachman, Roddy C CIV; VICEPRESIDENT@WHITEHOUSE.GOV
Cc: AMERICANVOICES@MAIL.HOUSE.GOV; INFO@EARTHJUSTICE.ORG; INFO@PEWTRUSTS.ORG
Subject: [Non-DoD Source] Fw: PUBLIC COMMENT ON MARAD USCG DEEPWATER PORT TO SELL OUR RESOURCES TO WORLD SO A FEW CAN MAKE BIG MONEY BY DEPLETING AMERICA
Date: Saturday, July 16, 2016 9:36:10 AM

IND1-1 I OPPOSE THIS DEEPWATER PORT WHICH IS TO LET A FEW FAVORED PEOPLE OR RICH CORPS SELL OUR AMERICAN BOUNTY TO THE WORLD PERHAPS OIUR ENEMAIES SO THEY CAN MAKE BIG MONEY AND AMEICAN CAN BE DESTROYED. I AM NOT IN FAVOR OF ALLOWING SELLIGN OUR GAS OR OIL OUT OF THIS COUNTRY. WE OWN IT. WE NEED TO KEEP IT FOR OURSELVES. LEAVE IT IN THE GROUND. THIS COMMENT IS FOR THE BELOW NOTICE TO THEPUBLIC. I NOTE THAT THE NOTICE TO THE PUBLIC HAS BEEN EXTREMELY SNEAKY AND SECRETIVE. PLEASE RECEIPT. JEAN PUBLIEE JEANPUBLIC1@YAHOO.COM

--- On Fri, 7/15/16, Jean Public <jeanpublic1@yahoo.com> wrote:

> From: Jean Public <jeanpublic1@yahoo.com>
> Subject: comment
> To: jeanpublic1@yahoo.com
> Date: Friday, July 15, 2016, 9:33 AM
> Federal Register Volume 81, Number
> 136 (Friday, July 15, 2016)]
> [Notices]
> [Page 46077]
> From the Federal Register Online via the Government
> Publishing Office [www.gpo.gov]
> [FR Doc No: 2016-16800]
>
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> ----------
>
> ENVIRONMENTAL PROTECTION AGENCY
>
> [ER-FRL-9028-1]
>
>
> Environmental Impact Statements; Notice of Availability
>
> Responsible Agency: Office of Federal
> Activities, General
> Information (202) 564-7146 or https://urldefense.proofpoint.com/v2/url?u=http-3A__www2.epa.gov_nepa&d=CwIFaQ&c=0NKfg44GVknAU-XkWXjNxQ&r=LsNTp4G56Lk4f6G2aSGxUxLKWIESds9CQQOyHQ1JH4A&m=pZsEVGxEvu8OWVhd-Gx0nal0dF9f28P4T5KBcITUKsI&s=UgIjiX8MRPODt4rRiob2igM2MfJER2okWIgIK0OfGsk&e= .
>
> Weekly receipt of Environmental Impact Statements (EISs)
> Filed 07/05/
> 2016 Through 07/08/2016
> Pursuant to 40 CFR 1506.9.
>
> Notice
>
> Section 309(a) of the Clean Air Act requires
> that EPA make public
> its comments on EISs issued by other Federal agencies. EPA's

INDIVIDUALS

IND1 Jean Public

IND1-1 Thank you for your comment.

IND1 Jean Public (cont'd)

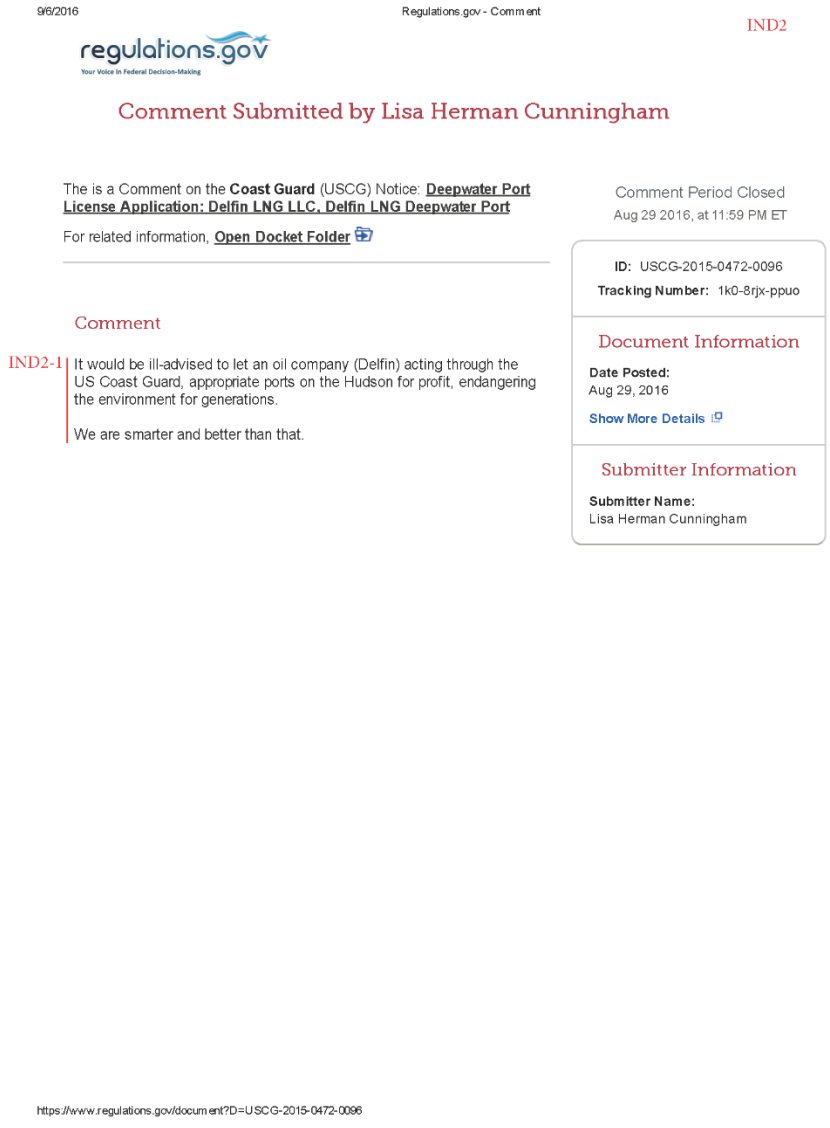
IND1

> comment
> letters on EISs are available at:
> https://urldefense.proofpoint.com/v2/url?u=http-3A__www.epa.gov_compliance_nepa_eisdata.html&d=CwIFaQ&c=0NKfg44GVknAU-XkWXjNxQ&r=LsNTp4G56Lk4f6G2aSGxUxLKWIESds9CQQOyHQ1JH4A&m=pZsEVGxEvu8OWVhd-Gx0nal0dF9fz8P4T5KBclTUKsI&s=G6yUHekBlO-CpSQ2CWU5aW5TBewN07t2Gtv3HokBsvM&e= .
>
> EIS No. 20160153, Final, Caltrans, CA, High Desert Corridor,
> Review
> Period Ends: 08/15/2016, Contact: Ron Kosinski 213-897-0703
> EIS No. 20160154, Final, NPS, MA, Herring River Restoration
> Project,
> Review Period Ends: 08/15/2016, Contact: Mark Husbands
> 303-987-6965
> EIS No. 20160155, Final, FTA, MN, Bottineau Light Rail
> Transit Metro
> Blue Line Extension, Review Period Ends: 08/15/2016,
> Contact: Maya
> Sarna 202-366-5811
> EIS No. 20160156, Draft, FRA, TX, Texas-Oklahoma Passenger
> Rail Study
> Service-Level, Comment Period Ends: 08/29/2016, Contact:
> Melissa
> Hatcher 202-493-6075
> EIS No. 20160157, Final, USN, WA, Land-Water Interface and
> Service Pier
> Extension at Naval Base Kitsap Bangor, Review Period Ends:
> 08/15/2016,
> Contact: Robin Senner 360-396-0029
> EIS No. 20160158, Draft, MARAD, USCG, LA, Port Delfin LNG
> Project
> Deepwater Port Application, Comment Period Ends: 08/29/2016,
> Contact:
> Roddy C. Bachman 202-372-1451
>
> The U.S. Coast Guard and the Maritime
> Administration are joint lead
> agencies for the above project.
>
> EIS No. 20160159, Draft, FERC, OH, NEXUS Gas Transmission
> Project and
> Texas Eastern Appalachian Lease Project, Comment Period
> Ends: 08/29/
> 2016, Contact: Joanne Wachholder 202-502-8056
> EIS No. 20160160, Final, BR, CA, Mendota Pool Bypass and
> Reach 2B
> Improvements Project, Review Period Ends: 08/15/2016,
> Contact: Becky
> Victorine 916-978-4624
> EIS No. 20160161, Final, USACE, WA, Puget Sound Nearshore
> Ecosystem
> Restoration, Review Period Ends: 08/15/2016, Contact: Nancy
> C. Gleason
> 206-764-6577
> EIS No. 20160162, Final, USFS, MT, Telegraph Vegetation
> Project, Review
> Period Ends: 08/15/2016, Contact: Sharon Scott 406-495-3943

IND1

> EIS No. 20160163, Final, DOE, LA, ADOPTION--Lake Charles
> Liquefaction
> Project, Contact: John Anderson 202-586-0521
>
> The U.S. Department of Energy (DOE) has
> adopted the Federal Energy
> Regulatory Commission's Final EIS #20150233 filed 08/14/2015
> with EPA.
> DOE was a cooperating agency, therefore recirculation of the
> document
> is not necessary under Section 1506.3(b) of the CEQ
> Regulations.
>
> Amended Notices
>
> EIS No. 20160085, Draft, USFWS, WY, Eagle Take Permits for
> the
> Chokecherry and Sierra Madre Phase I Wind Energy Project,
> Comment
> Period Ends: 07/29/2016, Contact: Louise Galiher
> 303-236-8677
>
> Revision to FR Notice Published 04/29/2016;
> The U.S. Fish and
> Wildlife Service has reopened the comment period to end
> 07/29/2016
> EIS No. 20160115, Draft, DOD, Other, Continental United
> States (CONUS)
> Interceptor Site, Comment Period Ends: 08/17/2016, Contact:
> Christopher
> Johnson 571-231-8212
>
> Revision to FR Notice Published 06/03/2016;
> Extending Comment
> Period from 07/18/2016 to 08/17/2016
>
> Dated: July 12, 2016.
> Karin Leff,
> Acting Director, NEPA Compliance Division, Office of Federal
>
> Activities.
> [FR Doc. 2016-16800 Filed 7-14-16; 8:45 am]
> BILLING CODE 6560-50-P
>
>
>

IND2 Lisa Cunningham



9/6/2016 Regulations.gov - Comment

IND2

regulations.gov
Your Voice in Federal Decision-Making

Comment Submitted by Lisa Herman Cunningham

The is a Comment on the **Coast Guard** (USCG) Notice: **Deepwater Port License Application: Delfin LNG LLC, Delfin LNG Deepwater Port**

For related information, **Open Docket Folder**

Comment Period Closed
Aug 29 2016, at 11:59 PM ET

ID: USCG-2015-0472-0096
Tracking Number: 1k0-8rjx-ppuo

Comment

IND2-1 It would be ill-advised to let an oil company (Delfin) acting through the US Coast Guard, appropriate ports on the Hudson for profit, endangering the environment for generations.

We are smarter and better than that.

Document Information

Date Posted:
Aug 29, 2016

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Submitter Information

Submitter Name:
Lisa Herman Cunningham

https://www.regulations.gov/document?D=USCG-2015-0472-0096 1/1

IND2-1 Thank you for your comment.

Transcript-1

17

pretty friendly crowd, so I'm sure I won't need to enforce any of this tonight.

It will move forward as follows: Elected officials will speak first, followed by private citizens, at which time we will give a chance for anybody else who has not signed up on my speaker's list. There is only four of you on here tonight. So anybody else who would like to speak, we will open it up.

Please try to keep your comments to three to five minutes. I'm not going to be enforcing anything tonight, but please try to keep it to that timeframe.

Once I call your name, please step up to the mic, state your name, spell your name for the court reporter, and move forward with your comments.

So at that time, we'll open the floor up. First up, we have Curtis Fountain.

SP1 MR. FOUNTAIN: Curtis Fountain, C-U-R-T-I-S, F-O-U-N-T-A-I-N.

I am the president of the Cameron Parish Police Jurors. We appreciate y'all coming tonight and everybody else that's here. We just want to show our support for Delfin. I know people don't like to hear it, but we're going to -- I'm say it again. Several years ago we had some storms and we lost some people. We lost some people in the area; we lost 30 percent of

SP1 to SP5 Johnson Bayou, LA; August 9, 2016 (cont'd)

Transcript-1

SP1-1 our population. Delfin, we feel, is going to be a good asset to the community. We just feel that they're a qualified company to move in here and help us move forward. We'd just like for you to consider them -- letting them -- allowing them to build their project. Thank you.

SP2 MR. SPARKS: Next up we have Mason Lindsay.

MR. LINDSAY: Good evening. I'm Mason Lindsay. I'm the chair of the Calcasieu Parish local Merchant Planning Committee and I work for S & S Sprinkler Company. My profession has always been in the fire and safety business. I want to thank you for hosting this forum tonight so that we can show our support for the Delfin LNG project.

SP2-1 If you had the opportunity to choose what type of industry you want, this would be the ideal project, due to the fact of the safety record of the pipeline industry. Very few incidents. And the same with the LNG industry. It's a clean industry, it has very little footprint. The footprint is very small on the environment. It's a very clean industry.

One of the things we do in our LMPC is we review incidents. We've never reviewed an LNG incident. There is, you know, other incidents we have reviewed and have had the opportunities to go into refineries and

SP1-1 Thank you for your comment.

SP2-1 Thank you for your comment.

SP1 to SP5 Johnson Bayou, LA; August 9, 2016 (cont'd)

Transcript-1

19

different chemical plants and the LNG facilities in Cameron and Lake Charles. And it's a win.

SP2-2 There's no negatives that I can think of for this project at all. It has tremendous economic impact on this area. And as was expressed earlier, you know, this area has seen some hurricanes and has lost a lot of population. This is the largest land mass parish in the state, and it's got the smallest population. A lot of people left in the storms that occurred approximately ten years ago, and they didn't come back.

One of the other problems that we have experienced over the last 50 years is coastal erosion.

SP2-3 We own some property just about a mile from here. And over the last 50 years you can see the, you know, the hundreds of yards of beach that has disappeared. There's been some projects but it's slow. There has been lots of studies, but slow projects. Having a terminal like this will enhance the abilities get additional projects that -- to help fight the erosion over the course.

So I hope that y'all approve this project. It's a win-win for everyone, including the Johnson Bayou area, the parish, and the state. And it's also good for the nation.

Thank you.

SP2-2 Thank you for your comment.

SP2-3 Thank you for your comment.

SP1 to SP5 Johnson Bayou, LA; August 9, 2016 (cont'd)

Transcript-1

20

MR. SPARKS: Sir, before you step down could you spell your name for the court reporter.

MR. LINDSAY: Oh, sorry. It's M-A-S-O-N. The last name is L-I-N-D-S-A-Y.

MR. SPARKS: Thank you.

SP3 Next up we have Ernest Broussard.

MR. BROUSSARD: Commander Perez, members of the panel, I thank you for allowing us to address.

My name is Ernie Broussard. I am the regional VP of business development for Hunt Guillotte. And we actually from -- well, I'm here, quite frankly, to speak of some historical information about the community. In another life I had the extreme good fortune and privilege to represent Cameron and its recovery post the storm incursions of '06 and '08, and we've become very much intimately familiar with the core and the fabric of this community. And I can't echo it any better than either Mr. Fountain, that you've just heard, Mr. Romero, or even Ms. Hebert, who is -- will be ever present in this process.

SP3-1 But we just wanted to note that even with all that we do, we're very excited about this community from a regional perspective, and very excited about the concept of your offshore operation. We actually feel that the concept is -- actually represents a minimal

SP3-1 Thank you for your comment.

SP1 to SP5 Johnson Bayou, LA; August 9, 2016 (cont'd)

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SP3-1 (con't)

amount of environmental intrusion. It is not only environmentally friendly, but it does preserve one of the three naturally appearing cheniers in the world. And that's where your project is going to be located.

We actually applaud the concept, you know, the Delfin institution group, for bringing this to you. And even though they are in Houston, you know, they have a great -- they have a great professional team. But

SP3-2

when you assess the community feasibility, the community impact, and the long-term implications, we'd just ask that you involve the community.

This community is still in recovery, quite frankly, but you will not find a stronger, more resilient and, dare I say, verbal community. But once they commit and once they embrace you as a project, they will be unyielding as long as you are consistent with them.

They know pipelines, they know ports. You know, they have a history and -- because at the end of

SP3-3

the day, their culture has to continue, their year-round hunting and fishing. We even have people that come from out of here to bird and shell. Which, quite frankly, I haven't figured out what that is or why I'm surprised that somebody would come look at a bird without shooting it. But this is the community that you're dealing with.

SP3-2 Thank you for your comment.

SP3-3 Thank you for your comment.

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So, again, I want to applaud the founders of Delfin for the consideration of this project and this community. And I think that you will find that they will stand ready to help steward this to completion.

Thank you.

MR. SPARKS: Sir, do you mind spelling your name for the court reporter.

MR. BROUSSARD: You're not from here. Broussard should be pretty easy. But it's B-R-O-U-S-S-A-R-D. Thank you.

MR. SPARKS: And our last signed-up speaker

SP4 for the night is Howard Romero.

MR. ROMERO: Good afternoon. My name is Howard Romero, H-O-W-A-R-D, R-O-M-E-R-O.

Before we -- well, I'm on the West Cameron Port board. Also, my family owns several private home businesses which I'm a part owner, and I'm a retired school principal here at Johnson Bayou for 17 years, taught here for 24 and a half years and was raised right back here in the field. So very familiar with the Johnson Bayou area.

We would like to say to you when you look across and you see a fairly small crowd, the reason why is because they already know everything about LNG. When we first ever -- Cheniere came in here and to get a

SP1 to SP5 Johnson Bayou, LA; August 9, 2016 (cont'd)

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permit, this room, everybody in here was here. You couldn't put another one in here. And the reason why was because they didn't know anything about permitting and what was going to happen. Today, they are very familiar with LNG. They've been through all of the committee meetings with Cheniere, with Simbra. We've been there with -- we were working with G2, we're working with Venture Global. And, by the way, we've visited with these guys with Delfin several times.

The good part about it, we appreciate what you guys do. Because, see, you guys look at all of the problems that may exist and you address them. The other part of that, we would tell you, that you've got a pretty good group of guys here with Delfin because we visited with them also. And they're letting us know how well they're prepared to be in our community. So that's a great thing.

SP4-1 So with all of that, all of us in Cameron Parish, we welcome LNG. They say we're the capital of the world. We just want to make sure nobody else catches up with us, so we need to get a few more permits.

So we thank y'all more than you think for coming and visiting with us. And the small crowd is only because they know all about LNG and they're

SP4-1 Thank you for your comment.

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welcoming LNG. So thank y'all for coming. We appreciate you.

MR. SPARKS: Thank you. That was the last signed-up speaker for the night. So now we'll open the floor to anybody else who would like to speak. So when I ask, please raise your hands. Make sure you state your name and spell your name for the court reporter. I see we've already got one right here. So you're up.

MS. MARCEAUX: I apologize for not signing up first. So the Miss Hebert that Mr. Broussard

SP5 mentioned is me. My name is Claire Hebert Marceaux. That's C-L-A-I-R, H-E-B-E-R-T, M-A-R-C-E-A-U-X.

I'm a Cameron Parish native. The only other place I've lived in my lifetime was in Lafayette, Louisiana, so I didn't even leave the state. I've very proud to be a native of this parish.

I'll echo the same thing, the same sentiments that you heard from the speakers before me. We are a very proud people. We're a very resilient people. I think that we are fair-dealing. I'll mention specifically Dan Werner and Bill Daughdrill, who have extended every courtesy to me as port director, which is my position here in the parish. I work at the service of the Cameron Parish Police Jury and the West Cameron Port Commission.

SP1 to SP5 Johnson Bayou, LA; August 9, 2016 (cont'd)

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This experience for us -- not only with Delfin, but the others as Mr. Romero alluded to -- has really opened up a new world of commerce to us. We appreciate the opportunity, but we expect to have a seat at the table, whether it's part of the EIS, whether it's a part of the development that is -- that comes as ancillary support to this particular project and its environmental impacts. We want to be a part of the conversation.

So if there's ever -- my comments in regard to the EIS deal more with access to our port here and access to information that we may have. If there's ever a need, we certainly are happy to provide that. Thank you for being here.

MR. SPARKS: Thank you. Would anybody else care to speak tonight? Please raise your hand.

Commander Perez, no one has raised their hands.

COMMANDER PEREZ: Thank you. So we will be here until 8 o'clock. So -- that's part of the agenda. So at this time we're going to go into a recess. At any time if there's any new -- somebody arrives and wants to make a comment or if y'all change your mind decide to make a formal comment, please come and see me and then we'll reconvene, gather your comment, and then we'll

SP5-1 Thank you for your comment.

continue with the agenda.

If by 8 o'clock we don't have any other comments or no petition to speak, then we will conclude the meeting. But I encourage you to please express your thoughts, share whatever you want to share with the panel, and then we can capture it on the record and then we'll take your comments, like I mentioned before, into consideration for the final EIS.

So if we don't have any comments at this time we'll take a break, and then we'll continue so until we have a petition for comment or we'll conclude the meeting at 8 o'clock.

Any questions?

Thank you so much.

(Break.)

COMMANDER PEREZ: Hello. At this time it's 8 o'clock. Do we have any other volunteers? Any other questions, concerns? Anybody else that would like to speak, provide their comments?

I take silence as a testament that we're done tonight. So this concludes the public meeting for the LNG, Delfin LNG license application, and the draft EIS. Thank you so much for participating. And then we'll continue tomorrow.

(The meeting concluded at 8:00 p.m.)

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COUNTY OF JEFFERSON :

I, ADA V. CHRISTY, a Certified Shorthand Reporter in and for the State of Texas, do hereby certify that the facts as stated by me in the caption hereto are true; that the above meeting indicated were made before me, and same were reduced to typewriting under my direction; that the above and foregoing meeting as set forth in typewriting is a full, true, and correct transcript of the proceedings had at the time of taking of said meeting.

I further certify that I am not, in any capacity, a regular employee of the party in whose behalf this meeting is taken; and I certify that I am not interested in the cause, nor of kin or counsel to either of the parties.

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and meet with us tonight.

Commander Perez.

COMMANDER PEREZ: Thank you. Well, at this time we're going to continue the meeting and then I'm going to let Mr. Sparks lead the way. He will facilitate the process of collecting the comments from the general public. Thank you so much.

MR. SPARKS: Can everybody hear me okay? Getting it back there? Thank you.

Just a few things before we get started. Please make sure your cell phones are on silence. If you need to take a phone call or talk amongst yourselves, please do so out in the hallway.

Tonight we don't have any elected officials that are signed up, so I'm just going to call people in the order in which they signed up. When I do call your name, please come up to the microphone, state and spell your name for the court reporter.

Because we only have four people signed up, we're not going to put a time limit on speaking, but please try to keep it to three to five minutes. After we've gone through the four individuals, we will open up to anybody else who would like to comment.

First up is Travis Woods.

SP6 MR. WOODS: Good evening. Travis Woods,

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T-R-A-V-I-S, W-O-O-D-S. I'm with T&L Solutions, a local contractor. I am currently president of the Gulf Coast Industrial Contractors Group in Lake Charles, Louisiana. I am the chairman of the Port Arthur Texas Contractors Group. I also sit on -- I'm a board of directors member for the Port Arthur Chamber of Commerce. And I've been in construction for 40 years. And I just want to let you know we approve. We would like to say that we stand good to approve this project because the economic impact, bringing jobs to the area, is always a fantastic situation. Cause with jobs then we have those folks go out and they buy cars and they buy homes and they move to the area to stay.

I moved to this area about 30 years ago from North Louisiana and never went back because there was always something happening in this area. And we're really excited about this project.

I've been in construction for 40 years, worked in chemical plants, paper mills. And there's always, in those plants, an economic negative. Okay. And I have studied this project. This is the best -- I would say the lowest economic impact of any project I've ever seen. It's just really exciting to know that this thing could work the way it's going to work and just have very little impact on the environment.

SP6-1 Thank you for your comment.

SP6-2 Thank you for your comment.

SP6 to SP10 Beaumont, TX; August 10, 2016 (cont'd)

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So I thank you for your time.

MR. SPARKS: Thank you. Next up we have Ron Arrington.

SP7 MR. ARRINGTON: Ronald Arrington, R-O-N-A-L-D, A-R-R-I-N-G-T-O-N. And I have no

SP7-1 environmental concerns about either the onshore or the offshore portion of the Delfin LNG deepwater port. I hope it is quickly approved and construction starts.

Now, the citizens of Southeast Texas, we

SP7-2 embrace these projects and welcome the positive economic impact. And I hope the positive economic impact is considered, if there are any negative environmental things which I have not seen. Okay. Thank you.

MR. SPARKS: Thank you. Next we have Chad Blanchard.

SP8 MR. BLANCHARD: Good evening. Chad Blanchard, C-H-A-D, B-L-A-N-C-H-A-R-D.

I am a local citizen as well, a local business owner. We embrace projects like this. I'm also an anthologist from an academic standpoint. I've

SP8-1 looked at this project and there is some innovative design that I think is to be appreciated with this project. I definitely appreciate the least impact on the environment with the way the design is that I've seen so far. I can appreciate the least impact on

SP7-1 Thank you for your comment.

SP7-2 Thank you for your comment.

SP8-1 Thank you for your comment.

Transcript-2

SP8-2

humans or the general public, as far as a safety concern. A project that will be this far offshore will obviously have least impact on the humans in a community, for safety concerns, as far as that goes.

I am an avid fisherman and outdoorsman, so I enjoy the Gulf of Mexico and what it has to offer.

SP8-3

I -- again, I feel like this will not have any impact on that with the way the design is developed so far, and I trust in the regulatory officials like the Coast Guard that will be monitoring what's going on with Delfin, and really appreciate that.

As far as an economic standpoint, I'm seventh generation Texan. And although this project

SP8-4

will be into our neighbor's backyard on the land based facility, we can certainly appreciate the regional development for the economic development. It's great to see projects that will bring the infrastructure that we already have to develop more diversity for the State of Texas as well as Louisiana, and for our grandchildren and great-grandchildren to see.

So I'm proud to support this project and look forward to it moving through as quickly as possible. Thank you.

MR. SPARKS: Thank you. Next up we have Elton Hollis.

SP8-2 Thank you for your comment.

SP8-3 Thank you for your comment.

SP8-4 Thank you for your comment.

SP6 to SP10 Beaumont, TX; August 10, 2016 (cont'd)

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MR. HOLLIS: Good evening. Elton Hollis, E-L-T-O-N, H-O-L-L-I-S. Just like my predecessor, I've been in Texas all my life and have seen what Southwest Louisiana and Southeast Texas can do in combination. We

SP9-1

welcome a company like Delfin LNG and their partners with the respect that they bring, along with the safety records. If you look into these projects with these guys, you'll see a stellar safety record along with no impacts into the environmental area, so we appreciate that.

From an economic standpoint you can't get

SP9-2

much better than this area. We eat, sleep, and breathe the oil and gas industry; and we appreciate any kind of business that comes in here and helps our people as far as work. And so we approve of this project. Thank you.

MR. SPARKS: Thank you. And that was the last registered speaker for tonight. Anybody care to get up and speak.

Sir? Please just remember to state your name and spell it for the court reporter.

MR. PILLSBURY: My name Jerry Wayne

SP10

Pillsbury, and I'm with the pipefitter's union. We helped get this -- well, the first phase of it. We helped with the first permit all we could. We did get the fabrication on the stainless pipe, a very hard

SP9-1 Thank you for your comment.

SP9-2 Thank you for your comment.

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procedure, very tough X-Raying procedure. Our Crown Pipe Shop did it. I think it was less than a 1 percent repair rate on it, which is very good, and which falls into the safety side of it. Excuse me.

I would like to say we got some of the greatest I&E hands here, and I&E being instrument and electrical. We do all the pneumatic instrumentation. I would like to try to get -- we've got six I&E contractors and we can profoundly -- we get a lot of that work, so I would like to talk to somebody tonight, maybe, on getting in touch with our contractors.

And as far as safety goes, we try to do it, you know -- most of the harder, dangerous, are the type jobs we get and -- because we're real meticulous and well-trained. And we would be glad to help any way in the world to get in the -- with the permits again. And thanks for listening to me.

MR. SPARKS: Sir, before you step down do you mind spelling your name for the court reporter.

MR. PILLSBURY: It's just like the flour: P-I-L-L-S-B-U-R-Y. I've got the name, not the money. Thank y'all.

MR. SPARKS: Thank you. Would anybody else care to come up and speak or comment?

Commander, at this time nobody wishes to

SP10-1 Thank you for your comment.

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speak.

COMMANDER PEREZ: Okay. So following the protocols, we'll be -- the group, the panel, we will here until 8 o'clock, as the meeting was announced. If we have any late-showers or anybody else that feels that you want to add another comment, please feel free to do so.

But in the meantime, we'll go into an official recess, and then we'll remain in recess until we have another speaker or anybody else that wants to share their comments. If we don't have any other comments or there are no more speakers, then we will conclude the meeting at 8 o'clock. But at this time, like I said, we'll be in recess and then we'll stand by for further comments. Thank you.

(Recess.)

COMMANDER PEREZ: Do we have any other speakers, comments, or questions? Anybody wants to step over besides you? No? Okay.

So officially concluding the meeting. Thank you so much. 8 o'clock.

(The meeting concluded at 8:00 p.m.)

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I, ADA V. CHRISTY, a Certified Shorthand Reporter in and for the State of Texas, do hereby certify that the facts as stated by me in the caption hereto are true; that the above meeting indicated were made before me, and same were reduced to typewriting under my direction; that the above and foregoing meeting as set forth in typewriting is a full, true, and correct transcript of the proceedings had at the time of taking of said meeting.

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