October 10, 2023

Jolie Harrison, Chief
Permits and Conservation Division
Office of Protected Resources
National Marine Fisheries
ITP.Tucker@noaa.gov

Comments submitted via e-mail

RE: Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Columbia East Lateral XPRESS Project, Agency/Docket No. RTID 0648-XD182

Dear Ms. Harrison:

Sierra Club opposes the proposed authorization to take marine mammals incidental to the East Lateral Xpress Project in Barataria Bay, Louisiana. Furthermore, Sierra Club urges NMFS to further consider impacts from the East Lateral Xpress project and the potential for take under Level A harm, in addition to the proposed Level B harassment.

The pile driving activities for the East Lateral Xpress project will take place in portions of Barataria Bay, in an area where NMFS researchers sighted multiple bottlenose dolphins during a population survey conducted in spring of 2019.[1] Columbia Gulf proposes pile driving to construct a new Point of Delivery Meter Station on an existing platform and a new Tie-in Facility at the terminus a new 30-inch lateral pipeline. Project activities include installation, by impact hammer, of 20 18-inch concrete piles and 104 36-inch spun cast piles.

NMFS asserts that noise from pile-driving is the only activity expected to result in level B harassment of bottlenose dolphins, and that, "[b]ased on the nature of the activity and the anticipated effectiveness of the mitigation measures including the utilization of Protected Species Observers to monitor for marine mammals and implementation of pre-clearance and soft start

[1] Garrison, L.P, Litz, J. and Sinclair, C. 2020. Predicting the effects of low salinity associated with the MBSD project on resident common bottlenose dolphins (*Tursiops truncatus*) in Barataria Bay, LA. NOAA Technical Memorandum NOAA NMFS-SEFSC-748: 97 p. https://doi.org/10.25923/53z9-nn54, (hereafter "Garrison et al. (2020)"), at iii, 46 (describing population estimate based on 2019 capture-mark-recapture survey), 57.

protocols discussed in detail below in the Proposed Mitigation section, Level A harassment is neither anticipated nor proposed to be authorized."[2]

While mitigation measures may avoid some forms of more severe take, there is no indication that these measures would preclude more Level B harassment than NMFS proposes, or render it unlikely. NMFS' conclusion that no Level A take will occur is arbitrary and capricious because the agency failed to consider the impacts in light of the poor health of many members of the stock population. Due to the lasting impacts of the catastrophic Deepwater Horizon oil spill on the health of Barataria Bay dolphins, NMFS must consider (1) whether impacts to lung capacity and buoyancy, discussed below, may limit or slow the ability of Barataria Bay dolphins to flee from disturbance, resulting in prolonged harassment and (2) whether the impact of being forced to flee from noise is more severe due to the already compromised health of the dolphins, and therefore could cause not only further Level B harassment, but Level A harassment.

As stated in a recent study by Schwacke et al.:

> The 2010 Deepwater Horizon (DWH) oil spill exposed common bottlenose dolphins (Tursiops truncatus) in Barataria Bay, Louisiana to heavy oiling that caused increased mortality and chronic disease and impaired reproduction in surviving dolphins. We conducted photographic surveys and veterinary assessments in the decade following the spill. We assigned a prognostic score (good, fair, guarded, poor, or grave) for each dolphin to provide a single integrated indicator of overall health, and we examined temporal trends in prognostic scores. … Disease conditions persisted and have recently worsened in dolphins that were presumably exposed to DWH oil: 78% of those assessed in 2018 had a guarded, poor, or grave prognosis.[3]

Based on health assessments of Barataria Bay dolphins, Smith et al. (2020) found that the prevalence and severity of moderate to severe lung disease in survivors of the spill worsened over time:

> In 2013 and 2014, moderate to severe lung disease persisted among BB [Barataria Bay] dolphins, and remained elevated relative to the prevalence at the SB [Sarasota Bay, Florida] comparison site [a comparison site with no Deepwater Horizon oil contamination]. More recent live animal health assessments (2016-2018) showed long-term persistence and potential worsening of moderate to

[2] 88 Fed. Reg. 61,530 (Sep. 9, 2023).

[3] Schwacke, L.H., Marques, T.A., Thomas, L., Booth, C., Balmer, B.C., Barratclough, A., Colegrove, K., De Guise, S., Garrison, L.P., Gomez, F.M., Morey, J.S., Mullin, K.D., Quigley, B.M., Rosel, P., Rowles, T.K., Takeshita, R., Townsend, F.I., Speakman, T.R., Wells, R.S., Zolman, E.S. and Smith, C.R. (2022), Modeling population effects of the Deepwater Horizon oil spill on a long-lived species. Conservation Biology, e13878, (hereafter, "Schwacke et al. (2022)"), at 1 of 13, available at https://doi.org/10.1111/cobi.13878 (emphasis added).

> severe lung disease in BB dolphins, specifically in animals alive during the oil spill (prevalence of 0.20, 0.35, and 0.55 in 2016, 2017, and 2018, respectively).[4]

As described in Smith et al. (2020), bottlenose dolphins suffering from lung disease would be expected to have impaired respiration, an impaired ability to regulate against decompression sickness, impaired buoyancy, and increased energetic demands:

> In bottlenose dolphins and other cetaceans (porpoises, dolphins, and whales), the lungs serve a dual purpose of both respiration and buoyancy control (Ridgway et al. 1969). Investigations of dolphin pulmonary anatomy have shown that terminal airways are reinforced with cartilage, and myoelastic sphincters are found surrounding terminal bronchioles and alveolar entrances (Simpson & Gardner 1972). The alveoli can completely collapse at depth, forcing air into the reinforced air spaces, presumably for prevention of decompression sickness (Ridgway et al. 1969). The presence of moderate to severe pulmonary disease would be expected to impair these physiologic mechanisms, negatively impact buoyancy, and increase energetic demands. This is supported by the authors' (CRS, FMG, FIT) personal observations of managed dolphins diagnosed with moderate to severe pulmonary disease that have altered swim and dive patterns, likely due to a decrease in functional lung capacity and concomitant impaired buoyancy.[5]

Consequently, in assessing whether harassment will occur, and whether that harassment is Level A or Level B, for Barataria Bay dolphins, NMFS must take into account their compromised ability to move away from sources of disturbance, and the increased impacts of the energetic cost of attempting to flee, among other factors.

As scientists estimate that the population of the Barataria Bay stock has declined by 45% due to the Deepwater Horizon spill, and will take 35 years to recover to 95% of the baseline population,[6] the impacts of human activities that could risk additional population losses or injury should be evaluated carefully by NMFS and avoided unless the substantive and procedural requirements of the MMPA have been satisfied.

Furthermore, please find attached, as Exhibit A, a letter from the Sierra Club submitted in March 2022, expressing concern regarding the potential for Level B harassment of bottlenose dolphins of the Barataria Bay Estuarine System stock associated with the construction of Venture Global's

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[4] Cynthia R. Smith, Teresa K. Rowles, Forrest M. Gomez, Kathleen M. Colegrove, Ryan Takeshita, Eric S. Zolman, Brian C. Balmer, Randall S. Wells, Forrest I. Townsend, Lori H. Schwacke, Marine Mammals and Respiration: Evidence of Poor Pulmonary Health in Bottlenose Dolphins Following the Deepwater Horizon Oil Spill, 2020 International Oil Spill Conference, Abstract # 688234 (hereafter, "Smith et al. (2020)"), at page 2. Included in Exhibit A, as Attachment 4.

[5] Exhibit A, Attachment 4 – Smith et al. (2020), at page 11.

[6] *See* Schwacke et al. (2022), at 1 of 13 ("We estimated that the population has declined by 45% (95% confidence interval (CI) 14–74%) relative to baseline and will take 35 years (95% CI 18–67) to recover back to 95% of baseline numbers.")

Plaquemines LNG and Gator Express Pipeline Project in Louisiana. Sierra Club reiterates these same concerns for the East Lateral Xpress project, and incorporates those comments herein. NMFS should further consider the impact from this project in connection with impacts to the species from the numerous additional oil and gas infrastructure projects proposed in this area, and assess whether these projects will contribute to further impacts to this dolphin population.

If you have any questions regarding the matters raised in the attached letter, please do not hesitate to reach out.

Sincerely,

/s/ Rebecca McCreary
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Attorney for Sierra Club

Exhibit A

Sierra Club et al. Letter re: Potential Marine Mammal Protection Act Level B harassment of Barataria Bay Estuarine System (BBES) stock of common bottlenose dolphins (Tursiops truncatus) associated with pile driving for the Plaquemines LNG and Gator Express Pipeline Project

March 18, 2022

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Laura Engelby
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United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Regional Office
263 13th Avenue South
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Transmitted via e-mail

RE: Potential Marine Mammal Protection Act Level B harassment of Barataria Bay Estuarine System (BBES) stock of common bottlenose dolphins (*Tursiops truncatus*) associated with pile driving for the Plaquemines LNG and Gator Express Pipeline Project

Dear Assistant Regional Administrator Bernhart, Branch Chief Engelby, and Conservation Coordinator Horstman,

On behalf of the Sierra Club, the Center for Biological Diversity, and Healthy Gulf, I am writing to express concern regarding the potential for Level B harassment of bottlenose dolphins of the Barataria Bay Estuarine System stock associated with the construction of Venture Global's Plaquemines LNG and Gator Express Pipeline Project in Louisiana[1] and request that the National Marine Fisheries Service ("NMFS") take appropriate action. Sierra Club, the nation's oldest grassroots organization, is a not-for-profit corporation with approximately 796,000

[1] *See* Federal Energy Regulatory Commission Docket Nos. CP17-66-000 and CP17-67-000.

members nationwide and is dedicated to the protection and preservation of the environment. The Center for Biological Diversity is a non-profit, public interest environmental organization with more than 1.7 million members and supporters. The Center is dedicated to the protection of species and their habitats through science, policy, and environmental law. With thousands of members across the Gulf Coast, Healthy Gulf's purpose is to collaborate with and serve communities who love the Gulf of Mexico by providing the research, communications, and coalition-building tools needed to reverse the long pattern of over exploitation of the Gulf's natural resources. The Plaquemines LNG project, which is underway,[2] includes pile driving activities in Barataria Bay, which is habitat for an estimated population of 2,071 bottlenose dolphins.[3] Site preparation and other activities, including pile driving on the Mississippi River side of the project, have already begun. The Barataria Bay pile driving, which is part of Phase I of the construction plan, could commence at any time.[4]

Sierra Club is concerned that the mitigation measures for the pile driving activities are not sufficient to preclude harassment of bottlenose dolphins, and that violations of the Marine Mammal Protection Act's prohibitions may soon occur if the pile driving activities in Barataria Bay commence in the absence of an Incidental Harassment Authorization ("IHA"), or other authorization, from NMFS. The MMPA prohibits the take of marine mammals, including take by Level B harassment, absent authorization from the Service.[5] Sierra Club asks that NMFS act

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[2] Venture Global Plaquemines LNG and Gator Express Pipeline Monthly Construction Status Report No. 029 (Mar. 8, 2022), Docket Nos. CP17-66-000, CP17-67-000, Accession Number 20220308-5046, https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20220308-5046&optimized=false.

[3] Garrison, L.P, Litz, J. and Sinclair, C. 2020. Predicting the effects of low salinity associated with the MBSD project on resident common bottlenose dolphins (*Tursiops truncatus*) in Barataria Bay, LA. NOAA Technical Memorandum NOAA NMFS-SEFSC-748: 97 p. https://doi.org/10.25923/53z9-nn54, (hereafter "Garrison et al. (2020)"), at iii, 46 (describing population estimate based on 2019 capture-mark-recapture survey).

[4] Additionally, on February 23, 2022 Texas Eastern Transmission, LP applied for a Coastal Use Permit from the Louisiana Department of Natural Resources for the TETCO pipeline that would connect to the project at or near the Plaquemines LNG Barataria Bay meter stations. https://sonlite.dnr.state.la.us/sundown/cart_prod/cart_crm_application?pcup_num=P20220033&pline_id=2&pshow_appl_email=Y

[5] 16 U.S.C. § 1371(a) (prohibition on take); 16 U.S.C. § 1362(13) (defining take to mean "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal."); *Id*. § 1362(18)(A) (defining "harassment" to mean "any act of pursuit, torment, or annoyance which—(i) has the potential to injure a marine mammal or marine mammal stock in the wild; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering."); *Id*. § 1362(18)(D) (defining "Level B" harassment as an act that "has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering"). The MMPA enables NMFS to authorize

promptly to evaluate and investigate this matter to ensure that no unauthorized harassment occurs, and that any harassment that cannot be avoided entirely is minimized to have the least adverse impact practicable by mitigation requirements imposed in an IHA issued prior to the commencement of pile driving.[6]

The pile driving activities for Plaquemines LNG and Gator Express Pipeline Project will take place in the northern portion of the central section of Barataria Bay, in an area where NMFS researchers sighted multiple bottlenose dolphins during a population survey conducted in spring of 2019.[7] The pile driving activities will be taking place for the construction of two meter station platforms, one just southwest of Wilkinson Bayou, the other just south of Bay Jimmy and Bay Batiste.[8] The figure below, reproduced from Garrison et al. (2020),[9] shows the dolphin sightings during the 2019 survey, with a red star added to indicate the approximate location of the pile driving activities:

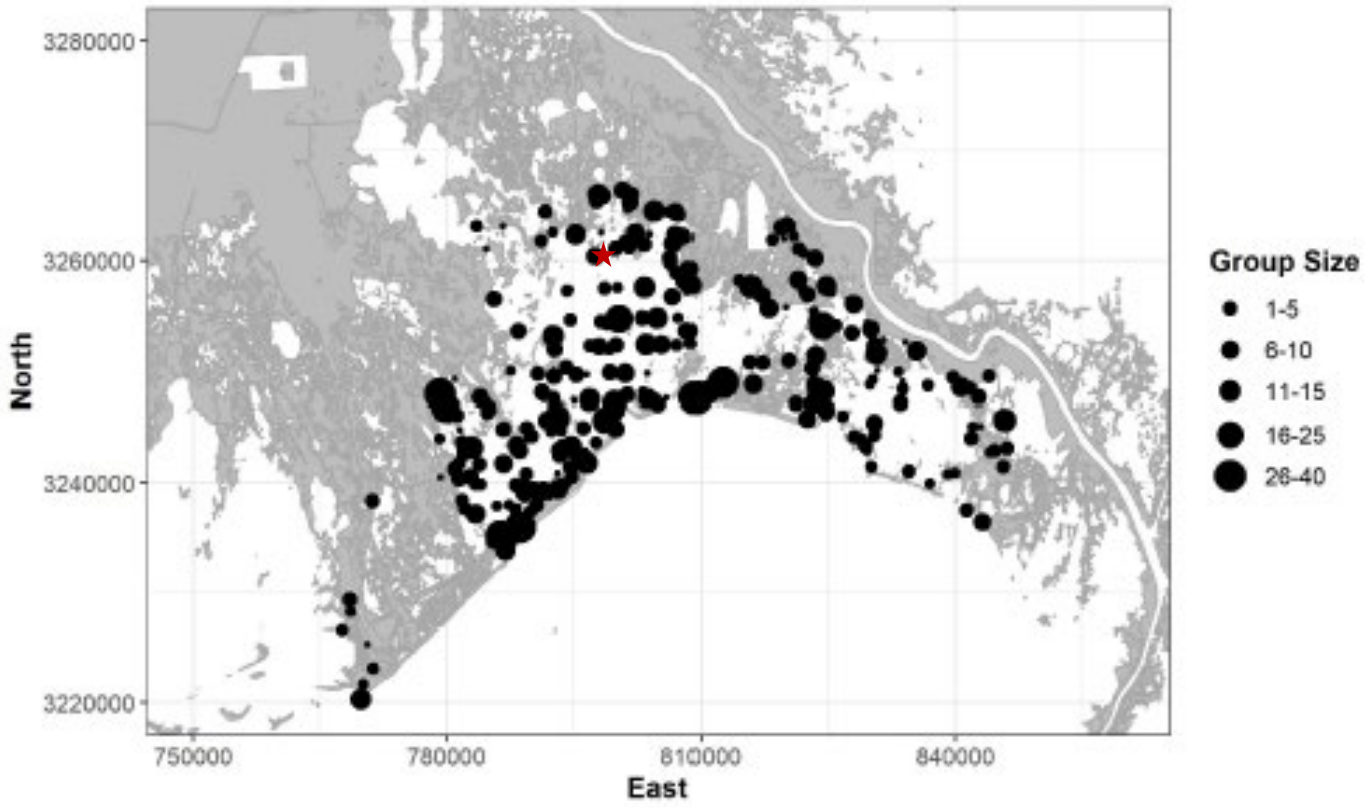
incidental harassment caused by such activities pursuant to the provisions at sections 101(a)(5)(A) and (D) of the MMPA, and subject to the stringent requirements of those provisions. 16 U.S.C. § 1371(a)(5)(A) and (D).

[6] Notably, with regard to two other recent LNG projects constructed in the habitat of dolphin stocks, NMFS recently issued Incidental Harassment Authorizations for Level B harassment associated with pile driving activities. *See* 85 Fed. Reg. 40,250 (July 6, 2020) (final findings for Rio Grande LNG and Annova LNG IHAs); *see also* 85 Fed. Reg. 27,365 (May 8, 2020) (proposed findings and IHAs for Rio Grande LNG and Annova LNG).

[7] *See* Garrison et al. (2020) at 57.

[8] *See* Attachment 1 - "Figure 1 Project Changes – Overview Map."

[9] Garrison, et al. (2020) at 57 ("Figure I.5. Dolphin group sizes during the spring 2019 CMR survey.").



On April 1, 2021, Venture Global submitted updated specifications for the pile driving activities to the National Marine Fisheries Service, as well as an updated analysis of the underwater noise impacts of those activities on wildlife, including cetaceans.[10] NMFS apparently reviewed this information for the purposes of evaluating compliance with the Endangered Species Act, but there is no indication in the available records that NMFS evaluated whether the activities would comply with the Marine Mammal Protection Act with regard to bottlenose dolphins.[11] The analysis of underwater noise impacts that Venture Global submitted to NMFS contains information indicating that Level B harassment of bottlenose dolphins is not precluded by the proposed mitigation measures. Specifically, the analysis apparently submitted to NMFS by Venture Global shows that the threshold for Level B harassment due to the vibratory driving of steel H-type piles[12] will extend to a distance of 70 meters (~230 feet):

[10] *See* Attachment 2. Sierra Club obtained these documents a recent Freedom of Information Act request to NMFS filed in February 2022. *See* FOIA Request No. DOC-NOAA-2022-000725.
[11] *See* Attachment 3.
[12] NMFS considers 120 dB rms to be the threshold for Level B harassment from a continuous noise source like vibratory pile driving. *See, e.g.,* 85 Fed. Reg. at 27380 ("Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that

Estimated Distances to Cetacean Behavioral Thresholds[13]

Type Pile	Hammer Type	Distance (m) to 160 dBRMS (behavior for impulsive noise)	Distance (m) to 120 dBRMS (behavior for non- pulse noise)
36" Concrete - Hollow	Impact	42.0	NA
18" Concrete - Square	Impact	NA	NA
12" Steel H-Type	Vibratory	NA	70.0

The mitigation measures proposed by Venture Global include maintaining a 150-foot buffer around pile driving locations from any observed marine mammals.[14] Since the area ensonified to the Level B harassment threshold of 120 dB rms around a pile driving location for the steel H-type piles extends to approximately 230 feet, this 150-foot buffer plainly is not adequate to ensure that no Level B harassment of bottlenose dolphins will occur. Given a radius of 230 feet from the pile driving source for noise at 120 dB rms, a circular area of approximately 165,614 square feet would be ensonified to the threshold for Level B harassment.[15] A buffer with a radius of 150 feet from the source would encompass a circular area of only 70,650 square feet,[16] leaving an area of 94,964 square feet[17] (approximately 2.2 acres) around each individual pile driving point where Level B harassment could still occur despite the buffer.

The other relevant mitigation measure proposed by Venture Global is the use of "soft starts" for the pile driving, which it describes as "gradually increasing the intensity of pile driving to allow free-swimming aquatic life to leave the area."[18] But the "soft start" approach seemingly does not

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marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1 μPa (rms) for continuous (e.g., vibratory pile-driving, drilling) and above 160 dB re 1 μPa (rms) for intermittent (e.g., impact pile driving) sources…Both Rio Grande and Annova's activities include the use of continuous (vibratory pile driving and removal) and intermittent (impact pile driving) sound sources; therefore, the 120 and 160 dB re: 1 μPa (rms) are applicable.").

[13] *See* Attachment 2-C at page 15 of 64 in FOIA response record "FR0000199-FAL.pdf"; *see also id*. at page 28 of 64.

[14] *See* Attachment 2-B at page 5 of 6 in FOIA response record "FR0000263-FAL.pdf".

[15] Area = πr^2 = 3.14 x (229.659 ft)^2 = 165,614 ft^2

[16] 3.14 x (150 ft)^2 = 70,650 ft^2

[17] 165,614 ft^2 - 70,650 ft^2 = 94,964 ft^2

[18] *See* Attachment 2-B at page 5 of 6.

eliminate Level B harassment. Ostensibly, increasing the noise level until the marine animals are so disturbed by the noise that they interrupt their normal behavior to flee the area *is* Level B harassment.[19] While this measure might avoid more severe forms of take, such as Level A harassment or injury, there is no indication that it would preclude Level B harassment, or render it unlikely. Furthermore, due to the lasting impacts of the catastrophic Deepwater Horizon oil spill on the health of Barataria Bay dolphins, NMFS must consider (1) whether impacts to lung capacity and buoyancy, discussed below, may limit or slow the ability of Barataria Bay dolphins to flee from disturbance, resulting in prolonged harassment and (2) whether the impact of being forced to flee from noise is more severe due to the already compromised health of the dolphins, and therefore could cause not only Level B harassment, but Level A harassment.

As stated in a recent study by Schwacke et al.:

> The 2010 Deepwater Horizon (DWH) oil spill exposed common bottlenose dolphins (*Tursiops truncatus*) in Barataria Bay, Louisiana to heavy oiling that caused increased mortality and chronic disease and impaired reproduction in surviving dolphins. We conducted photographic surveys and veterinary assessments in the decade following the spill. We assigned a prognostic score (good, fair, guarded, poor, or grave) for each dolphin to provide a single integrated indicator of overall health, and we examined temporal trends in prognostic scores. … *Disease conditions persisted and have recently worsened* in dolphins that were presumably exposed to DWH oil: *78% of those assessed in 2018 had a guarded, poor, or grave prognosis*.[20]

Based on health assessments of Barataria Bay dolphins, Smith et al. (2020) found that the prevalence and severity of moderate to severe lung disease in survivors of the spill *worsened* over time:

> In 2013 and 2014, moderate to severe lung disease persisted among BB [Bataria Bay] dolphins, and remained elevated relative to the prevalence at the SB [Sarasota Bay, Florida] comparison site [a comparison site with no Deepwater Horizon oil contamination]. More recent live animal health assessments (2016-2018) showed long-term persistence and potential worsening of moderate to severe lung disease in BB dolphins, specifically in animals alive during the oil

[19] An act that "has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering" but which does not have the potential to injure a marine mammal is "Level B harassment." 16 U.S.C. § 1362(18)(D); 50 C.F.R. § 216.3.

[20] Schwacke, L.H., Marques, T.A., Thomas, L., Booth, C., Balmer, B.C., Barratclough, A., Colegrove, K., De Guise, S., Garrison, L.P., Gomez, F.M., Morey, J.S., Mullin, K.D., Quigley, B.M., Rosel, P., Rowles, T.K., Takeshita, R., Townsend, F.I., Speakman, T.R., Wells, R.S., Zolman, E.S. and Smith, C.R. (2022), Modeling population effects of the *Deepwater Horizon* oil spill on a long-lived species. *Conservation Biology*, e13878, (hereafter, "Schwacke et al. (2022)"), at 1 of 13, *available at*, https://doi.org/10.1111/cobi.13878 (emphasis added).

spill (prevalence of 0.20, 0.35, and 0.55 in 2016, 2017, and 2018, respectively).[21]

As described in Smith et al. (2020), bottlenose dolphins suffering from lung disease would be expected to have impaired respiration, an impaired ability to regulate against decompression sickness, impaired buoyancy, and increased energetic demands:

> In bottlenose dolphins and other cetaceans (porpoises, dolphins, and whales), the lungs serve a dual purpose of both respiration and buoyancy control (Ridgway et al. 1969). Investigations of dolphin pulmonary anatomy have shown that terminal airways are reinforced with cartilage, and myoelastic sphincters are found surrounding terminal bronchioles and alveolar entrances (Simpson & Gardner 1972). The alveoli can completely collapse at depth, forcing air into the reinforced air spaces, presumably for prevention of decompression sickness (Ridgway et al. 1969). The presence of moderate to severe pulmonary disease would be expected to impair these physiologic mechanisms, negatively impact buoyancy, and increase energetic demands. This is supported by the authors' (CRS, FMG, FIT) personal observations of managed dolphins diagnosed with moderate to severe pulmonary disease that have altered swim and dive patterns, likely due to a decrease in functional lung capacity and concomitant impaired buoyancy.[22]

Consequently, in assessing whether harassment will occur, and whether that harassment is Level A or Level B, for Barataria Bay dolphins, NMFS must take into account their compromised ability to move away from sources of disturbance, and the increased impacts of the energetic cost of attempting to flee, among other factors.

As scientists estimate that the population of the Barataria Bay stock has declined by 45% due to the Deepwater Horizon spill, and will take 35 years to recover to 95% of the baseline population,[23] the impacts of human activities that could risk additional population losses or injury should be evaluated carefully by NMFS and avoided unless the substantive and procedural requirements of the MMPA have been satisfied.

Based on the documents provided to Sierra Club by NMFS in response to its February 2022 FOIA request seeking records related to NMFS's review of the impacts of the Plaquemines LNG and Gator Express Pipeline Project with regard to MMPA requirements,[24] and on the publicly

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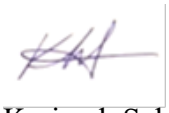
[21] Cynthia R. Smith, Teresa K. Rowles, Forrest M. Gomez, Kathleen M. Colegrove, Ryan Takeshita, Eric S. Zolman, Brian C. Balmer, Randall S. Wells, Forrest I. Townsend, Lori H. Schwacke, Marine Mammals and Respiration: Evidence of Poor Pulmonary Health in Bottlenose Dolphins Following the Deepwater Horizon Oil Spill, 2020 International Oil Spill Conference, Abstract # 688234 (hereafter, "Smith et al. (2020)"), at page 2. Included as Attachment 4.
[22] Attachment 4 – Smith et al. (2020), at page 11.
[23] *See* Schwacke et al. (2022), at 1 of 13 ("We estimated that the population has declined by 45% (95% confidence interval (CI) 14–74%) relative to baseline and will take 35 years (95% CI 18–67) to recover back to 95% of baseline numbers.")
[24] FOIA Request No. DOC-NOAA-2022-000725.

available documents on the Federal Energy Regulatory Commission's dockets for the project,[25] there appears to be no indication that Venture Global has sought an Incidental Harassment Authorization for the pile driving activities in Barataria Bay associated with the two meter stations for this project. Nor does there appear to be any documentation showing that NMFS has already determined that harassment of bottlenose dolphins is unlikely to occur.

Given the recent surveys documenting the presence of Barataria Bay bottlenose dolphins in the vicinity of the locations where the pile driving for the two meter stations will occur, and information indicating that Level B harassment of bottlenose dolphins due to the steel H-pile driving is not precluded by the mitigation measures described by Venture Global's documents, Sierra Club asks that NMFS evaluate whether harassment in violation of the MMPA is likely to occur from the pile driving, and that NMFS accordingly takes appropriate action to prevent any harassment of bottlenose dolphins from occurring prior to the issuance of an Incidental Harassment Authorization from NMFS, such as notifying the Federal Energy Regulatory Commission of the need to halt pile driving activities in Barataria Bay absent NMFS authorization for such harassment.

If you have any questions about this request, please contact me at 202-548-4584 or karimah.schoenhut@sierraclub.org. Thank you for your attention to this matter.

Sincerely,



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[25] *See* FERC Docket Nos. CP17-66-000 and CP17-67-000.

ATTACHMENTS

Attachment 1

Venture Global Figure Showing Location of Meter Stations[1]

[1] Obtained via public FERC docket.

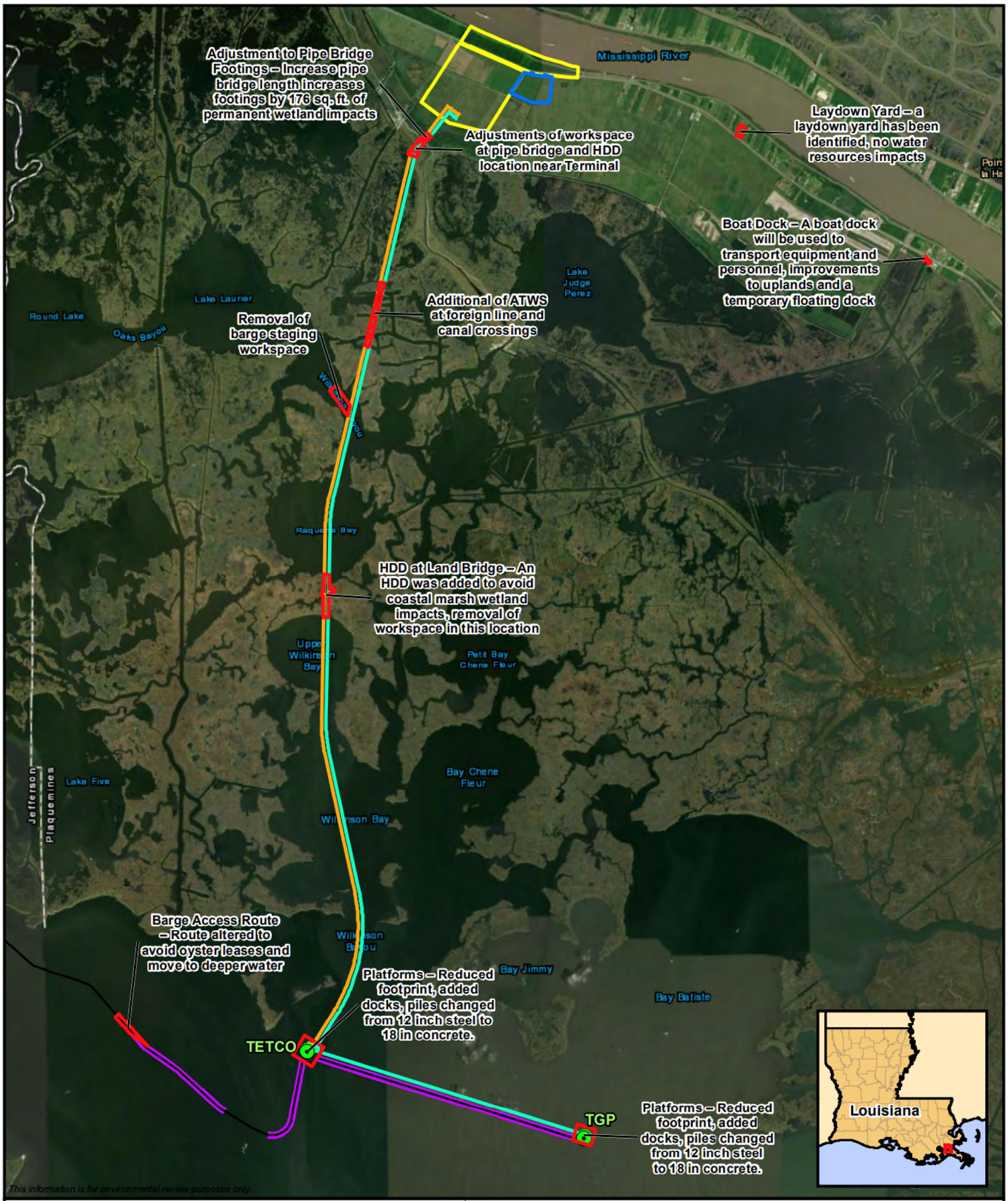

Figure 1
Project Changes – Overview Map
Plaquemines LNG and Gator Express Pipeline Project
Plaquemines Parish, Louisiana

PLAQUEMINES GATOR EXPRESS

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Attachment 2

Documents Submitted to NMFS April 1, 2021[2]

[2] Obtained via FOIA request to NMFS

Attachment 2-A:

Record "FR0000195-FAL.pdf"

Produced by NMFS in Response to FOIA DOC-NOAA-2022-000725

From: Ross Hargrove
Subject: RE: SERO-2018-00280 - Venture Global Plaquemines LNG and Gator Express Project
To: Michael Tucker - NOAA Federal
Cc: Elizabeth Dolezal; Julia Joy
Sent: April 1, 2021 11:22 AM (UTC-04:00)
Attached: Gator Express_Underwater Noise memo_040121.pdf, Gator Express_Sea_Turtle_Calcs_040121.xlsx

Mike,

Hope you are doing well. As you are aware, Venture Global Plaquemines LNG, LLC (Plaquemines LNG) is developing a liquefied natural gas terminal (Terminal) and Venture Global Gator Express, LLC (Gator Express) is developing an associated feed gas pipeline and appurtenant aboveground facilities (Pipeline System). Both companies are wholly owned subsidiaries of Venture Global LNG, Inc. (Venture Global).

In August 2020, Gator Express consulted with the National Marine Fisheries Service (NMFS) (SERO-2018-00280 following the modification of Project workspaces and meter station platforms, at which time the NMFS concurred that the modifications would not result in any new or increased impacts to Endangered Species Act-listed species, when compared to those analyzed in the September 2019 consultation. The 2019 consultation concluded that the Project is not likely to adversely affect the green sea turtle (both North and South Atlantic distinct population segments [DPS]); Kemp's ridley sea turtle; leatherback sea turtle; loggerhead sea turtle (Northwest Atlantic DPS); hawksbill sea turtle; giant manta ray; oceanic whitetip shark; Bryde's whale' blue whale; fin whale; sei whale; and, sperm whale.

The Federal Energy Regulatory Commission (FERC) approved the Project on September 30, 2019. Since the previous consultation, the Project has proceeded with final design and preparing for construction. Modifications to the Project since the August 2020 consultation included modifications to the pile sizes associated with the meter station platforms to be installed within Barataria Bay.

As a result of recent geotechnical investigations at the meter station sites, Gator Express has chosen to use 36-inch-diameter hollow concrete piles to support the meter stations rather than the 18-inch-square piles previously proposed. Please recall that underwater noise was a concern regarding installation of the meter station platforms within Barataria Bay. To assess the potential for underwater noise associated with the modified piles for the meter stations, Gator Express used the noise spreadsheets developed by the NMFS and concluded that the noise generated by the 36-inch-diameter hollow concrete piles will be similar to that of the previously proposed 18-inch-square concrete piles. The attached memo presents a range in the total number of piles to be installed. Gator Express is in the process of conducting a wave study to determine the final number of piles required for each platform. Regardless of the final quantity of piles, the noise calculations (see attached) will not change since pile installation assumptions (e.g., strikes per pile, piles per day) will remain unchanged.

Venture Global believes the changes described above will not change the previous affect determinations for the species identified above. Venture Global believes that the consultation does not need to be reinitiated because the activities are similar to those previously considered and no take has occurred. Please review and confirm that the consultation will not need to be reinitiated. Your response will be provided to FERC to facilitate their review of these modifications to the Project. We appreciate your continued review and assistance.

Regards,
Ross

Ross Hargrove
Director Consultant

M +1 612 805-8244

From: Michael Tucker - NOAA Federal <michael.tucker@noaa.gov>
Sent: Thursday, August 13, 2020 8:26 AM
To: Ross Hargrove <Ross.Hargrove@erm.com>
Cc: Elizabeth Dolezal <edolezal@venturegloballng.com>; Julia Joy <Julia.Joy@erm.com>; Kelly Shotts - NOAA Federal <kelly.shotts@noaa.gov>
Subject: Re: SERO-2018-00280 - Venture Global Plaquemines LNG and Gator Express Project

Hi Ross,
Thank you for the update. We agree that the proposed changes to the project plans described herein will not result in any new or increased impacts to ESA-listed species under NMFS' jurisdiction. It is more likely that these proposed changes will reduce any potential effects of the project on ESA-listed species, compared to those analyzed in our September 2019 consultation. Because the proposed project modifications will not cause an effect to ESA-listed species or critical habitat in a manner or to an extent not previously considered, there is no need to reinitiate consultation on this project.
Let me know if you have any questions. Thanks again,

Mike

On Fri, Jul 31, 2020 at 4:55 PM Ross Hargrove <Ross.Hargrove@erm.com> wrote:

> Mike,
>
> Per our conversation, I have attached the maps that depict the footprint changes associated with the Venture Global Plaquemines LNG and Gator Express Pipeline Project (collectively Venture Global or the Project) that have been incorporated into the Project since the Section 7 Endangered Species Act consultation (SERO-2018-00280) was concluded in September 2019. The consultation concluded that the project is not likely to adversely affect the green sea turtle (both North and South Atlantic distinct population segments [DPS]); Kemp's ridley sea turtle; leatherback sea turtle; loggerhead sea turtle (Northwest Atlantic DPS); hawksbill sea turtle; giant manta ray; oceanic whitetip shark; Bryde's whale' blue whale; fin whale; sei whale; and, sperm whale.
>
> The Federal Energy Regulatory Commission (FERC) approved the Project on September 30, 2019. Since that time Venture Global has proceeded with final design and preparing for construction. Construction of the Terminal is expected to begin in September 2020 and construction of the pipeline system is expected to begin in January 2021. As part of the final design, Venture Global has made the following changes to the Pipeline System as summarized below.
>
> - The addition of a horizontal directional drill (HDD) installation to minimize coastal marsh impacts;
> - Reduction of meter station platform footprints;
> - Revision to the barge access route to further minimize impacts on oyster resources and move the route to deeper water;
> - Addition of 12 additional temporary workspaces to facilitate pipeline construction across foreign lines and canals;
> - Removal of additional temporary workspaces no longer needed and minor adjustments of

construction workspaces;

- Modified pipe bridge over the levee resulting in a longer span and increased size of footings;
- Addition of a 6-acre laydown yard; and,
- Use of an existing boat dock, requiring installation of a temporary floating dock to enable transfer of equipment and personnel to the Project site.

Overall the workspace modifications associated with the Pipeline System will reduce impacts on wetlands and waterbodies by approximately 40 acres. Please recall that underwater noise was a concern regarding installation of the meter station platforms within Barataria Bay. The updated meter station platforms will be smaller, however, rather than using 12-inch-diameter steel piles the platforms will be supported by 18-inch-square concrete piles. An updated noise analysis is attached which demonstrates that use of the concrete piles will reduce potential impacts on aquatic life in comparison to the steel piles previously analyzed.

Venture Global believes the changes described above and depicted on the attached maps will not change the previous affect determinations for the species identified above. Venture Global believes that the consultation does not need to be reinitiated because the activities are similar to those previously considered and no take has occurred. Please review and confirm that the consultation will not need to be reinitiated. Your response will be provided to FERC to facilitate their review of these modifications to the Project. We appreciate your continued review and assistance.

Regards,
Ross

Ross Hargrove
Director Consultant

ERM
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M +1 612-805-8244
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Please note our new address as of June 19, 2020.

ERM *The business of sustainability*

--
Michael Tucker

Endangered Species Biologist
NOAA Fisheries Southeast Region
U.S. Department of Commerce
727-209-5981
https://www.fisheries.noaa.gov/region/southeast

Attachment 2-B:

Record "FR0000263-FAL.pdf"

Produced by NMFS in Response to FOIA DOC-NOAA-2022-000725

ERM

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Memorandum

To	Mike Tucker
From	Troy Enright
Date	April 1, 2021
Subject	Venture Global Plaquemines LNG and Gator Express Pipeline – Addendum to Underwater Noise Mitigation Plan

INTRODUCTION

Venture Global Plaquemines LNG, LLC (Plaquemines LNG) is proposing to construct and operate a liquefied natural gas (LNG) terminal (Terminal) on the Mississippi River in Plaquemines Parish, Louisiana. The Terminal will consist of natural gas liquefaction, storage, and export facilities. Venture Global Gator Express, LLC (Gator Express Pipeline) proposes to construct and operate a lateral pipeline and appurtenant aboveground facilities (Pipeline System) to supply feed gas to the Terminal. The Terminal facilities and Pipeline System are collectively referred to as the Plaquemines LNG and Gator Express Pipeline Project (Project).

Environmental Resources Management, in support of the regulatory consultation process for the Federal Energy Regulatory Commission (FERC) Environmental Impact Statement (EIS), developed an underwater noise analysis, which was submitted to FERC on February 28, 2017.

An Underwater Noise Mitigation Plan was prepared in response to FERC staff recommendations outlined in the November 2018 Draft EIS and discussions with National Marine Fisheries Service (NMFS). The Underwater Noise Mitigtation Plan was submitted to FERC and NMFS Southeast Regional Office (SERO) for review on January 4, 2019. FERC staff noted in the Final EIS that the mitigation meausres outlined in the Underwater Noise Mitigation Plan will substantially reduce underwater sound levels generated by pile driving activities, and that the underwater noise impacts will be reduced to acceptable levels.

Based on further consultation with NMFS, nylon cushioning caps were added to the mitigation measures to be used during installation of the 12-inch-diameter steel piles in Barataria Bay. The estimates for underwater noise for pile driving activities in Barataria Bay were updated by NMFS SERO in their September 17, 2019, concurrence response letter to FERC and included the nylon cushioning caps.

On July 31, 2020, Gator Express Pipeline proposed modifications to the pile types to be used to construct the two meter station platforms in Barataria Bay. Gator Express Pipeline requested to modify the originally proposed 12-inch-diameter steel piles to construct two meter station platforms in Barataria Bay to larger square concrete piles with sizes up to 18-inch-square. Additionally, temporary steel H-type piles were proposed to provide support during the construction process. On August 13, 2020, NMFS concurred that the proposed modification to 18-inch-square concrete piles and temporary steel H-type pile would not result in any new or increased impacts to ESA-listed species under NMFS' jurisdiction.

Due to refinement of the design of the meter stations associated with the Pipeline System, Venture Global is proposing additional modifications to the piles to be use to construct the meter station platforms. This memorandum presents the effects of these proposed changes with respect to the previously established underwater noise levels. ERM has also updated the sea turtle impact estimates based on the revised behavioral and physiological (injury) thresholds for sea turtles available through the NMFS (Greater Atlantic Regional Field Office [GARFO]) acoustics tool for ESA-listed species dated September 2020.

As shown below, the proposed modifications to the pile types, when assessed using the updated behavioral and injury thresholds, will result in no injury radius for impacts to sea turtles associated with pile driving activities, and a distance to behavioral injury thresholds for sea turtles that is within the construction workspace in Barataria Bay thus resulting in less physical injury and behavioral disturbance than the previous approved estimates.

PROPOSED MODIFICATIONS

Gator Express Pipeline originally proposed to construct two meter station platforms in Barataria Bay using 12-inch-diameter steel piles, which were later modified to 18-inch-square concrete piles. Gator Express Pipeline now intends to construct the two meter station platforms using larger 36-inch-diameter hollow concrete piles. Temporary steel H-type piles will also be used to provide support during the construction process.

Table 1 summarizes the piles types, installation method, and type of water for the previously approved 18-inch-square concrete piles and for the proposed revised piles. Table 2 summarizes the estimated sound levels associated with the in-water pile driving activities, including the underwater sound levels associated with the 18-inch-square-concrete piles, the 36-inch-diamater hollow concrete piles, and the steel H-type piles.

TABLE 1
Plaquemines LNG and Gator Express Pipeline Project
Pile Types in Barataria Bay

Pile types	Number of Piles	Installation Method	Confined Space or Open Water
Previously Proposed Piles in Barataria Bay			
18-inch-square concrete piles	750	Impact	Open Water
Steel H-type piles	64	Vibratory	Open Water
Updated Piles in Barataria Bay			
36-inch-diameter hollow concrete piles	250 - 300	Impact	Open Water
Steel H-type piles	40 - 65	Vibratory	Open Water

TABLE 2

Plaquemines LNG and Gator Express Pipeline Project

Summary of Near-Source (32.8 feet/10 Meters) Sound Levels for In-Water Pile Driving

Type of Pile	Average Sound Level Measured in dB re: 1 µPa		
	Peak	RMS	SEL
Previously Approved Piles in Barataria Bay			
18-inch-square concrete pile – impact-driven [a, b]	185	155	166
Steel H-type pile – vibratory-driven [a]	165	150	150
Updated Proposed Piles in Barataria Bay			
36-inch diameter hollow concrete pile – impact driven [c]	200	176	166
Steel H-type pile – vibratory-driven [a]	165	150	150

Notes: dB = decibel; Peak = peak sound level; RMS = root-mean-square sound level; SEL= sound exposure level

[a] Data obtained from "Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish" (Caltrans, 2015) for a 18-inch-square concrete pile.

[b] Noise levels prior to mitigation.

[c] Data obtained from "Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish" (Caltrans, 2020) for a 30-inch-diameter hollow concrete pile.

NOISE MODELING RESULTS

To estimate the underwater sound levels associated with the 36-inch-diameter hollow concrete piles and temporary steel H-type piles, an underwater noise analysis was completed using the *GARFO Acoustics Tool*, updated September 14, 2020, which includes updated injury and disturbance thresholds for sea turtles. The NMFS SERO consultation response letter focused the underwater noise analysis for pile driving activities in Barataria Bay on sea turtles; therefore, the injury and disturbance thresholds for sea turtles are presented. For comparison purposes, the noise modeling results for the previously approved 18-inch-square steel piles and temporary steel H-type piles are also included.

As previously noted, the injury and disturbance thresholds for both the 18-inch-square concrete piles and the 36-inch-diameter hollow concrete piles were calculated using the updated sea turtle injury and disturbance thresholds provided in Table 3. The results of the underwater noise analysis are included in Table 4, and calculation details are included in Attachment 1.

TABLE 3
Plaquemines LNG and Gator Express Pipeline Project
Underwater Noise Thresholds for Sea Turtles during Marine Construction Activity

Species	Underwater Noise Thresholds		
	Behavioral Disturbance Threshold	Temporary Threshold Shift (Injury)	Permanent Threshold Shift (Injury)
Sea Turtle [a]	175 dB RMS	189 dB SEL_{cum} 226 dB Peak	204 dB SEL_{cum} 232 dB Peak

Notes: dB = decibel; Peak = peak sound pressure (re: 1 µPa), unweighted; RMS = root-mean-square sound pressure (re: 1 µPa), unweighted; SEL_{cum} = cumulative sound exposure level (re: 1 μPa^2s), weighted according to functional hearing group.

[a] From NMFS's July 2020 GARFO Acoustics Tool. Separate thresholds for vibratory pile driving were not provided. . Sea turtle thresholds from Navy, 2017.

TABLE 4
Plaquemines LNG and Gator Express Pipeline Project
Threshold Distance for Injury and Disturbance to Sea Turtles for Different Pile Types

Type of Pile	Threshold Distance (feet / meters) [a]		
	Physical Injury		Behavioral Disturbance
	Peak Sea Turtles	Cumulative SEL Sea Turtles	Sea Turtle RMS
Previously Approved Piles in Barataria Bay			
18-inch-square concrete pile – impact-driven [b]	0 / 0	0 / 0	0 / 0
Steel H-type pile – vibratory-driven	0 / 0	0 / 0	0 / 0
Updated Proposed Piles in Barataria Bay			
36-inch-diameter hollow concrete pile – impact-driven [b]	0 / 0	0 / 0	39 / 12
Steel H-type pile – vibratory-driven	0 / 0	0 / 0	0 / 0

Notes: dB = decibel; SEL = sound exposure level; RMS = root-mean-square sound pressure

[a] Distances calculated using the NMFS Acoustic Tool for GARFO (Updated September 2020)

[b] No underwater noise reduction was assumed.

CONCLUSIONS

As presented in Table 4, the underwater noise associated with the 36-inch-diameter hollow concrete piles will result in no peak or physical injury noise levels for sea turtles. The distance to behavioral disturbance thresholds will be approximately 39 feet, which would be within the construction workspace for the installation of the meter stations in Barataria Bay; therefore, due to other physical barriers restricting access to the construction workspace (i.e., underwater spoil piles), no sea turtles are anticipated to be located within the threshold distance to behavioral disturbance associated with pile driving activities. Therefore, ERM believes the proposed modifications will not change the NMFS SERO conclusions regarding potential effects to ESA-listed species provided in their September 17, 2019, letter. ERM recommends that Gator Express Pipeline implement the mitigation measures already agreed to for installation of the piles, which are summarized below.

- Noise-dampening nylon cushioning will be used during impact pile driving of the 36-inch-diamater hollow concrete piles.

- Vibratory pile driving will be used when installing the temporary steel H-type piles.

- Use of “soft starts” (gradually increasing the intensity of pile driving to allow free-swimming aquatic life to leave the area) at the beginning of each pile installation or when a 15-minute or more delay in pile driving has occurred.

- Adoption of a 150-ft buffer around all pile driving locations, where dedicated observers will maintain watch for sea turtles and other protected species. If a sea turtle or other protected species is spotted within the buffer zone, all in-water pile driving work will be halted until the animal moves outside of the buffer zone or has not been observed in the area for 30 minutes.

ERM requests concurrence with these conclusions and recommendation from NMFS SERO.

Attachment 1: Underwater Noise Calculation Details

Attachment 2-C:

Record "FR0000199-FAL.pdf"

Produced by NMFS in Response to FOIA DOC-NOAA-2022-000725

GARFO Acoustics Tool: Analyzing the effects of pile driving in rive

Last Updated 09/14/2020

Check often for updated versions of this tool at: https://www.fisheries.noaa.gov/ne

INTRODUCTION (read everything below before using tool):

threshold shift (TTS)
limits for listed cetaceans. NOAA Fisheries assumes no responsibility for interpretation and application of the results of these models by non-NOAA Fisheries users, as conditions at each project site may vary.

your project, or:

nmfs.gar.esa.section7@noaa.gov

Behavioral and Physiological (Injury) Thresholds for ESA-Listed Species in NMFS' Greater Atlantic Region

Species	Thresholds	Units
Sturgeon/Salmon Behavioral	150	dB re 1 µPA RMS
Sturgeon/Salmon Physiological	206	dB re 1 µPA Peak
Sturgeon/Salmon Physiological (>2g)	187	dB re 1 μPa^2s cSEL
Sturgeon/Salmon Physiological (<2g)	183	dB re 1 μPa^2s cSEL
Sea Turtle Behavioral	175	dB re 1 µPA RMS
Sea Turtle Temporary Threshold Shift (TTS, SEL weighted)	189	dB re 1 μPa^2s SEL
Sea Turtle Temporary Threshold Shift (TTS, Peak SPL)	226	dB re 1 µPA Peak
Sea Turtle Permanent Threshold Shift (PTS, SEL weighted)	204	dB re 1 μPa^2s SEL
Sea Turtle Permanent Threshold Shift (PTS, Peak SPL)	232	dB re 1 µPA Peak
Cetacean Behavioral (impulsive)*	160	dB re 1 µPA RMS
Cetacean Behavioral (non-pulse)*	120	dB re 1 µPA RMS
Cetacean Physiological**	See Below	See Below

***Use the impulsive threshold for impact pile driving; use the non-pulse threshold for vibratory pile driving**

****Please refer to NOAA's 2018 Marine Mammal Acoustic Technical Guidance document and user spreadshee a project creates underwater noise that exceeds the permanent threshold shift (PTS) or temporary threshold s**

https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-gu

*****See full Reference list at the bottom of this sheet.**

Sound Measurement Terminology

Measurements of Pressure

Peak sound pressure level: the largest absolute value of the instantaneous sound pressure expressed in decibels refere
Root Mean Square (RMS): the square root of the average squared pressures over the duration of a pulse; most pile-d with most of the energy contained in the first 30 to 50 msec (Illingworth and Rodkin, Inc. 2001, 2009). Therefore, R of the operations, and represent the effective pressure and the intensity (in dB re: 1 µPa) produced by a sound source

Measurements of Energy

Sound exposure level (SEL): the integral of the squared sound pressure over the duration of the pulse (e.g., a full pile acoustic pressure in the signal and is thus an indication of the total acoustic energy received by an organism from a p
Single Strike SEL (sSEL): the amount of energy in one strike of a pile.
Cumulative SEL (cSEL): the energy accumulated over multiple strikes or continuous vibration over a period of time level, but is a measure of the accumulated energy over a period of time to which an animal is exposed.

Simplified Attenuation Formula (SAF) - use for all projects in rivers and nearshore waters

GARFO developed the Simplified Attenuation Formula (SAF) in order to estimate the ensonification area of pile dri
It was our conclusion that Practical Spreading Loss Model (PSLM) overestimated the ensonification area of pile driv
PSLM also requires an estimate of the number of strikes needed to install a pile (or the number of seconds with a vib
always available. SAF assumes a constant sound attenuation rate (depending on the type of pile). Attenuation rates w
Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish," prepared for Caltrans in 2009 (and
In this spreadsheet, we refer to this document as **Caltrans (2009; 2012; 2015)**. You can download it here:
If Caltrans did not include a clear attenuation estimate, GARFO uses 5dB/10m, which we believe to be a conservativ
as well as greater rate at which sound waves attenuate as they get further from the source and cover a wider area (5d
Caltrans).

EXAMPLE (for sturgeon):

C = distance (m) from pile where sound measurement was taken
T = underwater noise attenuation rate (dB/10m)
RMS(A) = RMS (dB) estimated at C m from pile
RMS(B) = RMS (dB) behavioral threshold for sturgeon (150 dB RMS)
SEL(A) = SEL (dB) estimated at C m from pile
SEL(B) = SEL (dB) injury threshold for sturgeon (150 sSEL)*
* NOTE: When it is not possible to accurately calculate the distance to the 187 dB cSEL re: 1µPa2•s isopleth, we ca
When the received SEL from an individual pile strike is below a certain level, then the accumulated energy from multiple strikes would not contribute to injury, regardless of how many pile strikes occur. This SEL is referred to as "effective quiet", and is assumed, for the purposes of this spreadsheet, to be 150 dB re 1µPa sSEL. Effective quiet establishes a limit on the maximum distance from the pile where injury to fishes is expected – the distance at which the single-strike SEL attenuates to 150 dB. Beyond this distance, no physical injury is expected, regardless of the number of pile strikes. However, the severity of the injury can increase within this zone as the number of strikes increases.

Simplified Attenuation Formula:

Distance (m) to Sturgeon Behavioral Threshold = C+((RMS(A)-RMS(B))/T)*10)
Distance (m) to Sturgeon Injury Threshold = C+((SEL(A)-SEL(B))/T)*10)

Practical Spreading Loss Model (PSLM) - only use for OPEN-OCEAN projects (for nearshore docks/piers, st

In addition to SAF, this spreadsheet incorporates PSLM for projects occuring in deeper, open waters. The equations f
the assumptions below, were adapted from NMFS Pile Driving Calculations tool created by NMFS West Coast Regi
https://www.wsdot.wa.gov/sites/default/files/2017/12/12/ENV-FW-BA-NMFSpileDrivCalcs.xls
See Also:
https://www.westcoast.fisheries.noaa.gov/publications/protected_species/marine_mammals/killer_whales/

Assumptions

1) Estimates of underwater sound are based on measured levels from similar size and type of pile. Please refer to Caltrans' compendium (Caltrans 2009; 2012; 2015).

2) Fish are assumed to remain stationary and the single strike SEL does not vary in magnitude between strikes. Cumulative SEL = single-strike SEL + 10*log(# strikes).

3) Currently there are no data to support a tissue recovery allowance between pile strikes. Therefore, all strikes in any given day are counted, regardless of time between strikes. However, generally the accumulated SEL can be reset to zero overnight (or after a 12 hour period), especially in a river or tidally-influenced waterway when the fish should be moving.

4) Effective Quiet. When the received SEL from an individual pile strike is below a certain level, then the accumulated energy from multiple strikes would not contribute to injury, regardless of how many pile strikes occur. This SEL is referred to as "effective quiet", and is assumed, for the purposes of this spreadsheet, to be 150 dB re 1µPa sSEL. Effective quiet establishes a limit on the maximum distance from the pile where injury to fishes is expected – the distance at which the single-strike SEL attenuates to 150 dB. Beyond this distance, no physical injury is expected, regardless of the number of pile strikes. However, the severity of the injury can increase within this zone as the number of strikes increases.

5) Practical Spreading Loss model: ($TL = 15*\log(R_{1/R0)}$)

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rine/inshore waters on ESA-listed species in the Greater Atlantic R

w-england-mid-atlantic/consultations/section-7-consultation-technical-guidance-greater-atlantic

eveloped this spreadsheet as an in-house tool for assessing the potential effects to ESA-listed fish and sea turtles exposed to elev
nts (coastal areas, bays, and rivers). For cetacean physiological (injury) effects, please refer to NOAA Fisheries' 2018 Marine
her or not a project creates underwater noise that exceeds the permanent threshold shift (PTS) or temporary threshold shift (TTS
d application of the results of these models by non-NOAA Fisheries users, as conditions at each project site may vary.
signed to your project, or:

Reference* **
Andersson et al. 2007; Mueller-Blenke et al. 2010; Purser and Radford 2011; Wysocki et al. 2007
FHWG 2008; Stadler and Woodbury 2009
FHWG 2008; Stadler and Woodbury 2009
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Navy 2017
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Malme et al. 1983, 1984; NRC 2005; Richardson et al. 1995; Southall et al. 2007; Tyack 1998

t for assessing whether or not
hift (TTS) limits for listed cetaceans.
idance

nced to 1 micro Pascal (dB re: 1 µPa) in water.
riving impulses occur over a 50 to 100 millisecond (msec) period,
MS pressure levels are generally “produced” within seconds
.

driving strike). SEL is the integration over time of the square of the
articular source (such as pile strikes). Measured in dB re 1µPa2-s.

; the cSEL value is not a measure of the instantaneous or maximum noise

ving projects in shallow, confined areas, such as rivers.
ing projects in shallower, confined spaces.
ratory hammer), and this info is not
ere estimated using measurements reported in "Technical Guidance for
amended in 2012 and 2015) by ICF Jones & Stokes and Illingworth and Rodkin, Inc.
https://dot.ca.gov/programs/environmental-analysis/caltrans-biology/biological-studies/hydroacoustics
e estimate because of the likely absorption of sound into the riverbed/seafloor,
B/10m is also representative of the most commonly seen range of attenuation rates in

lculate the distance to the 150 dB re 1µPa sSEL isopleth.
d energy from multiple strikes would not contribute to injury, regardless of how many pile strikes occur. This SEL is referred to as "effecti
nes a limit on the maximum distance from the pile where injury to fishes is expected – the distance at which the single-strike SEL attenuate
severity of the injury can increase within this zone as the number of strikes increases.

ill use SAF).
or PSLM (used on the next sheet), as well as
on:

esa_status/characterize_sound_propagation_modeling_guidance_memo.pdf

Please refer to Caltrans' compendium (Caltrans 2009; 2012; 2015).

ween strikes. Cumulative SEL = single-strike SEL + 10*log(# strikes).

ore, all strikes in any given day are counted, regardless of time between strikes. However, generally the accumulated nced waterway when the fish should be moving.

then the accumulated energy from multiple strikes would not contribute to injury, regardless of how many pile strikes heet, to be 150 dB re 1µPa sSEL. Effective quiet establishes a limit on the maximum distance from the pile where ond this distance, no physical injury is expected, regardless of the number of pile strikes. However, the severity of

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egion

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egions; USFWS Regions 1 and 8; California, Washington, and Oregon Departments of Transportation; California De

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chus mykiss. Aquaculture 272: 687-697.

partment of Fish and Game; and Federal Highways Administration. June 12, 2008.

When selecting the appropriate "proxy project" below, be sure to take into account the Pile size, Pile type, Hammer type, Water depth (of installation), and the Notes column (found all the way to the right).

- Use the filters in each column to narrow down the choices for your "proxy project." If the exact pile type/size is not here, ask your NMFS section 7 biologist if she has info for your pile type, or use the next largest size pile of the same materia l for a conservative estimate.
- If you don't know the hammer type (e.g., impact vs. vibratory), assume an impact hammer will be used, as sound pressure levels produced by impact hammers are generally louder than those produced by vibratory hammers.
- Once you find the appropriate proxy, highlight the entire row, copy it, and paste it (**values only**, not formulas) into one of the green rows in the "Tables (Using SAF)" sheet or "Tables (Using PSLM) sheet, depending on which formula you want to use. We recommend SAF for projects in rivers and nearshore environments, and PSLM for open ocean projects.
- If you have an estimate of the required number of strikes (impact hammer) or seconds (vibratory hammer) to install the pile, insert that number in the appropriate cell in **Column I**, below. This will impact the PSLM.

Unless otherwise noted, information in this table specific to the piles, where/how they were installed, the measured underwater noise (Peak, RMS, SEL), and estimated attenuation rates were obtained from:
"Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish," prepared for Caltrans in 2009 and amended in 2012 and 2015 by ICF Jones & Stokes and Illingworth and Rodkin, Inc.
You can download this document here: https://dot.ca.gov/programs/environmental-analysis/caltrans-biology/strategic-biological-planning-advance-mitig (Referred to in this spreadsheet as Caltrans (2009; 2012; 2015)

												SAF					PSLM					SAF			PSLM				SAF		PSLM				
Approximate Pile Size	Pile Type	Hammer Type	Water Depth (m)	Distance (m)	Peak (dB)	RMS (dB)	SEL	# of strikes (impact) or # of seconds (vibratory)	cSEL[1]	Attenuation Rate dB/10 m	Transmission loss constant (for PSLM)	Sea Turtle Physiological (TTS, SEL weighted)	Sea Turtle Physiological (TTS, Peak SPL)	Sea Turtle Physiological (PTS, SEL weighted)	Sea Turtle Physiological (PTS, Peak SPL)	Sea Turtle Distance to Behavioral(m)	Sea Turtle Physiological (TTS, SEL weighted)	Sea Turtle Physiological (TTS, Peak SPL)	Sea Turtle Physiological (PTS, SEL weighted)	Sea Turtle Physiological (PTS, Peak SPL)	Sea Turtle Distance to Behavioral(m)	Sturgeon/Salmon Distance to 206 Peak dB (m)	Sturgeon/Salmon Distance to Physiological SEL (m) [2]	Sturgeon/Salmon Distance to Behavioral RMS (m)	Sturgeon/Salmon Distance to 206 Peak dB (m)	Sturgeon/Salmon Distance to >2g Physiological cSEL (m)	Sturgeon/Salmon Distance to <2g Physiological cSEL (m)	Sturgeon/Salmon Distance to Behavioral RMS (m)	Cetacean Distance to Behavioral (impulsive) RMS (m)	Cetacean Distance to Behavioral (non-pulse) RMS (m)	Cetacean Distance to Behavioral (impulsive) RMS (m)	Cetacean Distance to Behavioral (non-pulse) RMS (m)	Project	Project Location	Notes
12"	Steel H-Type	Vibratory	5	10	165	150	150	NA	NA	5	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10.0	10.0	0.0	NA	NA	10.0	NA	70.0	NA	1000.0	Not Available	Not Available	Sound pressure levels were taken from Table I.2-2 on page I-3 of Caltrans (2012) - likely an average of several measurements taken for this size pile.
12"	Steel Pipe	Vibratory	1-2	10	182	167	157	NA	NA	5	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24.0	44.0	0.3	NA	NA	135.9	24.0	104.0	29.3	13593.6	Point Isabel Foundation Repair	El Cerrito, CA - San Francisco Bay	Calculation for vibratory hammer done by GARFO (-10 dB). Original project involved piles driven using small diesel impact hammer. Piles installed in shallow water near land.
12"	Steel Pipe	Vibratory	5	10	171	155	155	NA	NA	5	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20.0	20.0	0.0	NA	NA	21.5	NA	80.0	NA	2154.4	Not Available	Not Available	Noise measurements came from Table I.2-2 on page I-3 of Caltrans (2012) - likely an average of several measurements for this sized pile.
24"	AZ Steel Sheet	Vibratory	15	10	175	160	160	NA	NA	5	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	30.0	30.0	0.1	NA	NA	46.4	10.0	90.0	10.0	4641.6	Not Available	Not Available	"Typical" Sound pressure levels taken from Table I.2-2 of Caltrans (2012) on page I-3. No project specific info provided - SPLs are likely an average of multiple measurements taken for this size pile. No attenuation rate provided, so GARFO used 5dB/10m.
24"	AZ Steel Sheet	Vibratory	15	10	182	165	165	NA	NA	5	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	40.0	40.0	0.3	NA	NA	100.0	20.0	100.0	21.5	10000.0	Not Available	Not Available	"Loudest" Sound pressure levels taken from Table I.2-2 of Caltrans (2012) on page I-3. No project specific info provided - SPLs are likely an average of multiple measurements taken for this size pile. No attenuation rate provided, so GARFO used 5dB/10m.
36"	Steel Pipe	Vibratory	5	10	185	175	175	NA	NA	5	15	NA	NA	NA	NA	10.0	NA	NA	NA	NA	10.0	NA	60.0	60.0	0.4	NA	NA	464.2	40.0	120.0	100.0	46415.9	Not Available	Not Available	Sound pressure levels taken from Table I.2-2 of Caltrans (2012). No project specific info provided - SPLs are likely an average of multiple measurements taken for 36" piles. Listed as the "typical" SPL for this size.
72"	Steel Pipe	Vibratory	5	10	183	170	170	NA	NA	5	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50.0	50.0	0.3	NA	NA	215.4	30.0	110.0	46.4	21544.3	Not Available	Not Available	"Typical" Sound pressure levels taken from Table I.2-2 of Caltrans (2012) on page I-3. No project specific info provided - SPLs are likely an average of multiple measurements taken for this size pile.
72"	Steel Pipe	Vibratory	5	10	195	180	180	NA	NA	5	15	NA	NA	NA	NA	20.0	NA	NA	NA	NA	21.5	NA	70.0	70.0	1.8	NA	NA	1000.0	50.0	130.0	215.4	100000.0	Not Available	Not Available	"Loudest" Sound pressure levels taken from Table I.2-2 of Caltrans (2012) on page I-3. No project specific info provided - SPLs are likely an average of multiple measurements taken for this size pile.
36"	Steel Pipe	Vibratory	5	10	180	170	170	NA	NA	5	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	50.0	50.0	0.2	NA	NA	215.4	30.0	110.0	46.4	21544.3	Not Available	Not Available	Sound pressure levels taken from Table I.2-2 of Caltrans (2012). No project specific info provided - SPLs are likely an average of multiple measurements taken for 36" piles. Listed as the "loudest" SPL for this size.
20"	Steel Pipe	Vibratory	<1	10	194	161	169	NA	NA	5	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	48.0	32.0	1.6	NA	NA	54.1	12.0	92.0	11.7	5411.7	Bradshaw Bridge	Lathrop, CA - San Joaquin River	Calculation with vibratory hammer (-10 dB) done by GARFO. Original project used an impact hammer. Temporary trestle piles driven in relatively shallow water along the east bank of the San Joaquin River. Attenuation rate of 19Log(Dist)
20"	Steel Pipe	Vibratory	3-4	10	198	177	166	NA	NA	3	15	NA	NA	NA	NA	16.7	NA	NA	NA	NA	13.6	NA	63.3	100.0	2.9	NA	NA	631.0	66.7	200.0	135.9	63095.7	Stockton WWTP Pipeline	Stockton, CA - San Joaquin River	Calculation with vibratory hammer (-10 dB) done by GARFO. Original project: Diesel impact (D19) hammer. Piles driven in San Joaquin River, where water depth was shallow. Attenuation = 3-5 dB at 20m.
30"	Steel Pipe	Vibratory	3	10	200	180	167	NA	NA	5	15	NA	NA	NA	NA	20.0	NA	NA	NA	NA	21.5	NA	44.0	70.0	4.0	NA	NA	1000.0	50.0	130.0	215.4	100000.0	Siuslaw River Bridge	Florence, OR - Siuslaw River	Calculation with vibratory hammer (-10 dB) done by GARFO. Original project: diesel impact hammer (D-52). Permanent 1-inch thick piles driven in three sections as part of a bubble on/off test
12"	Steel Pipe	Vibratory	2	10	193	181	168	NA	NA	5	15	NA	NA	NA	NA	22.0	NA	NA	NA	NA	25.1	NA	46.0	72.0	1.4	NA	NA	1165.9	52.0	132.0	251.2	116591.4	Sausalito Dock	Sausalito, CA - Richardson Bay	Calculation for vibratory done by GARFO (+26 dB to get to Impact Hammer without Cushion, -10 dB to get to vibratory). Piles driven using 3,000-pound drop hammer that included a cushion block. Cushion block consisted of wood. Drop heights ranged from 5 to 8 ft. Caltrans (2012) says the attenuationrate was >5dB after 10m, so GARFO conservatively used 5dB/10m.
13"	Steel Pipe	Vibratory	5	10	171	155	155	NA	NA	5	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20.0	20.0	0.0	NA	NA	21.5	NA	80.0	NA	2154.4	Mad River Slough Pipeline	Mad River Slough - Arcata, CA	Piles driven in tidal river slough using vibratory hammer. No attenuation rate provided, so GARFO used 5dB/10m.
14"	Steel Pipe	Vibratory	>15	20	186	170	160	NA	NA	2	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	70.0	120.0	0.9	NA	NA	430.9	70.0	270.0	92.8	43088.7	Richmond - San Rafael Bridge	San Rafael, CA - San Francisco Bay	Calculation with vibratory hammer done by GARFO (-10dB). Original project involved piles driven in fairly deep waters with a diesel impact (Delmag d19-42) as part of siesmic retrofit work for the Richmond-San Rafael Bridge. Very short driving periods in deep water next to bridge piers. 2 dB/10m attenuation rate is a GARFO calculated average based on the measurements provided at different distances in Table I.2-3 (p. 1 of 4).
24"	Steel Pipe	Vibratory	5	10	193	179	168	NA	NA	3	15	NA	NA	NA	NA	23.3	NA	NA	NA	NA	18.5	NA	70.0	106.7	1.4	NA	NA	857.7	73.3	206.7	184.8	85769.6	Rodeo Dock Repair	Rodeo, CA - San Francisco Bay, CA	Calculation for vibratory hammer (-10dB) done by GARFO. Original project involved dock repair using diesel impact hammer (Delmag D36-32). Attenuation rate of 3dB/10m done by GARFO based on approximate average of measurements provided in Table I.2-3 (p. 1 of 4).
24"	Steel Pipe	Vibratory	0	15	187	175	163	NA	NA	4	15	NA	NA	NA	NA	15.0	NA	NA	NA	NA	15.0	NA	47.5	77.5	0.8	NA	NA	696.2	52.5	152.5	150.0	69623.8	Russian River Geyserville Temporary Trestle Piles	Geyserville - Russian River, CA	Calculations with vibratory hammer done by GARFO (-10dB). Original project involved emergency bridge repair for the Russian River during rainy seasonw hen river was near flood stage. These were temporary trestle piles driven on land adjacent to water through saturated soils. Diesel impact hammer (Delmag D46-32). Attenuation rate of 4dB/10m done by GARFO based on approximate average of measurements provided in Table I.2-3 (p. 1 of 4)
30"	Steel Pipe	Vibratory	4-5	10	195	180	170	NA	NA	5	15	NA	NA	NA	NA	20.0	NA	NA	NA	NA	21.5	NA	50.0	70.0	1.8	NA	NA	1000.0	50.0	130.0	215.4	100000.0	Richmond-San Rafael Bridge	San Rafael, CA - San Francisco Bay	Calculations for vibratory hammer (-10dB) done by GARFO. Original project involved temporary trestle piles driven in relatively shallow water along the western portion of the Richmond-San Rafael Bridge. Diesel Impact hammer (Delmag D62-22). Attenuation rate of 5dB/10m done by GARFO - approximate average of the measurements provided in Table I.2-3 (p. 1 of 4)
12"	Steel H-Type	Vibratory	2	30	169	155	144	NA	NA	5	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	40.0	0.1	NA	NA	64.6	NA	100.0	NA	6463.3	Noyo River Bridge	Fort Bragg, CA	Calculations for vibratory hammer (-10dB) done by GARFO. Original project involved temporary trestle piles installed with a small diesel impact hammer in shallow water. Attenuation rates varied from <5dB at 30-56m from the piles, to >5dB at 56-90m from the pile. Based on this, GARFO used 5dB/10m as an attenuation rate.
10"	Steel H-Type	Vibratory	2	10	161	147	136	NA	NA	5	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0	NA	NA	NA	NA	64.0	NA	631.0	San Rafael Canal	San Rafael, CA	Piles driven using vibratory hammer close to slough shore in shallow water. Sound attenuated 10-11 dB after 10m, but GARFO used 5dB/10m as a conservative attenuation rate as only two sets of measurements were provided in Caltrans.
12-16"	Timber	Vibratory	12.2	9	176	165	165	NA	NA	5	15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	39.0	39.0	0.1	NA	NA	90.0	19.0	99.0	19.4	9000.0	Norfolk Naval Station	Norfolk, VA	Piles driven with vibratory hammer. Size estimate from personal communication with Keith Pommerenck of Illingworth & Rodkin (6/22/16). Measurements were the highest average recorded levels in the provided range (Illingworth & Rodkin 2015; p. I-184-5).

(yellow highlight) = Info was missing from Caltrans, so we subtracted 15 dB for RMS, 25 dB for SEL. This follows the guidance set forth in the NMFS Pile Driving Calculations tool created by NMFS West Coast Region
http://www.dot.ca.gov/hq/env/bio/files/NMFS%20Pile%20Driving%20Calculations.xls

[1]For impact, cSEL = SEL + 10Log (N), where N = # of strikes
For vibratory, cSEL = SEL + 10Log(N), where N = duration of exposure in seconds
Change duration and # of strikes accordingly

Tables using the Simple Attenuation Formula (SAF) for sound attenuation

In order to use the autogenerated tables, below, copy the row of the "proxy project" you'd like to use from t and Paste Special "Values" in one of the green rows, below. Reformat the tables as you see fit for your pro

Approximate Pile Size	Pile Type	Hammer Type	Water Depth (m)
36"	Concrete - Hollow	Impact	5
18"	Concrete - Square	Impact	5
12"	Steel H-Type	Vibratory	5

Action Agencies: For your effects analysis, **always include Tables 1 & 2**, below. Use of Tables 3-5 will d

You can delete/add rows from the tables, as necessary, just be sure that the formulas car

TABLE 1:

Proxy Projects for Estimating Underwater Noise

Project Location	Water Depth (m)	Pile Size (inches)	Pile Type
Walton County, FL	5	36"	Concrete - Hollow
Not Available	5	18"	Concrete - Square
Not Available	5	12"	Steel H-Type

TABLE 2:

Proxy-Based Estimates for Underwater Noise

Type of Pile	Hammer Type	Estimated Peak Noise Level (dB_{Peak})	Estimated Pressure Level (dB_{RMS})
36" Concrete - Hollow	Impact	200	176
18" Concrete - Square	Impact	185	155
12" Steel H-Type	Vibratory	165	150

TABLE 3:

Estimated Distances to Sturgeon/Salmon Injury and Behavioral Thresholds

Type of Pile	Hammer Type	Distance (m) to 206dB_{Peak} (injury)	Distance (m) to 150 dB_{sSEL} (surrogate for 187 dBcSEL injury)
36" Concrete - Hollow	Impact	NA	42.0
18" Concrete - Square	Impact	NA	42.0

12" Steel H-Type	Vibratory	NA	10.0

TABLE 4

Estimated Distances to Sea Turtle Injury and Behavioral Thresholds

Type Pile	**Hammer Type**	**Distance (m) to Sea Turtle TTS (SEL weighted) 189 dB_{RMS}**	**Distance (m) to Sea Turtle TTS (Peak SPL) 226 dB_{Peak}**
36" Concrete - Hollow	Impact	NA	NA
18" Concrete - Square	Impact	NA	NA
12" Steel H-Type	Vibratory	NA	NA

TABLE 5:

Estimated Distances to Cetacean Behavioral Thresholds

Type Pile	**Hammer Type**	**Distance (m) to 160 dB_{RMS} (behavior for impulsive noise)**	**Distance (m) to 120 dB_{RMS} (behavior for non-pulse noise)**
36" Concrete - Hollow	Impact	42.0	NA
18" Concrete - Square	Impact	NA	NA
12" Steel H-Type	Vibratory	NA	70.0

he "Pile Types & Acoustic Formulas" tab,
ject/letter.

Distance (m)	Peak (dB)	RMS (dB)	SEL
10	200	176	166
10	185	155	166
10	165	150	150

epend on whether or not those species are affected by the pile driving.
ry over.

Hammer Type	Attenuation rate (dB/10m)
Impact	5
Impact	5
Vibratory	5

Estimated Single Strike Sound Exposure Level (dB_{sSEL})
166
166
150

Distance (m) to Behavioral Disturbance Threshold (150 dB_{RMS})
62.0
20.0

10.0

Distance (m) to Sea Turtle PTS (SEL weighted) 204 dB_{SEL}	**Distance (m) to Sea Turtle PTS (Peak SPL) 232 dB_{Peak}**	**Distance (m) to Sea Turtle Behavioral Threshold 175 dB_{RMS}**
NA	NA	12.0
NA	NA	NA
NA	NA	NA

# of strikes (impact) or # of seconds (vibratory)	cSEL[1]	Attentuation Rate dB/10 m	Transmission loss constant (for PSLM)
2500	199.97940	5	15
5040	203.02431	5	15
12000	190.79181	5	15

SAF				
Sea Turtle Physiological (TTS, SEL weighted)	**Sea Turtle Physiological (TTS, Peak SPL)**	**Sea Turtle Physiological (PTS, SEL weighted)**	**Sea Turtle Physiological (PTS, Peak SPL)**	**Sea Turtle Distance to Behavioral(m)**
NA	NA	NA	NA	12
NA	NA	NA	NA	NA
NA	NA	NA	NA	NA

PSLM			
Sea Turtle Physiological (TTS, SEL weighted)	**Sea Turtle Physiological (TTS, Peak SPL)**	**Sea Turtle Physiological (PTS, SEL weighted)**	**Sea Turtle Physiological (PTS, Peak SPL)**
NA	NA	NA	NA
NA	NA	NA	NA
NA	NA	NA	NA

	SAF		
Sea Turtle Distance to Behavioral(m)	**Sturgeon/Salmon Distance to 206 Peak dB (m)**	**Sturgeon/Salmon Distance to Physiological SEL (m) [2]**	**Sturgeon/Salmon Distance to Behavioral RMS (m)**
11.65914	NA	42	62
NA	NA	42	20
NA	NA	10	10

PSLM			
Sturgeon/Salmon Distance to 206 Peak dB (m)	**Sturgeon/Salmon Distance to >2g Physiological cSEL (m)**	**Sturgeon/Salmon Distance to <2g Physiological cSEL (m)**	**Sturgeon/Salmon Distance to Behavioral RMS (m)**
3.98107	73.33197	116.59144	541.16953
0.39811	116.59144	116.59144	21.54435
0.01848	10	10	10

SAF		PSLM	
Cetacean Distance to Behavioral (impulsive) RMS (m)	**Cetacean Distance to Behavioral (non-pulse) RMS (m)**	**Cetacean Distance to Behavioral (impulsive) RMS (m)**	**Cetacean Distance to Behavioral (non-pulse) RMS (m)**
42	122	116.59144	54116.95265
NA	80	NA	2154.43469
NA	70	NA	1000

Project	Project Location
Choctawhatchee Bay Test Pile	Walton County, FI
Not Available	Not Available
Not Available	Not Available

Notes

Sound pressure levels taken from Table I.2-1 of Caltrans (2020) for 30-inch square concrete piles. No proje
Sound pressure levels taken from Table I.2-1 of Caltrans (2012). No project specific info provided - SPLs a
Sound pressure levels were taken from Table I.2-2 on page I-3 of Caltrans (2012) - likely an average of sev

ct specific info provided.
re likely an average of multiple measurements taken for this size pile.
eral measurements taken for this size pile.

Tables using the Practical Spreading Loss Model (PSLM) for sound attenuation

In order to use the autogenerated tables, below, copy the row of the "proxy project" you'd like to use from t and Paste Special "Values" in one of the green rows, below. Reformat the tables as you see fit for your pro

Approximate Pile Size	Pile Type	Hammer Type	Water Depth (m)

Action Agencies: For your effects analysis, **always include Tables 1 & 2**, below. Use of Tables 3-5 will d

You can delete/add rows from the tables, as necessary, just be sure that the formulas car

TABLE 1:

Proxy Projects for Estimating Underwater Noise

Project Location	Water Depth (m)	Pile Size (inches)	Pile Type
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

TABLE 2:

Proxy-Based Estimates for Underwater Noise

Type of Pile	Hammer Type	Estimated Peak Noise Level (dB_{Peak})	Estimated Pressure Level (dB_{RMS})
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0

TABLE 3:

Estimated Distances to Sturgeon/Salmon Injury and Behavioral Thresholds

Type of Pile	Hammer Type	Distance (m) to 206dB_{Peak} (injury)	Distance (m) to cSEL of 187 dB (injury for fish >2g)
	0	0.0	0.0
	0	0.0	0.0
	0	0.0	0.0
	0	0.0	0.0
	0	0.0	0.0
	0	0.0	0.0

TABLE 4

Estimated Distances to Sea Turtle Injury and Behavioral Thresholds

Type Pile	Hammer Type	Distance (m) to Sea Turtle TTS (SEL weighted) 189 dB_{RMS}	Distance (m) to Sea Turtle TTS (Peak SPL) 226 dB_{Peak}
	0	0.0	0.0
	0	0.0	0.0
	0	0.0	0.0
	0	0.0	0.0
	0	0.0	0.0
	0	0.0	0.0

TABLE 5:

Estimated Distances to Cetacean Behavioral Thresholds

Type Pile	Hammer Type	Distance (m) to 160 dB_{RMS} (behavior for impulsive noise)	Distance (m) to 120 dB_{RMS} (behavior for non-pulse noise)

Type Pile	Hammer Type	dB_{RMS} (behavior for impulsive	Distance (m) to 120 dB_{RMS} (behavior for non-pulse noise)
	0	0.0	0.0
	0	0.0	0.0
	0	0.0	0.0
	0	0.0	0.0
	0	0.0	0.0
	0	0.0	0.0

he "Pile Types & Acoustic Formulas" tab,
ject/letter.

Distance (m)	Peak (dB)	RMS (dB)	SEL	# of strikes (impact) or # of seconds (vibratory)

epend on whether or not those species are affected by the pile driving.
ry over.

Hammer Type	Attenuation rate (dB/10m)
0	0
0	0
0	0
0	0
0	0
0	0

Estimated Single Strike Sound Exposure Level (dB_{sSEL})
0
0
0
0
0
0

Distance (m) to cSEL of 183 dB (injury for fish <2g)	Distance (m) to Behavioral Disturbance Threshold (150 dB_{RMS})
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0

Distance (m) to Sea Turtle PTS (SEL weighted) 204 dB_{SEL}	Distance (m) to Sea Turtle PTS (Peak SPL) 232 dB_{Peak}	Distance (m) to Sea Turtle Behavioral Threshold 175 dB_{RMS}
0.0	0.0	0.0
0.0	0.0	0.0
0.0	0.0	0.0
0.0	0.0	0.0
0.0	0.0	0.0
0.0	0.0	0.0

			SAF		
cSEL[1]	**Attenuation Rate dB/10 m**	**Transmission loss constant (for PSLM)**	**Sea Turtle Physiological (TTS, SEL weighted)**	**Sea Turtle Physiological (TTS, Peak SPL)**	**Sea Turtle Physiological (PTS, SEL weighted)**

AF PSLM

Sea Turtle Physiological (PTS, Peak SPL)	Sea Turtle Distance to Behavioral(m)	Sea Turtle Physiological (TTS, SEL weighted)	Sea Turtle Physiological (TTS, Peak SPL)

PSLM

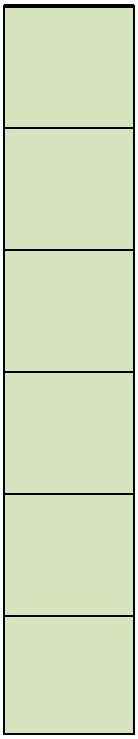
Sea Turtle Physiological (PTS, SEL weighted)	Sea Turtle Physiological (PTS, Peak SPL)	Sea Turtle Distance to Behavioral(m)

SAF			PSLM
Sturgeon/Salmon Distance to 206 Peak dB (m)	**Sturgeon/Salmon Distance to Physiological SEL (m)** [2]	**Sturgeon/Salmon Distance to Behavioral RMS (m)**	**Sturgeon/Salmon Distance to 206 Peak dB (m)**

PSLM			SAF
Sturgeon/Salmon Distance to >2g Physiological cSEL (m)	**Sturgeon/Salmon Distance to <2g Physiological cSEL (m)**	**Sturgeon/Salmon Distance to Behavioral RMS (m)**	**Cetacean Distance to Behavioral (impulsive) RMS (m)**

SAF	PSLM			
Cetacean Distance to Behavioral (non-pulse) RMS (m)	**Cetacean Distance to Behavioral (impulsive) RMS (m)**	**Cetacean Distance to Behavioral (non-pulse)**	**Project**	**Project Location**

Notes



Attenuation measure
Cushion Block (used with impact hammer)
Wood
Micarta
Nylon
Vibratory hammer (used instead of impact hammer)
Any type
Air Bubble Curtain
1-24-inch pile
25-48-inch pile
>49-inch pile
Dewatered Cofferdams/Isolation Casings*
1-24-inch pile
25-48-inch pile
>49-inch pile

If cofferdam is not dewatered, attenuation benefits are limited.

Associated reduction in underwater noise
11 to 26 dB reduction from unattenuated impact hammer underwater sound levels
7 to 8 dB reduction from unattenuated impact hammer underwater sound levels
4 to 5 dB reduction from unattenuated impact hammer underwater sound levels
10 to 20 dB reduction from unattenuated impact hammer underwater sound levels
5 dB reduction in underwater noise
10 db reduction in underwater noise
20 dB reduction in underwater noise
5 dB reduction in underwater noise
10 db reduction in underwater noise
20 dB reduction in underwater noise

Source
ICF Jones & Stokes (2009); page 4-11
ICF Jones & Stokes (2009); page 4-11
ICF Jones & Stokes (2009); page 4-11
ICF Jones & Stokes (2009); page 4-16
ICF Jones & Stokes (2009); page 4-10
ICF Jones & Stokes (2009); page 4-10
ICF Jones & Stokes (2009); page 4-10
ICF Jones & Stokes (2009); page 4-10 "Dewatered coffer dams generally can be expected to provide attenuation that is at least as great as the attenuation provided by air bubble curtains."
ICF Jones & Stokes (2009); page 4-10 "Dewatered coffer dams generally can be expected to provide attenuation that is at least as great as the attenuation provided by air bubble curtains."
ICF Jones & Stokes (2009); page 4-10 "Dewatered coffer dams generally can be expected to provide attenuation that is at least as great as the attenuation provided by air bubble curtains."

Attachment 3

NMFS Response to Documents Submitted April 1, 2021[3]

[3] Obtained via FOIA request to NMFS

Record “FR0000269-FAL.pdf”

Produced by NMFS in Response to FOIA DOC-NOAA-2022-000725

From: Michael Tucker - NOAA Federal
Subject: Re: SERO-2018-00280 - Venture Global Plaquemines LNG and Gator Express Project
To: Ross Hargrove
Cc: Elizabeth Dolezal; Julia Joy
Sent: April 5, 2021 12:30 PM (UTC-04:00)

Hi Ross,
Yes, NMFS agrees that the consultation does not need to be reinitiated because the activities are similar to those previously analyzed, and the changes you have described will not change the potential effects of the project, which remain not likely to adversely affect ESA-listed species under NMFS' jurisdiction.

Mike

On Thu, Apr 1, 2021 at 11:23 AM Ross Hargrove < Ross.Hargrove@erm.com> wrote:

> Mike,
>
> Hope you are doing well. As you are aware, Venture Global Plaquemines LNG, LLC (Plaquemines LNG) is developing a liquefied natural gas terminal (Terminal) and Venture Global Gator Express, LLC (Gator Express) is developing an associated feed gas pipeline and appurtenant aboveground facilities (Pipeline System). Both companies are wholly owned subsidiaries of Venture Global LNG, Inc. (Venture Global).
>
> In August 2020, Gator Express consulted with the National Marine Fisheries Service (NMFS) (SERO-2018-00280 following the modification of Project workspaces and meter station platforms, at which time the NMFS concurred that the modifications would not result in any new or increased impacts to Endangered Species Act-listed species, when compared to those analyzed in the September 2019 consultation. The 2019 consultation concluded that the Project is not likely to adversely affect the green sea turtle (both North and South Atlantic distinct population segments [DPS]); Kemp's ridley sea turtle; leatherback sea turtle; loggerhead sea turtle (Northwest Atlantic DPS); hawksbill sea turtle; giant manta ray; oceanic whitetip shark; Bryde's whale' blue whale; fin whale; sei whale; and, sperm whale.
>
> The Federal Energy Regulatory Commission (FERC) approved the Project on September 30, 2019. Since the previous consultation, the Project has proceeded with final design and preparing for construction. Modifications to the Project since the August 2020 consultation included modifications to the pile sizes associated with the meter station platforms to be installed within Barataria Bay.
>
> As a result of recent geotechnical investigations at the meter station sites, Gator Express has chosen to use 36-inch-diameter hollow concrete piles to support the meter stations rather than the 18-inch-square piles previously proposed. Please recall that underwater noise was a concern regarding installation of the meter station platforms within Barataria Bay. To assess the potential for underwater noise associated with the modified piles for the meter stations, Gator Express used the noise spreadsheets developed by the NMFS and concluded that the noise generated by the 36-inch-diameter hollow concrete piles will be similar to that of the previously proposed 18-inch-square concrete piles. The attached memo presents a range in the total number of piles to be installed. Gator Express is in the process of conducting a wave study to determine the final number of piles required for each platform. Regardless of the final quantity of piles, the noise calculations (see attached) will not change since pile installation assumptions (e.g., strikes per pile, piles per day) will remain unchanged.
>
> Venture Global believes the changes described above will not change the previous affect determinations for the

species identified above. Venture Global believes that the consultation does not need to be reinitiated because the activities are similar to those previously considered and no take has occurred. Please review and confirm that the consultation will not need to be reinitiated. Your response will be provided to FERC to facilitate their review of these modifications to the Project. We appreciate your continued review and assistance.

Regards,

Ross

Ross Hargrove
Director Consultant
M +1 612 805-8244

From: Michael Tucker - NOAA Federal <michael.tucker@noaa.gov>
Sent: Thursday, August 13, 2020 8:26 AM
To: Ross Hargrove <Ross.Hargrove@erm.com>
Cc: Elizabeth Dolezal <edolezal@ventureglobalIng.com>; Julia Joy <Julia.Joy@erm.com>; Kelly Shotts - NOAA Federal <kelly.shotts@noaa.gov>
Subject: Re: SERO-2018-00280 - Venture Global Plaquemines LNG and Gator Express Project

Hi Ross,

Thank you for the update. We agree that the proposed changes to the project plans described herein will not result in any new or increased impacts to ESA-listed species under NMFS' jurisdiction. It is more likely that these proposed changes will reduce any potential effects of the project on ESA-listed species, compared to those analyzed in our September 2019 consultation. Because the proposed project modifications will not cause an effect to ESA-listed species or critical habitat in a manner or to an extent not previously considered, there is no need to reinitiate consultation on this project.

Let me know if you have any questions. Thanks again,

Mike

On Fri, Jul 31, 2020 at 4:55 PM Ross Hargrove <Ross.Hargrove@erm.com> wrote:

> Mike,
>
> Per our conversation, I have attached the maps that depict the footprint changes associated with the Venture Global Plaquemines LNG and Gator Express Pipeline Project (collectively Venture Global or the Project) that have been incorporated into the Project since the Section 7 Endangered Species Act consultation (SERO-2018-00280) was concluded in September 2019. The consultation concluded

that the project is not likely to adversely affect the green sea turtle (both North and South Atlantic distinct population segments [DPS]); Kemp's ridley sea turtle; leatherback sea turtle; loggerhead sea turtle (Northwest Atlantic DPS); hawksbill sea turtle; giant manta ray; oceanic whitetip shark; Bryde's whale' blue whale; fin whale; sei whale; and, sperm whale.

The Federal Energy Regulatory Commission (FERC) approved the Project on September 30, 2019. Since that time Venture Global has proceeded with final design and preparing for construction. Construction of the Terminal is expected to begin in September 2020 and construction of the pipeline system is expected to begin in January 2021. As part of the final design, Venture Global has made the following changes to the Pipeline System as summarized below.

- The addition of a horizontal directional drill (HDD) installation to minimize coastal marsh impacts;
- Reduction of meter station platform footprints;
- Revision to the barge access route to further minimize impacts on oyster resources and move the route to deeper water;
- Addition of 12 additional temporary workspaces to facilitate pipeline construction across foreign lines and canals;
- Removal of additional temporary workspaces no longer needed and minor adjustments of construction workspaces;
- Modified pipe bridge over the levee resulting in a longer span and increased size of footings;
- Addition of a 6-acre laydown yard; and,
- Use of an existing boat dock, requiring installation of a temporary floating dock to enable transfer of equipment and personnel to the Project site.

Overall the workspace modifications associated with the Pipeline System will reduce impacts on wetlands and waterbodies by approximately 40 acres. Please recall that underwater noise was a concern regarding installation of the meter station platforms within Barataria Bay. The updated meter station platforms will be smaller, however, rather than using 12-inch-diameter steel piles the platforms will be supported by 18-inch-square concrete piles. An updated noise analysis is attached which demonstrates that use of the concrete piles will reduce potential impacts on aquatic life in comparison to the steel piles previously analyzed.

Venture Global believes the changes described above and depicted on the attached maps will not change the previous affect determinations for the species identified above. Venture Global believes that the consultation does not need to be reinitiated because the activities are similar to those previously considered and no take has occurred. Please review and confirm that the consultation will not need to be reinitiated. Your response will be provided to FERC to facilitate their review of these modifications to the Project. We appreciate your continued review and assistance.

Regards,

Ross

Ross Hargrove
Director Consultant

ERM
222 South 9th Street | Suite 2900 | Minneapolis, MN | 55402

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E ross.hargrove@erm.com | **W** www.erm.com

Please note our new address as of June 19, 2020.

--

Michael Tucker

Endangered Species Biologist

NOAA Fisheries Southeast Region
U.S. Department of Commerce
727-209-5981
https://www.fisheries.noaa.gov/region/southeast

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Michael Tucker

Endangered Species Biologist
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U.S. Department of Commerce
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https://www.fisheries.noaa.gov/region/southeast

Attachment 4

Smith et al. (2020)[4]

[4] *Downloaded from* https://scholar.archive.org/work/txojydoeuratvl7dqmrsfdjxzu/access/wayback/https://watermark.silverchair.com/i2169-3358-2021-1-688234.pdf?token=AQECAHi208BE49Ooan9kkhW_Ercy7Dm3ZL_9Cf3qfKAc485ysgAAAvcwggLzBgkqhkiG9w0BBwagggLkMIIC4AIBADCCAtkGCSqGSIb3DQEHATAeBglghkgBZQMEAS4wEQQMTSUTbyIfpv8kB0QXAgEQgIICqiNmcSbQ5iNKqMEVn0I6LvTSb-mMaRpsMxPOmIBbg2ugVPWAcCqI3aOjnWRZlNpk5iJXenBbl59MarkKVDWjlii9uKi_cBwb0x6M9ldW2aL31Q2iXMwk8KdS6NBr6y2ICCQ13Thij3gaGPsWamMJW2NpxrgS7juI5wtS4OUDJxYv8GFmOOHDmi0OjNgirBpspBLS3T-lL_W6Azg7bR1vkDtR7JNLc8KhdyQ-KpivVr8Nu7YnzvCjIENAyVoHpPaAu96Y4Ba3SkJfR4UNinCOgQb8T1mxTtnYhsOALxSsF0CprtBa4sFpkzMMiolbp73ek9i1PAVnxIFFmagRfnho97ArAVdrHmjMOSnRiNQBVGI7bHAjpBlnUnNZ0YEE4SC9HdCa2EmN8zw8x0ICTlxHWsN91NB30xZWnr-Teku5cQ5v8Z53WA4l3IIi8zX0NCzezIR2EseFx5L5vifGba-C7HT7QEVu5itlzesYhAfGJJdpIbp7sPd3wLV0wgZrehhE3-Rw24UQwrZZ7pB372qocX8bNrgkG3tyC_3Mbj8nEq0qcXXu3hkGBjGFfyzfefKKnAM0eOYqtgocTtX65447nFjJaaG8P6hm0s-rUg_LqgCBKrpa72OJ4Ux61ertVTH9OE0IbzwFmCw2vqC7ORra5X6xEiswXDeTP0ji7wpG2_QbMxKa76uJOZv5-xW5-16eJcwYdUw0Pe54XTAf2n2xkKGt-ZcK3mDw_KKajSDwcE3JfKKiAuSUC7mQ28ghaun6WyamScv-G5IB_pAzA-cP40D6KTTKp34KnHHyzMvoFqg4WMxxUnG_DgVRGFTYI64sq5OxvdhJPqJNHS2BLlqalw4uh_fUtgEQJ4wGtPjAQsEEc3JYevXAeYafIKUtPcbw34_0rHoXyL7Xghc

Marine Mammals and Respiration: *Evidence of Poor Pulmonary Health in Bottlenose Dolphins Following the Deepwater Horizon Oil Spill*

Cynthia R. Smith[1*], Teresa K. Rowles[2], Forrest M. Gomez[1], Kathleen M. Colegrove[3], Ryan Takeshita[1], Eric S. Zolman[1], Brian C. Balmer[1], Randall S. Wells[4], Forrest I. Townsend,[5] Lori H. Schwacke[1]

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[2]*National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Protected Resources, 1315 East West Highway, Silver Spring, Maryland 20910, USA*

[3]*Zoological Pathology Program, University of Illinois College of Veterinary Medicine, 3300 Golf Road, Brookfield, Illinois 60513, USA*

[4]*Chicago Zoological Society, c/o Mote Marine Laboratory, 1600 Ken Thompson Parkway, Sarasota, Florida 34236, USA*

[5]*Bayside Hospital for Animals, 251 Racetrack Road NE, Fort Walton Beach, Florida 32547, USA*

ABSTRACT

[Abstract#688234] The *Deepwater Horizon* (DWH) disaster resulted in large-scale contamination of bays, sounds, and estuaries in the northern Gulf of Mexico (GoM), home to multiple stocks of bottlenose dolphins. Inhalation, direct aspiration, ingestion with subsequent aspiration, and dermal absorption of oil and its toxic components were all considered possible routes of exposure for dolphins living within the oil spill footprint. To determine if dolphins were

adversely impacted, capture-release health assessments were performed in heavily-oiled Barataria Bay (BB), Louisiana, and in Sarasota Bay (SB), Florida, a comparison site with no DWH oil contamination. Initial studies were conducted as part of a Natural Resource Damage Assessment (2011-2014), with follow-on studies supported by the Gulf of Mexico Research Initiative (2016-2018). To specifically evaluate pulmonary health, transthoracic ultrasound techniques previously developed for managed dolphins were applied to wild dolphins. Results showed that BB dolphins were ~5 times more likely to have moderate to severe lung disease than SB dolphins in 2011, the year following the spill. Concurrent pathology investigations of dead dolphins in the northern GoM reported similar pulmonary findings. In 2013 and 2014, moderate to severe lung disease persisted among BB dolphins, and remained elevated relative to the prevalence at the SB comparison site. More recent live animal health assessments (2016-2018) showed long-term persistence and potential worsening of moderate to severe lung disease in BB dolphins, specifically in animals alive during the oil spill (prevalence of 0.20, 0.35, and 0.55 in 2016, 2017, and 2018, respectively). Long-term monitoring of dolphin populations is critical to fully understand the potential for and timeline of individual and population recovery from the impacts of a large-scale oil spill event, as well as the cost-benefit trade-offs for restoration activities. In particular, BB dolphins provide valuable insight into the long-lasting effects of oil and oil-related contaminants on animal, human, and ecosystem health.

INTRODUCTION

Deepwater Horizon Oil Spill

In April 2010, the *Deepwater Horizon* (DWH) offshore drilling rig exploded and sank, resulting in large-scale contamination of bays, sounds, and estuaries in the northern Gulf of Mexico

(GoM) (Michel et al. 2013). More than 3 million barrels of oil (~900 million pounds) were released before the well was sealed (U.S. v. BP et al. 2015), resulting in an oil slick that spanned ~43,000 square miles of ocean and oiled over 1,000 miles of shoreline habitats (ERMA 2015, Michel et al. 2013). Although clean-up efforts removed ~600 million pounds of oil-contaminated waste from Gulf waters and nearshore and coastal environments of the northern GoM (EPA 2011), the oil spill caused substantial injury to marine life (DWH NRDA Trustees 2016).

Injury to Marine Mammals

As DWH oil spread throughout the northern GoM, marine mammals were documented swimming through the oil (Aichinger Dias et al. 2017). Response monitoring activities from April to September 2010 documented over 1,100 cetaceans from at least 10 species of dolphins and whales swimming through thick surface oil or surface oil sheen (Aichinger Dias et al. 2017, Wilkin et al. 2017). Marine mammals living within the oil spill footprint were likely exposed through multiple routes, including inhalation, direct aspiration, ingestion with or without subsequent aspiration, and dermal absorption of oil and its toxic components (Takeshita et al. 2017, Smith et al. 2017).

In the months to follow, one of the largest and longest marine mammal mortality events occurred in the northern GoM, lasting from 2010 through July 2014 (Litz et al. 2014). Marine mammal responders routinely collected biological data and samples from carcasses, and after a comprehensive investigation into all potential causes of the mortality event, the most likely cause was determined to be the DWH oil spill (Litz et al. 2014, Venn-Watson et al. 2015a). Some of the most consistent necropsy findings in non-perinate dolphins recovered within the oil spill footprint were bronchopneumonia and adrenal gland atrophy, and an increased prevalence of fetal distress

and *in utero* pneumonia was found in dead perinates (Venn-Watson et al. 2015b, Colegrove et al. 2016).

Live dolphins were also examined to investigate the chronic health effects of the oil spill. The temporary capture of dolphins for comprehensive health examinations was performed in heavily-oiled Barataria Bay (BB), Louisiana, as well as oil-impacted Mississippi Sound (MS), Mississippi/Alabama. Dolphins were also examined in Sarasota Bay (SB), Florida, a comparison site with no DWH oil contamination. Initial studies were conducted from 2011-2014 as part of a Natural Resource Damage Assessment (NRDA), with follow-on studies funded by the Gulf of Mexico Research Initiative (2016-2018).

Results from the live dolphin health studies performed during the NRDA were consistent with findings from the concurrent dead dolphin investigations. Specifically, live dolphins were diagnosed with multiple health issues, including moderate to severe lung disease, poor body condition, an impaired stress response, and hematological/serum chemistry indicators of inflammation, hypoglycemia, and abnormal iron levels (Schwacke et al. 2014). From 2011-2013, nearly half of the dolphins evaluated in oil-impacted habitats (BB and MS) were considered unhealthy, indicated by a guarded or worse prognosis, and 17% percent of examined dolphins received a poor or grave prognosis, meaning they were not expected to survive (Schwacke et al. 2014).

The increased prevalence of dolphins with compromised health coincided with high mortality rates within the oil spill footprint. Follow-up studies of BB dolphins using mark-recapture survival models yielded estimated annual mortality rates of 13.2-19.6% in the years immediately following the spill (Lane et al. 2015, McDonald et al. 2017), which were much higher than mortality rates previously reported for bottlenose dolphins using similar techniques near

Charleston, South Carolina (4.9%), and Sarasota, Florida (3.8%) (Speakman et al. 2010, Wells et al. 1990). Alternative hypotheses were considered, including exposure to harmful algal blooms (DWH NRDA Trustees 2016), persistent organic pollutants (Balmer et al. 2015), and infectious disease outbreaks (Venn-Watson et al. 2015a). These factors were ruled out as likely contributors to the increased mortality rates documented within the oil spill footprint, leaving exposure to toxic oil components as the most likely cause of death.

Pulmonary Disease in Dolphins

To specifically evaluate pulmonary health in dolphins likely exposed to DWH oil and related byproducts, transthoracic ultrasound techniques previously developed for managed dolphins (Smith et al. 2012) were used on wild dolphins temporarily captured for health assessments. The dolphin body is well-suited for ultrasound, as their skin is smooth and hairless, so doesn't require any preparation before conducting the exam. Current ultrasound machines are powerful enough to penetrate dolphin blubber and rugged enough to be used in extreme field conditions (e.g. high air temperatures, saltwater environments, unstable operating platforms). Pulmonary abnormalities can be rapidly detected and are divided into previously defined categories (Smith et al. 2012): (1) pleural effusion, or fluid surrounding the lungs; (2) superficial pulmonary nodules, or <2cm round/ovoid foci of non-aerated lung; (3) pulmonary masses, or 2cm or greater well-defined areas of non-aerated lung; (4) alveolar-interstitial syndrome, or evidence of reduced air in the lung and replacement of air with cellular infiltrate, and (5) pulmonary consolidation, where fluid or cellular infiltrate is occupying the alveolar spaces in the lungs. Once examinations have been completed, each lung field (left and right) is given an overall score as follows: normal (no evidence of disease), mild, moderate, or severe lung disease (Schwacke et al. 2014, Smith et al. 2017).

In the year following the spill, dolphins examined within the oil spill footprint had a 5-fold higher prevalence of moderate to severe lung disease when compared to dolphins living outside the oiled region, based on ultrasound examination (0.34 in BB versus 0.7 in the comparison site) (Schwacke et al. 2014). During 2013 and 2014, the prevalence of moderate to severe lung disease among BB dolphins decreased slightly (0.23 and 0.25, respectively), but remained elevated relative to the prevalence at the SB non-oiled comparison site. Concurrent pathology investigations of dead dolphins recovered from the northern GoM in the years following the spill reported similar pulmonary findings (Colegrove et al. 2016). The prevalence of bacterial pneumonias, many of which were severe, in carcasses recovered within the oil spill footprint was significantly higher than in comparison populations (0.22 (oiled) vs 0.02 (non-oiled)). Pneumonias were caused by multiple bacterial pathogens indicating that lung disease was not due to infection with a single, highly pathogenic bacterium, but rather was due to secondary infection of damaged lung tissue (Venn-Watson et al. 2015b).

The increased prevalence of lung disease in dolphins living within the DWH oil spill footprint was consistent with respiratory findings from humans exposed to oil and its toxic components (Zock et al. 2007, Jung et al. 2013, Alexander et al. 2018, Gam et al. 2018a, Gam et al. 2018b). However, relatively few studies have focused on the chronicity of respiratory disease post-exposure. Therefore, to determine if pulmonary disease would persist in wild dolphins living within the oil spill footprint, BB dolphins were examined during capture-release health assessments in 2016, 2017, and 2018 as part of two Gulf of Mexico Research Initiative (GoMRI) supported investigations to better understand the chronic health effects of the DWH disaster.

METHODS

Dolphin capture-release health assessments

Dolphin health assessments were conducted via capture, temporary restraint, and release in oil-impacted BB during 2016, 2017, and 2018, as well as SB (non-oiled comparison site) in 2016 and 2018. For comparative analyses over time, we included previously reported pulmonary data from health assessments in BB (2011, 2013, 2014) and health assessments in SB (2011, 2013) (Schwacke et al. 2014, Smith et al. 2017). We also analyzed additional ultrasound images that had been collected in SB in 2012, 2015, and 2017. Capture-release methodologies and diagnostic sampling techniques are described elsewhere and were similar during all study years and across locations (Wells et al. 2004, Schwacke et al. 2014, Barratclough et al. 2019). Briefly, dolphins were encircled with a seine net and supported by experienced handlers for examination. We avoided small calves with a known or suspected age of less than two years. The amount of time each animal spent out of the water and overall time restrained was minimized, and veterinary staff continuously monitored animals throughout their health assessments.

Pulmonary ultrasound evaluation

Pulmonary ultrasound exams were performed by experienced marine mammal sonographers (CS, FG) using the dorsal-ventral slide technique as previously described (Smith et al. 2012). Pulmonary abnormalities were detected following standardized methods (Smith et al. 2012, Schwacke et al. 2014), to include pleural effusion, alveolar-interstitial syndrome, pulmonary masses, pulmonary nodules, and pulmonary consolidation. Alveolar-interstitial syndrome (AIS) was graded as mild, moderate, or severe as follows: mild – occasional clusters of ring-down artifacts; moderate – frequent clusters of ring-down artifacts, distributed throughout the dorsal, ventral, or entire lung field; severe – contiguous ring-down artifacts that created a ‘white-out’ effect and loss of reverberation artifact, detected in multiple areas. When present, distribution of

AIS throughout the lung field was noted. Pulmonary nodules (<2cm) and masses (≥2cm) were measured and described.

Photo-identification

We compared dorsal fin images of the dolphins that we sampled to images of known individuals collected from prior photo-identification studies (McDonald et al. 2017, Wells et al. 1990). Our team has conducted photo-identification studies in BB since 2010, and in SB since 1970; therefore, a majority of the dolphins were known. Based on photographic sighting history, we categorized each individual dolphin as being alive in 2010 during the DWH spill, or being born after the spill. This allowed us to compare the prevalence of lung disease in BB dolphins presumably exposed to DWH oil in 2010 to those born after the spill, and to compare similar age cohorts between the two study sites.

Statistical analysis

To examine potential time trend in the prevalence of lung disease for dolphins that were alive in 2010 when the DWH spill occurred, we applied a generalized additive model (GAM) with smoothing splines. We created a binary outcome variable to indicate lung scores that were normal or showed mild lung disease (0), versus those that showed moderate to severe lung disease (1). We used a binomial distribution and logit link for the GAM, and included site (BB/SB) as an additional binary covariate. Because of the short time span, we had limited samples of dolphins born after 2010, therefore we pooled samples across years. To examine potential differences in lung disease prevalence between the two sites for the younger cohort, we applied a similar GAM, but without the smoothing spline term for time. We generated heatmaps stratified by site and age cohort to visually examine prevalence of the various lung abnormalities. For AIS, the heatmap was based on mean score with moderate scores assigned 0.5 and severe scores assigned 1.0, inferring that

severe scores were twice as bad as moderate scores; for all other (binary) variables, the heat maps display prevalence of cases. We conducted an additional GAM, again with smoothing splines, to evaluate temporal changes in worsening AIS dorsal to ventral (yes/no) for dolphins alive at the time of the spill. All analyses were conducted in R (ref); we used the mgcv package for GAM analyses.

RESULTS

Sample demographics

Between 2011 and 2018, we evaluated the pulmonary health of 171 BB dolphins; 132 of which were alive at the time of the spill and 18 born after the oil spill. We could not definitively classify 21 BB dolphins to an age cohort. Over the same time period, we assessed the pulmonary health of 103 dolphins from the unoiled comparison site (SB), 84 which were alive in 2010 and 19 born after 2010.

Dolphins alive in 2010 during the DWH spill

Our GAM analysis indicated that sampling site strongly influenced the prevalence of moderate to severe lung disease ($p<0.001$), with dolphins sampled in BB, which was heavily oiled by the DWH disaster, having the higher prevalence. Many of the lung scores for BB dolphins were severe (prevalence of 0.23 in 2017 and 0.22 in 2018 in oiled BB), while none of the SB dolphins alive in 2010 were diagnosed with severe lung disease post-DWH (2011-2018).

There was some evidence that prevalence of moderate to severe lung disease changed over the years (GAM smooth term $p=0.06$ for BB, $p=0.07$ for SB); however, the increases were primarily confined to one or two years: 2018 in BB and 2016-2017 in SB. The prevalence of moderate to severe lung disease in BB was 0.20, 0.35, and 0.55 in 2016, 2017, and 2018,

respectively. During the period of highest prevalence of moderate lung disease in SB (no SB animals alive at the time of the spill were diagnosed with severe disease), there was also significant uncertainty in the estimates due to limited sample sizes.

AIS was a significant factor in the BB lung disease cases, and in some cases worsened dorsal to ventral within the lung field. While dorsal to ventral worsening was not seen at all in SB dolphins, the prevalence increased over the years for BB dolphins that were alive at the time of the DWH spill ($p<0.001$) and was highest in 2018, the final year of sampling. We documented other lung abnormalities including pleural effusion, pulmonary nodules, consolidation, and masses in BB. Some of these abnormalities, including pulmonary nodules, were also seen in SB, albeit to a much lesser extent.

Dolphins born after the DWH spill in 2010

Prevalence of moderate or severe lung scores did not differ between BB and SB for dolphins born in 2010 after the DWH spill ($p=0.67$), and was relatively low. Nodules were the most commonly observed abnormality for both BB and SB cohorts.

DISCUSSION

In the aftermath of the DWH disaster and subsequent oiling of coastal habitats, we found a high prevalence of moderate to severe lung disease in bottlenose dolphins living within one of the heavily-oiled estuaries (BB). BB dolphins have high site fidelity, meaning that animals tend to live in the same region for multiple years and are unlikely to leave (Lane et al. 2015; Wells et al. 2017). Our follow-on studies proved critical in determining that dolphin pulmonary health was not improving. The high prevalence of moderate to severe lung disease suggests a chronic, progressive lung damage has occurred following oil exposure, which should be considered when investigating

potential pathways and mechanisms of respiratory compromise. Other possible contributing factors include an increased susceptibility to lung infections due to oil-induced immune system aberrations, cardiac damage with secondary pulmonary compromise, and age-related health changes.

In bottlenose dolphins and other cetaceans (porpoises, dolphins, and whales), the lungs serve a dual purpose of both respiration and buoyancy control (Ridgway et al. 1969). Investigations of dolphin pulmonary anatomy have shown that terminal airways are reinforced with cartilage, and myoelastic sphincters are found surrounding terminal bronchioles and alveolar entrances (Simpson & Gardner 1972). The alveoli can completely collapse at depth, forcing air into the reinforced air spaces, presumably for prevention of decompression sickness (Ridgway et al. 1969). The presence of moderate to severe pulmonary disease would be expected to impair these physiologic mechanisms, negatively impact buoyancy, and increase energetic demands. This is supported by the authors' (CRS, FMG, FIT) personal observations of managed dolphins diagnosed with moderate to severe pulmonary disease that have altered swim and dive patterns, likely due to a decrease in functional lung capacity and concomitant impaired buoyancy.

Pulmonary damage and subsequent respiratory compromise would not be unusual for mammals several years following exposure to an oil spill. Respiratory symptoms were reported in humans following inhalation exposure from multiple spills, including the DWH disaster (Alexander et al. 2018, Rusiecki et al. 2018). In addition to dolphins and humans, studies involving fish and mice experimentally exposed to DWH oil and/or byproducts reported respiratory injury (Brown-Peterson et al. 2015, Jaligama et al. 2015, Pan et al. 2018). Potential mechanisms of primary injury have been compared across taxa, including oxidative damage, cellular damage, and

cellular necrosis. Secondary pathways have also been investigated, including immunotoxicity, cardiotoxicity, and chronic stress.

Based on comprehensive examination of all available data collected to date, chronic pulmonary disease was likely a significant factor in the overall poor health of dolphins living within the oil spill footprint, and there were additional consequences to dolphins that had sustained this injury. To help define clinical significance to individual animals, oxygenation and blood gas analyses were conducted (2016 and 2017), which identified evidence of compensatory acid-base imbalances in dolphins with lung disease (Sharp et al. 2017). Poor pulmonary health and acid-base imbalances could help explain the sustained high rates of reproductive failure in BB (Lane et al. 2015; Kellar et al. 2016; Smith et al. 2020), as maternal illness and related adverse health outcomes could put pregnancies at risk and impact a female's ability to adequately care for her young. Additionally, overall health scores have been determined over time (2011-2018) in BB dolphins and showed that dolphin population health has not improved over time, but instead worsened in 2017 and 20178 (Schwacke et al. 2020).

A limitation of this study was the small number of SB dolphins (comparison site) sampled during 2016 and 2017 that were alive during the DWH oil spill (5 in 2016; 8 in 2017), and caution must be taken when interpreting the increasing trend of moderate lung disease during those two years. Although the prevalence of moderate lung disease increases, the prevalence of pulmonary abnormalities remains low. There are no cases of pulmonary masses, pulmonary consolidation, or dorsal-to-ventral worsening of AIS in SB during 2017 or 2018. Additionally, there are no cases of severe pulmonary disease diagnosed in SB during the entire post-DWH disaster study period, compared to a prevalence of 0.23 in 2017 and 0.22 in 2018 in oiled BB.

This study shows strong evidence of a chronic and potentially progressive respiratory injury in bottlenose dolphins living within the oil spill footprint. Other species of cetaceans living further off-shore were exposed, but their health was difficult to evaluate and few data exists to determine the potential adverse health impacts. However, the nearshore bottlenose dolphin data suggests that any cetacean with a similar exposure to DWH oil or its byproducts could sustain a similar injury. Long-term monitoring of dolphin populations living within the oil spill footprint is critical for fully understanding the potential for and timeline of individual and population recovery from the impacts of a such a large-scale oil spill event, to include extrapolation of impacts to other cetacean populations in the northern GoM. BB dolphins in particular provide valuable insight into the long-lasting effects of oil and associated contaminants on animal, human, and ecosystem health.

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Tuesday, October 10, 2023

To the National Marine Fisheries Service,

The Sierra Club submits the following 766 messages on behalf of our supporters with the following language and with 159 personalized messages:

Re: I’m urging you to deny the East Lateral Xpress Pipeline's permit request

Dear Ms. Harrison,

The National Marine Fisheries Service must deny the East Lateral Xpress Pipeline’s request for a harassment permit that would threaten up to 40 dolphins in Barataria Bay off the coast of Louisiana. The dolphin population in the Bay has yet to recover from the 2010 BP oil spill and so many other industry activities, and may not survive another blow to their population. Approximately 2,000 dolphins currently reside in Barataria Bay, one of the most important dolphin populations in the Gulf. However, the BP oil spill and other industrial pollution have rendered the population weak and unable to reproduce. Harassing 40 dolphins will destabilize the whole ecosystem. Let me be clear: the stakes are high. This action is not only about dolphins. Approving the permit would exacerbate a host of other pressing issues, including sea-level rise, saltwater intrusion, land loss, oil spills, warming the waters, and low oxygen levels. Our ecosystem is already out of balance, and further disruptions will have devastating consequences. Moreover, harassing this dolphin population will have a direct and adverse impact on the livelihoods of our fishers and shrimpers, who depend on the Gulf's abundant resources. With these critical concerns, we respectfully urge you to protect Barataria Bay's dolphins and the Gulf ecosystem as a whole. We believe it is our collective responsibility to safeguard that delicate balance of our natural world and ensure the well-being of our communities that rely on this ecosystem. We kindly request your intervention as the National Marine Fisheries Service to deny the East Lateral Xpress Pipeline's harassment permit application. Thank you for your time and consideration of this pressing matter. We look forward to your support in preserving our cherished marine environment, keeping the legacy of our cultural identity, and helping the communities that rely on its health.

Thank you for considering my comments.

1. Anu Moorthy
Baltimore, MD 21215
All living things are a part of the balance of nature. Whenone component is lost there is a ripple effect on all of the rest.

2. Jane Stopher
Louisville, KY 40205
All of us are God?s creatures and are interconnected. Harming one harms us all.

3. Barbara Tait
Shorewood, IL 60404
Animals of all kinds are being subjected to ever more "harassment", bring impending collapse to many populations and ecosystems around the country. It is time to stop this ever expanding assault on the natural world that supports us. Assaults like this in the name of fossil fuel activity are especially egregious, causing world wide as well as local severe harm. As a scuba diver I know the beauty and intelligence of dolphins up front and I urge you to protect them from this "harassment".

4. Rebecca Oslin
Jacksonville, FL 32216
another note should not be necessary..s.hakim

5. Janet Swihart
Long Beach, WA 98631
Anything that harms our wildlife ultimately harms our communities. Take action today!

6. Doris Gilestra
New York, NY 10033
As a mother and grandmother, I believe it is our duty to protect and preserve wildlife as precious natural resources held in trust for all future generations. I also feel a deep responsibility as a Steward for all of Earth's Divine Creation. That responsibility will always be more important than politics or profit.

7. Madelynne News
Upper Chichester, PA 19061
As conservationists we are trying to do the right things to help save our planet. And we frown upon companies who try to abuse it by destroy our natural resources and wildlife. Please realize what you are about to do by constructing this pipeline and let your conscience be you guide. Thank you

8. Stephan Donovan
Oro Valley, AZ 85737
Big oil is ruining our natural habitats. It is padt time you, in congress represent your voters and stop this now.

9. Susan Olive
Niles, OH 44446
Consistently, our wildlife loses to mankind, we must protect wildlife, and be very concerned about oil spills.No pipeline!!

10. Dustin Jackson
Scottsbluff, NE 69361
Deny it for the sake of everything that should be good and isn't anymore

11. CHRISTINE CALAIS
Lafayette, LA 70501
Despair,pain, are not just human experiences, but are usually caused by us.

12. Allie Barkalow
Santa Rosa, CA 95401
Dirty water kills wildlife and people. It?s past time to get off of fossil fuels!

13. Pam Harper-Smith
College Station, TX 77840
Disrupting the Bay ecosystem to build a gas pipeline is getting the priorities backwards. To combat climate change, we need to stop building oil and gas infrastructure, and building more while interfering with a fragile ecosystem is a poor choice all around.

14. Donald Meroni
Winter Haven, FL 33880
Do the right thing!

15. Diane Lesser
North Augusta, SC 29860
Do what you?re paid to do

16. Jeannie Finlay-Kochanowski
Toledo, OH 43608
Dolphins are important!

17. Denise Garza
Fremont, CA 94536
Dolphins are intelligent and sensitive--a lot like humans, in many ways. Our world, including Barataria Bay, benefits by their live, healthy presence.

18. Jody Baron
Broomfield, CO 80020

Dolphins are intelligent precious inhabitants of the Gulf of Mexico off Southeast Louisiana; please protect these sensitive mammals and their young from harrassment from this proposed pipeline.

19. Lorraine Clarke
Pooler, GA 31322
Dolphins are loving and social animals that don't harm anyone and they need our protection from the commercial interests that don't care about life and are leading to the global warming and destruction of our planet stop it now

20. Michelle Anson
Penn, PA 15675
Dolphins are special, intelligent, social animals who form tight bonds in their social groups, need each other, and need your help!

21. Cathy Deptula
Brandon, FL 33511
Dolphins are such a joy to see. Protecting them also helps the shrimpers and fishers, which not only important people, also contribute greatly to Louisiana's economy.

22. Janet Rountree
Suffolk, VA 23434
Dolphins can not stand up for themselves and our environment. We have to

23. Raymond Choma
Charlotte, NC 28278
Dolphins deserve protection from commercial interests. We are losing all our animals and this must be stopped.

24. Randy Raspotnik
Casselberry, FL 32707
Dolphins have bigger brains than humans, so we should preserve them for when we destroy ourselves.

25. Noah Ehler
Carnation, WA 98014
Dolphins matter to me because they need fresh air and water to drink and because I love all animals deserve rights as well..

26. Janice Jones
El Cerrito, CA 94530
Don't allow harm to these dolphins. We must sacrifice their lives and health to fossil fuels.

27. Tacey Conover

Eugene, OR 97405
DON'T DISTURB THE DOLPHINS!

28. Phoebe Bowers
Geneva, FL 32733
Dont let these precious creators vanish forever.

29. Phyllis Marriott
Citrus Heights, CA 95621
Ecosystems and the creatures in them must come first to protect where we all live, the Earth!

30. Beverly De Vingo
Mt Airy, GA 30563
Enough already. The Louisiana Gulf coastline has suffered far too much damage already. PLEASE say NO to the East Lateral Xpress Pipeline?s request for a harassment permit.

31. Lorelette Knowles
Everett, WA 98201
Every dolphin contributes to the life and beauty of the gulf region. At a time when we are working diligently to pull away from fossil fuels, this permit is completely unnecessary.

32. Amity Jones
Spokane, WA 99212
Every species is special, and the loss of one jeopardizes all others, including humans.

33. Dorothy Maurer
Blue Bell, PA 19422
Everyone should be quickly moving away from fossil fuels. Saying no to this pipeline is a needed action.

34. Chris Moore
Denver, CO 80210
Exposures to chemical pollution, such as the British Petroleum oil spill, and industries development in the region have made it difficult for female dolphins to reproduce and for the herd to grow anflourish. Please reject a permit application asking permission to harass 40 dolphins in Barataria Bay off the coast of Southeast Louisiana so a pipeline company can ship dirty methane gas to the Plaquemines LNG export terminal. The East Lateral Express Pipeline will only make the environment worse. I ask that you please do not allow this East Lateral Express Pipeline permit to be approved. Thank you.

35. Luanne DeFelice
Baldwinsville, NY 13027
Extinction needs to be natural, not man-made!

36. Elsa Caquias
Ocala, FL 34483
for the good of all surrounding marine life and the dependent communities. Humanity and the environment matter.

37. Linda Granato
Philadelphia, PA 19136
Harassing up to 40 dolphins in Barataria Bay by Xpress Pipeline will worsen an already weak ecosystem and threaten the wildlife and vulnerable dolphins!

38. Elizabeth Kelch
GreenCoveSprings, FL 32043
However, you MUST do MUCH MORE. We MUST keep ALL Climate-Changing fossil fuels IN THE GROUND! We MUST achieve 100% Clean, Renewable Energy like Solar and Wind in electrical generation and transportation by 2030.

39. Anette Brackett
Neosho, MO 64850
I don?t support oil production at the cost of other vital interests. Our Virente is Noah important than ever.

40. Charles Feezer
Eloy, AZ 85131
I know this is a mass emailed letter, but I can?t put it better than they did. Please read it, and keep our dolphins, fisheries, and the gulf itself safe from the pollution this buildout is sure to cause.

41. Phoebe Bowers
Geneva, FL 32732
I lived on the Gulf Coast for years. I am a member of the Port Aransas Conservancy still working to keep our section of the Gulf free of pipelines and other industries which would damage the dolphin, fish and other wildlife. I support the dolphins of Barataria Bay.

42. James Bauer
New Orleans, LA 70119
I strongly urge you to uphold environmental justice by denying the harassment permit. Do no facilitate pollution at the cost of people and the planet! For the sake for the communities and animals depending on the fragile marine ecosystem, please prevent the harassment of important dolphins. The future is made a reality by your choices. I ask that you make the justice and healthy planet we need a reality by choosing to deny the harmful permit harassment application.

43. Janice March
Sarasota, FL 34234

I worked on oil rigs for many years in the Gulf of Mexico. Never again. There is nothing clean about the oil and gas industry. Louisiana is already filthy and polluted. No more fossil fuels please.

44. Vickie West
Fayetteville, AR 72702
I'm asking you to deny this permit for the health inherent dangers and inevitable disaster this pipeline will have on the ecosystem of the area as well as the economy of the region. The dolphins are key to the ecosystem and already threatened. Dolphins are gentle, intelligent creatures. Harassment for profit is just wrong. To think of destroying an ecosystem just to drill for more pollution causing oil at a time when the world desperately needs to develop alternatives to energy is just ludacris. And what about the people who depend on the health of these waters for their livelihood. Do their lives not matter? What about the people that depend on them? Please consider the grave consequences of allowing this permit.

45. Marjorie Skidmore
Colchester, CT 06415
I've lived on the Gulf for 47 years, and I've seen it attacked in so many ways. Please stop.

46. Sharon Dyal
Fernandina beach, FL 32034
In wilderness is the preservation of the planet. Please save these dolphins from wanton destruction related to big oil's maneuvers, always about the money, money, money. Do your job and protect this fragile ecosystem and its wildlife.

47. Carol E Gentry
Albuquerque, NM 87102
Instead of continuing to damage the life on this planet, we need to be doing everything we can to improve conditions. Greed should not even enter into the decision and a request to allow harassment of marine life in order to ship dirty LNG is nothing but greed.

48. Cameron McElroy
Richland, WA 99352
It is beyond time to protect these dolphins

49. Laura Smith
College Station, TX 77845
It is important to protect our waters and the 40 dolphins in Barataria Bay.

50. Lusine Harutyunyan
Encino, CA 91316
It is past time to do the right thing for our planet and the creatures that inhabit it. I urge you to take this opportunity to protect dolphins.

51. Travis Dickson
Concord, NC 28025
It is really important to me to keep the ecosystem fully functioning and the fossil fuel industry and actions associated with it negatively impact the global environment. Please intervene and stop this.

52. Barbara Burton
Memphis, TN 38111
IT MATTERS!!!

53. Christina Baylis
Boise, ID 83702
It's high time to protect our Gulf and its inhabitants, especially dolphins. I was born and raised here, swam in the gulf before I walked and swam with dolphins as an adolescent. These sentient beings are an integral part of our beloved Gulf of Mexico and must be protected.

55. Rachel Campbell
Charlotte, NC 28226
LEAVE THE DOLPHENS ALONE!

56. Shelby Coyle
Pembroke Pines, FL 33029
Leave the dolphins alone.

57. Nancy Stamm
Fort Pierce, FL 34945
Let the dolphins be and stop endangering their habitat.

58. Stephanie Speltz
Lawler, IA 52154
Listen, we're done ravaging the earth. We know our deadline to act to avert climate change is rapidly passing by, and we have all the tools we need to do the right thing. We just need to do it. Further destruction of the Louisiana coastline to make someone some extra bucks is Just. Not. Okay. The Gulf has been through enough already--let it heal.

59. Victoria A Olson
Oakland Park, FL 33309
Living beings should be ahead of any profits.

60. Heather M BRaut
Nokomis, FL 34275
Living in Florida, I am very concerned about what happens to the habitat of the Gulf of Mexico. The Gulf waters in Louisiana are basically in our backyard. It took years to clean up from the BP

mess. We don't need more problems added to the stresses on the waters anywhere near Florida.

61. N Coyle
Jensen Beach, FL 34958
LNG companies only benefit themselves and all the risk and harm is inflicted upon local communities. They should all be outlawed.

62. Tracey Dare
Doral, FL 33172
My family and I love dolphins. Please protect them

63. Gary Barton
Dallas, TX 75229
Nature is a finite resource. Its ability to recover from the damage we inflict should not be taken for granted.

64. Judith Livingstone
East Dennis, MA 02641
No harassment of Dolphins! Keep our ecosystems healthy!

65. David Billingham
Chicago, IL 60641
Oil Permits Only Hasten the Demise of Dolphins and the Life of Our Gulf Waters

66. Haroon Khan
Houston, TX 77055
Our oceans and their wildlife are dying. Your denial of this permit request is an important step in stemming this tide!

67. Lee Norvitz
Homestead, FL 33035
Our sea life is under incredible pressure these days. Please do the right thing by them and the fishers and shrimpers, who carry on the LA legacy, by denying the ELX Pipeline's permit request. As someone who grew up near the Gulf, I have seen how it has suffered enough and needs to recover.

68. erik melear
Orlando, FL 32806
Our world to survive is more important than filling greedy pockets with profits from dirty fossil fuel uses.

69. Judy Kessinger
Clearwater, FL 33764

Personal Message

70. Ralph Shannon
Hudson, FL 34667
Please be humane and act responsibly to keep our waters safe for dolphins and other wildlife. The domains lives depend on your actions, so please be kind and practice emphany.

71. Mary Gutierrez
Fort Walton Beach, FL 32548
Please consider the natural ecosystem that will be devastated by this pipeline. We?ve taken over enough, we can?t keep destroying the land without serious consequences.

72. Sharon McNamara
Branford, CT 06405
Please consider this important legislation to support wild life and the echo system which is greatly endangered. What is not done now will have dire consequences for all life on earth. Thank you for your consideration.

73. Nadine James
Apopka, FL 32703
Please consider this. Our dolphins and ecosystems are so very important. Don't you want our children to have a clean planet and beautiful wildlife to enjoy and inspire them!!??

74. Nancy Meador
Harwood, TX 78632
PLEASE DENY PERMIT FOR THE EAST LATERAL XPRESS PIPELINE. OMG!! .

75. Julie Manciagli
Auburn, AL 36830
PLEASE DENY THE EAST LATERAL XPRESS PIPELINE PERMIT! THE DOLPHINS ARE A HUGE PART OF OUR ECOSYSTEM. THEY DESERVE OUR SUPPORT AND PROTECTION!!!

76. Mary Ann Plant
Hoover, AL 35226
Please deny this harmful pipeline. It is not reasonable to place the affected ecosystem and marine life at risk from pollution and disruption during its implementation and afterward when leaks are inevitable.

77. Marge Pertuit
Cinnaminson, NJ 08077
PLEASE deny this permit, for all the reasons below. It is our responsibility to be stewards of the Gulf, the coasts and wildlife.

78. LUIS VEGA

Corpus Christi, TX 78413
Please do all in your power to protect life in Barataria Bay.

79. seymour hakim
Philadelphia, PA 19128
Please do NOT approve this pipeline. The gulf and all its sea life including dolphins should not be sacrificed so we can destroy the world with more oil and gas. We need to get OFF of fossil fuels not double down. Please do not approve this misguided idea.

80. Leslie Smoot
Owens Cross Roads, AL 35763
Please do the right thing for the people, dolphins and the planet.

81. Ashley Herman
Fort Worth, TX 76244
Please don?t let the pipeline hurt the dolphins or any residents of our beautiful gulf coast!

82. Sunny Rose Trevino
Corpus Christi, TX 78404
Please don?t let them hurt our dolphins!

83. Gary Roy
WPB, FL 33411
Please don't harm the dolphins! It is not right to sacrifice the dolphins and the livelihood of fishermen for a pipeline. Additionally in order to protect the environment, I do not believe the pipeline should be approved. We do not need any new fossil fuels projects.

84. Gudrun Dennis
Gainesville, FL 32653
Please find a way to protect these beautiful creatures as we find new sustainable and economically feasible ways of addressing the needs of our region.

85. Laura Winston
Saint Augustine, FL 32084
Please help save the dolphins and the whole planet!

86. Steve Groze
Youngsville, LA 70592
please help these majestic beautiful dolphins

87. Joy Keeping
Richmond, TX 77406
Please help us!

88. Hanna Caywood
Odon, IN 47562
Please prioritize the health of the bay above fossil fuel profits

89. Diane Ramey
Englewood, CO 80113
Please protect God?s creatures! The dolphins deserve to live without fear if death.

90. Jenny Ramoni
New Orleans, LA 70115
Please protect our wildlife and the planet!

91. Dana Herman
Shell Lake, WI 54871
Please put the future of marine wildlife ahead of profits.

92. Sarah Eubanks
Live Oak, FL 32060
Please recognize this issue and stop the harm on these marine wildlife.

93. Michael Buescher
Lewisville, TX 75077
Please reject the permit application asking to harass dolphins in Barataria Bay so a pipeline company can ship methane to the Plaquemines LNG export terminal.

94. Linda Reeves
Ocala, FL 34476
Please save these folphins!

95. Debra Guendelsberger
Fort Garland, CO 81133
Please stop destroying vital wildlife.

96. Erin Stephens
Pensacola, FL 32503
Please stop killing the earth and its species.

97. Jeannie DeFerbrache
Davenport, FL 33897
Please take the right action to protect these beautiful animals. We look to you to do the best for them.

98. Pat Garcia
Austin, TX 78702

Please, please protect our precious ecosystem from any further damage!

99. philip farinelli
Cranston, RI 02920
Please!

100. Thomas Monroe
Pompano Beach, FL 33064
Please!

101. Evelyn Pendall
Syracuse, NY 13203
Please. We must conserve the oceans and save these dolphins

102. Catherine McNamara
Orlando, FL 32828
Protect Nature and protect humanity.

103. Catherine T Bushway
SAINT CLOUD, FL 34769
Protect nature!!!

104. Beverly Mitchell
BoiseBoise, ID 83709
PROTECT THE DOLPHINS! END ALL PIPELINES!!!

105. Jane Wiley
Tampa, FL 33624
Protecting wildlife is of utmost importance to me, for doing so also protects human life. Pipelines and fossil fuels damage our environment. It is high time to limit both.

106. Eric Casey
Plano, TX 75075
Save our dolphins and not worsening our marine the livelihood of fishers and shrimpers and reject the permit application for a pipeline company to carry methane gas to Plaquemines LNG export terminal. Thank You Mister Wade

107. Lori Hoffman
Ft Lauderdale, FL 33306
Save our dolphins!

108. Rocquelle Woods
Huntsville, AL, United States, AL 35824
Save our words, animals, mammals, ocean and air

109. Catherine Stevens
Bayonet Point, FL 34667
Save the Dolphins in Louisiana from the LNG Buildout! Anything that harms our wildlife ultimately harms our communities. Take action today! Any new fossil fuel infrastructure is now in keeping with ending fossil fuel emisions. We must stop using fossil fuels!

110. Margie Lynch
St Petersburg, FL 33710
Save the Gulf and the wildlife!!

111. Lynda Santos
Indiana, PA 15701
Say No to the East Lateral Pipeline Permit

112. Debra Espinoza
El Paso, TX 79936
Sighting dolphins is always a special moment, that always reminds us humans that there is intelligence in other life forms, that we need to be aware of this and that we must respect it. "First they came for the dolphins and I did not speak out, and then . . . "

113. Elliott Bailiff
Woodland Hills, CA 91367
Stop Fossil Fuel Polluting the Gulf!

114. Andres Mejides
Homestead, FL 33031
Stop murdering the Gulf

115. Lowell A Sasser
Ft Pierce, FL 34981
Stop risking our planet for profit!

116. Kathrin Dodds
Mission, TX 78573
stop sacrificing our natural resources...when they are gone, they are gone forever !!

117. Martha Gorak
Katy, TX 77450
Supporting the beloved, declining dolphin populations in Barataria Bay, which are which are irreplaceable, are far more important than short-term benefits to big business. Please do the right thing!

118. Glenn Barclift

Jacksonville, FL 32234
THANK YOU.

119. Andy Colee
Valparaiso, FL 32580
Thanks for reading my letter and taking action.

120. Rainbow Di Benedetto
Austin, TX 78750
Thanks so much for considering my request.

121. James Jaramillo
Santa Fe, NM 87505
The amount of environmental death and destruction on planet earth over the past 10 years is increasing dramatically. Dolphins live near the top of the food chain. If dolphins are having trouble, as the Barataria Bay dolphins clearly are, you can be sure that the entire ecosystem is in danger. The dolphins are TELLING YOU SOMETHING IMPORTANT. Why would you want to knowingly harass them even further? This makes no sense. No amount of money is worth further damage to the ecosystems that keep us alive. Maybe the wealthy can use the private profits they steal by damaging the environment from everyone to live a little longer than the rest of us. But why should we allow them to do this? Why should YOU allow them to do this?

122. Patrick Dannunzio
The Villages, FL 32162
The BP oil spill is one thing. We don't need the East Lateral Xpress Pipeline to be another. Please deny the East Lateral Xpress Pipeline's permit request.

123. Nancy Pope
Tarpon Springs, FL 34689
The evil unleashed will return to the purveyors with a vengeance.

124. Adolfo Arabitg
SAINT PETERSBURG, FL 33701
The function and underlying principle of representative democracy is that every decision that you make must either not make us less safe, or make us safer. Boy have you failed at that. I assume that you don't actually believe in the Constitution.

125. William Pritchard
Panama City, FL 32409
The Gulf of Mexico dolphin population has already suffered enough as a result of man made environmental impacts . These amazing creatures should be protected not subjected to more insults.

126. Arlene Macintosh

Weston, FL 33327
The health of this area's waters is important to the people who make their living off of the waters in these areas.

127. Dianne Maughan
Inverness, FL 34450
The ocean and its animals are more important than a pipeline

128. Doreen Smithwick
Carrollton, TX 75007
The time has come for wisdom to prevail in government meaning enabling destructive practices based on parasitic greed to STOP.

129. Randall Foreman
Metairie, LA 70005
These dolphins are, once again, at risk of survival due to the continued exploitation from the oil industry and development. Please act now before it is too late and reject the permit application.

130. Laura Vera
Dickinson, TX 77539
These mammals deserve to live build your pipeline somewhere else.

131. Jean Saja
Raymond, MS 39154
They create messes that affect all .

132. Mary Thornton
Fort Worth, TX 76111
This group of dolphins needs to be allowed to live freely from harm and not exposed to any potential danger.

133. Jeptha Greer II
Sylacauga, AL 35151
This is Critical. We cannot endanger dolphins!

134. Chad Fuqua
Houston, TX 77080
This is quote literally a matter of life and death. Please make the responsible choice. Your constituents, as well as millions of other people whom inhabit this planet we all call home.

135. Charles Rodriguez
St Petersburg, FL 33701
This MUST stop. Please leave this space for the people and wildlife in the Gulf.

136. Nancy Ruth Krauch
Pinellas Park, FL 33781
this not be permitted

137. Robert Stark
Houston, TX 77062
this pipeline must be denied! It will threaten the dolphins that inhabit the Barataria Bay and they are still recovering from the 2010 oil spill!

138. Chad Leming
New Orleans, LA 70114
This pipeline will put a strain on dolphin habitats, possibly costing lives & devastation in unfathomable ways. It?s crucial we consider how our production impacts wildlife by destructing their habitats to make room for our development. There has to be a healthier way to find balance, but without taking these things into consideration, or constant consuming, is creating harm in increasingly significant ways to land, waterways, & air. Plus, destroying living organisms & creatures in the process. More thoughtful action needs to be taken, when deciding on infrastructures. Please take this into consideration when making a decision on the ELX, & if it?s mutually beneficial to wildlife & humans? It no longer needs to be an ?us? vs ?them?mentality just because of greed, you have the power to stop that!

139. Law Office of Arna Cortazzo
1303 Avalon Drive, Rockledge, FL 32955, FL 32955
This population of dolphins is already weak and struggling to reproduce. More stress and harassment of these dolphins is bad for Barataria Bay and all people in the region. NOAA and National Marine Fisheries Service musy people people, the environment, and this dolphin population above the interests of pipeline companies. Protect the dolphins of Barataria Bay and say no to East Lateral Express.

140. Celia O'Kelley
Tuscaloosa, AL 35401
This will also pose a significant threat to the livelihoods of a small community in Plaquemines Parish, Louisiana, of fishers and shrimpers who rely on the health of our fisheries to make a living. Benefit for a few will cause irreparable harm to so many families and marine creatures living in this fragile environment.

141. Kim White
Kissimmee, FL 34741
We ALL have a responsibility to work together in order to Protect and SAVE our Wilderness, Waterways and Environment from senseless Destruction and Poisoning in the name of Ignorance and Greed. We have to SAVE our Wildlife, including The incredibly amazing Dolphins! We have to STOP the senseless killing of our Wildlife out of Ignorance and Greed!!!

142. Amber Abascal

San Antonio, TX 78232
We are responsible for all that is going on in this world and we must do everything for the survival to all! People and all Wildlife and domestic animals! God created us All!

143. Kevin Hartley
Kerrville, TX 78028
We cannot keep destroying our environment! We do live on this earth!

144. Analisa Crandall
Adkins, TX 78101
We don?t need another stinking LNG plant! We don?t need to frack. We do need to take care of the communities and the surrounding environments that are being harmed by these very dirty industries. The wetlands are more important than the ephemeral cash flow from either. Stop destroying the planet for some else?s profit?! Good grief! Dolphins are more important than the narcissist in control of any frigging oil or gas company! Greedy men?s lives are valued in dollars and cents versus an endangered species, an endangered ecosystem, an endangered planet which gives life and breathe to every thing on this planet. Please. Let?s take care of those unable to take care of themselves, who have no voice but live with these decisions everyday.

145. Kellie Evilsizer
Austin, TX 78759
We don?t need anymore petrochemical infrastructure in Louisiana. There has already been too much damage done for a limited number of jobs .

146. Debbie Deland
Orlando, FL 32835
We have already done so much harm to our environment in the pursuit of cheap energy. It really needs to stop. In this case in particular, the wildlife at risk are dolphins, an animal that we know to be emotional and very communicative. In addition, it threatens the traditional livelihood of fishers and shrimpers in the region, who should be protected as those who provide us with truly fresh, local seafood. I always enjoy watching the shrimp boats out on the ocean off the Outer Banks and value heading over to Wanchese when the boats come in with their catch. I imagine it's much the same in Barataria Bay.

147. Lyssa Mercier
Frisco, TX 75034
We HAVE to monitor big business because it obviously won't. Our natural (ocean/dolphins) environment supports us too! I'm sure there's a way for the energy company to do this such that there is no natural impact.....they just don't want to spend the money!

148. Pamela Mooman
Angleton, TX 77515
We must protect these important dolphins. Please do your part.

149. Sharon Alexander
De Leon, TX 76444
We must save all our marine wildlife!! Stop all pipelines n drilling now!! Our planet is now very fragile, the plastics in the ocean are killing our precious marine wildlife n our fish. Please stop this insanity now!!

150. Jacqueline Zimmerman
Palm Beach, FL 33480
We must stop endangering our oceans and the species that live there. If we were those dolphins, we wouldn't want that done to us!

151. Cary deVroedt
Gainesville, FL 32607
We need the dolphins as part of our environment and life.

152. Mark Goodman
Dallas, TX 75248
We need to save these beautiful creatures..Everyone knows that if one species becomes extinct,.it affects.other species Oil spills are so deadly to animals and our environment

153. Lisa Mazzola
Tampa, FL 33612
We need to transition away from all fossil fuels.

154. Erin Eitel
249 Adeline Dr, TX 78640
We share the water with these creatures.

155. Malaine Foster
Lakeland, FL 33809
When I was in graduate school I studied the lives & behaviors of dolphins. They are important members of our gulf coast marine ecosystem and are among the most intelligent mammals as well. Their communication systems, their ?language? has inspired researchers and the general public for centuries. They should not be sacrificed while greedy, destructive, polluting business sacrifice this amazing mammal population AND humans as well who come in contact with this proposed heinous business venture.

156. Megan McDonald
Huntsville, AL 35803
Why don't we treat all living creatures the way we want to be treated. We are supposed to me the most intelligent of all creatures.

157. Marie Sophia Vassilakidis
Houston, TX 77057

Wild places and wildlife are important to my family and me!

158. Kimberley Stoecklein
Brooksville, FL 34601
Wildlife should come first? Even in the gulf.

159. Pamela Miller
Tolar, TX 76476
Would you want to swim in polluted waters?

160. Michael Curry
Austin, TX 78703

161. Veronica Rossetti
Jensen Beach, FL 34957

162. Jane Schnee
Sebastian, FL 32958

163. Ted Von Hippel
South Daytona, FL 32119

164. Vitra García
Miami Shores, FL 33138

166. Lou Dhahran
Honolulu, HI 96826

167. Kathy Newman
San Antonio, TX 78250

168. Jim Titus
Sioux City, IA 51106

169. David Zambie
Austin, TX 78727

170. Karen McKinley Smith
Eastlake, OH 44095

171. Teresa Woods
Wesley Chapel, FL 33543

172. Catherine Van Zanten

Austin, TX 78757

173. CATHERINE TETZLAFF
HOBE SOUND, FL 33455

174. Denise Bossarte
Houston, TX 77064

175. Ardeth Brodie
Houston, TX 77062

176. Dietlinde Wolf
Miami, FL 33136

177. Dallas Windham
Irving, TX 75038

178. Peter Hermann
Boerne, TX 78006

179. Karen Sharkey
Rockledge, FL 32955

180. gabrielle Granofsky
Brooksville, FL 34602

181. Linda Novkov
Cape Coral, FL 33909

182. Jaimie Whitbread
Coppell, TX 75019

183. Kaneisha Lewis
Fort Worth, TX 76123

184. Marilyn Lee
Florence, AL 35630

185. clyde stanley
Minden, LA 71055

186. Peggy Moody
Gwinn, MI 49841

187. Robert Kelley
Conroe, TX 77304

188. Ray Telfair
Whitehouse, TX 75791

189. Bruce Troutman
Key West, FL 33040

190. Tom Anderson
Silver Springs, FL 34488

191. Russell Posch
Temple, TX 76504

192. Paulo Kelly
Naples, FL 34110

193. Kevin Murphy
Richardson, TX 75080

194. David Sime
Titusville, FL 32780

195. Bruce Zivley
Wimberley, TX 78676

196. Elena Rhodes
Gainesville, FL 32607

197. Robin Yates
Houston, TX 77059

198. Penny Noriega
Lutz, FL 33549

199. Betsy Cruckshank
Clearwater, FL 33755

200. Colin Flynn
Jacksonville, FL 32205

201. Cat Smith
Niceville, FL 32578

202. Mobi Warren
Don't, TX 78232

203. Natasha Kline
Saint Augustine, FL 32086

204. Adrienne Inglis
Lago Vista, TX 78645

205. Stephanie Honore
Kissimmee, FL 34746

206. Carol Nicholson
Alachua, FL 32615

207. Carol Woronow
Houston, TX 77070

208. Leigh C
Corpus Christi, TX 78411

209. Andrea Chisari
Mims, FL 32754

210. Debra Wile
The Villages, FL 32162

211. Jennifer Jenkins
Houston, TX 77071

212. Randall Speck
Fort Myers, FL 33908

213. Marilyn Coronado
Miami, FL 33162

214. Deann Darling
Arlington, TX 76011

215. Tracey Bonner
Arlington, TX 76014

216. Sissi Asperti

Miami Beach, FL 33139

217. Jeanne Stangle
Slidell, LA 70460

218. Tammy Lettieri
Coconut Creek, FL 33066

219. Yareli Ortega
Fort Worth, TX 76106

220. Sandra Baillie
Ocala, FL 34472

221. judy mickey
Naples, FL 34109

222. James Bryson
Houston, TX 77015

223. Carol Grimm
San Marcos, TX 78666

224. Robert Posch
Orlando, FL 32825

225. Diane M Berry
Cedar Park, TX 78613

226. Diana Cowans
Bradenton, FL 34209

227. Traver Cowles
Branford, CT 06405

228. Daryl Barowicz
Tallahassee, FL 32311

229. Karen Spradlin
Jacksonville, AL 36265

230. Diana Ward
Saint Petersburg, FL 33713

231. Fay Bracken
Winter Garden, FL 34787

232. Reginald Presley
Miami, FL 33170

233. Wayne Harris
Bradenton, FL 34203

234. Laura Long
Cedar Creek, TX 78612

235. Rod Stokes
Valrico, FL 33596

236. Gail Flanders
Coral Gables, FL 33134

237. Darvin Oliver
Mart, TX 76664

238. Robert Gonzalez
Corpus Christi, TX 78413

239. Pam Wolf
Punta Gorda, FL 33950

240. Leah Stables
San Mateo, FL 32187

241. Kelly Epstein
Spring, TX 77379

242. Steven Cook
Seminole, FL 33778

243. Douglas Rives
Wheeler, TX 79096

244. Geri Ott
Matlacha, - 33993

245. Brian Wilson
Coral Gables, FL 33134

246. Jeffrey Bains
The Villages, FL 32159

247. Susan Schlessinger
Port Saint Lucie, FL 34953

248. Jimmy Anderson
Garland, TX 75044

249. Debbie Dossey
New Caney, TX 77357

250. Alfred Jonas
Biscayne Park, FL 33161

251. ALEJANDRA PARAPAR
Key Biscayne, FL 33149

252. Holly Crawford
Coral Gables, FL 33134

253. Nancy Warlick
Orlando, FL 32803

254. Mary Cato
Arlington, TX 76012

255. Lisa Wegman
Wichita Falls, TX 76310

256. Alfonso Lopez
San Antonio, TX 78237

257. Lisa Tsokos
HOUSTON, TX 77005

258. Barbara Zupko
Mary Esther, FL 32569

259. Lynn Nelson
Atlantic Beach, FL 32233

260. Jo Jones

Clearwater, FL 33764

261. Janet Robinson
Jacksonville, FL 32223

262. John Lundborg
Livingston, TX 77399

263. Paul Hansen
Austin, TX 78727

264. Brant Kotch
Houston, TX 77024

265. Gina Stiff
Kissimmee, FL 34747

266. Michelle Mondragon
Altamonte Springs, FL 32701

267. William Baker
Mineral Wells, TX 76067

268. Paul Fields
Canton, TX 75103

269. Steve Willingham
Largo, FL 33777

270. lynn marlen
Panama City, FL 32401

271. Leah Overbeck
Ocklawaha, FL 32179

272. Sean Vennett
Tampa, FL 33679

273. Cynthia Osborn
Huntsville, TX 77320

274. Janine Kwarcinski
Parrish, FL 34219

275. Johnny & Karen Armstrong
Ruston, LA 71270

276. Whitney Cloud
Hawley, TX 79525

277. Vicki Wheeler
Deshler, OH 43516

278. Stephen Cohen
Palm Coast, FL 32137

279. Barbara Fite
Lutz, FL 33549

280. Pat Vassilakidis
Houston, TX 77006

281. Vicki Gorman
Houston, TX 77021

282. Xiomara Jean-louis
Coral Springs, FL 33071

283. Amy Kohlert
Spring, TX 77388

284. Jo Mcmillan
Ocala, FL 34476

285. iris Shelton
Jacksonville, FL 32221

286. Catherine Croom
Bulverde, TX 78163

287. Gloria Diggle
Fort White, FL 32038

288. Jamie Bechtelheimer
Dallas, TX 75228

289. Gordon Seyfarth
The Villages, FL 32162

290. Eric Dallin
Gulfport, MS 39503

291. Michael Stuart
Wilton Manors, FL 33334

292. Martin Becker
Marco Island, FL 34145

293. Patricia Reeves
Bradenton, FL 34208

294. Alexandra Zeledon
Plantation, FL 33317

295. Ann Friedman
Taylor, TX 76574

296. Jennifer Gage
Palm Harbor, FL 34685

297. Mary Babineau
Saint Petersburg, FL 33703

298. William Fisk
Palm Bay, FL 32905

299. Rita Garvey
Clearwater, FL 33756

300. Monika Apathy
Englewood, FL 34223

301. Katherine Dooley
Saint Petersburg, FL 33702

302. Lisa Bailey
Mountain Brook, AL 35223

303. Glenn E
Richton, MS 39476

304. Michele Laporte

Lakeland, FL 33803

305. Barbara Schwartz
Ocala, FL 34470

306. Silvia Hall
Boca Raton, FL 33431

307. SANDRA MONT
Orange, TX 77630

308. Patricia Patterson
Wewahitchka, FL 32465

309. Vicky Rey
Hudson, FL 34667

310. Jerry Lee
Tuscaloosa, AL 35404

311. Michael Kugler
Oxford, FL 34484

312. Deb E
Richton, MS 39476

313. Liz Murphy
Austin, TX 78751

314. Amanda Winters
2110 W Slaughter Ln, TX 78748

315. JANET C DAVIS
Gerrardstown, WV 25420

316. Rebecca Boetto
El Paso, TX 79912

317. Randolph Streng
Dallas, TX 75243

318. Claudia Miranda
Lake Mary, FL 32746

319. Christine Gasco
Tarpon Springs, FL 34689

320. James Roberts
Dallas, TX 75205

321. Juliann Bratcher
OCALA, FL 34482

322. Rebecca Jones
Clearwater, FL 33762

323. J Dougherty
Sanford, FL 32773

324. Lisa Roof
Del Rio, TX 78840

325. Benjamin Ochshorn
Tampa, FL 33612

326. Laurie Campbell
Port Charlotte, FL 33981

327. Linda Singer
Huntsville, AL 35801

328. Carol Murray
Sarasota, FL 34238

329. Larry Lewis
Apopka, FL 32703

330. Kylara Hunter
Donna, TX 78537

331. Lisa Thompson
Seminole, FL 33776

333. Louis Reichert
Boynton Beach, FL 33437

334. Eric West
PT ORANGE, FL 32127

335. Elizabeth Yow
Georgetown, TX 78626

336. R B
Palm Bay, FL 32905

337. Miranda O'shields
Fort Payne, AL 35967

338. Elizabeth Scherbak
Venice, FL 34293

339. Christine Guldi
Dallas, TX 75248

340. Barbara Najarian
ST PETERSBURG, FL 33712

341. Philip Ritter
Surprise, AZ 85388

342. Marajean Graham
Devine, TX 78016

343. Paul Christmas
Grand Prairie, TX 75050

344. Lori Oliveira
Palm Beach Gardens, FL 33418

345. Duncan Brown
Canyon, TX 79015

346. Maureen Burke
Palm Beach Gardens, FL 33418

347. Frank Blake
Houston, TX 77006

348. Deborah Walker
Palm Harbor, FL 34685

349. Juli Kring

Houston, TX 77099

350. Paul Carvalho
El Paso, TX 79912

351. KAREN E BAUM
Palestine, TX 75801

352. Von Peacock
LAREDO, TX 78043

353. Carol Ohlendorf
Lakewood Ranch, FL 34202

354. Lorene A
Hollywood, FL 33026

355. Carole Poholek
Miami, FL 33136

356. Denise Lemessy
Miami, FL 33166

357. Fran Siegfried
Dunnellon, FL 34432

358. David Hancock
Miami, FL 33133

359. Ian Scofield
Liberty Hill, TX 78642

360. David Garfinkle
Tarzana, CA 91356

361. Linda Headley
Cross City, FL 32628

362. Paul O'Byrne
Thonotosassa, FL 33592

363. Linda Fielder
Carrollton, TX 75006

364. Judy Moran
Panama City, FL 32404

365. Scott Fershleiser
New Port Richey, FL 34652

366. BONNIE GLISSON
HOUSTON, TX 77025

367. Kim Jones
Indian Harbour Beach, FL 32937

368. Mark Koritz
Atlanta, GA 30338

369. Susan Hayes
Homosassa, FL 34448

370. Catharina Bernabei
Miami, FL 33165

371. Susan Caruso
Fort White, FL 32038

372. Carol Pennington
Manchaca, TX 78652

373. Eleanor Parisi
Saint Petersburg, FL 33703

374. Eric Katz
Palm Beach Gardens, FL 33410

375. JUDY LANDRESS
Ozona, TX 76943

376. Alex Zajac
Wellington, FL 33449

377. Giselle Whitwell
Austin, Texas, TX 78734

378. Mary Puccini
Dallas, TX 75243

379. A Martin
Garland, TX 75044

380. Lisa Williams
Jacksonville, FL 32210

381. Winifred Mears
Orlando, FL 32821

382. Ida Nissen
Pensacola, FL 32503

383. Heidi Hickman
Irving, TX 75038

384. Amy Anderson
Spring Hill, FL 34609

385. Meaghan Leavitt
St. Petersburg, FL 33710

386. Ewa and Zbigniew Stein
Port Charlotte, FL 33948

387. Joseph Ray
Jacksonville, FL 32206

388. Judith Gurule
Dickinson, TX 77539

389. steve Lucas
boca raton, FL 33487

390. Tina Beedle
Milton, FL 32570

391. William Forbes
Nacogdoches, TX 75963

392. Gwenn Schemer
Wellington, FL 33414

393. Dorothy Kobylanski

Port Orange, FL 32129

394. Rev Margaret Raynolds
Saint Petersburg, FL 33704

395. Todd Richardson
Odessa, TX 79761

396. Cindy Vincelette
Livingston, TX 77399

397. Lily Rerecich
Austin, TX 78739

398. DeSean Freeman
Pike Road, AL 36064

399. Marian Ryan
Winter Haven, FL 33880

400. Elizabeth Watts
Boynton Beach, FL 33436

401. Jenny Bramlette
Wesley Chapel, FL 33545

402. Bettina Moser
Gainesville, FL 32607

403. Tara Roberts
Apalachicola, FL 32320

404. Christi Heilbronner
San Antonio, TX 78252

405. Saralee Le Maire
Micanopy, FL 32667

406. Katharyn Reiser
Austin, TX 78704

407. David Cagle
Jacksonville, FL 32277

408. A Patterson
Dallas, TX 75218

409. Diane Miller
Leesburg, FL 34748

410. Juan Huerta
San Antonio, TX 78228

411. Cheryl Stevens
Rancho Viejo, TX 78575

412. Donna Burrows
Houston, TX 77072

413. CHERYL A CUSELLA
Delray Beach, FL 33484

414. Steven G. Kellman
Shavano Park, TX 78231

415. Jill Janda
Sanibel, FL 33957

416. Penny Fleischman
Bushnell, FL 33513

417. Sue Simmons
Port Arthur, TX 77642

418. Myra Dewhurst
Nokomis, FL 34275

419. Sandra Boylston
Sanford, FL 32773

421. Sarah K
Birmingham, AL 35213

423. J. Morley Schloss
Loxahatchee, FL 33470

424. Cindy Harkness
Lubbock, TX 79413

425. Chanin Tong
Sarasota, FL 34232

426. Marguerite Donnay
Melbourne, FL 32940

427. Joanne Burton
Gainesville, FL 32608

428. Joseph VanBlargan
Dallas, TX 75214

429. Scott Swanson
Austin, TX 78704

430. Diane Moore
Dallas, TX 75205

431. Madalynn Carey
San Antonio, TX 78230

432. Sharon Cloninger
Austin, TX 78757

433. Gloria Morrison
Pecos, TX 79772

434. Chris Kotschi
Fort Worth, TX 76120

435. Marian Erwin
Parrish, FL 34219

436. Gary Hild
Navasota, TX 77868

437. Barbara Johnson
Palm Beach Gardens, FL 33418

438. Holly Farish-Hunt
Gainesville, FL 32608

439. Gerald Phipps

Gainesville, FL 32608

440. Bill Langer
Hollywood, FL 33026

441. Terrie Smith
Spring Valley, CA 91977

442. Lynn Hoang
Fullerton, CA 92833

443. Jeffrey Pennell
Palm Beach Gardens, FL 33410

444. Elisabeth Sommer
El Paso, TX 79912

445. Roland Hutson
Austin, TX 78745

446. Cynthia Hoffmann
Gilroy, CA 95020

447. Dennis Schafer
San Antonio, TX 78214

448. Nataliya Yakovleva
Largo, FL 33770

449. David Smith
CEDAR PARK, TX 78641

450. Ariel Hoover
Sanibel, FL 33957

451. Mark Bedgood
Corsicana, TX 75110

452. alina szostak
Miami, FL 33125

453. Joe and Fran Aguirre
Denver, CO 80211

454. Katherine Brown
New York, NY 10038

455. Judi Travis
Delray Beach, FL 33446

456. L Borgen
Harker Heights, TX 76548

457. Daniel D
San Antonio, TX 78260

458. Carolyn Hawks
Pensacola, FL 32506

459. Thomas Wolfsohn
San Marcos, TX 78666

460. Martha Singleton
Miami, FL 33143

461. Debra Hoven
Palm Harbor, FL 34684

462. Margaret Weiss
Canyon Lake, TX 78133

463. Vivian Blow
Monroe, LA 71201

464. ALAN HART
Metairie, LA 70001

465. CHRISTOPHER COFFMAN
Ocala, FL 34473

466. Scott Jennings
New Orleans, LA 70118

467. Debra Guel
Round Rock, TX 78711

468. Barbara Fleischer
Metairie, LA 70003

469. Gilda Levinson
Coral Springs, FL 33071

470. Lisa Li
Jacksonville, FL 32218

471. Craig Nazor
Austin, TX 78758

472. Pascale Clerie
Homestead, FL 33032

473. Leslie Smith
San Marcos, TX 78666

474. Thomas Thompson
Hobe Sound, FL 33455

475. Gerry and Louise Fitzgerald
Sanibel, FL 33957

476. Ann Marie Teder
Chardon, OH 44024

477. Greg Sells
Austin, TX 78741

478. Gwendolyn Wood
Miami Lakes, FL 33014

479. David Klingensmith
Eugene, OR 97401

480. Wendy Wish
Winter Park, FL 32792

481. Hilda Gilman
St Augustine, FL 32084

482. Leslie O'Loughlin
Amarillo, TX 79106

483. Jeanne Jordan

Carrollton, TX 75007

484. Lucy Hart
Encino, CA 91316

485. Susan Lefler
Livingston, TX 77399

486. Stacey Mazza
Myakka City, FL 34251

487. Zachary Rosenberg
El Paso, TX 79936

488. Sandra Varvel
El Paso, TX 79907

489. Margaret Schulenberg
Round Rock, TX 78664

490. Annie Caton
Brenham, TX 77833

491. Gregory Chandler Jr
Huntsville, AL 35803

492. DeAnna Wiley
St. Pete., FL 33709

493. Lynda Prather
Tampa, FL 33602

494. Kathy Aub
Boca Raton, FL 33431

495. Shawn Russell
Sanford, FL 32771

496. Jeffrey M Holstein
Clearwater, FL 33756

497. John Evrard
Cocoa, FL 32926

498. arline lohli
Trinity, FL 34655

499. Sandy Geis
St Petersburg, FL 33714

500. Rebecca Cowart
orlando, FL 32810

501. Elizabeth Hope Corona
Homosassa, FL 34448

502. Malgorzata Marjanska-Fish
Indialantic, FL 32903

503. Sue Sefscik
Dunnellon, FL 34431

504. James Teas
Palmetto Bay, FL 33157

506. Rachel Fickey
Palestine, TX 75803

507. Laura Devlin
st augustine, FL 32080

508. Helen May
Atlantic Beach, FL 32233

509. Donna Shaw
Simi Valley, CA 93065

510. Gayle Tolchin
Boca Raton, FL 33498

511. Sharon Peariso
Leesburg, FL 34748

512. David Mulcihy
Houston, TX 77058

513. Kathi Ward
Saint Petersburg, FL 33704

514. Dianna Burton
Amarillo, TX 79109

515. Rick Petryk
Ft. Lauderdael, FL 33301

516. Oron Bass
High Springs, FL 32643

517. Rob Self
Chicago, IL 60631

518. Damien Condo
North Palm Beach, FL 33408

519. J White
Deerfield Bch, FL 33442

520. Mary Montanus
Orlando, FL 32806

521. Kathy Grafer
Weston, FL 33326

522. Ralph Horton
Longwood, FL 32779

523. Michele Birdwell
Melbourne Beach, FL 32951

524. Judith Hankins
Jacksonville, FL 32207

525. Jarrod Simmons
Plaquemine, LA 70764

526. Mary Donohoe
Dripping Springs, TX 78620

527. Kaiba White
Austin, TX 78741

528. Susanne Hesse & Doug Dyer

Alachua, FL 32615

529. Teresa Stringer
Ocklawaha, FL 32179

530. Jan Moore
Dunedin, FL 34698

531. Karen Branen
Orlando, FL 32817

532. Katika Chuon
Atlantic Beach, FL 32233

533. Jeannine Dorroh
Huntsville, AL 35811

534. Pat Perry
Tyler, TX 75701

535. Richard Fowlkes
Santa Rosa Beach, FL 32459

536. Cheryl Abbott
Cocoa, FL 32927

537. Nancy Stevens
Tampa, FL 33606

538. Pam Seerden
Spring, TX 77388

539. Jennifer Veitenheimer
Inver Grove Heights, MN 55076

540. Leonora Xhrouet
Davie, FL 33328

541. Denise Inkel
Bal Harbour, FL 33154

542. Nancy Carl
Carlton, OR 97111

543. Jean Thomad
Houston, TX 77068

544. Margaret Creed
Orlando, FL 32837

545. Francis Stone
Virginia Beach, VA 23464

546. Patty Mark
Saint Augustine, FL 32084

547. Julia Wenzel
Winter Haven, FL 33881

548. Lilian Burch
Fort Lauderdale, FL 33304

549. Lisa Bass
St Johns, FL 32259

550. Lisa Rodgers
Sarasota, FL 34237

551. linda kitchen
oak park, IL 60304

552. Betty Dean
St. Augustine, FL 32086

553. Deirdre Fowler
Burlington, WI 53105

554. David Lord
Coconut Creek, FL 33073

555. Michelle Berlinger
Leander, TX 78641

556. Evelyn Adams
McKinney, TX 75071

557. Deepak Dadlani
Miami, FL 33131

558. Susan Hill
Sarasota, FL 34238

559. Fraces Lange
San Antonio, TX 78207

560. Michael Reed
Dallas, TX 75214

561. Harriet Levine
San Antonio, TX 78213

562. Margaret Moncure
Kingwood, TX 77339

563. Thomas Lesley
Birmingham, AL 35206

565. Catherine Parsley
Dallas, TX 75205

566. Wendy Baxter-Kennedy
Sarasota, FL 34239

567. Don Faulk
Austin, TX 78749

568. LINDALIND REID
Texas City, TX 77590

569. Tiffany Gross
Saint Augustine, FL 32084

570. Janelle Murphy
Texas City, TX 77590

571. Carol Drabin
Jupiter, FL 33478

572. Gary Shephard
Watauga, TX 76148

573. Jean Toler

Flagler Beach, FL 32136

574. Kate Bremer
blanco, TX 78606

575. Alicia Gallagher
Benicia, CA 94510

577. Marce Walsh
Houston, TX 77066

578. George Cole
WESTERLY, RI 02891

579. George Saucedo
El Paso, TX 79902

580. Kathy Schatzle
Metairie, LA 70001

581. Victoria Buchwald
Clearwater, FL 33764

582. Fred Suhr
McAllen, TX 78504

583. Marianne Lazarus
Melbourne, FL 32940

584. Kim Domangue
Houma, LA 70364

585. Evelyn Webert
Princeton, TX 75407

586. Elida Macdonald
Clearwater, FL 33765

587. Barbara James
Lake Worth Beach, FL 33460

588. Sarah Sudheer
Austin, TX 78750

589. Pamela Kane
Bedminster, NJ 07921

590. Terry Travelute
Venice, FL 34285

591. Thomas Dean
Tallahassee, FL 32312

592. jenna baiamonte
Melbourne, FL 32940

593. Jackie Feliciano
Bradenton, FL 34203

594. Bev Griffiths
Trinity, FL 34655

595. Marybeth Tepper
St Augustine, FL 32092

597. Mindy Le
Titusville, FL 32780

598. Kerrin Meyer
Austin, TX 78723

599. Kim Keller
Rockledge, FL 32955

600. Peg Runnels
Austin, TX 78759

601. Nellie Medlin
Holly Springs, MS 38635

602. Jeri Romero
Hallandale Beach, FL 33009

603. Heather Fraelick
Chicago, IL 60647

604. Kathryn Lemoine
West Monroe, LA 71291

605. Susan Brooks
Port Charlotte, FL 33953

606. Susan Knabeschuh
Beaumont, TX 77706

607. Ella McRae
DADE CITY, FL 33523

608. Susan Nichols
Kingwood, TX 77339

609. Julie Runion
Cocoa, FL 32922

610. Beverly Thomas
Wallkill, NY 12589

611. Marc Gill
San Antonio, TX 78216

612. Philip Vet and Elyce Remmel
Henderson, NV 89012

613. William Fehrs
Orange Park, FL 32073

614. Jean Cameron
Gainesville, FL 32606

615. Mary Laskowski
Spring, TX 77389

616. richard acosta
miami, FL 33155

617. Darlene Messer
Austin, TX 78745

618. Sue Safford
Tallahassee, FL 32301

619. Laura Glover

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620. Kaylee Agans
Macomb, IL 61455

621. Kathryn Melton
Deer Park, TX 77536

622. Nadia Diaz Garibay
MIDLAND, TX 79701

623. Marian McCurdy
Bulverde, TX 78163

624. Tim Glover
Micco, FL 32976

625. Carmen Blakely
Lutz, FL 33559

626. Jane Schwamberger
Seffner, FL 33584

627. Amber Shay
MARIETTA, PA 17547

628. Patricia Emmert
Austin, TX 78741

629. Miriam Clark
Lake Helen, FL 32744

630. Pamela Paul
Safety Harbor, FL 34695

631. Elaine Byrne
Austin, TX 78717

632. Claudia Schmid
Miami, FL 33145

633. Kay Brainerd
Belleville, MI 48111

634. Susan DeWitt
Largo, FL 33770

635. William Iannone
Fort Myers, FL 33919

636. Bruna Laurent
Palm Bay, FL 32908

637. DeAnna Blank
Waupaca, WI 54981

638. Holly Stuart
Salt Lake City, UT 84102

639. Judith Wilson
Naples, FL 34108

640. Tammy Harman
Land O Lakes, FL 34637

641. Nadia Traietti
Austin, TX 78736

642. Evie Mancino
Tampa, FL 33618

643. Vanessa Van Doorne
New Braunfels, TX 78132

644. Ann Tretter
St Pete Beach, FL 33706

645. Karen Iverson
Clearwater, FL 33764

646. John Davis
Satellite Beach, FL 32937

647. Rachel Arnone
Bradenton, FL 34202

648. Art Hanson
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649. Karishma Chatterjee
Arlington, TX 76016

650. Nicholas Frederick
Erath, LA 70533

651. Peter Monie
San Antonio, TX 78232

652. Lyn Taylor
St Petersburg, FL 33704

653. Andre Meaux
West Palm Beach, FL 33409

654. Scott McCarthy
Gainesville, FL 32609

655. Annie Dwight
Key Largo, FL 33037

656. Maggie Lauer
Clearwater, FL 33756

657. Claire Bush
Austin, TX 78722

658. Caleb Merendino
Hollywood, FL 33020

659. Sonora Hudson
Houston, TX 77023

660. Theresa Gerace
Langhorne, PA 19047

661. Janene Lindholm
PFLUGERVILLE, TX 78660

662. Heather Woodman
Orlando, FL 32825

663. Lauren Tozzi

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664. tami schreurs
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665. REBECCA H Acuna
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666. Meredith McGuire
Bulverde, TX 78163

667. Kathryn Flood
Stuart, FL 34997

668. Lauretta Finiguerra
New Orleans, LA 70113

669. Terry Burns
San Antonio, TX 78216

670. Maureen Kowsky
SEMINOLE, FL 33772

671. Kathy Cott
Mesquite, TX 75149

672. Joan West
Plano, TX 75074

673. Kenneth Turner
Bryan, TX 77802

674. Sarah McGee
Killlen, AL 35645

675. L M
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676. Mister Wade
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677. Solomon Blecher
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678. Cynthia Engel
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679. Lynne Mattingly
Coleman, TX 76834

680. Barbara Hicks
Sarasota, FL 34243

681. Terry Shelton
Hobe Sound, FL 33455

682. Mary Lou Zeis
Hamburg, NY 14075

683. Barbara Abraham
Hampton, VA 23661

684. Dr. Susan Brooks
Port Charlotte, FL 33953

685. Riah Wemple
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686. Thomas Jaudzemis
South Padre Island, TX 78597

687. Dirk Rogers
Wichita Falls, TX 76301

688. Helen Goldenberg
Tamarac, FL 33321

689. Mitzi duBois
Milton, FL 32570

690. Heather Johnson
LYNN HAVEN, FL 32444

691. annso laurent
Carrollton, TX 78000

692. anne sophie Luenrt
Carrollton, TX 75010

693. Jan Rose
Hewitt, NJ 07421

694. Joni Wilson
Houston, TX 77070

695. Corinne Ramsey
Helena, AL 35080

696. Suzanne Ivy
Paige, TX 78659

697. Stephanie Gilbert
Pelham, AL 35124

698. Jennifer Yacio
Arlington, TX 76012

700. Kaylee Dickerson
Jacksonville, FL 32223

701. Neil McQueen
Corpus Christi, TX 78412

702. Melanie Lipton
Sarasota, FL 34241

703. Dawn Ohlsson
Sarasota, FL 34231

704. Stephanie Moya
Spring, TX 77388

705. Roddy Hughes
, - 87106

706. Linda Jones
Cornville, AZ 86325

707. Jerry Christiansen
Dripping Springs, TX 78620

708. Nancy Bliss

Orlando, FL 32822

709. Julie Witek
CINCINNATI, OH 45249

710. Linda Smithe
Jupiter, FL 33458

712. Andria Childs
Winter Garden, FL 34787

713. Joyce Basciano
Austin, TX 78703

714. Shane O'Shea
Humble, MA 77396

715. Karyn Ann Kowaleski
Cape Coral, FL 33909

716. Sandra Remilien
North Miami, FL 33161

717. Benjamin Alpers
Austin, TX 78721

718. Melanie Sinclair
Austin, TX 78745

719. Deborah Longman-Marien
Melbourne, FL 32940

720. Denise Jones
Conroe, TX 77305

721. Lynn O'Brien
Jacksonville, FL 32225

722. Anil Prabhakar
Cedar Park, TX 78613

723. Henry Schneiderman
Parrish, FL 34219

725. Jim Aldrich
Tallahassee, FL 32317

726. Frances Howell-Coleman
Winter Haven, FL 33881

727. Jennifer Manderfeld
San Antonio, TX 78212

728. Aaron Moore
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729. H Ande
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730. Melony Boley
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731. Elyse Coulson
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732. Jamey Ray
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733. Michelle Pierro
Spokane, WA 99205

735. Vesa Kaakkuriniemi
, - 11742

736. Jane Markley
Festus, MO 63028

737. Helen Hays
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738. Mary Helms
Tallahassee, FL 32309

739. Joaquin Villarreal
Brownsville, TX 78526

740. Paul Eisenberg
, - 21210

741. Alec Thorp
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742. Nicole Bembenek
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743. Debra Bogan
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744. Betty Sehres
Lakewood Ranch, FL 34202

746. Anna K
Corpus Christi, TX 78410

747. Annmarie McCann
Venice, FL 34293

748. Jamie Gross
Pembroke Pines, FL 33027

749. Daniel Gormley
Sarasota, FL 34243

750. Katherine Hobbs
Chesapeake, VA 23320

751. Christy Folk
Orlando, FL 32804

752. Tiffany McEachern
Temple, TX 76504

753. Suzanne Fejes
Pompano Beach, FL 33062

754. Cheryl Robison
Fort Worth, TX 76107

755. Ann Berringer
Tampa, FL 33618

756. Diane Langejans

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757. Robert Akerley
DELAND, FL 32720

758. Jacky Kusterer
McKinney, TX 75071

759. Nage Kaushik
Austin, TX 78753

760. Christian Richer
Corpus Christi, TX 78413

761. Lisa Stone
Houston, TX 77096

762. Jacqueline Grote
Plano, TX 75024

763. Keith Cutler
SARASOTA, FL 34234

764. Analyn Urpi
PLANO, TX 75024

766. Don Barnhill
League City, TX 77573