

8 CONSULTATION AND COORDINATION

8.1 PROCESS FOR THE PREPARATION OF THE 2012-2017 OCS OIL AND GAS LEASING PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

8.1.1 Draft Proposed Program and Draft PEIS

Preparation and review of the draft programmatic environmental impact statement (PEIS) closely paralleled that of the 2012-2017 Outer Continental Shelf (OCS) Oil and Gas Leasing Program (the Program) decision documents. Comments received on the program decision documents were also reviewed for consideration in the preparation of the PEIS.

In January 2009, the previous Administration published a Draft Proposed Program (DPP) and a Notice of Intent (NOI) to prepare a programmatic environmental impact statement (PEIS) that requested comments from States, local governments, Native groups, federally recognized tribes, the oil and gas industry, Federal agencies, and other interested individuals and groups and set out a schedule for scoping meetings in the areas of the DPP. In February 2009, the Secretary of the Interior extended the comment period on the DPP and postponed the scoping meetings to allow time to consider further public comment before determining which areas in the DPP should be scoped and analyzed for consideration in subsequent program proposals. A preliminary revised Program was proposed on March 31, 2010.

8.1.2 Scoping for the Draft PEIS

An NOI to prepare and scope the Program PEIS was published in the *Federal Register* (75 FR 16828) on April 2, 2010. That NOI invited the public to provide comments on the scope and content of the PEIS and identified as many as 14 locations where public scoping meetings might be held.

On June 30, 2010, Secretary of the Interior Salazar announced that the public scoping meetings would be postponed in response to the Deepwater Horizon (DWH) incident. The additional time would be used to evaluate safety and environmental requirements of offshore drilling. On December 1, 2010, Secretary Salazar announced an updated oil and gas strategy for the OCS. The new strategy continued a moratorium for areas in the Eastern Gulf of Mexico (GOM) and eliminated the Mid-Atlantic and South Atlantic Planning Areas from consideration for potential sales and development through the 2017 planning horizon. The Western GOM, Central GOM, Cook Inlet, Chukchi Sea, and Beaufort Sea OCS Planning Areas would continue to be considered in the PEIS. Subsequently, on January 4, 2011, a Notice of Scoping Meetings for the proposed 2012-2017 OCS oil and gas leasing program PEIS was published in the *Federal Register* (76 FR 376) and a second scoping period was conducted from January 6, 2011, through March 31, 2011. During this scoping period, public scoping meetings were scheduled for 12 locations in the GOM (three locations), Alaska (eight locations), and Washington, D.C. The scheduled Alaska meetings for Point Hope and Point Lay were not held because of inclement

weather and subsequently could not be rescheduled because of ongoing schedule conflicts (e.g., whaling season). The public scoping meetings were held to garner significant issues and public concerns for inclusion in the PEIS. In addition, the Bureau of Ocean Energy Management (BOEM) received comments through the mail and maintained a public website to accept scoping comments electronically.

BOEM established cooperating agency status with the U.S. Department of Commerce National Oceanic and Atmospheric Administration (NOAA), the State of Alaska, and the Alaska North Slope Borough. They reviewed preliminary versions of the Draft and Final PEIS.

8.1.3 Commenting on the Proposed Program and Draft PEIS

Comments were requested during a 90-day period on the proposed Program and during a 60-day period on the associated Draft PEIS. The comments received were evaluated and considered in the preparation of the Proposed Final Program and Draft PEIS. The Proposed Final Program will be submitted to the President and to the Congress along with an explanation from the U.S. Department of the Interior (USDOJ) concerning the reasons for the decision.

8.2 PUBLIC COMMENT ON THE DRAFT PEIS

A Notice of Availability (NOA) for the public release of the Draft PEIS was published in the *Federal Register* on November 10, 2011. The notice announced a 60-day public comment period from November 10, 2011 until January 9, 2012. All comments received during the public comment period were impartially considered and given equal weight by BOEM. Section 8.4.4 of this Final PEIS presents the responses to these comments prepared by BOEM. The stakeholders providing comments are listed in Tables 8.4-1 and 8.4-2.

During the public comment period, BOEM provided the public with three methods for delivering comments on the Draft PEIS:

- Electronically, using a Web-based form accessible on the Internet at <http://www.boem.gov/5-year/2012-2017>,
- Regular mail to BOEM Headquarters, and
- Public meetings.

Thirteen public hearings were held on the following dates and at the following locations:

- December 5, 2011 — Wainright, Alaska
- December 6, 2011 — Nuiqsut, Alaska
- December 6, 2011 — Washington, D.C.

- December 6, 2011 — Houston, Texas
- December 7, 2011 — Kaktovik, Alaska
- December 7, 2011 — Mobile, Alabama
- December 8, 2011 — New Orleans, Louisiana
- December 9, 2011 — Anchorage, Alaska
- December 12, 2011 — Kotzebue, Alaska
- December 13, 2011 — Point Hope, Alaska
- December 14, 2011 — Point Lay, Alaska
- December 16, 2011 — Barrow, Alaska

Two meetings to receive public comments were held on the same day in Houston, Mobile, and New Orleans, with single meetings at all other hearing locations. All meetings except the one held in Washington, D.C., were advertised in local newspapers and through local press releases.

Comments were received from State and local officials; Federal, State, and local agencies; environmental and nongovernmental organizations; the oil and gas energy sector; and individuals. Per CEQ NEPA Regulations, 40 CFR 1503.4, BOEM prepared responses to all substantive comments (see Section 8.4.4) and revised portions of the Final PEIS to incorporate some of the changes suggested by commenters.

8.3 DISTRIBUTION OF THE FINAL PEIS

The Final PEIS was distributed to Federal, State, and local agencies; to interested groups and individuals who had been involved in the preparation of the Program and the PEIS process; and to stakeholder and project area libraries.

FEDERAL AGENCIES: Copies of the PEIS were provided to the following Federal agencies:

- Federal Energy Regulatory Commission
- Marine Mammal Commission
- U.S. Department of Commerce
 - National Oceanic and Atmospheric Administration (NOAA)
 - NOAA National Marine Fisheries Service

- U.S. Department of Defense
 - U.S. Air Force
 - U.S. Army Corps of Engineers
 - U.S. Navy
- U.S. Department of Energy
- U.S. Department of the Interior (USDOJ)
 - U.S. Fish and Wildlife Service
 - Bureau of Indian Affairs
 - Bureau of Mines
 - Bureau of Safety and Environmental Enforcement
 - National Park Service
- U.S. Department of Transportation
- U.S. Department of Homeland Security
 - U.S. Coast Guard
- U.S. Department of State
- U.S. Department of Justice
- U.S. Environmental Protection Agency (USEPA)
- U.S. Geological Survey

CONGRESS: Copies of the PEIS were provided to the following Congressional offices:

- House of Representatives Committee on Resources
- United States Senate Committee on Energy and Natural Resources

TRIBES/TRIBAL ORGANIZATIONS: Copies of the PEIS were provided to the following tribes and tribal organizations:

ALASKA

Afognak Native Corporation
Agdaagux Tribe of King Cove
Alaska Area Native Health Service
Alaska Eskimo Whaling Commission
Alaska Federation Of Natives
Alaska Intertribal Council
Alaska Inter-Tribal Council
Alaska Native Harbor Seal Commission
Aleut Corporation
Arctic Slope Native Association
Arctic Slope Regional Corporation

Bering Straits Native Corporation
Brevig Mission Native Corporation
Bristol Bay Native Association
Bristol Bay Native Corporation
Calista Corporation
Central Council of the Tlingit & Haida
Indian Tribes of Alaska
Chenega IRA Council
Chickaloon Village Traditional Council
Chignik Lake Village Council
Chinik Eskimo Community
Chugach Alaska Corporation

Chuloonawick Native Village	Native Village of Port Heiden
Cook Inlet Regional Corporation	Native Village of Shaktoolik
Cook Inlet Tribal Council	Native Village of South Naknek
Council Native Corporation	Nelson Lagoon Tribal Council
Elim Native Corporation	Newtok Corporation
Emmonak Native Corporation	Newtok Traditional Council
English Bay Native Corp	Nima Corporation
Eskimo Walrus Commission	Ninilchik Traditional Council
Inalik Native Corporation	Northwest Arctic Borough Planning Department
Inupiat Community of The Arctic Slope	Nunakauiak Yupik Corporation
Ivanoff Bay Tribal Council	Old Harbor Native Corporation
Kaktovik Inupiat Corporation	Orutsararmuit Native Council
Kanatak Tribal Council	Ouzinkie Native Corp
Karluk IRA Council	Ouzinkie Tribal Council
Kawerak Incorporated	Ouzinkie Tribal Media Center
Kenaitze Indian Tribe	Paimiut Corporation
Kikiktagruk Inupiat Corporation	Pauloff Harbor Tribe
King Island Native Corporation	Pilot Point Tribal Council
King Salmon Village Council	Platinum Traditional Village Council
Knik Tribe	Port Graham Corporation
Kodiak Area Native Association	Qagan Tayagungin Tribe
Kongnikilnomuit Yuita Corporation	Qanirtuuq Corporation
Koniag Incorporated	Qawalangin Tribe of Unalaska
Kotlik Yupik Corporation	Qenritalek Coast Corporation
Kotzebue IRA	Quetekcak Native Tribe
Koyuk Native Corporation	Saguyak Incorporated
Larsen Bay Tribal Council	Savoonga Native Corporation
Maniilaq Association	Seldovia Native Association Inc
Naknek Native Village Council	Seldovia Village Tribe
NANA Regional Corporation	Shaktoolik Native Corporation
NANA Regional Corporation IRA Council	Shishmaref Native Corporation
Nanwalek Traditional Council	Shumagin Corporation
Native Village of Akutan	Sitnasauk Native Corporation
Native Village of Barrow	Sivuqaq Incorporated
Inupiat Traditional Government	Solomon Native Corporation
Native Village of Belkofski	St Michael Native Corporation
Native Village of Chignik	Swan Lake Corporation
Native Village of Ekuk	Teller Native Corporation
Native Village of False Pass	Tyonek Native Corporation
Native Village of Kaktovik	Ukpeagvik Inupiat Corporation
Native Village of Kanatak	Unalakleet Native Corporation
Native Village of Kivalina	Unga Corporation
Native Village of Kotlik	Unga Tribal Council
Native Village of Kwigillingok	Valdez Native Tribe
Native Village of Kwinhagak	Village of Wales
Native Village of Nuiqsut	Wales Native Corporation
Native Village of Perryville	White Mountain Native Corporation
Native Village of Point Hope	
Native Village of Point Lay	

STATE AGENCIES: Copies of the PEIS were provided to the governors and clearinghouses of the following States:

GOVERNORS

The Honorable Robert Bentley, Governor of Alabama
The Honorable Sean Parnell, Governor of Alaska
The Honorable Edmund G. Brown, Governor of California
The Honorable Dannel P. Malloy, Governor of Connecticut
The Honorable Jack Markell, Governor of Delaware
The Honorable Rick Scott, Governor of Florida
The Honorable Nathan Deal, Governor of Georgia
The Honorable Bobby Jindal, Governor of Louisiana
The Honorable Paul LePage, Governor of Maine
The Honorable Martin O'Malley, Governor of Maryland
The Honorable Deval Patrick, Governor of Massachusetts
The Honorable Haley Barbour, Governor of Mississippi
The Honorable John Lynch, Governor of New Hampshire
The Honorable Chris Christie, Governor of New Jersey
The Honorable Andrew M. Cuomo, Governor of New York
The Honorable Bev Perdue, Governor of North Carolina
The Honorable John Kitzhaber, Governor of Oregon
The Honorable Tom Corbett, Governor of Pennsylvania
The Honorable Lincoln D. Chafee, Governor of Rhode Island
The Honorable Nikki Haley, Governor of South Carolina
The Honorable Robert F. McDonnell, Governor of Virginia
The Honorable Chris Gregoire, Governor of Washington

ALASKA

Alaska Department of Environmental Conservation
Alaska Department of Natural Resources
Alaska Dept of Environmental Conservation
Alaska Oil and Gas Conservation Commission
Alaska Oil and Gas Conservation Commission
Bering Straits Coastal Resource Service Area (BSCRSA)

Department of Environmental Conservation
Department of Environmental Conservation
Department of Natural Resources
Department of Transportation & Public Facilities
Department of Community and Regional Affairs
Department of Fish and Game
Department of Labor
Division of Fisheries Rehabilitation
Division of Oil and Gas
Division of Parks & Outdoor Recreation
DNR Division of Oil and Gas
State of Alaska
State of Alaska Department of Natural Resources
State of Alaska Division of Habitat & Restoration
State of Alaska Division of Mining, Land and Water

ALABAMA

Alabama Department of Conservation
Alabama Department of Conservation & Natural Resources
Alabama Highway Department
Alabama Historical Commission
Alabama House District 99
Alabama Oil & Gas Board
Fairhope, Coastal Section
Geological Survey of Alabama
Natural Resources Committee
State Lands Division

CALIFORNIA

California Coastal Commission
California Department of Conservation
California Energy Commission
California State Lands Commission
Department of Fish & Game
Office of Spill Prevention and Response Resources
Agency of California

DELAWARE

Delaware Department of Natural Resources and Environmental Control

FLORIDA

Apalachicola National Estuarine
Department of Environmental Protection
Department of Agriculture and Consumer Services
Department of Environmental Protection
Department of State
Department of Transportation

Department Office of Coastal and Aquatic
Managed Areas
Fish and Wildlife Conservation Commission
Florida Chamber of Commerce
Florida Coastal Management Program
Florida DEP/ Mining & Minerals Regulation
Florida Department of Environmental Protection
Florida Department of State
Florida Fish & Wildlife Conservation
Florida Sea Grant College
Growth Management Administrator
Intergovernmental Program
National Marine Committee
Northwest Department District Office
Northwest Department of Environmental
Protection District Office
Office of Policy & Stakeholder Coordination
Office of the Attorney General
State of Florida
Tampa Port Authority International Headquarters

LOUISIANA

Abbeville Harbor and Terminal District
Department of Culture/Recreation/Tourism
Department of Environmental Quality
Department of Natural Resources
Department of Transportation & Development
Department of Wildlife & Fisheries
Louisiana Department of Natural Resources
Louisiana Geological Survey
Louisiana Geological Survey/Lsu
Louisiana Sea Grant College Program
Marine Fisheries Division
State of Louisiana

MISSISSIPPI

Department of Environmental Quality
Mississippi Department of Archives and History
Mississippi Department of Wildlife Conservation
Mississippi State Port Authority

NORTH CAROLINA

North Carolina Department of Environment and
Natural Resources

SOUTH CAROLINA

South Carolina Department of Health and
Environmental Control

TEXAS

Railroad Commission of Texas
Texas Commission on Environmental Quality
Texas General Land Office
Texas Historical Commission
Texas Legislative Council
Texas Parks & Wildlife Department
Texas Water Development Board Department
Tracs Coordinator

VIRGINIA

Commonwealth of Virginia
Virginia Department of Conservation and
Recreation
Virginia Department of Environmental Quality
Virginia Department of Game and Fisheries
Virginia Department of Historic Resources
Virginia Institute of Marine Science

LOCAL AGENCIES: Copies of the PEIS were provided to the following local agencies:

ALASKA

Aleutians East Borough
Chignik Lagoon
Chugachmiut
City & Borough of Yakutat
City of Anchorage
City of Chignik
City of Emmonak
City of North Pole
Cook Inlet RCAC
Egegik Village
Lake and Peninsula Borough
Manokotak Village
Municipality of Anchorage
North Pacific Fishery Management Council
North Slope Borough

Northwest Arctic Borough
Village of Clarks Point
Village of Goodnews Bay
Village of Salamatoff
Village Of Sheldon Point
Village of Tyonek

ALABAMA

Town of Dauphin Island

CALIFORNIA

Port of Hueneme
San Luis Obispo Council of Governments
San Luis Obispo County Air Pollution Control
District
Santa Barbara County

FLORIDA

Assistant County Administrator
Bay County
Citizens Association of Bonita Beach
Citrus County
City of Fort Walton Beach
City of Gulf Breeze
City of Naples
City of Panama City
City of Pensacola
City of Wilton Manors
Desoto National Monument
Destin City Council
Environmental Services Department
Escambia County
Florida Regional Councils Association
Franklin County
Franklin County Courthouse
Gulf County
Gulf County Planning & Building Department
Hernando County Planning Department
Hillsborough City-County Planning Commission
Hillsborough County
Lee County
Lee County Board of County Commissioners
Lee County Community Development
Levy County Planning Department
Monroe County Industrial
Okaloosa County
Okaloosa County Planning
Pasco County Government Center
Perdido Key Chamber
Santa Rosa County
Sarasota County Coastal Resources
Sarasota County Courthouse
Sarasota County Government
The City of Destin
Walton County
Walton County Growth Management

LOUISIANA

Beach Adoption Coordinator
Calcasieu Regulatory Planning

Calcasieu Regulatory Planning Commission
City of Grand Isle
City of Lafayette
City of Lake Charles
City of New Orleans
Grand Isle Port Commission
Greater Baton Rouge Port Commission
Greater Lafourche Port Commission
Jefferson Parish
Jefferson Parish Department of Environmental
Affairs
Jefferson Parish Port District
Lafourche Parish Water District No. 1
Lafourche Parish Coastal Zone Management
Morgan City
Parish President
Plaquemines Parish Port
Plaquemines Parish Port, Harbor and Terminal
District
Port of Iberia
Saint Bernard Planning Commission
South Lafourche Levee District
St. Bernard Planning Commission
St. Bernard Port, Harbor and Terminal District
St. Charles Parish
Terrebonne Parish
Twin Parish Port Commission
West Cameron Port Commission

MISSISSIPPI

City of Bay Saint Louis
City of Gulfport
City of Pascagoula
Greenville Port Commission
Jackson County

TEXAS

City of Corpus Christi
Port of Beaumont
Port of Brownsville
Port of Corpus Christi Authority
Port of Galveston

LIBRARIES: Copies of the PEIS were provided to the following libraries:

ALASKA

Kwigillingok Public Library
A. Holmes Johnson Memorial Library
Acquisitions University of Alaska
Alaska Fish and Game Library
Akhiok Community School Library
Alakanuk Public Library

Alaska Pacific University
Alaska Resources Library & Information Services
Acquisitions
Alaska State Library
Amakigchick & Chaputnguak School Library
Anchor Point Public Library
BP Exploration (Alaska), Inc.

Brevig Mission Community Library
Buckland Public Library
Chenega Bay Community School
Chiniak Public Library
Cordova Public Library
Craig Public Library
Davis Menadelook Memorial
Dillingham Public Library
Elim Community Library
Eliwi Community Library
Ernest Nylin Memorial Library
Esther Greenwald Library
Fairbanks North Star Borough
Gambell Community Library
Golovin Community Library
Government Documents/Maps, University of
Alaska, Fairbanks
Haines Borough Public Library
Halibut Cove Public Library
Homer Public Library
Hooper Bay Public Library
Hydaburg School Library
Ilisaavik Library
Irene Ingle Public Library
Jessie Wakefield Memorial Library
Juneau Public Library
Kachemak Bay Campus Library
Kake City Community/School Library
Karluk Community School Library
Kasaan City Library
Kasilof Public Library
Katie Tokienna Memorial Library
Kaveolook School Library
Kegoyah Kozga Public Library
Kenai Community Library
Kenai Peninsula College
Kettleon Memorial Library
Kiana Elementary School Library
King Cove Community/School Library
Kodiak College
Koyuk City Library
Kuskokwim Consortium Library
Kwigillingok Public Library
Larsen Bay Community School Library
Library Geophysical Institute
Library Information Services
Metlakatla Junior/Senior High School Library
Nanwalek Elementary/High School Library
Ninilchik Community Library
North Slope Borough School District
Northwest College
Old Harbor Library
Ouzinkie Community School Library
Palmer Public Library

Pelican Public Library
Perryville Community School
Petersburg Public Library
Pribolof Island School District
Prince William Sound Community College Library
Quinhagak Public Library
Sand Point School
Savoonga Public Library
Seldovia Public Library
Seward Community Library
Skagway Public Library
Soldotna Public Library
State of Alaska
Stebbins Community Library
Tatitlek Community School Library
Tenakee Springs Public Library
Thorne Bay Community Library
Ticasuk Library
Tikigaq Library
Trapper School Community Library
Tuzzy Consortium Library
University of Alaska
University of Alaska IMS
University of Alaska Southeast
University of Alaska, Anchorage
University of Alaska, Fairbanks
Valdez Consortium Library
Z.J. Loussac Public Library

ALABAMA

Alabama Public Library Service
Auburn University at Montgomery
Dauphin Island Sea Lab, Marine Environmental
Gulf Shores Public Library
Juliette Hampton Morgan Memorial Library
Marine Environmental Sciences Consortium
Mobile Public Library
Montgomery Public Library
Thomas B. Norton Public Library
University Library
University of Alabama Libraries
University of Southern Alabama

CALIFORNIA

California Academy of Sciences Library
California State Library
Cambria Library
Carpinteria Public Library
Corte Madera Library
Eureka Humboldt Co. Library
Goleta Public Library
Healdsburg Library
Humboldt State University Library
Library-Business & Economics Department

Long Beach Library
Mendocino County Library
Mill Valley Public Library
Monterey Public Library
Morro Bay Library
Novato Branch Library
Pacific Grove Library
Pacifica Public Library
Peninsula Conservation Foundation Library
Petaluma Regional Library
Point Reyes Bird Observatory Library
Point Reyes Library
Redwood City Library
Sacramento Public Library
Salinas Public Library
San Diego County Library
San Diego Public Library
San Francisco Public Library
Santa Barbara Museum of Natural History Library
Santa Barbara Public Library
Santa Cruz Public Library
Santa Monica Public Library
Santa Rosa Sonoma County Library
Sebastopol Public Library
Serials Collections, University of California
Stinson Library
U.S. National Park Service
University of California
Ventura College Library

COLORADO

Colorado School of Mines
Colorado State University
Information Center, ENSR Corporation
Science Library, University of Colorado

DISTRICT OF COLUMBIA

American Petroleum Institute Library
Department of the Interior

FLORIDA

Ann Marbut Environmental Library
Bay County Public Library
Collier County Public Library
Florida A&M University
Fort Myers — Lee County Library
Fort Walton Beach Public Library
Government Documents Department, University of
Florida/Levin College of Law
Leon County Public Library
Marathon Public Library
Monroe County Public Library
Northwest Regional Library System
Pensacola State College Library

Port Charlotte Public Library
S.E. Wimberly Library
Selby Public Library
St. Petersburg Public Library
Strozier Library
Tampa-Hillsborough County Library System
U.S. Department of Commerce — National
Oceanic and Atmospheric Administration
University of Florida Library
University of Miami Library
West Florida Regional Library

LOUISIANA

Calcasieu Parish Library
Cameron Parish Library
Frazar Memorial Library
Grand Isle Branch Library
Iberville Parish Library
Jefferson Parish Library — Lafitte Branch
Jefferson Parish Lobby Library
Jefferson Parish Regional Branch Library
Jefferson Parish West Bank Outreach
Lafayette Public Library
LaFourche Parish Library
Louisiana State Library
Louisiana State University Library, Leon County
Public Library
Louisiana Tech University
Loyola University
Loyola University Library
Lumcon Library
Martha Sowell Utley Memorial Library
McNeese State University
Middleton Library
New Orleans Public Library
Nichols State University
Plaquemines Parish Library
Slidell Branch Library
St. Bernard Parish Library
St. Charles Parish Library
St. John the Baptist Parish Library
St. Mary Parish Library
St. Tammany Parish Library
State Library of Louisiana
Terrebonne Parish Library
Tulane University
University of New Orleans
University of South West Louisiana
Vermilion Parish Library
West Bank Regional Library
West Regional Library

MISSISSIPPI

Eudora Welty Library

Gulf Coast Research Laboratory
H.T. Sampson Library
Hancock County Library System
Harrison County Library
Jackson George Regional

NEW HAMSHIRE

Darhmouth College Library
U.S. Army Cold Regions Research and
Engineering Laboratory Library

OHIO

Ohio State University

OKLAHOMA

University of Tulsa Library

OREGON

Oregon Institute of Marine Biology
Oregon State Library
Oregon State University

TEXAS

Abilene Christian University
Alma M. Carpenter Public Library
Amoco Production Company Library
Aransas Pass Public Library
Arnulfo L. Oliveria Memorial Library
Austin Public Library
Bay City Public Library
Brazoria County Library
Calhoun County Library
Chambers County Library System
Comfort Public Library
Corpus Christi Central Library
Dallas Public Library
Dennis M. O'Connor Public Library
East Texas State University
Fugro, Inc.
Houston Public Library
Jackson County Library
Lamar University
Laratama Library
LBJ School of Public Affairs
Liberty Municipal Library
Orange Public Library
Port Arthur Public Library
Port Isabel Public Library
R.J. Kleberg Public Library
Reber Memorial Library

Refugio County Public Library
Rice University
Robert J. Kleberg Public Library
Rosenberg Library
Sam Houston Regional Library
Sam Houston Regional Library Research Center
Steen Library/Sfasu
Stephen F. Austin State University
Texas A&M University
Texas A&M University Libraries
Texas Southmost College Library
Texas State Library
Texas State Library & Archives Commission
Texas Tech University Library
University of Houston Library
University of Texas at Arlington
University of Texas at Arlington Library
University of Texas at Brownsville
University of Texas at Dallas
University of Texas at Dallas Library
University of Texas at El Paso Library
University of Texas at San Antonio
University of Texas Libraries
Victoria Public Library

VIRGINIA

National Technical Information Service
U.S. Geological Survey Library

WASHINGTON

National Marine Fisheries Service
National Marine Fisheries Service NW & Alaska
Fisheries Center Library
Parametrix Inc., Library
Seattle Public Library
U.S. Environmental Protection Agency

INTERNATIONAL

Danish Polar Centre
Librarian Establishment, Pacific National Defense
Lulea University Library
Marine Research Institute Library
McGill University
Peches Et Oceans
Swedish Institute of Space Physics Library
University of Alberta Library
University of Calgary, Serial Acquisitions
University of Cambridge
University of Oulu Biology Library

OTHER AGENCIES, ORGANIZATIONS, AND INDIVIDUALS: Copies were also distributed to the following agencies and individuals:

REGIONAL PLANNING COUNCIL

South Alabama Regional Planning Commission
Apalachee Regional Planning Council
East Central Florida Regional Planning Council
North Central Florida Regional Planning Council
Northeast Florida Regional Planning Council
South Florida Regional Planning Council
Southwest Florida Regional Planning Council
Tampa Bay Regional Planning Council

Treasure Coast Regional Planning Council
West Florida Regional Planning Council
Withlacoochee Florida Regional Planning Council
Regional Planning Commission, New Orleans
Southern Mississippi Planning and Development
District
Southeast Texas Regional Planning Commission
Golden Crescent Regional Planning Commission,
Victoria

NON-GOVERNMENTAL ORGANIZATIONS:

ALASKA

Advanced Supply Chain Intl LLC
Alaska Clean Seas
Alaska Coastal Community Alliance
Alaska Eskimo Whaling Commission
Alaska Fisheries Development Foundation
Alaska Marine Conservation Council
Alaska Miners Association
Alaska Nanuuq Commission
Alaska Oil and Gas Association
Alaska Public Interest Research Group
Alaska Public Radio Network
Alaska State Chamber of Commerce
Alaska Support Industry Alliance
Alaska Survival
Alaska Trollers Association
Alyeska Pipeline Service Company
Anadarko Petroleum Corporation
Arctic Slope Regional Corporation
Barrow Whaling Captains Association
Bering Sea Fishermen's Association
Bering Straits Coastal Resources Service Area
Bio Economic Research and Analysis
BP Exploration (Alaska), Inc.
Cascadia Wildlands Project
Center For Alaska Coastal Studies
Chevron USA, Inc.
Chignik River Ltd.
Choggiung Ltd.
Conocophillips Alaska, Inc.
Cook Inlet Keeper
Cook Inlet RCAC
Cook Inlet Region, Inc.
Cook Inlet Spill Prevention & Response Co.
Denali Drilling, Inc.
Earthjustice
Fairbanks Economic Development Corporation
Greater Fairbanks Chamber of Commerce

Hawk Consultants
Kachemak Bay Conservation Society
Kachemak Bay Institute
Kenai Chamber Of Commerce
Kugkaktlik Limited
Kwik Incorporated
LGL Alaska Research Associates, Inc
National Audubon Society
National Biological Survey
National Wildlife Federation
NGTA Incorporated
North Star Terminal & Stevedore Co. LLC
Northern Alaska Environmental Center
Northwest Setnetters
Oceana
Peninsula Clarion
Petro Marine Services
Petro Star, Inc.
Point Hope Whaling Captains Association
Prosperity Alaska
REDOIL
Resource Development Council
Sea Lion Corporation
Shell Energy Resources Company
Shell Exploration and Production Company
Sierra Club Alaska Field Office
Southwest Alaska Municipal Conference
Tesoro Alaska Petroleum Company
The Alaska Sea Otter and Steller Sea Lion
Commission
The Nature Conservancy
The Wilderness Society
Tikigaq Corp.
Trustees for Alaska
Western Geco
Whittier Small Boat Harbor
Yak-Tat-Kwaan

ALABAMA

Adem
Alabama Nature Conservancy
Alabama Petroleum Council
Alabama State Port Authority
Alabama Wildlife Federation
Alabama Wildlife Society
Cartwright & Co., Inc.
General Insulation
Harrison Brothers Dry Dock
Horizon Shipbuilding, Inc.
Marine Business Exchange
Midstream Fuel Service
Mobile Area Chamber Of Commerce
Mobile Bay Audubon Society
Mobile Bay National Estuary Program
Mobile Baykeeper
Offshore Inland
Perdido Watershed Alliance
Portersuille Revival Group
South Alabama Regional Planning Commission
Total Minatome Corporation

ARIZONA

International Dark-Sky Association
Telonics, Inc.

CALIFORNIA

American Cetacean Society
Area Energy, LLC
Bisco Industries
California Sport Fishing Association
Center for Biological Diversity
Chevron Energy Research & Technology
Company
Citizens Planning Association
ECOSLO Board of Trustees
Environmental Coalition
Environmental Defense Fund
Get Oil Out, Inc.
LA Commercial Fisherman's Association
League of Women Voters of San Luis Obispo
Natural Resources Defense Council
Pacific Environment
PacSEIS, Inc.
PRBO Conservation Science
Sea Turtle Restoration Project
Sierra Club
Sierra Club Marine Committee
Southern California Trawler's Association
Surfrider
Testa Environmental Corporation
Trans-Pacific Seafood
Turtle Island Restoration Network
Western States Petroleum Association

COLORADO

Armstrong Oil and Gas, Inc.
Aspen Exploration Corp.
Forest Oil Corporation

DISTRICT OF COLUMBIA

Alaska Wilderness League
Alaska's Washington Representative
American Petroleum Institute
Center for Regulatory Effectiveness
Coastal States Organization
Defenders of Wildlife
Environment America
Environmental Law Institute
Greenpeace
Independent Petroleum Association of America
Institute for Energy Research
International Association of Fish
League of Conservation Voters
League of Women Voters
National Association of Manufacturers
National Audubon Society
National Fish & Wildlife Foundation
National Ocean Industries Association
Pax Christi
Pew Charitable Trusts
Pew Environmental Group
Sierra Club
Wilderness Society
World Wildlife Fund

FLORIDA

1000 Friends of Florida
Alton Strategic Environmental Group
Apalachee Regional Planning Council
Apalachicola National Estuarine Research Reserve
Apalachicola Riverkeeper
Audubon of Florida
Audubon Society — Apalachee
Center for Ecotoxicology (Mote Marine
Laboratory)
Center For Marine Conservation
Chuck's Dive World
Citizens Association of Bonita Beach
Conservancy Of Southwest Florida
Continental Shelf Associates, Inc.
CSA International
Development Foundation
Earthjustice
East Central Florida Regional Planning Council
Ecological Associates, Inc.
Ecology and Environment, Inc.
Environmental Resources
Escambia County Marine Resources
Field Conserv Service Tnc

Florida Audubon Society
Florida Chamber of Commerce
Florida Chapter Sierra Club
Florida Defenders of the Environment
Florida Fish & Wildlife Conservation Commission
Florida Institute of Oceanography
Florida Marine Research Institute
Florida Natural Areas Inventory
Florida Petroleum Council
Florida Power and Light
Florida Public Interest Research
Florida Wildlife Federation
Gulf of Mexico Fishery Management Council
Gulf and South Atlantic Fisheries Foundation, Inc.
Gulf and South Atlantic Fisheries Development
Foundation
Gulf Coast Environmental Defense
Han & Associates, Inc.
Harbor Branch Oceanographic Institute
Hillsborough County Commission
Izaak Walton League Of America, Inc.
James Madison Institute
Lampf Herbert Consultants
League of Women Voters
Magnum Steel Services Corp.
Manasota-88, Inc.
Manatee County Port Authority
Marine Science Center (Room 204)
Mote Marine Laboratory
North Central Florida Regional Planning Council
Northeast Florida Regional Planning Council
Organized Fishermen of Florida
Pensacola Archaeological Society
Perdido Key Association
Perdido Key Chamber Of Commerce
Port of Panama City
Port of Pensacola
Port St. Joe Port Authority
R.B. Falcon Drilling
Regional Planning Council Withlacoochee Florida
Roffers Ocean Fishing Forecast Service
SAIC, Inc.
Santa Rosa Sound Coalition
Save The Manatee Club
Sierra Club
South Florida Regional Planning Council
Southeastern Fisheries Association
Southwest Florida Planning Council
Southwest Florida Regional Planning Council
Tampa Bay Regional Planning Council
The Conservancy
The Nature Conservancy
Treasure Coast Regional Planning Council
URS Corporation

West Florida and Power 93
West Florida Regional Planning Council
Withlacoochee Regional Planning Council

KANSAS

Exploration Manager
Gordon Energy Solutions

LOUISIANA

Acadian Integrated Solutions
Adams and Reese
Applied Technology Research Corp.
Aries Marine Corporation
Asco USA, LLC
Audubon Louisiana Nature Center
Baker Energy
Bepco, L.P.
B-J Services Co.
C.H. Fenstermaker & Associates
Capital/Region Planning Commission
Century Exploration N.O., Inc.
Chet Morrison Contractors
Chevrontexaco
Chevron USAC-K Associates, LLC
Clean Gulf Associates
Coalition to Restore Coastal Louisiana
Coastal Environments, Inc.
Cochrance Technology
Columbia Gulf Transmission
Concerned Shrimpers of America
Deleon & Associates LLC
Economic Development & Tourism Office
Ecosystem Management
Energy Partners, Ltd.
Ensco75
Flash Gas and Oil Southwest, Inc.
Freeport-Mcmoran, Inc.
Global Industries, Ltd.
Greater Baton Rouge Port Commission
Gulf Coast Fisherman's Coalition
Gulf Restoration Network
Houma-Terrebonne Chamber Of Commerce
John E. Chance & Associates, Inc. (Land
Surveys, Inc.)
L&M Botruc Rental, Inc.
LA 1 Coalition, Inc.
Larose Intercoastal Lands, Inc.
Louisiana Gulf Coast Conservation Association
Louisiana Highway 1 Coalition
Louisiana Mid-Continent Oil and Gas Association
Louisiana Offshore Oil Port, Inc.
Louisiana Oil and Gas Association
Louisiana Shrimp Association
Louisiana Wildlife Federation, Inc.

LSU Sea Grant College
Lynder Oil Company
Marathon Oil Co.
Mid-Continent Oil & Gas Association
National Estuary Program
Natural Resources Committee
New Orleans Group of the Sierra Club,
Ocean Conservancy
Offshore Operators Committee
Offshore Process Services
Oil and Gas Property Management
Phoenix International, Inc.
Port of Iberia
Project Consulting Services
Raintree Resources, Inc.
Regional Planning Commission
Restore or Retreat
Seot, Inc.
Shell
Shell E&P Company
Shell Offshore, Inc.
Sierra Club
Sierra Club — Delta ChapterSJI, LLC
South Central Industrial Association
Stone Energy Corporation
Strategic Management Services-USA
T. Baker Smith, Inc.
Taylor Energy Co.
The Daspit Companies
The Gulf Restoration Network
The Nature ConservancyVastar Resources
Walk, Haydel & Associates
Waring & Associates
West Cameron Port Commission

MASSACHUSETTS

Conservation Law Foundation
Horizon Marine, Inc.
International Oil Marketers Association

MARYLAND

Izaak Walton League Of America, Inc.
Reefkeeper International

MISSISSIPPI

Department of Marine Resources
Gulf Coast Research Laboratory
Gulf States Marine Fisheries Commission, Ocean
Springs
Mississippi Development Authority
Mississippi Mineral Resources Institute
Mississippi Nature Conservancy
Mississippi Sea Grant Advisory Service
Mississippi-Alabama Sea Grant Consortium

Southern Mississippi Planning and Development
District

NORTH CAROLINA

Science Applications International Corp.
Surfrider Outer Banks Chapter

NEBRASKA

Northern Natural Gas Company

NEW JERSEY

Clean Ocean Action
Environment New Jersey
Exxonmobil Biomedical Sciences, Inc.
N.J. Marine Sciences Consortium

NEW MEXICO

Acoustic Ecology Institute

NEW YORK

Natural Resources Defense Council
Occidental Oil and Gas
Waterkeeper Alliance

OKLAHOMA

American Association of Petroleum Geologists
Industrial Vehicles International, Inc.

SOUTH CAROLINA

South Carolina Wildlife and Marine Resources

TEXAS

Agip Petroleum Company, Inc.
Amerada Hess Corporation
American Association of Petroleum Geologists
Anadarko Petroleum Corporation
Apache Corporation
Athens Group, Inc.
Audubon Society — Austin, Southwest Region
B. T. Operating Company
Baker Atlas
Box Energy Corporation
BP America, Inc.
BP Amoco
Brigham Oil and Gas, L.P.
British Petroleum
BW Offshore
Cairn Energy USA, Inc.
Cal Dive International
Center Point Energy
Chevron U.S.A., Inc.
Chevrontexaco Upstream
Chickasaw Distributors, Inc.
Chicksaw Distributors, Inc.

Clayton W. Williams, Jr., Inc.
Coastal Conservation Association
Coastal Coordination Council
Columbia Gas Development Corp.
ConocoPhillips Company
Consumer Energy Alliance
Devon Energy Corp.
Drilling Rig Masters
Editor
El Paso
El Paso Production
Enterprise Products
Enterprise Products Operating LP
Environmental Programs
EOG Resources, Inc.
Executive Director (Offshore Energy Center)
Exxonmobil Corporation
Exxonmobil Upstream Development Company
Flower Garden Banks NMS
Geo-Marine, Inc.
Global Geophysical
Golden Crescent Regional Planning Commission
Green Canyon Pipeline Co.
Halliburton
Heerema Marine Contractors, U.S., Inc.
Hunt Oil Co.
International Association of Geophysical
Contractors
J. Connor Consultants
James K. Dodson Company
JK Enterprises
Kiewit Offshore Services, Ltd.
Lake Charles Harbor and Terminal District
LCT, Inc.
LGL-Ecological Research Assoc., Inc.
Mosbacher Energy Co.
Murphy Exploration & Production
Nature Conservancy
Newfield
Newfield Exploration Company
NMFS HCD Galveston Facility
Offshore Data Services, Inc.
Patton Boggs LLP
Pennzoil Company
Pennzoil Exploration
Petrobas America, Inc.
Port Mansfield/Willacy County Navigation District
Port of Isabel — San Benito Navigation District
Port of Houston
Port of Port Aransas Municipal Harbor
Port of Port Arthur
PPG Industries, Inc.
PPI Technology Services
Seacor Marine

Seneca Resources Corporation
Sensorwise
Serimax North America
Shell E&P Company
Shell Energy Resources Company
Shell Exploration & Production Company
Shell Global Solutions (US), Inc.
Shell Oil Co.
Sierra Club — Lone Star Chapter
Southeast Texas Regional Planning Commission
Statoil U.S.A. E&P, Inc.
Stephens Production Company
Tatham Offshore, Inc.
Texas City Terminal Railway Company
Texas Geophysical Company, Inc.
Texas Nature Conservancy
Texas Sea Grant Extension
Texas Shrimp Association
Texas Water Conservation Association
TGS-NOPEC Geophysical Company
The Houston Exploration Company
The Nature Conservancy
Theom and Associates
Transco Explor. & Production Co.
Vallourec & Mannesmann Tubes
Veritas
W&T Offshore, Inc.
Walter Oil & Gas Corporation
Wayman W. Buchanan, Inc.
Wil Rig (U.S.A.)

VIRGINIA

60 Plus Association
American Trucking Association
Applied Statistical Associates, Inc.
Chesapeake Climate Action Network
Hampton Roads Planning District Commission
International Window Film Association
Mangi Environmental Group, Inc.
National Wildlife Federation
Southern Environmental Law Center
The Nature Conservancy

INTERNATIONAL

CANADA

Joint Secretariat
Maurice-Lamontagne Institute Fisheries
and Oceans

8.4 PUBLIC COMMENTS ON THE DRAFT PROGRAMMATIC EIS

8.4.1 Introduction

A Notice of Availability (NOA) for the public release of the Draft PEIS was published in the *Federal Register* on November 10, 2011. The notice announced a 60-day public comment period from November 10, 2011, until January 9, 2012. All comments received during the public comment period were impartially considered and given equal weight by BOEM. Comments were received from State and local officials; Federal, State, and local agencies; environmental and nongovernmental organizations; the oil and gas energy sector; and individuals.

A total of 342 comment documents¹ were received from Federal, State, and local governments and agencies, nongovernmental organizations, and individuals. Members of several of the nongovernmental organizations submitted comments using a ‘standard’ form letter for their constituents. For example, the Sierra Club submitted a compact disc with 24,000 form letters (or versions of the form letter) from organization members across the country. While this represents 24,000 submittals, the vast majority of these are identical to the form letter. Other groups submitting largely standardized form letters included the Institute for Energy Research (890 letters) and CREDO (71,626 letters).

As comment documents were received during the public comment period, they were assigned a 5-digit document number. Within each document, individual comments were further numbered. All comment documents received during the public comment period were cataloged in this manner and considered in the preparation of the Final PEIS. Evaluation of the 342 comment documents yielded a total of 1,992 unique comments.

8.4.2 Summary of Major Issues Raised by Commenters on the Draft PEIS

As comments documents were being evaluated and individual comments identified, comments with similar themes were grouped into categories based on the overall nature of the comment. Analysis of comments received on the Draft PEIS identified nine major topics of concern: (1) National Environmental Policy Act (NEPA) process and public involvement; (2) NEPA analysis; (3) alternatives; (4) environmental issues and concerns; (5) cumulative impacts; (6) oil spills; (7) mitigation; (8) regulations and safety; and (9) statutory compliance. These topics covered a wide range of issues, including, but not limited to, compliance and adequacy pertaining to NEPA and the Endangered Species Act (ESA), development of alternatives and selection of planning areas for program consideration, resource impact concerns, impacts on subsistence, oil spills and response, and public outreach.

¹ A ‘comment document’ refers to the entire submittal provided by a commenter, whether in writing or verbally during one of the public hearings that was held on the Draft PEIS. Each comment document, in turn, may have one or more individual comments on one or more different topics. In some cases, the submitted document contained only a single substantive comment.

NEPA Process and Public Involvement. Some commenters called for BOEM to prepare site-specific EISs for each planning area and to not defer resource specific analyses and regulatory compliance activities to the leasing stage or later, but conduct those analyses as part of the 2012-2017 Program PEIS. Concerns related to public involvement included uncertainty over how the public comments received during scoping were used to prepare the PEIS, and displeasure with the overlap of the public comment period for the 2012-2017 Program PEIS with NEPA comment periods for other NEPA projects in the affected areas.

NEPA Analysis. Some commenters felt that BOEM underestimated risks and impacts of oil spills, did not identify spill responses plans or procedures, and overestimated the benefits of OCS oil and gas development. Several commenters called for the PEIS to include an evaluation of a ‘worst case’ oil spill scenario. Some commenters called for BOEM to adopt the recommendations of the Council on Environmental Quality (CEQ) and the National Commission on the Deepwater Horizon Oil Spill and Offshore Drilling (the National Commission) and reform its NEPA compliance procedures. Some commenters felt that BOEM did not take a hard look and adequately assess differences in impacts across alternatives, nor adequately consider important impacting factors, such as climate change, on the nature of those impacts. A number of commenters raised concerns regarding insufficient or incomplete information, calling for BOEM to conduct more studies before adopting any new leasing program.

Alternatives. Some commenters called for the addition of more planning areas, while others suggested limiting leasing to only certain areas within the planning areas. Several commenters felt that BOEM did not adequately evaluate the environmental impacts of the alternatives or the benefits of the No Action Alternative, while others felt there was insufficient consideration of alternate/renewable energy sources. Concerns were raised about including alternatives with Arctic leasing given the current industry and governmental capability to contain and clean up possible spills in the Arctic.

Environmental Issues and Concerns. A number of comments were received expressing concerns about how OCS oil and gas development would affect both natural and socioeconomic resources and conditions, including, but not limited to, impacts on air and water quality, biota, socioeconomics, public health, subsistence, and environmental justice. Many commenters were concerned about the impacts of both routine operations and accidental oil spills on one or more resources. Some comments expressed concern about how OCS oil and gas activities may affect human health and subsistence (especially in the Arctic).

Cumulative Impacts. Some commenters felt that the cumulative analyses did not sufficiently consider reasonably foreseeable future actions, climate change, and impacts on resources. Some commenters felt that the analyses did not adequately evaluate the Arctic and impacts on Arctic resources. Some commenters expressed concerns that the cumulative analyses did not adequately consider the full effects of oil spills, including the DWH event.

Oil Spills. Some commenters felt that the risk characterization of a catastrophic discharge event (CDE) presented in the Draft PEIS was insufficient, while others felt that the risks of deepwater drilling were overstated. A concern was also identified that the Draft PEIS did not sufficiently address the persistence of environmental impacts of oil spills on natural

resources. Many commenters expressed concerns about the ability of industry and BOEM to respond to oil spills, especially if they occur under ice cover and in Arctic winter conditions. Some commenters requested a greater discussion of the use and impacts of dispersants, and more discussion of the reforms enacted by industry following the DWH event.

Mitigation. Some commenters felt that the Draft PEIS provided only minimal and generic information on required mitigation. Commenters felt that the PEIS should identify both planning area- and resource-specific mitigation measures and requirements.

Regulation and Safety. Some commenters requested that BOEM and the Bureau of Safety and Environment Enforcement (BSEE) reform their regulations and practices to reflect the findings and recommendations of the National Commission on the Deepwater Horizon Oil Spill and Offshore Drilling. Other commenters called for the PEIS to better identify safety changes implemented by industry since the DWH event. One commenter requested that the PEIS include a risk assessment of drilling. Several commenters identified a concern that BOEM, BSEE, the U.S. Coast Guard, and industry do not have adequate oil spill response measures in place to support OCS oil and gas leasing, especially in the Arctic.

Statutory Compliance. Some commenters noted that some major Federal laws and Executive Orders were missing from Appendix C (Federal Laws and Executive Orders), and that the Draft PEIS was not in compliance with, nor adequately explained, provisions of various environmental statutes. A number of commenters expressed concerns regarding BOEM's position with regard to the ESA, the Marine Mammal Protection Act (MMPA), and the Magnuson-Stevens Fishery Conservation and Management Act (FCMA). Commenters requested that the PEIS include U.S. Fish and Wildlife Service (USFWS) requirements for protecting polar bear dens, and identify industry practices for compliance with the USFWS requirements. Some commenters expressed concerns that the Executive Order instituting the National Ocean Policy and Coastal and Marine Spatial Planning directly conflicts with the Outer Continental Shelf Lands Act.

Other Comments. In addition to specific comments on the major issues summarized above, BOEM also received a variety of comments that were either not applicable to the PEIS, were general in nature, did not request or require changes to the Draft PEIS, or addressed topics other than the 2012-2017 OCS Leasing Program. These comments discussed topics such as general concerns about climate change, opposition to or support of oil and gas development and fossil fuel use, a need for basic services and human rights, the value of traditional knowledge, and displeasure with industry activities in the Arctic.

8.4.3 Summary of the Changes Made to the Draft PEIS

Following the closure of the public comment period on the Draft PEIS, BOEM reviewed and considered all of the comments received on the draft and made revisions to the PEIS as appropriate. Factual or editorial errors identified in the comments were corrected, and text was clarified or expanded to provide additional information on the proposed action and alternatives, the exploration and development scenarios, baseline environmental conditions, climate change,

oil spills, potential environmental impacts, or other concerns. In addition, a cost-benefit analysis of the alternatives was added, and the discussion of issues of programmatic concern was expanded to provide a new discussion of programmatic deferrals and mitigation. Several of the figures were revised to clarify areas of confusion or correct errors identified by some commenters, and some new figures were developed.

8.4.4 Response to Comments

Presented below are the major issues that capture the substantive concerns raised in the comments received on the Draft PEIS. BOEM has prepared responses to the concerns associated with these issues, which are provided below. Table 8.4-1 identifies stakeholders providing comments on each issue.

8.4.4.1 Issue 1 NEPA Process and Public Involvement

1. Each planning area is unique. Combining the Gulf of Mexico, Cook Inlet, and Chukchi and Beaufort Seas in the PEIS is confusing and potentially problematic for the reader to understand the many distinctions between these areas. The regions are remarkably different with respect to location, climate, seasonal variations, as well as the level of activity anticipated from offshore energy exploration and development. Therefore, BOEM should create a separate site-specific, detailed EIS for each at the planning stage, especially in areas with complex geology, in deepwater, and in the Arctic and other frontier areas.

Response: BOEM is cognizant of and sensitive to the unique environmental conditions that exist across the various OCS Planning Areas. The purpose of and need for preparing a schedule of potential OCS oil and gas lease sales is to “best meet national energy needs for the 5-year period following its approval” (43 USC 1344) by balancing the potential for adverse environmental and societal impacts with the beneficial impacts of the discovery and development of oil and gas. In developing the 5-year leasing schedule, BOEM considers regional and national energy needs; leasing interests as expressed by possible oil and gas producers; applicable laws, goals, and policies of affected States, local governments, and tribes; competing uses of the OCS; relative environmental sensitivity and marine productivity among OCS regions; public input; and the equitable sharing of benefits and risks among stakeholders. Therefore, to handle each OCS planning area separately, as the comment is suggesting, would be contrary to the purpose and need of the proposed action analyzed. The PEIS evaluates the potential effects to all planning areas that the Secretary of the Interior (Secretary) is considering in this PEIS, in order to adequately balance the factors described above. Including all of the OCS areas that the Secretary has already identified for consideration will ultimately lead to a more informed decision with regard to the program as a whole.

In regard to the specific suggestion that BOEM create a separate site-specific analysis for each planning area, it is especially important to note here that BOEM uses a tiered analytical approach in its NEPA documents. When a broad NEPA document such as a PEIS has been

prepared, any subsequent site-specific assessment or evaluation can summarize (and include by reference) the issues discussed in the broader document, and thus, the site-specific assessment can focus its analyses on project-specific issues of the particular proposed action (40 CFR 1502.20). Following selection of the Program, any subsequent lease sale-specific NEPA analyses and documentation may tier off the PEIS for the Program. This PEIS is the first of many NEPA analyses that will be done for the activities that occur as a result of the Program. The NEPA assessments, including EISs and environmental assessments (EAs) associated with various stages of OCS oil and gas development, are shown in Table 1-1 of the PEIS.

2. BOEM has exhibited a pattern of postponing its decisions on protected areas, mitigation measures, deferrals, health impact assessments, etc. until later stages in the tiered leasing program. After delaying these decisions, there is concern that BOEM fails to adequately address these issues in the subsequent stages. In particular, when these decisions are postponed until the exploration plan stage, there is concern that the timeframe of this phase prevents preparation of an adequately detailed site-specific analysis. To address these concerns, the impacts should be addressed at the programmatic phase. Barring that, EISs should be required for specific lease sales, especially for lease blocks in deep water, in areas with complicated geology, in the Arctic, and in frontier locations. At this programmatic stage, BOEM should conduct better science in order to more narrowly target lease sales.

Response: The use of the tiering framework, from the 5-year Program through plan approval, allows BOEM to consider reasonable alternatives and integrate new environmental information during program implementation when the issues of concern are most ripe. BOEM does prepare NEPA documents for specific lease sales, but tiering encourages BOEM to first address a broad general program, such as the 2012-2017 OCS Oil and Gas Program, in an initial environmental impact statement, and then analyze narrower lease sale and project-specific proposals under the initial program in subsequent, more focused NEPA analyses. In fact, CEQ encourages the use of programmatic NEPA and tiering in these situations as evident in the NEPA Task Force report, *Modernizing NEPA Implementation* (CEQ 2003). This PEIS does not analyze additional deferrals and mitigations as alternatives.

A useful approach for addressing the issues raised in comments is to strengthen the program's tiering process so that it is more effective and transparent, rather than attempting to develop specific mitigations and spatial/temporal deferrals at the preliminary planning stage of the program when information needed for an informed decision may not be available, needed consultation and coordination may not have occurred, and the analytic granularity is generally too coarse for site-specific or resource-specific decisions. BOEM has included a new section in the Issues of Programmatic Concern to facilitate the process of considering and evaluating different deferral and mitigation strategies that may need to be applied at appropriate program decision points. Consistent with the NEPA Task Force recommendation, the PEIS provides a roadmap, explaining where and when deferred issues raised by the public and/or regulatory agencies will be addressed. Chapters 1 and 2 of the PEIS explain how more detailed analyses should follow that will evaluate the need for specific mitigations in different program areas. Section 4.3.2 describes the process BOEM will follow during program implementation to foster focused leasing, deferral and mitigation

strategies will be tracked and evaluated during the program, along with mechanisms for stakeholders to engage in and contribute to the lease sale alternative evaluation and development process.

With regard to conducting better science, BOEM has a robust research program in its Environmental Studies Program. Many of the studies funded and completed for the Environmental Studies Program directly support and inform the analyses presented in BOEM NEPA documents. In many instances, these studies assist BOEM in developing and improving upon mitigation strategies that ultimately may help identify and protect sensitive environmental areas. BOEM has found that leasing and plans can be tailored to protect resources, the details for which come most appropriately at those stages.

3. The PEIS acknowledged NOAA's concerns about sensitive hard-bottom habitat in the GOM, but deferred serious consideration of specific exclusion areas until later NEPA analyses for specific lease areas. NOAA would prefer to see the exclusion of these areas considered during the 5-year Program stage, rather than waiting for the lease sale phase. NOAA encourages BOEM to exclude these sensitive areas under the Outer Continental Shelf Lands Act Section 18 requirement to consider the ecological characteristics, environmental sensitivity, and other anticipated uses of the area in determining the timing and location of the leasing program.

Response: Exclusion areas are generally determined at the lease sale stage. However, the Assumed Mitigation that is described in Appendix B does explain mitigation that BOEM assumes would be included. This includes mitigation relative to chemosynthetic communities, topographic features, Pinnacle Trend, and the Flower Gardens. Section 2.9.5 of the PEIS addresses the addition of areal and temporal exclusion areas, as well as the rationale for deferring the designation of new exclusions to lease sale and plan stages of the Program. In addition, a new section (Section 4.3.2) discussing programmatic deferrals and mitigation can be found in Section 4.3 Issues of Programmatic Concern.

4. BOEM should incorporate the "worst-case discharge" calculations from oil spill response plans into its NEPA documents.

Response: Pursuant to BSEE OCS Regulations (30 CFR 254.47), operators are required to submit worst-case discharge (WCD) scenarios to BSEE for all OCS facilities. Furthermore, pursuant to 30 CFR 550.219 and 550.250, all plans must also be accompanied by information regarding oil spills, including calculations of the WCD scenario; this is further clarified by notices to lessee (NTL) No. 2010-N06. The WCD scenario is currently used to evaluate the adequacy of the assets in an oil spill response plan (OSRP), which is a required mitigation measure. Total calculation for the volume of oil that could be released in a WCD scenario is determined by the type of facility in question.

5. BSEE does take into consideration WCD calculations submitted by industry; however, the incorporation of WCD calculations for wells submitted by industry are not appropriate to incorporate at the programmatic level of NEPA analysis, as these numbers are submitted by industry and reviewed by BOEM and BSEE, where appropriate, at subsequent stages in the

leasing process, per relevant OCS regulations. By continuing to call events like the Macondo event phrases like “catastrophic oil spill”, the Federal Government is perpetuating a misunderstanding that is inherent to that phrase. A spill cannot be catastrophic. An eruption or a volcano of oil can be. It was recommended that any reference in the PEIS to such volumes of lost oil from operations not be called spill, but be called by a more accurate descriptive name.

Response: BOEM has used an appropriate term to describe this unprecedented oil spill and other low-probability events with catastrophic consequences. BOEM’s official term in the PEIS for this type of very large oil spill is a catastrophic discharge event (CDE). In the case of the April 2010 CDE, BOEM’s official term is the DWH event.

6. It is unclear how public comments from the scoping meetings have been incorporated into the PEIS. These important comments should be addressed in the PEIS so that the public can best understand the evolution of BOEM’s work on the leasing program.

Response: On January 4, 2011, a Notice of Scoping Meetings for the proposed 2012-2017 OCS Oil and Gas Leasing Program PEIS was published in the *Federal Register* (76 FR 376) and a scoping period was conducted from January 6, 2011, through March 31, 2011. During this scoping period, public scoping meetings were held in 10 locations in Alaska, Texas, Louisiana, Alabama, and Washington, D.C. In addition, BOEM received comments through the mail and maintained a public website to accept scoping comments electronically.

As evidenced in the scoping comments received, there was a wide range of interest in, and opinions expressed about, the 2012-2017 OCS Oil and Gas Leasing Program PEIS, and the comments summarized in Section 1.4.3 of the PEIS illustrate the varied and, at times, contradictory issues, concerns, and desired future conditions expressed by individuals, organizations, industry, and public agencies. This PEIS determined whether issues raised during the scoping period were relevant enough to be considered and analyzed further; any issues raised that were deemed irrelevant or beyond the scope of this PEIS were not further analyzed. Section 1.4.3 is intended to categorize and summarize the substance of the scoping comments, not reproduce the exact wording of individual comments. A number of analytical issues, many of which are addressed in this PEIS, were identified during scoping. These include the geographic scope of the PEIS, the analytical scope of the PEIS, the impacting factors to be considered in the analyses, and the resources that may be affected by the Program. These analytical issues are fully discussed in Section 1.5 of this PEIS. Also, issues that arose during the scoping process may be found addressed throughout the PEIS, as appropriate.

7. BOEM should take into account the burden on Alaska Native communities that are buried in overlapping public comment periods for very technical documents. To have different ending dates for the PEIS and the proposed Program served only to increase confusion and undermine the public process. BOEM should strive to release documents with sufficient time to review by communities and should coordinate internally with sister agencies to reduce confusion and simultaneous comment periods. Submitted comments were not made accessible during the comment period. BOEM should extend the comment period to allow

additional time for review. BOEM should ensure that it conveys the importance and purpose of their public hearings in advance. Public meetings held on Friday evenings during the holiday season are not convenient and have a low turnout. Meetings during the week from 3:00 p.m. to 7:00 p.m. are ideal.

Response: BOEM announced its intent to hold public hearings for the Draft PEIS for the Proposed 5-Year OCS Oil and Gas Leasing Program for 2012-2017 in a *Federal Register* Notice that was published on November 11, 2011 (<https://www.federalregister.gov/articles/2011/11/10/2011-29152/draft-programmatic-environmental-impact-study-peis-for-proposed-5-year-outer-continental-shelf-ocs>). The PEIS document was posted the same day of the Secretary's announcement of the proposed 2012-2017 Program on November 8, 2011. Hard copies of the PEIS were also sent to Alaska libraries (including universities, colleges, and public libraries) prior to filing the PEIS with the U.S. Environmental Protection Agency (USEPA). A complete distribution list can be found in Section 8.3.

The list of libraries that were sent a hard copy is presented in Section 8.3, and is posted here: http://www.boem.gov/uploadedFiles/BOEM/5-Year/2012-2017/PEIS/2012-2017_Draft_PEIS_library_list.pdf.

Public meetings were scheduled and held in full consideration of the Christmas holidays, with the first meeting beginning on December 5, 2011, in Wainright, Alaska. Eight more public meetings were held in Alaska, with the last one taking place on December 16 in Barrow, Alaska, at the Inupiat Heritage Center one week before the Christmas holidays. BOEM regrets that the 7-10 p.m. timeframe was inconvenient for some, although it was taken into consideration that meetings scheduled in the evenings are generally more convenient for most people because of other obligations during the day.

8. BOEM should develop and take public comment on a NEPA handbook designed to guide the agency's environmental analysis of OCS oil and gas issues. In a review of the Alaska Region office, the Government Accountability Office noted that "the lack of a comprehensive NEPA guidance handbook, combined with high staff turnover, leaves the process for meeting NEPA requirements ill-defined for the analysts charged with developing NEPA documents." The National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling recommended that BOEM, in consultation with the Council on Environmental Quality (CEQ), "develop and make public a formal NEPA handbook." The National Commission recommended that the handbook "provide guidelines for applying NEPA in a consistent, transparent, and appropriate manner to decisions affecting OCS oil and gas activities." Before BOEM undertakes any additional action in the Arctic that requires environmental analysis under NEPA, the agency should commit to developing and making available for public comment a NEPA handbook as recommended by the National Commission. The National Commission recommends that BOEM address the issue of tiering in the proposed NEPA handbook noted. (Ref: Government Accountability Office, GAO-10-276, *Offshore Oil and Gas Development: Additional Guidance Would Help Strengthen the Minerals Management Service's Assessment of Environmental Impacts in the North Aleutian Basin* (March 2010); National Commission on the BP Deepwater Horizon Oil

Spill and Offshore Drilling, *Deep Water: The Gulf Oil Disaster and The Future of Offshore Drilling* (Jan. 2011)).

Response: BOEM issued NEPA Guidance in September 2011 in response to a recommendation from the 2010 Government Accountability Office (GAO) report, in which it recommended that USDOJ develop and set a deadline for issuing a comprehensive NEPA handbook providing guidance on how to implement NEPA and periodically update and revise this guidance as needed. BOEM regional offices are continuing to develop internal guidance that is more appropriately tailored to their specific geographical jurisdiction.

9. In July 2011, the President established the Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska (“Working Group”) to, among other things, “engage in long-term planning,” facilitate sharing of scientific and cultural knowledge and traditional information, and coordinate scheduling of regulatory and permitting activities in the Arctic. The Proposed Final Program should clarify how BOEM will engage with the Working Group. Good faith participation in the National Ocean Council (NOC) process would facilitate improved communication and coordination among different agencies with respect to decisions about oil and gas. BOEM should provide the public with more information about how BOEM will use the “Working Group” to coordinate with other Federal agencies, share information, and inform management decisions about leasing activities in the Arctic. BOEM is encouraged to use the “Working Group” process.

Response: The Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska was established by Executive Order 13580 in 2011 and seeks to coordinate the efforts of Federal agencies responsible for overseeing the safe and responsible development of onshore and offshore energy resources and associated infrastructure in Alaska and to help reduce the Nation’s dependence on foreign oil. An entirely separate Executive Order (E.O. 13547 — Stewardship of the Ocean, Our Coasts, and the Great Lakes) issued in 2010 establishes a national policy to ensure the protection, maintenance, and restoration of the health of ocean, coastal, and Great Lakes ecosystems and resources, enhance the sustainability of ocean and coastal economies, preserve the Nation’s maritime heritage, support sustainable uses and access, provide for adaptive management to enhance understanding of and capacity to respond to climate change and ocean acidification, and coordinate with the Nation’s national security and foreign policy interests.

Executive Order 13547 also provides for the development of coastal and marine spatial plans that build upon and improve existing Federal, State, tribal, local, and regional decision-making and planning processes. These regional plans will enable a more integrated, comprehensive, ecosystem-based, flexible, and proactive approach to planning and managing sustainable multiple uses across sectors and improve the conservation of the ocean, coasts, and the Great Lakes. Please refer to Section 4.3.1 of the PEIS for further discussion of BOEM’s compliance with Executive Order 13547.

Therefore, these two initiatives are distinct and driven by separate directives, even though there are some overlaps in the issues that are being covered by each. Notwithstanding the foregoing, BOEM supports the implementation of E.O. 13580 by participating in the Alaska

“Working Group” as well as any future efforts on public outreach regarding this engagement, however, further discussion of this topic is outside the scope of this PEIS.

8.4.4.2 Issue 2 NEPA Analysis

1. The PEIS underestimates the risks and overstates the potential benefits of oil and gas OCS activity.

Response: The purpose of this PEIS is to identify and document the potential impacts of the proposed action and alternatives to the proposed action. In Chapter 4 of this PEIS, the effects of routine activities and cumulative effects associated with the proposed action are analyzed. BOEM also analyzes the potential impacts of a CDE.

The discussion of the potential benefits of oil and gas activity has been clarified in this PEIS. As a complement to the impact analysis and conclusions in this PEIS, Section 2.12 summarizes the conclusions of the cost-benefit analysis of the Program. The cost-benefit analysis compares the net economic value with the net social value, the latter of which includes environmental costs. The full cost-benefit analysis discussion can be found in the Proposed Final Program document. In addition, Section 4.5, Other Alternatives, has been expanded to include a more robust tradeoff discussion, including possibly foregone socioeconomic benefits.

2. BOEM should adopt the recommendations of CEQ and the National Commission on the Deepwater Horizon (DWH) event, including: reforming its NEPA compliance procedures and incorporating ‘worst-case scenario’ calculations from oil spill response plans into its NEPA documents. BOEM has not addressed NEPA actions with regard to lessons learned.

Response: BOEM prepares EISs when deemed appropriate, such as with this PEIS and multi-sale EISs. CEQ regulations require low-probability, catastrophic events to be analyzed if reasonably foreseeable. BOEM follows the CEQ regulations at 40 CFR 1502.22 in this regard. BOEM has made changes to its NEPA procedures and provides for wider use of EAs with opportunity for public comment on post-lease activities than prior to the DWH event. The PEIS has an expanded Section 4.3.3 to include not only past, but also current and likely future reforms by BOEM and BSEE that have come frequently from various independent investigations such as the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling. See Section 4.3.3.3.4 and response to Comment 3 in NEPA Process and Comment 1 in NEPA Analysis above.

3. BOEM should ensure that the 2012-2017 Program is part of a planning effort that acknowledges connections between marine, coastal, and terrestrial areas in the Arctic and balances energy extraction with conservation.

Response: BOEM agrees that the 2012-2017 Program should be integrated with connections between marine, coastal, and terrestrial areas in the Arctic and all of its planning areas; therefore, BOEM coordinates with other Federal, State, local, and tribal governments and

other groups and individuals that utilize various resources and geographic areas. See Section 4.3.3 for recent regulatory reforms implemented to reduce risk. BOEM must implement its programs in concert with USDOJ leadership, which seeks to minimize environmental impact and maintain a robust research program with its Environmental Studies Program.

4. What if there are drastic changes within five years?

Response: The Secretary of the Interior is empowered to cancel or postpone a lease sale, each of which was done in the GOM after the DWH event. The Secretary can also defer a lease sale area. The Secretary must also undertake annual reviews of the program per Section 18(e) of the Outer Continental Shelf Lands Act (OCSLA). That could be a mechanism to revise the program (i.e., delay or cancel sale) or reapprove a program. Enhanced Section 18(e) reviews will be done as a way to increase clarity. See Section 4.3.2 and the Proposed Final Program document for additional information.

5. While the PEIS indicates potential intensity of environmental harm from oil and gas exploration and drilling activities, it avoids concluding whether an impact will be “significant,” which is the main purpose of an EIS under NEPA. Instead, the PEIS provides over-simplified charts noting whether population-level impacts for biological and physical resources are expected to be “negligible, minor, moderate, or major” and whether the incremental contribution is expected to be “small, medium, or large.” Some explanation as to what these terms mean are found in the PEIS, but it is unclear how the terms are to be interpreted in relation to whether there will be a “significant impact,” which is the threshold requirement for preparation of a subsequent EIS. This is troubling given the history of using tiered analysis for offshore oil and gas to achieve categorical exclusions, which circumvent adequate safety and mitigation measures to protect against oil spills and other impacts. Further, the absence of a determination at the programmatic level as to whether activities could have a “significant impact” carries the potential for DWH event, the General Accounting Office “found considerable variation among MMS’s OCS regions in how they determine what constitutes a ‘significant’ environmental impact” (Ref: 177 See 40 CFR 1502.1 (“The primary purpose of an environmental impact statement is to serve as an action-forcing device...it shall provide a full and fair discussion of significant environmental impacts...”).

Response: NEPA’s significance threshold is of most importance when deciding how to analyze a proposed action. In the case of the 5-year Program, it was determined that significant impacts could occur to various resource areas. Therefore, an environmental impact statement was prepared instead of an environmental assessment. See Section 1.3.1 for a general discussion on the scope of this PEIS. The PEIS identifies the nature, extent, and magnitude of impacts that may be incurred by natural, physical, socioeconomic, and cultural resources and systems from routine OCS Program activities as well as from accidental oil spills. The assessment approach used for the analyses presented in the PEIS, as well as definitions of impact levels, are presented in Section 4.1.3, and the impact levels are identified on a resource-by-resource basis in the Chapter 4 of the PEIS. The assessment approach as well as the impact levels used in this PEIS are fully consistent with the NEPA-

required considerations of both context and intensity for determining significance (40 CFR 1508.27). There are many impacts that could be significant depending on many factors, including a possible unexpected CDE for which the impacts could be quite variable. BOEM has always recognized that a CDE has impacts that could be significant in any of its planning areas. A CDE is not part of the proposed action, but it is recognized and analyzed as a low probability catastrophic discharge event. BOEM regions have very different environments and types and levels of activities so it should be expected that there would be variation in how significant impacts are determined and why subsequent EIS's are prepared at later stages such as the lease sale stage. The fact that this PEIS was prepared is recognition of the fact that impacts from the proposed action could be "significant," but exactly when and where the impacts rising to the level of "significant" will occur cannot be determined until a later stage of OCS development.

6. The PEIS fails to meet NEPA requirements for the analysis of alternatives. BOEM failed to rigorously explore and objectively evaluate all reasonable alternatives to the Proposed Action, failed to do a thorough, comparative analysis of potential impacts at the programmatic level, and failed to include temporal or spatial deferral alternatives within a given planning area. The Department can and should do a more thorough and robust analysis of potential impacts and alternatives at the programmatic level. NEPA requires the Department to consider whether the agency can carry out proposed actions in a manner less environmentally damaging, and whether alternatives exist that make the action unnecessary.

Response: BOEM believes that analysis presented in the PEIS meets the standards of analysis prescribed by the CEQ and that the alternatives analyzed in this PEIS represent a range of reasonable alternatives; the activities corresponding to each alternative are analyzed in view of current environmental standards, and the alternatives meet the purpose and need identified at the beginning of Chapter 1. Chapter 2 discusses the range of alternatives considered in this PEIS and includes those alternatives which are fully analyzed in this PEIS as well as those considered but eliminated from further analysis at this programmatic stage for various reasons. Alternatives not analyzed at this stage may be appropriate for re-consideration at the lease sale stage.

Considering alternatives suggesting specific spatial or temporal deferrals, it should be emphasized that portions of planning areas (subareas) can be deferred either at the outset of, or later during, a 5-year leasing program, at the Secretary's discretion. The Secretary may "carve out" deferral areas that are based on specific, established need and supported by adequate information, such as deferral areas selected in previous 5-year program alternatives and needed to continue protection of bowhead whale migration in the Beaufort Sea and coastal subsistence uses in the Chukchi Sea.

Detailed analyses of the large number of proposed exclusions in different planning areas, which vary widely in spatial definition and the completeness of supporting scientific information, can be more meaningfully accomplished at the lease sale stage. The determination of other areal and temporal exclusions and restrictions will depend on the location of specific lease sale areas and whether exploration and further analysis of resource potential, environmental concerns, and potential effects on other uses such as subsistence and

fishing. New scientific information may become available or public input may be provided later in the Program in advance of actual lease sales that help inform such exclusion decision-making. The exclusion of specific areas or blocks within a planning area is generally considered at the lease sale stage of the Program or when specific OCS projects are being evaluated.

During scoping and the public comment period on the PEIS BOEM also received numerous comments about including an alternative that would delay both Arctic and Gulf proposed lease sales to the later years of an approved 5-year Program. Based on the Secretary's balancing decision of OCSLA factors, BOEM has already delayed Arctic sales and proposes to conduct those sales late in the Proposed Program; however, BOEM has not delayed sales in the GOM. The Secretary maintains the discretion to delay and/or cancel any lease sales in any OCS Planning Areas that are part of an approved program if he deems it prudent. Therefore, the concept and possibility of delaying lease sales is implicit in the alternatives presented in this PEIS.

Before a lease sale can occur, an additional NEPA document would need to be prepared for each of the OCS lease sale areas included in the proposed 5-year Program. These subsequent NEPA documents would focus in greater detail on local conditions in the lease sale area. During Program implementation, decisions on additional deferrals specific to that particular sale would be made. But it is generally premature to make those decisions now, particularly because if conditions described and evaluated in a 5-year PEIS changed during the Program as a result of new information, technologies, or other developments that mitigated the issues responsible for the deferral of a subarea, it would not be possible to restore the subarea for leasing during the existing Program if it were not included in the Program at the outset.

7. The PEIS should not assume that Alaskan oil and natural gas will only be transported via onshore pipelines. Tanker transport and a subsea pipeline should be considered and evaluated. The PEIS should include a discussion of the existing natural gas infrastructure and marketplace in North America.

Response: Section 1.2 has information on demand for oil and gas. Discussing all possible infrastructure and marketplace conditions is beyond the scope of this PEIS.

Onshore pipelines are the preferred transportation system for both oil and gas for engineering, economic and safety reasons. The analyses in the PEIS focus on the most likely and reasonably foreseeable activities. Additional discussions of all possible development strategies are beyond the scope of this general PEIS analysis. After leasing and exploration has resulted in the discovery of commercial size oil or gas pools, all aspects of development proposals would be analyzed before these plans are approved. At this time, BOEM does not know the location or characteristics of future commercial projects, so although the Bureau cannot categorically exclude any alternatives for development, it also must focus on the most reasonably foreseeable alternatives.

Several possible marine transportation scenarios were considered, including oil and liquid natural gas (LNG) tankering, but pipeline systems are clearly the most feasible for logistical, regulatory and economic reasons. Logistically, in the Arctic, sea ice conditions will continue

to inhibit marine traffic for the majority of the year — regardless of recent trends in summer open-water conditions. Shallow water areas near shore will restrict the size of tankers, so dozens of ships would be required to carry the same volume as a large diameter overland pipeline. Therefore, pipelines are anticipated to be used for Alaska operations instead of other marine transportation options. Economically, pipelines are a more efficient delivery system for both oil and gas, and marine transport is only used when conditions preclude pipelines. Our pipeline scenario represents the most reasonably foreseeable scenario for purposes of analysis. Many other scenarios are possible, although less likely, and it is not practical to analyze less-likely alternatives for transporting oil and gas from Arctic Alaska.

Either natural gas will remain stranded or it will be delivered to market through a future transportation system. To cover the range of possibilities, BOEM included three scenarios related to a range in oil and gas prices. Under current conditions (low gas prices and no transportation system), the more likely scenario is that gas remains stranded in northern Alaska. Assuming a transportation system is built, BOEM includes natural gas production for the mid- and high-price scenarios. Of the possible systems to transport gas, a large-capacity pipeline is the most feasible for logistical, regulatory, and economic reasons. LNG transport is a possible, but less likely, alternative than a large overland pipeline system.

In 2003, a new 40-year right-of-way was approved for the Trans-Alaska Pipeline System (TAPS). Shortly thereafter, an upgrade of the system's pump stations was completed. In 2009, a study was completed to analyze problems and possible solutions associated with low flow rates. The goal of these projects is to extend the economic life of TAPS while maintaining operational efficiencies and safety. This means that there is no fixed life expectancy, and a properly configured and maintained TAPS could continue to transport oil for many decades into the future. A detailed engineering review of the corrosion status and maintenance program for the entire pipeline infrastructure on the North Slope is far beyond the scope of this general PEIS, and BOEM believes the current analytical assumptions are reasonable.

Concerning references about elevated onshore pipelines to connect to TAPS, these general assumptions are part of the reasonably foreseeable scenario and are not taken from a published engineering feasibility study. Therefore, no reference can be supplied. However, before any new pipeline systems are built, detailed studies will be done to define optimum locations and designs to minimize environmental impacts. At this time, before commercial discoveries have occurred, it is premature to speculate on the site specific details or impacts of future pipeline systems across the North Slope.

8. There should not be numerical limits or pre-determined restrictions on the number of pipeline landfalls or the potential development of oil and gas resources in Alaska.

Response: BOEM determines the scenario based on past use and best available projections. The scenario is specifically designed in the PEIS to give the subject matter experts enough information to evaluate the general impacts from the proposed action. The Alaska-Arctic scenario described in Chapter 4.4.1.3 explains why no new pipeline landfalls or support bases are expected to occur in the Chukchi region. It is assumed that the required infrastructure would have already been constructed as a result of Lease Sale 193 activities.

9. The PEIS does not adequately take into account the effects of climate change and incorrectly claims that missing information pertaining to climate change impacts is not essential to a reasoned choice among alternatives. The PEIS wrongly claims that missing information pertaining to the impacts of climate change on marine and coastal birds is not essential to a reasoned choice among alternatives. BOEM's rationale for reaching this conclusion is that, because the information is missing for all alternatives, it is irrelevant in choosing among them (4-594). That suggestion is flawed for one simple reason: the Proposed Action and alternatives would affect climate change differently and so lead to different impacts on resources.

The effects of climate change may not be entirely clear, but the impacts of climate change would be different under the different alternatives considered in the PEIS. Better information on the effects of climate change on resource areas, which does exist in the literature, would allow for a more accurate understanding of the differential impacts of the alternatives, and thus allow for a more reasoned choice among alternatives. BOEM should correct its erroneous statement that missing information pertaining to the impacts of climate change is not essential to a reasoned choice among alternatives, and modify its PEIS to reflect this correction accordingly.

Response: The PEIS includes analyses of climate change as part of the baseline condition for several resource areas. Climate change is also analyzed and highlighted as an impacting factor in the cumulative impacts section for several resource areas. Scientifically credible information available at the time the PEIS was written was used, including updates between the Draft and Final PEIS. BOEM follows the CEQ regulations at 40 CFR 1502.22 regarding incomplete and unavailable information. BOEM disagrees that a clear distinction could be made among the alternatives for their impact on climate change. Instead, it is BOEM's finding that the alternatives, including the No Action Alternative, would not have a substantially different impact on climate change. Oil and gas are worldwide commodities controlled by complex economic markets and the lack of a lease sale or sales would not noticeably affect the global demand for or production of oil and gas. Climate change is a global issue that must be globally managed.

The PEIS considers how climate change, based on the observed changes that have been occurring during the past several decades, may affect baseline conditions of resources over the 40- to 50-year period during which oil and gas production could occur following lease sales under the Program. The effects of climate change on ecosystems are complex and non-uniform across the globe and vary among atmospheric, terrestrial, and oceanic systems. Considerations of climate change effects in OCS Planning Areas focus on marine and coastal system impacts, where environmental sensitivities are typically associated with increasing atmospheric and ocean temperatures, sea-level rise, and ocean acidification. These general categories of climate change responses are occurring in addition to human-induced pressures related to coastal population densities (e.g., land use changes, pollution, overfishing) and trends of increasing human use of coastal areas. The PEIS presents resource-specific discussions of the affected environment with discussions of the effects of ongoing, observable climate changes on those resources. In addition, the impacts of the continuing trend in climate change during the life of the Program are evaluated as well. Section 3.3 of

the PEIS contains a discussion of climate-change effects and baseline conditions, as do each of the resource sections.

10. Comments suggested that inadequate baseline science or information was currently available for some resources on the OCS, and moreover, without that information, potential impacts to those resources were difficult to evaluate. The PEIS does not properly deal with the fact that baseline information is missing and incomplete. BOEM has a duty to gather research when information is lacking.

Response: BOEM uses scientifically credible information that is available at the time the PEIS is written, including updates between the Draft and Final PEIS. BOEM follows the CEQ regulations at 40 CFR 1502.22 regarding incomplete and unavailable information. There is often uncertainty with respect to the context and intensity of impacts at the programmatic level of analysis. In instances of missing information related to resource impacts and mitigation for this PEIS, it was determined that the information was not essential to the Secretary's reasoned choice among alternatives at this broad, programmatic stage. If missing or unavailable information were to be arguably necessary to a reasoned choice among alternatives, the Secretary would treat this information as directed by the CEQ regulations implementing NEPA. Even in the face of unavailable information, the Secretary must maintain an oil and gas leasing program, but, at the lease sale stage, the Secretary does have the discretion to delay and cancel lease sales that are part of an approved 5-year Program. For example, if missing information is identified and it is deemed essential to a lease sale decision, the Secretary can cancel or delay the sale.

BOEM asserts that there is adequate scientific baseline knowledge of the OCS for the decision at hand, which is establishing a schedule of potential lease sales and framing the geographic scope for which OCS development can occur. If exploration and development occur as a result of the lease sale, each ensuing project would undergo additional environmental review and analysis that focuses on a smaller area, as mentioned above. Should the proposed 5-year Program be approved, subsequent NEPA documents would focus in greater detail on local conditions and identify additional mitigation measures relevant to the lease sale area. Therefore, in view of the increasing focus and specificity of NEPA documents that would occur if an approved 5-year program progresses to further stages, BOEM believes that the analysis in this PEIS is appropriate at this preliminary planning stage of the proposed 2012-2017 Program.

11. It would be helpful for the PEIS to provide more information on how BOEM will determine the appropriate level of NEPA documentation for actions "tiered" from this PEIS.

Response: Table 1-1 in the PEIS shows the various tiering stages. BOEM has clarified its commitments and procedures in the PEIS with regard to deferrals (see Section 4.3.2). The regional offices determine what level of NEPA documentation is needed based on many factors (e.g., see 40 CFR 1502.9(c)). BOEM follows CEQ regulations and guidance in determining the appropriate level of NEPA documentation for all Bureau actions. Generally, in the BOEM GOM Regional Office, the NEPA document would be an environmental impact statement (EIS) at the lease sale stage and an environmental assessment (EA) or

categorical exclusion review (CER) at the plan stage. Generally, in the BOEM Alaska Regional Office, the NEPA document would be an EIS for at the lease sale and EIS or EA at the plan stages due to the frontier nature of oil and gas activity in the Alaska region.

12. Section 1.3.1.1, Incomplete and Unavailable Information: The PEIS states that “CEQ regulations require an agency to obtain, or explain why it cannot obtain, relevant information about reasonably foreseeable significant adverse impacts that is essential to a reasoned choice among the alternatives presented in an EIS (40 CFR 1502.22).” However, the actual instructions concerning how to analyze incomplete or unavailable information in regulation 1502.22 have more detail than the quoted sentence suggests. We recommend revising this statement to better reflect the CEQ regulations.

Response: The discussion of incomplete and unavailable information, now found in Section 1.4.2 of the PEIS, presents a salient excerpt and points the reader to the full regulatory citation.

13. BOEM claims that deferring deepwater leasing would not be reasonable because allowing deepwater leasing strikes the right balance between potential benefits (specifically, helping to meet the Nation’s need for oil and gas) and adverse impacts, such as environmental damage to the ocean and coastal zone. How the PEIS arrives at this conclusion is not at all clear. Indeed, no analysis in support of this statement is conducted; it is simply stated as a self-evident truth. That approach is exactly backward. The purpose of an EIS is to evaluate the “comparative merits” of the Proposed Action and reasonable alternatives (40 CFR 1502.14) and then determine which action is most appropriate in light of the environmental impacts of each. In the PEIS, however, BOEM simply presumes that maximum oil and gas production — including deepwater leases — is more appropriate than an option that excludes deepwater leases. BOEM’s approach ignores the purpose of NEPA review by rejecting out of hand a reasonable alternative that would “avoid or minimize” the adverse environmental impacts of the 5-year Program (40 CFR 1502.1).

Response: Without new deepwater activity in the GOM for the Program, 93% of the expected oil production from the Program would become unavailable, essentially removing GOM oil production from the 2012-2017 Program (see Table 4.4.1-2 for depth-related scenario information). As discussed in Section 4.3.3, water depth is only one of many factors that control oil-spill risk (see Table 4.3.3-2 for a listing of these complex risk factors). While there may be greater logistical difficulties associated with containing a catastrophic discharge event in deepwater, the risk to environmental resources from shallow-water drilling in some circumstances could be greater because of the proximity to and greater likelihood of oil contact with many of those resources. Therefore, excluding deepwater from the Program does not necessarily equate to avoiding or minimizing adverse environmental impacts. In addition, excluding deepwater activity in the GOM for this Program does not stop any associated adverse environmental impacts that could occur from currently leased oil and gas activity in deepwater areas of GOM. BOEM’s rationale for not fully analyzing a GOM deepwater deferral has been expanded (see Section 2.9.7).

14. With the exception of the Central and Western GOM Planning Areas, all OCS Planning Areas would benefit from the addition of new geophysical seismic data. Doing so would help us understand what resources are subject to administrative withdrawals or moratoria, would better inform the decision making process for administrative withdrawals or moratoria during the length of the program, and would encourage interest in those areas if and when they are opened.

Response: The collection of geophysical data in OCS areas outside Program areas is beyond the scope of this PEIS. The PEIS considers the environmental effects of geophysical operations in the six planning areas under consideration.

15. A comprehensive, stakeholder-driven scientific research and monitoring program should be in place before BOEM decides whether and where leases should be offered on the OCS.

Response: BOEM has a robust research program with its Environmental Studies Program (ESP), which was initiated in 1973. BOEM's ESP in the Alaska Region alone has funded over 400 biological, physical oceanographic, contaminants, and socioeconomic studies for a total of over \$300 million and currently has 50 studies underway, 90% having to do with the Arctic offshore.

BOEM implements a concerted effort to find and fund relevant research in all of the regions where it is involved. The research is comprehensive, covering physical oceanography, atmospheric sciences, biology, protected species, social sciences and economics, submerged cultural resources and environmental fates and effects. The Environmental Studies Program Information System (ESPIS) is a searchable database of all completed ESP reports (<http://www.boem.gov/Environmental-Stewardship/Environmental-Studies-Program-Information-System.aspx>). It includes technical summaries of more than 700 BOEM-sponsored environmental research projects, and more than 2,000 full research reports. BSEE's Technology Assessment and Research (TAR) Program and Environmental Studies Program work in concert by conducting interdisciplinary cooperative research projects. These joint efforts allow for a broader research scope and help to maximize the efficient use of the funds available for studies. The TAR Program supports research associated with operational safety and pollution prevention as well as oil-spill response and cleanup capabilities. The TAR program was established in the 1970s to ensure that industry operations on the OCS incorporated the use of the best available and safest technologies.

See also comment responses in Issues 4 (Environmental Concerns), 5 (Cumulative Impacts), and 6 (Oil Spills) for more information on how the PEIS has been further expanded to address these concerns.

16. The PEIS does not contain a sufficient analysis of the impacts of the DWH event in the GOM in order to make a decision. The full impacts of the DWH event on the GOM are not yet understood. The ecological baseline in the Gulf has changed and the PEIS should be updated to include this information as well as lessons learned from the event.

Response: The purpose of the PEIS is to look at environmental impacts associated with a decision on a schedule of potential OCS oil and gas lease sales from 2012–2017. The full impact of the DWH event on the GOM probably will not be understood for many years to come and may never be understood. However, BOEM used the best available, scientifically credible information to update the Final PEIS. Chapters 3 and 4 of the PEIS have been updated with numerous references to peer-reviewed scientific information about the status of the GOM environmental baseline and the nature of the effects from the DWH event. In addition, the PEIS includes a much expanded Section 4.3.3 on risk that did not appear in the EIS for the 2007-2012 Program and within that Section, 4.3.3.3.4 discusses BOEM regulatory reforms as a result of the DWH event. Lessons learned and regulatory reforms will be an ongoing process.

BOEM implements a concerted effort to find and fund relevant research in all the regions where it is involved. Research covers physical oceanography, atmospheric sciences, biology, protected species, social sciences and economics, submerged cultural resources, and environmental fates and effects. The ESPIS is a searchable database of all completed ESP reports. It includes technical summaries of more than 700 BOEM-sponsored environmental research projects, and more than 2,000 full research reports. BSEE's TAR Program and ESP work in concert by conducting interdisciplinary cooperative research projects. These joint efforts allow for a broader research scope and help to maximize the efficient use of the funds available for studies. The TAR Program supports research associated with operational safety and pollution prevention as well as oil spill response and cleanup capabilities. The TAR program was established in the 1970s to ensure that industry operations on the OCS incorporated the use of the best available and safest technologies.

There is often uncertainty with respect to the context and intensity of impacts at the programmatic level of analysis. In instances of missing information related to resource impacts and mitigation for this PEIS, it was determined that the information was not essential to the Secretary's reasoned choice among alternatives at this broad, programmatic stage. If missing or unavailable information were to be arguably necessary to a reasoned choice among alternatives, the Secretary would treat this information as directed by the CEQ regulations implementing NEPA. Per OCSLA, the Secretary is not at liberty to delay the issuance of the entire 5-year Program due to the unavailability of the information, but at the lease sale stage the Secretary does have the discretion to delay and cancel lease sales that are part of an approved 5-year Program. For example, if missing information is identified and it is deemed essential to a lease sale decision, the Secretary can cancel or delay the sale.

At this stage, the Secretary is only establishing a schedule of potential lease sales and framing the geographic scope for which OCS development can occur. If exploration and development occur as a result of the lease sale, each ensuing project would undergo additional environmental review and analysis that focuses on a smaller area, as mentioned above. Should the proposed 5-year Program be approved, subsequent NEPA documents would focus in greater detail on local conditions and identify additional mitigation measures relevant to the lease sale area. Therefore, in view of the increasing focus and specificity of NEPA documents that would occur if an approved 5-year Program progresses to further stages, the Bureau believes that the analysis in this PEIS is appropriate at this preliminary planning stage of the proposed 2012-2017 Program.

17. Ecosystem-based models are needed to predict how expanded offshore oil and gas drilling in the GOM would impact the marine environment and resources. Fulton et al. (2011) demonstrates an ecosystem-based model called the Atlantis modeling framework, which has been used for decades for marine management decision making. This modeling framework is being coupled to climate, biophysical and economic models to help consider climate change impacts, monitoring schemes and multiple use management. This model could be utilized in the PEIS to give a comprehensive view of the impacts of oil and gas activities on water quality, air quality, greenhouse gas emissions, oil spill risk, affected habitats, subsistence communities and other resources. Using this model would greatly improve the PEIS by giving it a more encompassing view of oil and gas activities weighed against affected environments and the multiple long-term uses that have been described within the lease sale areas in the 5-year Program.

Another good example of an applied environmental sensitivity index is Grilli et al. (2011), which was used for offshore wind site assessment in the Rhode Island Special Area Management Plan. This model incorporates fisheries, recreation, and biodiversity to weigh the impacts of siting offshore wind in certain locations off Rhode Island. This model could be further scaled up to give an impact index for the 5-year Program's proposed oil and gas activities in the GOM Large Marine Ecosystem by incorporating multiple uses and biodiversity. These modeling studies will require consultation from NOAA and FWS about endangered species and commercially important species. In light of such a large stressor like the DWH event, it is even more imperative that the PEIS adequately model how the GOM has changed and how it could be further impacted by offshore oil and gas activities in the 5-year Program in order to make a reasoned decision amongst the alternatives.

Response: An ecosystem model is an abstract representation of an ecosystem which is developed to help understand how the actual ecosystem functions. It integrates known biological and physical data to help make predictions about how the ecosystem may react under different conditions. Ecosystems themselves are complex, with many interacting variables. Ecosystem models have to simplify these interactions using a limited number of variables that are well-understood. Ecosystem models are, by their nature, limited by the quality and completeness of the data used to develop them and by the scope of the objectives of the model design. Ecosystem models developed for a specific geographic area (such as Atlantis) may not easily transfer to other areas, because of the lack of comparable data inputs or differences in the importance of various ecosystem components to ecosystem structure and function. Specifically, the Atlantis model and methodologies like the Rhode Island Special Area Management Plan (SAMP) have only been implemented in a few small areas to address specific non-energy management concerns. The effort involved to scale these methodologies to the entire U.S.OCS would be a substantial, multi-year process limited by the intense data requirements noted above. BOEM is currently evaluating multiple potential methodologies to address the potential impacts of OCS energy development (including Atlantis and the Rhode Island SAMP) as the agency strengthens its analysis of relative environmental sensitivity, but it disagrees that a large-scale ecosystem model is essential to making a reasoned choice among the alternatives presented in the PEIS.

BOEM recognizes models can be useful tools to help understand what outcomes are expected under various conditions and uses models in the analysis of impacts for the 5-year Program and subsequent lease sales and plans. BOEM includes conceptual models for a wide range of individual resources in the 5-year PEIS (see Figures 4.4.7.1- 4.4.10.3) and incorporated NOAA's Environmental Sensitivity Index and coastal vulnerability indexes into its analyses. BOEM did not develop large-scale ecosystem models as part of the 5-year EIS process; such models might have value, but they would also have limitations, particularly at such a broad scale. The PEIS does, however, thoroughly evaluate the potential for impacts on individual resources within a broader ecosystem context.

18. Due to the extent of potential adverse impacts from offshore facility lighting with regards to protected birds and other species, and the options for reducing these impacts, we believe that a supplemental Draft PEIS must be prepared to ensure these issues are adequate to meet NEPA requirements for the Draft PEIS. While we recognize this can delay completion of the PEIS, the impacts that are not adequately addressed are significant as are BOEM's relevant legal obligations under Federal law.

Response: BOEM asserts that the PEIS currently addresses facility lighting issues sufficiently in the PEIS for the programmatic stage of the oil and gas leasing process. At this stage, the Secretary is only establishing a schedule of potential lease sales and framing the geographic scope for which OCS development can occur. If exploration and development occur as a result of the lease sale, each ensuing project would undergo additional environmental review and analysis that focuses on a smaller area. Should the proposed Program be approved, subsequent NEPA documents would focus in greater detail on local conditions and identify additional mitigation measures relevant to the lease sale area. Therefore, in view of the increasing focus and specificity of NEPA documents that would occur if an approved 5-year Program progresses to further stages, BOEM asserts that the analysis in this PEIS is appropriate at this preliminary planning stage of the Program.

19. The effects of hydrocarbon consumption that would be produced or not produced in the Proposed Alternative should have a direct bearing on the decisions regarding the proposed leasing program. This would assess the full footprint of the Proposed Alternative and must be included. The PEIS violates NEPA by failing to quantify greenhouse gas emissions within the scope of the 5-year Program.

Response: Consistent with judicial guidance, the USDOJ does not analyze the global environmental impact of oil and gas consumption in its NEPA documents as analyzing the entire gamut of activities that entail the use of the byproducts derived from OCS extraction would be considered too remote and speculative to permit any meaningful analysis.

20. It was suggested that the PEIS clarify that, in addition to re-gasifying LNG for import, an emerging trend in GOM LNG development is to liquefy the gas for export.

Response: The trend in exporting domestically produced LNG has been clarified in the PEIS in Section 4.6.1.2. Most natural gas is exported to Mexico or Canada; however, as an

overall trend, relatively more natural gas is imported. Authorization to export LNG is provided by the U.S. Department of Energy Office of Oil and Gas Global Security and Supply, Office of Natural Gas Regulatory Activities.

21. A national energy strategy should stress conservation, efficiency, alternative transit, and the development of diverse energy supplies due to concerns about climate change and other environmental impacts from fossil fuels. Alternatively, there were suggestions that a national energy strategy should incorporate responsible oil and gas development in addition to energy conservation and renewable energy. Instead of oil and gas development, BOEM should consider a national energy strategy that shifts away from fossil fuels and promotes investments in various renewable energies and conservation strategies. This strategy would mitigate climate change and promote green jobs and energy security/independence.

Response: The purpose of the proposed action is to prepare a schedule of potential OCS oil and gas lease sales to best meet national energy needs for the 5-year period following its approval. While we may agree that a national energy strategy is important, BOEM works within statutory and policy bounds and is not in a position to start developing a new national energy strategy.

BOEM believes that the alternatives analyzed in this PEIS present a range of reasonable alternatives to meet the purpose and need identified at the beginning of Chapter 1, and the activities corresponding to each alternative are analyzed in view of current environmental standards.

The role of energy conservation and renewable energy sources in meeting the energy demands of this country continues to grow. Such sources, however, could not replace the energy supplied by oil and gas from OCS sources in the near term. A more detailed discussion of alternative forms of energy and other energy substitutes for oil and gas appears in Section 4.5.7, which considers the environmental effects of the No Action Alternative. BOEM has an offshore renewable energy program committed to orderly, safe, and environmentally responsible renewable energy development activities, such as the siting and construction of offshore wind farms on the OCS, as well as other forms of renewable energy, such as wave, current, and solar. For more information about this Program, BOEM recommends that you visit the following bureau Web page: <http://www.boem.gov/Renewable-Energy-Program/index.aspx>.

While the Bureau's offshore renewable energy program seeks to expand and diversify the national energy portfolio, OCLSA mandates that the management of the OCS be conducted in a manner which considers economic, social, and environmental values of both the renewable and nonrenewable resources contained in the outer Continental Shelf. Notwithstanding the valuable contributions of renewable energy sources, OCLSA specifically mandates the development of an OCS oil and gas program every five years and renewable energy development is not yet a substitute for oil and gas development.

8.4.4.3 Issue 3 Alternatives

1. The inclusion of additional areas in the leasing program would encourage new investment in offshore exploration and eventually development - an investment that would create new jobs, generate billions of dollars in economic activity, and allow for the delivery of much-needed energy to American consumers, while continuing to reduce U.S. dependence on foreign energy resources. We encourage BOEM to continue to look for opportunities to bring potentially promising areas into the leasing program.

Response: There are 26 planning areas on the OCS, and 6 of these have been identified for leasing consideration as part of the Program (Figure 1-1). Twenty planning areas located along the Atlantic, Pacific, Florida, and Alaska coasts are neither part of the proposed action nor analyzed in any alternative considered in this PEIS. There is no requirement to include all OCS planning areas in the PEIS. On December 1, 2010, Secretary Salazar announced an updated oil and gas strategy for the OCS that recognizes a continuing Congressional moratorium in place for most of the Eastern GOM (Figure 1-2) and eliminates the Mid-Atlantic and South Atlantic Planning Areas from consideration for potential sales and development through the 2017 planning horizon. The Western GOM, Central GOM, Eastern GOM (only a very small portion thereof), Cook Inlet, Chukchi Sea, and Beaufort Sea OCS Planning Areas (Figure 1-1) are considered in the proposed Program and consequently analyzed in this PEIS. Although additional OCS areas were included in the Draft Proposed Program, the Secretary decided to exclude them from the proposed 2012-2017 Program after giving further consideration to the potential for environmental damage, the potential for the discovery of oil and gas, and the potential for adverse impact on the coastal zone in all OCS areas. The Secretary also decided to focus, in the Program, on areas with already-established leasing programs, although this could change in future 5-year programs.

2. Alternative 1 should be modified to delay GOM lease sales for 2012 or 2013 to allow time to analyze impacts of the DWH event. The PEIS violates NEPA and OCSLA by failing to consider an alternative that would forego any lease sales in the GOM Planning Areas during 2012 and 2013 so that additional data on the impacts of the DWH event can be gathered. The alternatives analysis is integral to an EIS and should ensure that decision-makers can consider “all possible approaches to a particular project (including total abandonment of the project) which would alter the environmental impact and the cost-benefit balance.” BOEM’s ability to cancel scheduled lease sales does not preclude its duty to conduct this environmental analysis. And while BOEM could analyze the impacts of canceling individual lease sales in subsequent EISs at the lease sale stage, that in no way negates BOEM’s duty to analyze, in this EIS, the environmental impacts of a programmatic alternative in which GOM lease sales are not scheduled at all in 2012 and 2013. This alternative would be reasonable and crucial to a reasoned choice among alternatives. In fact, by not considering the alternative, the PEIS is less able to achieve one of its stated purposes. If lease sales in the GOM were canceled for 2012 and 2013, oil and gas companies could still explore for oil and gas on thousands of preexisting leases; oil and gas companies currently hold 4,251 leases in the GOM that are inactive, meaning they have no approved exploration or development plan, roughly double the number of active leases in the Gulf (*U.S. Department of the Interior Oil and Gas Lease Utilization – Onshore and Offshore*, Report to the President, Mar. 2011,

pg. 4). These inactive leases, according to the Department of the Interior, contain approximately 70% of the Undiscovered Technically Recoverable Resources in the GOM, totaling 11.6 billion barrels of oil and 59.2 tcf of natural gas. The Secretary also decided to focus, in the 2012-2017 Program, on areas with already-established leasing programs, although this could change in future 5-year programs.

Response: The OCSLA mandates that the Secretary prepare a schedule of proposed lease sales every five years. OCSLA also mandates that the Secretary select the timing and location of leasing in consideration of a proper balance among the potential for environmental damage, potential for the discovery of oil and gas, and the potential for adverse impact on the coastal zone. The Secretary must see that lease sales are conducted in an expeditious manner. These tenets clearly define the purpose and need of the proposed action. This PEIS was prepared to meet that obligation and help inform the Secretary's decision as to where and when those lease sales may be held. The consequences of approving the proposed program would be to establish a schedule for one or more lease sales within the areas included in the program, but that does not guarantee that any particular sale will occur; a scheduled lease sale can be canceled if deemed necessary in the future. Before any lease sale can occur, additional NEPA documents would be prepared for the OCS lease sale areas included in the 5-year Program, as is currently being prepared in the GOM for potential Western and Central Planning Area lease sales.

The PEIS does not include a specific alternative to delay lease sales in the GOM to allow for more time to analyze the impacts of the DWH event or allow the Gulf ecosystem to recover from oil spill effects. A different but practical equivalent of this alternative (i.e., delaying sales until oil spill response and drilling safety reform is complete), was considered, but eliminated from further evaluation as an alternative. Section 2.9.3 has been revised to address the recommendation to delay lease sales until more information is gathered regarding the DWH event.

BOEM does not analyze the suggested alternative to delay leases in the GOM until more information about the post-spill baseline condition is available because this is a decision that can best be made at the lease sale phase and is largely already embodied in the No Action Alternative considered for each individual lease sale. In previous 5-year EISs, BOEM's predecessor, the Minerals Management Service, evaluated alternatives to slow the pace of leasing with the stated objective of giving affected governments and communities more time to plan for and address sale-related impacts. However, an option to hold fewer or delay lease sales was limited to areas where leasing was not already occurring.

In the GOM, where annual lease sales are anticipated, holding relatively fewer or delaying a few lease sales does not necessarily equate to significantly less cumulative OCS activity in the present or next few years. Under a fewer or delayed Gulf lease sales scenario, BOEM still expects that most of the OCS activity that could occur over the next few years will occur under leases issued pursuant to previously approved 5-year Programs, already approved or imminently approval plans, new geophysical and geological permit applications, etc. These activities can even occur in the absence of a new 2012-2017 Program with or without another lease sale, that corresponding level of activity may influence the recovery of the GOM ecosystem. However, deferring an entire 5-year Program of lease sales in the GOM, or in

either the Central or Western Planning Areas, could have an important effect in reducing the level of OCS activity at some point in the future; therefore, those alternatives are considered in the PEIS.

Holding fewer Gulf lease sales later in the 2012-2017 Program may result in a relatively minor incremental decrease or delay in the number of seismic surveys occurring in support of a new lease sale and, potentially, fewer exploration operations may proceed through the Exploration Plan, OSRP, and Application for Permit to Drill (APD) approval process following the first lease sales in the Western and Central Planning Areas. The context is fundamentally different from the Arctic, where a delay is proposed because of lack of ongoing activity and that delay will allow BOEM and BSEE to collect new data related to proposed exploration activities under previous lease sales. Even in the absence of new lease sales in 2012 and 2013 in the GOM, it is possible that industry would elect to develop existing leases, resulting in no net change in the level of overall activity. Similarly, in the longer-term reasonably foreseeable future, it is possible that holding fewer lease sales in this 5-year Program may or may not affect the overall cumulative activity in the GOM over the 40–50 year life of the program. If OCS activities remain confined to acreage currently under active lease at the start of the program, OCS operators would likely proceed on leased acreage while exploration, delineation, and development strategies would be re-evaluated in consideration of restricted access to acreage that, if acquired, could have served to improve the delineation of their oil and gas prospects. New lease terms were put into place for Lease Sale 218 and combined Lease Sales 216/222 during the last sales under the 2007-2012 Program to in part incentivize industry to re-evaluate its portfolios of leases and develop leases more quickly. Industry may perceive these policy changes as a signal of future access restrictions and may react by increasing its bidding activity on tracts in available areas under later 2012-2017 lease sales in order to improve its acreage position. Restricting access to acreage available for lease in space or time will challenge industry to reallocate and re-prioritize assets; however, the nature of this re-distribution is somewhat speculative and will not be carried out only within the confines of the U.S. OCS.

If the 1989 Valdez incident in Prince William Sound is a corollary, a definitive scientific understanding of the environmental impacts of the DWH event may take a very long time to achieve through the pre-assessment and injury-assessment phases of the Natural Resources Damage Assessment (NRDA) process (i.e., well beyond a 2-year horizon). Under the provisions of the Oil Pollution Act, the NRDA Trustees are collecting valuable scientific data to help define the extent of impacts and loss of public resources realized during and following the DWH event. This also necessitates consideration of the extent to which the Gulf ecosystem is resilient and has inherent capacity to recover. BOEM is a cooperating agency on the NRDA Programmatic EIS currently being developed to evaluate a range of restoration alternatives to compensate the public and the environment for loss of natural resources and services due to the DWH event.

This PEIS was prepared to provide the Secretary of the Interior with best-available environmental information to consider when developing a national schedule of OCS oil and gas lease sales for the 2012–2017 timeframe. Again, the Secretary maintains the discretion to postpone or cancel lease sales at any time, or suspend operations if scientific evidence indicates it is prudent to do so.

To make sure that this issue is memorialized in the PEIS, BOEM has included a new section (Section 4.3.2) in the Issues of Programmatic Concern in order to facilitate the process of considering and evaluating different alternatives and mitigation strategies that may need to be applied at appropriate program decision points. Consistent with the NEPA Task Force recommendation, the PEIS provides a roadmap, explaining where and when deferred issues raised by the public and/or regulatory agencies will be addressed. Chapters 1 and 2 of the PEIS explain how more detailed analyses in subsequent lease sale NEPA documents will evaluate the need for specific mitigation in different program areas. Section 4.3.2 also describes the process BOEM will follow during program implementation to ensure focused leasing alternatives will be tracked and evaluated during the program, along with mechanisms for stakeholders to engage in and contribute to the lease sale alternative evaluation and development process.

3. BOEM should have made allowances for partial leasing of each of the OCS planning areas.

Response: Portions of planning areas (subareas) can be deferred either at the outset of, or later during, a 5-year leasing program, at the Secretary's discretion. The Secretary may "carve out" deferral areas that are based on specific, established need and supported by adequate information, such as deferral areas analyzed and selected in previous 5-year program alternatives and needed to continue protection of bowhead whale migration in the Beaufort Sea and coastal subsistence uses in the Chukchi Sea. Detailed analyses of the large number of proposed exclusions in different planning areas, which vary widely in spatial definition and the completeness of supporting scientific information, can be more meaningfully accomplished at the lease sale stage. The determination of other areal and temporal exclusions and restrictions will depend on the location of specific lease sale areas and whether exploration and further analysis of resource potential, environmental concerns, and potential effects on other uses such as subsistence and fishing. New scientific information may become available or public input may be provided later in the Program in advance of actual lease sales that help inform such exclusion decision-making. The exclusion of specific areas or blocks within a planning area is generally considered at the lease sale stage of the Program or when specific OCS projects are being evaluated. Please refer to Section 4.3.2 for a description of the process BOEM has committed to during program implementation to ensure focused leasing alternatives will be tracked and evaluated during the Program, along with mechanisms for stakeholders to engage in and contribute to the lease sale alternative evaluation and development process.

4. The PEIS includes minimal discussion of Alternative 5 to exclude the Beaufort Sea Planning Area and Alternative 6 to exclude the Chukchi Sea Planning area for the duration of the program. The discussion is limited to one short paragraph for each alternative, concluding only that "the potentially available resources" that would "not be made available" under these alternatives include: "as much as 0.4 Bbbl of oil and as much as 2.2 Tcf of natural gas" for the Beaufort Sea Planning Area and "as much as 2.1 Bbbl of oil and as much as 8.0 Tcf of natural gas." The PEIS lacks a discussion of the advantages of excluding these regions from lease sales — such as avoiding the numerous potential significant impacts to the ecological and economic health of the region that could result from oil and gas drilling. Without this

evaluation, it is impossible for the PEIS to provide “a clear basis for making a reasoned choice among the alternatives by the decision-maker.”

Response: Section 4.5 of the PEIS describes the potential effects associated with each of the action alternatives considered. Sections 4.5.4 and 4.5.5 generally considered adverse effects avoided by not pursuing oil and gas exploration and development activities in the Beaufort Sea and Chukchi Sea Planning Areas, respectively. The PEIS has been revised to better characterize the possible beneficial effects of pursuing those alternatives, which are inherently related to avoided adverse effects. The potential for different economic effects under those exclusion alternatives is also presented in Section 4.5 and Section 2.12.

5. BOEM must revisit its analysis of the “No Action Alternative” in order to more fully depict the potential benefits of no action, ensuring that costs are depicted appropriately for the Arctic region, appropriately incorporate conservation and efficiency, and include a discussion of an option value. Once it corrects those failings, BOEM must use this information in the PEIS to more accurately reflect the costs and benefits of alternatives relevant to the Arctic Ocean.

Response: BOEM has revised the effects analysis of the “No Action” Alternative (Alternative 8; see Section 4.5.7). BOEM has incorporated by reference the Energy Alternatives and the Environment Report (OCS Study BOEM 2011-051), which provides the underlying energy substitution scenario, including estimates of substitutions across energy sectors that may be reasonably expected under that alternative. A redacted, preliminary version of the draft report formed the basis of the discussion of the No Action Alternative in the PEIS. BOEM has revised the Energy Alternatives and the Environment Report to address relevant comments received on the PEIS and Proposed Program. In turn, the No Action Alternative content has been revised in the PEIS. In addition, the PEIS incorporates by reference and summarizes the cost-benefit analysis prepared under the Section 18 requirements of the OCSLA. The cost-benefit summary can be found in Section 2.12.12 of the PEIS. The underlying methodologies for economic analysis are described in a series of related reports (e.g., Economic Analysis Methodology for the 5-year OCS Oil and Gas Leasing Program 2012-2017 (OCS Study BOEM-2011-050) and Description of the Cost and Benefit Calculations in the Offshore Environmental Cost Model (no publication number is available).

The PEIS discloses potential adverse and beneficial impacts associated with the No Action Alternative, such as the potential for increased spill impacts from tankering in non-Arctic U.S. waters and avoided adverse impacts from no OCS oil and gas development and tankering in the Arctic. The Proposed Final Program depicts the monetized cost of pursuing the No Action Alternative in the Arctic Planning Areas. The PEIS and Proposed Final Program documents treat the potential for conservation and efficiency substitution, which were estimated as a 6% reduction in demand over the life of the program. The PEIS and supporting analytical documents have been revised to further clarify the nature of impacts under the No Action Alternative, incorporate the cost-benefit analysis per the CEQ requirements in 30 CFR 1502.23, and more fully discuss adverse and beneficial effects of the No Action Alternative, including potential economic ramifications. Note that the CEQ

requirement does not provide any instruction about the methodology and/or content of the cost-benefit analysis, but rather, simply states that if a cost-benefit analysis, in whatever form, is prepared, that analysis should be used to help aid in evaluating the environmental consequences of alternatives.

Option value is the sum of individuals' willingness to pay for maintaining or preserving a public good now for later or different use, even if there is little or no likelihood of actually ever using it, which has not historically been considered in BOEM's Section 18 cost-benefit analyses. It is discussed within the framework of the Fair Market Value analysis in the context of hurdle prices (p. 70-72 of Proposed Program). In the Proposed Final Program, BOEM has clarified that discussion addressing option value, which in turn has been incorporated by reference into Chapter 2 of this PEIS.

6. By not considering the potential for increased research and development and deployment of alternate/renewable energy sources, spurred by a reduced emphasis on oil and gas production, the PEIS fails to adequately characterize the potential for those alternatives to displace the oil and gas that would be produced under the Proposed Action. For example, the PEIS does not include assumptions about additional government investment in potential of electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs). This shortcoming does not apply only to the PEIS's discussion of EVs, but to its discussion of oil and gas action alternatives as a whole. Thus, the PEIS fails to properly substantiate its claim that alternate/renewable energy sources could not replace some or all oil and gas that would be produced under the Proposed Action. The Energy Information Agency's (EIA) energy projection is only one of many trusted sources that provide energy projections. The PEIS seems to ignore other trusted sources for energy consumption projections.

Response: The substitution effects anticipated by pursuing the No Action Alternative can be found in BOEM's Energy Alternatives and Environment report. The report has been incorporated into the discussion of the impacts of the No Action Alternative presented in the PEIS (Section 4.5.7) to provide BOEM's most current evaluations of energy substitutions for oil and gas and their near- and long-term market outlooks. As explained in another associated report, Economic Analysis Methodology for the 5-year OCS Oil and Gas Leasing Program 2012-2017 (OCS Study BOEM 2012-022, BOEM uses the MarketSim model to estimate the substitutions for offshore oil and gas production in the absence of lease sales in each of the areas. MarketSim calculates the energy market substitutions of additional imports, onshore production, and fuel switching, as well as reduced demand and consumption of oil and gas that could potentially replace OCS production. MarketSim models oil, gas, coal, and electricity markets under a special energy projection baseline run by the EIA's National Energy Modeling System (NEMS). The exploration and development scenarios from each Planning Area, summarized in Section 4.4 of the PEIS, are then introduced into the model as a shock to this special baseline, triggering a series of simulated price changes until each fuel market reaches equilibrium or supply equals demand. The MarketSim uses elasticities derived from the special EIA NEMS runs and elasticities from other credible elasticity studies to estimate the changes that would occur to prices and energy production and consumption through 2064.

BOEM maintains that the EIA information is an authoritative source where the underlying assumptions regarding each energy sector are clearly specified in source documentation. In this specific analysis, MarketSim incorporates a modified NEMS version of the EIA's 2009 Annual Energy Outlook (AEO) reference case (updated to reflect the American Recovery and Reinvestment Act). The AEO reference case is normally based on baseline assumptions for future OCS oil and gas leasing, but has been modified to assume no OCS leasing. The modified version is prepared by EIA at BOEM's request. Each energy sector is modeled separately for residential, commercial, industrial, and transportation demand with the own-price and cross-price elasticity specific to each submarket and fuel. NEMS also includes macroeconomic and international modules to address concerns like those raised in this comment about policy decisions that potentially affect energy demand and consumption. Each module incorporates the potential impact of government policies combined with the most likely trajectories for primary energy prices, technology adoption, and global economic growth. In order to produce a policy-neutral forecast, the AEO reference case used in NEMS incorporates only existing laws, rules, and regulations, taking into account the effective start and end date of each. The discussion of energy alternatives in this paper demonstrates the potential — independent of OCS leasing decisions — for reduction in oil and gas demand, both from increased efficiency and the transition to alternative fuels. To explore the impact of these factors, the EIA's AEO Outlook analyses also include a number of "side cases" that look at the impact of deviations from the baseline assumptions used in the reference case. The Energy Alternatives and Environment report has been revised to more clearly address side cases: policies and standards cases, technology cases, and greenhouse gas cases.

In general, the side cases illustrate the potential variability in future energy market conditions and examine many of the substitution opportunities already discussed in the No Action Alternative. The changes under these cases generally include reductions in overall energy consumption and may also accelerate the shift away from oil and gas; however, the alternative energy substitutes do not alter the fundamental dependence of the U.S. economy on oil and gas, or at least, reduce oil demand to the point that the United States would become a net exporter. Furthermore, the impact of any of these NEMS side cases would likely affect all alternatives, not just the no action alternatives. Therefore, the relative percentage changes of substitutions under the No Action Alternative are unlikely to change significantly under alternate NEMS cases. For this reason, BOEM does not conduct detailed MarketSim analyses for each side case and different set of policy assumptions. Finally, it is important to note that the Secretary's authority is generally confined to a decision on the oil and gas leasing program options, not the national energy policy decisions that are embodied in the NEMS side cases. As a result, information based on the policy-neutral forecast in the AEO reference case (reflecting only current laws, rules, and regulations) is the most useful for the Secretary in making his decision. BOEM acknowledges that there are other factors beyond the Secretary's authority that could lead to innovations in energy efficiency and renewable energy technologies, major changes in consumer attitudes towards "green" energy, and unforeseen changes in global energy markets.

In summary, the MarketSim analysis indicates that increases in imports and domestic onshore production as well as fuel switching would be necessary to meet continuing domestic demand for oil and gas resources. Although the model provides estimates specific

to the anticipated production from each Planning Area, on average it indicates overall that most of the anticipated production would be replaced by increased oil imports, but with the remainder replaced by increased onshore gas production, gas imports, domestic coal production, electricity, onshore oil production, and other energy sources. As summarized in the PEIS in Section 4.6, the production reduction without new leasing would lead to slightly higher prices, which would lead to only a small change in the quantity of oil and gas demanded. Additional domestic production, increased imports, or fuel switching would be necessary to meet the continuing demand for oil and gas resources. Renewable energy contributions will account for less than around 2% of the substitution market, despite ongoing Administration initiatives to expand renewable energy sources on Federal lands and on the OCS.

7. Alternate/Renewable energy and energy efficiency need not replace all of the energy supplied by OCS oil and gas in order to be considered a viable alternative. Alternate/Renewable energy and energy efficiency would minimize significant impacts to the environment and create jobs, so an alternative that renewable energy can serve as a partial substitute for oil and gas leasing should be considered.

Response: Section 2.9.4 presents the rationale why BOEM has eliminated from detailed analysis the alternative of partial substitution of renewable energy sources. As summarized in Section 4.5.7, the reduction in production provided no new OCS oil and gas leasing in the next five years would lead to slightly higher prices which in turn would lead to only a small reduction in oil and gas demand and substitution towards renewable energy sources (~4% in biofuels, solar, wind, hydropower, etc.). Additional domestic production, increased imports, or fuel switching would be absolutely necessary to meet the continuing demand for oil and gas resources as the United States will continue to be a net importer of oil. Although BOEM recognizes recent advances in renewable energy technology, renewable energy-friendly Federal and State energy policy changes (e.g., Department of Energy and tax subsidies, State renewable energy portfolio standards), and increases in U.S. market demand and supply, renewable energy, under the present set of policy assumptions, is not a major partial substitute over the window of consideration. Although CEQ's Forty Questions indicates that BOEM should consider alternatives outside of the Secretary's jurisdiction, in certain circumstances, the investments and policy changes required to achieve such a significant policy shift are not reasonable or economically practical within the 2012–2017 framework. This fact supports a less searching treatment of partial alternative energy as a reasonable alternative to some oil and gas OCS development.

Consistent with judicial guidance on the 5-year Program, BOEM has incorporated by reference the Energy Alternatives and Environment report within the framework of the No Action Alternative to address the potential for substitution towards renewable energy sources. Within the constraints of the relevant authorities, the Secretary is already leading several initiatives to expand wind and solar energy development on Federal lands and on the OCS, such as Smart from the Start along the Mid-Atlantic coast. The Secretary has streamlined the regulatory burdens to facilitate renewable energy development and at the present time, there is no indication that, within market conditions, more can be done. If major policy changes were implemented over the 40–50 year life of the program, reduced

consumption and/or increases in supply of renewable energy may affect the energy alternatives/substitutions. The Energy Alternatives and Energy report discloses that potential. However, as long as the United States is a net importer of oil and oil prices are determined on a world market, the alternative energy substitutes would likely affect all alternatives.

8. BOEM's rationale for not considering a 'Develop Alternate/Renewable Energy Sources' Alternative is flawed and the Final EIS should include an alternative to develop alternative energy and energy efficiency in lieu of OCS leasing.

Response: Section 2.9.4 presents the rationale why BOEM has eliminated from detailed analysis the alternative of full or partial substitution of renewable energy sources. The role of renewable energy sources in meeting the energy demands of this country continues to grow. Such sources, however, could not replace the energy supplied by oil and gas from OCS sources in the near term. A more detailed discussion of alternative and other energy substitutes for oil and gas appears in Section 4.5.7, which considers the environmental effects of the No Action Alternative. BOEM has an offshore renewable energy program committed to orderly, safe, and environmentally responsible renewable energy development activities, such as the siting and construction of offshore wind farms on the OCS, as well as other forms of renewable energy, such as wave, current, and solar. For more information about this Program, we recommend that you visit the following bureau Web page:
<http://www.boem.gov/Renewable-Energy-Program/index.aspx>.

While BOEM's offshore renewable energy program seeks to expand and diversify the national energy portfolio, OCSLA mandates that the management of the OCS be conducted in a manner that considers economic, social, and environmental values of both the renewable and nonrenewable resources contained in the OCS. Notwithstanding the valuable contributions of renewable energy sources, OCSLA specifically mandates the development of an OCS oil and gas program every five years and, renewable energy development is neither a whole substitute nor a reasonable partial substitute for oil and gas development at this time. See also the response to Comment 7 in Alternatives.

9. The PEIS should thoroughly analyze an alternative to postpone the lease sales until the recommendations from the National Commission and the National Academy of Engineering are fully implemented.

Response: As described in the PEIS, BOEM has considered but dismissed the alternative to postpone leases until the recommendations of the National Commission, the National Academy of Engineering, and other review bodies, including the Department's own Inspector General, are fully implemented. As described in Section 4.3.3, the Secretary of the Interior has pursued and continues to pursue an aggressive reform with respect to the regulatory oversight of OCS oil and gas. Many of these reforms address the underlying criticisms that resulted in recommendations for reform. The assumption that postponing leases will ultimately result in reduced activity levels on the OCS in the same timeframe is flawed, as was previously explained in context of the recommendation to delay lease sales for two years to allow the GOM ecosystem to recover from oil spill effects. In the PEIS,

BOEM has further clarified its rationale for dismissal from further consideration in the PEIS of postponement of some or all sales. It also clarifies and explains that the Secretary maintains the discretion to consider the practical equivalent of the alternative suggestion at each lease sale and does so in the No Action Alternative considered at the lease sale stage. Moreover, consistent with BOEM's commitment to do so, Section 4.3 (Issues of Programmatic Concern) of the PEIS memorializes this alternative suggestion and will track its consideration through subsequent lease sales in the GOM, when it may be considered and analyzed if determined appropriate at the lease sale phase.

8.4.4.4 Issue 4 Environmental Issues and Concerns

8.4.4.4.1 Issue 4.1 General Concerns.

1. The Arctic is a fragile ecosystem that should receive special consideration; the PEIS should consider wide ecosystem impacts of a spill, and use an ecosystem approach when analyzing cumulative impacts. The PEIS should also consider climate change impacts at the ecosystem-level, and evaluate the cumulative effects of small oil spills on ecosystems.

Response: BOEM recognizes that oil and gas development may affect natural, physical, and socioeconomic resources in the Arctic. Each resource section presented in Chapter 3 of the PEIS includes a subsection that specifically identifies the Arctic resources that may be affected by normal operations and/or accidental oil spills. Similarly, Chapter 4 of the PEIS identifies and discusses potential impacts on the Arctic environment and its resources. Specific mitigation measures for minimizing or avoiding impacts during normal operations, as well as spill response plans, will be developed at the lease sale stage and in subsequent development activities. Cumulative impacts on the Arctic environment and its resources are presented in Sections 4.6.2.3, 4.6.3.3, 4.6.4.3, and 4.6.5.3.

2. The PEIS should include discussions of how climate change, and especially changes in ocean acidification, sea ice loss, water temperatures, and freshwater inflows could affect primary and secondary productivity and nutrient cycling, and the range extension of sub-Arctic species and thus affect coastal and marine food webs and biotic communities in the Arctic.

Response: The potential effects of climate change on coastal and marine environments and resources are discussed throughout the PEIS. Additional text discussing the potential effects of climate change (as associated with sea ice loss, increased ocean acidification, altered freshwater inflows, and increasing water temperatures) on primary and secondary productivity and food webs and associated effects on higher trophic levels, and range expansions of sub-Arctic species, has been added to several of the resource-specific discussions found in Chapter 3 of the PEIS.

3. The Draft PEIS fails to adequately analyze potential harm to the marine environment from noise impacts, including impacts to fisheries and marine mammals.

Response: The PEIS evaluates noise impacts on a variety of resources (see Chapter 4). Section 4.4.5 Potential Impacts on the Acoustic Environment examines the potential impacts of noise generated during routine oil and gas activities (such as vessel traffic, helicopter overflights, and seismic surveys) on ambient noise levels in the planning areas. BOEM does recognize the potential effects of operational noise (including that from seismic surveys), and noise-related impacts on marine mammals, marine and coastal birds, sea turtles, and invertebrates; these are addressed in the ecological resource-specific discussions of impacts found in Section 4.4.7 of Chapter 4. Those impact discussions have been revised to provide additional information regarding impacts. More detailed location- and resource-specific evaluations of noise impacts on resources will be conducted for lease sale activities and later NEPA documents. Compliance with ESA and MMPA will require consultations with NMFS and USFWS and will identify specific measures that will reduce the likelihood and magnitude of adverse impacts from routine operations to marine mammals (and other ESA-listed biota).

4. Biological hot spots and areas important for subsistence should be excluded from leasing plans. The USGS named a few of the known biological hot spots in its Arctic science review: Chukchi ice lead system, Barrow Canyon, Hannah Shoal, Point Barrow, Boulder Patch, and Camden Bay.

Response: BOEM recognizes the presence and importance of biological hot spots in the Arctic. Camden Bay and the Boulder patch are specifically discussed in Section 3.7.2.3 of the PEIS, and the importance of ice leads is discussed in Section 3.8.1.3. Section 3.9 of the PEIS also identifies other areas of concern such as marine protected areas. Potential impacts on these various areas are discussed throughout Chapter 4 of the PEIS. The potential for impacting important biological areas will be addressed in more specific detail at the lease sale stage, as will the identification of mitigation measures to avoid or minimize impacting important areas.

5. Oil spills have impacts that can adversely affect biota and ecosystems and must be accounted for, including the effects of long-term exposure.

Response: Chapter 4 of the PEIS discusses the impacts of oil spills, ranging in size from expected small accidental spills to unexpected catastrophic discharge events, on a resource-by-resource basis. The cumulative effects from long-term exposures are discussed in Section 4.6.4 Marine and Coastal Fauna.

6. Many sections of the Draft PEIS appear to utilize a single species approach when it comes to analyzing and describing impacts. Consider using an ecosystem approach for the cumulative impacts analysis. Suggest including a discussion on the food web and resulting ecosystem impacts.

Response: The discussion of cumulative impacts to biota, as presented in the PEIS in Section 4.6.4, does not focus on individual species, but rather, discusses impacts on entire categories (e.g., marine mammals, coastal birds, etc.). When individual species are

discussed, this is primarily in the context of providing examples of impacts. The text has been revised to present more of an ecosystem perspective, and text regarding the role of food webs in the movement of spill-related contaminants in affected ecosystems has been added to several of the fauna-specific impact sections in Chapter 4, as well as to the discussion of cumulative impacts on marine and coastal fauna in Section 4.6.4.

7. The Draft PEIS often broadly discusses biologic and physical aspects of Cook Inlet without regard for the specific area of the Inlet at issue, and there are important differences between these areas. The lower Inlet, in which the Federal lease sale may occur, is much different from the upper Inlet. Provide greater detail about the biological and physical aspects of Cook Inlet.

Response: The affected environment discussion of the Cook Inlet Planning Area focuses on the area itself, which encompasses the lower half of the inlet. Section 4.2.3 also discusses the physical oceanography in the Cook Inlet. The level of detail provided in the PEIS is appropriate and does include resource status throughout the inlet. For example, the discussion regarding water quality (Section 3.4.2) identifies flushing times, riverine and marine inputs, and longitudinal gradients of suspended sediments within the inlet, and the discussion of marine and coastal birds identifies important avian areas throughout the inlet (see Figure 3.8.2-8 in Section 3.8.2.2). Many of the impact sections also discuss potential effects on resources in the upper portion of the inlet. Should a lease sale occur, greater detail regarding the inlet would be provided as part of the lease sale stage activities and NEPA analyses.

8. BOEM should incorporate information about the effects of the DWH event and conduct studies to examine the decomposition and weathering of spilled oil and on the effects of dispersants on water quality and ecological resources.

Response: The programmatic-level NEPA analyses presented in the PEIS are appropriate for decision makers to make a general planning decision. The PEIS uses scientifically credible information and accepted scientific methods to make reasoned judgments and arrive at reasoned conclusions regarding the impacts and consequences of oil and gas development that could occur under the 2012-2017 Program. The PEIS discusses the effects of the DWH event on GOM resources throughout Chapter 3. Section 4.3.3 of the PEIS discusses the risk of spills (including large spills such as the DWH event), and includes a discussion of the breakdown and weathering of oil. In addition, the resource-specific impact discussions (beginning with Section 4.4.3) address the impacts of oil spills (including unexpected CDEs), as well as the impacts of cleanup activities, including the use of dispersants. These discussions have been updated to include more recent information. More detailed analyses would be conducted at later stages in the OCS leasing process. These analyses would incorporate the results of new studies that are currently underway regarding the effects of the DWH incident and the use of dispersants. There are currently numerous studies being conducted to support a Natural Resource Damage Assessment (NRDA) being prepared on the DWH spill. While much of the data and results of those investigations is currently unavailable, information from the NRDA studies will be included (as it becomes available) in lease sale and subsequent NEPA assessments. In addition, BOEM has a very robust research

program through its Environmental Studies and Technology Assessment Research Programs, and the results of applicable studies coming from those programs would also be incorporated into later lease sale studies.

9. There is no proven technology to clean up an oil spill in Arctic conditions with cold temperatures, limited ability, broken sea ice, and high winds. Oil and gas development can impact bowhead, walrus, fish, and other subsistence resources. There is little baseline science that exists to measure the effects of the spill on the Arctic ecosystem.

Response: BOEM has always recognized that a large spill could have significant environmental impacts, and also recognizes that spills occurring under winter Arctic conditions would be especially challenging to control and cleanup. In addition, the schedule for the proposed 2012-2017 Program provides that the first Arctic lease sale would not take place until 2015; leasing decisions made at that time would take into account any advances in spill response and cleanup technologies and comply with any new regulations and NTL's that may be issued by that time.

10. The Draft PEIS does not adequately account for the impacts of the Deepwater Horizon event or show the comprehensive impacts of the 5-year Program on GOM marine resources.

Response: The purpose of the PEIS is to evaluate the potential effects of oil and gas development (from routine operations, expected accidental spills, and unexpected CDEs) on the natural, physical, and socioeconomic environment, and not to evaluate the DWH event. The PEIS does discuss the impacts of the DWH event on the current conditions of physical, natural, and socioeconomic resources of the GOM. These impacts are discussed on a resource-by-resource basis throughout Chapter 3. BOEM addresses the relevance of incomplete and unavailable information as it relates to impacts in Section 1.4.2. The PEIS has been revised to incorporate new information that has become available since the publication of the Draft PEIS. In addition, Section 4.3.3 of the PEIS discusses in depth the risk of CDEs. More detailed analyses will be conducted at the lease sale stage of the Program.

11. Chapter 6 of the Draft PEIS fails to discuss the effects of climate change, ocean acidification, and the impacts of oil spills on short-term use and long-term productivity; there is no analysis cited to support the suggestion that the pre-2010 impacts of oil and gas production in the GOM have not had an impact on biological productivity.

Response: Chapter 6 has been revised to acknowledge the potential effects of climate change (including ocean acidification), and additional text has been added to Chapter 6 of the PEIS regarding the possible effects of oil spills (including CDE-level spills) on long-term productivity. Section 3.3 of the PEIS discusses the potential effects of climate change on baseline environmental conditions in the GOM and Alaska, including potential effects of sea level rise, ocean acidification, and other climate-related factors. While the DWH event clearly had short-term impacts on ecological resources in some portions of the GOM, it is too soon after the spill to draw any conclusions regarding the nature and magnitude of any long-

term effects of the spill. As results of current, ongoing, and likely future studies evaluating long-term impacts of the spill become available, BOEM will incorporate those results in its future assessments and future decision making regarding oil and gas activities on the OCS.

8.4.4.4.2 Issue 4.2 Climate. A number of comments discussed concerns related to climate change, usually in regards to effects to specific resources. These comments are addressed in other issue comment categories and responses.

8.4.4.4.3 Issue 4.3 Water.

1. USEPA recommended the insertion of the following language in Section 4.4.3.1.

“Permits issued under Section 402 of the Clean Water Act for offshore activities must comply with any applicable water quality standards and/or Federal water quality criteria as well as Section 403 of the Clean Water Act. Water Quality Standards consist of the water body’s designated uses, water quality criteria to protect those uses and determine they are being attained, and anti-degradation policies to help protect high quality water bodies. Discharges from offshore activities near State water boundaries must comply with all applicable State Water Quality standards.”

In addition, USEPA recommended that BOEM consider incorporating the water quality effects information contained in the USEPA Region 10 Ocean Discharge Criteria Evaluations (ODCEs) previously developed for the 2006 Arctic Oil and Gas Exploration National Pollutant Discharge Elimination System (NPDES) General Permit (<http://yosemite.epa.gov/r10/water.nsf/npdes+permits/arctic-gp>), as well as those that are currently being finalized for new Chukchi Sea and Beaufort Sea Exploration NPDES General Permits. USEPA Region 10 can provide copies of the latter documents when complete if they become available prior to the publication of the Final PEIS.

Additional information should be provided about the expired USEPA Region 10 Arctic Oil and Gas Exploration NPDES General Permit and the two separate permits that will be issued for exploration for the Beaufort and Chukchi Seas that will replace the Arctic General Permit.

Lastly, the entry for dredging and marine disposal in Table 4.6.2-1 (Section 4.6.2) should be clarified. USEPA is responsible for identifying recommended ocean disposal sites. USEPA and USACE are jointly responsible for management and monitoring of ocean disposal sites. USACE issues permits for ocean dumping of dredged material under the Marine Protection, Research, and Sanctuaries Act (MPRSA), subject to USEPA review and concurrence.

Response: The suggested language on Sections 402 and 403 of the Clean Water Act has been added into Section 4.4.3.1 of the PEIS. The water quality effects information contained in the USEPA Region 10 NPDES permit for oil and gas exploration have been incorporated into Section 4.4.3.3 of the PEIS. Information about the USEPA Region 10 NPDES permit

for has been added to Section 4.4.3.3 in the PEIS. Table 4.6.2-1 has been updated to clarify the entry for dredging and marine disposal.

2. What is the status of the DWH event? Is there oil still leaking through seeps?

Response: The DWH event was capped on July 15, 2010. Text related to the DWH event has been updated throughout the PEIS to incorporate recent information (see Section 3.4.1.4). Naturally occurring oil seeps can be found on the sea floor of the Gulf of Mexico, and the contribution of such natural seeps to petroleum hydrocarbons in Gulf of Mexico waters is discussed in Section 3.4.1.2.2.

3. Section 4.4.3.2 of the PEIS should mention that on October 31, 2008 the United States Environmental Protection Agency (USEPA) formally approved the State of Alaska's National Pollutant Discharge Elimination System (NPDES) General Permit program application. Authority is being transferred in phases. Phase IV, which includes the discharges associated with the oil and gas industry, will be transferred to the State on October 31, 2012. The Alaska Department of Conservation (ADEC) will authorize discharges after that date.

Response: Information on the NPDES authority transfer process has been updated in Section 4.4.3.2.

4. Section 4.4.3.2.1 of the Draft PEIS states: "The majority of wastes generated during construction and developmental drilling would consist of drill cuttings and spent muds (MMS 2002a). Drilling muds and cuttings generated when installing exploration and delineation wells would be discharged at the well site." Drilling muds are mentioned in many sections throughout the document. It would be helpful in all of these sections (not just in this one) if the reader was informed whether the muds associated with drilling in a particular geographic area were oil-based, synthetic-based, or water-based.

Response: Additional information about drilling muds has been added to the water-quality text of the PEIS. Discussion of specific drilling muds used at a regional level is beyond the scope of the 5-year PEIS and would be presented in a lease sale or project-specific EIS.

5. Section 4.4.3.2.1 of the Draft PEIS states: "Fill deposited during artificial island construction also increases turbidity." NOAA does not have any disagreement with this statement. However, NOAA is not aware of artificial islands being used in Cook Inlet for drilling.

Response: The reference to artificial islands in Cook Inlet has been omitted in the PEIS.

6. Section 4.4.3.3.2, Accidents: NOAA recommends clarifying the statement "A hydrocarbon plume in the water underneath the ice could persist with concentrations that are above ambient standards and background levels for a distance that would be five times greater than that in the open sea (MMS 2008b)." What is meant by "ambient standards"?

Response: Background conditions in the arctic are discussed in Section 3.4.3 of the PEIS. Text in Section 4.4.3.3 has been updated to reference the background conditions that are discussed in the Affected Environment section of the PEIS, Section 3.4.3.

7. Should the reference to “dispersant release” in Section 3.7.3.1.1 of the PEIS be changed to “dispersant application”?

Response: The text in Section 3.7 has been revised as suggested.

8. Clarify the studies and information presented in the Draft PEIS about the fate of the oil that was released during the DWH event.

Response: Further information and clarification about the fate of the oil that was released during the DWH event has been provided in Section 3.4, but many studies are ongoing, and may be for many years to come. Information from these and future studies will be evaluated and incorporated, when available, into future USEPA analyses conducted under the 2012-2017 OCS Leasing Program.

9. Section 3.4.1.4 of the Draft PEIS states, “The composition of the oil from the DWH event varies with the state of weathering of the oil; as the lighter-end components are removed from weathering process, only the heavier-end components remain (Core and Technical Working Groups 2010).” Should not this statement be revised to state that “only a portion of the heavier-end components remain” to clarify that heavier-end components are also partially weathered?

Response: Section 3.4.1.4 has been revised to clarify the meaning of this statement, and additional references have been added.

10. Section 3.4.1.4 of the Draft PEIS states, “Some of the constituents released during the DWH event evaporated at the surface or rapidly dissolved into the GOM waters before the oil reached the surface.” Should this statement include the fact that some constituents also underwent photo-oxidation at the surface?

Response: The text in Section 3.4.1.4 has been revised to include photo-oxidation in the list of processes and to include additional references.

11. Section 3.4.1.4 of the Draft PEIS states, “Evidence from the DWH event indicates that methane gas released from the well was rapidly broken down by bacterial action with little oxygen drawdown (Camilli et al. 2010; Kessler et al. 2011.” Should this statement refer to “natural gas” instead of “methane gas” because Kessler found that ethane and propane were also rapidly degraded, potentially even more quickly than methane?

Response: The text in Section 3.4.1.4 has been revised to reflect that in addition to methane gas, ethane and propane gases were also present in the DWH event release, and were consumed by bacterial action.

12. Should the discussion of the fate of the oil released during the DWH event in Section 3.4.1.4 of the Draft PEIS be expanded to include a discussion of biodegradation of other oil components in the water column and along the shoreline, as discussed in work done by Operational Science Advisory Team of the Unified Area Command (OSAT) and studies by Gong and others presented at IOSC and SETAC?

Response: The scope of this discussion is more appropriate for lease sale or project specific EISs. No changes were made to the PEIS as a result of this comment.

13. Section 3.4.1.4 of the Draft PEIS refers to the “four major constituents” of the chemical dispersant used during the DWH event. Should this phrase be changed to “four dispersant constituents” because the four items listed by BOEMRE are not the largest constituents of dispersants by volume?

Response: The text in Section 3.4.1.4 has been revised as suggested.

14. Section 3.4.1.4.1 of the Draft PEIS discusses “a large amount of data” collected during the NRDA process regarding the scope of oil contamination. Should this discussion note that the last observation of surface oil by trained aerial observers occurred August 3, 2010, as discussed in OSAT-1?

Response: This addition is not necessary for clarity. No changes were made to the PEIS as a result of this comment.

15. Section 3.4.1.4.1 of the PEIS states, “Within 3 km (2 mi) of the wellhead, however, concentrations of oil related chemicals in the deepwater sediments were still found to be elevated above benchmark concentrations for aquatic life (OSAT 2010).” Should this statement be qualified because not all samples in the region were above the benchmarks? Should this statement indicate that only “some samples” were above the benchmarks?

Response: The text in Section 3.4.1.4.1 has been revised to indicate that only some samples were above the benchmarks.

16. Section 3.4.3 of the Draft PEIS states, “Hydrocarbon concentrations in sediments of the Beaufort Sea are relatively high compared with other undeveloped marine areas (Steinhauer and Boehm 1992).” Should this statement be revised to reflect the fact that the Steinhauer study uses the terms “elevated” (not “relatively high”) and “non-polluted” (not “undeveloped”)?

Response: Page 249 of the Steinhauer and Boehm, 1992, report states that, “The relatively high concentrations of both saturated and aromatic hydrocarbons that constitute the sediment background in the Beaufort Sea may present difficulties in detecting low-level petrogenic inputs due to oil and gas-related activities.” The PEIS text in Section 3.4.3 has been revised to reflect that Steinhauer and Boehm, 1992, presented the Beaufort Sea sediments as “non-polluted.”

17. Section 3.4.3 of the Draft PEIS states, “Total hydrocarbon concentrations in sediments range from 2 to 85 milligrams per kilogram (mg/kg) (Steinhauer and Boehm 1992; Naidu et al. 2001; Brown 2003).” This statement is not included in any of the three references cited.

Response: The text in Section 3.4.3 has been revised to reflect the hydrocarbon concentrations presented in the studies cited.

18. Section 3.4.3 of the Draft PEIS refers to “concentrations of hydrocarbons at a sampling site near West Dock in Prudhoe Bay...” Should this statement specify that these were “PAH concentrations of hydrocarbons...”?

Response: The text in Section 3.4.3 has been changed to reflect that there were elevated concentrations of PAHs at the sampling site near West Dock in Prudhoe Bay.

19. Section 3.4.1.4 of the Draft PEIS states, “To evaluate the impacts of the DWH event on the environment, the USEPA has set benchmark concentrations of 41 compounds found in the oil from the DWH event for human health, aquatic health, and sediment (OSAT 2010). This statement could be clarified to better reflect USEPA’s selection of the benchmarks. Should the phrase “USEPA has set” be changed to “USEPA selected” and should the phrase “compounds found in the oil from the DWH event” be changed to “compounds typically found in oil”? Additionally, should “41 compounds” be changed to “43 compounds” because benchmarks were also developed for nickel and vanadium?

Response: Text was changed in Section 3.4.1.4 to reflect that the benchmarks were “USEPA selected.” No change was made to the text with regard to the composition of the oil that was released during the DWH event. The text has been updated to reflect that the human health benchmarks included those for nickel and vanadium.

20. Sections 3.4.1.4.1, 3.4.1.4.2, and 3.4.1.4.3 of the Draft PEIS state that “oil leaks from boats” could have been alternate sources of oil detected after the DWH event. Should this text also note that natural seeps are a common source of oil in the GOM?

Response: Reference to natural seeps has been added to the list of examples presented in Sections 3.4.1.4.2 and 3.4.1.4.3.

21. Section 3.4.1.4.3 of the Draft PEIS states that “seven sediment samples taken within 3 km (2 mi) of the wellhead exceeded the aquatic life sediment quality benchmark...” Should this statement indicate the total number of samples taken within the vicinity to clarify that not all samples exceeded benchmarks?

Response: The text in Section 3.4.1.4.3 has been modified to include the total number of sediment samples (17).

22. Section 3.4.1.4.3 of the Draft PEIS states that Camilli et al. “conducted a subsurface hydrocarbon study two months after the DWH event...” Should this statement clarify that Camilli et al.’s sampling occurred while oil was still being released from the wellhead?

Response: The statement in Section 3.4.1.4.3 has been clarified as requested.

23. Section 3.4.1.4.3 of the Draft PEIS states that Camilli et al. “found a continuous oil plume...” Should this statement be revised to refer to “dispersed oil” or “clouds of dispersed oil” to clarify that oil concentrations even in the so-called “plume” were in the low ppm to ppb range and that oil was not present in a continuous subsea “slick”? See Atlas & Hazen (2011).

Response: The statement in Section 3.4.1.4.3 has been clarified as requested.

24. In citing Camilli and Diercks, Section 3.4.1.4.3 of the Draft PEIS states that the “plume persisted for many months at this depth with no substantial biodegradation.” The Camilli and Diercks studies cited here were based on conditions during the spill and are not representative of the current state of the GOM, or biodegradation once the release was stopped. Should this discussion also reference Reddy et al. (2011)? This study notes that petroleum hydrocarbons had a degradation half-life of approximately one month, while the gas and n-alkanes had a half-life on the order of two days, which suggests that biodegradation likely rapidly depleted the subsurface dispersed oil once the release was stopped.

Response: Additional information and references have been included in the discussion of the DWH event that is presented in Section 3.4.1.4 of the PEIS. A reference to the study by Reddy et al. (2011) was added in Section 3.4.1.4, where the general fate of the released petroleum hydrocarbons is discussed. Additional discussion was added to Section 3.4.1.4.3 and clarification was provided that some of the studies cited, including the one by Camilli et al. (2010), were conducted while oil was still being released from the wellhead.

25. Section 3.4.1.4 of the Draft PEIS states that Camilli et al. (2010) “measured concentrations throughout the water column and found similarly high concentrations of aromatic hydrocarbons in the upper 100 m (328 ft).” Does this study in fact support this conclusion?

Response: Yes, the study supports the conclusion stated in the PEIS. The attenuation at 10-m depth that Camilli et al. 2010 are referring to is hypothesized by the authors to be due to ventilation to the atmosphere that occurred near the surface. No change has been made to the PEIS as a result of this comment.

26. Should the discussion of Joye et al. (2011) in Section 3.4.1.4 of the Draft PEIS mention the sampling period (May/June 2010)?

Response: The discussion in Section 3.4.1.4 has been updated to include sampling periods used by Joye et al. 2011.

27. Should the discussion of Joye et al. (2011) and Yvon-Lewis et al. (2011) in Section 3.4.1.4 of the Draft PEIS discuss Ryerson et al. (2011), which found “No CH₄ enhancements correlated with the spill were detected on either of the two P-3 survey flights; rather CH₄ variability is attributed to larger-scale atmospheric transport and mixing of air masses affected by sinks and sources unrelated to the spill. ...” Ryerson et al. (2011)?

Response: Information from the study by Ryerson et al. 2011 has been included in the updated discussion of the DWH event presented in Section 3.4.1.4.

28. Section 3.4.1.4 of the Draft PEIS states, “The fate of 771,000 gallons of chemical dispersants injected at the DWH wellhead near the seafloor (1,500 m [4,921 ft]) was studied by Kujawinski et al. (2011).” Should this statement be revised to indicate that the quantity of chemical dispersants was approximate? Should it also be noted that Kujawinski et al.’s results were for DOSS (dioctyl sodium sulfosuccinate), only one of the dispersant ingredients? Should it be clarified that Kujawinski found DOSS concentrations to be extremely low, and below aquatic toxicity levels?

Response: The text in Section 3.4.1.4 has been updated to clarify results of Kujawinski et al. (2011).

29. Section 3.7.2.1 of the Draft PEIS stated that impacts of a large spill “could be increased if they occurred in areas with degraded water quality, such as areas continuing to be affected by the DWH.” Should this statement reference the extent of the “area” still affected, which is relatively limited?

Response: BOEM has used the best available information at the time of publication of the FEIS to describe the area affected by the DWH event. NOAA, through the NRDA process, is still working to identify areas and resources affected by the DWH event. It should be noted that the area affected by the DWH event could expand or shrink over the years due to the influence of multiple factors.

30. Ocean discharge of a wide variety of waste streams also threatens to introduce toxins that can bioaccumulate in our food chain and disrupt the sensitive Arctic ecosystem.

Response: Sections 4.4.7.1.3, 4.4.7.3.3, and 4.6.4.3.1 of the PEIS discuss bioaccumulation related to the OCS program in the Arctic.

31. The approach stated in Section 1.5.4 of the Draft PEIS for evaluating water quality impacts focuses on effects on biological resources: “Water quality issues relate primarily to marine water quality and how changes in water quality could affect biological resources”. This statement should be expanded to clearly include human resources including public health, and traditional and customary uses.

Response: The PEIS discusses public health in Sections 3.15 and 4.4.14; water quality in Sections 3.4 and 4.4.3; and subsistence uses of resources in Sections 3.14, 3.15, 4.4.13, and 4.4.14.

32. Aquatic Life Benchmarks to estimate environmental toxicity do not reflect best available science. The Draft PEIS appears to rely heavily on the recommendations of the Aquatic Life Benchmarks developed during the BP/Deepwater Horizon incident in 2010. The PAH Benchmarks are useful because they are a measure of some of the most toxic compounds in crude oil, but they are not inclusive enough because they do not accurately measure the total toxicity of all substances in crude oil. Therefore, the toxicity of PAH Aquatic Life Benchmarks relied upon in this Draft PEIS are limited and not fully characterized. Nor does USEPA, the source of the Benchmarks, appear to currently have the resources to more fully evaluate toxicity of oil spills. The PEIS should recognize the limits of the Benchmarks and adjust assumptions to reflect those limits. Furthermore, recognizing limits in USEPA's ability to evaluate routes of exposure and mechanisms of toxicity of oil and oil-derived substances, BOEM should consider filling this gap through its environmental studies program.

Response: The USEPA is the principal source for toxicity information. It should be noted that the USEPA states on its website (<http://www.epa.gov/bpspill/health-benchmarks.html#gen2>) that "benchmarks are meant to be used for screening purposes only; they are not regulatory standards, site-specific cleanup levels, or remediation goals." In Section 3.4.1.4 of the PEIS, the OSAT report is cited and the evaluation approach of the OSAT is discussed in the context of providing information about the DWH event and how that event has shaped the baseline condition of the water quality in the GOM. Much data was collected in the wake of the DWH event, and studies continue to be published discussing and evaluating that data. The OSAT study is only one of many studies cited in the PEIS to characterize the baseline condition of the water quality in the GOM, and the PEIS does not rely solely on this source in its analysis. Observed impacts on the ecological environment as a result of the DWH event are discussed in Sections 3.7 and 3.8. No changes were made to the PEIS as a result of this comment.

33. Section 4.4.11.2 of the Draft PEIS should restate the predicted amount of turbidity and drilling wastes so that there is a reference point to compare it with river discharge. In addition, it should specify the time frame in which the discharge will occur. Claiming that the turbidity and discharge by exploration and development is less than naturally occurring river discharge is misleading. River discharge carries nutrients to the ocean, and the turbidity occurs near shore extending only a few miles offshore. Furthermore, river discharge is a seasonal and predictable event to which organisms in the near shore community have adapted to. The drilling sites may occur far away from any river discharge. Increased turbidity and discharge resulting from exploration and development may impact the phytoplankton community by changing its species composition to organisms that are adapted to low light levels and have lower levels of primary production.

Response: The text in Section 4.4.11.2 has been revised to address this comment.

34. Provide updated data concerning shoreline and nearshore impacts related to the Deepwater Horizon Event.

Response: The text in Section 3.4.1.4 has been updated to reflect new information on shoreline and nearshore impacts of the DWH event available at the time of publication of the Final PEIS.

35. Should the Draft PEIS be revised to incorporate references to studies showing that natural seeps are common in the GOM, as well as the 2009 MMS study finding that background levels of PAHs in sediments on the Outer Continental Shelf can be as high as 1000 ppb?

Response: The PEIS contains a discussion of natural seeps in the GOM (See Section 3.4 of the PEIS). A discussion of background levels of PAHs in sediments of the Outer Continental Shelf has been added to Section 3.4.

36. The Proposed Program notes that oil spills are unavoidable yet states that compliance with NPDES permits would reduce or prevent most impacts from normal operations. However, given the remoteness of the Arctic and the limited amount of development that currently exists, it is unclear whether sufficient government capacity is in place to ensure frequent monitoring and enforcement of NPDES permit terms. The Draft PEIS goes on to state that “in the presence of cold temperatures and ice, cleanup activities could be more difficult than in more temperate environments” (Section 4.4.3.4). Yet it goes on to conclude that a “large spill in coastal waters could result in longer term impacts on water quality, but cleanup efforts would reduce the likelihood of permanent impairment. A large spill in marine waters would be expected to have temporary impacts on water quality; however, cleanup efforts and evaporation, dilution, and dispersion would minimize the long-term impacts” (Section 4.4.3.4). This is an extraordinary and seemingly unsupportable conclusion, given the nation’s past experience with oil spills, especially in colder waters; the anticipated difficulties of response and clean-up efforts in the Arctic; and the known lack of significant response infrastructure.

Response: The USEPA is responsible for enforcement of NPDES permits. The information presented in Section 4.4.3.3 about oil spills in the Arctic has been updated.

37. The Draft PEIS estimates discharges of up to 12,000 barrels of drilling fluids and 12,000 tons of drill cuttings disposed in the Chukchi Sea (Section 4.3.3.3). Section 5.1 describes these discharges as having “unavoidable adverse environmental effects” and Section 4.4.3.4 states that “overall coastal and marine water quality impacts due to routine operations and operational discharges under the proposed action would be unavoidable.” These intentional discharges, however, are clearly avoidable. We request the final EIS include a discussion of the feasibility of zero discharges during exploration activities. If zero discharges are required for production, they surely could be avoided during exploration.

Response: The Alaska-Arctic scenario described in Section 4.4.1 includes a conservative estimate of the drilling fluids potentially discharged during exploration and development

drilling in order to ensure that all potential impacting factors and water quality effects are disclosed. It should be noted that all potential discharges, either from exploration or development operations, will require USEPA NPDES permits. In the past, a limited number of widely scattered offshore exploration wells in Alaska have been allowed to discharge the drilling wastes onsite. USEPA Region 10 is in the process of reissuing the expired Arctic NPDES General Permit for exploration drilling as two general permits (Beaufort and Chukchi GP). Information about the USEPA Region 10 NPDES permit for has been added to Section 4.4.3.3 in the PEIS. The areas of coverage include potential discharges from existing lease locations and future leases that might be sold during the 2012-2017 OCS Oil and Gas Leasing Program. USEPA has signaled its intent to eliminate the authorization to discharge non-aqueous drilling fluids and associated drill cuttings, allowing only water-based drilling fluids and cuttings to be discharged, and even the latter would not be permitted to be discharged during active bowhead whaling activities in the Beaufort Sea, unless the USEPA authorizes the discharge after review of the operator's evaluation of the feasibility of drilling facility storage capacity and land-based disposal alternatives. The discharge standard may change during the 50-year activity profile associated with the program. Individual operations may provide for zero discharge as recently proposed by Shell for exploration drilling operations in Camden Bay at the Sivulliq and Torpedo prospects. Onshore exploration wells are typically required to haul all wastes back to an offsite disposal facility. For offshore production operations (many wells drilled from a platform), the PEIS assumes that drilling wastes will have to be hauled offsite for disposal. In comparison, in the GOM the USEPA allows onsite disposal.

38. The statements in Section 4.4.6.3.3 of the Draft PEIS regarding discharge of drill cutting practices should be verified against current BOEM requirements and industry practices currently being allowed. Re-injection of produced waters should not be assumed. The PEIS should describe the discharge of produced waters in more detail, including the potential volume, possible petroleum content, and potential impacts to the environment.

Response: The Section 4.4.6.3 text states that “it is assumed that drilling muds and cuttings would be discharged in the Beaufort and Chukchi Sea Planning Areas for exploration wells only. Drilling wastes from development and production wells would be reinjected into the wells.” This description is consistent with the scenario described in Table 4.4.1-4. For further information, see the response to Issue 4.3 Water, comment number 37.

8.4.4.4 Issue 4.4 Air.

1. The Draft PEIS should be revised to reflect the transfer in air permitting in the Arctic OCS from USEPA to BOEM.

Response: Section 4.4.4.3 has been revised to indicate that jurisdiction for air permitting lies with BOEM and not USEPA, and a callout has been added to Appendix C, which discusses air-permitting authorities. The transfer of jurisdiction will not affect the conclusions regarding air quality presented in the Final PEIS.

2. Several comments noted the need to discuss icebreakers as important source of air emissions in the Arctic that is not present in the GOM.

Response: The discussion in Section 3.5.2.3 of icebreaker emissions was expanded based on the information in the referenced website, as applicable.

3. Several comments noted that the air quality data presented in the Draft PEIS needs to be updated.

Response: Air quality data were updated in Sections 3.5 and 4.4.4 with available recent data from the Alaska Department of Conservation.

4. USEPA recommends that the air quality analysis for future, project-specific EISs include the following, as appropriate, an evaluation of how the actions will comply with the new short-term 1-hr NO₂/SO₂ NAAQS and PM_{2.5} standards, and an updated Class I increment analysis for the Breton National Wilderness area.

Response: No text change required. In this PEIS, BOEM is only establishing a schedule of potential lease sales and framing the geographic scope for which OCS development can occur. If exploration and development occur following an actual lease sale, each ensuing project would undergo additional environmental review and analysis. These site-specific reviews would address impacts for all ambient standards in effect at that time and updated increment studies of affected Class I areas.

5. Section 3 — Affected Environment: Florida's State air quality standards and the nonattainment status of Hillsborough, Florida, which is a coastal GOM county, need to be updated.

Response: Text was revised in Section 3 to update the Florida standards and nonattainment status of Hillsborough, Florida.

6. USEPA questions the validity of the analysis in Section 4.4.4 of the Draft PEIS. Based on USEPA's review of the analyses provided, it is not clear that these conclusions are supported with respect to the new short-term NO₂ and SO₂ standards and the PM_{2.5} standards by ignoring the fact that SO₂ and NO₂ are precursors of PM_{2.5}, the time variation of NO_x emissions, and USEPA source-specific modeling indicating that near-shore drilling activities may have significant NO_x impacts. The studies used in the PEIS do not address PM_{2.5} impacts. USEPA is also concerned that future NEPA analyses required for the Lease Sales and Project Plan approvals may, as has occurred in the past, rely upon the more generalized analysis conducted in the PEIS, rather than provide the more detailed analysis that is needed to ensure protection of the NAAQS and coastal consistency.

Likewise, the conclusion that the Program will be well within the PSD increments does not appear to be supported for Class I areas. Given the year of the study used in the PEIS, it does not incorporate recently permitted sources, nor include emissions from sources located within

the lease blocks covered in this PEIS. The study also is reported to include only platforms and not exploratory operations. Hence, it is unclear whether it can be determined at this stage that impacts are “well within PSD increments” without more detailed analysis. USEPA recommends that the PEIS identify how the subsequent NEPA analyses for the Lease Sales for locations that may impact Breton will ensure protection of these sensitive Class I areas.

Response: No text change is required. There is often uncertainty with respect to the air impacts at the programmatic level of analysis. The PEIS used the information and studies available at the time it was written at that time, OCS activities had not been modeled to assess their potential impacts on the short-term NO₂ and SO₂ standards and the PM_{2.5} standards. Since that time, additional Prevention of Significant Deterioration (PSD) modeling has been done, and the text in Section 4.4.4 was updated to include results of this modeling for the Frontier Discoverer and Noble Discoverer drillships. BOEM recognizes the need to address these issues and standards and the PEIS used available data to make reasonable estimates of the likely impacts. It was not felt that detailed assessments of impacts with respect these standards were essential to making a reasoned choice between alternatives at the programmatic level. BOEM plans to use the most detailed information available at each step in its NEPA analyses from the programmatic down to the individual lease sale level. At this programmatic stage, BOEM is only defining the geographic scope within which OCS development can occur. If exploration and development occur following an actual lease sale, each individual project would undergo additional air review and analysis focusing on the specific project area and addressing all applicable ambient standards.

7. In Section 3.5.2.2 of the Draft PEIS, the statement that ambient air concentrations in Alaska, outside of the metropolitan areas, are below the NAAQS is not correct. Elevated levels of PM₁₀ and PM_{2.5} have been measured at various locations throughout the State. Ambient air outside may not always be in compliance with the PM₁₀ and PM_{2.5} NAAQS. We recommend revising this statement to reflect actual conditions.

Response: Text in Section 3.5.2.2 was updated based on the Alaska data referenced in the comment, as applicable.

8. The Draft PEIS discusses VOC (volatile organic compound) releases in Section 3.5.2.1 (“Evaporation from the oil spill itself would result in VOCs in the atmosphere.”). This discussion should include a discussion of the dissolution of lighter and more volatile oil components.

Response: There is no disagreement that atmospheric emissions could be affected by dissolution of certain fractions in the water. There is also no disagreement that VOCs would enter the atmosphere, regardless of the partitioning. Text was updated in Section 3.5.2.1 based on the reference to indicate, if supported by the reference, that lighter components dissolve preferentially in water.

9. The discussion in Section 3.5.2.1 of the Draft PEIS of SOA (secondary organic aerosols) should note that similar concentrations of SOA have been observed in urban data and note where that the measurements were not taken where the public has access.

Response: No text change was made. The concentration of SOAs in urban areas is not relevant. The text is limited to reported observations without attempting to account for them.

10. The Draft PEIS does not note that monitoring during the DWH response included more than BTEX (benzene, toluene, ethylbenzene and xylene) and the term “unmeasured” should be removed.

Response: Text was added to Section 3.5.2.1 to note that additional compounds were measured. “Unmeasured” was not removed, as it accurately reflects the reference cited in the PEIS.

11. The discussion of in situ burning in Section 4.4.4.1.2 of the Draft PEIS should include a discussion of the Nova Scotia Offshore Burn Experiments.

Response: The suggested reference for the Nova Scotia Burn Experiments was included and discussed in Section 4.4.4.1.

12. The discussion in Section 3.5.2.1 of the Draft PEIS of potential public health effects as a result of DWH event needs to account for evidence that the benzene measurements were unlikely to be attributable to evaporation from a surface slick, as measurement indicated that benzene was completely dissolved in the water column prior to surfacing. This discussion should note that short-term Louisiana benzene standard may have been exceeded as the result of numerous onshore sources. Should it also note that maximum onshore benzene concentrations measured by USEPA were higher than maximum offshore concentrations reported by BP, the National Institute for Occupational Safety and Health (NIOSH), and others, suggesting an onshore contribution?

Response: The discussion in Section 3.5.2.1 was supplemented with information from Ryerson, T.B., et al., 2011 (Atmospheric Emissions from the Deepwater Horizon Spill Constrain Air-Water Partitioning, Hydrocarbon Fate, and Leak Rate, *Geophysical Research Letters* 38:L07803), noting that most benzene dissolved in the water column based on the referenced study. The statement about levels being above the standard was modified to indicate that the standard was met even though individual samples may have exceeded the standard level. Text was added to Section 3.5.2.1 to include the information regarding onshore sources presented in the comment.

13. In Section 3.5.2.1, the Draft PEIS appears to compare short-term monitoring results taken during the DWH event response to Louisiana’s annual ambient air quality standard for benzene.

Response: The PEIS does not compare short term measurements to a long-term standard. It notes that even though some individual measurements exceed the long term value, the long term standard is still met (as invariably is the case for an average). However, the text in Section 3.5.2.1 was clarified to avoid confusion.

14. Section 4.4.4.1.1: The sentence about using low-sulfur fuel as a mitigation measure should be revised to indicate that low sulfur fuel and likely ultra-low sulfur fuel would only be available in the future.

Response: The comment incorrectly states that low- and ultra-low-sulfur fuel would only be available in the future. Refineries began producing ultra-low-sulfur diesel (ULSD) in 2006, and the use of low-sulfur fuels is specified in the USEPA Clean Air Highway Diesel final rule (see <http://www.epa.gov/oms/highway-diesel/regs/420f06064.htm>). The PEIS text was updated in Section 4.4.4.1 to indicate that low-sulfur fuel is not a mitigating measure, but a requirement.

15. Section 4.4.4.4: The first sentence in this section should end with the additional phrase “in onshore areas”.

Response: The text in Section 4.4.4 was revised as suggested.

16. For a single operator with a single exploration plan, proposed activities can result in consumption of almost the entire National Ambient Air Quality Standards (NAAQS). Therefore, BOEM cannot conclude that additional leasing will not impact compliance air quality standards or human health in the Arctic.

Response: No change was required. There is often uncertainty with respect to the air impacts at the programmatic level of analysis. Specific projects have not been proposed and the detailed data needed to accurately predict the potential impacts of OCS activities on NAAQS are unavailable. As discussed in Section 4.4.4, the PEIS assessed the potential impacts of OCS operations on the NAAQS using the information and studies available at the time it was written. At that time, it was felt that, in view of the unavailability of specific supporting data, detailed assessments of impacts with respect to these standards were not essential to making a reasoned choice between alternatives at the programmatic level. BOEM plans to use the most detailed information available at each step in its NEPA analyses from the programmatic level down to the individual lease sale level. At this programmatic stage, BOEM is only defining the geographic scope for which additional OCS leasing can occur. If exploration and development occur following an actual lease sale, each individual project would undergo additional air review and analysis based on detailed site-specific data. These reviews would include air quality modeling to address potential impacts of the specific proposal on all the NAAQS.

17. The discussion of ozone and ozone formation in Section 4.4.4.3 of the Draft PEIS is inaccurate and inadequate. The EIS concludes that “conditions in Alaska are seldom favorable for significant O₃ formation.” This conclusion is contrary to air quality monitoring data collected by ConocoPhillips and Shell on the North Slope. Moreover, the Draft PEIS says nothing about USEPA’s proposal to revise the standard. In light of the amount of background Ozone in the Arctic already, BOEM cannot ignore Ozone as a significant concern in the offering of additional leases in the Beaufort or Chukchi Seas.

Response: The text was updated where required in Section 4.4.4.3 using available data referred to in the comment. No changes were made based on what USEPA might do, what its opinion of USEPA's own standards is, or on proposed standards. An analysis based on proposed standards is inappropriate, as standards can change between proposal and promulgation.

18. BOEM cannot rely on the PSD increments to substitute for an analysis of air emissions impacts in the Arctic and the increments used are outdated. Section 4.4.4.3 of the Draft PEIS concludes that no modeling is required to analyze SO₂ and PM₁₀ emissions relying upon data from a 1991 MMS document on NO₂ emissions. The Draft PEIS also concludes that if NO₂ emissions are so low (1.29 µg/m³), no further analysis is necessary. However, this is factually incorrect. For example, Shell's air permits for the Discoverer showed modeling results far above the NO₂ concentration noted in the PEIS. Please ensure that you update the PEIS with current and real projections about the actual impacts that Arctic offshore operations will have on air quality.

Response: The text was updated in Section 4.4.4.3 to include the PSD increments that were promulgated after the publication of the Draft PEIS and to clarify the use of PSD increments in the air impact analysis as discussed in the next paragraph.

The analysis in the PEIS does not rely solely on PSD increments. It notes that, "The combined facility concentrations for Liberty plus background were well within NAAQS (between 2 and 30% of the standards)." Additionally, PSD increments are less than the corresponding NAAQS and, if a source meets an increment, that source alone will not cause a violation of the NAAQS. However a NAAQS analysis must also consider the contribution of other sources, often estimated by adding the source contribution to a background level as noted in the quote above. At the low impact levels provided in the references available for the PEIS, an analysis using PSD increments is reasonable. Even at the impact levels noted by the comment, which are about 10 times as large as those in the Draft PEIS, comparison with the PSD limits remains a valid indicator. The Discoverer permit was used as a source for PM_{2.5} impact estimates and the text in Section 4.4.4.3 was revised accordingly.

The PM_{2.5} PSD increments were included in the discussion in Section 4.4.4.3, and in Section 3.5.2.

BOEM plans to use the most detailed information available at each step in its NEPA analyses from the programmatic down to the individual lease sale level. At this programmatic stage, BOEM is only defining the geographic scope for which new OCS leasing can occur. If exploration and development occur as a result of an actual lease sale, each individual project would undergo additional air review and analysis based on detailed site-specific data. These reviews would include air quality modeling to address potential impacts of the specific proposal on all the NAAQS.

19. Section 4.4.4.2.2: The sections describing the air quality effects from oil spills, in situ burning and a catastrophic discharge event present different types of emissions for each region. Please identify if these emissions affect all areas or are specific to individual regions.

Section 4.4.4, Table 4.4.4-5: Because much of the activity in the Beaufort Sea and Chukchi Sea may be confined to ice-free portions of the year, it should be noted that the emissions will not be spread evenly over the year, but be condensed into approximately four months.

Response: The text was clarified in Section 4.4.4 to note whether there are expected differences in the emissions from in-situ burning in different regions. The discussions of CDE emissions in the two Alaska areas (Sections 4.4.4.2 and 4.4.4.3) refer to the GOM discussion and need no change. The discussions of spill emissions are essentially identical and need no change.

Text was added to Table 4.4.4-5 to note that emissions in Beaufort and Chukchi Seas will occur only during ice-free months.

20. In Section 4.4.4.1.2, the PEIS should specify where the measurements were taken and the relationship to the location of the public and workers; the discussion should also cite studies other than Schaum with significantly different measurements; the PEIS should clarify the term “small” by comparing it with standard reference values; and the use of Kuwaiti oil field fires should be supplemented with results from additional studies.

Response: The reference is a source characterization and emission factor development study, not an exposure study. To avoid misinterpretation, text was added to Section 4.4.4.1 to note where the measurements were taken and that the general public does not normally have access to these locations.

No change was required. The text fairly represents the results of the Schaum study and the reference to Schaum was not deleted. No additional studies were cited, as Schaum is an authoritative USEPA/NOAA study. The estimates from Schaum were included with the statement that the estimates “were below USEPA’s level of concern” of 10^{-6} .

Text was amended in Section 4.4.4.1 to note that there may be differences between burns in the desert and GOM environments. The PEIS text was expanded to include findings of other studies of health impacts of the Kuwaiti oil field fires.

21. The discussion of BTEX concentrations should be expanded to include comments beyond BTEX because significant sampling data is available to address the observed concentrations of other hydrocarbons.

Response: No text change was required. The context of the paragraph is the concern over benzene levels, not the broader issue.

22. The rationale for not calculating the GHG (greenhouse gas) emissions resulting from the combustion of oil and gas produced under the Proposed 5-year Program is flawed. BOEM claims that the scope of the PEIS is too limited to account for such emissions, stating that “consumption of oil and gas is considered at a broader level when decisions are made regarding the role of oil and gas generally, including domestic production and imports, in the overall energy policy of the United States” (1-18). However, under the No Action Alternative, reduced demand would substitute for 6% of the lost OCS oil and gas (4-496,

Table 4.5.7-1). Clearly, then, the Proposed 5-year Program does have a direct bearing on the general decision of how much oil and gas the nation will consume, and where that oil and gas will come from. Although BOEM cannot predict where OCS oil and gas will be combusted, BOEM can predict and quantify in what sector OCS oil and gas will be combusted and the consequent GHG emissions. Data are available from the EIA and USEPA giving projected levels of consumption of oil and gas by sector to 2035 and GHG emissions factors for oil and gas. These data could be used to estimate GHG emissions from oil and gas produced under the 5-year Program.

Response: No text change was required. At this programmatic stage, BOEM is only defining the geographic scope for which new OCS leasing can occur. This PEIS is only examining the emissions caused by oil and gas operations on the Outer Continental Shelf (see Section 1.5.5.5). Regulation of the use of these products onshore is the responsibility of other government agencies and should be analyzed in their NEPA documents. Information on when and how the produced oil and gas will ultimately be consumed is speculative and would not inform a decision as to where OCS leasing should occur. Also, see the response to Comment 20, Section 8.4.4.1 Issue 1 as well as Section 1.5.5.5.

23. Please add greenhouse gases or CO_{2e} to the discussion of thresholds for BACT

Response: The text was changed in Section 4.4.4 to acknowledge the 100,000/75,000 thresholds for CO_{2e}.

24. Section 4.4.4, Table 4.4.4-6: It would be useful to provide the total greenhouse gas emissions for the program in addition to the emissions by planning area.

Response: The program totals (three planning areas) for all three planning areas were added to the tables for each planning area.

8.4.4.4.5 Issue 4.5 Acoustics.

1. Several comments noted that the discussion of sound impacts to marine mammals and birds in the GOM should receive a similar detailed level of treatment as the sound impact discussion for the Arctic region.

Response: Text was updated in Sections 3.6 and 4.4.5 based on additional available studies that deal with the effects of noise on marine wildlife in the GOM. The discussions of sound impacts in each potential lease area reflect the availability of data, which varies between areas.

2. Several comments suggested using information from recent reports regarding background noise in the Arctic.

Response: Text was updated in Sections 3.6 and 4.4.5 to reflect the monitoring at Northstar Island and other relevant references as appropriate.

3. Several comments suggested that the Draft PEIS be updated to reflect the extensive references on marine mammals and listed species currently available.

Response: No text change was required. The discussions of the acoustic environment presented in Sections 3.6 and 4.4.5 address only the potential changes to the acoustic baseline conditions that could result with oil and gas development under the 2012-2017 Program. Impacts of noise on marine mammals, birds, fish, and other biota are discussed separately in Section 4.4.7. At this programmatic stage, BOEM is only establishing a schedule of potential lease sales and framing the geographic scope within which additional OCS leasing can occur. The National Marine Fisheries Service (NMFS) and/or BOEM are currently preparing EISs and other environmental analyses that characterize sound sources used in oil/gas activities and potential impact of these sounds on marine mammals and other marine resources. It is at this activity-specific level that a more detailed analysis as requested in this comment should be conducted. For more information, please see <http://www.nmfs.noaa.gov/pr/permits/eis/arctic.htm> (Arctic), and <http://www.nmfs.noaa.gov/pr/permits/incidental.htm> (for the GOM).

4. Noise from oil and gas activities is an important concern because of the potential to disrupt the migration of species used for subsistence in the Northwest Arctic Borough. There is no detailed discussion of the cumulative effects of noise on animals from oil and gas activities combined with other activities such as increased shipping. In addition, the discussion of natural background noise in Section 3.6.3.1 does not recognize the lack of information about the level of background noise. The 2011 report of the U.S. Geological Survey (USGS) contains a good discussion on this topic.

Response: The PEIS text was updated in Section 3.6.3.1 to reflect the information in the USGS report. In addition, NMFS is currently preparing an EIS addressing the effects of seismic surveys and exploratory drilling on marine mammals in the Arctic. BOEM and the North Slope Borough are cooperating agencies. BOEM anticipates that this document will contain the requested level of detail and discussion on noise effects and their impact to cumulative effects necessary for activity-level decisions (see <http://www.nmfs.noaa.gov/pr/permits/eis/arctic.htm>). Also see responses to related cumulative impact comments in Section 8.4.4.5 (Comments 3 and 5).

5. Section 4.4.7.1.3: This discussion contains several statements which appear to confuse frequency with sound pressure or intensity.

Response: The text in Section 4.4.7.1 was clarified.

6. Section 2.10, Table 2.10-1, Impact-Producing Factors Associated with OCS Oil and Gas Development: Offshore construction noise should be included in the table under Noise.

Response: The table was updated as suggested.

7. Section 3.6.2.2: Regarding the statement about noise data for Cook Inlet oil platforms, Blackwell and Greene (2002) included inwater noise measurements; the highest level recorded was 119 dB re 1 μ Pa at a distance of 1.2 km.

Response: The text in Section 3.6.2.2 was updated to incorporate the results of the referenced study as appropriate.

8. It is far more accurate to say that routine operations will affect the acoustic environment in the Beaufort Sea, (and in the Chuckchi Sea). Suggest changing the first sentence of Section 4.4.5.4.1 to “Routine operations will affect ambient noise conditions”.

Response: The text in Section 4.4.5.3 (previously Section 4.4.5.4.1) was revised as suggested.

9. Table 4.1.1-1, and Table 4.1.3-1: Offshore construction should be included as an impact producing factor.

Response: The referenced tables in Section 4.1 were revised as suggested.

10. Section 4.4.5: Ambient noise levels should be stated, if known. If unknown, NOAA recommends that BOEM should conduct a study to quantify the amount of noise in the GOM.

Response: No text change was required. BOEM has included a study profile in its new Study Development Plan to do this for the GOM. For a discussion of incomplete and unavailable information, see Section 1.4.2 and the response to Comment 10 in Section 8.4.4.2.

11. Tables 2.10-1 and 4.1.1-1 in Sections 2.10 and 4.1.1. BOEM should note that exploration drilling is accompanied by seismic noise.

Response: The referenced tables in Sections 2.10 and 4.1.1 were revised as suggested.

12. In Section 3.6.1.4, BOEM has listed seismic technologies that, except for marine vibroseis, are outdated, are not in commercial use, and are not expected to be used during the life of this 5-year plan. Accordingly, IAGC believes that BOEM should remove these technologies from Subsection 3.6.1.4.4 and Table 3.6.1-1 or BOEM should include a comment that these technologies are not used.

Response: BOEM concurs that the use of sleeve exploders and gas guns represents outdated seismic technology and references to their use were removed from Section 3.6.1.4.4 of the PEIS and the corresponding Table 3.6.1-1. BOEM does, however, believe that there may be potential (to what degree is yet unknown) for marine vibroseis to be used in some level of

seismic surveying over the time period considered in this document. In order to cover that possibility, the references to marine vibroseis were retained in this section and the table. The use of smaller sleeve guns was added to the text and the table.

8.4.4.4.6 Issue 4.6 Coastal Habitats.

1. Decommissioned Pipelines: NOAA recommends that in Section 4.4.6.1.1 the PEIS address the potential loss of suitable sediment sources for renourishment/restoration activities that might result from pipeline construction or decommissioning.

Response: BOEM agrees that loss of sediment sources should be included as a potential impact. BOEM has a significant sand resources policy that is memorialized in NTL No. 2009-G04 (Significant OCS Sediment Resources in the Gulf of Mexico) and is a standardized condition of all lease sales. Text has been added to Section 4.4.6.1 that discusses impacts of construction and decommissioning.

2. Section 3.5.2.1 of the Draft PEIS refers to various statistics regarding the fate of oil released during the Deepwater Horizon Event. Should this discussion note that the statistics given were accurate for the fall of 2010, and that residual oil amounts have decreased significantly as a result of biodegradation and continued weathering?

Response: BOEM agrees that residual oil has decreased since 2010. A statement has been added and referenced in Section 3.5.2.1 regarding the dated nature of the statistics and the continued biodegradation and weathering.

3. Section 3.5.2.1 of the Draft PEIS states, "In summary, a third (33%) of the total leaked oil in the BP spill was captured or mitigated by the unified command recovery operations, including burning, skimming, direct recovery from the wellhead, and chemical dispersion." What source can be cited to support this number? Does this number reflect the amount of oil collected from the shoreline? If not, does it underestimate the effectiveness of the response?

Response: BOEM agrees that a source should be cited and the sentence clarified. In Section 3.5.2.1, a citation has been added to the text and the discussion clarified regarding shoreline collection.

4. Section 3.5.2.1 of the Draft PEIS states, "Half of the total leaked oil (naturally and chemically dispersed and residual) is currently being degraded naturally." Why is dissolved oil not included in this estimate, as it is highly biodegradable? Much of dispersed, dissolved, and residual oil has been degraded since 2010. Should this statement also be modified to note that the oil "is continuing to be" degraded naturally?

Response: BOEM agrees that dissolved oil and continual degradation should be discussed. The statement has been clarified in Section 3.5.2.1.

5. Section 3.7.3.1.1 of the Draft PEIS refers to a DWH oil “plume” that was “as thick as 200 m.” Is use of the term “thick” misleading because it implies that the so-called “plume” was a solid mass? Additionally, rather than the term “plume,” would it not be more accurate if this discussion referred to “dispersed oil” or “clouds of dispersed oil” to clarify that oil concentrations even in the so-called “plume” were in the low ppm range and that oil was not present in a continuous subsea “slick”? See Atlas & Hazen (2011).

Response: BOEM agrees that the phrase should be clarified. The reference says the plume was “as high as 200 m, and in certain areas more than 2 km in width.” Atlas and Hazen use the term cloud and plume. The text in Section 3.7.3.1.1 has been changed to “clouds of oil” to reflect the more recent reference. The hydrocarbon concentrations in the plume have also been added.

6. Section 3.7.3.1.1 of the Draft PEIS states, “The spill released both oil and methane gas into the water column. Some of it rose to the surface above the well.” Should this statement be clarified to apply to the oil, not the methane? In the DWH event, effectively all the methane dissolved in the water column, with little or no methane reaching the atmosphere. Data collected by Yvon-Lewis et al. (2011) in June 2010, while the spill was still active, indicated the methane release was not significantly contributing to methane concentrations in the surface water or atmosphere. NOAA overflight measurements in June 2010 also found no methane at the surface (Ryerson et al. 2011).

Response: BOEM agrees that the statement needs clarification. The text in Section 3.7.3.1.1 has been modified to clarify that methane was not released into the atmosphere. Additional references have also been cited.

7. Section 3.7.3.1.1 of the Draft PEIS states, “Surveys in late June 2010 indicated that there was a subsurface methane plume in 800 to 1,200 m (2,625 to 3,937 ft) of water that extended from the DWH.” Should this statement clarify that the so-called “plume” was found in approximately 800 to 1,200 m of water?

Response: BOEM disagrees. The comment is confusing — the PEIS already states that the plume is in 800–1200 m of water.

8. Section 3.7.3.1.1 of the Draft PEIS states, “However, by September 2010, the plume had not been found, despite extensive areal [*sic*] sampling coverage (Kessler et al. 2011).” Should this statement be clarified to reflect the fact that surveys conducted from August to October 2010 did not find methane concentrations elevated above background levels for the GOM? See Kessler et al. (2011).

Response: BOEM agrees that the statement should be clarified. The text in Section 3.7.3.1.1 has been modified to clarify the sampling dates and add information on methane concentrations.

9. NOAA recommends adding “temperature” to the list of factors in the last sentence of paragraph 2 of Section 4.4.6.1.4 (impact conclusions).

Response: BOEM agrees to the change. “Temperature” has been added to the list of factors in each of the CDE impact conclusions presented in Section 4.4.6.1.

10. Section 3.7.2.1.7 of the Draft PEIS states, “Some researchers have reported seeing dead and dying benthic animals as well as what appear to be thick deposits of oil or flocculants of oil and organic matter on the seafloor (BOEMRE 2010b).” Does the cited source support this proposition? Does this source state that further testing must be completed to determine if the substance observed was DWH oil?

Response: BOEM agrees that the statement in Section 3.7.2.1.7 needs further explanation. The text has been modified to clarify the statement.

11. Section 3.7.4.1 of the Draft PEIS states, “Some researchers have reported seeing what appear to be thick deposits of oil or flocculants of oil and organic matter on the seafloor (BOEMRE 2010b).” The source cited uses the wording “brown substance” instead of “deposits of oil” and states that further tests will be done to identify the source of the brown substance. Should an updated source be used to explain the actual source of the substance? Alternatively, the statement could be revised to say “Some researchers have reported seeing what appears to be a brown substance on the sea floor, but have not yet confirmed the source of these deposits.”

Response: BOEM agrees that the text should be revised. The text in Section 3.7.4.1 has been modified to remove the word oil.

12. Section 3.7.2.1.7 of the Draft PEIS states, “It is likely that the sediment hydrocarbon concentrations decreased significantly with distance from the well.” Rather than phrasing this conclusion in speculative terms, should not this statement discuss sediment data from OSAT?

Response: BOEM agrees that sediment data should be used. The text has been modified in Section 3.7.2.1.7 to incorporate OSAT findings.

13. Section 3.7.2.1.7 of the Draft PEIS states, “In heavily oiled areas, the recovery time is unknown, but sediments in deeper waters may take longer to recover because of colder temperatures.” While microbial activity is generally greater in warmer waters, should this statement note that deep sea cold waters contain microbial populations evolved to consume oil at ambient, low temperatures? Hazen et al. (2010) have identified species responsible for rapid biodegradation observed after DWH. Laboratory studies by Ken Lee reported at the International Oil Spill Conference (IOSC) confirmed that biodegradation may be rapid and efficient at temperatures as low as 0.5°C.

Response: BOEM agrees that the text should be modified. Section 3.7.3.1.1 describes microbial degradation and states “These studies suggest the GOM has a tremendous natural capacity to assimilate accidental oil spills.” The text has been modified in Section 3.7.2.1.7 to read: “However, studies of deepwater plumes following the DWH event suggest bacterial communities rapidly respond to the presence of oil and microbial reduction in oil concentrations occurred more rapidly than expected given the low temperatures and high pressure (Hazen et al. 2010). Whether the same rapid breakdown would occur along the seafloor is unknown.”

14. Section 3.7.2.1.7 of the Draft PEIS states, “Overall, natural processes should break down the oil, and it is likely that no permanent changes in soft sediment habitat affected by the DWH event would occur.” Should this statement be reworded to clarify that natural processes “will break down the oil”? Should this statement identify examples of natural process, such as biodegradation, dissipation, evaporation, etc.?

Response: BOEM agrees that the sentence should be clarified. The text has been modified in Section 3.7.2.1.7 to read “Overall, natural physical and bioremedial processes will break down the oil...”

15. Section 4.4.6.1.1 of the Draft PEIS states, “In some locations, the potential exists for dredging to result in the resuspension and transport of oil spilled during the DWH event.” Given the limited impact of the DWH event on sediments outside of the area immediately surrounding the wellhead (not a dredging area) and isolated areas with tar mats, would not such an event be a low probability event? Moreover, would it not be more accurate to say, “In some locations, the potential exists for dredging to result in the resuspension and transport of sediments that may contain residual oil from the DWH event...”?

Response: BOEM agrees that the text should be clarified. The text in Section 4.4.6.1.1 has been revised to indicate low probability and the resuspension of sediments.

16. The Texas Parks and Wildlife Department (TPWD) agrees with the conclusions presented in Section 4.4.3.1.1 that construction of onshore support facilities (e.g., pipeline landfalls, pipe yards, processing facilities) could affect the quality of near shore and fresh waters in the GOM Planning areas. Impacted resources could also include jurisdictional and nonjurisdictional wetlands. Section 4.6.2 of the Draft PEIS does discuss Section 404 of the Clean Water Act as it pertains to cumulative impacts associated with dredging and marine disposal. However, it does not address potential impacts to wetlands (jurisdictional and non-jurisdictional) that may occur as result of infrastructure development associated with the oil and gas industry. TPWD recommends the PEIS include a discussion of Section 404 of the Clean Water Act (regulating the discharge of dredged and fill material into waters of the United States, including wetlands) as it may pertain to impacts to coastal resources associated with the proposed project. TPWD also recommends that Executive Order (EO) 11990 — Wetlands, be included in the PEIS. Activities associated with the proposed project should include measures per EO 11990 that would minimize the destruction, loss or degradation of wetlands regardless of jurisdictional determination.

Response: The text in Section 4.4.6.1.1, which discusses wetland impacts, has been revised to include a discussion of Clean Water Act (CWA) Section 404 and EO 11990 (the latter was also added to Appendix C).

8.4.4.4.7 Issue 4.7 Marine Habitats.

1. The following statement that appears in Section 4.4.6.3.2 of the Draft PEIS should be quantified: “Eventually, the oil would be broken down by natural processes, and pelagic habitat would recover.” What is the expected time to recovery?

Response: Recovery time is a function of the specific spill, environmental conditions, and resource of interest. Therefore, recovery time cannot be quantified in a general way. The text in Section 4.4.6.3 has been modified to remove ‘eventually’ and to instead state that “habitat recovery increases as oil breaks down.”

2. The discussion presented in Section 4.4.6.4.1 needs to consider meteorological and bacterial degradation at depth, not only at the water surface.

Response: The Camilli et al. (2010) and Kessler et al. (2011) studies cited in the text are all investigations of microbial breakdown of oil in deepwater plumes. The text in Section 4.4.6.4.1 has been changed to “...quickly by bacteria both at the surface and at depth.”

3. Section 4.6.3.2.2 states “Warmer temperatures may also increase phytoplankton productivity, potentially resulting in greater food inputs to benthic habitats and subsequent increases in the productivity of benthic biota.” Warmer temperatures may increase productivity; however, in many cases the phytoplankton community shifts to dominance by small cell phytoplankton. Consequently, most of the production is consumed in the water column by microzooplankton, resulting in less input to food reaching the bottom. NOAA recommends quantifying the statement “Although pelagic habitat is likely to recover quickly following an oil spill...” What is meant by “quickly”?

Response: Shifts from benthic to pelagic based food webs are discussed in the Arctic fish (Section 3.8.4.3) and benthic habitat (Section 3.7.2.3) sections. Additional text on the potential changes in primary and secondary productivity was added. The text was also modified to say, “Alternatively, the greater expected river discharge could increase stratification and reduce light available for primary productivity resulting in a reduction in algal inputs to the benthos.” The impacts of climate change on phytoplankton are highly speculative because of the numerous controlling factors (Strom et al. 2010). Therefore, the text in Section 4.6.3.2.2 was modified to read “Climate change could increase or decrease phytoplankton productivity, potentially resulting in greater or lesser food inputs to benthic habitats and subsequent increases or decreases in the productivity of benthic biota.” Also, the word “quickly” was removed.

4. The Marine and Coastal Habitats summary states that “Protective measures, currently required at the lease sale phase through lease stipulations, exist for seafloor habitats such as live bottom and pinnacle trend areas in the GOM.” It is unclear what these protective measures are. These stipulation measures may be especially important in regions where seafloor habitat is not well studied such as in the Arctic. NOAA recommends that BOEM provide a citation to where these measures can be located.

Response: Stipulations are lengthy and therefore inappropriate for the Summary of the PEIS. References to, and descriptions of, stipulations are provided in Section 4.4.6.2.1 and Appendix B Assumed Mitigation and Other Protective Measures. In the case of the Arctic, which is a frontier area, specific mitigation to protect habitat would be developed through the lease sale process.

5. The summary of Potential Impacts on Essential Fish Habitat presented in Table 2.10-2 for Alternative 1 – Proposed Action only mentions coral as a type of EFH (essential fish habitat). This summary should be similar to the Potential Impacts described for Coastal and Estuarine Habitats and Marine Pelagic Habitats in Table 2.10-2.

Response: Text was added to Table 2.10-2 to include other EFH for which mitigation measures exist.

6. NOAA recommends that BOEM consider consulting pages 5-7 to 5-10 of the NOAA report “Impacts to Essential Fish Habitat from Non-fishing Activities in Alaska” to add to the discussion of impacts and mitigation options in Section 3.7.4.2 of the PEIS.

Response: NOAA’s mitigation recommendations from its report have been added to the impact discussions in Sections 4.4.6.4.2 and 4.4.6.4.3 of the PEIS.

7. Section 4.4.6.2.1 of the Draft PEIS states, “Modeling indicates that oil spilled at the surface could mix to a depth of 20 m (66 ft) at highly diluted concentrations (MMS 2008a).” Does this modeling include the surface application of dispersants, or are the results based on natural dispersion? This section also states, “However, if dispersants are used in the subsurface or if the released oil has a significant fraction of gas, a subsurface plume may form that would increase the potential for contact with a HDDC habitat.” See also PEIS Section 4.4.6.3.1 (“A subsurface plume capable of traveling long distances could form if dispersants are used or if the well releases a mixture of oil and gas.”). These statements imply that subsea dispersant use and a significant fraction of gas are the only means for a subsurface “plume” to occur, but any condition that produces very small dispersed oil droplets may result in such a plume.

Response: ‘Natural dispersion’ was added to Section 4.4.6.3.1 and the commented sentence in Section 4.4.6.3.1 was modified to say “...or if the oil is released at high velocity.”

8. What source was used to support the statement that natural gas would tend to rise in the water column and could degrade habitat quality in a large portion of the water column, and particularly the conclusion regarding the “degradation of habitat quality”?

Response: Although not well studied, natural gas can be toxic to marine life, and therefore, its release into the water would represent a degradation of habitat quality within the area affected by the gas release. A large methane release in the Sea of Azov resulted in cell damage, biochemical alteration, impaired movement, blood disorders, and alteration of biochemical processes in fish collected around the platform and in fish held in water near the platform (Patin 1999). The blowout also reduced mollusk abundance in the benthos. The Patin 1999 reference was added to Section 4.4.6.3.1 of the PEIS.

9. Does the Camilli et al. (2010) study report that hydrocarbons were detected more than 35 km from the source, as suggested in Section 4.4.6.1 of the Draft PEIS?

Response: Section 4.4.6.2.1 has been corrected to say 35 km, and not 56 km. This statement is correct elsewhere in the text.

10. There are many shallow and deepwater hard-bottom features that support an array of biological diversity. The commenter is supportive of BOEM’s willingness to provide a buffer around biologically sensitive areas and recommends that BOEM should ensure that adequate information exists to confirm that biologically sensitive areas are not within the proposed area before permitting activities and that BOEM should consider oil and gas activities that have the potential to impact deepwater habitats outside the buffer zone.

Response: NOAA is consulted before BOEM permits activities that could affect sensitive benthic habitat. BOEM has several lease stipulations protecting corals, deepwater corals, and live hard-bottom, as described in Section 4.4.6.2.1. The stipulations are NTL-2009-G39 and NTL-2009-G40. Descriptions of stipulations to protect sensitive coral habitats are provided in Section 4.4.6.2.1. Oil and gas activities do have a potential to affect these habitats located outside the buffer zone. Section 4.4.6.2.1 has a discussion of the potential impacts of drilling muds on corals located away from the drilling site.

11. A commenter requested more information be provided on oil spill impacts on EFH for Arctic cod (*Boreogadus saida*) because of the importance of this species to the Chukchi Sea and the Beaufort Sea Large Marine Ecosystems. They also request that it be stated that a CDE could have moderate effects on EFH.

Response: The susceptibility of Arctic cod to spills is discussed in Section 4.4.7.3.3, and a discussion was added to Section 4.4.6.4.3. In addition, information regarding the spawning period of the Arctic cod was added to the Arctic Cod EFH description in Section 3.7.4.3. Species specific impacts will be considered in more detail in individual lease sale EISs.

12. The following statement was presented in Section 4.4.6.3.4 of the Draft PEIS: “Pelagic habitats would eventually recover their habitat value as hydrocarbons broke down and were

diluted.” Statement needs to be quantified. How long would it take? Will the digestion be 100% effective? Suggest including findings of past and ongoing studies of natural degradation of hydrocarbons by indigenous bacteria (i.e., McFarlin, Leigh, 2011, indigenous microorganisms degrade dispersed oil in Arctic seawater).

Response: Discussions of additional studies were added to Section 4.4.6.3.3 to support the statement that the hydrocarbons would be broken down and indigenous oil-consuming bacteria are present. However, a specific time to recovery cannot be provided because each spill is different. All data from the Valdez spill suggests breakdown and dilution in the water column is rapid (Neff and Stubbenfield 1995; Boehm et al. 2007), while localized benthic contamination can persist for >10 years (Short et al. 2007; Taylor and Reimer 2008; Exxon Valdez Oil Spill Trustee Council 2010c).

- 13 Increased river discharge may intensify the strength of the Alaska Coastal Current making advection much more important than local production processes. Warming would prolong the period that phytoplankton is nitrate limited and production is dominated by small phytoplankton cells. This would lengthen the food chain with less production going into fish and other higher trophic levels.

Response: Any predicted changes in productivity resulting from climate change are highly speculative because of the numerous controlling factors (Strom et al. 2010). Text in Section 4.4.7.3 of the PEIS was modified to state that increases or decreases in primary productivity are possible, and additional discussion of potential changes in productivity was provided to this section.

14. Commenter requests two conference presentations be cited in Section 3.8.5.1 that describe benthic invertebrate communities near the Macondo well before and after the DWH event.

Response: Results of the OSAT sediment sampling data have been incorporated into Section 3.7.2. The results given in Putt et al. (2010) and Benfield et al. (2010) have been incorporated into the discussion of invertebrates (Section 3.8.5.1), although these are presentations, not peer-reviewed papers.

15. A commenter requested more information be added to Section 3.7.3.3.2 on the impacts of ocean acidification on the commercial shellfish (king and Tanner crab and snow crab) populations in the Cook Inlet Planning Area.

Response: This comment refers to the pelagic habitat section (Section 3.7.3), so benthic invertebrates were not discussed. The potential impact of climate change on snow crabs is discussed in the invertebrates climate change section (Section 3.8.5).

16. The commenter states that BOEM must analyze the effects of its leasing program in contributing to climate change, and analyze potential oil and gas activities in the context of climate change and provides several references that could provide information on this topic.

Response: The PEIS discusses the potential impacts of climate change on Arctic habitats and biota. Information from the cited reports was added to Section 3.3, as well as to Sections 3.7 and 3.8.

8.4.4.4.8 Issue 4.8 Mammals.

1. When describing potential oil spill clean-up impacts to endangered beach mice or the endangered Florida salt marsh vole in Section 4.4.7.1.1, it would be more appropriate to use more relevant citations rather than documents developed for Alaska.

Response: The discussion in Section 4.4.7.1.1 of potential oil spill and oil spill clean-up impacts on beach mice and the Florida salt marsh vole has been modified to include more relevant and/or recent information on the GOM.

2. What is the cause of the recent ringed seal deaths in the Arctic Region? Can it be related to climate change?

Response: A discussion of the Unusual Mortality Event (UME) that involves ringed seals and other pinniped species in the Arctic has been added to Section 3.8.1.3.1 and is also mentioned in Section 4.6.4.3.1. As of the drafting of this response, the NMFS has not yet determined the cause of this UME, but continues to post UME updates at <http://www.alaskafisheries.noaa.gov/protectedresources/seals/ice/diseased/>.

3. The endangered manatee should be included in the list of marine mammals identified as receiving detailed analyses in the PEIS since manatees are discussed in some detail further in the document.

Response: The West Indian manatee has been added to the list of mammals in Section 1.5.4 that are receiving detailed analyses in the PEIS.

4. The cited reference, NMFS 2011f, is absent in the references section for Chapter 3. Please provide a detailed citation for that reference.

Response: The citation for NMFS (2011f) found in Section 3.8.1.1 of the PEIS has been added to the Chapter 3 references (Section 3.17 of the PEIS).

5. The depicted range map for endangered beach mice (Figure 3.8.1-1) is inaccurate.

Response: Figure 3.8.1-1 has been revised to include the historic range of the endangered beach mice subspecies, and the text of Section 3.8.1.1.2 has been updated to list the counties where each endangered beach mouse subspecies is known or believed to occur.

6. When referring to beluga whales in Cook Inlet, replace 'stock' with 'distinct population segment.'

Response: As suggested, “stock” has been replaced with “distinct population segment” in Sections 3.8.1.2 and 4.4.7.1.2 where Cook Inlet beluga whales are discussed.

7. The UME that was declared in the northern GOM is still ongoing as the stranded bottlenose dolphins found with *Brucella* have been combined with the animals that stranded post-DWH.

Response: The discussion in Section 3.8.1.1.1 of the UME in the northern GOM has been updated to include the information on the stranded bottlenose dolphins mentioned in the comment. The discussion also includes the web link to the NMFS website on this UME at http://www.nmfs.noaa.gov/pr/health/mmume/cetacean_gulfofmexico2010.htm.

8. When mentioning oil spills in the Cook Inlet Planning Area in Section 4.4.7.1.2, there is no mention of the Beluga whales although other whale species are mentioned.

Response: The Section 4.4.7.1.2 discussion referred to in the comment has been amended to include mention of the beluga whale.

9. The PEIS should address the effects of climate change on sea ice and how this can impact marine mammals.

Response: A discussion of climate change impacts on sea ice, as it may affect marine mammals, can be found in Sections 3.8.1.3.1 and 4.6.4.3.1.

10. An appropriate level of analysis on the effects of noise on bowhead whales in the Arctic Region was not included in the Draft PEIS.

Response: The level of analysis presented is appropriate for a programmatic EIS. More thorough assessments of noise impacts on bowhead whales will be included in Arctic region-, lease-, or activity-specific NEPA documents prepared by BOEM during the 2012-2017 OCS Leasing Program. In addition, BOEM and the NMFS are preparing an EIS for geophysical (seismic) and exploratory drilling in the Arctic (<http://www.nmfs.noaa.gov/pr/permits/eis/arctic.htm>).

11. The Draft PEIS fails to include a discussion of bowhead whale use of the Beaufort and Chukchi Seas in regards to feeding habitat and migration routes.

Response: Additional information on bowhead whale-feeding habitat and migration routes in the Beaufort and Chukchi Seas has been added to the PEIS. Region-, lease-, and activity-specific NEPA analyses will address potential impacts on bowhead whales in more detail. Lease-specific activities and permits will also be required to comply with the requirements of the Endangered Species Act and the Marine Mammal Protection Act.

12. The PEIS does not reflect the most current and accurate information on the movement patterns of bowhead whales.

Response: Sections 3.8.1.3.1 and 4.4.7.1.3 of the PEIS have been updated to include current information on the movement patterns of bowhead whales.

13. The PEIS needs to address the impacts of drilling muds on the walrus and its prey.

Response: Information on potential impacts of drilling muds on Arctic resources are provided throughout Chapter 4. With regard to the walrus and its prey, please see Sections 4.4.6.2.3 (Arctic marine benthic habitats), 4.4.6.3.3 (Arctic marine pelagic habitats), 4.4.7.1.3 (Arctic marine mammals), and 4.4.7.5.3 (Arctic invertebrates and lower trophic levels).

14. The receding sea ice is impacting walrus.

Response: BOEM recognizes the concern that climate change is having an adverse effect on sea ice, and that this may impact the Pacific walrus as well as several other marine mammals. Information about the Pacific walrus is provided in Subsection 3.8.1.3.1 of the PEIS; while information on climate change impacts on sea ice, as it affects marine mammals, can be found in Sections 3.8.1.3.1 and 4.6.4.3.1.

15. Manatees could be impacted by vessel strikes and oil spills.

Response: Section 4.4.7.1.1 of the PEIS acknowledges the potential for vessels to strike manatees. While incidents cannot be discounted, the potential for an OCS vessel to hit a manatee is unlikely. Marine mammal observers and adherence to vessel speed requirements in shallow waters contribute to the protection of manatees from vessel strikes. The Draft Multisale EIS (available on BOEM's website: <http://www.boem.gov/Environmental-Stewardship/Environmental-Assessment/NEPA/nepaprocess.aspx>) provides an analysis of potential oil spill impacts on manatees. Site-specific mitigation measures, including those pertaining to oil spills, will be in lease-specific NEPA analyses.

16. The PEIS should include additional support (as cited in the comment) for the conclusion that seismic does not adversely affect marine mammals under current BOEM seismic survey requirements.

Response: BOEM is aware of the information cited in the comment, but disagrees with the broad-scale recommendation that BOEM determine in this document that seismic does not "adversely affect marine mammals under current BOEM regulation." BOEM will undertake a more detailed discussion of seismic activities and impacts on marine mammals in lease sale and activity specific NEPA documents, especially the draft PEISs for geological and geophysical activities in the GOM, mid/south Atlantic, and Arctic (in preparation).

17. Marine mammals can also inhale oil when they surface to breathe which causes damage to mucous membranes and airways and can be fatal.

Response: Potential impacts on marine mammal mucous membranes and airway passages from an oil spill have been added to the accident discussions in Section 4.4.7.1.

18. Section 4.4.5.3.1 of the Draft PEIS states: “However, most exploration activity takes place during the open-water season, minimizing the effects on polar bears (MMS 2008b).” NOAA notes that there are no polar bears in Cook Inlet.

Response: The mention of polar bears in the Cook Inlet area has been deleted from Section 4.4.5.2 (previously Section 4.4.5.3.1).

19. Section 4.4.7, Table 4.4.7-1: NOAA recommends that the table be put into an MMPA context for marine mammals. Mortality and serious injury may also result from vessel collisions. Injury (Level A harassment) should be included in the decommissioning analysis as it was authorized in the Explosive Removal of Offshore Structures (EROS) rule. Dolphins have also been previously killed in EROS-related activities.

Response: Table 4.4.7-1 has been amended, as suggested.

20. Section 4.4.7.1.1: Bryde’s whales reliably occur in the DeSoto Canyon area.

Response: Information on the Bryde’s whale occurring in the DeSoto Canyon area has been added to Section 4.4.7.1.1.

21. Section 4.4.7.1.1: Sperm whales also commonly occur in the DeSoto Canyon area and west of the Florida Keys and Tortugas.

Response: Information on sperm whales occurring in the DeSoto Canyon area and west of the Florida Keys and Tortugas has been added to Section 4.4.7.1.1.

22. Section 4.4.7.1.2, Alaska — Cook Inlet: The designated no-entry zone for Steller sea lion major haul outs and rookeries in and near the Cook Inlet OCS Planning Area is 3 nautical miles (5.5 kilometers) rather than 3,000 feet as indicated here (50CFR 223.202).

Response: The distance of the designated no-entry zone near the Cook Inlet OCS Planning Area has been corrected in Section 4.4.7.1.2.

23. Section 4.4.7.1.2: The described prohibitions on helicopter approaches to humpback whales are not applicable to Alaskan waters, where no such prohibitions exist. NMFS has established regulations for vessels operating near humpback whales (66FR29502, May 31, 2001).

Response: The sentence pertaining to restrictions on helicopter approaches to humpback whales in Hawaiian waters has been deleted.

24. Section 4.4.7.1.4, Conclusion: It is difficult to reconcile BOEM’s conclusion that impacts to marine mammals in the Arctic could range from negligible to moderate against many of the statements and conclusions presented in this section. Examples of this include the following statements: “Any increased mortality in a pinniped population could impact the population as a whole, especially for sensitive or declining populations (e.g., Pacific walrus)” and “a catastrophic discharge event contaminating ice leads or polynyas in the spring could have devastating effects, trapping bowhead whales.”

Response: The negligible-to-moderate impacts on marine mammals presented in Section 4.4.7.1 apply to routine operations. BOEM acknowledges that a catastrophic discharge event could potentially cause a major impact on marine mammals. All lease sales will require separate NEPA analyses on marine mammals and Endangered Species Act consultations.

25. Section 4.6.4.3.1, Marine Mammals. It would be helpful to have a quantitative estimate of cumulative effects on marine mammals. Tables earlier in the document indicate a range of possible number of drill sites, and likely locations of drilling. This kind of information could be combined with marine mammal density information and known “takes” of marine mammals to provide a quantitative estimate of the expected cumulative effects, at least for some species.

Response: Quantitative estimates of cumulative impacts are not needed, or even reliable, at the programmatic level. Such assessments can be included in more region-, lease sale-, or activity-specific NEPA analyses.

26. There is often a 2–3-year lag between new research results and the inclusion in the marine mammal stock assessment reports. NOAA Fisheries (NMFS) recommends referring to more recent Alaska Marine Mammal Stock Assessments (Allen and Angliss 2011, and Allen and Angliss 2010) instead of the now-outdated Angliss and Allen 2009.

Response: The marine mammal sections have been updated to incorporate information from NOAA’s most recent Stock Assessment Reports.

27. In the Summary, Marine and Coastal Fauna: NOAA suggests deleting the example for “temporary abandonment of young”.

Response: The example dealing with temporary abandonment of young has been deleted from the Summary section of the PEIS location indicated in the comment.

28. In the Summary, the question is not whether vessel collisions may occur, but how frequently relative to a species’ population size. Some populations (e.g., North Pacific right whales) are so imperiled that even infrequent collisions will have a population-level effect. NOAA recommends that BOEM modify the sentence (and any later parts of the document) to make it clear that what are important to analyze are the effects of collisions on the impacted population, not just the number of collisions.

Response: The Summary identifies the overall types of impacts possible. Text revisions have been made in Section 4.4.7.1 to indicate that the potential effect of vessel collisions on marine mammals depends on both the number of collisions and the population size of the species.

29. Section 3.7.2.3: Bowhead whales are also known to feed in this nearshore area and should be included in the list of species utilizing this habitat.

Response: The bowhead whale has been added to the list of biota that feed in nearshore benthic areas in Section 3.7.2.3.

30. In Section 3.8.1, the original literature should be referenced whenever possible.

Response: In the marine mammal sections of the PEIS, the original literature has been utilized whenever practicable and/or available. However, in a number of situations, NOAA's Stock Assessment Reports or other similar reports were referenced as they are more readily available to members of the public that may want to see a source document.

31. The Gervais' beaked whale (*Mesoplodon europaeus*) is also endemic to the deep waters across the tropical and temperate Atlantic Ocean.

Response: The text has been modified to state that the Gervais' beaked whale is also endemic to deep waters across the tropical and temperate Atlantic Ocean.

32. Section 3.8.1, Table 3.8.1-1: The scientific name for sei whale is *Balaenoptera borealis*, not *Balaenoptera edeni*.

Response: The scientific name for the sei whale has been corrected in the PEIS.

33. Section 3.8.1, Table 3.8.1-1: Spelling error. The scientific name for pygmy killer whale is *Feresa attenuate*, not *Feresa attentuata*.

Response: The spelling of the scientific name for the pygmy killer whale has been corrected in Table 3.8.1-1.

34. Section 3.8.1.1.1: Gervais' beaked whale is not distributed worldwide, but is in deep waters across the tropical and temperate Atlantic Ocean, both north and south of the equator (Jefferson et al. 2008).

Response: The distribution of the Gervais' beaked whale has been corrected, as indicated in the comment, in Section 3.8.1.1.1 of the PEIS.

35. Section 3.8.1.2.1: The NMFS Alaska Regional Office uses 340 as the population estimate, which is based on the 2010 aerial surveys.

Response: The population estimate for the population of Cook Inlet beluga whales in Section 3.8.1.2.1 has been updated using the 2011 aerial survey information.

36. Section 3.8.1.2.2, Terrestrial Mammals: BOEM should specify that the abundance estimates are based on old data, and provide the years of the surveys.

Response: Statements have been added to Section 3.8.1.2.2 in the PEIS to mention the year of the surveys for which the older abundance estimates apply.

37. Summary, Marine Mammals: In other paragraphs, there have been statements about the magnitude of expected impacts, and this information should also be summarized here. For instance, “Disturbance from noise sources is the most likely impact and is expected to (insert expected magnitude of outcome here).” This same pattern should be followed for the expected effects of an oil spill (as is done for the expected impact of an oil spill on birds in the subsequent paragraph) and for related sections on the Chukchi Sea.

Response: The marine mammal text in the Summary has been modified as suggested in the comment to make statements on expected impacts, to be consistent with those presented for other species groups such as birds.

38. Terrestrial Mammals. If the lease sale results in a discovery, there is likely to be additional development of onshore facilities, and subsequent impacts on terrestrial mammals. Although this document may not be required to consider possible long-term outcomes, it is suggested mentioning this possibility. The program document estimates net benefits from exploration and development beyond the lease sale period (e.g., page 100); it seems logical then that some assessment of impacts beyond the lease sale period should also be considered.

Response: The impact analyses presented in Section 4.4.7.1 consider impacts over the life of the projects developed under the proposed action (40+ years). Region-, lease-, or activity-specific NEPA documents would address terrestrial mammals in more detail, including impacts from onshore facilities. The cumulative impact analyses in these documents would include an assessment of impacts on terrestrial mammals that would extend beyond the lease sale period.

39. The Draft PEIS discusses the consequences of a CDE in Section 4.4.7.1.1. The discussion assumes that several outcomes “would” happen as a result of a CDE. For example, the Draft PEIS states, “Additional effects on marine mammals would occur from water and air quality degradation associated with response and cleanup vessels...” PEIS in Section 4.4.7.1.1: Should these statements be revised to indicate that such consequences could happen, particularly given that the possible effects of PAHs (polyaromatic hydrocarbons) on marine mammals are not well understood? Should it also be noted that response measures to such an event will take into account the locations and potential impact on marine mammals and their habitat? On Scene Coordinator Report (Sept. 2011).

Response: The potential outcomes of a CDE on marine mammals in Section 4.4.7.1 have been changed from “would” to “may.” A sentence has also been added that water and air quality degradation associated with response and cleanup vessels may also affect marine mammals. More detailed analyses of a CDE’s impacts on marine mammals can be found in the Draft GOM Multisale EIS (available on BOEM’s website: <http://www.boem.gov/Environmental-Stewardship/Environmental-Assessment/NEPA/nepaprocess.aspx>).

40. Section 3.8.1: Reference to Section 3.5.5 is incorrect. There is no Section 3.5.5. Further, Section 3.5 does not refer to subsistence resources or local knowledge (of marine mammals). Section 3.8.1.2.1: This paragraph has no mention of Humpback whales in Cook Inlet or near Kodiak Island. This paragraph would be more valuable with information specific to the Cook Inlet Planning Area and the stock(s) frequenting this area instead of a general summary of humpbacks in Alaska. Sentences regarding Chukchi Sea and Beaufort Sea humpbacks should be moved to 3.8.1.3.1 on the Arctic area.

Response: Sections 3.8.1.2.1 and 3.8.1.3.1 of the PEIS have been amended as suggested in the comment.

41. Section 3.8.1.2.1: Are these stocks the one most likely to be present in Cook Inlet? If not, why are the population sizes only for these provided? Section 3.8.1.2.1: A reference and/or explanation regarding the effect of climate change on beluga whales is needed to support this statement. Section 3.8.1.2.2: American bison — the only wild population is located near Delta Junction, AK. This is not generally considered part of south central Alaska, but rather Interior Alaska and is over 200 miles from Upper Cook Inlet. Correct the sentence to reflect the proper geographic area. Section 3.8.1.2.2: Roosevelt Elk — This is an introduced species in Alaska, present on only two islands in south central Alaska and some islands in southeast Alaska. Recommend re-examining the species to be included in this list of select terrestrial mammals.

Response: Sections 3.8.1.2.1 and 3.8.1.2.2 of the PEIS have been amended as suggested in the comment.

42. Section 3.8.1.2.2: Is the intent of providing population size for Kenai and Game Management Unit 16B to show the variation in population size in different areas or is it to try to represent the Planning Area population? If the former, a density estimate would be more informative. If the latter, these areas exclude bear population numbers for the southern half of the planning area. Section 3.8.1.2.2: Clarify the two population numbers. Is this a range? Are these estimates from two distinct years in the early 1990s? Section 3.8.1.2.2: Regarding the use of population estimates from Game Management Unit 16/16B. It should be noted that this unit includes the entire watershed for the upper western Cook Inlet, encompassing areas as distant as Denali National Park.

Response: Section 3.8.1.2.2 of the PEIS has been amended as suggested in the comment.

43. Section 3.8.1.2.2: South Alaska has limited application. Is the intention to refer to south central and southeast Alaska? These areas are two very distinct and distant geographic areas that have been commonly recognized in public documents discussing both ecological and economic resources. It would be clearer to rephrase “throughout south central Alaska...” Further, are these food sources only in Southeast Alaska? Recommend removing information not applicable to the south central river otter population.

Section 3.8.1.3.1: The text would be more clear and informative if it was more specific to the Arctic region and stocks that occur in this region. Much of this information is a repeat of information provided in the Section 3.8.1.2.1

Section 3.8.1.3.1: The text expresses conflict concerning whether there are population estimates available or not. Is the concern that the NMFS estimate is not reliable or recent? Either remove statement that estimates are not available, or provide explanation on the discrepancy or doubt regarding NMFS estimate.

Section 3.8.1.3.1: Recommend moving Pacific Walrus to this subsection since they are presently an ESA Candidate species, but within the lease period, they may be further listed as endangered or threatened. In 3.8.2 Candidate species are listed within the subsections on T&E Species.

Section 3.8.1.3.1: Is there any information available on the decline of the Southern Beaufort Sea stock? When did the decline begin? Any causes attributed to the decline? As a species listed as threatened, with current litigation regarding its ESA Critical Habitat, it will be beneficial to provide additional information on this statement.

Section 3.8.1.3.1: The killer whale text is a great example of a concise, region-specific description. Recommend using this as an example for revising paragraphs on Humpback whales and other species descriptions that include information on stocks elsewhere in Alaska or its range.

Section 3.8.1.3.1: Move Pacific walrus paragraph to the subsection that discusses pinnipeds, as recommended in previous comment. Insert information on identification of species as a Candidate for listing by USFWS, including listing priority.

Section 3.8.1.3.1: Include an explanation of possible cause to >36% population decline in 16 years between 1990 and 2006. This is particularly useful considering Candidate status of the Pacific walrus.

Section 3.8.1.3.1: It may be beneficial to include information regarding the recent court decision on *Center for Biological Diversity v. Lubchenco*, 758 F. Supp. 2d 945 (N.D. Cal. 2010). The court found that Service did not violate the ESA in failing to list the ribbon seal as threatened or endangered. The court decision is stayed; however, pending Ninth Court mediation, with a report on mediation expected early 2012. Additionally, API (American Petroleum Institute) and AOGA (Alaska Oil and Gas Association) had filed comments with NMFS on March 25, 2011 that could be used in addressing the ribbon seal situation.

Section 3.8.1.3.2: Species list is randomly ordered, with species of same family not grouped together. We suggest listing the species taxonomically.

Response: Sections 3.8.1.2.2, 3.8.1.3.1, and 3.8.1.3.2 of the PEIS have been amended as suggested by commenters.

44. There is an incomplete sentence in Section 4.4.7.1.2 of the Draft PEIS.

Response: The incomplete sentence in Section 4.4.7.1.2 has been amended.

45. Section 4.4.7.1.2: This information, and similar, regarding rookeries, haul-outs or other important use areas or population concentration areas would be beneficial in Section 3. This comment is intended globally for Section 3.8, but is particularly applicable to 3.8.1.

Response: Information provided in Chapter 4 pertaining to haulouts, rookeries, and other important use areas or population concentration areas for several marine mammal species has been moved or duplicated in Chapter 3, Section 3.8.1.

46. “Accidents” Section 4.4.7.1.2: Consistent structure between the Planning Areas would assist the reader to review potential consequences. The description in the Arctic area is more specific with the discussion of the modes of exposure (inhalation, ingestion, and direct contact) compared to the more general statements of exposure in the Cook Inlet area. The Arctic section’s format of “X action/behavior resulting in Y exposure with Z consequence” is straightforward and easy to access. Please review and update as appropriate.

Response: The marine mammal accident assessment discussions have been modified to make them more consistent across the document (e.g., the Cook Inlet discussion has been changed to be similar to that provided for the Arctic region).

47. Section 4.4.7.1.2: Sentence is confusing and needs to be rewritten: “Since there are reports of oiled marine mammal’s exposure.”

Response: The Section 4.4.7.1.2 sentence referred to in the comment has been amended.

48. Section 4.4.7.1.2: A discussion of the risk of oil spills to Beluga Whale is needed. The only mention of the species, whose Cook Inlet population is endangered, is the last sentence of the Catastrophic Discharge Event subsection.

Response: A discussion of the risk of an oil spill on beluga whales has been added to Section 4.4.7.1.2.

49. Section 4.4.7.1.3: Resolve the conflict in the number of cetaceans present in different locations of this section.

Response: The conflict between the sentences in Section 4.4.7.1 (previously Section 4.4.7.1.4) mentioned in the comment has been resolved.

50. Section 4.4.7.1.4: Sentence regarding beluga whales is misleading. While belugas do primarily occur in the area north of the Planning Area, the ESA Critical Habitat includes, in addition to Upper Cook Inlet, the entire west coast of Cook Inlet south to Kamishak Bay and Kachemak Bay. Please review and update as appropriate.

Response: The sentence regarding beluga whales in the Cook Inlet in Section 4.4.7.1.4 has been amended in response to the comment.

51. Section 4.4.7.1.4: The organizational variability between BOEM's approach for presenting marine mammal impacts vs. terrestrial mammal impacts is confusing. Why are all areas combined for marine mammals, but segregated for terrestrial mammals? With the high variability between GOM and Alaskan habitats and species under consideration, it does not make sense to assume all impacts for all areas would be the same. This is critical under the heading 'Accidents' (page 4-293), but again, there is no differentiation between GOM and Alaska.

Response: Section 4.4.7.1 has been revised to make the conclusions presented for marine mammals consistent with the format used for terrestrial mammals (i.e., improved differentiation in the impacts between the GOM region and the Alaska regions).

52. In the GOM, there are many areas in which information about sensitive resources and the impact of oil activities on them and their habitats are unknown. For instance, while noise impacts on cetaceans can be great, the impact of anthropogenic noise on endangered sperm whales in the GOM is unknown.

Response: Where appropriate, the discussion in the PEIS of impacts on marine mammals in the GOM indicates where information may be incomplete. The potential impacts of anthropogenic noise on sperm whales and other marine mammals will be addressed in more detail in GOM-specific NEPA analyses, particularly in the *Programmatic EIS for the Geological and Geophysical Exploration of Mineral and Energy Resources in the GOM* currently being prepared by the NMFS and BOEM.

53. Section 4.4.13.3.1: The discussion of the impacts of noise from oil and gas operations (including seismic) only references traditional knowledge of the impacts of noise and none of the considerable body of western science that reaches similar conclusions. As an example, the attachment to these comments shows deflection areas for bowhead whales in the Beaufort Sea as documented by western science. BOEM needs to provide a Summary of both traditional knowledge and western science on the impacts of noise on bowhead whales and then analyze these impacts and discuss mitigation measures for them.

Response: Impacts of noise on bowhead whales (and other marine mammals) based on "western science" are presented in Section 4.4.7.1.3 of the PEIS. A thorough assessment of

noise impacts on bowhead whales will be included in Arctic region-, lease-, or activity-specific NEPA documents (i.e., the EIS currently in preparation by the NMFS and BOEM for geophysical (seismic) and exploratory drilling in the Arctic (<http://www.nmfs.noaa.gov/pr/permits/eis/arctic.htm>) and related authorizations under the Marine Mammal Protection Act and Endangered Species Act. For examples, see: (1) FWS — http://alaska.fws.gov/fisheries/mmm/Beaufort_Sea/76FR47010.pdf, http://alaska.fws.gov/fisheries/mmm/Chukchi_Sea/pdf/73FR33212.pdf and <http://alaska.fws.gov/fisheries/mmm/itr.htm>; (2) NMFS — <http://www.nmfs.noaa.gov/pr/permits/incidental.htm>; and (3) BOEM — http://www.alaska.boemre.gov/ref/Biological_opinions_evaluations.htm and http://www.alaska.boemre.gov/ref/eis_ea.htm.

54. ICAS (Inupiat Community of the Arctic Slope) joins in the comments of the AEW (Alaska Eskimo Whaling Commission) in critiquing the consideration of impacts to bowhead whales, their habitat, and Inupiat subsistence practices in the Draft PEIS. The discussion of these topics is minimal and fails to analyze all the impacts to our communities from additional offshore oil and gas leasing.

Response: The concerns raised in the comment will be addressed in detail in region-, lease-, or activity-specific NEPA documents.

55. Section 4.4.7.1.1: This “well documented aggregation” could also be because this was an area that experienced significant survey effort (see Jochens et al. 2008). Newer data indicates they are spread throughout the GOM. Additional study would be required to substantiate these statements, therefore we request that they be deleted.

Response: Telemetry data from Jochens et al. (2008) suggests a core use area in the Mississippi Canyon, though tagged animals did use the entire northern GOM. The highest use area of the GOM was between the Mississippi Canyon and the DeSoto Canyons.

56. OCS oil and gas development in the Arctic should occur during the summer or after the whaling season to minimize disturbance from seismic surveys.

Response: The potential effects of seismic surveys on marine mammals are reviewed in Section 4.4.7.1.3 of the PEIS. More detailed analysis of seismic surveys will be provided in lease- and activity-specific NEPA documents (i.e., the EIS currently in preparation by NMFS and BOEM for geophysical (seismic) and exploratory drilling in the Arctic (<http://www.nmfs.noaa.gov/pr/permits/eis/arctic.htm>)).

57. Section 4.6.4.3: Which whale species is the discussion referencing? Please review and update as appropriate.

Section 4.6.4.3: Is this supposed to state “no known harvest”? Please review and update as appropriate.

Section 4.6.4.3: The annual subsistence harvest for Pacific Walrus seems very high. Garlich-Miller et al. (2006), states the following: “Since 1992, the harvest of Pacific walrus has been limited to the subsistence catch of coastal communities in Alaska and Chukotka. Harvest levels through the 1990s ranged from approximately 2,400 to 4,700 animals per year”). Please review and update as appropriate.

Response: Section 4.6.4.3 of the PEIS has been amended in response to the items mentioned in the comment.

58. In the past, our whaling captains have experienced firsthand how underwater noise associated with drilling, seismic studies, and icebreaking have interfered with the bowhead whale hunt at Cross Island. When whales are deflected from their normal migration route, our whaling captains are forced to travel great distances in dangerous conditions to obtain the food that feeds our people. Our traditional knowledge tells us that bowhead whales are very sensitive to underwater noise, and yet western science is still unable to tell us what the cumulative impacts are to the whales from multiple exposures to seismic, drilling, and icebreaking activities over a wide portion of the whale’s range over a period of many years. We are also concerned about the potential impacts to other subsistence resources, including beluga whales, seals, fish, and caribou.

Response: Section 4.4.7.1.3 of the PEIS discusses noise impacts on bowhead whales. Both Section 3.8.1.3.1 and 4.4.7.1.3 of the PEIS have been updated to include additional information on movement patterns of bowhead whales and the potential impact of noise on their movements. Section 4.4.7.1.3 also discusses potential impacts on belugas, seals, and caribou; while Section 4.4.7.3.3 discusses potential impacts on fish. Lease- and activity-specific NEPA documents will analyze potential impacts on these subsistence resources in more detail (i.e., the EIS currently in preparation by the NMFS and BOEM for geophysical (seismic) and exploratory drilling in the Arctic (<http://www.nmfs.noaa.gov/pr/permits/eis/arctic.htm>)).

59. The impacts of airgun surveys are felt on an extraordinarily wide geographic scale — especially on endangered baleen whales, whose vocalizations and acoustic sensitivities overlap with the enormous low- frequency energy that airguns put in the water (numerous citations provided).

Response: The PEIS has been amended in Section 4.4.7.1.3 to include additional information (including that from several of the references listed in the comment) regarding noise impacts on marine mammals. Also, lease- and activity-specific NEPA, ESA, and MMPA documents will address noise impacts in more detail (i.e., the EISs currently in preparation for geophysical (seismic) surveying in the GOM, mid/south Atlantic and Arctic—see <http://www.nmfs.noaa.gov/pr/pdfs/fr/fr69-67535.pdf>, <http://www.gomr.boemre.gov/homepg/offshore/atlocs/gandg.html>, and <http://www.nmfs.noaa.gov/pr/permits/eis/arctic.htm>).

60. The amount of disruptive activity under consideration in the Draft PEIS is enormous. Potential impacts of seismic surveys should be discussed.

Response: Section 4.4.7.1.1 discusses the potential impacts of seismic surveys on marine mammals in the GOM. Lease- and activity-specific NEPA, ESA and MMPA documents will address noise impacts in more detail (i.e., the EIS currently in preparation for geophysical (seismic) surveying in the GOM (<http://www.nmfs.noaa.gov/pr/pdfs/fr/fr69-67535.pdf>). The cumulative impact sections of these documents will also address other sources of noise that marine mammals are exposed to in the GOM.

61. The Draft PEIS lacks any serious analysis of the potential impacts of program-related noise on marine wildlife, and offers in its place a number of specious claims in an apparent effort to diminish their serious effects. The Draft PEIS does not address the true elephants in the room: behavioral impacts, which have been demonstrated to occur at very large distances from seismic arrays, and masking effects, for which empirically-based, quantitative models are available. BOEM's dismissive treatment of acoustic impacts simply does not reflect the best available science. For all of the foregoing reasons, the PEIS must analyze and acknowledge that the activities under review – particularly the airgun surveys that presently represent the dominant means of offshore exploration – are likely to significantly impact marine mammals; affect vital rates in endangered species and populations, including the North Atlantic right whale.

Response: Potential impacts of noise on marine mammals are provided in Sections 4.4.7.1.1 through 4.4.7.1.3. The PEIS has been amended to include additional information regarding noise impacts on marine mammals. Also, lease- and activity-specific NEPA, ESA, and MMPA documents will address noise impacts in more detail (i.e., the EISs currently in preparation for geophysical (seismic) surveying in the GOM, mid/south Atlantic and Arctic — see <http://www.nmfs.noaa.gov/pr/pdfs/fr/fr69-67535.pdf>, <http://www.gomr.boemre.gov/homepg/offshore/atlocs/gandg.html>, and <http://www.nmfs.noaa.gov/pr/permits/eis/arctic.htm>. The cumulative impact sections of these documents will also address other sources of noise to which marine mammals are exposed.

62. Section 4.4.7.1.1: This section summarizing the effects of seismic surveys on marine mammals should include effects to prey (e.g., fish and squid). Studies suggest that squid, the primary prey item of endangered sperm whales, may experience statocyst damage that may result in injury or death resulting from exposure to low frequency sound.

Response: Potential impacts of seismic surveys on fish and invertebrates (which includes marine mammal prey) are provided in Sections 4.4.7.3 and 4.4.7.5, respectively.

63. Section 4.4.7.1.1: The seismic pulse is under 10 ms every 12 sec. or more, therefore the 10% duty cycle is much lower than cited, and thus any potential masking would be much smaller than suggested. This should be corrected.

Response: Additional information on duty cycles of seismic pulses have been added to Section 4.4.7.1.1 of the PEIS to demonstrate that the duty cycle of seismic surveys can be much lower than 10%.

64. Section 4.4.7.1.3: Industry practices as mandated by the USFWS and NMFS include maintaining 1-mile exclusion zones around known polar bear dens, use of aerial Forward Looking InfraRed Radar (FLIR) surveys to identify polar bear dens, and Incidental Harassment Authorization and Polar Bear & Wildlife Interaction Plans which specify the means by which industry minimizes contact, conflict, or stress upon the Polar Bears. These industry and regulatory practices should be specified to demonstrate protection of the polar bears. This section should also note a prior USFWS finding that “documented impacts on polar bears by the oil and gas industry during the past 30 years are minimal” and “historically, oil and gas activities have resulted in little direct mortality to polar bears.”
Line 12: Statements similar to those presented in this paragraph on sensitive and listed species need to be provided more extensively throughout the document so that the reader understands the significance and regulatory authorization of the discussed impact, along with the mitigation measure(s) to be employed to reduce the impact to levels consistent with ESA directives.

Response: The USFWS (2008b, 2011) has developed regulations that authorize the nonlethal, incidental take of small numbers of polar bears (and Pacific walruses) from oil and gas industry activities in the Chukchi Sea and Beaufort Sea areas, respectively. These documents include the requirement for maintaining 1-mile exclusion zones around known polar bear dens. A text addition has been made to Section 4.4.7.1.3 that refers to these documents. The FWS also has a website (<http://alaska.fws.gov/fisheries/mmm/itr.htm>) that addresses incidental take regulations on marine mammals under its jurisdiction (including polar bears, walruses, and sea otters). Section 4.4.7.1 defines level A and B harassment takes of marine mammals. As appropriate, statements similar to that presented in the paragraph referred to in the comment have been added to the PEIS.

65. “BOEM showed a slide earlier and it showed a red buffer zone of 25 miles up from Point Lay to Wainwright. It is really not enough. Walruses and other marine mammals are hauling out because there isn’t any more ice nearby that they can rest on, where they can leave their juveniles and go forage for food. They find themselves making their way to land and spending one month, and it’s working towards two months now, of every year looking for a place to rest. These animals, when they beach themselves, they’re so tired they can’t even get out of the surf. They’re sick. We’re finding sores all over these walruses, all over the seals, along with the belugas. Point Lay is a lagoon system that is about 100 miles long and is pretty unique. It’s got more water fowl and sea mammals than anywhere else in the world. They spend their summers there. These areas are very sensitive, along with thousands of other sensitive areas along the Chukchi Sea and up towards Barrow and all the way to Kaktovik. All these shorelines are used. We were finding hundreds of dead walruses, mostly juveniles. These animals were getting sick, there were sores. Scores of them were dead. And I want to mention something about the belugas, too. Point Lay hunters have been harvesting belugas for as long as I’ve been there, and I have only been there since 1973. Point Lay’s history goes way back, and belugas was one of the mainstays there. This year, the animals seem to be a different group. And that’s kind of strange and unusual because the belugas that they were normally seeing were much larger. This is a group of — a pod of belugas that were mature but smaller. So we’re not sure where this group actually came from.”

Response: A discussion of the UME that involves predominately ringed seals, but also some walrus, in the Arctic has been added to Sections 3.8.1.3.1 and 4.6.4.3.1 of the PEIS. A discussion of climate change impacts on sea ice can also be found in those sections of the PEIS, as well other subsections throughout Sections 3.8.1.3 and 4.6.4.3. As of the drafting of this response, NMFS has not yet determined the cause of this UME but will continue to post updates at <http://www.alaskafisheries.noaa.gov/protectedresources/seals/ice/diseased/>. The Marine Mammal Stranding Network, as well as the North Slope Borough and others, are involved in the investigation of the UME. BOEM is aware that walrus are coming ashore in large numbers when the sea ice retreats northward of the continental shelf, leaving calves particularly vulnerable to deaths during disturbance events and energetically depleted from long swims between foraging areas and the shore. The U.S. Geological Survey (USGS) and USFWS have been studying this phenomenon since about 2007. Recent genetic samples taken from a pod of beluga in Kotzebue Sound seem to indicate that it is genetically distinct from the group that used to show up there. Both the Alaska Department of Fish and Game and the North Slope Borough take samples from the beluga hunts and have an ongoing research program that studies different beluga stocks. There are some changes in habitat use by at least some pods of beluga, though why and where they are going is not completely understood. It is possible that these changes may relate to climate change or changes in prey distribution. In past lease sales, BOEM has looked at both a 25-mile and 50-mile buffer along the coastline. While a 50-mile buffer offers more protection, a 25-mile buffer was selected for Lease Sale 193. There have been discussions about deferring important walrus foraging habitat, primarily the Hanna Shoal area. BOEM is aware of the changing distribution of some marine mammal species, which seems to be driven by factors related to loss of sea ice and climate change. This information will be considered along with other factors in determining the lease sale areas and possible deferrals in future sales in the Chukchi Sea.

66. Section 4.4.7.1.1: NMFS uses different thresholds for Level B harassment, depending on the sound source (impulse, continuous, sonar, etc.), not just 160 dB. For exploratory and production drilling in the Arctic, 120 dB is used as the threshold for Level B harassment as it is a continuous noise source.

Response: Text has been added to Section 4.4.7.1.1 to include the NMFS thresholds.

8.4.4.4.9 Issue 4.9 Birds.

1. The PEIS should better address the attraction of migrating birds to offshore platform lighting.

Response: Injury or mortality to birds from collisions with platforms is discussed in Section 4.6.4.1.2 of the PEIS. The text has been revised to include additional text regarding the attraction of birds to platform lighting.

2. The Draft PEIS should be revised to update distribution and habitat information (including figures) for the red knot, wood stork, Audubon's crested caracara, piping plover, and the experimental eastern population of the whooping crane.

Response: Text and figures have been updated in Sections 3.8.2 and 4.4.7.2 to reflect current information and distribution of threatened, endangered, and candidate bird species, to update the numbers of bird species that could occur in each of the planning areas, and to clarify locations of important bird habitats that could be affected by oil and gas activities and accidental spills.

3. The Draft PEIS should be revised to provide information regarding the Migratory Bird Treaty Act, the ESA, and BOEM compliance with Executive Order 13186 Responsibilities of Federal Agencies to Protect Migratory Birds.

Response: The Migratory Bird Treaty Act of 1918 (MBTA) is a strict liability law that contains no provision authorizing a permitting system for “incidental take” such as is contained in the Endangered Species Act. The Memorandum of Understanding (MOU) between the Minerals Management Service (MMS, now BOEM) and USFWS regarding implementation of Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, is carefully worded such that BOEM is not obligated to any specific action or actions, but is obligated “to the extent allowed by law, subject to the availability of appropriations and within budgetary limits, and in harmony with the Department’s and the BOEM’s missions and capabilities,” to take bird conservation practices into consideration when taking any actions. BOEM includes an effects analysis to migratory birds, thereby taking bird conservation into consideration.

Discussions of the Migratory Bird Treaty Act were added to Sections 3.8.2.1.1 and 4.4.7.2.1.

4. The accuracy of the presented DWH event bird impact data should be reviewed and updated if appropriate; additional information on affected species and oil toxicity may be warranted; the discussion of oil impacts on birds should be updated.

Response: Table 3.8.2-6 was checked for accuracy and the provided source is correct. Water quality impacts resulting from the DWH event are discussed in Section 3.4.1.4 of the PEIS. “Seabirds” is a meaningful ornithological designation (as seen in Peterson field guides). Section 3.8.2.1.5 was updated to mention laughing gulls as the dominant bird species reported as affected by the DWH event. Section 3.8.2.1.5 was updated to include more specific information about the potential effects of crude oil and weathered oil on bird species.

5. Additional language should be added to expand on the attraction of birds to platform lighting. To mitigate collision impacts to birds, BOEM should require new lighting technologies (such as red lights) on offshore platforms.

Response: BOEM recognizes recent advances in lighting technology as a potential bird collision mitigation strategy. Mitigation measures must comply with FAA and Coast Guard regulations (which currently do not allow for red lighting), and will be determined at the lease sale phase when more detailed analyses occur. Additional text has been added to Sections 3.8.2 and 4.4.7.2 regarding platform lighting and bird attraction. The identification of potential mitigation measures takes place at the lease sale EIS or EA level (see Table 1-1,

Chapter 1). Please see Section 8.4.4.8, Issue 8, Mitigation, for additional responses concerning requests for specific mitigation measures.

6. The Draft PEIS discusses bird habitat disturbance by spill containment and cleanup activities in Section 4.4.7.2.1. Should this discussion take into account the involvement of wildlife experts in response activities for the purpose of minimizing response impacts to wildlife and habitat?

Response: Section 4.4.7.2.1 was updated to explain that spill response plans will include consultations with wildlife experts to minimize potential impacts.

7. Table 4.4.7-2 indicates that potentially minor impacts on juvenile and adult birds may result from seismic noise. Seismic noise is not implicated in injury or mortality of these life stages of birds and the table should be corrected to indicate no or negligible effect anticipated.

Response: Table 4.4.7-2 was updated to show no or negligible effects are anticipated for juvenile or adult birds from seismic noise.

8. The Draft PEIS incorrectly claims that missing information pertaining to the impacts of climate change on marine and coastal birds is not essential to a reasoned choice among alternatives. Better information on the effects of climate change on birds would allow for a more accurate understanding of the differential impacts of the alternatives, and thus allow for a more reasoned choice among alternatives.

Response: BOEM disagrees. Programmatic-level analyses and decisions do not require the same detailed analyses that may be necessary at later stages of OCS leasing (see Section 1.4.2 for additional discussion of incomplete and unavailable information). Resolving the uncertainty regarding the effects of climate change on birds is not essential at this programmatic stage. BOEM acknowledges the potential effects of climate change on not only birds but all natural resources. The PEIS discusses the potential consequences of climate change on Arctic birds (Section 3.8.2.3.5). Additional text has been added to Section 3.8.2 of the PEIS to discuss climate change consequences for birds in the GOM and Cook Inlet planning areas. Also, see the response to Comment 9 in Section 8.4.4.2, Issue 2, NEPA Analysis.

9. The text should be modified to indicate that moderate impacts would be anticipated to marine and coastal birds in the case of a CDE.

Response: Depending on the location, timing, and species and habitats affected, a CDE could have a moderate-to-major impact on marine and coastal birds. This impact range is identified for CDEs occurring in the GOM (Section 4.4.7.2.1), Cook Inlet (Section 4.4.7.2.2), and Arctic (Section 4.4.7.2.3) planning areas.

8.4.4.4.10 Issue 4.10 Reptiles.

1. The USFWS requests the inclusion of the Alabama red-belly turtle (*Pseudemys alabamensis*) and gopher tortoise (*Gopherus polyphemus*) in the Affected Environment and Impact Sections (Sections 3.8.3 and 4.4.7.4). Both of these species are reptiles listed under the Endangered Species Act.

Response: Discussion of these species has been added to the Affected Environment Section (Section 3.8.3) and Impact Section (Section 4.4.7.4).

2. Table 4.1.3-1 in Section 4.1.3 should be revised to omit duplication of impacting factors and revise some of the impacts to sea turtle habitats and life stages.

Response: This table in Section 4.1.3 has been revised to omit duplication and update impacting factors.

3. The stranding numbers of sea turtles during the Deepwater Horizon event have been revised. Revise sea turtle stranding numbers in the PEIS accordingly (Section 4.4.7.4.2).

Response: Turtle stranding numbers have been revised in Section 4.4.7.4 to reflect the most up-to-date information at this time.

4. Additional discussion on the role of *Sargassum* to sea turtle life history is needed. The effects to *Sargassum* should be considered in the potential effects to sea turtle habitat resulting from a catastrophic discharge event. *Sargassum* is also a vitally important developmental habitat for sea turtles. *Sargassum* can be found throughout the GOM and can reproduce both sexual and through vegetative regeneration and can be affected in all planning areas. Although *Sargassum* may recover from such events in the long-term, the short-term effects to the ecosystem resulting from a catastrophic discharge event can be of high magnitude.

Response: Additional discussion on the role of *Sargassum* in the sea turtle life history and impacts to *Sargassum* from OCS O&G activities has been added to Sections 3.7.3.1.2 and 3.8.3.

5. The habitat listed for Kemp's ridley sea turtles (Table 3.8.3-1 in Section 3.8.3) is missing the juvenile and oceanic habitat. Both oceanic and neritic habitats are important for different life history stages of Kemp's ridleys.

Response: Text has been revised in Section 3.8.3 to discuss juvenile and adult habitats for Kemp's ridley sea turtles.

6. The Affected Environment section could benefit from a more rigorous description of both the neritic and oceanic developmental stages of sea turtles that could be affected by oil and gas activities. Sea turtle life history patterns and the developmental habitat shifts have been

categorized as Type 1, Type 2, and Type 3, depending on the species. Oceanic stage Kemp's ridleys, as well as neritic stage animals, were directly impacted during the Deepwater Horizon Oil spill and could be impacted by other OCS activities in the GOM.

Response: Reptile section (Section 3.8.3) has been updated to include additional discussion of habitat preferences of all turtle life stages.

7. Request discussion of other reptile species listed as sensitive species or species of concern by the USFWS or the States in the GOM Planning regions. Non-federally listed reptile species were not discussed in the Draft PEIS.

Response: Only reptile species that are federally listed as threatened or endangered under the Endangered Species Act are discussed in this PEIS. The discussion of other sensitive or rare reptile species is more appropriate at the more detailed lease sale or activity-specific stages.

8. Figure 3.8.3-1 in Section 3.8.3 does not accurately represent the occurrence of sea turtles or the nesting of sea turtles along the Texas coast. The inclusion of this figure may lead one to draw inaccurate conclusions regarding the potential impact of oil and gas development in the Western GOM Planning Area.

Recommendation: Either omit this figure from the PEIS or revise it to more accurately reflect the occurrence of sea turtles and nesting sea turtles in the GOM and particularly along the Texas coast.

Response: Additional data sources will be reviewed and the figure will include the best available data. However, new information that could be used to revise the figure is not essential in order to make a reasoned choice among alternatives.

9. The Draft PEIS states, "Following the DWH event, a total of 1,146 sea turtles were recovered from the GOM that had come in contact with or were in the vicinity of spilled oil" (Section 3.8.3.1). Does this statement account for the fact that some of these turtles were collected well after the DWH well had been capped? As a result, it is unlikely that those turtles were ever in the vicinity of the spilled oil. Additionally, some were collected in Florida, which also reduces the likelihood that they were in the vicinity of oil. Is there any data indicating that sea turtle nests were in fact oiled, or is this speculation?

Response: Text has been revised in Section 3.8.3.1 to clarify the interpretation of the data regarding turtle and nest fouling following the DWH event.

10. The BOEM is legally obligated to prevent the deaths of protected species under the Migratory Bird Treaty Act and the Endangered Species Act. Similar concerns could be expressed about the Draft PEIS treatment of issues relating to endangered and threatened marine turtles.

Response: The PEIS identifies sea turtles as being listed as threatened or endangered under the ESA. Any discussion on impacts to these species will be conducted at the lease sale or activity-specific level in compliance with ESA and MBTA requirements. The PEIS describes the ESA and MBTA requirements in Sections C.1.8 and C.1.10, respectively, in Appendix C.

11. BOEM has admitted that the “range of toxicity, the degree of sensitivity to oil hydrocarbons, and the effects of cleanup activities on sea turtles are unknown . . .” (Supplemental EIS for Lease Sale 218 at 4-139). *Id.* at 4-160.

Response: It is unclear whether the comment refers to this 5-year OCS PEIS or to the GOM Lease Sale 218 EIS. Regardless, more detailed analysis on these issues will occur at the lease sale or activity-specific level following the PEIS.

8.4.4.4.11 Issue 4.11 Invertebrates.

1. Section 3.8.5.3, Alaska — Arctic — More detailed information on crab stocks in this region can be found in Rand and Logerwell (2011) and in the Arctic FMP. See Rand, K. M., and E. A. Logerwell 2011. The first demersal trawl survey of benthic fish and invertebrates in the Beaufort Sea since the late 1970s. *Polar Biol.* 34:475–488.

Response: Additional information on the snow crab was added to Section 3.8.5.3.

2. The commenter states that in Sections 3.7.2.1.7 and 3.7.4.1 of the Draft PEIS, the statements regarding the brown substance coating deepwater corals are incorrect because the source does not attribute the “brown substance” to the DWH event and states that laboratory analysis is still needed to determine the source.

Response: The statement modified to say brown substance. Text modified in Sections 3.7.2.1.7 and 3.7.4.1 to state “covered in brown flocculent (<http://www.boemre.gov/ooc/press/2010/press1104a.htm>), and recent analyses (White et al. in press) provide evidence that the flocculent contained oil from the DWH event located approximately 11 km (7 mi) to the northeast.”

3. Section 4.4.6.2.1 of the Draft PEIS states, “There is evidence that oil released from the DWH event was mixed with dispersant . . . and may have killed deepwater corals...” Should this statement be clarified to note that testing is still underway to determine if the substance was DWH oil or dispersants? Can the results be provided? In addition, should this passage note that while the effects of dispersant on deepwater corals are poorly understood, dispersant chemicals contain constituents that are considered to have low levels of toxicity when compared to toxic constituents of spilled oil (Wells 1989)?

Response: The text in Section 4.4.6.2.1 has been modified to say “There is evidence that oil released from the DWH event was mixed with dispersant (Kujawinski et al. 2011), and there is some evidence that oil from the DWH event killed habitat-forming deepwater corals

(<http://www.boemre.gov/ooc/press/2010/press1104a.htm>; White et al., in press; Section 3.7.2.1.7).” The effect of chemically dispersed oil on corals is equivocal, with some studies finding large effects of oil and dispersant mixtures on corals and others finding only minor effects (Dodge et al. 1984; Wyers et al. 1986; Epstein et al. 2000; Haapkivla et al. 2007; Shafir et al. 2007).

4. Sections 4.6.4.1.5 and 4.6.4.3.4 of the Draft PEIS discuss the magnitude and severity of potential effects to invertebrate resources from oil spills. Should these discussions note that the distribution and densities of invertebrate communities in waters potentially affected by the Deepwater Horizon event are under investigation? See NOAA, NRDA Workplans and Data, available at <http://www.gulfspillrestoration.noaa.gov/oil-spill/gulf-spill-data/> (linking over a dozen studies of oysters, benthic invertebrates, nekton, and zooplankton). In addition, LDWF has conducted, and continues to conduct, sampling and analysis of crab, shrimp, and oysters.

Response: Ongoing studies were noted in Section 4.6.4.1.5, the section that discusses invertebrates in the GOM. However, very little data from these studies has been synthesized and peer reviewed. Therefore, it is too soon to do a comprehensive evaluation of the impacts of the DWH event. However, as more information becomes available, BOEM will include the results in subsequent environmental analyses. The purpose of this PEIS is to identify and document the potential impacts of the proposed action and alternatives to the proposed action. To support planning decisions for establishing a 5-year schedule for lease sales, detailed analyses of highly variable, region-specific and/or well-specific risk is neither feasible nor appropriate. See Section 1.4.2 for a discussion of incomplete and unavailable information.

5. The commenter states that Section 3.8.5.1 of the Draft PEIS should note that the yearly hypoxic zone occurs on the Louisiana and Texas continental shelf, away from the deepwater zone where the DWH event occurred.

Response: This was a general statement about bacteria contributing to the GOM hypoxic zone and was not in reference to the DWH event. It was noted in the text in Section 3.8.5.1 that the hypoxic zone is on the continental shelf not in deepwater. Hypoxia in the GOM is discussed in detail in the water quality section (Section 3.4.1).

6. Sections 3.8.5.1 and 4.4.6.3.1 of the Draft PEIS state that studies following the DWH event demonstrated that the amount of methanotropic and oil-eating bacteria increased greatly after the DWH event (Camilli et al. 2010; Kessler et al. 2011). Should these statements also cite Hazen et al. (2010)?

Response: Reference added as requested to Sections 3.8.5.1 and 4.4.6.3.1.

7. Tables 4.4.7-8 and 4.4.7-9 in Section 4.4.7: The table shows the impact level from noise from seismic surveys potentially affecting invertebrates as blue = minor. Yet the language in

Sections 4.4.7.5.1 and 4.4.7.5.3 suggest that the effects would be “negligible.” This table should be changed to reflect an impact level from seismic noise to white = negligible.

In addition, in Table 4.4.7-10, the colors are not consistent with Footnote A. If this table is incorrect, and seismic noise was intended to be classified as a higher impact level, please immediately advise the writer as to the correct classification. In such a circumstance, we reserve and request the right to comment on the corrected table.

Response: The PEIS defines negligible as “no measurable impacts” and minor as “most impacts on the affected resource could be avoided with proper mitigation.” If impacts occur, the affected resource will recover completely without mitigation once the impacting stressor is eliminated.” Noise can affect invertebrates and, therefore, the definition of Minor better fits with the impacts on invertebrates as described in the literature. Negligible has been changed to minor in the text in Sections 4.4.7.5.1 and 4.4.7.5.3 to match the tables.

8. Commenter requests that a discussion of the impacts of oil spills on pelagic marine invertebrates be added to Section 4.4.7.5.3 and Section 4.4.6.3.3 and notes that if dense aggregations of spawning zooplankton contact oil, reproduction and recruitment may be halted for a year or more depending on how long it would take to clean up the oil spill.

Response: Invertebrates (including zooplankton) are discussed throughout Section 4.4.7.5. In order to avoid text duplication, Section 4.4.7.5.3 directs the reader to Section 4.4.7.5.2 for a complete discussion of the effects of exploration and site development activities on invertebrates. The existing text has been expanded to discuss impacts on zooplankton from oil spills.

8.4.4.4.12 Issue 4.12 Threatened and Endangered Species.

1. There should be full ESA Section 7 consultation, including the preparation of a Biological Assessment and Biological Opinion. BOEM must avoid conflating the ESA take prohibition with critical habitat designation.

Response: The Program broadly defines the portion of each planning area that is proposed for subsequent leasing consideration, and decision options for the leasing program are preserved for the Secretary at the time the decision is made for each sale. It is at the lease sale stage or activity-specific stage (i.e., regional seismic EISs) that BOEM begins Section 7 consultations (see Section 1.5.5.4 of the PEIS). BOEM agrees that critical habitat and species listings are separate under the ESA and that designation of critical habitat does not directly prohibit take of the species. BOEM fully complies with all requirements of the ESA, and impacts to ESA-listed species and designated habitats are discussed in various section of Chapter 4 of the PEIS. Also see responses to ESA-related comments presented in Issue 9 of this section of the PEIS.

2. The impact levels used in the Draft PEIS are directed at populations not individuals. However, per ESA, BOEM should direct that evaluation of impacts to individuals that are

much more critical and justified for listed threatened and endangered species. Text should be provided to clarify this issue and subsequent evaluations should consider the uniqueness and vulnerability of listed species when assessing and/or designating a particular impact level.

Response: The impact level definitions provided in Section 4.1.4.1 have been revised to indicate that for evaluations of ESA-listed species, the impact levels consider impacts on individuals as well as populations. In addition, the PEIS has been revised to provide a more uniform and consistent discussion of impacts on ESA-listed species at both the individual and population level. As discussed in Section 1.5.5.4 of the PEIS, ESA Section 7 consultations (whether informal or formal) are premature at the 5-year programmatic stage, and ESA Section 7 consultations would begin at the lease sale stage. It is at this stage that more species-specific impact evaluations would occur, including identification for adversely affecting individuals. BOEM recognizes the uniqueness and vulnerability of listed species. The PEIS identifies these species in Section 3.8, and discusses possible impacts in Section 4.4.7, of the PEIS.

3. The sections on ESA (and other) birds associated with Cook Inlet and Arctic areas are treated much more extensively than any other discussions on ESA species. Revise the document to provide a consistent treatment of the important sensitive biological receptors within each proposed lease area.

Response: Section 3.8 of the PEIS has been revised to present a more equal treatment of impacts on ESA species and other non-listed species.

8.4.4.4.13 Issue 4.13 Land Use and Infrastructure.

1. The commenter suggested a modification to the text to indicate that the Trans-Alaska Pipeline System (TAPS) could not transport gas. Gas from the Beaufort and Chukchi, therefore, would not be transported via the TAPS, but instead would be transported via a new gas line to the lower 48 States or a port in south central Alaska or directly from future North Slope infrastructure.

Response: A typographical error was made in the PEIS that indicated that TAPS would transport both oil and gas in Sections 2.1 and 4.4.1.3. The text was amended to show that TAPS will only transport oil. The text revision in these two sections did not result in changes to potential impacts discussed as part of individual resource sections and conclusions.

2. The commenter was concerned about the future viability and operations of the TAPS (including the economic implications for the owners) being connected to the actions described in the Draft PEIS. The comment text indicated that while substantial interest in resources along the North Slope is present, as evidenced by recent lease sales of State lands, the actions undertaken as part of this PEIS are not essential to the future of TAPS.

Response: While BOEM recognizes the economic and infrastructural importance of TAPS, the concerns for maintenance, improvements, and future viability for this pipeline are out of

scope for the evaluation conducted as part of this PEIS, and for BOEM and its compliance with OCSLA. It should be noted that a new 40-year right-of-way was approved in 2003 for TAPS, which was followed shortly afterward by an upgrade of the system's pump stations. Additional activities have been conducted with the goal of extending the economic life of TAPS, while maintaining operational efficiencies and safety. See the response to Comment 7 in Section 8.4.4.2.

3. This commenter described a concern for potential impacts on onshore and offshore resources associated with the use of helicopters, planes, and other vessel traffic.

Response: The expected levels of helicopter and vessel traffic that could occur under the proposed action are presented in Table 4.4.1-1 for the GOM planning areas, Table 4.4.1-3 for the Cook Inlet planning area, and Table 4.4.1-4 for the Beaufort and Chukchi Seas planning areas. The potential impacts resulting from use of various transport modes (e.g., helicopters and airplanes) are analyzed on a resource-by-resource basis in Chapter 4.

4. The commenter suggested that oil and gas exploration companies should locate support facilities and infrastructure onshore in order to create a tax base and training opportunities for locals, while at the same time reducing the cost of health care, schools, transportation, utilities, and housing in the Northwest Arctic Borough.

Response: Support facilities and onshore infrastructure for Chukchi oil and gas activity are unlikely to be located within the borders of the Northwest Arctic Borough. However, workers in the Northwest Arctic Borough could be involved in work generated by OCS activities. The Northwest Arctic Borough might consider partnering with the oil and gas industry, the North Slope Borough, and/or other entities for work training programs, which would be applicable to work on the OCS.

Job training and other reductions in cost (e.g., health care, schools, and utilities) as described in this comment are not, per se, a part of BOEM's responsibilities.

5. The commenter suggested that the TAPS is only used for crude oil, rather than gas as described in the PEIS. The commenter further suggested that the use of a natural gas pipeline to the mid-continent and the tanker concepts are not viable for transporting resources from the Chukchi and Beaufort Seas. The commenter, therefore, suggested two scenarios, one in which resources remain stranded, and another in which the natural gas is exported outside the country.

Response: The Draft PEIS incorrectly stated that the TAPS would be used to transport both oil and natural gas from the Arctic to Valdez. This error has been corrected in Sections 2.1 and 4.4.1.3 of the PEIS. As discussed in Section 4.4.1.3, a natural gas pipeline from near Prudhoe Bay is assumed to be in place and operational by 2020. The construction of a pipeline for natural gas transport to the lower 48 States has been under serious consideration by industry since 2011, and more recently, industry and the State of Alaska are examining the potential for a pipeline to the southern Alaska coast to support liquefied natural gas (LNG) export outside of the country. Examination of LNG export is outside the scope of the

PEIS. Authorization to export LNG is provided by the U.S. Department of Energy, Office of Oil and Gas Global Security. See the response to Comment 21 regarding LNG export in Section 8.4.4.2.

6. The commenter suggested that the text showing Kivalina as the third largest port in the State of Alaska should be changed to Ketchikan, since Kivalina only has a barge landing.

Response: The listing of ports was provided by port tonnage based on figures from the United States Army Corp of Engineers (USACE) for the year 2009 (<http://www.ndc.iwr.usace.army.mil/wcsc/portname09.htm>). According to this data source (which lists the top 100 ports, by tonnage), Valdez was listed as the 18th-largest port in the United States; Nikiski (formerly Nikishka) was listed as 76th; Kivalina was listed as 89th; and Anchorage was listed as 96th. Ketchikan is not included in this listing by the USACE.

Kivalina is a port for a large mine at Red Dog. The actual port is located outside the immediate community.

The text in Section 3.11.2 was amended to clarify this information and therefore lists the port as Kivalina (Red Dog).

7. The commenter was unaware of any applications for a gas line that would connect the Beaufort and Chukchi Seas to the lower 48 States.

Response: Applications for the development of natural gas pipelines are being processed. The BLM, for instance, is processing right-of-way (ROW) applications for the Denali-Alaska Gas Pipeline, the Alaska Pipeline Project, and the Alaska Gasoline Development Corporation Stand Alone Pipeline.

Among these projects, the initial open season for the Alaska Pipeline Project was conducted from May to July 2010. Project proponents intend to file to the Federal Energy Regulatory Commission (FERC) in October 2012.

8. The commenter stated that the Arctic has very limited coastal infrastructure outside of the Prudhoe/Kuparuk development. The commenter suggested that the opportunity should be used to carefully plan where needed coastal development should be located, including infrastructure to support coastal communities, exploration, production, transportation, safety, and pollution response.

Response: Existing infrastructure in the Arctic is described in Section 3.11.3. Additional information is also provided in the exploration and development scenario, which is presented in Section 4.4.1.3. While the scenario indicates what types of infrastructure would be needed as part of the overall program, the location, construction, and operation would be determined by an individual applicant and in consideration of other permitting/regulatory requirements. To plan for coastal development at this level (as described in this comment) is outside the scope of this PEIS as well as outside the authority of BOEM.

9. The commenter suggested that the Draft PEIS lacked a discussion of the use of jack-up rigs or platforms in the Chukchi Sea, drill ships, specific drilling techniques (e.g., the extended reach and directional drilling), and gravel islands, thereby ignoring current oil and gas technologies and strategies for protecting critical marine resources and potentially conflicting uses.

Response: The PEIS includes a discussion of the types of drilling approaches and technologies that would be used in the Arctic, including the Chukchi Sea. Section 4.4.1.3 of the PEIS discusses the uses of gravel islands, mobile platforms, and drill ships under various depth and weather conditions.

10. The commenter requested that the PEIS clarify why the Beaufort Sea required a pipeline, and how oil and gas would be transported from the Chukchi Sea, referencing the text in Section 4.4.7.2.3, the construction of onshore pipelines section.

Response: The exploration and development scenario for the Arctic is described in further detail in Section 4.4.1.3. The section referenced in the comment summary above is a summary statement that references the exploration and development scenario. As stated in Section 4.4.1.3, oil produced in the Beaufort Sea Planning Area would be delivered via trenched subsea pipeline to existing onshore facilities. In the Chukchi Sea Planning Area, production operations would use gravity-base structures with trenched subsea pipelines to transport oil to landfalls. In both areas, onshore pipelines would convey the oil and gas from the landfall facilities to production facilities at Prudhoe Bay.

8.4.4.4.14 Issue 4.14 Fish and Fisheries.

1. Commenter requests the PEIS note that the U.S. Fish and Wildlife Service issued a substantial 90-day finding (50 CFR Part 17: 60431-60444) on September 29, 2011, for the American eel and is currently conducting a status review of the species to determine if it warrants protection under the Endangered Species Act of 1973.

Response: The text has been updated in Section 3.8.4.1.12 to reflect new information about the status of the American eel.

2. Commenter states that lakes used for ice roads contain fish and that small fish are pumped out of these lakes when the ice roads are being made and the fish are visible along the road. These impacts should be addressed.

Response: A discussion of impacts to fish from ice roads has been added to Sections 4.4.7.3.3 (Fish) and 4.4.6.4.3 (EFH).

3. Commenters state that they were horrified by the BP oil disaster and that impacts to oysters and menhaden are unknown because the studies are ongoing. They have also heard stories that oil is coming up from around the Macondo well and that Corexit is still being sprayed. Commenter also noted that more fish have sores on their bodies that never used to be there.

Response: The spill at the Macondo well was capped on July 15, 2010, and Corexit is no longer being sprayed. BOEM concurs that some effects from the oil spill may take years to determine. BOEM also concurs that all effects are not known at this time, and we will continue to follow research on this issue. However, it can be difficult from anecdotal information to determine causality.

4. The commenter states that airgun surveys have important consequences for the health of fisheries and provides several citations to support the claim.

Response: Section 4.4.7.3 acknowledges that fish hearing is potentially damaged by air guns and the literature cited in the comment has been discussed in the text when applicable to fish. Potential impacts on commercial fisheries were noted in the commercial fisheries section.

5. Section 4.4.7.3, Fish: BOEM acknowledges that trace metal and hydrocarbon constituents in drilling fluids can be toxic to fish at all life stages if they are exposed to high enough concentrations. NOAA recommends that BOEM either include a reference, or a brief description of what constituents might be present in these fluids.

Response: Section 4.4.3.1 (Potential Impacts on Water Quality-GOM) describes the various categories of drilling fluids and their primary constituents. A reference to this section and the papers it cites has been added to Section 4.4.7.3.

6. Sections 4.4.11.1.2 and 4.4.11.2.1, Commercial Fisheries: NOAA has previously commented that negative values in tables describing the estimates of increased costs to fishing vessels need explanation. Based on how positive values are treated in the text, a negative value implies operational costs will decrease as a result of the placement of new oil/gas structures. These negative values require explanation; absent explanation, the underlying model becomes suspect, raising questions on the estimated increased costs as well. Further, it is unclear how the results in Section 4.4.7.5.2 are derived. For example, the PEIS states that for the Western Planning Area 0-60m depth, the cost impact for one structure is estimated to be \$41.24 (Table 4.4.11.1-1). If 44–80 platforms are to be built, the respective range of cost is \$1,815 ($\41.24×44) – \$3,299 ($\41.24×80) and not the \$1,993–\$3,819 reported. Similar math “disconnects” result from examining the estimates for the Central Planning Area.

Response: The commenter is correct in assuming that negative values in Tables 4.4.11.1 and 4.4.11.2 indicate that costs would decrease as a result of the placement of offshore oil and gas structures. Specifically, in Table 4.4.11.1, coefficients for platforms in the 0–60 m (0–197 ft) depth range are negative in the Central and Eastern Planning Area, which implies that additional platforms in this depth range will dampen the negative impacts of platforms in other depth ranges in the Planning Area. The text in Section 4.4.11 of the PEIS has been changed to clarify the nature of impacts, and provide more information on the calculation procedures.

7. Section 4.6.3.2.3, Essential Fish Habitat: “Egg and larval stages would be at greater risk of exposure to oil spills because spawning aggregations of many groundfish species (e.g., walleye pollock) produce pelagic eggs that could come into contact with surface oil slicks. Herring are also potentially susceptible to oil spills because they spawn in nearshore waters for protracted periods of time.” In Shelikof Strait pollock eggs are spawned at depth 250-300m and rise to the surface. Larvae are found 30–40m depth. Pollock eggs are found at the surface in the eastern Bering Sea so there could be other areas in the Gulf of Alaska where the eggs would be right at the surface. Note that Sablefish larvae are neustonic. They would be at risk in an oil spill that left Cook Inlet proper and contaminated the Gulf. Please check the AFSC (Alaska Fisheries Science Center) Ichthyoplankton Information System <http://access.afsc.noaa.gov/ichthyo/index.cfm> for a complete listing of the habitats for the target species.

Response: Additional information on pollock was added to Section 4.6.3.2.3. Detailed fisheries impact analysis would occur at the individual lease sale.

8. In the assessment of potential impacts on fish resources and EFH, the conclusion was that no permanent impacts on fish populations are expected although some fish populations may be measurably depressed for several years in the event of a spill. This conclusion fails to recognize the relative importance of a single year class to overall population health, such as is found with some gadid and herring species.

Response: The size of a particular year class is affected by a variety of physical, chemical, and biological factors. Most impacts are unlikely to affect a whole year class unless the species is concentrated in one location. The text in Sections 3.7.4 and 4.4.6.4 was modified to add information on gadids and herring as appropriate to addressing permanent impacts on fish populations.

9. Commenter requests that the effects of platform removals be added to the summary section on fish and EFH impacts.

Response: Added effects of platform removals to Section 4.4.6.4 on fish and EFH impacts.

10. The NMFS is in the process of rulemaking, which will remove the species identified below (Section 3.7.4.1) from their respective fishery management units in the GOM. Although final action has not occurred at this time, BOEM should verify their status prior to publishing the Final PEIS. (Contact: David Dale, Southeast Region Essential Fish Habitat Coordinator david.dale@noaa.gov). Reef Fish: dog snapper, mahogany snapper, schoolmaster, misty grouper, red hind, rock hind, blackline tilefish, anchor tilefish, sand perch, and dwarf sand perch. Coastal Migratory Pelagics: bluefish, cero, dolphin, and little tunny.

Response: David Dale has been contacted, and the text in Section 3.7.4.1 was revised to reflect species updates provided by Mr. Dale.

11. Section 3.7.4.2: This section has an incomplete reference pointing only to NMFS (2005).

Response: It is uncertain as to what the commenter means by saying the reference is incomplete. However, the referenced link www.fakr.noaa.gov/npfmc/fmp/fmp.htm is no longer functional and has been replaced with www.fakr.noaa.gov/npfmc/index.html.

12. Section 3.8.4.2.3, Demersal Fishes: “Groundfish typically use Cook Inlet as a seasonal feeding area, while spawning occurs offshore, often on the continental shelf edge of the GOA.” This is accurate for most but not all groundfish. Pollock, for example, use Shelikof Strait and the Shumagin Islands as their primary spawning areas, which are located above the continental shelf. NOAA recommends BOEM revise this text.

Response: Areas used by Pollock have been clarified in Section 3.8.4.2.3.

13. Section 3.8.5.2, Alaska — Cook Inlet. Climate-change effects on commercially important crustacean species such as king and Tanner crab should be specifically mentioned here.

Response: Text on ocean acidification and commercial crabs has been added to Section 3.8.5.2.

14. Section 3.8.5.3, Alaska — Arctic: More detailed information on crab stocks in this region can be found in Rand and Logerwell (2011) and in the Arctic FMP. See Rand, K. M., and E. A. Logerwell (2011). The first demersal trawl survey of benthic fish and invertebrates in the Beaufort Sea since the late 1970s. *Polar Biol.* 34:475–488.]

Response: Snow crab information from Rand and Logerwell (2011) has been added to Section 3.8.5.3.

15. Commenter states that the DWH event resulted in potential long-term impacts to fish and impacts to commercial fisheries and cites literature support. Such revenue losses and long-term effects of spill- induced fishery closures on fishing communities must be recognized in Chapter 6 of the PEIS.

Response: It is premature to say what the long-term effects of the DWH event may or may not be on fisheries in the GOM. Throughout the implementation of the 2012-2017 Program, BOEM will continue to review and incorporate research findings into our understanding of effects and our OCS oil and gas activities. The Whitehead study referenced in the comment was added to Section 3.8.4.1. The impacts of the DWH event on commercial fisheries are addressed in Section 3.12.1.1. Text has been added to Chapter 6 that discusses the effects of an unexpected CDE on long-term productivity.

16. The commenter wants more acknowledgement that the DWH event could produce long-term impacts to fish and provides citations for additional information.

Response: The text in Section 4.4.7.3 states “...although there remains the potential for long-term population impacts from sublethal and chronic exposure.” Discussion of impacts on the bluefin tuna was expanded in this section. Population dynamics are difficult to predict.

Productivity can be density-dependent. It is hard to determine the limiting factors for populations. Sublethal effects are possible, although they may be less pronounced in far-ranging species since they may not be exposed to geographically concentrated contamination. BOEM would concur that the true impact will take years to determine.

17. The commenter does not like the data cited in the text as sourced from a Mississippi State University website, feeling that the information is too limited, and provides his own analysis of fisheries impacts.

Response: BOEM agrees that the information provided on the cited website is very limited in scope, and the text in Section 3.8.4.1 has been revised to remove the citation and associated reference. Information provided by the commenter was not peer-reviewed in nature, consisting of newspaper articles, and thus was not used to revise the PEIS. The PEIS does not claim there were no impacts on shrimp populations or shrimp fisheries from the DWH event. It is too early to assess the impacts of the DWH event on fish populations and fisheries catch and it will take time and rigorous scientific inquiry to determine the extent and severity of impacts from the DWH event.

18. Section 3.7.4.1 of the Draft PEIS states, “Oil released as a result of the DWH event affected more than 1,046 km (650 mi) of the GOM coastal EFH,” citing OSAT-2 (2011) and National Commission (2011). Do these authorities refer to “EFH,” or instead to “Gulf Coast habitats”? The commenter also states the PEIS should include the results from Atlantic Bluefin Tuna Status Review Team, 2011. Status Review Report of Atlantic Bluefin tuna (*Thunnus thynnus*), Report to National Marine Fisheries Service, and that there are many studies of the DWH event on marine life.

Response: Gulf Coast habitats are considered EFH for reef and other species under the Gulf of Mexico Fishery Management Plan (Section 3.7.4.1). The Status Review 2011 report results were incorporated into the PEIS, and other text was modified to indicate there are many ongoing studies of the DWH event but little of the data is synthesized, peer-reviewed, and available.

19. Commenter asks whether the “long-term, population-level impacts” described in the Draft PEIS are adequately supported or, instead, largely conjectural? At a minimum, should not these statements be qualified by referring to current research suggesting that, while certain fish species may have experienced biological impacts in the short-term as a result of the DWH event, there is little evidence of a significant decrease in fish populations after the DWH event? See Fodrie et al. (2011); Atlantic Bluefin Tuna Status Review (2011).

Response: This statement was not referring to the effects of the DWH event, but rather, the potential effects of catastrophic spills in general. The effects of the *Exxon Valdez* spill may have had population effects (see the *Exxon Valdez* Oil Spill Trustee Council site <http://www.evostc.state.ak.us/>), although it can be difficult to differentiate what was spill-caused and what was due to other factors.

20. Section 3.7.4.1 of the Draft PEIS states, “Although much of the oil remaining after cleanup is highly weathered, several constituents have the potential to cause toxicological effects (OSAT-2 2011).” Should this statement clarify that oil weathering depleted a large portion of the more toxic PAHs in oil? Should this statement reference Boehm SETAC (Society for Environmental Toxicology and Chemistry) and IOSC (International Oil Spill Conference) presentations on high rates of biodegradation for DWH oil?

Response: The text has been clarified in Section 3.7.4.1 as suggested, but also includes a discussion of the OSAT-2 finding that the residual oil evaluated contained high-molecular-weight hydrocarbons, including the more toxic PAHs that are resistant to weathering and microbial biodegradation.

21. Section 3.7.4.1 of the Draft PEIS states, “The methane plume appeared to be relatively short-lived (Kessler et al. 2011), but dispersant was still detectable at low, nontoxic levels up to 300 km (186 mi) away from the wellhead 64 days after the dispersant release ended (Kujawinski et al. 2011).” The cited Kessler article reviews methane concentrations in August and September 2010, one to two months after the wellhead was closed. The timeframe of the Kessler article is similar to the 64-day timeframe of the dispersant study. Should the quoted PEIS statement be rewritten to note that methane was effectively consumed within one to two months, and that dispersant concentrations, while still detectable, were very low (at the ng/L level) — well below toxic concentrations - in the same time period?

Response: Text in Section 3.7.4.1 modified to: “The methane plume appeared to be relatively short-lived with most of the methane being consumed by bacteria within 120 days from the onset of release (Kessler et al. 2011). Dispersant was detectable at low, nontoxic levels up to 300 km (186 mi) away from the wellhead 64 days after the dispersant release ended (Kujawinski et al. 2011). Sediment and water quality contaminant data from OSAT also added.

22. Section 3.12.2.2: The 1987 sourced information appears dated. Suggest including a statement that no more recent data are available in place of the implicit statement. Suggest investigating the availability of more recent information on recreational fishing than 1987 studies.

Section 3.12.2.3: There is quantitative data presented for most types of the fishing or statements to indicate the lack of such data. Provide similar statements for the subsistence fishing as other fisheries if available.

Response: The text in the PEIS has been changed in Sections 3.12.2.2 and 3.12.2.3 to reflect the data noted in the comment.

23. Section 4.4.7.3.1, Protected Species: Gulf Sturgeon: Although accidents are addressed to some degree for this species, why have impacts from a CDE not been discussed more extensively, or at least within the “Accidents” section? Data obtained during the DWH event

studies (i.e., OSAT 1) would aid in understanding the vulnerability and/or potential effects (or not) from such a unique event.

Response: Section 4.4.7.3.1 has been modified. Although there are many ongoing studies, there is very little actual data and even less consensus on the effects of the DWH event on future fish populations. The Fodrie paper is one of the few peer-reviewed papers currently available and it is cited in the PEIS as is the population model for bluefin tuna. The OSAT studies were of sediment and water column PAH concentrations and are discussed in the habitat discussions presented in this PEIS (see Section 4.4.6). Also, the DWH event should not be taken as being necessarily similar to future spills, although the PEIS includes an analysis of the potential effects to fish and fish habitats in an unexpected CDE were to occur in the GOM.

24. Section 4.4.11.1.1: This section is extremely limited considering the biological, economical and sociological attributes associated with commercial and recreational fishing in the GOM.

Response: The biological, economic, and sociological aspects of commercial fishing in the GOM are covered in detail in Sections 3.12 and 3.14 of the PEIS. The intention of Section 4.4.11.1 is to provide a description of expected cost impacts on commercial fisheries, and the various regulatory limits on activity. Additional information was added as appropriate. Detailed evaluation of fisheries will be considered in specific lease sales.

25. The Draft PEIS fails to appropriately consider information from the Deepwater Horizon event in analyzing the environmental impacts of future spills. Chapter 6 asserts that there has been “no discernible decrease in [biological] productivity in U.S. offshore areas where oil and gas have been produced for many years.” Yet, early data from the Deepwater Horizon event strongly suggests that this is not the case. At the height of the Deepwater Horizon event, 36% of Federal waters in the GOM were closed to commercial and recreational fishing, suggesting there were, in fact, significant biological impacts. We understand that the timeframe for completing the PEIS makes it impossible to incorporate all the lessons learned from the Gulf spill. However, this does not absolve BOEM from considering existing information and analyzing the potential for environmental impact, especially given the numerous assurances of Federal leaders and agencies that the same mistakes will not be made twice.

Response: Reasons for fishery closure are not tightly linked to biological productivity. The closures were to protect human health and the perception of the quality of the seafood not from spill areas. This way the public is reassured that fish being sold could not be from spill-affected areas. Studies of the DWH event are ongoing and conclusions cannot be drawn at this time concerning effects on overall productivity.

26. Commenter requests clarification and consistency on impact tables in Section 4.4.7.

Response: Definitions of the impact levels used in the PEIS are provided in Section 4.1.4. Minor is defined as: “If impacts occur, the affected resource will recover completely without

mitigation once the impacting stressor is eliminated.” There is literature describing how noise can affect fish, and therefore, the definition of “minor” better fits with the impacts on fish as described in the literature. Text has been modified in Section 4.4.7 to match the table when they are not consistent.

27. Section 4.4.7.3: The sentence “However, fish larvae may suffer greater mortality because of their small size and relative lack of mobility” is speculation, and should be referenced or removed.

Response: A reference has been added in Section 4.4.7.3 to support the original statement.

28. Summary, Fish Resources and Essential Fish Habitat: This language incorrectly singles out seismic potential impact for displacement of fish in the vicinity of the activity. The implication made that seismic surveys such as those that will be conducted under the Program will injure or kill fish in the vicinity of the seismic survey activity is not correct, and is not supported by the scientific literature. Therefore, these references/statements should be corrected or removed.

Response: The text in the Fish Resources and Essential Fish Habitat section of the Summary was modified to include other noise sources. There is some uncertainty as to the impact magnitude of seismic surveys on fish, but impacts are possible. Complete discussion of noise effects on fish can be found in Section 4.4.7.3.1 (Fish Resources-GOM), which can include mortality.

29. Section 4.4.7.3.3: It should be stated that moderate impacts are expected in the case of a CDE.

Response: The text in Section 4.4.7.3.3 was modified as requested.

30. Section 4.4.7.3.1, Protected Species: Gulf Sturgeon, Accidents: The essential features of Gulf sturgeon critical habitat could be affected by accidental discharges of oil and other chemicals. NOAA recommends that the essential features of critical habitat be discussed for their potential to be adversely affected.

Response: The potential for impacts on Gulf sturgeon critical habitat are noted in the existing text in Section 4.4.7.3.1. The potential impacts of oil spills on coastal habitats that comprise the critical habitat of the Gulf sturgeon are described in Section 4.4.6.1, and a reference to this section has been added to Section 4.4.7.3.1, where the Gulf sturgeon is discussed. More detailed treatment of Gulf sturgeon Critical Habitat would be provided in future specific lease sale EISs.

31. Section 3.8.4.1.4: The units that may be affected by the lease plan should be listed and described. Maps should also be provided. The essential features of Gulf Sturgeon critical habitat that are provided in the final rule should be described as well. Southeast U.S. critical habitat metadata can be found on NMFS GIS page at <http://www.nmfs.noaa.gov/gis/>

data/critical.htm#se. An image of all the critical habitats units is available at <http://www.nmfs.noaa.gov/pr/pdfs/criticalhabitat/gulfsturgeon.pdf>.

Response: An expanded listing of Gulf sturgeon critical habitat and supporting citations have been added to Section 3.8.4.1.4. The coastal habitats used by Gulf sturgeon are described in Section 3.8.4.1.4 and a figure depicting critical habitat has been added to this section.

32. Section 3.12.2.3, Alaska — Arctic. NOAA recommends that the paragraph on subsistence fisheries be expanded considerably. There is abundant literature documenting the locations, levels, and importance of subsistence fishing to Arctic communities.

Response: Section 3.12.2.3 discusses only recreational fisheries, so subsistence fishing is not discussed. The paragraph was removed because it is not appropriate for the section. Subsistence fishing is discussed in detail in Section 3.14.3.2

33. Section 4.4.7.3: The text in this section is erroneous and misleading, as the circumstances created by the study (i.e., repeated, close exposure to an airgun over an extended period of time) would almost certainly not take place in association with actual seismic surveys conducted under the Program. The sentence should be removed or corrected.

Response: Section 4.4.7.3 states that the study refers to continuous long-term exposure. Later in the paragraph, the text states that “For adult fishes, continuous exposures are unlikely under natural circumstances as fish could move from the area.” The text in Section 4.4.7.3 was modified to make this clearer.

34. Section 2.10, Table 2.10-2, Essential Fish Habitat: The summary of Potential Impacts on Essential Fish Habitat for Alternative 1 – Proposed Action only mentions coral as a type of EFH. This summary should be similar to the Potential Impacts described for Coastal and Estuarine Habitats (Section 4.4.6.1) and Marine Pelagic Habitats (Section 4.4.6.3).

Response: The text in Section 2.10 was modified to include other EFH and relevant mitigation measures.

8.4.4.4.15 Issue 4.15 Oceanography.

1. Commenters requested a more detailed description of ice conditions and dynamics in Cook Inlet be provided in the PEIS, as ice and scour are important impact-producing factors, and sea ice conditions differ between the upper and lower portions of Cook Inlet.

Response: Section 4.2.2 of the PEIS was revised to describe differences in sea ice conditions in the lower and upper reaches of Cook Inlet.

2. The State of Alaska requested that BOEM contrast in Chapter 2 the Alaska OCS planning areas to deepwater environments in the GOM, differentiating physiography and physical oceanography.

Response: The principal purpose of Chapter 2 is to present the alternatives considered and analyzed in the PEIS, rather than differentiating between planning areas evaluated under the Program alternatives. Section 2.9 describes the alternatives that were considered but eliminated from further consideration. Section 4.2 provides a detailed description regarding the physiography and physical oceanography of the Arctic and Cook Inlet in comparison to the GOM.

8.4.4.4.16 Issue 4.16 Areas of Special Concern.

1. Several sections of the Draft PEIS discuss “areas of special concern.” These discussions focus on designated areas such as marine protected areas. Since there are few marine protected areas designated for the Alaska Arctic, we (the Northwest Arctic Borough) recommend these sections be expanded to include important ecological areas. The 2010 Arctic Marine Synthesis Atlas of the Chukchi and Beaufort Seas provides a good source for areas of ecological importance.

Response: The different types of Areas of Concern (AOCs) are given at the beginning of Section 3.9. Ecologically important areas of the Arctic are described in the PEIS in detail under separate resource categories presented in Sections 3.7 and 3.8. More detailed habitat descriptions are most appropriate for a specific lease sale EIS.

2. Discussion should be included as to whether or not consideration was given to the exclusion of areas designated as national marine sanctuaries and monuments, essential fish habitat, or habitat areas of particular concern from leasing. Additionally, some consideration should be given at the program planning stage to alternatives other than sales of all unleased acreage. In particular, recognition of sensitive and protected marine habitats (e.g., Hanna Shoal) should be considered at this stage, rather than waiting until the lease sale stage.

Response: Exclusion areas are generally determined at the lease sale stage. Section 2.9.5 of the PEIS addresses alternatives recommending the addition of new areal and temporal exclusion areas, as well as the rationale for generally deferring the designation of exclusion areas to the lease sale phase. In addition, a new section (Section 4.3.2) discussing programmatic deferrals and mitigation can be found in Section 4.3, Issues of Programmatic Concern. Also, see responses to Comments 2 and 3 in Section 8.4.4.1, NEPA Process and Public Involvement, for further discussion of exclusion areas and alternatives.

3. The Natural Diversity Database maintained by Texas Parks and Wildlife Department (TPWD) indicates that more than 200 rookeries and migratory bird fallout sites, more than 50 rare or special terrestrial communities, 40 rare plant populations, and over 170 records of State and/or federally listed endangered, threatened, or rare vertebrates have been documented within 10 miles of the Texas coastline.

Response: The different types of AOCs are given at the beginning of Section 3.9. The important ecological areas of the Arctic do not have the legal definitions typical of AOCs. However, the ecologically important areas of the Texas coastline are described in the PEIS in detail under separate resource categories. These include Section 3.8.2.1, Marine and Coastal Birds, and Section 3.7.1.1, GOM Coastal and Estuarine Habitats. Endangered species are discussed under individual sections on birds, reptiles, and fish. Specific mention of the importance of the large coastline of Texas for biota has been added to the text in these sections. More detailed habitat descriptions would be provided in lease sale-specific EISs.

4. The Draft PEIS states, “These habitats were also affected by prevention and cleanup efforts (NOAA 2010).” PEIS at Section 3.7.4.1. To which NOAA source does this statement cite?

Response: The text in Section 3.7.4.1 has been revised to cite OSAT-2 (2011) rather than NOAA 2010.

8.4.4.4.17 Issue 4.17 Archeological and Historical Resources.

1. The proposed 5-year leasing program includes two sales in 2014 and 2016 in the Eastern GOM Planning Area. We do have concerns about potential adverse impacts to cultural resources. Requirements for cultural resource surveys in areas that have potential to encounter historic sites and properties should be implemented. Adequate buffer areas for site protection of significant resources and the avoidance of adverse impacts should be required. Both coastal and submerged sites and properties must be considered prior to any undertaking.

Response: The required Section 106 consultations set forth in the National Historic Preservation Act (NHPA) and its implementing regulations will be carried out during the lease sales proposed under the oil and gas program and during subsequent undertakings that require approval subsequent to lease issuance. As required in the *Identification of Historic Properties* part (36 CFR 800.4), BOEM will determine the scope of identification efforts, review existing information, and seek information on existing and potential historic properties from consulting parties and the public. BOEM may require cultural resource surveys as part of its reasonable and good faith effort in carrying out appropriate identification efforts based on current research, the magnitude and nature of the undertaking, and the nature and extent of potential effects on historic properties. Any adverse effects on cultural resources may require mitigation.

2. There is a concentration of the wrecks of historically important whaling ships off of Cape Lisburne.

Response: Section 3.16.3.2 acknowledges that numerous shipwrecks are found in the Cape Lisburne area. In the event that exploration or development operations are proposed for that area, BOEM is required to comply with the Section 106 process of the NHPA. As required in the *Identification of Historic Properties* part (36 CFR 800.4), BOEM will determine the scope of identification efforts, review existing information, and seek information on existing and potential historic properties from consulting parties and the public. BOEM may require

cultural resource surveys as part of its reasonable and good faith effort in carrying out appropriate identification efforts based on current research, the magnitude and nature of the undertaking, and the nature and extent of potential effects on historic properties. Any adverse effects on cultural resources may require mitigation.

8.4.4.4.18 Issue 4.18 Human Health Assessment.

1. Commenters from both the GOM and the Arctic expressed concern regarding a variety of health issues such as the incidence of diabetes, heart disease, cancer, and respiratory ailments, and concern that these health issues could be caused or exacerbated by oil and gas development activities and oil spills. Commenters from the Arctic cited that their concerns were based on traditional knowledge and personal observations.

Response: BOEM recognizes the concern for human health and the potential impacts of oil and gas development on human health. BOEM has identified human health impacts as an issue of programmatic concern and expanded the discussion presented in the PEIS (see Section 4.3.4). Health effects will be further considered at the later stages of the oil and gas development process (e.g., with NEPA documents prepared during the lease sale stage).

2. Commenters requested that human health assessments be conducted as soon as possible, including before a decision is made on the 2012-2017 OCS O&G program; commenters also question BOEM's decision for deferring the conduct of health assessments to later stages of oil and gas development (lease sale or later).

Response: This PEIS is a broad-level document discussing impacts over entire planning regions, which address a different spatial scale than would the examination of health issues of specific human populations at specific locations. The conduct of human health assessments to evaluate potential impacts to populations at specific locations is more appropriate at the lease sale or plan stage, when there will be a better understanding of where development may actually occur and who may be affected.

3. There is concern of mercury poisoning that is occurring throughout the Arctic (including Canada) needs to be addressed. The commenter also expressed concern regarding flaring.

Response: The PEIS evaluates potential impacts at a broad, planning area scale. The analysis of cumulative impacts presented in Sections 4.6.1.2.2, 4.6.1.2.3, and 4.6.1.2.4 of the PEIS discuss the cumulative impacts of persistent contaminants, including mercury. The evaluation of mercury releases and flaring will be further addressed at the lease sale level, where the evaluations can focus on specific locations and populations.

4. BOEM should review the Operational Science Advisory Team report (OSAT-2) on the fate and effects of remnant oil and revise the Draft PEIS to better address the potential for human contact with tar balls, oil weathering and human contact, reoiling potential, and the fate of oil-related volatile organic compounds.

Response: The OSAT-2 report was reviewed and is cited in Section 4.3.4.4 of the PEIS. This section has been revised in the PEIS to better discuss human contact with tar balls, human contact with oil and oil weathering products, reoiling potential, and the fate and transport of VOCs.

5. Was the Goldstein et al. 2011 study on the mental and physical health effects of the DWH event, cited in Section 4.3.4.4 of the Draft PEIS, done using an appropriate baseline? Should this statement be revised or deleted because it pertains to surveys of first responders to Hurricane Katrina?

Response: The Goldstein et al. 2011 report is a summary article that reports the finding of multiple other peer-reviewed publications that specifically investigated the impacts of oil spills on mental and physical health. Some studies did note that some of the mental health effects observed following the DWH event may have been compounded, as some of the spill responders were also Hurricane Katrina responders who suffered some of the same mental health effects. Section 4.3.4.4 has been revised to include the findings of a recent study (Osofsky et al. 2011) that specifically examined mental health impacts following the DWH event and considered effects from Hurricane Katarina.

6. Section 4.4.4.1 of the Draft PEIS states, “The effects of a catastrophic discharge event on public health and the environment can be classified as short-term and long-term effects. The short-term effects include watery and irritated eyes, skin itching and redness, coughing, and shortness of breath or wheezing.” Should this statement be revised to state that short-term effects may include the aforementioned issues?

Response: BOEM agrees that the aforementioned effects ‘may’ occur, and the referenced text in Section 4.4.4.1 has been revised to state that the short-term effects ‘may’ include the aforementioned effects.

7. Section 4.3.2.4.1 of the Draft PEIS states, “After an accidental release of oil into the environment, the more volatile, water-soluble, and degradable compounds will be weathered and degraded, leaving behind the heavier, less degradable elements.” Should this statement be clarified to reflect the fact that hydrocarbons with higher molecular weights will ultimately undergo weathering, but at slower rates? Additionally, the heavier, less-degradable elements have lower toxicity.

Response: BOEM agrees with the comment, and the text in Section 4.3.4.4.1 (previously Section 4.3.2.4.1) has been revised as suggested.

8.4.4.4.19 Issue 4.19 Socioeconomics.

1. Concerns about oil and gas development, and especially oil spills, will affect tourism and the restaurant, fishing, and service industries in the GOM.

Response: BOEM acknowledges that socioeconomic impacts are possible, especially in the event of large oil spills. The role of the food service, fishing, and tourism sectors in the economic baseline of the GOM, and the potential impacts of OCS oil and gas activities (and spills) on these sectors are discussed in Sections 3.10, 4.4.9, 4.4.11, and 4.4.12 of the PEIS.

2. The resources of the OCS are a vital source of jobs, revenue, energy, reliability, security, and economic growth, the importance of which is reported in an independent study in the GOM.

Response: The PEIS has been revised in Section 3.10 to include information referenced in the comment.

The economic impact of the oil and gas industry on employment in the GOM is presented in Section 3.10.5 of the PEIS. Although no projections of direct oil and gas employment are provided, current baseline conditions and projections to 2030 provided for population, employment, and earnings for the region, assuming current levels of leasing activity. These projections include long-term projections of oil and gas industry activity, spending, and employment, and implicitly assume levels of activity in the industry based on existing lease sales before the DWH event and the drilling moratorium.

Although BOEM agrees that the oil and gas sector has significant impacts on the remainder of the United States, both in terms of capital and labor expenditures, the PEIS assessed the impact of existing oil and gas activity and of proposed OCS activity in the counties adjacent to the GOM, rather than the entire United States, as this would be the region most affected by the proposed OCS activity.

3. Section 4.4.9.3 demonstrates that most of the estimated employment benefits from oil and gas activities in the Arctic will go to Alaska's largest population centers. While the North Slope Borough may tax infrastructure within its boundaries associated with offshore development, the Northwest Arctic Borough would receive increased risks to its socioeconomic structure without commensurate economic impacts/benefits. Recommend the PEIS include a discussion of how revenue sharing could increase local economic benefits, and how environmental justice issues are involved with the leasing of the area, particularly with low-income minority communities being placed at risk.

Response: Under current fiscal circumstances, the Northwest Arctic Borough would not receive direct revenue from OCS activities in the Chukchi Sea. The Borough is currently receiving fiscal support from the State of Alaska as a result of the shipment of oil and gas through TAPS and associated infrastructure and from Alaska Native Corporation investments in oil companies. Individuals resident in the Borough also receive benefits from the Alaska Permanent Fund Dividend. Per Section 18 requirements of the OCSLA, the "Equitable sharing of Developmental Benefits and Environmental Risks" section (in Part IV.C) of the Proposed Final Program (PFP) discusses equitable sharing of development benefits and risks. The PFP describes the three current programs that contribute revenue to coastal producing states, including Section 8(g), Revenue Sharing, which provides coastal producing states with 27% of revenues from all leases within 4.8 km (3 mi) of a state's submerged lands boundary. While impact assistance and other such programs provide a share of Federal revenues to

States and political subdivisions adjacent to or near OCS development to help to mitigate environmental risk, the Secretary cannot expand, extend, or otherwise revise the provisions to further the equitable sharing of the developmental benefits and environmental risks. Although different revenue schemes could change the flow of economic benefits to different States, or indirectly to certain coastal communities, it is speculative at this phase what those impacts could be, given different, potentially wide-ranging revenue-sharing scenarios. Analysis of the impacts of OCS activities on sociocultural resources in the Northwest Arctic Borough is also presented in Section 4.4.13.3 of the PEIS.

Projected economic benefits of OCS activities in the Arctic region, including labor income and employment estimates, are described in Section 4.4.9.3 of the PEIS. Detailed analysis of economic flows to a specific local community is not ripe at the 5-year decision point, as the programmatic analysis is too broad to distinguish local economic impacts. It should be noted that direct benefits from OCS activity may come in the form of property taxes on onshore operations or other sources. A more detailed analysis of the potential fiscal impacts of OCS development in the Chukchi Sea would be undertaken at the lease sale level.

Potential environmental justice impacts of OCS activities in the Northwest Arctic Borough are included as part of the analysis of impacts in the Arctic region. These impacts are described in Section 4.4.14.3 of the PEIS.

4. NOAA has previously commented that public perception of contaminated seafood and market/price/economic impacts may be great, as was seen with Deepwater Horizon. NOAA recommends that the PEIS discuss public perception of contaminated seafood as a potential impact.

Response: The impacts of the DWH event on commercial and recreational fishing are discussed in Sections 3.12.1.1 and 3.12.2.1 of the PEIS, and additional text has been added to Section 3.12 regarding public perception of contaminated seafood. The PEIS states that although the impact of the event on fish landings has not been determined, Federal waters were closed to fishing for two months after the event, to address the perception of contamination.

The potential impacts of perceived contamination of commercial and recreational fish as a result of OCS accidents are discussed in Sections 4.4.11.1, 4.4.11.2, and 4.4.11.3 of the PEIS. Given the region-specific nature of fisheries, additional information on the impact of adverse perceptions on demand for fish in OCS areas would be analyzed at the lease sale level.

5. BOEM needs to better evaluate and present potential economic costs and benefits of the alternatives under its consideration, taking particular care to ensure that information about the potential economic impacts of various alternatives is accurate. It also must ensure that this information is fully and fairly depicted in the PEIS. Importantly, BOEM must revisit its analysis of the no action alternative in order to more fully depict the potential benefits of no action, ensure that costs are depicted appropriately for the Arctic region, appropriately incorporate conservation and efficiency, and include a discussion of option value. Once it

corrects those failings, BOEM must use this information in the PEIS to more accurately reflect the costs and benefits of alternatives relevant to the Arctic Ocean.

Response: An analysis of the economic impacts of each alternative, including the No Action Alternative, is included in the PEIS (Section 4.5.7). A cost-benefit analysis was prepared in support of the Program, and this analysis is discussed in Section 2.12 of the PEIS. Impacts of the proposed action on population, employment, and earnings, are presented in Section 4.4.9, on commercial and recreation fisheries in Section 4.4.11, and on recreation and tourism in Section 4.4.12. The impacts of the No Action Alternative, which includes population, employment, and earnings projections to 2030, assuming that currently leased OCS activities continue, are presented in Section 4.5.7, which has been revised to provide additional analyses. Energy substitutes that could be used in association with the No Action Alternative are described in this section. Presentation of more specific information, including a discussion of option value, is more appropriately included in the assessment of the impacts of individual lease sales.

6. The Deepwater Horizon event threatens the long-term productivity of over 100 species of fish, crustaceans, mollusks, and invertebrates that are commercially fished in the GOM. Commercial fisheries represents a revenue stream that drives part of the GOM economy. However, as demonstrated above, oil and gas drilling (and especially spills) threatens the long-term integrity of GOM species. This tradeoff needs to be acknowledged in Chapter 6 of the PEIS.

Response: The discussion in Section 4.4.11.1 on the importance of commercial fisheries to the economy of the GOM has been revised to include more recent information. Chapter 6 has been revised to include a discussion of the potential effects of oil spills on the long-term productivity of the GOM.

7. The Draft PEIS makes several statements regarding the effects of the DWH event on the surrounding coastal housing markets. Many of the cited sources are inappropriate, and the statements ignore the general nation-wide collapse of the housing industry. The comment provides several citations and requests that the PEIS be revised to more accurately portray the housing market of the GOM.

Response: Text in the PEIS has been revised in Section 3.10.7 to clarify the status of the GOM housing market and include data referenced in the comment.

8. Section 3.10.2.2: The percentage of individuals living in poverty in the North Slope Borough and the Northwest Arctic Borough were both compared to the community of Barrow; however, the comparison is for a community within the borough. Barrow is located within the North Slope Borough and not within the Northwest Arctic Borough.

Response: The text and table in Section 3.10.2.2 have been revised to reflect the comment.

9. Section 3.13.3.2: There is only one casino in Alaska operated by Metlakatla Tsimshian Tribe, which is an Indian-owned establishment on their land. There are gaming (pull-tab and bingo) establishments operated for the benefit of non-profit organizations.

Response: The text in Section 3.13.3.2 has been revised to reflect the comment.

10. Section 4.4.11.1.1 is extremely limited considering the biological, economic, and sociological attributes associated with commercial and recreational fishing in the GOM.

Response: The biological, economic, and sociological aspects of commercial fishing in the GOM are covered in detail in Sections 3.8.4.1, 3.12.2.1, and 3.14.1 of the PEIS. The intention of Section 4.4.11.1 is to provide a description of expected cost impacts on commercial fisheries and the various regulatory limits on activity.

11. Section 5.3 has no discussion on ‘Economic Activity’ included in this subsection. Consider adding the section from either the Supplemental EISs for the GOM Central or Western Planning Areas (OCS EIS/EA BOEMRE 2011-027 or -034 respectively).

Response: Text in Section 5.3 of the PEIS has been revised to include a discussion of economic activity.

12. The Draft PEIS states that the impacts to local economies and employment would be minimal with the expansion of leases. It was also noted that current employment related to oil and gas in the Gulf States is roughly 62,000 people, with most of those jobs located in Texas and Louisiana. In comparison, the recreation and tourism industries employ roughly 1,000,000 people across the Gulf Coast. While we understand the oil and gas leasing program’s importance in ensuring adequate energy resources for the nation, it is important to recognize the oil and gas industry’s potential to impact the health of other industries, as was clearly displayed by the 2010 Deepwater Horizon Event.

Response: A description of the role of the recreation sector, including beach recreation, casino gambling, and recreation and tourism employment, as well as a description of the benefits of oil and gas development and also the economic impacts of historic oil spills, are included in Section 3.13. The economic impacts of the DWH event, including those on recreation and tourism, are described in Section 3.10.7; while the economic impacts of OCS activity (including impacts of expected and unexpected accidental oil spills) on recreation and tourism are discussed in Section 4.4.12 of the PEIS.

13. We are concerned that the analysis presented in the Draft PEIS does not appear to be considering the socioeconomic impacts of the Proposed 5-year Program on people living in all 50 States of this country. We strongly recommend that the final program and environmental impact statement fully consider the socioeconomic impacts on all the American people that would come from both producing energy from the offshore, and of not producing energy from many areas of the offshore. The resources of the OCS are owned by

all Americans, and the hardship created by withholding our energy resources from people in middle America should be considered in the decision-making process.

Response: Although BOEM agrees that the oil and gas sector affects the remainder of the United States, both in terms of capital and labor expenditures, the PEIS principally assessed the socioeconomic impact of existing oil and gas activity, and of proposed OCS activity, in the counties adjacent to the GOM, and in Alaska as a whole, as these would be the regions most affected by the proposed OCS activity. Impacts to specific states or communities in the remainder of the United States would be comparatively small and are not therefore specifically addressed in the analysis. However, the aggregate, national net benefits and costs of the Program are summarized in Chapter 2 of the PEIS and presented in detail in the Proposed Final Program.

14. The Draft PEIS erroneously concludes that in areas where tourism and recreation provide significant employment, accidental oil spills, including catastrophic discharge events, would result in only “short-term loss of employment, income and property values.” The Draft PEIS even goes so far as to imply that oil spills could benefit the economy in some affected coastal regions because “expenditures associated with spill clean-up activities would create short-term employment.” The conclusion that a catastrophic oil spill would only result in short-term economic impacts is totally unfounded and is contradicted elsewhere in the Draft PEIS where the Department acknowledges that the Deepwater Horizon event had “significant economic impacts throughout the (GOM) region, affecting population, employment, and regional earnings and incomes.

Response: Although it is often not possible to quantify all the impacts that may occur as a result of an oil spill, the analysis in the PEIS does not intend to suggest that there would be no adverse impacts resulting from an accidental spill. There could be some longer-term economic impacts because of real or perceived changes in the quality of resources or recreational values, especially with an unexpected CDE. It is clear that there would be employment and income impacts from a spill with the loss of tourism and recreation spending, and the temporary loss of revenues from the sale of commercial fish catches. These losses have been documented in the PEIS where data are available. For small and large anticipated accidental spills, employment and income losses in these two sectors would be offset, at least to a certain extent, by spill cleanup expenditures and the resulting employment and income, offsetting adjustments that are likely to occur over a number of years. For an unexpected CDE, impacts could be much more long-term, depending on the location, size, and duration of the CDE and the effectiveness of spill control and cleanup activities.

8.4.4.4.20 Issue 4.20 Environmental Justice.

1. Indigenous peoples and tribal communities in the Arctic are disproportionately impacted by industrial activities in the Gulf of Alaska, Bering Sea, Chukchi Sea, and Beaufort Sea. Please refer to the recent MMS study entitled Three Decades of Research and Socioeconomic Impacts Related to Offshore Petroleum Development in Coastal Alaska

Response: Text in the PEIS has been revised to include the document referenced in the comment.

2. The co-existence of native subsistence hunting and fishing and modern commercial and industrial development in Alaska should be more fully explored in the context of the future lease sales. These uses of the OCS can co-exist with the proper stipulations and mitigations in place. The PEIS should include a discussion of the Inupiat customs and culture along with a description of the North Slope Borough and its villages and towns. The PEIS should also discuss some of the proposed oil and gas development activities in this region and the mitigation measures (e.g., the marine mammal monitoring program and the oil spill response plans) that have been developed to avoid or minimize potential adverse effects.

Response: The impact of individual lease sales and Alaska Native hunting and fishing for subsistence purposes would be assessed in the relevant lease sale EIS. Sections 3.14 and 4.4.13 of the PEIS provides a discussion of the programmatic impact of oil and gas development on subsistence activities in Alaska. The PEIS also includes discussion of the sociocultural aspects of the North Slope, including descriptions of the villages and towns in Sections 3.14 and 4.4.13 of the PEIS. Demographic information on these communities, where data are available, is provided in Section 3.10.2 of the PEIS. Mitigation measures developed to protect species important to Alaska Native communities are presented in Appendix B of the PEIS.

3. An environmental justice analysis should be conducted that identifies whether and to what extent the Inupiat people are being asked to bear a disproportionate share of the environmental burdens created by the Nation's 2012-17 offshore program.

Response: Section 3.15 provides a description of the distribution of low-income and minority populations in the areas adjacent to the planning areas considered for leasing under the 2012-2017 Program, and Section 4.4.14.3 presents an assessment of the environmental justice impacts of OCS activities, that could occur on the North Slope under the 2012-2017 Program. BOEM uses the most up-to-date information that can be gathered from public participation, studies, and census bureau data.

4. While local communities in Northwest Alaska receive few benefits from OCS activities, they bear all direct risks from offshore oil and gas activities including threats to the environment, social structure, and Inupiat culture. Recommend the PEIS include a discussion of how revenue sharing could increase local economic benefits, and how environmental justice issues are involved with the leasing of the area, particularly with low-income minority communities being placed at risk.

Response: Potential environmental justice impacts of OCS activities in the Chukchi Sea on the Northwest Arctic Borough are included as part of the analysis of impacts in the Arctic region, which also includes the North Slope Borough. These impacts are described in Section 4.4.14.3 of the PEIS. Analysis of the impacts of OCS activities on sociocultural resources in the Northwest Arctic Borough is also presented in Section 4.4.13.3 of the PEIS.

Projected benefits of OCS activities in the Arctic region are described in Section 4.4.9.3 of the PEIS. A more detailed analysis of the potential fiscal impacts of OCS development in the Chukchi Sea on the Northwest Arctic Borough would be undertaken at the lease sale level.

8.4.4.4.21 Issue 4.21 Invasive Species.

1. In the past, the threat of invasive species introductions has not been considered significant as it compares to the threat in other areas, because there has not been a large amount offshore drilling in the Alaska OCS. However, the potential for introduction may increase in the future with increased oil and gas development activities.

Response: The text in Section 4.3.5, Invasive Species, has been revised to indicate that while introduction of invasive species through oil and gas activities was historically not considered significant because of the very low level of offshore drilling in Alaskan waters, the potential for introduction may increase with increased drilling, together with potential climate-related changes in environmental baseline conditions.

8.4.4.4.22 Issue 4.22 Sociocultural and Subsistence Issues.

1. Subsistence harvesting is essential to Arctic Alaska Native communities both as an important source of food and as a central defining aspect of their culture. Marine and coastal environments provide a significant part of their diet, which is both important to Native health and not easy to replace from outside sources. The exchange of resources harvested from the wild is important to the maintenance of social ties both within and between communities. Participation in learning subsistence harvesting skills is an essential part of passing Alaska Native culture on to the next generation. Arctic Alaska Native culture depends upon the maintenance of healthy ecosystems.

Response: BOEM is aware of the central importance of subsistence harvesting, in particular the bowhead whale hunt, to Arctic Alaska Native communities with regard to food security, human health, traditional socio-cultural values, and cultural continuity. BOEM strives to manage oil and gas development on the OCS in a manner that minimizes or eliminates threats to subsistence harvesting. The importance of subsistence harvesting to native cultures is discussed in Sections 3.14.3 and 4.4.13.3.

2. Several Alaska Native commenters expressed concerns over the effects of an oil spill on subsistence marine resources. They feared that spilled oil could taint or eliminate species important to their survival. They expressed doubts that a spill could be contained in Arctic waters, that there was not sufficient local infrastructure or labor force for a quick, efficient response and that clean-up procedures in icy conditions are unproven.

Response: BOEM understands these concerns regarding the possible effects of an oil spill in the Arctic and has updated Section 4.3.3, Risk of a Low-probability Catastrophic Discharge Event, with new information that pertains to oil spill response and containment in the Arctic.

BOEM has also added additional text in Section 4.3.2, Programmatic Deferrals and Mitigations, which discusses stakeholder requests to delay Arctic leasing until adequate oil spill response and containment is proven in the context of how these concerns will be further evaluated during the program. The effects of an oil spill on marine mammals are discussed in Section 4.4.7.1 of the PEIS

3. Several Alaska Native commenters related experiences in the past where off shore oil and gas exploration and development had had negative effects on subsistence resources.

Response: The BOEM and BSEE take seriously Alaska Native concerns regarding subsistence resources and seek to take into account what has been learned about the effects of oil and gas development from past experience, including the experience of Alaska Natives, in developing and enforcing stipulations at future lease sale stages.

4. Several Alaska Native commenters have advocated additional spatial and/or temporal deferrals that would lessen adverse effects on marine mammal migration and behavior at critical times and in critical places such as whale migration routes at certain times of the year.

Response: There has been an extensive dialog between the North Slope Borough and BOEM regarding prospective deferrals. BOEM seeks to work with stakeholders in formulating mitigation, particularly to protect bowhead whales and other marine mammals and minimize conflicts with subsistence practices. Section 4.3.2 of the PEIS discusses programmatic deferrals and mitigation, and describes a process that BOEM is putting in place to identify, evaluate, and prepare for implementation, and mitigation strategies (which may include deferrals) that may be applied at appropriate program decision points. This process includes stakeholder input into the development of mitigation strategies. BOEM has informed the North Slope Borough that consideration of deferrals will be carried forward into the lease sale stage.

5. Several commenters related their perception of climate change and its effects on the Arctic environment. These included warmer temperatures and diminished ice pack. They expressed concern over the loss of ready access to sea mammal haulouts because of retreating and thinning ice. They were also concerned that more ice free days would encourage an increase in shipping traffic, which in turn would interfere with whale migration patterns.

Response: Section 3.14.3 has been revised to include more information on climate change and its possible effects on subsistence harvesting

6. Several commenters expressed the need for greater communication both with Federal Government agencies and oil and gas companies. They felt that Federal agencies were not listening to their concerns and requested more consultation. They requested increased avenues of communication among local populations. Alaska Natives requested additional training on how they could have more input into decisions related to oil and gas

development. They also felt that oil and gas company personnel would benefit from a better understanding of local culture.

Response: BOEM is committed to meaningful communication and consultation with the Alaska Native communities that rely on subsistence harvesting from Arctic waters. Consultations with Alaska Native tribal governments took place during the scoping process and in association with public meetings on the draft. Alaska Natives expressed their concerns in public meetings during the scoping period and submitted letters commenting on the draft. These comments have been taken into account in the PEIS. Under DOI Order No. 3117 issued in December 2011, meaningful consultation with Alaska Native villages is planned for early in the planning process for lease sale NEPA evaluations.

7. Several commenters raised the issue of the impacts of industrial noise, especially of the noise from seismic exploration, on the migration habits of whales and other marine mammals. Noise-induced deflection of whales from their normal migration routes increases the difficulty and danger of the whale hunt and can lead to a reduced or eliminated whale harvest with serious repercussions in subsistence-based communities.

Response: BOEM has analyzed the potential effects of noise on marine mammals as discussed in Section 4.4.7.1 of the PEIS. The analysis of potential effects of noise in the PEIS has been expanded to take into account more recent studies of the effects of noise on marine mammals. BOEM will consider including stipulations meant to minimize or eliminate the deflection of marine mammals from their normal migration routes due to industrial noise at the lease sale phase.

8. Several commenters have indicated that BOEM should take traditional environmental knowledge acquired over many generations of experience with the local ecology into account in its long-term planning and leasing program.

Response: BOEM has great respect for the accumulated knowledge of Alaska Native whalers and elders. BOEM strives to keep channels of communication with local native communities open and has striven to incorporate traditional knowledge throughout the PEIS.

9. An oil spill in the Arctic would have devastating and long-lasting effects. The GOM is still feeling the effects of the DWH event and traditional foods are still tainted.

Response: The long-lasting effects of the DWH event have been investigated and the text of Section 4.4.13 of the PEIS updated as appropriate. The potential effects of accidental spills as well as of unexpected CDE-level spills are discussed on a resource-by-resource basis throughout Section 4.4 of the PEIS. These analyses acknowledge that an unexpected CDE spill in the Arctic would have major impacts on physical, biological, and sociocultural resources and systems in the Arctic.

10. The oil industry cannot prove that Alaska Native communities would not be disproportionately affected; that coastal communities would not be affected by pollution in waterways that they rely on for subsistence

Response: The PEIS acknowledges in Section 4.4.14 that a large oil spill, especially a CDE that comes in contact with subsistence resources, could have disproportionately high impacts on the Alaska Native population, particularly if the subsistence resources were diminished or tainted as a result of the spill. In the event of a CDE, long-term impacts on subsistence resources would be expected, and these may lead to longer and greater environmental justice impacts. Similarly, the PEIS evaluates other potential impacts from routine operations, such as vessel and drilling discharges, on Alaska Native communities.

11. The results of whaling patterns and other hunting patterns should be made available and taken into account.

Response: Studies of Alaska Native whale hunting patterns were taken into account in the description of the environment in Section 3.14.3.2.

12. A program sharing revenues from the royalties of off-shore oil and gas production would be of great benefit to local communities and would help fund research on the effects of oil and gas production on Arctic ecosystems.

Response: Revenue sharing would require a change in the law and is beyond the scope of this PEIS. Also see the response to Comment 3 in Section 8.4.4.4.19, Issue 4.19, Socioeconomics, for additional discussion of revenue sharing.

13. Subsistence whaling is a difficult and dangerous activity. It is riskier if the bowhead whale are deflected from their normal migration pattern farther from land, both because of dangerous currents and the longer distance required to tow the whale to the butchering site. Camden Bay is utilized by whales as a calving area. If Shell develops a facility near Camden Bay, whalers fear the bowhead whales will be deflected from their usual migratory route, making the whale hunt riskier, more difficult, and likely less successful.

Response: BOEM is aware of the difficulties and dangers associated with pursuing deflected whales. They are discussed in Section 4.4.13.3. Additional information on bowhead whale feeding habitat and migration routes in the Beaufort and Chukchi Seas has been added to Section 3.8.1.3 of the PEIS. Lease sale stage NEPA analysis will address potential impacts on bowhead whales in more detail. Lease-specific activities will also be required to comply with the requirements of the ESA and the MMPA, and will take traditional knowledge of Iñupiat whalers into account. For a discussion of possible deferrals that would restrict oil and gas activities at times and in places that could affect migrating whales, see the response to Comment 4 earlier in this section.

14. Captaining a whaling crew is an expensive proposition because of the equipment and number of people involved. Conflict avoidance agreements and enforcement of regulations and

stipulations are vital to the success of a whaling crew in that they reduce deflection of migrating whales. Since local communities have to deal with the impact of oil and gas development, it is only fair that they share in the revenues from that development.

Response: BOEM is aware of the socioeconomic challenges that whaling captains face. Working out conflict avoidance agreements between local subsistence-based communities and oil and gas developers is one of the lease stipulations intended to mitigate the effects of oil and gas development on subsistence whalers (see Appendix B.2.1.6). Sharing of the revenues from oil and gas development would require both a policy change and a change in the law. This is beyond the scope of this PEIS. For additional discussion regarding revenue sharing, see the response to Comment 3 in Section 8.4.4.4.19.

15. The commenter is a subsistence whaling captain who has experienced negative consequences from oil and gas development in the past, including a change in the taste of whale meat. Less regulated past development had great negative consequences including deflecting game, pollution from drill cuttings. There is less ice now than in days past.

Response: BOEM acknowledges the effects of oil and gas development on the physical, biological, and human environments. The potential effects oil and gas development under the 2012-2017 leasing program are discussed on a resource-by-resource basis throughout Section 4.4 of the PEIS. A discussion of traditional knowledge of ice loss may be found in Section 3.14.3.2 of the PEIS. Also see responses to Comments 3 and 5 in Section 8.4.4.4.22.

16. Changes are appearing in the Arctic environment. Diseased ringed seals have recently been found that also have sores. Research is required to determine whether sores and disease among the seals is a result of oil and gas development activities for from some other source. There has also been a marked reduction in the amount of ice on the Arctic Sea.

Response: A discussion of the UME that involves ringed seals and other pinniped species in the Arctic has been added to Section 3.8.1.3.1 and is also mentioned in Section 4.6.4.3. A discussion of climate change impacts on sea ice can also be found in those sections of the PEIS.

17. The Alaska Eskimo Whaling Commission seeks to protect whales and has learned to mitigate past impacts by working directly with industry, not always with government help.

Response: BOEM seeks to work with stakeholders, including the Alaska Eskimo Whaling Commission, in formulating mitigation measures that minimize or eliminate adverse effects on Arctic whales.

18. The commenter feels a long-standing tie to the land and has seen the development of oil and gas in his lifetime. He is now barred from areas near Prudhoe Bay where he formerly ran a dog sled, fished, and hunted caribou. He would like to see his culture continue on to future generations of Alaska Natives.

Response: This perspective on changes at Prudhoe Bay has been used to enhance the discussion in Section 3.14.3.

19. Anaktuvak, while not on the coast, is tied to coastal communities through trade, barter, and good will, and receives marine mammals as subsistence foods. It supports the concerns of coastal communities.

Response: Text explaining that Anaktuvak Pass is connected to the coastal economy by trade relationships, and is thus partially reliant on the harvest of wild marine resources, has been included in Section 3.14.3.2 of the PEIS.

20. The commenter is undecided as to whether he supports oil and gas development on the outer continental shelf. He is concerned for preserving his subsistence life style and would like to know what local economic benefits development could have.

Response: While BOEM cannot control where workers will come from or where money earned will be spent, with proper job training there should be employment opportunities for the local population. See also the response to Comment 1 earlier in this section.

21. The commenter refers to past adverse effects of seismic surveys on seal and tomcod populations. The food chain was impacted and although studies were done on the dying seals, no information was provided to local communities.

Response: Sections 4.4.7.1 and 4.4.7.3 discuss impacts of noise on mammals and fish, respectively. A discussion of the UME that involves ringed seals and other pinniped species in the Arctic has been added to Section 3.8.1.3.1 and is also mentioned in Section 4.6.4.3.

22. The Northwest Arctic Borough has passed a resolution establishing a policy for responsible resource development that protects important subsistence resources, Inupiaq culture, and health. Oil and gas companies do not have local traditional knowledge and will need local help to manage production in a responsible manner.

Response: See the response to Comment 1 provided earlier in this Section. BOEM acknowledges Northwest Arctic Borough's desire to see responsible resource development off the coast of the Northwest Arctic Borough, and is committed to responsible development in any leasing program. It is the intent of BOEM and BSEE, through careful management of OCS activities, that minimal to no impacts on the marine subsistence harvest, Inupiaq culture, and health would occur. The management tools available to accomplish this would be mitigation measures, spatial and temporal deferrals, rigorous inspections, and implementation of rules and regulations. BOEM and BSEE also would seek to work with the Boroughs, tribes, and other relevant stakeholders to maximize the use of traditional knowledge to assist in the management and stewardship of OCS activities and resources.

23. The North Slope Borough and Northwest Arctic Borough are committed to being proactive and insisting that any development on the OCS be done in a responsible manner consistent

with Alaska Native values. They insist on proper planning, gathering and funding baseline data, sharing of data gaps and raw data so that industry can develop appropriate measures to mitigate impacts to subsistence resources and hunting, and the health of local communities.

Response: BOEM acknowledges Alaska Natives desire for responsible development and is committed to meaningful communication with all stakeholders including Alaska Native villages and organizations. BOEM funds a range of multidisciplinary studies relevant to the impacts of oil and gas development on Arctic Alaska. The results of these studies are made public; however, to ensure accuracy, raw data gathered cannot be released until vetted and peer-reviewed. Similarly, raw data from oil companies is often proprietary and can only be released with their permission. BOEM uses the results of these studies for baseline description of the environment and assessment of potential impacts for NEPA documents. It is the intent of BOEM and BSEE, through careful management of OCS activities, that minimal to no impacts on the marine subsistence harvest would occur. The means available to accomplish this could include mitigation measures, rigorous inspections, and implementation of rules and regulations. Mitigation measures are developed through the lease sale and plan processes.

24. Alaska Native communities of the Northwest Arctic Borough are directly affected by the success or failure of subsistence harvest of marine mammals in the Arctic because they are connected through a region wide bartering web. The Arctic marine harvest is an important part of the regional subsistence base through barter and exchange.

Response: Section 3.14.3 has been revised to indicate that exchange and kinship ties bind coastal and inland Alaska Native communities and that inland communities are tied to the marine subsistence harvest even when they are not direct participants.

25. No one has demonstrated that an oil spill in the Arctic could be cleaned up effectively. A spill would be disastrous for subsistence harvesters. In addition, recent warming trends have resulted in a lessening of polar ice. More leasing will result in more shipping, including an increased presence of ice-breakers. This could make traveling on ice by subsistence hunters more hazardous.

Response: Climate change and its effect on baseline environmental conditions are discussed in Section 3.3, and the condition of sea ice is discussed in Section 4.2.2 of the PEIS. Impacts from increased Arctic shipping are discussed in Section 4.6.5.3.5 and in other discussions of cumulative effects. The PEIS has been revised to strengthen the discussion of the impacts of increased ocean-going vessel traffic. Also see the responses to Comments 2 and 5 earlier in this section.

26. Industrial byproducts of oil and gas development will taint subsistence food supply. A very large oil spill would result in the contamination of marine food sources and would increase subsistence harvesting on land resulting in pressure on caribou, moose, and bird populations.

Response: Text discussing the potential shift of subsistence harvesting to inland resources in the event that marine resources were inaccessible or tainted has been added to Section 4.4.13.3. Also see responses to Comments 1 and 2 earlier in this section.

27. Gaps in our knowledge of the effects from a very large oil spill include studies of the cultural consequences of such a spill, consequences of the diversion of subsistence harvesting to inland sources, and the effects of chronic petroleum waste introduced into marine mammal diets.

Response: The sociocultural effects of a very large oil spill, such as those from the *Exxon Valdez* incident, have been studied including effects on subsistence harvesters. These are discussed in Section 4.4.13.2. Text discussing the shift of subsistence hunting to inland resources as the result of an oil spill has been added to that section. Section 4.4.7.1 includes discussion of potential oil spill impacts on marine mammals and terrestrial mammals. Section 4.4.7.2 addresses impacts on marine and coastal birds.

28. The people of the Northwest Arctic Borough rely on the subsistence harvest, which plays a central role in Inupiaq culture. The Draft PEIS pays more attention to the North Slope Borough than the Northwest Arctic Borough. Northwest Arctic Borough communities would also be affected by oil and gas activities. All vessel traffic to the north coast would pass through Northwest Arctic Borough waters, and an oil spill could migrate into those waters as well. The Draft PEIS incorrectly asserts that Northwest Arctic Borough communities would be less directly affected than North Slope communities. More discussion of the impacts of routine operations on Northwest Arctic Borough communities are needed and must include a discussion of inland communities, all of which are included in coastal zone studies, that interact with coastal communities. Impacts on anadromous fish and other species that migrate long distances should be included. Effects of a CDE should not be considered temporary.

Response: The discussions of subsistence patterns in the Northwest Arctic Borough in Sections 3.14.3.1 and 3.14.3.2 have been expanded to include inland communities with ties to the coast. The discussion of impacts from events in the Arctic planning areas in Section 4.4.13.3 has been expanded to include the Northwest Arctic Borough. Impacts of routine operations on sociocultural systems and subsistence in the Arctic are discussed in Section 4.4.13.3, which addresses impacts on communities both within the Northwest Arctic Borough and the North Slope Borough. BOEM understands your concerns regarding the possible effects of an oil spill in the Arctic. The impacts of oil spills in the Arctic are addressed on a resource-by-resource basis (including marine and terrestrial mammals, birds, and fish) throughout Section 4.4 of the PEIS. In addition, the discussion in Section 4.3.3 of a CDE has been updated with new information that pertains to oil spill response and containment in the Arctic.

29. The discussion of subsistence whaling should be expanded to include additional areas important to whaling crews such as areas to the east of fall hunting grounds where industrial activities could deflect whales around hunting grounds, and pursuit areas.

Response: Section 3.14.3.2 has been updated to include an expanded discussion of other key areas important to subsistence whalers as indicated in the comment.

30. The PEIS should include a discussion of Inupiat culture and North Slope Borough communities and monitoring and mitigation plans that have been made to avoid or minimize potential adverse effects of oil spills.

Response: The discussion of North Slope communities and subsistence in Sections 3.14.3.1 and 3.14.3.2 have been expanded as appropriate for a PEIS. More detailed discussions of North Slope communities will be included in region- and lease-specific NEPA documents. BOEM has updated Section 4.3.3 with new information that pertains to oil spill response and containment in the Arctic. Also see the comments and responses related to Arctic oil spills presented in Section 8.4.4.6.3. BOEM has also added a new Section 4.3.2, Programmatic Deferrals and Mitigations, to the PEIS that discusses the process that BOEM will follow to identify mitigation measures in later stages of the Program.

31. Revise Summary, Social, Cultural, and Economic Resources section text, to “(including whales and other marine mammals, fish and birds).”

Response: The suggested text has been added to the Summary.

32. Text should be added to the discussion of GOM subsistence harvesters to include mention of their psychosocial welfare now and following major disturbances to existing conditions. The commenter also identifies inaccuracies in the discussion of the Alaska Native Claims Settlement Act.

Response: The suggested changes to the discussion of subsistence and renewable resource harvesting along the Gulf Coast have been made in Section 3.13.1.2. The discussion of land claim disputes between Alaska Native communities and the State of Alaska in Section 3.14.3.1 has been revised to state more accurately the roles played by the Alaska Statehood Act and the Alaska Native Claims Settlement Act (ANCSA) in resolving those disputes.

33. The characterization of Northwest Arctic Borough as small and relatively poor is not supported by the text. The Draft PEIS erroneously equates NANA with the Northwest Alaska Native Association. Currently NANA is not an acronym.

Response: The indicated text corrections have been made in Section 3.14.3.1. The characterization of Northwest Arctic Borough communities as relatively poor has been removed.

34. U.S. law requires that the OCS be managed in a manner that considers economic, social, and environmental values of its renewable and nonrenewable resources, and the potential impact of oil and gas exploration on other resource values of the OCS and the marine, coastal, and

human environment. How will BOEM ensure that no unmitigatable adverse impacts to subsistence harvest will occur under the 5-year plan?

Response: It is the goal of BOEM and BSEE, through careful management of OCS activities, to minimize or prevent adverse impacts on the Arctic subsistence base. The means available to accomplish this could include mitigation measures, spatial and temporal deferrals, rigorous inspections, and implementation of rules and regulations. Specific mitigation measures, lease stipulations, and protections are developed at the lease sale and later stages. This PEIS considers economic, social, and environmental values.

35. BOEM does not have a science-based plan for meeting its obligations under the MMPA. Alaska Natives depend upon a healthy bowhead whale stock. If multiple oil and gas operations are implemented in the Arctic, and whale stocks are adversely impacted, the International Whaling Commission (IWC) could halt or curtail subsistence whaling to the detriment of local communities dependent on subsistence whaling.

Response: BOEM does not have control over IWC decisions. BOEM coordinates with NOAA to ensure compliance with the MMPA. It is the intent of BOEM and BSEE, through careful management of OCS activities, to avoid or minimize to the extent possible impacts from OCS-related oil and gas development on the bowhead whale or other marine mammals. The means available to accomplish this could include mitigation measures, spatial and temporal deferrals, rigorous inspections, and implementation of rules and regulations. See Section 4.3.2 for a discussion of BOEM's approach for mitigation planning under the Program. Also see the response to Comment 1 earlier in this section.

36. Impact levels as defined in Section 4.1.4 do not address impacts on subsistence resources. Major impact levels do not comport with the MMPA if they threaten the viability of bowhead whales and other marine mammals that Alaska Natives depend on.

Response: The impact levels presented in Section 4.1.4.2 apply to socio-cultural impacts, including subsistence harvesting. Text has been added to make this clearer. Adverse impacts on subsistence from routine oil and gas operations can be mitigated through consultation and scheduling (windows avoiding migrations). Major accidental spills that adversely affect marine mammals would be in violation of the MMPA and result in enforcement actions by NOAA. Section 3.8.1 discusses the MMPA and its requirements, as well as its relationship with Alaskan subsistence users. Additional discussion of the MMPA and the harassment or taking of marine mammals is provided in Section 4.4.7.1.

37. The PEIS includes some inaccurate statements regarding the Alaska Native subsistence whale hunt. It does not include subsistence whaling communities Kivalina, Wales, Savoonga, Gambell, and Little Diomedé in its analyses and includes misstatements about the whale hunt from Barrow and Wainwright.

Response: Corrections have been made to the discussion of whaling schedules in Section 3.14.3.2. The more distant whaling communities mentioned in the comment lie

outside the planning areas that are the subject of this PEIS. While the whales and other marine resources upon which these communities depend for subsistence could be affected by oil and gas development in the Chukchi and Beaufort Seas, there will be no leases in the waters adjacent to these communities. Sections 3.14.3.2 and 4.4.13.3 have been revised to include these communities and to address the potential effects on them from oil and gas development in Chukchi and Beaufort Planning Areas.

38. BOEM needs to have accurate information about impacts to subsistence activities in Alaska to support decision making and to comply with its obligations under the MMPA.

Response: In the PEIS, BOEM strives on the basis of scientific studies and literature, traditional knowledge, and public engagement to present accurate and current information on subsistence activities in the areas of the Arctic that could be affected by the 5-year plan.

39. The discussion of the impacts of noise from oil and gas operations on subsistence species only references traditional knowledge. Western science has reached similar conclusions and should be referenced.

Response: Discussions of the impacts of noise on marine mammals (including subsistence species) are presented in Sections 4.4.7.1.1, 4.4.7.1.2, and 4.4.7.1.3 of the PEIS. Similar discussions on the effects of noise on birds and fish are presented in Sections 4.4.7.2 and 4.4.7.3, respectively.

40. BOEM needs to revamp the PEIS to adequately address impacts to subsistence communities in northern Alaska in compliance with the MMPA.

Response: Section 4.4.13.3 has been revised to more adequately address potential impacts to subsistence communities in northern Alaska. BOEM has no direct responsibilities under the MMPA, and no authority to enforce the MMPA, but it does require oil and gas companies to comply with the MMPA and therefore, industry must obtain permits from NOAA for the incidental harassment of marine mammals before operating in the Arctic OCS. Under MMPA Section 101 (16 USC 1371 Sec. 101 (l)) such permits are issued only when the activity "...will not have an unmitigatable adverse impact on the availability of such species or stock for taking for subsistence uses." This permit then ensures that there will be no unmitigatable adverse impacts on the availability of a stock or species taken for subsistence uses.

41. The commenter disagrees with the statement made in Section 4.4.14.3.1 that altering the local availability of subsistence resources would be a short-term and local impact. The lack of subsistence resources would be significant. Since local communities exchange food and resources with other communities, it would not be local.

Response: BOEM recognizes the importance of subsistence resources to Alaska Native communities and is aware of the exchange connections between villages. Discussions of subsistence harvesting and bartering are found in Section 4.4.13.3. BOEM seeks to work

with stakeholders in formulating mitigation measures that would reduce or eliminate local impacts. There has been an extensive dialog regarding prospective temporal and spatial deferrals. BOEM has informed stakeholders that mitigation (which may include deferrals) will be carried forward into the lease sale NEPA documents. Section 4.3.2 of the PEIS discusses programmatic deferrals and mitigation, and describes a process that BOEM will put in place to identify, evaluate, and prepare for implementation, and mitigation strategies (which may include deferrals) that may be applied at appropriate program decision points. This process includes stakeholder input into the development of mitigation strategies.

42. There is a tension between unavoidable adverse impacts to the subsistence harvest under the 5-year plan listed in Chapter 5 of the Draft PEIS, and the prohibition against “unmitigatable adverse impacts” to subsistence hunts in the MMPA, which BOEM must resolve.

Response: BOEM has no responsibilities under the MMPA, and no authority to enforce the MMPA, but it does require oil and gas companies to comply with the MMPA, and therefore, industry must obtain permits from NOAA for the incidental harassment of marine mammals before operating in the Arctic OCS. Under MMPA Section 101 (16 USC 1371 Section 101 (l)) such permits are issued only when the activity “will not have an unmitigatable adverse impact on the availability of such species or stock for taking for subsistence uses.” This permit then ensures that there will be no unmitigatable adverse impacts on the availability of a stock or species taken for subsistence uses. There is a difference between “unavoidable” and “unmitigatable.” An “unavoidable” impact may be susceptible to mitigation, resulting in a reduced level of effect, unavoidable though it may be. In contrast, no action could be implemented to reduce the level of effect from an “unmitigatable” impact.

43. The Inupiat Community of the Arctic urges BOEM not to offer additional leases in the Beaufort and Chukchi Seas during the next 5 years, because of potential damage to the environment and their subsistence culture which is sensitive to environmental damage. Loss of subsistence resources would result in damage to their physical, mental, and spiritual health.

Response: The PEIS considers the potential for environmental damage, the potential for the discovery of oil and gas, and the potential for adverse impact on the coastal zone for a variety of alternative courses of action. Under Alternatives 5, 6, and 8 there would be no leasing in one or both of the Arctic planning areas. The PEIS seeks to clearly articulate the consequences of these alternatives as an aid to the decision-maker as he or she decides whether or not to move forward with the proposed action. Also see the response to Comment 1 in this section.

44. The Federal Government has not effectively analyzed the cumulative effects of oil and gas operations on multiple lease tracts. Alaska Natives who depend upon marine resources bear the brunt of potential risk from these activities. The Draft PEIS is greatly lacking in

information and analysis on subsistence activities necessary to understand what areas should be preserved.

Response: BOEM seeks to include current, complete, and accurate data appropriate for an EIS at the programmatic level. Subsistence activities in Alaska are discussed in Sections 3.14.2.2 and 3.14.3.2, while impacts on subsistence are discussed in Sections 4.4.13.2 and 4.4.13.3. The cumulative impacts of OCS oil and gas development on Alaskan subsistence activities are discussed in Sections 4.6.5.2.5 and 4.6.5.3.5. More detailed information on subsistence activities will be included in region- and lease sale NEPA documents. BOEM seeks to fill data gaps in part through consultation with local communities and through the scoping process.

45. The Draft PEIS lacks a sufficiently detailed discussion of subsistence whaling, and potential impacts of oil and gas development on the OCS on subsistence-based communities.

Response: Section 1.4.2 discusses incomplete and unavailable information, and discusses the analytical requirements for programmatic analyses and decisions. The PEIS presents discussions of subsistence (see response to previous comment), which are appropriate for a programmatic EIS. More detailed information and analyses on subsistence activities will be included in region- and lease sale NEPA documents and later phases of the Program. BOEM seeks to fill data gaps in part through consultation with local communities and through the scoping process.

46. Inaccurate statements regarding the bowhead subsistence whale hunt must be corrected.

Response: Information regarding the bowhead whale hunt in Section 3.14.3.2 has been corrected and brought up to date.

47. Traditional knowledge can help to fill in some of the gaps in our understanding of Arctic ecosystems as well as guide future efforts to collect necessary information. In order to incorporate traditional knowledge we need funding. Create indigenous science positions within BOEM, have those positions advertised and based in Alaska. A real collaborative approach to research and data sharing will result.

Response: BOEM agrees that traditional knowledge can help to fill in some of the gaps in our understanding of Arctic ecosystems, and BOEM has partnered with members of Native communities to incorporate traditional knowledge in past environmental studies. These studies are in various stages of completion, and the information is continually utilized to support environmental analyses related to BOEM permitted activities in the Arctic. BOEM welcomes opportunities for future collaboration.

48. The leasing plan and subsequent exploration and development activities should comply with Executive Order 13175 and the Presidential memorandum regarding consultation with tribal governments. Commenters are concerned that BOEM intends to engage in “after the fact” government-to-government consultations, instead of consultations that may actually have an

impact on the design or conclusions in the plan. Merely holding hearings in a Native community does not constitute adequate government-to-government consultation. Commenters were pleased that the North Slope Borough was designated a cooperating agency in the preparation of the PEIS. However, they expressed that this participation alone will not satisfy BOEM's responsibility to engage local communities, especially tribal governments. It was recommended that BOEM have government-to-government meetings with the local tribes before public hearings. The tribal council members protect the native way of life. The tribes need partnership so that they can run smoothly and make clear decisions. They do not seem to have any real control over their destiny and the industry continues to move forward despite their concerns.

Response: In conjunction with the scoping meetings for this PEIS, BOEM scheduled multiple separate government-to-government consultation meetings with Native Alaskan tribal communities. BOEM appreciates the opportunity to meet with Native Alaskan tribal members and values the discussions that were had during these consultations. BOEM has communicated the Native Alaskan tribal concerns to the decision-maker through consideration in the PEIS. Furthermore, BOEM will continue our dialogue about possible plans and activities on the Arctic OCS, including any potential lease sales in the future. In that spirit, BOEM welcomes the opportunity to meet with Native Alaskan tribal communities on a government-to-government basis, and BOEM values the ongoing dialogues with Native Alaskan communities.

8.4.4.4.23 Issue 4.23 Geohazards.

1. Several comments were specific to the text and figures in Sections 4.2.1.2 and 4.2.1.3:
 - Figures 4.2.1-2 and 4.2.1-4: state in the legend that only earthquakes of M 7.0 are plotted. Also show Cook Inlet folds (fault-cored anticlines) on the figure, based on Haessler et al. (2000).
 - Delete statement on Border Ranges fault as current thinking holds that it is not active.
 - Specify the magnitude threshold for the 1,200 earthquakes.
 - The text discusses floods but not liquefaction and direct-shaking effects on structures which are of greater significance. Even though they are discussed in greater detail in the following paragraph, they should at least be listed in the first paragraph.
 - Provide more information on the 1964 event, especially its impacts on oil- and gas-related facilities (which was minimal). Also include a discussion of earthquake potential in the Cook Inlet fold belt, since these are some of the primary tectonic sources in the region.
 - Discuss lahars, the 2009 Redoubt eruption, and their impacts on the Drift River Terminal.
 - For the text: "...where a glacier-dammed lake at the headwaters of the Snow River fails every two to 2–5 years" — note that Post and Mayo (1971) report that flooding takes place on Snow River every 2–3 years.

- For the text: “Historically, the Knik River near Palmer (at the northernmost end of Cook Inlet) has flooded when glacier-dammed Lake George fails” — move this sentence because the preceding and following sentences refer to the Kenai River and they should follow one another. Move this sentence in front of the previous sentence.
- It should be stated that there is the possibility for creep along “listric growth faults,” similar to what occurs in the GOM. This creep could affect infrastructure.
- Describe the seismicity on the Beaufort Shelf in more detail. Summarize any evidence of seismicity. Also clarify what is meant by “no seismicity in recent times.” What is meant by the term “recent”?
- Note that there have been numerous events on the southern Chukchi Shelf and a few off Wainwright.

Response: The following responses address the comments in the order they appear above:

- Please see the seismicity discussion in Section 4.2.1.2.2, which states that since 1973, more than 1,200 earthquakes have been recorded in the Cook Inlet region; 10 of which had magnitudes greater than 6.0. The text here refers to Figure 4.2.1-2 for plots of the two largest earthquakes (the 1999 and 2001 M 7.0 earthquakes on the Kodiak and Sitkalidak Islands); they are shown on Figure 4.2.1-4 for consistency. Neither of these figures was intended to show all earthquakes in the region, just the largest two. The maps show faults that would fall into USGS Class A (Quaternary) faults; the text has been revised to discuss anticlinal folds in the region and these features are now shown on Figures 4.2.1-2 and 4.2.1-4.
- The text states that there has been no movement on the Border Ranges Fault in the past 24 million years. This indicates that the fault is “inactive,” therefore, the statement (which cites a publication of the Alaska Division of Geological and Geophysical Surveys; Stevens and Craw 2004) is correct. The text has been revised to state more explicitly that the fault is considered inactive.
- The 1,200 earthquakes referred to in the seismicity discussion for Cook Inlet include those greater than M 3.0; the text has been revised to indicate this.
- The order of these paragraphs discussing flooding due to earthquakes, liquefaction, and direct-shaking effects has been reversed to indicate the importance of liquefaction and direct-shaking effects relative to potential flooding.
- The text in the seismicity discussion for Cook Inlet has been revised to state that there was minimal damage to oil and gas structures as a result of the 1964 Alaska earthquake. Discussion of movement potential along folds has also been added.
- Lahars that inundated the Drift River valley and their effects on the Drift River Oil Terminal are discussed in the next paragraph.
- The 2 to 5 year range of the outburst floods at the headwaters of the Snow River encompasses the 2- to 3-year range cited by Post and Mayo (1971); therefore, the text has been retained. Reference to Post and Mayo (1971) has

- been included in the section to strengthen the support for range of these events.
- The last sentence of the first paragraph (Cook Inlet) refers to both glacial lakes and the Kenai River — summarizing that in both cases, floods occur more frequently in the fall and can be especially severe if the lakes or the Kenai River are already high or frozen. Therefore, the text has been retained.
 - The text in Section 4.2.1.3.2 of the PEIS (Arctic Region — Seismicity) has been revised to indicate that slow movement (creep) can occur along listric growth faults and affect the integrity of infrastructure over time.
 - The text of the seismicity discussion for the Arctic Region has been revised to include additional discussion on possible Quaternary movement along faults in Harrison Bay (using a new reference, Craig and Thrasher [1982]). The term “recent times” refers to post-Quaternary time (i.e., Holocene); this has been indicated in the text.
 - A reference to seismicity on the southern Chukchi Shelf (and off of Wainwright) has been added to the seismicity discussion for the Arctic Region as suggested (as documented by Avetisov 1996). Search results from an Alaska Earthquake Information Center database query for earthquakes along the Chukchi coastal zone were also included.
2. There are several additional sources of information that are available regarding subsea permafrost in the Arctic lease areas and these should be considered for the discussion in Section 4.2.2.2 (Subsea and Coastal Permafrost – Arctic Region). The sources include:
- For information on subsea permafrost, see: Map showing extent of subsea permafrost in circum-Arctic: Brown, et al., eds. 1997. Circum-Arctic map of permafrost and ground-ice conditions. Washington, DC: U.S. Geological Survey in Cooperation with the Circum-Pacific Council for Energy and Mineral Resources. Circum-Pacific Map Series CP-45, scale 1:10,000,000, 1 sheet.
 - Osterkamp and Harrison (1982) state that “Subzero temperatures were found in all holes drilled in Kotzebue Sound, and in the Chukchi and Beaufort Seas. Holes drilled in the Chukchi Sea near Barrow suggest that the shore-line is stable, or nearly so, and that ice-bearing permafrost is probably thin or absent a kilometer or more off-shore.” (See Osterkamp, E., and D. Harrison, 1982, “Temperature Measurements in Subsea Permafrost off the Coast of Alaska,” in: Proc. 4th Can. Permafrost Conf. Calgary, Alberta, 1981, Natl. Res. Council, Ottawa, pp. 238–248.)
 - MMS (2007) states that “the presence and distribution of subsea permafrost is largely unknown (Grantz et al., 1982; Thurston and Theiss, 1987). Subsea permafrost is not yet recognized in most seismic data from the Chukchi Sea (Sellman and Hopkins, 1984). Rogers and Morack (1982) recognized ice-bonded material from seismic data collected in 5 m of water north of Icy Cape.” (See *Chukchi Sea Planning Area Oil and Gas Lease Sale 193 and Seismic Surveying Activities in the Chukchi Sea Final Environmental Impact Statement*, OCS EIS/EA MMS 2007-026, Alaska OCS Region. Available at

- http://www.alaska.boemre.gov/ref/EIS%20EA/Chukchi_FEIS_193/LS%20193%20FEIS%20Vol%20I.pdf.)
- MMS (2007) also states that “The presence of extensive subsea permafrost on the Beaufort Shelf (Craig et al. 1985) suggests that some subsea permafrost may exist along the northwest coast of Alaska. However, no anomalous near-surface seismic velocities that would indicate the presence of ice-bonded sediments have been reported. The near-surface consolidated rock present throughout much of the Chukchi Shelf may have inhibited development of permafrost during lowered sea level (Grantz et al., 1982). Another explanation for the apparent lack of relict permafrost offshore is that it was melted by the relatively warm currents moving north from the Bering Sea.” (MMS: Chukchi Sea Planning Area Oil and Gas Lease Sale 193 and Seismic Surveying Activities in the Chukchi Sea - Final Environmental Impact).

Response: The references cited above have been reviewed and the text in Section 4.2.2.2 (Subsea and Coastal Permafrost — Arctic Region) has been revised to incorporate the findings of these reports as applicable.

8.4.4.5 Issue 5 Cumulative Impacts

1. The cumulative impacts analysis should include a discussion of additive, multiplicative, and synergistic effects on resources; conclusions regarding impact levels should be clarified and better supported.

Response: Additive, multiplicative, and synergistic effects are “interactive” effects in which the net adverse cumulative effect is greater than the sum of the individual effects (CEQ 1997: “Considering Cumulative Effects Under the NEPA”). Summaries discussing these types of effects on resources have been added to the end of Sections 4.6.2, 4.6.3, 4.6.4, and 4.6.5, and an overall summary is now provided in a new section, Section 4.6.6. Similarly, the PEIS has been revised to integrate the eco-region concepts presented in the Affected Environment chapter in the cumulative effects analysis. This integrating framework provides a useful lens to discuss additive, multiplicative, and synergistic effects in context of resilient and/or stressed ecosystems. The text has been revised to ensure that impact levels are clearly identified (according to the definitions provided in Section 4.1.4 of the PEIS) and substantiated. The relevance of uncertainty and incomplete information in context of impact conclusions is also addressed.

2. The cumulative impacts analysis must include a more substantial analysis of the effects of climate change; in areas of uncertainty (i.e., where information is unavailable or incomplete), include a summary of the existing scientific evidence and information on known trends.

Response: Section 1.4.2 discusses incomplete and unavailable information and the analytical requirements for programmatic analyses and decisions. The PEIS presents a discussion of climate change and its effect on baseline environmental conditions, in Section 3.3. The effect of climate change on baseline conditions was also considered in the

resource-by-resource impact discussions presented in Section 4.4 of the PEIS. This level of consideration and analysis is appropriate for a programmatic EIS and programmatic decision-making. The cumulative impacts analysis draws on the summary of climate change effects discussed in Section 3.3; climate change is also discussed in relation to the various resources (as it applies) throughout Chapter 3. The text in Section 4.6 (Environmental Impacts of the Cumulative Case) has been revised, as appropriate, to integrate this information. In cases where credible scientific evidence is not available (or complete enough) to support conclusions, the text has been revised to state that future research and monitoring may be required as part of the NEPA review at the lease sale or project level (in accordance with CEQ 1997). The references cited in these comments have been reviewed and incorporated into the discussion of cumulative impacts as appropriate.

3. The analysis of cumulative impacts in the Arctic Region is inadequate in the areas of subsistence resources (whales, seals, fish, and caribou), human health, noise effects on marine mammals, sociocultural systems (because large impacts are unacceptable), biological systems (including additive and synergistic effects), ice movement, transboundary effects (from Russian and Canadian offshore oil and gas activities), and climate change.

Response: The cumulative impacts analyses, in Section 4.6, addressing resources in the Arctic region have been strengthened by improving content integration and including additional information from various sources (earlier sections of the PEIS, as well as additional literature on potential impacts related to climate change, subsistence, and oil spills). The cumulative effects analysis presents a clearer description of cumulative actions, defining the spatial and temporal bounds considered in the cumulative analysis. The PEIS provides additional clarification of and supporting documentation for the impact levels identified (including interactive effects of multiple actions), and clarifies the role of mitigation and monitoring at the lease sale level. The PEIS is a programmatic NEPA document and as such, is meant to encompass the full breadth of potential cumulative impacts on important resources in the Arctic region and other regions of development. It is intended to guide subsequent lease-specific analyses that will focus on the effects of a particular proposed action. The NEPA analyses associated with the various stages of OCS oil and gas development are shown in Table 1-1. Note also that specific mitigation measures and lease stipulations are determined in the more in-depth NEPA analyses required for lease sales and projects.

4. The cumulative impact analysis should include additional reasonably foreseeable future actions (e.g., LNG facilities and those proposed by Shell and ConocoPhillips) and correct, update or reconsider the descriptions of other actions (i.e., gold mining and vessel traffic) in the Arctic Region. The breadth of actions considered should be expanded to include subsistence, transportation, tourism, commercial fisheries, and the effects of offshore activities conducted by neighboring countries.

Response: The cumulative impacts section has been revised to include additional reasonably foreseeable future actions and to correct and update the description of gold mining in the Arctic Region as commenters have suggested. Section 4.6 includes a new table with a comprehensive listing of the types of past, present (ongoing), and reasonably foreseeable

future activities that could affect important resources in the planning regions — including those mentioned in comments received.

5. The cumulative impacts of noise on marine mammals presented in Section 4.6.4 have not been adequately assessed.

Response: The cumulative impacts of noise on marine mammals presented in Section 4.6.4 have been revised to incorporate more information on the long-term effects of undersea noise (including seismic surveys) on a regional scale.

6. The Deepwater Horizon event undermines statements about the small impacts of small oil spills relative to existing seeps and potential spills from foreign tankers. Mitigation measures for spills and their impacts (especially large ones) should be described in the PEIS.

Response: The cumulative impact analysis differentiates between the occurrence and impacts of small, large, and catastrophic spill sizes. The text in the discussions of cumulative impacts has been revised to address large and CDE spills. BOEM and BSEE have developed a robust regulatory framework to minimize spill occurrence (see Section 4.3.3 for recent regulatory reforms).

7. How many generations does the PEIS address (i.e., what is the time frame of the cumulative impacts analysis)?

Response: The time frame for the cumulative impacts assessment for the PEIS is 40 to 50 years. This information is presented in Tables 4.6.1-1 and 4.6.1-2 and new Section 4.6.2.

8. The Federal Government should continue to support research in the Arctic region, including ecosystem-based research that can contribute to a better understanding of cumulative impacts.

Response: BOEM is in agreement.

9. Section 4.6.4.3.4, on Invertebrates and Lower Trophic Levels, suggests that there would not likely be overall population-level effects on invertebrate resources because there are a relatively small proportion of habitats that would come into contact with released oil; however, it is possible that oil could be transported to the east by currents in such a way that biologically active areas in the Arctic region could also be exposed (such as where baleen cetaceans congregate in summer and krill are present during winter and early spring). These impacts could propagate up the food web to Arctic cod and baleen whales.

Response: New text has been added to Section 4.6.4.3.4 to more clearly address the potential transport and fate of oil in sensitive ecosystems and spill-related contamination of krill and its implications for higher trophic levels. See also Section 4.4.7.1.3, which provides information on potential impacts to marine mammals from consuming oil-contaminated prey. Lease-specific NEPA analyses will address this issue in more detail.

10. NOAA had recommended that a discussion of the effect of pipelines and pipeline safety buffers be included in the cumulative effects section on coastal habitats because the presence of pipelines can reduce or eliminate suitable areas for borrow material needed for barrier island and wetland restoration projects. Pipeline safety buffers would reduce areas available for restoration. Pipelines and their safety buffers could also result in impacts to seabird nesting areas and sea turtle nesting beaches.

Response: Very few new pipelines will come to shore in the GOM due to the 5-year Program (see Table 4.6.1-1). Pipeline disturbance widths are generally small with modern placement methods, and the rights-of-way should be less than 200 m (656.2 ft) in width. Pipeline placement would avoid nesting locations and would not occur during active nesting. Operators are interested in protecting pipelines from coastal erosion so a synergy could be developed with coastal restoration projects. Because of demand for OCS material for coastal restoration, BOEM is trying to cluster pipelines and to keep pipelines away from known marine mineral resources. This information has been incorporated into Section 4.6.3.1.1 with the appropriate BOEM citations.

11. NOAA had commented previously that the cumulative effects section on commercial and recreational fishing (Section 4.6.4.4.4) contained an oversimplification of the factors impacting abundance of fish species because it does not account for the management strategies that are currently in place to prevent overfishing. We recommend that the section be revised to reflect NOAA's findings that recreational catches in some fisheries can have a larger impact on abundance of fish species than commercial fishing practices. NOAA can provide information on the number of fish stocks/species that are overfished in all regions.

Response: The original text, which states that "Sportfishing may also contribute significantly to cumulative effects on some fishery resources. As a consequence of the pressure fishing places on fishery resources, appropriate management is required to reduce the potential for depletion of stocks due to overharvesting. Even with management, the possibility of overfishing still exists." is compatible with NOAA comments. However, the text in Section 4.6.4.4.4 was revised to discuss additional factors affecting fish stocks. For additional information on commercial fisheries, see Section 4.6.5.1.3 (Commercial and Recreational Fisheries).

12. NOAA recommends that BOEM define terms such as "small" areas and "short" time period as they relate to the effects of oil spills to marine benthic and pelagic habitats in Section 4.6.3.3.2. Discuss the effects of spills that occur when ice covers the area (as opposed to the open water period).

Response: Because recovery time is a function of the specific spill, environmental conditions, and the resource of interest, it cannot be quantified in a general way. However, the text in Section 4.6.3.3.2 has been modified to give a range of time for oil breakdown. Currently, drilling is not allowed during periods of ice cover.

13. A true measure of the cumulative effects of oil spills cannot be accounted for until the effects of the Deepwater Horizon event is better understood. BOEM should revise the PEIS to analyze the full impact of the Deepwater Horizon event.

Response: The Affected Environment, effects analysis, and cumulative impacts sections have been updated to reflect the most recent information relevant to a description of the environmental baseline conditions and potential for compounding effects in the GOM. BOEM has also disclosed instances where incomplete and unavailable information exists and discussed its relevance to a choice among alternatives. Section 1.4.2 discusses incomplete and unavailable information. The reader is also referred to Section 4.3.3, which discusses the risk and fate of a low-probability, catastrophic discharge event. The text in the cumulative impacts analysis has been revised, as appropriate, to more fully integrate this information.

14. NOAA has previously commented on the cumulative effects on sea turtles (Section 4.6.4.1.4) that it is not aware of data to support the statement that OCS impacts would be minor relative to non-OCS impacts. It recommends including references.

Response: The text in Section 4.6.4.1.4 has been revised to include an impact level based on the available scientific information (independent of its magnitude relative to non-OCS activities).

15. It would be helpful to have a quantitative estimate of the cumulative effects on marine mammals in Section 4.6.4.3.1. The document indicates the possible number of drill sites and their likely locations; combining this information with marine mammal density information and known “takes” of marine mammals could provide a quantitative estimate of expected cumulative impacts (at least for some species).

Response: A quantitative estimate of cumulative marine mammal “takes” would need to account for all cumulative actions, including State oil and gas exploration and development and other non-oil activities. In support of the lease sale and plan stage NEPA documents and consultations, BOEM, NMFS and USFWS, working in collaboration, develop equivalent estimates of marine mammal density and potential take. This PEIS qualitatively describes the cumulative effects on marine mammals in Section 4.6.4.3.1, assuming on- or off-lease activities would comply with the requirements of the ESA, MMPA, and resulting authorizations, which may stipulate “take” limits.

16. Clarify the term “Northern fur sea lion.”

Response: The text has been revised to “Northern fur seal” in Section 4.6.4.2.1.

17. Section 4.4.1.3: Clarify whether there would be regulatory prohibitions against tankering or marine transportation of produced hydrocarbons. The environmental consequences of reductions in sea ice and opening of new sea routes on current navigational and economic conditions have not been fully addressed.

Response: There are no current regulations prohibiting the tankering or marine transportation of produced hydrocarbons. The effects of sea ice reduction and opening of new sea routes on the current navigational and economic conditions of the Arctic region has been included in the cumulative impacts analysis.

18. The discussion of natural hazards is disjointed because it is addressed under several topics (geologic hazards, ice hazards, and physical oceanography) in the PEIS. The discussion of potential impacts from certain hazards such as fog, high winds, storm surges, extreme temperatures, and seasonal darkness is incomplete. In addition, substantial information on the difficulties of recovering oil in broken ice conditions has not been included. The discussion of these topics would be improved if they were included in a single section. The Oil Spill Prevention and Response report (Nov. 2010) for the U.S. Arctic Ocean is a good example.

Response: Natural hazards are discussed only in Section 4.2 (which discusses both geologic hazards and sea ice and permafrost). The hazards are further broken down by planning regions to reflect the way the sections on the affected environment and impacts on the various resources are organized. The Arctic Ocean report commissioned by the Pew Environment Group was already referenced in Section 4.3.3, but has also been incorporated in the climate change and physical oceanography sections (Sections 3.3 and 4.2, respectively), as appropriate.

19. Provide a source for the statement in Section 4.6.4.3.2: “Oil contamination of food resources may influence recovery of a local population by affecting reproductive success and survival, with the degree of impact largely dependent on the patterns of prey distribution.” This statement should take into account compensating dynamic factors that affect wildlife populations (e.g., when population is reduced, the survival and productivity rates among remaining birds often increase).

Response: Section 4.6.4.3.2 has been revised to include additional scientific sources and to provide more information about the population-level impacts of oil spills on bird species.

20. The discussions of the Deepwater Horizon event should be updated or qualified by noting the oil estimates still at or below the water surface are current as of August 2010. Include a statement to clarify that oil continues to weather and that much of the oil reported by the Georgia Sea Grant Oil Spill Update has either dissolved or dispersed and was not recoverable.

Response: Section 4.6.2 has been updated to reflect the most recent information available on the effects of the DWH event, including the references cited in the comment.

- 21 The statement in Section 4.6.3.1.1, “Although much of the oil remaining after cleanup is highly weathered, several constituents have the potential to cause toxicological effects (OSAT-2 2011),” should clarify that oil weathering depleted a large portion of the hydrocarbons in oil, including PAHs. Add two references by Boehm et al. (2011) which cite

the high rates of biodegradation of oil from the Deepwater Horizon event: (1) “Distribution and Fate of PAH and Chemical Dispersants in the Water Column Following the Deepwater Horizon Oil Spill,” SETAC North America 32nd Annual Meeting (November 13-17); and (2) “Aromatic Hydrocarbon Concentrations in Seawater: Deepwater Horizon Oil Spill,” International Oil Spill Conference (May 23-26, 2011)

Response: The references cited in this comment have been reviewed and additional information regarding the breakdown of volatile compounds during weathering has been incorporated into Section 4.6.3.1.1.

22. The PEIS should do a better analysis of the cumulative and synergistic impacts of climate change and ocean acidification. BOEM should consider the impacts on climate change from the analysis of oil and gas consumption resulting from the Program’s lease sales. The statement in Section 1.4.5.5 “consumption of the refined oil is not considered because the scope of this PEIS is limited to issues that have a bearing on the decisions for the proposed leasing program” is an example of circular reasoning and therefore, does not substantiate the omission of an analysis of the impacts of hydrocarbon consumption.

Response: Section 4.6 evaluates the effects of climate change, ocean acidification, and other global trends as cumulative actions. Consistent with judicial guidance, BOEM does not provide an analysis of the impacts of oil and gas consumption on various resources; the rationale is stated in Chapter 1 (as noted in the comment). However, regional and national emissions from fuel combustion sources are accounted for in the air quality impacts analyses in the cumulative impacts section. Summaries discussing the additive, multiplicative, and synergistic effects on resources have been added to the end of Sections 4.6.2, 4.6.3, 4.6.4, and 4.6.5, and an overall summary is now provided in a new section, Section 4.6.6.

23. The statement in Section 4.6.2.1.1 that “as of January 2011, oiling was still present on many shorelines and on barrier islands” should be revised to “... some shorelines ...” because it gives the erroneous impression that many shorelines are still oiled. Also, the statement in Section 4.6.3.1.1 “On Grand Isle, Louisiana, and Bon Secour, Alabama, oil was found up to 105 cm (41 in.) below the surface...” should be revised to indicate that supertidal buried oil was found.

Response: Section 4.6.2 has been updated to reflect the most recent information available on the effects of the DWH event.

8.4.4.6 Issue 6 Oil Spills

8.4.4.6.1 Issue 6.1 General Oil Spill Concerns.

1. USEPA requested information on the potential effectiveness and impacts of using large-scale berm construction as a spill response technique.

Response: The PEIS principally describes typical measures used to respond to oil spills. Following the DWH event, sand berms were constructed in the GOM in an attempt to contain spill and prevent transport of oil into back-barrier and wetland ecosystems. All such response measures require advance approval of the On-Scene Federal Coordinator, U.S. Coast Guard. Section 4.3.3 of the PEIS has been revised to include a general discussion of the possibility of non-traditional spill response measures, the approval process, and potential ramifications of untested response tactics.

2. The PEIS does not adequately characterize the occurrence risk or potential impacts of a catastrophic discharge event that could result from OCS exploration or development operations during the proposed leasing program.

Response: The PEIS addresses the risks of oil spills, including the risk of catastrophic discharge event, in Sections 4.3.3 and 4.4.2. While the PEIS does not assume that a catastrophic discharge will occur, the potential for significant effects because of such an event are considered throughout Chapter 4 by environmental and socioeconomic resource.

3. The PEIS should include analyses of direct, indirect, and cumulative effects of catastrophic discharge events. This includes downstream effects resulting from spill response measures.

Response: The catastrophic discharge event is analyzed across all resource sections in Chapter 4 of the PEIS. Additional reference content has been provided in each resource section to further support the analysis therein.

8.4.4.6.2 Issue 6.2 Oil Spill Assumptions and Risks.

1. Spill risk and spill-associated impacts are related to the volume of oil produced. Larger reservoirs may pose a greater spill risk.

Response: Changes were made to the PEIS to clarify the underlying spill risk assumptions. The relationship between reservoir size and oil produced is characterized in the PEIS in Section 1.5.5.6.

2. The unpublished paper “Anderson (in preparation)” used to calculate spill risk must be made publicly available before it can be used as the basis for the spill risk analysis in the PEIS.

Response: Anderson et al. (2012) is now available on BOEM’s web site. Additional information has been added to the PEIS that includes the spill rates for platforms, pipelines, and tankers for 1996-2010. The rates for 1996–2010 were used in the estimation of the number of spills in each Planning Area. The basic assumptions of that spill rate analysis are summarized in the footnotes of the table.

3. The PEIS should include relevant reform information and recommendations from the National Oil Spill Commission Report on the Deepwater Horizon Event, the National

Academy of Engineering/National Research Council report, and other pertinent reports following the DWH event that specifically address the assessment of oil spill risk. The PEIS should address what BOEM and BSEE have accomplished or plan to accomplish to address the identified deficiencies. Moreover, the PEIS should demonstrate that the reform measures will contribute to improvements in offshore safety.

Response: The PEIS has been revised in Sections 1.3, 2.9, and 4.3.3 to address this concern. In particular, Section 4.3.3 has been revised to include a more complete discussion of both governmental and industry reform efforts, in place and ongoing, that are being implemented to respond to the reform considerations and recommendations. BOEM and BSEE have implemented and continue to implement many of the expert recommendations in the various DWH event investigation reports. Many of these enhanced measures, such as improved blowout preventer (BOP) reliability, improved cementing and other secondary barrier programs, better-defined operational and risk assessment procedures, and integrated treatment of human risk factors, have been benchmarked against international standards and experience where these improvements have been shown to effectively reduce risk (See DNV 2010b in Section 4.7 references).

4. The PEIS inadequately evaluates the risk of the occurrence of oil spills. The PEIS risk analysis is overly simplistic and relies on the same flawed historical approach. Using that methodology, BOEM underestimates the actual risk of accidental spills, especially those potentially occurring during higher-risk drilling operations. BOEM should improve the quantitative risk assessment of oil spills, considering the different risk profiles of different OCS operations, disclose the greater risk of drilling in deep water and Arctic conditions, and incorporate lessons learned from the DWH event.

Response: BOEM included a substantial treatment of the different factors that can contribute a different risk profile across different OCS oil exploration and development operations relative to different environmental conditions and operational circumstances. The reader is referred to that detailed discussion in Section 4.3.3. In addition, the PEIS has been revised to incorporate the best available information addressing occurrence of oil spills, including small, large, and potentially catastrophic spill sizes, across different operational phases and environments. Additional quantitative treatment of spill risk is included in Sections 4.3.3 and 4.4.2. BOEM maintains that the risk of large and potentially catastrophic discharge events is rare, including those resulting from loss of well control.

8.4.4.6.3 Issue 6.3 Arctic Oil Spill Concerns.

1. Many commenters emphasized the limitations of governmental and industry response capability currently in place to effectively contain, respond to and clean up oil spills in the harsh arctic environment. Comments commonly referenced the general lack of response planning, existing response support infrastructure, Arctic-specific containment and mechanical recovery technology, as well as the remoteness, extreme weather and sea state, cold temperatures, seasonal darkness, and presence of sea ice in the Arctic. Some of these

commenters indicated that leasing should not be pursued in the Arctic until sufficient response capability was in place.

Response: These general comments about spill response capability are already reflected in the PEIS in Section 4.3.3 and do not warrant additional changes to the PEIS. Related comments providing or requesting additional information are included and addressed in comments below.

2. Numerous commenters expressed serious concern over the risk of a large spill occurring in the Arctic and the possibility for severe long-term impacts on sensitive environmental resources and native communities.

Response: BOEM appreciates that the risk of oil spills in the Arctic is a fundamental concern. The PEIS acknowledges this risk throughout Chapter 4 of the PEIS. The reader is referred to the following sections of Chapter 4: 4.3.3, 4.4.2, and 4.6.

3. A number of comments differentiated the risk of a catastrophic discharge event in the Arctic from the risk of a catastrophic discharge event in deepwater GOM. The shallow-water wells and low-pressure geology found in the Arctic are less technically complex than the deepwater wells and high-pressure/high-temperature conditions in the GOM, and as a result, the risk of blowout and oil spills is less. A catastrophic discharge event is extremely rare, and with new requirements in place, industry is prepared for such a remote event with oil spill response plans appropriate for the nature and risk of operations.

Response: Section 4.3.3 describes the various factors that contribute to the risk of blowouts and catastrophic discharge events, as well as regional spill containment and response capability if such an event were to occur.

4. The PEIS should accurately disclose the effectiveness of mechanical recovery techniques of spilled oil in the Arctic. Commenters assert that Shell has incorrectly asserted that they can successfully recover up to 95% of oil if a spill occurs in the Arctic.

Response: Comment noted. See PEIS Section 4.3.3 for a discussion of the efficacy of mechanical recovery methods, including the potential for reduced effectiveness in ice conditions and narrow windows for physical recovery owing to ice state and ice breaking capability.

5. No one has yet determined how to clean up oil in pack ice, which covers the Arctic during eight months of the year. The Coast Guard possesses only three heavy ice breakers, one of which has been converted to a research vessel, another that is slated to be junked, and another that awaits a similar fate in Seattle. Skimmers — the main tool used in the BP spill — have been proven by Canadian researchers to be ineffective even when the water is clear of ice because of choppy conditions. We cannot answer all of these questions between now and when the lease sales open in 2015. The National Commission made recommendations on how to close the response and research gaps in the Arctic, including launching an immediate

Federal research effort to gather more scientific data about the Arctic Ocean, conducting annual stock assessments of species, and creating an interagency research program to focus on spill response and containment in the Arctic. Until we have more information, the Department cannot make a sound decision as to whether to drill in the Arctic Ocean. Especially in an era of acute Federal budget constraints, there is no guarantee that the work necessary to close these gaps will be completed. Until these efforts are completed, it is not possible to assess the true risks to the Arctic environment, or to the Native communities that depend on the resources of the Arctic for their survival.

Response: The PEIS reasonably discloses the potential for oil spills in the Arctic Planning Areas and fairly characterizes the existing spill response capability and challenges to well containment and oil response in various ice states. The PEIS also discusses the scope of recent oil spill response plans industry has prepared in support of proposed Arctic operations under recent lease sales. The commenter incorrectly presumes that OCS activities under the 2012-2017 Program that could result in the oil spill size of concern will occur instantaneously within the same time frame as the lease sale schedule. Instead, given recent precedent in industry investments, BOEM anticipates that first exploration drilling operation under the new program may not actually occur until after the end date of the 2012-2017 Program. In the intervening time, as characterized in Section 4.3.3, BOEM, BSEE, and the oil and gas industry are actively pursuing a sophisticated research program focused on oil spill response in the Arctic. Many of these efforts have been described in revisions to Section 4.3.3.

The Arctic lease sales included in the Preferred Alternative are intentionally scheduled late in the Program so that new research and practical experience garnered from exploration activities proposed in 2012 and 2013 under existing leases, provided they are approved by BOEM and BSEE, can better inform those decisions. The PEIS already considers no Arctic sales alternatives if the Secretary of the Interior wanted to pursue a course of action to avoid the potential for oil spills in the Arctic associated with 50-year implementation of the 2012-2017 Program. That being said, it would still be possible for spills to occur during exploration and development operations under leases acquired under previous programs. At any time, the Secretary maintains the discretion to cancel or further delay the sales if new information suggests it is prudent to do so, or conversely, if the absence of information warrants a more precautionary approach. Similarly, the Secretary maintains the discretion to issue suspension orders for given exploration or development operations provided the need.

8.4.4.6.4 Issue 6.4 A Catastrophic Discharge Event.

1. The references are incorrect or are missing from Section 4.3.4 in the Draft PEIS.

Response: The references cited in Section 4.3.3 were inadvertently not included in the reference section for Chapter 4. The PEIS includes all references relevant to the discussion of the risk of a low probability, catastrophic discharge event.

2. Section 4.3.4 of the Draft PEIS should reference the best available North Sea research efforts and demonstration projects regarding oil spill response measures and capability in ice conditions.

Response: Section 4.3.3 of the PEIS has been revised to include additional information concerning oil spill response research in the North Sea. In addition, the PEIS includes information about ongoing BSEE, U.S. Coast Guard, National Research Council, and Joint Industry Project efforts to study and improve oil spill response capability in the Arctic.

3. Section 4.3.4.3.1 of the Draft PEIS needs to provide more detailed information about the assumptions underlying the catastrophic discharge event scenarios in each OCS Planning Area. This includes a more robust discussion of the likelihood of occurrence of such an event in context of new prevention and containment requirements. An estimate of the frequency of major spills could include factors such as historical domestic and international catastrophic spill occurrences, environmental factors, number of platforms, pipelines, and oil tankers, as well as the volume of production. Additionally, the PEIS should make reference to other rare events and the nature of impacts that can be expected.

Response: Section 4.3.3 of the PEIS has been revised to better describe the methodologies used to derive the spill scenarios, clarifies the likelihood of occurrence, and identifies comparable spill examples. The PEIS indicates that the likelihood of occurrence of a catastrophic discharge event is small. BOEM maintains that the introduction of new prevention and containment requirements should further reduce the likelihood of occurrence, but, at the 5-year program stage, there is no definitive way to quantify that improvement given well-specific variables. BOEM has conservatively assumed for the purpose of its 40 CFR 1502.22 analysis that new prevention and containment requirements are not effective. Those assumptions are clearly specified in Section 4.3.3. The specific resource area analyses in Chapter 4 of the PEIS summarize the scale of possible environmental effects for small and large oil spills (which the analytical scenario assumes), as well as a low-probability catastrophic discharge event (which is unexpected).

4. The Northwest Arctic Borough expressed concern over the possibility of a catastrophic oil spill. Northwest Arctic Borough stressed the importance of spill prevention and response, including the need to have proven cleanup capabilities tested and deployed before any OCS activities begin. The Northwest Arctic Borough comments indicated that there were a range of deficiencies in the Draft PEIS. The Draft PEIS underestimated the likelihood of occurrence such a spill and the potential impacts from such a spill. Similarly, the Draft PEIS overestimated the response capabilities for such a spill. Table 4.3.4-1 failed to mention weather or broken ice conditions as factors that could lead to a catastrophic event. Northwest Arctic Borough questioned the accuracy of estimates that a catastrophic discharge would be contained within 40–75 days in the Chukchi Sea, as compared to greater estimates in the Beaufort, especially since the Chukchi Sea is further from infrastructure than either of the other two Alaska planning areas. NWAB requested that the PEIS clarify the reference to the 2010 SINTEF report on the Joint Industry Program on Oil Spill Response for Arctic Waters. The Joint Industry Program study used field trials to improve oil spill response techniques for in situ burning of oil and use of dispersants and mechanical recovery. The PEIS should have

indicated that the trials involved repositioning of equipment and deployment during controlled conditions. The PEIS should also have emphasized the current challenges faced by the Coast Guard in the Arctic in terms of human and resource capital to respond to a spill in ice conditions.

Response: BOEM revised Section 4.3.3 to address the technical aspects of this comment. The reader is also referred to Section 4.2.2 for a characterization of the potential interactions between sea ice and oil and gas infrastructure on the OCS and the resulting risk potential. BOEM has also clarified the underlying assumptions about the duration of a catastrophic discharge event in the Chukchi region. The PEIS includes an expanded discussion of the current regulatory regime for spill response planning and implementation, as well as the regional spill response capability.

5. NOAA recommended that BOEM broaden the scope of its analysis to consider the impacts of all activities, including potential oil spills and the use of chemical dispersants in any oil spill response efforts, to Essential Fish Habitat and other vulnerable deep-water habitats such as deep-sea corals. NOAA also suggested that BOEM evaluate the potential impacts to EFH for each life stage of each managed species, as well as impacts to other vulnerable habitats, from a worst-case scenario oil spill, including impacts to benthic and pelagic coastal and offshore habitats, and prepare proposed mitigation requirements for such a spill.

Response: Sections 4.4.6.4 and 4.4.7.3 of the PEIS include an analysis of potential impacts to EFH and fish appropriate for a programmatic NEPA document. Under CEQ requirements, the PEIS does not need to include an analysis of a worst-case oil spill. Rather, under the requirements of 40 CFR 1502.22, the PEIS must address reasonably foreseeable significant adverse effects resulting from a proposed action even if the probability of occurrence is low. To comply with this requirement, BOEM has analyzed the effects of a “catastrophic discharge scenario” for each Planning Area under consideration. The effects analysis for each resource in Chapter 4 considers events and impacts which may have catastrophic consequences, including population-level effects for sensitive biological resources and chronic disturbance to vulnerable or sensitive habitats. BOEM’s overall approach to region-specific or plan-specific mitigation is explained in detail throughout the document, most notably in Section 1.3.1. BOEM refers the commenter to BSEE regulations at 30 CFR Part 254 and the 2010 Certification NTL (NTL 2010-N10) that require that OCS operations have an oil spill response plan that is adequate to contain the worst-case discharge for an individual exploration or development plan. The worst-case discharge under the BSEE regulations should not be confused with the NEPA requirement described above.

6. NOAA recommended that BOEM provide further analysis and support for the statement that oil in Arctic waters can be “suspended” in the water column. NOAA also cautioned against the language here regarding the benefits of ice in confining or cleaning-up spilled oil. NOAA disagreed with any characterization that oil trapped in ice prevents the oil from affecting sensitive habitats and from spreading.

Response: The PEIS has been revised to more accurately describe the potential for oil to be entrained in the water column. The PEIS does not indicate that there are explicit benefits to oil being confined to ice. Section 4.3.3 states that ice may either facilitate or hinder the clean-up of oil or the scale of cleanup operations in the Arctic, depending on the circumstances.

7. The PEIS only addressed well-control issues and associated technological applications. Because sub-sea pipelines are envisioned for product delivery, NOAA recommended the PEIS include a similar analysis of pipeline spills. Such spills may have relatively large volumes and may be considered catastrophic. Pipelines may transit the spring lead system through which thousands of marine mammals migrate each spring, and any spill may occur under ice — presenting challenges for timely detection.

Response: BOEM acknowledges that pipeline spills can have sufficiently large volumes to contribute to significant environmental effects. However, the volume and duration of those spills will not be as large and long as spills that could potentially occur following loss of well control. BOEM has treated the likely frequency and size of pipeline spills in the small and large accidental spill analysis in Section 4.4.2 and throughout the Chapter 4 effects analyses. To comply with 40 CFR 1502.22 requirements, BOEM has deliberately used a long-duration loss of well control so as not to underestimate the potential spill size and duration of a low-probability catastrophic discharge event, and analyzed the potential for environmental effects from such an event. In general, the distance between two safety valves would not allow the volume to be catastrophic even from a rupture or equivalent occurrence. Subsea pipelines must be designed and constructed to operate safely in the harsh environment on the Arctic OCS where ice scour is prevalent. Arctic pipeline designs are based on extensive pipeline experience onshore in Arctic environments and offshore experiences in the Beaufort Sea and other parts of the world. The design goal for any pipeline is ultimately zero discharge of oil, and it must be in compliance with BSEE and U.S. Department of Transportation pipeline safety regulations. Any offshore pipeline system in the Beaufort and Chukchi Seas would be designed according to these codes, standards, and specifications. Should development be proposed, a joint technical review of the pipeline design by the BSEE and State Pipeline Coordinator's Office would be conducted in conjunction with the review processes for the right-of-way application. The pipeline would be hydrostatically tested before operation begins, have three leak-detection systems, and be monitored by pigging to ensure safe operations. During the development plan phase, mitigation can be considered to reduce the potential impacts of a spill further if determined to be necessary. For example, during the Northstar Development Project, British Petroleum proposed using a supplemental leak-detection system, LEOS, that increases the probability of detecting a pinhole leak from the pipeline under the ice that could potentially be below the pressure-point analysis and mass-balance line-pack compensation threshold.

8. In addition to ice, extreme temperatures, and shortness of the ice-free season mentioned here, seasonally limited available daylight is also likely to be a major constraint to a spill response, as aerial efforts are important to locate and track surface oil, direct response operations, and assess response effectiveness (aerial efforts are a requisite for certain response tactics).

BOEM should consider the limited infrastructure currently available in the Arctic to support large-scale response operations in the event of a well or pipeline blowout.

Response: BOEM has revised Section 4.3.3 to address and provide more detail about the unique challenges of oil spill response operations in the Arctic, including human capital and infrastructure needs.

9. In Section 4.3.4.2.2, the Draft PEIS states “since the toxicity of dispersants is an important consideration, mechanical containment methods are the preferred initial response. Very large spills may require immediate application of dispersants.” This discussion should be expanded to discuss the fact that although mechanical response is preferred, it is not always adequate and that dispersant use involves trade-offs and can provide a net benefit.

Response: Section 4.4.3 of the PEIS has been revised to include a more inclusive discussion of the trade-offs of dispersant application.

10. Many risk factors for catastrophic discharge events positively correlate with water depth. Thus, water depth is not simply one variable among others that needs to be considered in regulating OCS oil and gas operations. Instead, water depth is broadly representative of the risk of offshore drilling. While water depth is not the only risk factor that should be considered for catastrophic discharges, environmental impacts may be significantly different in deepwater leasing, and as such, that possibility underscores the need to consider an alternative in which deepwater leasing would be deferred.

Response: The PEIS considers the various factors that potentially contribute to the risk of occurrence of loss of well control and potential consequences of such an event. Recent research has indicated that water depth is not or is either marginally correlated with safety incidents — not spill or pollution events. The principal factor associated with downhole risk is the true vertical depth of the well, which in turn drives borehole pressure conditions. Moreover, it is not uniformly true that all wells drilled in deepwater are drilled to a greater final depth than in shallow water. Section 4.3.3 of the PEIS includes a robust discussion of the risk potential that deepwater and ultra-deepwater operations introduce. Despite the conjecture offered in the comment, there is no definitive evidence that water depth actually contributes to significantly different effects, although it does complicate spill containment and response operations as already disclosed in the PEIS. Consider the following example. A given exploration well spudded in shallow water may be drilled to a true vertical depth greater than a given deepwater well, despite the fact that the deepwater well is in a water depth more than several hundred meters. The geology overlying and formation and reservoir pressure conditions in the reservoir in a shallow water well may be comparatively riskier. The proximity to the coast, assuming a blowout and spill does occur, may present the potential for greater environmental impacts because of the likelihood of wide-spread and immediate contact with coastal and estuarine resources. Section 4.3.3 addresses the relative importance of fate considerations and spill proximity to sensitive resources. As explained in the PEIS, BOEM’s exploration and development scenario projects that the lion’s share of oil from the GOM will be produced most economically from deepwater. Excluding deepwater is

therefore inconsistent with the purpose and need of the proposed action which requires the Secretary to both develop OCS resources and protect the environment. Chapter 2 presents a detailed justification of why BOEM has not analyzed an alternative excluding deepwater leasing.

11. The PEIS overstates the relative risks associated with deepwater operations and fails to include important blowout and BOP pressure test data. Minerals Management Service studies indicate a significantly lower blowout rate for deepwater drilling operations. West Engineering, SINTEF, and OOC (Offshore Operators Committee) pressure test data show that critical pressure test failures are 19 to 27 times higher for surface BOPs than for subsurface stacks.

Response: BOEM has incorporated the references suggested and clarified the point being made in the PEIS. Although blowout events in the deepwater GOM are limited, the most comprehensive blowout frequency analysis, based on SINTEF's international database of blowout events, suggests that there is a greater relative frequency of blowouts in high-pressure/high-temperature conditions.

12. In Section 4.3.4.2.1 of the Draft PEIS, the statement "in shallow water, the relatively lower formation pressure typically results in a higher margin of safety, although encountering shallow gas represents a substantial hazard" is misleading and should be revised. With regard to formation pressures, well depth (not water depth) is the primary consideration. While ultra-deep (subsurface) shelf wells like those at the Blackbeard prospect typically encounter very high formation pressures, the ultra-deepwater Perdido field has low reservoir pressures. In this section, the Draft PEIS also states that "deepwater drilling rigs are multi-point moored to the sea floor or, more recently, dynamically positioned" is incorrect. DP [dynamic positioning] systems have been in use for 40 years. The Glomar Challenger had a full DP system for coring operations in 1968, and the Sedco 445 had a DP system for drilling in 1971. In this section, the Draft PEIS also states that "the technologically advanced BP Thunder Horse platform, for instance, intended to be BP's largest producer in the GOM, flooded because of the backward installation of a valve" does not relate to the discussion.

Response: Section 4.3.3 of the PEIS has been revised to address or clarify the text in the draft.

13. The PEIS states that "the number of incidents reported increases with more complex operations, in particular with deepwater operations which, by their very nature, often entail greater scale, expansion, and complexity (Cohen and Krupnick 2011)." Citing a reference is not helpful unless that reference includes data that substantiate the conclusions. Increased production from fewer manned surface facilities tends to reduce safety risks and the potential for operational failures, not increase them.

Response: BOEM inadvertently cited the wrong reference. The correct reference is Muehlenbachs et al. (2011). BOEM has clarified the statement and provided additional references to support the principal idea.

14. In Section 4.3.4.3.4, the Draft PEIS states that “the DWH event demonstrated that advances in drilling, safety, and spill response did not keep pace with increasingly complex operations by raising the standards for drilling and workplace safety, spill containment, and spill response.” This statement is not representative of the views of industry in general and should be removed. The Macondo incident has caused everyone to evaluate their operations. However, Macondo is not the sole performance measure for all operations and an entire industry. USDOJ data indicate that drilling operations have been getting safer and that the blowout rate has decreased. In addition, since the DWH event, a number of regulatory, policy, and industry-led initiatives have been developed and implemented. Together, these initiatives will work to further reduce the risk of future incidents and improve the offshore industry’s ability to respond to any accidents or oil spills that might occur in the future.

Response: The PEIS has been revised. Section 4.3.3 includes a detailed discussion of recent and ongoing governmental and industry reforms. The language in question has been revised.

15. In Section 4.3.4.2.1 of the Draft PEIS, the measure used to quantify the three largest spills prior to the DWH event is not provided.

Response: The PEIS has been revised to indicate that the spill sizes are expressed in barrels (bbl).

16. Table 4.3.4-1 of the Draft PEIS should be revised by removing the term “vs.” from “capping at the well vs. drilling relief well vs. chemical and mechanical response” since the current structure suggests that there are different trade-offs amongst each.

Response: Table 4.3.3-2 in the PEIS has been revised to clarify the intent. However, there are trade-offs associated with some of different response strategies, especially in chemical and mechanical response.

17. While catastrophic discharge event may be classified as a “spill of national significance,” spills that may not be classified as a catastrophic discharge event may still be classified as a “spill of national significance.” A discharge may be classified as a spill of national significance (SONS) by the Administrator of the USEPA for discharges occurring in the inland zone and the Commandant of the U.S. Coast Guard (USCG) for discharges occurring in the coastal zone (40 CFR 300.323). USEPA recommends that BOEM consider clarifying that a SONS may not necessarily be a “catastrophic discharge event.”

Response: Section 4.3.3 of the PEIS has been revised to clarify that a SONS may not necessarily be a catastrophic discharge event.

18. It is not enough that the PEIS lists potential hazards that could lead to an oil spill; it must analyze and describe how the hazards could cause a spill, and most importantly, whether and how these hazards could be mitigated to avoid a spill. For example, in Section 4.2, which describes the relationship of the physical environment to oil and gas operations, the PEIS describes seismic faults, weather conditions, and geological hazards in the Arctic that “may

present a risk to offshore oil and gas activities,” but does not specify what those risks are, nor does it make recommendations as to whether or how these hazards can be treated to avoid those risks. In sum, the PEIS is not sufficient without a reasonable analysis of the significant impacts oil spills may have on the regions proposed for leasing, the state and availability of current technologies and infrastructure to effectively contain and clean up a major or catastrophic spill in the different regions, and of whether and how the risks and impacts of such a spill can be mitigated.

Response: BOEM believes the PEIS does sufficiently link geological, operational, and other hazards to the occurrence of a spill or other incidental events. The reader is referred to Sections 4.2 and 4.3.3 for a complete discussion of risk. While the exact cause of the spill may vary, Chapter 4 of the PEIS fully analyzes the effects of small, large, and very large oil spills and differentiates between the intensity and context of potential impacts.

19. In Section 4.3.4.2.2, the Draft PEIS discusses the Marine Well Containment Company’s seabed containment system. The PEIS states “this system is intended to address the weakness of the BP containment dome that caused its failure during the DWH event. The system can inject antifreeze-like chemicals to inhibit natural gas hydrate build-up, which created spill containment complications during the DWH event. Of course, whether Marine Well Containment Company’s system will work as effectively as it claims will not be known until another blowout event occurs.” The commenter asked BOEM to revise this section of the document to note that the DWH response deployed other, more advanced systems later in the response that did have methane injection capabilities to control hydrate formation. Additionally, the capping and control systems deployed during the response in June 2010 were effective in capturing a significant portion of the released oil and gas. Accordingly, it has been shown that similar systems can be effective in similar situations.

Response: Section 4.3.3 of the PEIS has been revised to reference the improved capability for containment after BP’s containment dome was modified.

20. In Section 4.3.4.2.1, the Draft PEIS states “deepwater wells require subsea BOP placement at depths unreachable for human service; ROVs [remote operating vehicles] become necessary.” This statement insinuates that there is an increased likelihood in spill occurrence or failure in well control or containment. The effective use of ROVs at deepwater sites has been clearly demonstrated.

Response: BOEM provides additional reference to the Mide (2010) study that addresses the reliability of ROVs to clarify the dependency on ROVs for physical intervention on deepwater well equipment and associated risk.

21. In Section 4.3.4.2.1, the Draft PEIS states “important technology includes the acoustic backup system, which communicates with the BOP system in the event of electrical and hydraulic connection loss with the wellhead. DNV (2010) reported a 25% reliability of current acoustic backup systems. ROV activation of the BOP using the secondary control system had a 75% success rate.” Why is the acoustic backup system highlighted as important

when it has significantly lower reliability than ROV activation? Acoustic backup systems are likely to have even lower reliability during turbulent blowout conditions.

Response: Section 4.3.3 of the PEIS has been revised to clarify the statement in question and to address the reliability of other primary and secondary control systems.

22. It is not clear if the effects analysis considers the new reforms that require industry to have plans in place for a worst-case discharge and the circumstance that a spill cannot be contained with the containment technology. Even with the new safeguards in place, there is always a chance that capping or other methods of containment will not be successful.

Response: As stated in Section 4.3.3, the PEIS includes an effects analysis that assumes a catastrophic discharge event has occurred and, despite the new requirement for containment capability, containment is not possible or effective so the spill continues until a relief well is drilled or the well naturally bridges. The effects analysis is provided by resource and region in Section 4.4.

23. In Section 4.3.4.3.4 of the Draft PEIS, the bulleted list characterizing the Certification NTL is incomplete.

Response: The PEIS has been revised to clarify the requirements of the Certification NTL in Section 4.3.3.

24. Section 4.3.4.3.1 of the PEIS needs to provide more detailed information about the assumptions underlying the catastrophic discharge event scenarios in each OCS Planning Area. This includes a more robust discussion of the likelihood of occurrence of such an event in context of new prevention and containment requirements. An estimate of the frequency of major spills could include factors such as historical domestic and international catastrophic spill occurrences, environmental factors, number of platforms, pipelines, and oil tankers, as well as the volume of production. Additionally, the PEIS should make reference to other rare events and the nature of impacts that can be expected.

There is no definition or the context for what is considered a reasonably foreseeable spill. Some comments criticized that the catastrophic discharge event scenarios were not reasonable because they failed to take into account new technology and procedures and instead were based on the time required to drill a relief well. In light of the new well containment capabilities, it is very likely that the oil flow would be stopped or substantially reduced in less than the minimum durations specified for GOM and Alaska OCS oil blowouts.

Response: Section 4.3.3 of the PEIS has been revised to describe the methodologies used to derive the spill scenarios and clarifies the likelihood of occurrence. In Section 4.3.3, BOEM provides a clearer explanation of its conservative assumptions regarding an oil spill. The specific resource analyses in Chapter 4 of the PEIS summarize the scale of possible environmental effects for small and large oil spills (which our scenario assumes), as well as a low-probability catastrophic discharge event (which is unexpected). Consistent with the

requirements of 40 CFR 1502.22, the PEIS includes an analysis of impacts with have catastrophic consequences even if their probability of occurrence is low.

25. The PEIS does not contain adequate information concerning the regulatory protocols, effectiveness of, and impacts of subsea dispersant injection as a method to minimize the fate and effects of an oil spill. Subsea physical containment technologies should still be required for OCS operators until the environmental consequences of subsea dispersants have been investigated.

Response: The PEIS has been revised to provide additional information on the protocols and effectiveness of dispersant use in Section 4.3.3. Subsea physical containment is required under BSEE regulations and clarified by NTLs.

26. The PEIS does not adequately characterize the persistence of and re-exposure to spilled oil from a catastrophic discharge event.

Response: Section 4.3.3 has been revised to describe the potential for the persistence and re-exposure of oil in the marine and coastal environment. Also, Sections 4.4.6 and 4.4.7 discuss the potential for oil spill impacts on coastal and marine habitat and associated fauna.

27. The effects analyses in the PEIS are premised on a flawed assumption concerning the potential occurrence or likelihood of occurrence of a catastrophic spill in each OCS Planning Area. BOEM should provide more detailed analysis of the likelihood of occurrence and scale of effects associated with such an event, especially in the Arctic. Otherwise, the effects analysis violates the NEPA requirement to provide a full and fair discussion of environmental impacts.

Response: Assigning accurate probabilities to rare events is difficult as acknowledged in the PEIS. BOEM has expanded the analysis in the PEIS in an attempt to better characterize the risk of occurrence, although absolute quantification remains difficult given the relatively limited number of historical observations for both loss of well control and major pollution events and wide-ranging exposure variables. Even then, reliance on historical data presents its own set of challenges as the historical data may represent a trend associated with a different regulatory regime or industry practices. Quantitative risk assessment becomes most practical at the well design phase, much later in the phased OCSLA process, when the combined reliability of primary and secondary barriers or barrier-failure modes can be analyzed within a fault-tree approach. At the exploration and development phase, worst-case discharge is also calculated on a site-specific basis and can be useful in determining the potential scale of effects.

28. In Section 4.3.4.3.1, the Draft PEIS estimates the probabilities for risk for a 150,000 bbl spill in the Arctic and GOM to be 3.94×10^{-4} and 3.42×10^{-4} respectively. The fact that these risk probabilities are so similar, despite the many differences between these areas, is surprising. What "Arctic specific variables" are factored into the Bercha estimate?

Response: The PEIS (see Section 4.3.3.3.1) has been revised to include updated information and a description of the fault-tree approach used by the Bercha Group.

29. The Arctic Ocean is a unique operating environment. As discussed in the PEIS, the characteristics of the Arctic OCS — rough seas, dynamic sea ice, extreme cold, limited visibility and daylight — exacerbate the risks and consequences of an oil spill, while also complicating cleanup. Oil is also likely to persist in cold environments. Section 4.3.4 of the Draft PEIS needs to be updated to include more relevant information about spill response capability in the Arctic, including major challenges to timely and effective spill response, as well as recent planning and capability improvements to address those challenges. An updated discussion of the U.S. Coast Guard presence, ice-breaking capacity, and other support infrastructure needs to be provided. The PEIS needs to demonstrate the adequacy of existing preparedness and response capabilities. In the absence of this, the PEIS fails to demonstrate why the risk is acceptable and leasing is warranted.

Response: Containment and response in the Arctic must plan for the challenges of mobilizing, staging, and delivering technology and equipment and the ability to deploy it and get it on location in a timely manner in remote locations. The PEIS analysis includes assumptions that are consistent with recent exploration plans and oil spill response plans approved by BOEM and BSEE that include unprecedented measures. All operations in the Arctic must comply with oil spill containment and preparedness requirements in BSEE regulations and Notices to Lessees, such as the Certification NTL described in Section 4.3.3. Current practices for oil spill response plans are largely based on the type, location, season, and duration for each exploration activity. If development and production from the Alaska OCS Region were proposed, additional requirements and practices for conducting oil spill response would be developed commensurate with the type, location, and scope of proposed activities.

Secretary Salazar highlighted the work of U.S. agencies to ensure that the full scope of Federal command and control capabilities are in place in the event that an accident occurred during the limited period allowed for potential exploratory drilling in the Arctic. If drilling is allowed to go forward, the U.S. Coast Guard would be in charge of overall command and control activities. For example, the Coast Guard has committed to an on-scene, at-sea presence, with land-based support, in the event that exploratory drilling goes forward this summer. The Coast Guard's command and control activities, supported by BSEE, the USEPA, NOAA, and other Federal agencies, would proceed in conformance with federally mandated contingency plans for the North Slope area that have recently been revised and updated. Those plans include the identification of sensitive ecological resources in the region and outline protection strategies.

Preparedness and response exercises are essential to actual response effectiveness. For the last several summers, the Coast Guard has deployed vessels, aircraft and personnel to North Slope areas to practice operations in the area and work with local officials and citizens. On December 8, 2011, members of the Coast Guard and the State of Alaska conducted an Incident Command Post workshop with Shell personnel to improve oil spill preparedness. BSEE coordinated a table-top exercise with Shell and Federal, State, and local

representatives in May 2012. In addition, the Alaska Regional Response Team (ARRT), which is made up of 12 Federal agencies and the State of Alaska, is planning an exercise that will test ARRT processes for responding to an incident. Finally, BSEE will conduct a deployment test of a company's capping stack prior to the approval of their drilling permit application, as well as on-site unannounced inspections of deployed spill response equipment.

In its regulatory role, BSEE is proactively working with NOAA, USCG, State of Alaska, international bodies, and joint industry programs to review oil-spill response plans and preparedness by the oil-and-gas and maritime industries prior to exploration and development activities. BOEM and BSEE do not disagree that spill response preparedness and response capability may be improved by further research, planning, and regulatory reform. BOEM is only considering adding the Arctic Planning Areas to the 5-year Program, under which any drilling activity would not likely occur until sometime after 2020 following a number of subsequent NEPA analyses and project-specific approvals. In the intervening time, BOEM, BSEE, other governmental agencies, and industry may make significant strides and advances in Arctic spill preparedness. If exploration drilling occurs under past lease sales, valuable lessons and experience can be applied in context of OCS operations potentially conducted under this 5-year Program. Including the lease sales in the 5-year Program does not guarantee the lease sales will occur. However, excluding lease sales at this point may prematurely postpone the development of valuable oil and gas resources on the basis of the current state of preparedness as compared to what it will be at the timeframe relevant to actual operations.

30. In cold environments, there is the potential for oil to persist. Scientific studies documenting that phenomenon for the Exxon Valdez spill were provided.

Response: Section 4.3.3 of the PEIS addresses the fate of oil in cold environments and in ice, including the potential for persistence and repeated exposure to biological resources. BOEM has supplemented the discussion with the references provided: Peterson, C.H., S.D. Rice, J.W. Short, D. Esler, J.L. Bodkin, B.E. Ballachey, and D.B. Irons, 2002, "Long-Term Ecosystem Response to the *Exxon Valdez* Oil Spill," *Science*:302 (5653), 2082–2086. Short, J.W., M.R. Lindeberg, P.M Harris, J.M. Maselko, J.J. Pella, S.D. Rice, 2004, "Estimate of Oil Persisting on the Beaches of Prince William Sound 12 Years after the *Exxon Valdez* Oil Spill," *Environmental Science and Technology* 38:19–25. Siron, R., et al., 2003, "Fate and Effects of Dispersed Crude Oil under Icy Conditions Simulated in Mesocosms," *35 Marine Environmental Research* 273.

31. The last public "spill drill" in the Arctic, which tested booms and skimmers and other conventional methods of oil spill cleanup in only partial sea ice conditions was in 2000 and was deemed a failure. Since offshore exploration work has to be done in the short summer when the ice cap has melted, it is unlikely that an oil spill could be cleaned up before the sea freezes over in the fall, making clean-up essentially impossible until the next summer. If an oil leak continued after freeze up, the oil would freeze into the ice and be carried potentially great distances as the ice continues to move all winter. The oil industry has never conducted an offshore oil spill response drill in the Chukchi Sea to test its equipment and procedures.

Ice can clog skimmers, make vessel operations more challenging and make it difficult to deploy equipment. Oil spreads under ice, making it more difficult to track and clean up. Field exercises in the Beaufort Sea in 2000 showed that sea ice could shut down on-water recovery at very low concentrations.

Response: The PEIS discusses the importance of timing of OCS activities relative to the fate and transport of spilled oil and effectiveness of clean-up operations during ice conditions in the Arctic in Section 4.3.3. Nuka Research Planning Group and Pearson Consulting (2010) and Potter et al. (2012) describe more recent field drills and trials in the Arctic. Section 4.3.3 of the PEIS has been revised to include new information about spill response drills and research, including the new International Association of Oil and Gas Producers (OGP) Arctic Oil Spill Response Technology Joint Industry Program. BSEE and the U.S. Coast Guard are actively engaged in capacity-building with respect to oil spill preparedness and response capabilities.

32. The last time that clean-up was tested in the Arctic was in 2000 when BP Exploration tested the response tactics and strategies for North Slope Operations. BP's studies showed that the maximum oil expected to be recovered in calm seas with minimum icy Arctic conditions would be 0–1% in fall ice conditions, 10% in spring ice concentrations without ice management, and 30% in spring ice concentrations with extensive ice management. The trials also identified many mechanical response limitations in broken ice conditions. They discovered that booms do not work effectively in ice. Skimmers do not work effectively in broken ice.

Response: The 2000 broken ice trials in the Alaska Beaufort Sea demonstrated that the actual operating limits for a barge-based mechanical recovery system using conventional booms and skimmers. A follow-up trial testing the barge-based tactic, conducted in 2002, showed no major improvements and was followed shortly thereafter by the removal of that barge (the Endeavor) from the Alaska North Slope spill response equipment. The PEIS has been revised to incorporate additional information about the expected physical recovery of oil in different ice states assuming different ice management practices. See Section 4.3.3 of the PEIS.

33. The Canadian National Energy Board has analyzed the Arctic response gap with the finding that cleanup would not be possible on average three to five days of each week during some timeframes during a given year. Cleanup would not be at all possible from 44 to 84% of the time during the short Arctic drilling open-water season. For seven to eight months out of the year during the winter, no spill clean-up would be possible. Shell's recent exploration plan acknowledges that if Shell cannot achieve well control or remove all oil before freeze-up, the operator would abandon the well and leave the oil uncontained under the ice until spring thaw. Shell then proposes to develop a clean-up plan during the winter months and initiate response activities after spring breakup. This is not a plan.

Response: The PEIS has been revised to incorporate information about the potential response gap given the time of year. Although the recent Shell exploration plan and oil spill

response plan include unprecedented measures in preparedness, it is possible that containment measures would be unsuccessful prior to ice-over. This assumption is implicit in the catastrophic discharge scenario and subsequent effects analysis. See Sections 4.3.3 and 4.4.2 of the PEIS.

34. The International Tanker Owners Pollution Federation has noted that “containment and recovery at sea rarely results in the removal of more than a relatively small portion of a large spill, at best only 10–15% and often considerably less.” The US Arctic Research Commission recently echoed these concerns for the Arctic.

Response: This comment is consistent with the discussion in Section 4.3.3 addressing the efficacy of containment and mechanical recovery of oil.

35. During the DWH event in 2010, 20,000 to 60,000 people were involved in the cleanup operations. There is an obvious human capital and resources problem with mobilizing that number of people to the North Slope and accommodating their needs with existing infrastructure. That further reality underscores the importance of prevention and containment.

Response: The PEIS has been revised to incorporate the human capital challenges involved in mobilizing a large workforce into a remote area. Such a challenge underscores the fundamental importance of prevention and containment, the principal focus of BOEM, BSEE, and industry reform following the DWH event. See Section 4.3.3 of the PEIS.

36. The Proposed Program states that “the Beaufort Sea Planning Area has well-developed oil and gas infrastructure on adjacent land and in State waters.” However, this superficial conclusion fails to take into account the fact that existing infrastructure in this region is concentrated on land at Prudhoe Bay and is not sufficient to support response and cleanup of an oil spill in marine waters. Transportation-related infrastructure is minimal, and what exists is concentrated in the Prudhoe Bay oil field area. Heavy lift cranes and protected small boat shelters are found only at Prudhoe Bay’s West Dock. Getting this limited equipment to needed locations would be difficult given that the communities within this region are not connected by a permanent road system and airports and related facilities are limited. Airports at Barrow, Kotzebue, and Deadhorse have scheduled jet service and are owned and maintained by the State of Alaska.

Response: Although this specific assertion is not made in the PEIS, BOEM acknowledges the limited existing infrastructure (Section 3.11) and the need for advance logistical planning by OCS operators to mobilize the necessary technology, human capital, and equipment in advance of operations (Section 4.3.3). The distribution and scale of infrastructure needed for mobilization and deployment of containment and response efforts substantially constrains timely mobilization of such resources after a major spill has occurred. The PEIS has been revised to incorporate this concern.

37. An oil spill response stipulation exists for the GOM (Appendix B.1.4); however, a similar stipulation does not exist for Alaska OCS Planning Areas. Nonetheless, operators in the Arctic have developed practices specifically for the Arctic operating conditions. Operator efforts to address these challenges have also included more than 30 years of laboratory studies, simulation in test tanks and field experiments under carefully managed conditions in the U.S. and Canadian waters of the Beaufort Sea, in the Norwegian High Arctic, in the Barents Sea, and around Svalbard Island. Many of these projects have involved collaboration with the MMS.

Response: Additional information about ongoing research and relevant industry practices has been incorporated in the discussion of spill response in Section 4.3.3.

8.4.4.7 Issue 7 Mitigation

1. Appendix B provides only minimal and generic information on specific mitigation measures to be applied for reducing impacts. Although it is understood that this is a Programmatic document, a presentation of each regulatory rule or guidance (e.g., NTL No. 2010-G40, etc.), or a reference for accessing these, in place for reducing impacts should be provided in this appendix. Although many of these may be provided or generally discussed in the text of the document, it would aid the reader if all were provided comprehensively in Appendix B. The mitigation measures employed to reduce or eliminate impacts are critical to impact-level conclusions reached throughout the document. BOEM should provide a more comprehensive approach for disseminating these to the public. Furthermore, BOEM should specify the minimum required mitigation measures now rather than waiting for some later date to impose those conditions.

Response: The PEIS establishes an environmental baseline in Chapter 3 and then analyzes the impact factors associated with OCS development according to a reasonable scenario of activity and mitigation. Mitigation and other protective measures include those required by statute and regulation, or those deemed necessary by BOEM policy and practice for each planning area considered in the proposed 2012-2017 Program (see Appendix B: Assumed Mitigation and Other Protective Measures). At this programmatic stage, we can commit to those general mitigation measures imposed by statute or regulations, but it is premature to make absolute commitments about more site-specific mitigation without the detailed analyses that occur at the lease sale phase. However, we believe the analysis in this PEIS provides a reasonable framework for future evaluation of mitigation measures at subsequent phases in the proposed 5-year Program, such as, for example, the lease sale phase or the exploration plan submittal phase. Appendix B has been expanded to include other protective measures commonly applied through laws and regulations, as they pertain to the analyses in Chapter 4 of the PEIS.

2. The Bureau of Land Management (BLM) has developed a method to address existing data gaps for the National Petroleum Reserve Area (NPR-A). In some instances, the BLM has required pre-activity, multi-year, site-specific studies, when relevant or recent data are not otherwise available, for the purpose of helping develop mitigation measures. BOEM should

make the same commitments for OCS areas identified in the Programmatic EIS for offshore energy development in the Arctic.

Response: Decisions regarding the relevance of missing scientific information, or the need for specific mitigation to minimize potentially adverse environmental effects, are best addressed at the lease sale or plan phase, when the specific issue or concern can be well-defined and addressed in the requisite detail and analytical rigor. The BLM's Northeast NPR-A Supplemental Integrated Activity Plan process cited by the North Slope Borough is more comparable to the lease sale planning step in the OCSLA-phased process. BOEM does not generally adopt or prescribe mitigation within the framework of the national 5-year PEIS, or make commitments to multi-year, site-specific study without first defining the need and purpose, which, generally speaking, is not sufficiently characterized or formulated within the 5-year framework. BOEM does not disagree that additional scientific information may be needed to enhance mitigation and otherwise refine program implementation in individual Planning Areas. In fact, in the Proposed Program and Proposed Final Program, the Secretary of the Interior has intentionally scheduled single Chukchi Sea and Beaufort Sea lease sales late in the Program to provide additional time to identify information gaps and gather pertinent scientific data, including the need for additional site-specific study or mitigation development, to better inform lease sale, exploration, and development plan decisions. As reflected in the 2011 U.S. Geological Survey report, *An Evaluation of the Science Needs to Inform Decisions on Outer Continental Shelf Energy Development in the Chukchi and Beaufort Seas, Alaska*, BOEM's Environmental Studies Program continues to be a principal mechanism in defining and meeting those information needs. BOEM is collaborating with Federal partners in government-wide research programs such as Synthesis of Arctic Research (SOAR), Arctic Science Engineering Education for Sustainability (ARCSEES) program, North Pacific Research Board, Interagency Arctic Research Policy Committee, and National Academy of Sciences Polar Research Board research initiatives, as well as the National Research Council "Responding to Oil Spills in the Arctic Environment" review. Similarly, industry has been proactive in funding site-specific studies in the Arctic; in the case of Shell, they have funded millions of dollars in independent studies to characterize the environmental baseline, oceanographic conditions, potential effects on sensitive marine species, and define mitigation/monitoring needs and protocols.

At this preliminary planning stage, BOEM maintains that it is premature to define information and study needs when the analytic granularity is too coarse for site-specific or resource-specific decisions, when information from new or ongoing scientific research may be available at the time of the lease sale, and new and needed consultation and coordination will have occurred with resource agencies, such as Fish and Wildlife Service and National Marine Fisheries Service. However, BOEM does not want to downplay the underlying concern expressed in these comments, especially when there is apprehension that the point being made is ignored and unfairly treated in a tiered analytical and decision framework. BOEM has included a new section in the Issues of Programmatic Concern (see Section 4.3.2) to memorialize the issue and better explain the process of considering and evaluating different alternatives and mitigation strategies that may need to be applied at appropriate program decision points. BOEM encourages North Slope Borough to provide this same recommendation during scoping for potential Arctic lease sales.

3. The Draft PEIS failed to include a discussion of planning area-specific mitigation measures, such as seasonal restrictions in the Arctic and protected species observer programs. BOEM's analysis also rests on the assumption that the mitigation measures in Appendix B are effective; Appendix B essentially outlines the stipulations contained in leases, without analyzing whether they are, in fact, sufficient to minimize negative environmental impacts. BOEM's inclusion of mitigation measures at the PEIS level also violates CEQ's requirement that there be actual capacity to implement the mitigation measures by the Federal agency that proposes said mitigation measures in the PEIS.

Response: Mitigation and other protective measures are developed during the implementation phases of the Program. For analytical purposes only, this PEIS considers mitigation and other protective measures already established and required by existing statutes or regulations, as well as sale-specific measures (stipulations) that were commonly adopted in past sales and that will likely be implemented for any lease sales that would occur under the Program. However, it is at the lease sale stage that more detailed and geographically focused analyses are conducted to evaluate the magnitude of potential impacts and, if needed, to develop effective mitigation strategies to reduce the magnitude of those potential impacts to acceptable levels.

The 5-year PEIS is a programmatic NEPA document that analyzes the "size, timing, and location" of possible lease sales in the next five years. In the phased OCSLA and tiered NEPA process, the 5-year program is followed by lease sale or plan where more focused NEPA analyses are performed. In this framework, BOEM fully considers the need for and development of mitigation, effectiveness of the mitigation in terms of its stated purpose, as well as the potential effects associated with implementation of the mitigation. Appendix B has been revised to clarify the protective measures required by law, regulation, or historical practice that are assumed for analytical purposes in the 5-year PEIS. The mitigation and other protective measures considered in Appendix B have generally been developed over a long period of time and/or historically implemented. The mitigation has been codified because of its historical effectiveness, or as best practice at the bequest of resource agencies external to BOEM or its predecessor bureaus.

Monitoring the effectiveness of mitigation involves tracking the success of a mitigation effort in achieving expected outcomes and environmental effects. Consistent with CEQ's January 2011 guidance on "Appropriate Use of Mitigation," BOEM relies on scientific staff and outside experts familiar with the predicted environmental impacts to develop the means to monitor mitigation effectiveness, in the same way that BOEM also relies on agency and outside experts to develop and evaluate the effectiveness of mitigation. Implementation of mitigation and monitoring necessarily draws on the expertise of resource agencies with whom BOEM consults, such as U.S. Fish and Wildlife Service and National Marine Fisheries Service.

One of the more tangible vehicles BOEM uses to evaluate the effectiveness of regulations and mitigations is through the linked environmental study and assessment process. For example, BOEM has been studying and monitoring conditions at the Flower Garden Banks through its Environmental Studies Program for more than two decades, although initial monitoring efforts date to the 1970s. By continually monitoring and assessing stipulations or

mitigation measures that are based upon studies results, BOEM is positioned to change or strengthen environmental requirements. A clear-cut example of this is seen in BOEM's studies of deep-sea corals in the GOM. When it became apparent (due to new study results) that extensive deep-sea coral habitats were not being included in environmental reviews because they occurred slightly shallower than existing review triggers, BOEM moved quickly to notify operators of new guidance to avoid these sensitive communities. This type of adaptive reevaluation is continual and vitally important to the protection of our nation's precious offshore environments and resources. The same is true in the Arctic. An example is the ongoing BOEM study, entitled "Aggregate Effects Research and Environmental Mitigation Monitoring of Oil Industry Operations in the Vicinity of Nuiqsut." This study is using social science research methods to evaluate the effectiveness of specific mitigation measures being implemented to manage conflicts relative to onshore and offshore oil and gas exploration and development in the vicinity of subsistence use areas for the village of Nuiqsut. The added value from such studies can lead to new mitigation applied at the lease sale phase.

The implementation of mitigation by BOEM is also questioned in the comment. Following the October 2011 re-organization of BOEMRE, BOEM is now responsible for environmental analyses for all activities associated with leasing, authorization of on- and off-lease geological and geophysical surveys, and approvals of exploration and development plans. BOEM will develop and adaptively manage environmental protection measures specific to these activities. BSEE is responsible for environmental compliance related to issuing permits associated with plans (i.e., Applications for Permits to Drill), inspections of environmental measures, and enforcement for non-compliance. BSEE also reviews industry reporting and works with BOEM to adaptively manage environmental mitigation measures to ensure their effectiveness and enforceability. Under the new Safety and Environmental Management System (SEMS) requirements (clarified in BSEE National NTL 11-N09), OCS operators must address environmental information in all aspects of their SEMS program and specifically address requirements as set forth in regulation, lease stipulation, plan conditions of approval, etc. This includes verification and corrective actions and continual improvement related to mitigation measures. BSEE provides the regulatory oversight focused on compliance by operators with environmental regulations, as well as making sure operators comply with the measures required by BOEM.

The comment suggests that sufficient authority is not vested in BOEM to require mitigation in the 5-year PEIS. To be clear, the PEIS is not adopting specific mitigation within the 5-year Program decision, but rather, assumes it to be in place for analytical purposes because the mitigation has already been codified and/or is generally considered a matter of practice.

Further, CEQ requirements regarding mitigation do not specifically require that BOEM have express authority to require mitigation for it to be relevant to the decision. Consistent with CEQ's January 2011 guidance on the "Appropriate Use of Mitigation," BOEM is not making any commitments to mitigation without sufficient legal authority now or at a later stage. BOEM would like to point out that the bureau's underlying authority may provide the basis for its commitment to implement and monitor the mitigation at the lease sale or plan phase. However, the authority for the mitigation may also derive from legal requirements that are enforced by other Federal, State, or local government entities (e.g., air or water permits

administered by local or State agencies). Both scenarios generally apply during implementation of the 5-year program when mitigation is applied through lease sale stipulations or plan approvals. BSEE will take an active role in clarifying and enforcing those requirements.

4. BOEM needs to ensure that mitigation measures to protect subsistence activities are negotiated between subsistence communities and oil and gas companies through vehicles like Conflict Avoidance Agreements (CAA) that the Alaska Eskimo Whaling Commission (AEWC) negotiates with oil and gas companies each year.

Response: The 5-year PEIS is a programmatic NEPA document that analyzes the “size, timing, and location” of possible lease sales in the next five years. In the phased OCSLA and tiered NEPA process, the 5-year program is followed by lease sale- or plan-specific NEPA documents in which more focused NEPA analyses are performed and mitigation needs are identified and analyzed. This includes the effectiveness of the mitigation to achieve its stated purpose, as well as the effects of the mitigation. BOEM has not historically developed systematic or specific mitigation through the 5-year PEIS process. Instead, in the 5-year PEIS, BOEM assumes that certain mitigation and other protective measures already required by existing regulation or BOEM requirement/practice will be in place (see PEIS Chapter 1 and Appendix B). While BOEM believes mitigation is properly developed and analyzed in the phased OCSLA process — lease sale, exploration plan, development plan — the Bureau appreciates the importance of subsistence activities in the Arctic and stresses on that longstanding way of life. In recent years, oil and gas companies, such as Shell, have been proactively working with the Native communities and community interest groups to negotiate conflict avoidance agreements in advance of activities. Consistent with the framework of Coastal and Marine Spatial Planning, BOEM encourages multi-use and environmental conflict resolution. In the 5-year programmatic analytical approach, this issue is best addressed at the lease sale or plan phase when the spatial and temporal aspects can be defined and addressed in the requisite detail and analytical rigor. BOEM has included a new section in the Issues of Programmatic Concern (see Section 4.3.2) to memorialize the issue and better explain the process of considering and evaluating different alternatives and mitigation strategies that may need to be applied at appropriate program decision points. BOEM encourages the Alaska Eskimo Whaling Commission to provide this same recommendation during scoping for potential Arctic lease sales.

5. Noise impact mitigation measures should be included. Underwater noise is, as the USDOJ has stated in the past, one of the most prevalent forms of environmental impact from offshore exploration, development, and production activities. (Preliminary Revised 5-year OCS Oil & Gas Leasing Program for 2007-2012 (2010)). It requires honest analysis, dedicated research, robust protected areas, and substantial mitigation of both acute and cumulative effects well beyond current practice. While BOEM and NMFS are considering mitigation measures for seismic surveys in the EISs for GOM, Arctic, and Atlantic planning areas, it is important — for purposes of consistency and resource allocation — for BOEM to address a number of mitigation alternatives at the leasing program stage.

Response: The PEIS establishes an environmental baseline in Chapter 3 and then analyzes the impact factors associated with OCS development according to a reasonable scenario of activity and mitigation. Section 4.1 of the PEIS describes the potential impact-producing factors, including noise. Mitigation measures, considered in the PEIS, including those required by statute and regulation, or those deemed necessary by BOEM policy and practice for each planning area are described in Appendix B: Assumed Mitigation and Other Protective Measures. At this programmatic stage, we can commit to those general mitigation measures imposed by statute or regulations, but it is premature to make absolute commitments about more site-specific mitigation without the detailed analyses that occur at the lease sale phase. As the comment acknowledges, BOEM is actively pursuing Programmatic Environmental Impact Statements in the GOM, Mid- and South Atlantic, and Arctic in collaboration with the National Marine Fisheries Service in specific recognition of the potential for environmental impacts from noise in the marine environment. Those deliberative, multi-year processes are still ongoing at this time, such that the outcomes are not yet available to incorporate in the 5-year planning process. The PEIS for the Arctic was published in January 2012. The PEIS for the Mid- and South Atlantic was published in March 2012. The PEIS for the GOM is expected to be published in late 2012. Absent specific decisions, BOEM is confident that some of the mitigation strategies proposed within the framework of those documents will ultimately be adopted and applied in context of exploration activities that may occur under leases in the 2012-2017 Program in the GOM and Alaska Planning Areas. However, we believe the analysis in this PEIS provides a reasonable framework for future evaluation of mitigation measures at subsequent phases in the proposed 5-year Program, such as, for example, during geophysical permitting, the lease sale phase, or the exploration plan phase.

8.4.4.8 Issue 8 Regulations and Safety

1. Many commenters requested BOEM and BSEE to reform their regulations and practices based on the numerous recommendations from various reports prepared following the DWH event, including the National Oil Spill Commission Report on the Deepwater Horizon Event, the National Academy of Engineering Report, the National Research Council Report, the Deepwater Horizon Joint Investigation Team Report, USDOJ's Report Regarding the Causes of the April 20, 2010 Macondo Well Blowout, etc.

Response: Both BOEM and BSEE are proactively addressing the opportunities and needs at the heart of the recommendations of the various reports written following the DWH event. BOEM and BSEE have reviewed all the reports, already incorporated many recommendations, and continue to pursue and implement aggressive regulatory reform that addresses many of these recommendations or underlying need for reform or regulatory changes. As discussed in Section 4.3.3, BOEM and BSEE have focused on drilling safety reforms, especially on loss of well control prevention and well containment. BOEM has revised Section 4.3.3 of the PEIS to provide a more detailed presentation of the ongoing governmental reform process, in addition to new measures that have already been processed or implemented since publication of the Draft. Section 4.3.3 was also revised to include pertinent information about ongoing reform being pursued by industry, such as new safety,

risk assessment, and spill research initiatives. Please refer to Section 4.3.3 of the PEIS for more information.

2. BOEM should present a more balanced discussion of new safety and environmental regulations and other safety measures implemented since the DWH event, including ongoing challenges of reform implementation. The effectiveness of the regulatory framework and reform measures is relatively untested.

Response: BOEM appreciates these comments and recognizes that a proactive government and industry are critical to ensure safe and environmentally sound OCS oil and gas operations. BOEM has revised Section 4.3.3 of the PEIS to clarify the bases of recent and ongoing reform measures, referencing reform reports, benchmarked international standards, and international trends following comparable regulatory overhauls. Section 4.3.3 presents a focused discussion of (1) ongoing reforms in BOEM, BSEE, other Federal agencies, and industry and (2) promising safety, risk assessment, and oil spill response research.

3. One comment requested that BOEM present in the PEIS a risk assessment of the 5-year Program drilling activities to aid in decision-making. The risk assessment should consist of a formal probabilistic risk analysis that evaluates human, environmental, and economic risks associated with drilling, well construction, temporary well abandonment, oil and gas production, and eventual well abandonment.

Response: BOEM has focused its analytical effort in the PEIS on the occurrence and consequence of an oil spill, as compared to drilling-related safety incidences, or costs or losses of productive time. Section 4.3.3 includes a robust discussion of the various factors that may contribute to risk during drilling operations. The PEIS characterizes the risk of oil spills in Section 4.3.3 and 4.4.2 in detail appropriate for the proposed action. Quantification of the risk of oil spills, especially very large, unexpected spills, remains a challenging problem for the reasons explained in Section 4.3.3. The same section also includes a discussion of how risk is evaluated by both government and industry through the phased OCSLA process from the 5-year Program through site-specific drilling plans.

BOEM appreciates this comment and recognizes that a proactive government and industry are critical to ensure safe and environmentally sound OCS oil and gas operations. BOEM has revised the PEIS (see Section 4.3.3) to elaborate on recent and ongoing reform measures, referencing reform reports, benchmarked international standards, and international trends following comparable regulatory overhauls. Specific to the issue of risk assessment for OCS drilling activities, Section 4.3.3 also presents a discussion of recent joint BSEE-industry research regarding the development of a blowout risk assessment methodology, model, and risk assessment tool for OCS drilling planning and operations in the GOM.

4. The PEIS is thorough in its presentation of the regulatory and policy reforms that BOEM and BSEE have undertaken subsequent to the DWH event to improve safety and environmental outcomes.

Response: The recognition of BOEM's concerted effort to treat this topic in the PEIS is appreciated. However, since many commenters requested further clarity and information on this topic, BOEM revised Section 4.3.3 of the PEIS to provide more information about previously implemented, and ongoing reforms, including those being pursued by BSEE and industry.

5. A commenter suggested the PEIS make specific reference to substantial reform measures implemented by industry to improve offshore exploration and development operations following the DWH event. These reforms include new and revised standards, recommended practices, and guidelines that incorporate lessons learned from the DWH event.

Response: BOEM has updated the PEIS (see Section 4.3.3) to include new and/or revised industry standards, recommended practices, guidelines, etc., such as API Standard 65-Part 1 and 2, API RP 96, API Well Construction Interface Document Guidelines, API RP 53, API Specification Q2, and API Specification 16A. Similarly, the PEIS presents updated information about the reform initiatives of other joint industry efforts and task forces.

6. Many commenters expressed concern that BOEM, BSEE, and the U.S. Coast Guard does not have adequate oil spill planning and response measures in place to support oil and gas leasing on the OCS. BSEE should better reform its regulations and guidance to minimize the likelihood of a major oil spill and to enhance oil spill planning and response measures, ensuring adequate containment resources, oil spill response capability, and proven containment and clean-up technologies are in place to respond to a major oil spill, before allowing leasing, especially in the Beaufort and Chukchi Sea Planning Areas.

Response: BSEE and the U.S. Coast Guard, among other Federal and State entities, are responsible for oil spill planning and response efforts on the OCS. Adjacent coastal States also bring substantial expertise and resources to spill planning and response. BOEM and BSEE regulations under Subpart B of 30 CFR Part 550 and 30 CFR Part 254, respectively, require industry to demonstrate adequate spill planning and response capability, including the need to respond to a major spill in remote areas such as the Arctic Ocean.

Following the DWH event, BOEM and BSEE put into place new requirements regarding spill containment and response planning and capability. BSEE continues to participate in regional planning exercises, evaluate new spill response technologies, invest in new innovative spill response research, etc. Both BOEM and BSEE are funding a new NRC study that considers oil spill response capability in the Arctic. Section 4.3.3 of the PEIS provides information about ongoing spill planning and response reforms in government and industry.

7. Several commenters called for reform of, and improvement in, the governmental process used to evaluate oil spill prevention and response plans. Many comments questioned industry's ability to implement oil spill response measures in the event of a significant spill, suggesting that plans need to be benchmarked against the best international standards and/or real-world demonstrations of the effectiveness of planning exercises. The commenters expressed the need for BSEE to rigorously review operators' oil spill response plans prior to

approval in a manner that ensures adequate technical input. The review and approval process should ensure that plans include spill scenario information, such as containment and response capabilities. Oil spill response plans should be subject to review and approval by not only USDOJ, but other agencies with relevant operational expertise, including the USCG, USEPA, and NOAA. The plans should be available to the public for comment.

BOEM and BSEE should routinely evaluate and continually improve oil spill prevention and response measures, especially in the Arctic. In the effort toward continual improvement, BOEM and BSEE should consider adopting the recommendations from the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling and the National Academy of Engineering/ National Research Council. For example, operators should be required to employ best-available technologies and practices; provide detailed plans for source control; redesign blowout preventer systems “to provide robust and reliable cutting, sealing, and separation capabilities for the drilling environment to which they are being applied and under all foreseeable operating conditions of the rig on which they are installed;” establish test and maintenance procedures “to ensure operability and reliability appropriate to their environment of application”; and seek approval of proposed well design to demonstrate that (1) well components are equipped with sensors or other tools to obtain accurate diagnostic information and (2) wells are designed to mitigate risks to well integrity during post-blowout containment efforts.

Response: BOEM and BSEE recognize the importance of routinely evaluating and continually improving oil spill prevention and response capabilities and measures. The implementing regulations found in 30 CFR Part 550 and 30 CFR Part 250 require industry to conduct OCS operations using best-available technology and following established best practices. BSEE continues to pursue and implement a systematic regulatory reform that, in part, responds to the various reform recommendations. With increased inspection and spill response resources, BSEE plans to enhance inspections and drills, such as rigorous announced and unannounced oil spill response drills. BSEE currently has a robust process for the review and approval of industry oil spill response plans that includes appropriate technical expert input. Oil spill response plans are required to include a description of operator containment and response methodologies and capabilities per recent NTL requirements. In addition, BSEE conducts a robust research portfolio of studies each year to analyze various aspects of oil spill containment, fate, and response. The results of this research are used to continually improve oil spill prevention and response measures.

As part of the Department’s broad and continuing reform efforts, BSEE created a number of Implementation Teams to evaluate and, as warranted, pursue implementation of the various reform recommendations following the DWH event. The ongoing work of these teams lays the foundation for lasting change in the way the BSEE and BOEM will implement oil spill prevention and response measures in the future. The Oil Spill Response Team at BSEE is also conducting a comprehensive review of spill response and the adequacy of operators’ oil spill response plans. This team is working closely with the U.S. Coast Guard and other Federal agencies on developing enhanced spill response plans and more effective reviews of those plans in light of lessons learned from the DWH event response. Similarly, industry, through the establishment of the Center for Offshore Safety, new joint industry task forces,

and joint industry research programs, is proactively engaged in advancing oil spill prevention and response capabilities.

BOEM has revised the PEIS to provide more information about oil spill response planning roles and responsibilities, ongoing regulatory reforms, enhanced governmental and industry practices, and new spill response research and technology development (see Section 4.3.3).

8. Several commenters assert that prior to consideration of leasing in the Arctic OCS Planning Areas, BOEM should (1) add a stipulation to all Arctic leases requiring a certification for Oil Spill Response Organizations (OSROs) to verify their capability to respond given the environmental conditions and challenges in the Arctic, (2) require operators to have trained response personnel and Arctic-grade response equipment pre-staged along vulnerable Arctic coastlines, and (3) require key oil spill containment and response equipment be designed for and tested in Arctic conditions.

Response: This comment is ripe for response at the lease sale phase when mitigation requirements are evaluated and, in part, determined. Even though this is not a regulatory requirement, the need for such certification can be analyzed at the lease sale phase as appropriate (refer to the PEIS Section 4.3.2, Programmatic Deferrals and Mitigations). Moreover, BOEM also considers spill response capability during exploration and/or development plan evaluation under 30 CFR Part 550, Subpart B. Under its authority, 30 CFR Part 254, BSEE must also evaluate the merit of an operator's oil spill response plan.

A wide range of comments were submitted on the regulatory framework for oil spill planning and response, as well as the general state of capability. For a more detailed discussion, the reader is referred to Section 4.3.3.

9. A commenter stated that operators must obtain any necessary approvals and environmental permits from the appropriate State agency, if the project results in a discharge to waters of the State. Additionally, all precautions should be observed to control nonpoint source pollution from construction activities on the OCS.

Response: Both BOEM and BSEE are aware of the water quality permits required from affected coastal States for OCS activities. Operators also have to obtain NPDES permits under the requirements of the Clean Water Act. BOEM evaluates the need for other precautions and mitigation related to pollution control and water quality at the lease sale or plan stages.

10. Since pipelines installed and anchored on the Arctic seafloor will be decommissioned by capping in place, a commenter suggested that BOEM reference the standards to which industry will be held to that ensure the pipelines will be cleaned and pollution will not result.

Response: BSEE regulates the decommissioning of pipelines under 30 CFR Part 250, Subpart J, and pipeline decommissioning is addressed specifically in 30 CFR 250.1006 and 30 CFR 250.1750 through 250.1754. 30 CFR 250.1006 states that pipelines out of service for less than one year must be isolated with a blind flange or a closed block valve at each

end. Pipelines out of service for more than one year but less than five years must be flushed and filled with inhibited seawater. Pipelines out of service for five years or more are addressed under 30 CFR 250.1750 through 250.1754, which states that operators “may decommission a pipeline in place when the Regional Supervisor determines that the pipeline does not constitute a hazard (obstruction) to navigation and commercial fishing operations, unduly interfere with other uses of the OCS, or have adverse environmental effects.” 30 CFR 250.1751 describes the details of the pipeline decommissioning application process, including the information requirements to be submitted with the application. Section 4.1.1.4 of the PEIS has been updated with a summary of the pipeline decommissioning requirements.

8.4.4.9 Issue 9 Statutory Compliance

1. Appendix C (Federal Laws and Executive Orders) of the PEIS is missing several environmental statutes and Executive Orders.

Response: BOEM added the Migratory Bird Treaty Act of 1918, Executive Order 11990 — Protection of Wetlands, as well as other statutes that were missing from Appendix C of the PEIS. The list of environmental statutes and Executive Orders added to Appendix C is as follows:

- Rivers and Harbors Act (RHA) of 1899 (Sections 9 and 10) – 33 USC sec. 401 *et seq.*
 - Migratory Bird Treaty Act (MBTA) of 1968, as amended (1936, 1972, 1976, 2006) – 16 USC 703 *et seq.*
 - The new BOEM authorities in Alaska under the Clean Air Act (CAA) of 1963, as amended (1990, 2004) 42 USC sec. 7401 *et seq.*
 - Executive Orders:
 - Executive Order 11988, Floodplain Management (May 24, 1977), amended by EO 12148 (July 20, 1979)
 - Executive Order 11990: Wetlands Protection (May 24, 1977), amended by EO 12608 (September 9, 1987)
 - Executive Order 13175, Consultation and Coordination With Indian Tribal Governments
 - Executive Order 13186: Responsibilities of Federal Agencies To Protect Migratory Birds (January 10, 2001)
2. Commenters stated that the PEIS is not in compliance with or fails to adequately explain the provisions of various environmental statutes. One commenter expressed that an Alaska National Interest Lands Conservation Act Section 810 review for pipeline routes from the Chukchi Sea and Beaufort Sea to the Trans-Alaska Pipeline System needs to be conducted for the PEIS.

Response: BOEM updated Appendix C, Section C.1.4 The Alaska National Interest Lands Conservation Act (ANILCA) accordingly to show that pipeline routes in State waters are subject to ANILCA requirements.

3. Another commenter expressed that all OCS activities in waters adjacent to Alabama's coast must be carried out in full compliance with relevant Alabama laws, rules, and regulations, and in a manner that is fully compliant and consistent with the Coastal Zone Management Act (CZMA).

Response: All OCS activities that may affect Alabama's coastal resources will be conducted in a manner that is fully compliant and consistent with the CZMA. BOEM will comply with CZMA requirements at the lease sale phase of the 5-year Program. Please refer to Appendix C, Section C.1.7 The Coastal Zone Management Act (CZMA) and the Coastal Zone Reauthorization Amendments of 1990, for more information.

4. Several commenters expressed concern that the PEIS does not adequately address how BOEM complies with the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) for the 5-year Program.

Response: BOEM will consult with the USFWS and NMFS under Section 7 of the ESA at the lease sale phase during implementation of the 5-year Program. BOEM revised the section heading for Section 1.4.5.4 of the PEIS from "Biological Assessment and Opinion for Threatened and Endangered Species" to "Endangered Species Act Section 7 Consultations for Threatened and Endangered Species" to clarify when BOEM will undertake these consultations with the USFWS and NMFS under Section 7 of the ESA. Please refer to Sections 1.4.5.4 and 4.4.7.1 of the PEIS for more detail.

5. One commenter expressed concern that the PEIS does not adequately address how BOEM complies with the Magnuson-Stevens Fishery Conservation and Management Act (FCMA) for the 5-year Program.

Response: BOEM consults with NMFS under the Magnuson-Stevens FCMA for the western portion of the Eastern Planning Area of the GOM using a different mechanism than that used for the Western and Central GOM. Appendix C, Section C.1.9 The Magnuson-Stevens Fishery Conservation and Management Act, has been revised to clarify this difference in these consultations across the GOM Planning Areas.

6. One commenter requested the references to the incidental harassment authorization and letters of agreement be added to Section 4.4.5.4 of the PEIS. The inclusion of the conflict avoidance agreements (CAA) could be added but must note that the CAA is voluntary and the terms negotiated between individual operators and communities and subsistence user groups vary widely.

Response: Since details like incidental harassment authorization and conflict avoidance agreements are more appropriate for inclusion in the lease sale NEPA documents, BOEM has not added the requested information to the PEIS. However, oil and gas activities on the Arctic OCS are subject to compliance with the MMPA and ESA. Compliance with these acts collectively ensures that (1) there is no more than a negligible impact on marine mammals; (2) there is no unmitigatable adverse impact on subsistence uses of marine mammals; and

(3) there is no jeopardy to ESA-listed species or adverse modification to any critical habitat designated for ESA-listed species. Authorizations under the MMPA and ESA contain mitigation and monitoring measures to ensure these thresholds are not exceeded. Examples of such authorizations can be found at the following websites:

- USFWS
 - http://alaska.fws.gov/fisheries/mmm/Beaufort_Sea/76FR47010.pdf
 - http://alaska.fws.gov/fisheries/mmm/Chukchi_Sea/pdf/73FR33212.pdf
 - <http://alaska.fws.gov/fisheries/mmm/itr.htm>
- NMFS
 - <http://www.nmfs.noaa.gov/pr/permits/incidental.htm>
- BOEM
 - http://www.alaska.boemre.gov/ref/Biological_opinions_evaluations.htm
 - http://www.alaska.boemre.gov/ref/eis_ea.htm

7. Industry practices as mandated by the USFWS and NMFS include maintaining 1-mile exclusion zones around known polar bear dens, use of aerial FLIR surveys to identify polar bear dens, and Incidental Harassment Authorization and Polar Bear and Wildlife Interaction Plans, which specify the means by which industry minimizes contact, conflict, or stress upon the Polar Bears. These industry and regulatory practices should be specified to demonstrate protection of the polar bears. The PEIS should also note a prior USFWS finding that “documented impacts on polar bears by the oil and gas industry during the past 30 years are minimal” and “historically, oil and gas activities have resulted in little direct mortality to polar bears.” (72 *Fed. Reg.* at 1,079).

Response: Details such as specified exclusion zones for polar bears are more appropriate for inclusion and discussion at the lease sale phase; therefore, BOEM has not added the requested information to the PEIS. However, BOEM concurs that there are existing mitigation and monitoring measures as well as industry practices that are directed at minimizing or eliminating impacts to polar bears from oil/gas activities. The USFWS promulgated regulations under the MMPA that require a suite of mitigation measures in order to ensure a negligible impact (as defined under the MMPA) on polar bears. These regulations can be found at http://alaska.fws.gov/fisheries/mmm/Beaufort_Sea/76FR47010.pdf and http://alaska.fws.gov/fisheries/mmm/Chukchi_Sea/pdf/73FR33212.pdf. Additional detail on implementation of these measures can be found at <http://alaska.fws.gov/fisheries/mmm/itr.htm>. Further, the USFWS has also completed a consultation with BOEM under the Endangered Species Act that further ensures oil/gas activities permitted by BOEM do not result in jeopardizing the continued existence of polar bears (see <http://www.nmfs.noaa.gov/pr/permits/incidental.htm>).

8. Coastal and Marine Spatial Planning (CMSP) should not be characterized as a “national zoning plan.”

Response: The language has been revised in Section 4.3.1: Multiple Use Issues and Marine Spatial Planning, to read as follows, “In recent years, Coastal and Marine Spatial Planning (CMSP) has emerged as a new paradigm and planning strategy for coordinating all marine and coastal activities within an ecosystem-based framework.”

9. Commenters expressed that the Executive Order instituting the National Ocean Policy and CMSP directly conflicts with the Congressionally-established OCSLA.

Response: BOEM appreciates the concern over the overlapping requirements of the OCSLA and National Ocean Policy EO 13547. BOEM sees the planning frameworks of the OCSLA and CMSP as complementary. Please refer to Section 4.3.1: Multiple Use Issues and Marine Spatial Planning, of the PEIS for more information.

10. Several commenters suggested that the PEIS and 5-year Program should better integrate the National Policy for Stewardship of the Ocean, Our Coasts and the Great Lakes (referred to as NOP). Implementation of the NOP by using CMSP will help resolve issues of conflicting use.

Response: BOEM has incorporated the requirements of the National Ocean Policy EO 13547 into its 5-year Program, which includes CMSP. Please refer to Section 4.3.1: Multiple Use Issues and Marine Spatial Planning, of the PEIS for more information.

11. The PEIS mentions participation of all GOM States in the Federal coastal management program, but it fails to mention Alaska's withdrawal from the program and how the sunset of the Alaska Coastal Management Program (ACMP) may affect regulation of oil and gas activities in the Alaska DCS (Drilling, Completion, and Stimulation) Program. Until July of 2011, the statewide ACMP standards included the statutes and regulations of the Alaska Department of Environmental Conservation which were more stringent than Federal requirements. The Final EIS should include an analysis of the impacts of the loss of the ACMP.

Response: In 2011, the Alaska State Legislature did not pass legislation that would have extended the ACMP established under Section 303 of the CZMA. The ACMP expires in July 2011. Without a Federal Consistency Program and a supporting State regulatory regime in effect, BOEM will no longer have to coordinate under appropriate subparts of the CZMA consistency regulations, 15 CFR Part 930. However, under other Federal environmental mandates, including but not limited to NEPA and the OCSLA, BOEM must still consider the direct, indirect, and cumulative environmental effects on coastal resources on State lands or submerged lands from the proposed and connected actions. Under Section 19 of the OCSLA, any affected State may submit recommendations to the Secretary of the Interior regarding the size, timing, or location of a proposed lease sale or with respect to a proposed development and production plan (OCSLA Section 25). The lease sale phase is the usual decision-point for BOEM to evaluate the need for any mitigation that is now necessary absent former State requirements, applied pursuant to Section 307 of the CZMA, that were in place to avoid or minimize impacts to acceptable levels.

TABLE 8.4-1 Stakeholders Providing Issue-Specific Comments on the PEIS

Issue 1 — NEPA Process

John Mueller	Natural Resources Defense Council
USACitizen1	Northwest Arctic Borough
World Wildlife Fund, U.S. Arctic Field Program	National Oceanic and Atmospheric Administration
Eleanore Huffins	Alaska Wilderness League
Pamela Miller	Alaska’s Big Village Network
Alaska Department of Natural Resources	International Dark Sky Association
Jason Brune	North Slope Borough
Tom Hendrix	Defenders of Wildlife
Center for Water Advocacy	Eyak Preservation Council
Oceana	Center for Biological Diversity
Qaiyaan Su’esu’e	Northern Alaska Environmental Center
Harry Brower	Pacific Environment
Heather Dingman	Republicans for Environmental Protection
Inupiat Community of the Arctic Slope	Sierra Club
Mobile Bay Sierra Club	The Wilderness Society
Carol Admans-Davis	Mobile Baykeeper
Darcie Warden	Ocean Conservancy
The Wilderness Society, Lois Epstein	National Audubon Society
Catherine Shed	Pew Environmental Group
Carla Sims Kayotuk	Gulf Restoration Network
Don McKie	

Issue 2 — NEPA Analysis

US Fish and Wildlife Service, Southeast Region	North Slope Borough, Department of Wildlife Management
J. Capozzelli	Natural Resources Defense Council
Reed Secord	Natural Resources Development Council
U.S. Environmental Protection Agency	Sierra Club
Ted Tupper	Oceana
Isaac Blume	Lih Young
John Hocevar	Jenna Hertz
Henri Fourroux	Charles Edwardson
Rosemary Ahtuanguaruak	Pamela Miller
Tidewater, Incorporated	Rick Steiner
Audubon Alaska	Jason Brune
Carl Portman	Tom Lohman
Tina Robinson	Kiersten Lippmann
Marjorie Ahnupkana	Leandra de Sousa
Isaac Nukapigak	Benjamin Craft-Rendon
George Edwardson	Billy Nashoalook
Bill Tracey, Sr	Native Village of Point Hope
Qaiyaan Su’esu’e	Kristi Frankson
Louisa Riley	Lois Epstein
Shell Exploration and Production Company	National Oceanic and Atmospheric Administration
Gulf Restoration Network	Chad Nordlum
Katharyn Reiser	Northwest Arctic Borough
Oasis Earth	Alaska Wilderness League
Marybeth Holleman	Alaska’s Big Village Network
Ted Tupper	Surfrider Foundation
Aleut Corporation	Center for Water Advocacy
Christopher Lish	Defenders of Wildlife
Alaska Oil and Gas Association	Eyak Preservation Council

TABLE 8.4-1 (Cont.)

National Ocean Industries Association	World Wildlife Fund Petition
Statoil USA E&P Inc.	Pew Environmental Group
The Nature Conservancy	Pacific Environment
American Petroleum Institute	Republicans for Environmental Protection
The Wilderness Society	Alaska Oil and Gas Association
World Wildlife Fund, U.S. Arctic Field Program	Independent Petroleum Association of America
International Association of Drilling Contractors	International Association of Geophysical Contractors
U.S. Oil and Gas Association	North Slope Borough
Northern Alaska Environmental Center	Center for Biological Diversity
Resource Development Council	Alaska Eskimo Whaling Commission
Ocean Conservancy	Iñupiat Community of the Arctic Slope
National Audubon Society	Arctic Slope Regional Corporation

Issue 3 — Alternatives

U.S. Environmental Protection Agency	Republicans for Environmental Protection
Michelle Waters	Sierra Club
Donny Williams	The Wilderness Society
Holly Hanks	Gulf Restoration Network
Natural Resources Development Council	Pacific Environment
Oceana	Alaska’s Big Village Network
Rosemary Ahtuanguaruak	Northern Alaska Environmental Center
Natural Resources Defense Council	Center for Water Advocacy
Northwest Arctic Borough	Defenders of Wildlife
National Oceanic and Atmospheric Administration	World Wildlife Fund, U.S. Arctic Field Program
Alaska Wilderness League	Ocean Conservation Research
Center for Biological Diversity	Sierra Club
Eyak Preservation Council	Alaska Oil and Gas Association
Iñupiat Community of the Arctic Slope	Surfrider Foundation
Alaska Department of Natural Resources	

Issue 4 — Environmental Issues and Concerns

Issue 4.1 — General Concerns

David Pisaneschi	Pew Environment
J. Capozelli	Natural Resource Defense Council
Ukallaysaq Okleasik	Center for Water Advocacy
Oceana	Defenders of Wildlife
Alaska’s Big Village Network	North Slope Borough
Gulf Restoration Network	Southern Environmental Law Center
Ocean Conservation Research	Sierra Club
National Oceanic and Atmospheric Administration	Center for Biological Diversity

Issue 4.2 — Climate

There were no specific comments on climate. Comments concerned with how climate change may affect impacts of oil and gas development are addressed within the other issue categories.

Issue 4.3 — Water

U.S. Environmental Protection Agency	Alaska Oil and Gas Association
Darcie Warden	National Ocean Industries Association
Northwest Arctic Borough	U.S. Oil and Gas Association
National Oceanic and Atmospheric Administration	International Association of Drilling Contractors

TABLE 8.4-1 (Cont.)

American Petroleum Institute	The Nature Conservancy
Independent Petroleum Association of America	International Association of Geophysical Contractors
Alaska Eskimo Whaling Commission	Iñupiat Community of the Arctic Slope
North Slope Borough	

Issue 4.4 — Air

U.S. Environmental Protection Agency	International Association of Geophysical Contractors
Daniel Lum	Alaska Oil and Gas Association
Oceana	National Ocean Industries Association
Alaska’s Big Village Network	U.S. Oil and Gas Association
Independent Petroleum Association of America	International Association of Drilling Contractors
Center for Water Advocacy	Alaska Eskimo Whaling Commission
Defenders of Wildlife	Iñupiat Community of the Arctic Slope
Gulf Restoration Network	Alaska Department of Natural Resources
Ocean Conservation Research	North Slope Borough
Sierra Club	American Petroleum Institute
Southern Environmental Law Center	Center for Biological Diversity

Issue 4.5 — Acoustics

U.S. Fish and Wildlife Service, Southeast Region	International Association of Geophysical Contractors
Northwest Arctic Borough	Alaska Eskimo Whaling Commission
National Oceanic and Atmospheric Administration	

Issue 4.6 — Coastal Habitats

National Oceanic and Atmospheric Administration	Independent Petroleum Association of America
Texas Parks and Wildlife Department	U.S. Oil and Gas Association
American Petroleum Institute	National Ocean Industries Association
International Association of Geophysical Contractors	International Association of Drilling Contractors
Alaska Oil and Gas Association	

Issue 4.7 — Marine Habitats

North Slope Borough	The Nature Conservancy
Alaska Wilderness League	Alaska Oil and Gas Association
Alaska Big Village Network	National Ocean Industries Association
Center for Biological Diversity	U.S. Oil and Gas Association
Center for Water Advocacy	American Petroleum Institute
Defenders of Wildlife	Republicans for Environmental Protection
Eyak Preservation Council	Sierra Club
National Resources Defense Council	The Wilderness Society
Northern Alaska Environmental Center	Pacific Environment
World Wildlife Fund, U.S. Arctic Field Program	National Oceanic and Atmospheric Administration
Independent Petroleum Association of America	International Association of Drilling Contractors
International Association of Geophysical Contractors	

Issue 4.8 — Mammals

U.S. Fish and Wildlife Service, Southeast Region	National Oceanic and Atmospheric Administration
Edward Nukapigak	North Slope Borough
George Edwardson	Iñupiat Community of the Arctic Slope
Bill Tracey, Sr.	American Petroleum Institute
Department of Wildlife Management, North Slope Borough	International Association of Drilling Contractors
Billy Nashoalook	The Nature Conservancy

TABLE 8.4-1 (Cont.)

Alyssa Agnasagga	Center for Biological Diversity
Terry Tagarook	Alaska Eskimo Whaling Commission
Kristi Frankson	Alaska Oil and Gas Association
Save the Manatee Club	National Ocean Industries Association
Center for Regulatory Effectiveness	U.S. Oil and Gas Association
Independent Petroleum Association of America	International Association of Geophysical Contractors
Natural Resources Defense Council	

Issue 4.9 — Birds

U.S. Fish and Wildlife Service, Southeast Region	Independent Petroleum Association of America
Texas Parks and Wildlife Department	North Slope Borough
Oceana	Alaska Oil and Gas Association
Alaska’s Big Village Network	National Ocean Industries Association
Sierra Club	International Dark-Sky Association
Center for Water Advocacy	Center for Biological Diversity
Defenders of Wildlife	Gulf Restoration Network
Ocean Conservation Research	Southern Environmental Law Center
International Association of Drilling Contractors	International Association of Geophysical Contractors
International Association of Geophysical Contractors	U.S. Oil and Gas Association
American Petroleum Institute	

Issue 4.10 — Reptiles

U.S. Fish and Wildlife Service, Southeast Region	National Oceanic and Atmospheric Administration
Center for Biological Diversity	Alaska Oil and Gas Association
Texas Parks and Wildlife Department	National Ocean Industries Association
American Petroleum Institute	U.S. Oil and Gas Association
Independent Petroleum Association of America	International Association of Drilling Contractors
International Association of Geophysical Contractors	International Dark-Sky Association

Issue 4.11 — Invertebrates

National Oceanic and Atmospheric Administration	Independent Petroleum Association of America
American Petroleum Institute	North Slope Borough
International Association of Geophysical Contractors	International Association of Drilling Contractors
Alaska Oil and Gas Association	National Ocean Industries Association
International Association of Geophysical Contractors	U.S. Oil and Gas Association

Issue 4.12 — Threatened and Endangered Species

Rick Steiner	U.S. Oil and Gas Association
Oasis Earth	National Ocean Industries Association
National Oceanic and Atmospheric Administration	International Association of Drilling Contractors
American Petroleum Institute	Alaska Oil and Gas Association
Independent Petroleum Association of America	International Association of Geophysical Contractors

Issue 4.13 — Land Use and Infrastructure

U.S. Environmental Protection Agency	The Nature Conservancy
The Wilderness Society	Alaska Eskimo Whaling Commission
Bill Tracey, Sr.	North Slope Borough
Ira Ungudruk	Alaska Oil and Gas Association
Northwest Arctic Borough	National Ocean Industries Association
Ted Tupper	U.S. Oil and Gas Association

TABLE 8.4-1 (Cont.)

Independent Petroleum Association of America	International Association of Drilling Contractors
International Association of Geophysical Contractors	American Petroleum Institute

Issue 4.14 — Fish and Fisheries

U.S. Fish and Wildlife Service, Southeast Region	Independent Petroleum Association of America
Marjorie Ahnupkana	Southern Environmental Law Center
Alice Ipalook	American Petroleum Institute
Henri Fourroux	Alaska Oil and Gas Association
Nora Jane Burns	National Ocean Industries Association
Natural Resources Defense Council	U.S. Oil and Gas Association
National Oceanic and Atmospheric Administration	International Association of Drilling Contractors
Oceana	Gulf Restoration Network
Alaska's Big Village Network	Ocean Conservation Research
Center for Biological Diversity	Sierra Club
Center for Water Advocacy	Defenders of Wildlife
Surfrider Foundation	North Slope Borough
International Association of Geophysical Contractors	

Issue 4.15 — Oceanography

The Wilderness Society	Alaska Department of Natural Resources
National Oceanic and Atmospheric Administration	

Issue 4.16 — Areas of Special Concern

Northwest Arctic Borough	U.S. Oil and Gas Association
National Oceanic and Atmospheric Administration	International Association of Drilling Contractors
Texas Parks and Wildlife Department	Alaska Oil and Gas Association
American Petroleum Institute	National Ocean Industries Association
Independent Petroleum Association of America	International Association of Geophysical Contractors

Issue 4.17 — Archeological and Historical Resources

Florida Division of Historical Resources, SHPO	Native Village of Point Hope
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Issue 4.18 — Health Assessment

Delice Calcote	Iñupiat Community of the Arctic Slope
Rosemary Ahtuanguaruak	North Slope Borough
Bernice Kaigelak	Alaska Oil and Gas Association
Rosemary Ahtuanguaruak	National Ocean Industries Association
Heather Dingman	U.S. Oil and Gas Association
Henri Fourroux	Qaiyaan Su'esu'e
Bruce Inglangasak	American Petroleum Institute
Independent Petroleum Association of America	International Association of Drilling Contractors
International Association of Geophysical Contractors	

Issue 4.19 — Socioeconomics

Isaac Blume	Mark Wartes
Nicolette Nye	Northern Alaska Environmental Center
Qayaan Su'esu'e	Tidewater, Inc.
Jenna Hertz	Mobile Baykeeper
International Association of Geophysical Contractors	Charles Edwardson

TABLE 8.4-1 (Cont.)

Issue 4.20 — Environmental Justice

Center for Water Advocacy	Alaska Oil and Gas Association
Northwest Arctic Borough	National Ocean Industries Association
American Petroleum Institute	U.S. Oil and Gas Association
Independent Petroleum Association of America	International Association of Drilling Contractors
International Association of Geophysical Contractors	Iñupiat Community of the Arctic Slope

Issue 4.21 — Invasive Species

National Oceanic and Atmospheric Administration

Issue 4.22 — Sociocultural Systems

Isaac Blume	Native Village of Point Hope
John Hocevar	Janice Nashookpuk
Qayaan Su'esu'e	North Slope Borough
Charles Edwardson	Billy Stone, Sr.
Resisting Environmental Destruction on Indigenous Lands (REDOIL)	International Association of Drilling Contractors
Delice Calcote	Ukallaysaaq Okleasik
Center for Water Advocacy	Northwest Arctic Borough
Marjorie Ahnupkana	Earl Kingik
Alice Ipalook	Dood Lincoln
Isaac Nukapigak	Catherine Shed
Edward Nukapigak	Juanita Oktollik
Johnny Aiken	Carla Sims Kayotuk
Johnny Kunaq Brower	Katharyn Reiser
George Edwardson	Natural Resources Defense Council
Bill Tracey, Sr	Daniel Lum
Dallas-Lee Brower	Northwest Arctic Borough
Harry Brower	Geoff Carroll
Rosemary Ahtuanguaruak	Pew Environment
Cilia Attungowruk	Iñupiat Community of the Arctic Slope
Lawrence Burris	Rossmann Peetook
American Petroleum Institute	Ira Ungudruk
Alaska Oil and Gas Association	Ocean Conservancy
National Ocean Industries Association	National Audubon Society
The Nature Conservancy	Pew Environmental Group
Oceana	Alaska Eskimo Whaling Commission
Mobile Baykeeper	Alaska's Big Village Network
National Oceanic and Atmospheric Administration	Independent Petroleum Association of America
International Association of Geophysical Contractors	U.S. Oil and Gas Association

Issue 4.23 — Geohazards

Alaska Department of Natural Resources

Issue 5 — Cumulative Impacts

Oceana	Alaska's Big Village Network
Rick Steiner	Northern Alaska Environmental Center
Joshua Tucker	Center for Water Advocacy
Bill Tracey, Sr.	Defenders of Wildlife
Billy Nashoalook	Gulf Restoration Network

TABLE 8.4-1 (Cont.)

Raychelle Daniel	Ocean Conservation Research
Carla Sims Kayotuk	Sierra Club
Natural Resource Defense Council	Southern Environmental Law Center
Northwest Arctic Borough	American Petroleum Institute
National Oceanic and Atmospheric Administration	Independent Petroleum Association of America
Alaska Wilderness League	Iñupiat Community of the Arctic Slope
Alaska Department of Natural Resources	Pacific Environment
North Slope Borough	Republicans for Environmental Protection
National Audubon Society	Alaska Eskimo Whaling Commission
Pew Environmental Group	The Wilderness Society
Eyak Preservation Council	Center for Biological Diversity
Ocean Conservancy	National Ocean Industries Association
Northern Alaska Environmental Center	U.S. Oil and Gas Association
World Wildlife Fund, U.S. Arctic Field Program	International Association of Drilling Contractors
International Association of Geophysical Contractors	Alaska Oil and Gas Association

Issue 6 — Oil Spills

North Star Terminal & Stevedore Co.	Alaska Wilderness League
North Star Equipment Services	Steve Bruckner
Sierra Club Campaign	National Audubon Society
David Pisaneschi	John Hocevar
Natural Resources Defense Council	Earthjustice
J. Capozzelli	Emilie Surrosco
U.S. Environmental Protection Agency	Mike Gravitz
J. Capozzelli	Sierra Club
Michelle Waters	Oceana
Larry Nelson	Catherine Shed
Helen Caswell	Daniel Lum
Shawn Lowry	Marybeth Holleman
Qaiyaan Su'esu'e	Judy Patrick
Jenna Hertz	Christopher Lish
Charles Edwardson	Bruce Inlangasak
Roger Burggraf	Doug Smith
Resisting Environmental Destruction On Indigenous Lands	U.S. Fish and Wildlife Service - Southeast Region
Debbie Miller	Defenders of Wildlife
Travis Jarrett	Daniel Lum
Pamela Miller	Northwest Arctic Borough
Darcy Warden	Charles Becker
Rick Steiner	Lincoln Saito
Heidi Zimmer	Alaska's Big Village Network
Leah Frankson	Ocean Conservation Research
Joshua Tucker	Pew Environmental Group
The Wilderness Society	Ocean Conservancy
Audubon Alaska	Eyak Preservation Council
Eric Fox	Gulf Restoration Network
Kathleen Fisher	Alaska Oil and Gas Association
Marjorie Ahnupkana	Pacific Environment
Johnny Kunaq Brower	Republicans for Environmental Protection
George Edwardson	Earl Kingik
Ataamuk Shiedt	The Wilderness Society
Rosemary Ahtuanguaruak	Mark Newell
Geoff Carroll	Statoil USA E&P Inc.
Raymond Aguvluk	MSI Communications
Earl Kingik	Jacquelyn Edmundson

TABLE 8.4-1 (Cont.)

Ukallaysaaq Okleasik	Center for Water Advocacy
Lois Epstein	Delta Constructors, LLC
Shell Oil Company	The Nature Conservancy
Katharyn Reiser	Surfrider Foundation
Diane Shoemaker	Center for Biological Diversity
Willard Chinn, Jr	Iñupiat Community of the Arctic Slope
Dan Schok	Alaska Department of Natural Resources
Ditch Witch of Alaska	Credo Action Campaign
Barbara Gregoire	Northern Alaska Environmental Center
Judy Wilde	North Slope Borough
Christina Mounce	Elke Joos
Scott Marler	Oasis Earth
Curtis Parr	Ziba Morisi
National Oceanic and Atmospheric Administration	World Wildlife Fund, U.S. Arctic Field Program

Issue 7 — Mitigation

Alaska Eskimo Whaling Commission	North Slope Borough
National Oceanic and Atmospheric Administration	North Slope Borough, Department of Wildlife Management
American Petroleum Institute	U.S. Oil and Gas Association
International Association of Drilling Contractors	Independent Petroleum Association of America
Alaska Oil and Gas Association	National Audubon Society
National Ocean Industries Association	Pew Environmental Group
Ocean Conservancy	Oceana
International Association of Drilling Contractors	Natural Resources Defense Council

Issue 8 — Regulations and Safety

J. Capozzelli	Aleut Corporation
Oceana	Christopher Lish
Rick Steiner	Natural Resources Defense Council
The Wilderness Society	Northern Alaska Environmental Center
Alaska Chamber of Commerce	Pacific Environment
Alaska's Big Village Network	Republicans for Environmental Protection
Center for Water Advocacy	Pacific Environment
Defenders of Wildlife	Republicans for Environmental Protection
Eyak Preservation Council	Gulf Restoration Network
Alaska Wilderness League	Ocean Conservation Research
Alaska's Big Village Network	Southern Environmental Law Center
Center for Water Advocacy	American Petroleum Institute
Sierra Club	Ocean Conservancy
Statoil USA E&P Inc	National Audubon Society
U.S. Oil and Gas Association	Arctic Slope Regional Corporation
Pew Environmental Group	Mobile Baykeeper
Alaska Oil and Gas Association	Center for Biological Diversity
International Association of Drilling Contractors	Louisiana Department of Environmental Quality
National Oceanic and Atmospheric Administration	World Wildlife Fund, U.S. Arctic Field Program
Alabama Department of Environmental Management	International Association of Geophysical Contractors
Independent Petroleum Association of America	Surfrider Foundation
National Ocean Industries Association	North Slope Borough

Issue 9 — Statutory Compliance

Center for Regulatory Effectiveness	Alaska Oil and Gas Association
Natural Resources Defense Council	National Ocean Industries Association

TABLE 8.4-1 (Cont.)

Texas Parks and Wildlife Department	Northern Alaska Environmental Center
American Petroleum Institute	The Nature Conservancy
U.S. Oil and Gas Association	Alaska Eskimo Whaling Commission
U.S. Fish and Wildlife Service, Southeast Region	National Oceanic and Atmospheric Administration
Independent Petroleum Association of America	International Association of Geophysical Contractors
International Association of Drilling Contractors	Alabama Department of Environmental Management
