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PREPARING FOR OFFSHORE DRILLING IN THE ARCTIC: LESSONS LEARNED FROM THE FIRST SEASON

FIELD HEARING

BEFORE THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE

ONE HUNDRED TWELFTH CONGRESS

SECOND SESSION

OCTOBER 11, 2012

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ONE HUNDRED TWELFTH CONGRESS

SECOND SESSION

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PREPARING FOR OFFSHORE DRILLING IN THE ARCTIC: LESSONS LEARNED FROM THE FIRST SEASON

THURSDAY, OCTOBER 11, 2012

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Anchorage, AK.

The Committee met, pursuant to notice, at 10:02 a.m. in room 106, Gorsuch Commons, University of Alaska Anchorage Campus, Hon. Mark Begich, Chairman, presiding.

OPENING STATEMENT OF HON. MARK BEGICH, U.S. SENATOR FROM ALASKA

Senator BEGICH. We appreciate everyone being here this morning. This is a hearing of the U.S. Senate Commerce, Science, and Transportation Committee, the third hearing I've chaired here in Alaska, and I have to be frank with you. I think my colleagues back in Washington think I'm going to move the whole committee to Alaska because we have had so many hearings here. But as Chair of the Oceans, Atmosphere, Fisheries and Coast Guard Subcommittee, it's important to have these hearings here in Alaska as many of the issues under the Subcommittee directly deal with Alaska, and Alaska is a major player.

Alaska's coastline is longer than the rest of the nation's, and we have more waters in the Exclusive Economic Zone and twice as much continental shelf as the other 49 states combined.

And when the Senate ratifies—and I hope they do—the Law of the Sea treaty, Alaska's extended continental shelf could grow in area by twice the size of California.

Our state is second to none in the economic value and landings of commercial fisheries, and the seafood industry continues to be the largest private employer in the state.

Perched along the great circle route between the West Coast and Asia, Alaska plays a major role leader in maritime shipping across the Pacific. With the melting polar ice cap, the Bering Strait is growing in importance as a link between Europe and Asia.

The value of our oil and gas reserves, and particularly our yet untapped reserves, is really a game-changer for the nation. The waters of the Beaufort and Chukchi Seas hold what many estimate to be the largest yet to be recovered reserves of oil and natural gas in the world.

As Alaskans well know, we are highly dependent on our state's oil and gas industry. Last year, oil and natural gas accounted for

91 percent of our state's revenue. Yet these reserves have extraordinary promise, not only for Alaska, but for the nation as a whole, as a stable source of domestic-produced energy.

For these reasons, President Obama supported my push to start utilizing Alaska resources to support America's energy needs and pursued an "all of the above" approach to developing our nation's energy supplies.

We in Alaska know well the challenges and risks that accompany offshore development. As we look to the future, we need to proceed carefully, safely, and make sure local communities are fully prepared and engaged.

The purpose of today's hearing is to take a look back on the first season of exploratory activity, and review the operational lessons learned and, of course, ask what does the future hold for oil and gas, not only through the exploration period but the development period.

Of course, not everything went according to plan this season. But Alaskans are familiar with the difficulties of operating on the frontier where the weather is harsh and infrastructure is lacking. More importantly, we understand the importance of proceeding with caution to ensure protection of the broader Arctic ecosystem and especially the resources upon which subsistence users of the North Slope depend.

Today we will have several people testifying, and we appreciate the two panels that will be here. I welcome the testimony of the Deputy Secretary of the Interior, David Hayes, who has led the Federal interagency effort on onshore oil up here in Alaska; and also the testimony of Shell Oil's Pete Slaiby on the second panel today.

With increased energy development and maritime activity, our Nation must ensure that the Coast Guard has the capabilities to operate in the Arctic waters and to ensure safe commerce. I welcome Rear Admiral Thomas Ostebo of the United States Coast Guard at the hearing today.

All of these activities will rely on the weather and the ice forecasts and the scientific underpinnings shared by the National Oceanic and Atmospheric Administration. For the past 2 years, I've led Senate efforts to get NOAA's polar-orbiting satellites back on track. Most people would not know what those are. I know you will mention those a little bit here. But they are critical for all the activity of our nation, but especially in the Arctic. So I look forward to hearing Acting Director Laura Furgione's testimony later.

But I am particularly looking forward to hearing updates from Jacob Adams on behalf of the North Slope Borough and Edith Vorderstrasse on behalf of UIC.

What I am hoping today is to hear how things went this season from your perspectives. What are the benefits, challenges with the new development? What will it bring for you? Where are the opportunities, and what Federal investments are needed, in your estimation?

To prepare for these changes, I have proposed several pieces of legislation: to provide a steady funding stream for the needed scientific research in the Arctic, which is critical; strengthen our icebreaker fleet and address other infrastructure needs that the Coast

Guard needs; examine the unique health needs of residents of the Arctic; even strengthen our diplomatic role through the appointment of an Arctic Ambassador.

This review of the first season will help make us better, understand what is going on in the Arctic, but also will help us in Washington, D.C. for legislation needed to move forward in the Arctic.

Let me also say that when I have talked about this issue, and I know there is great debate, but it is no longer the question of if the Arctic will be developed, it is how it will be developed and how we move forward in the right way to meet all these issues that I have just laid out, plus many more. It is an incredible opportunity for Alaska. It is an incredible opportunity for this Nation to see the potential of the Arctic. Today we are focused on oil and gas, but there are many aspects to the Arctic.

Let me first start here with Mr. Hayes. Thank you very much for being here, and thank you for adjusting your schedule. I know you are going to head up to Wainwright I think tomorrow, and we believe the weather will be good. But as Alaska knows, the weather can change every minute.

Mr. Hayes, please.

STATEMENT OF HON. DAVID J. HAYES, DEPUTY SECRETARY, U.S. DEPARTMENT OF THE INTERIOR

Mr. HAYES. Thank you very much, Senator. It is a pleasure to be here, and I have submitted some written testimony for the record. I thought I would just make a few oral comments and would be delighted to engage in a dialogue with you, obviously, on these important subjects.

I want to thank you first for holding the hearing. I think it's timely, and obviously the subject is incredibly important to all of us.

I would like to focus in terms of my oral comments on the experience that we are having now with regard to the drilling activity in the Arctic, and to do so I want to step back for a bit and give a short bit of history here.

As you well know, you recommended a year or so ago, over a year ago now, that the Federal Government be better coordinated when it comes to permitting activities in the Arctic. And in part because of your advocacy, the President enacted an executive order on July 11 of last year that establishes an interagency group, a working group designed to facilitate the permitting of conventional and renewable energy in Alaska, and the President asked me to chair the group as the Deputy Secretary of the Department of the Interior.

We, of course, have enormous responsibilities at the Department of the Interior, and primary responsibility for the permitting associated with offshore activity. We also have very large land base responsibilities as well through the National Petroleum Reserve Alaska and other landholdings. And, of course, we have a special responsibility for Native Alaskans through the Bureau of Indian Affairs and our general trust responsibility.

But as you have pointed out many times, there are many other Federal players as well that must be participating in permitting activities, our friends at NOAA, at the Army Corps of Engineers, at

the Coast Guard and EPA and others, and through the interagency process that was established by the executive order that you helped promote.

I am pleased to report that the Federal Government has never been more coordinated in terms of permitting activities, and I believe has never before provided a clearer roadmap to companies that are interested in doing business in the Arctic with regard to the Federal responsibilities associated therewith.

I think we have enjoyed the working relationship with Mr. Slaiby and Shell in terms of the last year working together as our Bureau of Ocean Energy Management reviewed and ultimately approved an oil spill response plan for both the Chukchi and the Beaufort, working side by side with our colleagues at NOAA, at the Coast Guard, at EPA, and that's the way business should be done.

In terms of lessons learned, I think that this summer has been an enormously important learning experience with regard to offshore drilling activity. I want to compliment Shell for the professional approach that they have taken in responding to what we believe is the gold standard for safe and environmentally sound exploration activities that we have established through our regulatory requirements. These requirements are sensitive to the needs of Alaska Natives, in particular subsistence whalers. Shell has respected those needs and has been adhering to the high safety standards that we required.

Obviously, the difficult ice year inhibited the ability of Shell to do as much as they would have liked to have done this summer. But I just met with two of our inspectors this morning who have been on both rigs. They report that the top hole drilling activities that have been underway have been underway professionally and safely, and we look forward to, at the end of this drilling season, doing a post mortem and to working with the company and with other interested parties, the Coast Guard, et cetera, to learn the lessons that we have learned and take them into the next summer.

I will say I wanted to touch on one other subject before I turn it over to my colleagues on the panel. In connection with our interagency working group activities where we bring the Federal family together to help coordinate responses to permitting requests by companies, I will say that this exercise has been incredibly important not only to ensure that we are working together, but we also through this process have identified some needs that we see as a Federal family in terms of working with our state counterparts, our community interests, Native Alaskans and others, and they fall into a couple of categories.

One is a better and more complete relationship with the science community to make sure that decisionmakers have access to scientific issues that are so important to many permitting decisions. And in that regard, through our interagency working group, we have had an ongoing dialogue with the science community, and it has led to a request from the White House that we proceed with an effort to pull together the science in a coordinated way for access to Federal decisionmakers. Fran Ulmer, this state's own former Lieutenant Governor, and now chair of the Arctic Research Commission, is heading up that effort.

The other piece, finally, is we concluded that we should have a more holistic approach to helping make good decisions about specific projects and not proceed on a one-off by one-off project basis. Instead, take a more integrated management approach, where we look at the entire scope of sensitivities in terms of resources, environmental considerations, subsistence needs, et cetera, and then within that context have a sense of what future development in the Arctic might look like so that as we are proceeding on a specific project approval question, we have in mind the broader context.

We have been requested to prepare, and are in the process of preparing a report to the President on this broader look and how we should move forward in a broader context in decisionmaking, and we are committed to provide that report to the President by the end of the year, and we'll be reaching out to many interested stakeholders in the meantime.

So with that, I appreciate again your holding this hearing, Senator Begich, appreciate your personal leadership on these important issues.

[The prepared statement of Mr. Hayes follows:]

PREPARED STATEMENT OF HON. DAVID J. HAYES, DEPUTY SECRETARY, DEPARTMENT OF THE INTERIOR

Mr. Chairman and Members of the Committee, thank you for the opportunity to appear before you today to discuss the Department of the Interior's implementation of the Administration's program of safe and environmentally responsible offshore oil and gas development in the Arctic, specifically focusing on the lessons learned. Let me begin by providing a brief overview of recent energy-development related activities that the Department has carried out in Alaska, followed by a discussion of our achievements and future plans with the Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska.

Introduction

Alaska is an important component of our nation's energy strategy. President Obama has stressed the Administration's commitment to a comprehensive, all-of-the-above energy strategy to both grow America's energy economy and continue to reduce our dependence on foreign oil. This includes not only investing in advanced technologies and alternative fuels and energy generation, but also the safe, responsible, and environmentally sustainable production of domestic oil and gas. The Department of the Interior is doing its part to respond to the President's call. America's public lands and Federal waters provide resources that are critical to the nation's energy security.

Congress has placed enormous responsibility and trust in our Department when it comes to Alaska. Through the Bureau of Land Management, the National Park Service, and the U.S. Fish and Wildlife Service, we manage more than 200 million acres of Alaska—more than half the landmass of the entire State—and we also have primary responsibility regarding the permitting of offshore activities in Alaska's ocean waters. More particularly, Congress has entrusted our Department with the responsibility to oversee both conventional and renewable energy development on our public lands in Alaska, and on the Outer Continental Shelf (OCS). In addition, through the Bureau of Indian Affairs, and with the help of our other bureaus, we also have a special responsibility to promote the Federal Government's relationship with Alaska Natives, including honoring their cultural heritage and helping to implement their subsistence rights.

In addition to our regulatory and special trust responsibilities in Alaska, we have a major science commitment in Alaska. The world-class scientists in our United States Geological Survey have taken the lead for the U.S. government, working with the FWS, on many of our most threatened marine and terrestrial species, including polar bears, walruses, sea otters, and caribou (all of which are subject to FWS oversight). USGS scientists also are working with scientists at the University of Alaska and others every day to monitor and better understand seismic and volcanic hazards in the State, to assess Alaska's energy resources, and to analyze the impact that

the changing climate in Alaska is having on everything from coastal erosion to permafrost loss and increased fire risk.

With these significant and varied responsibilities in mind, our goal has been to develop a framework in which to manage these natural resources in a fashion that balances our statutory conservation and development missions. We have put in place a process that will facilitate targeted development in the right places at the right time, and to reconcile this development with the protection of areas of sensitive habitat or, in Alaska, that are important for subsistence hunting and fishing activities. This approach is evident in the Department's Proposed Final OCS Oil and Gas Leasing Program for 2012–2017.

Offshore Development

Ensuring the safe and responsible development of the nation's offshore oil and gas resources through leasing under the Five Year Program is an important part of the Administration's strategy. On August 27, 2012, Secretary Salazar approved the Five Year OCS Oil and Gas Leasing Program for 2012–2017 that makes all areas with the highest-known resource potential—including frontier areas in the Alaska Arctic—available for oil and gas leasing. The Five Year Program makes available areas focused on the most likely recoverable oil and gas resources that the Outer Continental Shelf is estimated to hold, and schedules 15 potential lease sales for the five-year period, including 12 in the Gulf of Mexico and three off the coast of Alaska.

The Five Year Program is designed to account for the distinct needs of the regions across the OCS, and it considers a range of factors, including current and developing information about resource potential, the status of resource development and emergency response infrastructure, recognition of regional interests and concerns, and the need for a balanced approach to the use of the nation's shared natural resources.

Consistent with this goal, the Five Year Program anticipates future lease sales in the Alaskan Arctic. More specifically, the Program identifies a potential 2016 sale in the Chukchi Sea and a 2017 sale in the Beaufort Sea. These potential lease sales are proposed to be held later in the Program because there already are a large number of leases that are awaiting exploration and development. In addition, important new information is being collected from the exploratory activities and vigorous scientific studies that are now underway.

This approach is consistent with the responsibly cautious approach that we are taking to oil development in the Arctic in order to account for its unique environmental resources. As we proceed, we are drawing from the best available science, and taking full account of the social, cultural, and subsistence needs of Alaska Natives. The Five Year Program also re-affirms existing protections for Arctic coastal areas by continuing to exclude certain areas from leasing, and by identifying an additional exclusion area near Barrow which Alaska Natives rely upon for subsistence whaling activities. The Bureau of Ocean Energy Management (BOEM) also has indicated its intent that future Arctic lease sales will be tailored to appropriate offshore areas, based on factors that include industry interest, resource potential, subsistence hunting and fishing, wildlife, and environmental sensitivities.

Onshore Development

We have pursued the same balanced development approach for onshore oil and gas development in Alaska's National Petroleum Reserve (NPR–A). Developing the energy resources of the NPR–A will help us to enhance domestic energy production and meet our nation's energy demands while decreasing our dependency on foreign oil sources. Secretary Salazar announced in August the preferred alternative for managing the 22.5 million acre NPR–A. This proposed plan will help harness the oil and gas potential of the NPR–A while also protecting wildlife and subsistence rights of Alaska Natives.

As part of that process, the Department engaged in unprecedented outreach to local communities, industry, and other stakeholders, and reviewed more than 400,000 comments. After a thorough analysis, BLM developed a proposal under which approximately 11.8 million acres, covering the large majority of estimated of oil and gas resources in the NPR–A, will be available for leasing. This area is estimated to hold approximately 549 million barrels of discovered and undiscovered economically recoverable oil and approximately 8.7 trillion cubic feet of discovered and undiscovered economically recoverable natural gas. But some sensitive areas, including some key subsistence hunting areas and the unique migratory bird stronghold in the Teshekpuk Lake area, one of the largest Arctic lakes in the world and summer home for hundreds of thousands of waterfowl, will not be eligible for leasing.

This proposed plan strikes the right balance between these important interests.

The proposal also makes clear that if pipelines and infrastructure are needed, including potential pipelines from the north and west, they can be accommodated fol-

lowing project-specific reviews and decision-making in accordance with existing law. Once this new management plan is finalized, it will provide industry with added certainty about where and how development can move forward in the NPR–A.

And at the end of last month, the Department announced that the BLM will hold its second oil and gas lease sale in the past year on November 7, 2012, in Anchorage. The sale will include 400 tracts and cover approximately 4.5 million acres in the NPR–A. This sale further responds to President Obama's direction in May 2011 that annual oil and gas lease sales be conducted in the NPR–A. The previous sale in the NPR–A, last December, made 283 tracts and three million acres available.

Alaska Interagency Working Group

Alaska and its resources are clearly an important part of our nation's energy future. We believe that we are making good, common-sense decisions on all of these Arctic development issues, based on the best science available and input from the State, municipalities, Alaska Natives and other stakeholders. And we are continuing to foster new and innovative methods for better informed and coordinated decisionmaking.

Under Executive Order 13580, issued July 20, 2011, the President established the Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska in order to facilitate the orderly and environmentally sound development of renewable and conventional energy in Alaska. The President appointed me, as the Deputy Secretary of the Department of the Interior, to serve as chair of the Alaska Interagency Working Group. Under the Executive Order, the Alaska Interagency Working Group is charged with coordinating permitting activities among the many agencies that have permitting-related authority. As noted above, many of the primary permitting responsibilities reside in the Department of the Interior, but other agencies involved in many projects include the National Oceanic and Atmospheric Administration, the Environmental Protection Agency, the U.S. Army Corps of Engineers, and the Coast Guard.

Through the President's Executive Order and operation of the Alaska Interagency Working Group, we have for the first time created a coordinating vehicle for that provides clearer access to decision-makers for all stakeholders with an interest in proposed development activity, and more certainty for companies that want to do business in Alaska and the Arctic. To be clear, the Alaska Interagency Working Group does not tell agencies how they should make decisions under the authorities that Congress has given them, but it sets an expectation that the participating agencies will actively communicate with each other and respect reasonable timelines. And this is paying dividends in better coordinated permitting and decisionmaking.

For example, the Alaska Interagency Working Group has consistently helped to facilitate coordination and collaboration between agencies as they considered requests by Shell, related to their proposed exploratory drilling activities in the Chukchi and Beaufort Seas. Relevant agencies worked together through their respective approval processes, each upholding their specific requirements on parallel, coordinated schedules. The working group also provided a forum for input by municipalities, Alaska Natives and other key stakeholders. This feedback helped agencies to develop the specific conditions of program approvals—for example, a measure included in the approval of Shell's Exploration Plan for the Chukchi Sea designed to mitigate the risk of an end-of-season oil spill by requiring Shell to leave sufficient time to implement cap and containment operations as well as significant clean-up before the onset of sea ice, in the event of a loss of well control.

This cross-agency effort helped to ensure that Shell had a clear, holistic understanding of the Federal Government's expectations, and what they needed to do in order to comply. Moreover, coordination between agencies has proved invaluable over the past months, as agencies worked through last-minute issues, often on tight timelines, in preparation for potential activity this summer. Ultimately, Shell is moving forward with certain drilling activities in both the Beaufort and Chukchi Seas as it prepares for potential additional exploration and development activities in the future.

As we made clear from the start, Shell's approved operations must meet the rigorous safety, environmental protection, and emergency response standards that the Department has put in place for the Arctic. Bureau of Safety and Environmental Enforcement inspectors are on each of Shell's drilling rigs full-time, carefully overseeing those activities. Shell has shown a commendable commitment to meeting these standards, and we will continue to work with Shell for the remainder of this year and into the future. As you know, Shell is currently conducting top-hole drilling activities in non-hydrocarbon bearing zones in both the Beaufort and Chukchi seas.

The collective experience gained in the course of our preparations for this summer's activities, in terms of organizing, testing and deploying emergency and response equipment, vessels and personnel, is invaluable and will serve us well into the future. We also expect that this summer's activities will yield important information about weather and sea ice conditions, coastal and ocean currents, biological data, as well as sea floor mapping. Much of this information will come from Shell's activities, and the Alaska Interagency Working Group has provided an important mechanism to help agencies to coordinate their own information-gathering and analytical efforts in order to maximize the extent to which new information is leveraged and incorporated into decision-making processes.

Strengthening the Role of Science and Adopting an Integrated Management Approach for the Arctic

The Alaska Interagency Working Group is also working to strengthen the role of science in agency management decisions related to energy development in the Arctic.

As noted above, the Department draws from the best available science as we develop our leasing and management plans, an approach that is critical when addressing energy and other development issues in the fragile Arctic. There is an enormous amount of scientific research underway in the Arctic, and the Alaska Interagency Working Group is helping to improve the lines of communication between the scientific community, decision-makers, and the public so they can work together to answer key questions.

As an outgrowth of the discussions that our Alaska Interagency Working Group has had with the science community, and the need that I have identified, as Chair, to improve the interface of the science community with decision-makers and to adopt a more holistic approach when making project-based decisions in Alaska—and particularly in the Arctic—the Alaska Interagency Working Group has been asked to prepare a report to the President by the end of this year that will address two issues:

1. The establishment of a centralized hub of scientific information to help inform decision-makers and the public; and
2. The development of a framework for building a more integrated approach to evaluating potential infrastructure development in the Alaskan Arctic.

With regard to the first issue, the Interagency Working Group is partnering with the Arctic Research Commission and its chair, Fran Ulmer, and other members of the scientific community to develop a centralized and accessible database of scientific information and traditional knowledge relevant to resource management in the Arctic. This will provide more and better access for all decision makers—whether they are State, Federal or local—to a centralized hub or portal for this information to help inform decision-makers and the public. Never before has there been an effort to pull together this range of scientific information on the Arctic into a single portal for access by all.

The initiative will build upon existing data collections, such as the North Slope Science Initiative's Data Catalogue, Arctic ERMA, ocean.data.gov, regional observing systems, private industry and the University of Alaska's Geographic Information Network of Alaska, and it will complement existing interagency efforts like the Interagency Arctic Research Policy Committee, which is developing a five-year plan for Arctic research covering FY 2013–2017. Special consideration will be given to ensuring that cultural and traditional knowledge are fully integrated.

Our work on the second issue will address the potential development of an "Integrated Arctic Management" framework for evaluating potential infrastructure development in the Alaskan Arctic. We recognize that with the burgeoning interest in the Arctic—domestically and internationally—and anticipated growth in energy development, shipping, tourism, and the like, traditional subsistence lifestyles and a sensitive environment may be impacted. It is important that, given these challenges, we make decisions based on good science, traditional knowledge, and with an eye toward the future. Simply put, today's decisions should be made in a broader context that looks down the road and considers what decisions may be put in front of us tomorrow.

Working closely with the State of Alaska, Alaska Natives, local communities, and the many agencies and stakeholders that have been focusing on specific projects or regions, the framework will complement the efforts of the National Ocean Council and pull together Arctic-wide information that is relevant to future decision-making, including ecologically and culturally important areas, natural resources and processes, and key drivers of environmental changes in the Arctic; trends, environmental and otherwise, that affect these resources over time; and commercial, soci-

etal, and governmental trends that could lead to future infrastructure related needs in the Arctic.

This type of approach will assist in making sound decisions regarding potential future infrastructure development in the Arctic as it recognizes the importance of a comprehensive approach in the Arctic, rather than evaluating activities on a sector-by-sector, project-by-project, or issue-by-issue basis.

Renewable Energy Development

Before I close, let me also mention that the Alaska Interagency Working Group is pursuing an aggressive renewable energy agenda and is working to facilitate the development of wind, biomass, and hydropower across Alaska, with a special focus on delivering affordable, reliable energy to remote villages located off the electricity grid. In particular, our Working Group is collaborating with the State of Alaska, industry, Alaska renewable energy experts, and native community representatives to develop practical and, to the extent possible, replicable small-scale wind-diesel energy technologies for villages off the grid in Alaska. The potential upside here is enormous, both for the Alaska Native villages and for the promise that such systems might hold for other isolated villages around the world.

Conclusion

President Obama has stressed the Administration's commitment to a comprehensive, all-of-the-above energy strategy to both grow America's energy economy and continue to reduce our dependence on foreign oil. America's public lands and Federal waters provide resources that are critical to the nation's energy security. We at the Department are doing our part to ensure that development of the resources under our jurisdiction is carried out in a manner that balances our statutory conservation and development missions, and we are committed continuing to advance better coordinated Federal permitting and decisionmaking across government.

We have put in place a process that will facilitate targeted development to the right places at the right time, and to reconcile this development with the protection of sensitive or special habitats. And through the Alaska Interagency Working Group, we are better coordinating Federal permitting activities and working to strengthen the role of science in agency management decisions related to energy development in the Arctic.

Mr. Chairman, thank you again for the opportunity to be here today to discuss these important issues. I am happy to answer any questions that you or the Committee may have.

Senator BEGICH. Thank you very much, Mr. Hayes.

Let me interrupt, if I can. I know, Admiral Ostebo, you are next, but I also had a note which is good news. The Coast Guard I think issued their Certificate of Inspection on the *Arctic Challenger* today or yesterday. This is the ship that we were waiting for, it had a lot of issues with it, but they went through what I call the punch list, and made sure it met the standards that the Coast Guard had. So, that was really good news to hear today.

STATEMENT OF REAR ADMIRAL THOMAS P. OSTEBO, COMMANDER, SEVENTEENTH DISTRICT, U.S. COAST GUARD

Admiral OSTEBO. Yes, sir. We have issued the COI, Certificate of Inspection.

Senator BEGICH. We like good news like that. I bet Shell likes good news like that.

Admiral OSTEBO. Sir, again, it's great to see you, although I would prefer to be in a helicopter out on one of our cutters again. That would be a lot more fun, but this is important, and it is——

Senator BEGICH. I'll make you feel like you're in a helicopter.

[Laughter.]

Admiral OSTEBO. Yes, sir.

This is a timely hearing, and I'd echo what Deputy Secretary Hayes said, that there are a lot of lessons learned, and this really couldn't have come at a better time.

So if I may, sir, good morning, Senator Begich, distinguished colleagues. I am honored to join you here today for this important panel.

First and foremost, I want to thank you for your continued support of the U.S. Coast Guard, and especially of our hard-working men and women here in Alaska. It is my honor to lead them as we execute a portfolio of critical, demanding missions throughout our Alaskan environment.

Senator, I also want to thank you again for your personal time in visiting the Coast Guard Cutter BERTHOLF earlier this year in August. As you know, BERTHOLF is the lead ship in our national security cutter fleet, and it was a great honor to have you aboard there with Secretary Napolitano and Admiral Papp.

I also want to thank our colleagues throughout the State of Alaska for their proactive leadership, partnership, and interest in the maritime equities, and have joined with the Coast Guard in all the work we have to do.

Alaska's state, local and native leaders are also truly outstanding to work with, and I'm most grateful for their partnership and collaboration in so many areas. We truly couldn't do our work without them.

I am pleased to report that the Coast Guard in Alaska is ready to meet today's missions. We are ready to assist those in distress and to work collaboratively to prevent and respond to oil spills and other concerns with our partners. We remain committed to protecting the nation's largest fisheries here in Alaska. A large part of that is in the Bering Sea itself.

Maritime activity in the most remote regions of Alaska continues to grow. This includes the drilling operations in both the Chukchi and the Beaufort Sea; foreign tankers and commercial vessels on the Northern Sea route, the Northwest Passage that exit through the Bering, and also transit through one of the world's richest fishing grounds; research vessels continue to increase offshore; cruise ship activity around Alaskan communities on the North Slope and in a lot of places where they haven't been before. Commercial transit through the Bering Strait Unimak Pass also continues to increase from year to year, and we follow these trends closely as we work to be prepared for the operational requirements in the years ahead.

We must also continue to refine our ability to provide and to support persistent presence and capability and operational presence in the Arctic and wherever human activity and environmental risks grow. This is why Operation Arctic Shield 2012 and our expanded work in the Arctic is so important. During the past 5 months, we have deployed the National Security Cutter BERTHOLF, and High-Endurance Cutter ALEX HALEY, two of our 225-foot ocean-going light-ice-capable buoy tenders, and we have repositioned two HH–60 Jayhawks, our newest and most capable helicopters, to Barrow to provide persistent presence as we tested and deployed the Oil Spill Recovery System in the Arctic for the first time. We gained many lessons learned in the high latitudes.

Strategically, Arctic Shield 2012 focused on three specific areas. One was outreach; two, operations; and three, assessing the capabilities that we currently have and looking to the future for those

that we'll need. Although this season wasn't as successful or wasn't as big as we had hoped as far as Secretary Hayes had mentioned with the weather and other concerns, we did learn much this year.

This summer we had over 16 engagements in our partnership role with 33 Arctic communities. We brought medical, dental and veterinary services throughout the North Slope. We conducted consultation and coordination with our Native communities and leaders regarding Coast Guard operations and the operations of industry offshore. We worked with public education Kids Don't Float fishing vessel inspections and recreational boat and ice safety training. All in all, we devoted over 1,000 hours of public service with our fine Coast Guardsmen across the North Slope. Our partnerships are critically important.

Operationally, we learned a lot this year, sir. We learned how our ships operate. We learned where the pivotal points are with communications and capability and working in the Arctic in the long run.

Infrastructure and atmospheric propagation causes a lot of trouble with communications. We know that's going to be a critical node in the future not only for the Coast Guard but for our DOD partners, for our interagency partners as we look to the expansion of activities in the Arctic. We're going to have to address that as Job 1, sir.

And finally, regarding our capabilities, we had a very productive test of our Oil Spill Recovery System in the Arctic. That was the first time it's been above the Arctic Circle. We realize it does not work in icy waters, but it does work effectively in the open waters of the Arctic, as we learned this summer.

Sir, in closing, I am grateful for your interest in the U.S. Coast Guard and for your support of all of our efforts this summer. It has been truly an historic summer for our forces, and I couldn't be more proud of the people that serve your state here in Alaska. The men and women of the Coast Guard Alaska are ready today and prepared for tomorrow. Through courage, determination and proficiency, we will continue to set the standard for mission execution nationally and provide frontline services here in your state.

Thank you very much for the opportunity to testify, and I look forward to your questions.

[The prepared statement of Admiral Ostebo follows:]

PREPARED STATEMENT OF REAR ADMIRAL THOMAS P. OSTEBO, COMMANDER, SEVENTEENTH DISTRICT, U.S. COAST GUARD

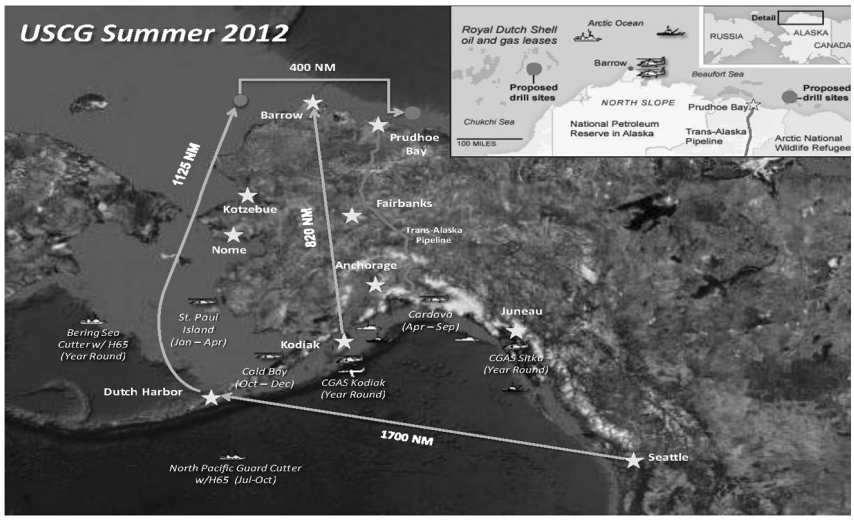
Senator Begich and distinguished colleagues, thank you for the opportunity to join you today. I am pleased to discuss Coast Guard Arctic responsibilities and operations. This past summer we prepared for Arctic activity driven by the oil industry's planned drilling operations in the Chukchi and Beaufort Seas. Partnering closely with Federal, State, Local, and Tribal government partners, and working with industry as the regulated parties, the Coast Guard was ready for operations in the Arctic with *Operation Arctic Shield.* The lessons we learned this year will inform our planning and strategy, to ensure we remain always ready to ensure the safety, security and stewardship of the emerging maritime frontier of the Arctic.

Operation Arctic Shield 2012

Arctic Shield 2012 was a three pronged interagency operation in Alaska's coastal Arctic domain consisting of outreach, operations, and assessment of capabilities from February through October 2012. Outreach was comprised of delivering education, awareness and health services for Arctic communities and outlying native

villages. Operations involved deployment of major cutter forces, air assets, communication equipment, and mission support to conduct the Coast Guard's missions. Assessment of capabilities involved an analysis of our front-line operations and mission support assets in Arctic conditions. Additionally, an oil spill contingency exercise in Barrow, Alaska, tested Coast Guard and Navy skimming equipment launched from a 225-foot Coast Guard buoy tender. Arctic Shield 2012 was carefully tailored to deliver the appropriate set of capabilities to this remote area. I am very proud of our team in the Seventeenth Coast Guard District for bringing the Arctic Shield plan to fruition.

The following unclassified schematic outlined our planned force lay down for Arctic Shield 2012. The graphic demonstrates our key challenge—moving Coast Guard resources from our long-established bases in south Alaska to the emerging frontier of northern Alaska.



For the first time, we had two MH–60 helicopters in Barrow standing the watch and ready to respond. This meant that, readiness and weather permitting, we could meet a 30-minute launch window for imminent missions such as search and rescue, environmental protection and law enforcement. The following photo shows the MH–60s in their leased hangar in Barrow.

We deployed USCGC BERTHOLF, the first National Security Cutter, to the southern Arctic region, providing persistent operational presence, and command and

control, in areas where we lacked the permanent infrastructure of a coastal Sector. We also deployed two light-ice capable 225-foot ocean-going buoy tenders to increase offshore operational capability in the region.

The Coast Guard in Alaska and the Arctic Region

The Coast Guard has been operating in the Arctic Ocean since 1867, when Alaska was just a territory. Then, as now, our mission is to assist scientific exploration, chart the waters, provide humanitarian assistance to native tribes, conduct search and rescue, and enforce U.S. laws and regulations.

In Alaska, Coast Guard aircraft and vessels monitor more than 950,000 square miles off the Alaskan coast to enforce U.S. laws. We patrol an even larger area of the North Pacific Ocean to stop large-scale high seas drift netting and other illegal fishing practices, including foreign incursions into the U.S. Exclusive Economic Zone. We also conduct marine safety and environmental protection missions in the region.

To protect the Arctic environment, we are engaging industry and the private sector to address their significant responsibilities for pollution prevention, preparedness, and response. Recognizing that pollution response is significantly more difficult in cold, ice, and darkness, enhancing preventative measures is critical. Those engaging in offshore commercial activity in the Arctic must also plan and prepare for emergency response in the face of a harsh environment, long transit distances for air and surface assets, and limited response resources. We continue to work to improve awareness, contingency planning, and communications. We are also actively participating in the Department of Interior-led interagency working group on Coordination of Domestic Energy Development and Permitting in Alaska (established by Executive Order 13580) to synchronize the efforts of Federal agencies responsible for overseeing the safe and responsible development of Alaska's onshore and offshore energy.

While prevention is critical, the Coast Guard must be able to manage the response to pollution incidents where responsible parties are not known or fail to adequately respond. In 2010, we deployed an emergency vessel towing system north of the Arctic Circle. We have also exercised the Vessel of Opportunity Skimming System (VOSS) and the Spilled Oil Recovery System (SORS) in Alaskan waters, but we had yet to conduct exercises north of the Arctic Circle until this summer. Both of these systems enable vessels to collect oil in the event of a discharge, however, these systems have limited capacity and are only effective in ice-free conditions. As part of Arctic Shield 2012, we conducted the furthest northern deployment and testing of the SORS in the vicinity of Barrow.

Fisheries are also a concern in the region. The National Marine Fisheries Service, based upon a recommendation from the North Pacific Fisheries Management Council, has imposed a moratorium on fishing within the U.S. Exclusive Economic Zone north of the Bering Strait until an assessment of the practicality of sustained commercial fishing is completed. The Coast Guard will continue to carry out its mission to enforce and protect living marine resources in the high latitudes.

We are employing our Waterways Analysis and Management System to assess vessel traffic density and determine the need for improved aids to navigation and other safety requirements. We are also moving forward with a Bering Strait Port Access Route Study, in coordination with our international partners, which is a preliminary analysis to evaluate vessel traffic management and appropriate ship routing measures.

The Coast Guard continues to support international and multilateral organizations, studies, projects and initiatives. We are actively working with the Arctic Council, International Maritime Organization and their respective working groups. We are leading the U.S. delegation to the Arctic Council Oil Spill Task Force that is developing an International Instrument on Arctic Marine Oil Pollution Preparedness and Response. We are also conducting joint contingency response exercises with Canada and we maintain communications and working relationships with Canadian and Russian agencies responsible for regional operations including Search and Rescue, law enforcement and oil spill response. We maintain bilateral response relationships with Canada and Russia, and last month we hosted representatives from the Russian State Marine Pollution Control Salvage and Rescue Administration to sign an expanded Memorandum of Understanding and Joint Contingency Plan to foster closer cooperation in oil spill response. We will continue to engage Arctic nations, international organizations, industry, academia and Alaskan state, local and tribal governments to strengthen our partnerships and inter-operability.

Our engagement with Alaska Native Tribes continues to be highly beneficial. Our continued partnership has made our operations safer and more successful. We are working hard to ensure tribal equities are recognized, and that indigenous peoples

and their way of life are protected. We look forward to continuing to strengthen our partnerships with our Alaskan Native partners.

The Coast Guard continues to push forward and assess our capabilities to conduct operations in the Arctic. Since 2008, we set up small, temporary Forward Operating Locations on the North Slope in Prudhoe Bay, Nome, Barrow and Kotzebue to test our capabilities with boats, helicopters, and Maritime Safety and Security Teams. We also deployed our light-ice capable 225-foot ocean-going buoy tenders to test our equipment, train our crews and increase our awareness of activity. Additionally, each year from April to November we have flown two sorties a month to evaluate activities in the region.

Looking ahead over the next 10–15 years, the Coast Guard's regional mission profile will continue to evolve. Increasing human activity will increase the significance and volume of maritime issues, such as freedom of navigation, offshore resource exploration, and environmental preservation.

The Coast Guard in Context of National Arctic Policy

U.S. Arctic policy is set forth in the 2009 National Security Presidential Directive 66/Homeland Security Presidential Directive 25. For the past four years, as we are today with Arctic Shield 2012, we have been conducting limited Arctic operations during open water periods. However, we face many challenges looking into the future. Some Arctic operations demand specialized capabilities and personnel trained and equipped to operate in extreme climates. Our assessments of the nation's requirements for operating in ice-laden waters will consider infrastructure requirements to support operations, and requirements for personnel and equipment to operate in extreme cold and ice.

Given the scope of these challenges, we have been conducting oil-in-ice research since 2010 to evaluate, develop, and test equipment and techniques that can be used to successfully track and recover oil in any ice filled waters, and have explored promising technologies, such as heated skimmers. The Coast Guard's strategic approach is to ensure we pursue the capabilities in the future to perform our statutory missions so we can ensure the Arctic is safe, secure, and environmentally sustainable. This strategy is consistent with our Service's approach to performing its *Maritime Safety, Security and Stewardship* functions.

Conclusion

Arctic Shield 2012 was an appropriate plan to meet projected mission requirements this year. Moving forward, we will continue building our strategy using a whole-of-government approach that will inform national dialogue and policy development for this critical region.

While there are many challenges, the increasingly open Arctic Ocean also presents unique opportunities. We look forward to working with the Congress on how our Coast Guard can continue to support our national Arctic objectives, protect its fragile environment and remain *Semper Paratus*—Always Ready in this new ocean.

Thank you for the opportunity to testify today. I look forward to your questions.

Senator BEGICH. Thank you very much. And I will say, the Bertholf is an incredible piece of equipment, and just knowing what its capacity is. I think, that the work by being up there, the activity between you, the local community, as well as industry, well, because of the Coast Guard's presence I think nine lives you were able to identify that you had saved because of that equipment.

Admiral OSTEBO. Yes, sir. Yes, sir.

Senator BEGICH. It's a great piece of equipment, and I enjoyed flying on it, and you had a great crew there.

Admiral OSTEBO. Thank you, sir.

Senator BEGICH. Ms. Furgione, please.

STATEMENT OF LAURA K. FURGIONE, ACTING ASSISTANT ADMINISTRATOR FOR WEATHER SERVICES AND ACTING DIRECTOR, NATIONAL WEATHER SERVICE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE

Ms. FURGIONE. Good morning, Chairman, and thank you for the opportunity to come to Alaska again. As I said, things have been

much better for me personally in the last 24 hours, so I appreciate the opportunity to be here with you and to testify before you again. I was with you in Barrow on your first hearing in the field.

My name is Laura Furgione. I am the Acting Director for the National Weather Service, which is a part of NOAA, the National Oceanic and Atmospheric Administration. This year in the Arctic, we have witnessed the lowest sea ice extent on record. That's 18 percent below the previous minimum that I was up here to experience firsthand in 2007, and 49 percent below the 1979–2000 average. As sea ice retreats, the Arctic waters become more accessible. That creates increasing needs for scientific information and emergency response preparedness and assistance.

NOAA plays a critical role in the Arctic by providing information, knowledge and services to allow folks to live and operate safely here in the Arctic. A strategic approach to leveraging across all agencies is essential for the United States to take advantage of emerging economic opportunities without causing irreparable harm to our precious and fragile resources here in the Arctic.

As interest and activities continue to expand in the Arctic, NOAA is receiving increasing requests for longer-range weather forecasts and warnings, detailed sea ice forecasts, and more accurate nautical charts. We strive to meet the needs of our stakeholders and partners, including the Coast Guard, the State of Alaska, and the Department of Interior in our collective effort to protect lives and property and support sound decisions for managing those resources.

The Arctic region has very little information infrastructure needed to provide weather forecasts and warnings of the caliber we have come to expect in the Lower 48. Thus, data from polar orbiting satellites, as you mentioned before, is critical to feed our real-time forecasting and warnings such as the Rapid Sea Ice Formation and Severe Storms. With your support in Fiscal Year 2012, NOAA has made significant progress, gained momentum, and established a foundation to move the JPSS, the Joint Polar Satellite System, forward.

Even with this support, NOAA could still face a data gap in the U.S. Civilian Polar Orbiting Satellites, which both civilian and military users rely upon. This critical piece of national infrastructure will be instrumental at a time when the Arctic development is expected to ramp up significantly.

Sea ice poses a specific forecasting challenge. Sea ice formation in the Arctic Ocean is complicated, and it's a process related to many environmental factors. Nonetheless, we are able to predict sea ice development and movement with varying degrees of uncertainty and certainty. Between the National Ice Thinner, which is a NOAA-Navy-Coast Guard partnership, and the National Weather Service here in Alaska, we're able to serve the U.S. Arctic with daily sea ice forecasts and analysis 5 days a week, and we hope to expand to 7 days a week.

NOAA is also focused on improving its Arctic Marine Transportation Services to support safe, environmentally sound navigation and economic development. Currently, Alaska has limited tide and current data, obsolete shoreline and hydrographic data, and in fact most of the Arctic waters that have been charted were surveyed

long ago, back to the Captain Cook days. As a result, confidence in the region's nautical charts is very low. NOAA's Arctic Nautical Charting Plan that was developed in 2011 identifies 17,000 miles of Alaska coastline and 240,000 square nautical miles of navigationally significant waters in need of surveying. To that end, we completed surveys of Kotzebue Sound, the Kuskokwim River, and the Krenitzin Islands in 2011.

In 2012, the NOAA ship *Fairweather* conducted a reconnaissance survey north through the Bering Strait to the U.S.-Canadian border to help prioritize survey needs for 2013 and beyond.

As energy exploration and transportation activities increase in the region, NOAA and our interagency partners are actively preparing for potential emergencies. NOAA is the lead scientific support agency to the Coast Guard during a marine oil spill response or a pollution threat. NOAA and its partners have developed an Environmental Response Management Application, otherwise known as ERMA, for the Arctic region. This is a Web-based geographic information system that will help emergency responders and environmental resource managers deal with spills and environmental damage. We thank the Interior Department for their support of the Arctic ERMA.

NOAA also enjoys a close working relationship with the Coast Guard in the Arctic, and across the Nation. We thank them for their hard work and willingness to partner on our shared missions.

Moving forward, Federal investments are needed as energy companies transition from exploratory oil and gas activities to production. Obtaining additional environmental observations and improved forecast modeling, nautical charts and response preparedness has all required significant effort from the Federal community and are critical to our successful and sustainable economic development in the region. As Deputy Secretary Hayes mentioned, the President has requested an interagency working group on coordination of domestic energy development and permitting in Alaska. NOAA is managing the writing of this report, which will address key components of an integrated Arctic management framework for evaluating potential infrastructure development in the Arctic.

There is a great deal of work to be done. NOAA is committed to strengthening Arctic science and stewardship in collaboration with our partners in order to provide information products and services needed by our stakeholders.

Thank you for the opportunity to appear before you today, and I look forward to answering any of your questions. Thank you.

[The prepared statement of Ms. Furgione follows:]

PREPARED STATEMENT OF LAURA K. FURGIONE, ACTING ASSISTANT ADMINISTRATOR FOR WEATHER SERVICES AND ACTING DIRECTOR, NATIONAL WEATHER SERVICE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE

Chairman Rockefeller, Ranking Member Hutchison, Senator Begich, and distinguished members of the Committee, thank you for the opportunity to submit testimony on preparations for, and lessons learned from, the first season of drilling in the Arctic. My name is Laura Furgione, Acting Assistant Administrator for Weather Services of the National Oceanic and Atmospheric Administration (NOAA). This year in the Arctic we have witnessed the lowest sea ice extent on record, 18 percent below the previous minimum in 2007 and 49 percent below the 1979 to 2000 average. Shifts in ocean ecosystems are evident from the Aleutian Islands to Barrow,

Alaska and across the Arctic Ocean, due to a combination of Arctic warming, natural variability, and sensitivity to changing sea ice conditions. As sea ice retreats, the Arctic waters become more accessible, creating cascading needs for scientific information and emergency response planning.

As the maritime community anticipates a future open Arctic trade route, and as the energy industry anticipates and prepares for years of oil and gas exploration in the Chukchi and Beaufort Seas, this hearing puts a well-deserved spotlight on emerging Arctic opportunities and challenges, as well as the Federal Government's role in helping the United States (U.S.) to safely and sustainably manage the use of its Arctic resources. One of NOAA's missions is gathering and disseminating environmental information for situational awareness, economic decision-making, and public safety. We are receiving more requests for services such as detailed Arctic weather forecasts and severe storm warnings, better short-and long-term sea ice forecasts, and more comprehensive and up-to-date nautical charts. NOAA also stands ready to deliver on its other core science and stewardship roles, such as providing baseline data for fisheries management and protected species and ecosystems, understanding how oil behaves in frigid waters, and assisting with emergency response.

Federal agencies with Arctic responsibilities must work together to maximize effectiveness and continue to generate the sound science necessary for upholding these responsibilities. Dr. Jane Lubchenco, Under Secretary of Commerce for Oceans and Atmosphere, told U.S. Coast Guard (USCG) Academy Cadets this past April, "Nowhere is the need for partnerships, stewardship, and leadership seen more keenly than in the Arctic." In my testimony, I will describe NOAA's contributions to a unified Federal Government approach that supports safe and environmentally sustainable economic activity in the Arctic, including oil and gas exploration.

NOAA's Arctic Vision and Strategy

After listening to what Arctic stakeholders said they needed via various means, including public comment, Alaska/regional meetings with stakeholders, and conversations with sister agencies on their Arctic requirements, in 2011 NOAA developed a comprehensive Arctic strategy that integrates and aligns our numerous and diverse capabilities within the broader context of our nation's Arctic policies and research goals. NOAA's Arctic Vision and Strategy[1] has six priority goals to directly support the efforts of our local, state, Federal, and international partners and stakeholders. NOAA has since organized its Arctic efforts around these goals:

1. Forecast Sea Ice
2. Strengthen Foundational Science to Understand and Detect Arctic Climate and Ecosystem Changes
3. Improve Weather and Water Forecasts and Warnings
4. Enhance International and National Partnerships
5. Improve Stewardship and Management of Ocean and Coastal Resources in the Arctic
6. Advance Resilient and Healthy Arctic Communities and Economies

These goals were selected because they represent areas where NOAA can address and provide leadership on urgent and timely issues that meet two key criteria: providing the information, knowledge, and policies to meet NOAA mandates and stewardship responsibilities and providing the information, knowledge, and services to enable others to live and operate safely in the Arctic. A strategic approach to leveraging our strengths and those of other Federal agencies with Arctic missions is essential for the United States to take advantage of emerging economic opportunities there without causing irreparable harm to this fragile region.

NOAA's Arctic Tools and Products

Within NOAA's existing capacity for Arctic action, we have had some successes in implementing our strategic goals, particularly those relating directly to improving stewardship on management of coastal resources and advancing communities and economies, such as marine transportation and oil and gas exploration. Additionally, NOAA has been working with its Federal partners through the National Ocean Council to implement actions to improve Arctic environmental response management and sea ice forecasting, enhance Arctic communications systems, and advance Arctic mapping and charting.

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[1] *http://www.arctic.noaa.gov/docs/arctic_strat_2010.pdf.*

Weather and Sea Ice Forecasting

NOAA delivers public, marine, and aviation weather forecast services to protect life and property, enhance the economy and fulfill U.S. obligations under international treaties for the safety and security of marine transportation, oil and gas exploration, and tourism activities, and to protect northern and western Alaska coastal communities from storm surge and other hazards. Major stakeholders and partners, including the USCG and the State of Alaska's Division of Homeland Security and Emergency Management, require more accurate weather and water information for planning and decision making to protect lives, property, and manage the region's many resources. For example, we learned during Hurricane Irene that it takes seven hours to evacuate Connecticut's coastal residents. By contrast, it takes 24 daylight hours to evacuate the villages along Alaska's west coast where hurricane-strength storms are becoming more frequent, impressing the need for more accurate and advanced notice regarding potential hazards. Since road systems are not viable transportation options in Alaska, Arctic populations rely heavily on aviation and marine weather for safe transportation and access to goods and services.

Weather prediction in the Arctic is generally not of the same accuracy, resolution (temporal and spatial), and reliability as similar products over the lower 48 states and mid-latitudes. The Arctic region has very little of the information infrastructure needed to provide weather forecast and warning services of a caliber comparable to the mid-latitudes. A primary reason for this discrepancy is the relative scarcity of field observations to support meteorological and oceanographic modeling and environmental observations and studies supporting weather and ice forecasts. Existing observations are highly limited in both geographic scope and frequency. The Arctic region also presents unique numerical modeling challenges with respect to the dynamic coupled interaction of the ocean, sea ice, and atmospheric processes both in near- and long-term prediction scales. For example, there is inadequate real-time meteorological data in U.S. Arctic waters to support accurate forecasting of ocean storms, which have the potential to threaten marine transportation, offshore oil and gas operations, and the Arctic coastal communities.

Sea ice formation in the Arctic Ocean is a complicated process related to many environmental factors, including: winds, temperatures, and radiation that vary over time; surface and sub-surface ocean temperatures, water salinity, ocean currents; and antecedent ice conditions. Despite these complexities, there are techniques that can be used to formulate some objective sea ice freeze-up guidance with varying degrees of uncertainty. NOAA employs many methods to forecast the development and movement of sea ice in the Arctic, including analog, dynamic sea ice models, and statistical methods. Considerable uncertainties in long-term sea ice forecasting and a rapidly changing baseline in the Arctic make it difficult to provide a precise date for the timing of sea ice freeze-up in the open water or in the many communities along Alaska's coastline. Accordingly, NOAA uses a probabilistic approach when possible, and delivers information in simpler terms (ranges of most probable dates) for the public. NOAA maintains strong relationships with its customers and stakeholders, providing briefings and outlook information to support tactical and strategic operational decision-making for the Arctic. In addition, NOAA partners with the U.S. Navy and USCG to operate the National Ice Center in Suitland, Maryland, which delivers global scale operational analyses and forecasts of sea ice conditions to a broad constituency of national and international users. NOAA's sea ice operations in Alaska and Maryland collaborate to provide daily products serving the U.S. Arctic five days a week. NOAA, along with the National Aeronautics and Space Administration and the National Science Foundation, also supports the National Snow and Ice Data Center within the Cooperative Institute for Research in Environmental Sciences at the University of Colorado, where a vast array of Arctic data are collated, managed, and made available to both academic and public users. NOAA has been implementing an ongoing expansion of the U.S. Climate Reference Network in Alaska with an aim to continue reducing the uncertainty in temperature and precipitation trends, which is critical to the accurate characterization of climate variability and change.

Currently, NOAA uses *in situ,* airborne, and satellite technologies to inform the meteorological and oceanographic datasets that generate forecasts in the Arctic. NOAA's international partners also contribute meteorological information to these datasets. However, to improve local and global forecasts in this region, new *in situ* and airborne technologies would be needed to enhance forecast coverage in the Arctic. Science and technology will need to be leveraged based on advanced numerical models, including being able to depict and convey ranges of uncertainty in the predictions. Improved Earth system models will include coupling of atmosphere, ocean, land, and ice at local, regional, and global scales. Improving forecasts of sea ice, on all but the shortest time periods, requires parallel improvement in general weather

forecasts, especially wind forecasts as wind speed and direction are key drivers of ice dynamics at this scale driving the requirement for increased wind observations.

Satellites

In data-sparse areas like Alaska, polar-satellite data are critical to weather forecasting, an essential component of aviation safety. Light aircraft aviation is a $400 million a year industry in Alaska, and since many Alaskan communities are not accessible by roads, residents often rely on aircraft as a primary mode of transportation. Furthermore, since geostationary satellite coverage is not available in large areas of the Arctic, NOAA's Search and Rescue beacon program relies heavily on polar-orbiting satellites to receive signals from distressed mariners and aircraft personnel. Although we experienced funding instability in FY 2011, with the support from Congress in FY 2012 ($924.0 million for polar orbiting satellites), NOAA has made significant progress, gained momentum, and established a foundation to move the Joint Polar Satellite System (JPSS) program forward. NOAA could still face a data gap beginning in 2016 in the U.S. civilian polar orbit if the Suomi NPP mission were to cease operations at the end of its projected life in 2016 before JPSS–1 becomes fully operational. Data from NOAA's polar orbiting satellite are critical in real-time forecasting and warning of events such as rapid sea ice formation and storms carrying hurricane force winds that are major hazards for life, property, and economic activities in the Arctic. This critical piece of national infrastructure will be instrumental at a time when Arctic development is expected to ramp up to protect U.S. assets in this region. NOAA is doing everything it can to minimize the potential data gap.

Marine Transportation

NOAA recognizes both the value and the challenge of improving the marine transportation system in Arctic waters. Currently, Alaska has limited geospatial infrastructure; sparse tide and current measurements and predictions; obsolete shoreline and hydrographic data; and poor nautical charts. Most Arctic waters that have been charted were surveyed with obsolete technology, some dating back to the 19th century, before the region was part of the United States. In addition, the large scales of most of the charts are not detailed enough to adequately support coastal navigation. As a result, confidence in the Arctic region's nautical charts is low.

NOAA policy places a high priority on updating nautical charts needed by the ever-increasing number of commercial shippers, tankers, passenger vessels, and fishing fleets transiting the Alaskan coastline. NOAA's Arctic Nautical Charting Plan, issued in June 2011, provides a strategy for additions and improvements to nautical chart coverage in U.S. Arctic waters and describes the activities necessary to produce and maintain charts suitable for safe navigation. The plan identified 17,000 miles of Alaskan coastline, and 240,000 square nautical miles of navigationally significant waters in need of new or updated surveying. Since 2007, NOAA has acquired approximately 2,950 square nautical miles of hydrographic data with modern survey methods (multibeam sonar) in the U.S. Arctic. In 2011, NOAA completed surveys in Kotzebue Sound, Kuskokwim River, and the Krenitzin Islands. In addition to updating existing charts, NOAA created a new chart of Kotzebue Sound.

In order to leverage NOAA's resources, NOAA is building on both public and private sector partnerships, domestically and internationally, to find complementary sources of data that strengthen our knowledge of the Arctic environment and improve science-based decision making. For example, NOAA signed an innovative data sharing MOA with oil companies doing work in the Arctic and has a growing relationship with USCG aimed at most effectively utilizing bathymetric data collected by USCG ships in the Arctic.

NOAA has expanded efforts to foster international collaboration on hydrographic surveying, nautical charting, and other mapping activities through our role as U.S. representative to the International Hydrographic Organization. In this capacity, we worked to establish an Arctic Regional Hydrographic Commission with Denmark, Canada, Norway, and Russia to facilitate coordination and data exchange in the region.

U.S. collaboration with Canada has resulted in several years of an effective partnership to conduct joint seafloor mapping missions of the Arctic extended continental shelf (ECS). Per criteria set forth in Article 76 of the Law of the Sea Convention to define ECS and in preparation for determining and submitting limits of the U.S. ECS in the Arctic, NOAA and the U.S. Geological Survey worked with Canada to acquire hydrographic and geological data using the USCG Cutter *Healy* and the Canadian icebreaker *Louis St. Laurent*. As of September 2012, the U.S. ECS project has mapped 106,710 square nautical miles of offshore seafloor bathymetry in the Arctic Ocean to support this effort. In fact, USCG Cutter *Healy* just completed a

five-week mapping cruise in the Arctic, collecting 20,000 square nautical miles of additional bathymetric and geologic data necessary to delimit the U.S. ECS in the high Arctic. Ancillary partnership projects leveraged aboard the *Healy,* such as an Arctic ocean acidification study and an ice buoy study, are also amassing data that will provide a better scientific understanding of the ecological processes on our continental margins, and new insights into climate variability, marine ecosystems, undiscovered or unconventional energy, mineral resources, and environmental triggers for extreme events, such as earthquakes and tsunamis. The U.S. could significantly advance our economic interests in the Arctic with respect to ECS and other activities by ratifying the Law of the Sea Convention.

To provide the foundational positioning framework supporting the above activities, NOAA is building on existing partnerships to acquire gravity data in Alaska. NOAA aims to achieve 80 percent coverage north of the Arctic Circle by the end of FY 2013. This project, Gravity for the Redefinition of the American Vertical Datum, will reduce elevation measurement positioning errors from multiple meters to two centimeters or less. The improved accuracy will help coastal communities and the private sector develop climate change adaptation strategies and make better informed decisions on infrastructure hardening, erosion and flood controls. NOAA is utilizing the Continuously Operating Reference Station (CORS) program and its partners to fill critical gaps in CORS coverage for Alaska. Although there are almost 100 active CORS in Alaska's CORS Network, less than two dozen CORS stations are in the Alaskan Arctic: nine sites along the Aleutian Chain, six in Arctic coastal areas of the Bering Sea, and seven along the North Slope.

In addition to new partnerships, NOAA is also looking at new technologies, such as sonars and autonomous vehicles that can be force multipliers for our existing resources. We are taking innovative steps to prioritize the charting of unsurveyed areas to minimize risk to shipping. In late September, the NOAA Ship *Fairweather* completed a 30-day reconnaissance survey to evaluate a sparsely surveyed 1,500-nautical mile coastal corridor (last measured by Captain James Cook in 1778) from Dutch Harbor through the Bering Strait and extending east through the Chukchi and Beaufort Seas to the U.S.—Canadian maritime boundary. Analysis of this mission will help NOAA define the highest priority survey projects in the Arctic.

Tides and Currents

NOAA is evaluating the technology and strategies needed for long-term monitoring of tides, water levels, and currents under harsh Arctic conditions. In 2008, NOAA developed an innovative system to collect water level data in remote, cold climate regions where winter sea ice precludes traditional tide station installations. In August 2008, two specially designed bottom-mounted water level gauges were deployed approximately two miles off the coast of Barrow, Alaska, in 100 feet of water. The systems were equipped with a high-stability pressure sensor, conductivity sensor, and acoustic, modern, disposable ballast, and a pop-up buoy for recovery. Both systems were recovered one year later, in August 2009, and re-deployed to collect a second year of water level, water temperature, and salinity data with recovery in August 2010. The data obtained represent unique data sets collected by NOAA on the North Slope of Alaska, and the results have already contributed to an improved vertical reference system for the region.

Existing tidal observations, along with many others, are available through the NOAA Integrated Ocean Observing System (IOOS) regional partner in Alaska, the Alaska Ocean Observing System (AOOS). IOOS, along with AOOS and other regional partners, addresses regional and national needs for ocean information, gathers specific data on key coastal and ocean variables, and ensures timely and sustained dissemination and availability of these data. AOOS released a new Arctic data portal in September 2012 that provides access to several thousand information layers ranging from habitat type to climatic regimes to research instruments. The Arctic data portal will be the foundation for a new set of tools focused on the northern Bering and Chukchi Seas region. These tools will assist with future conversations including shipping, local planning, climate change strategies, and oil and gas development.

Spill Response

As Arctic sea ice continues to melt and thin, energy exploration and transportation activities will be increasing in the region, escalating the risk of oil spills and accidents. In anticipation, NOAA and interagency partners are actively preparing for possible emergencies. As the lead agency for scientific support to the USCG during an offshore oil spill response or pollution threat, NOAA's expertise in pollution response and impact science will be critical in the event of an Arctic oil spill and subsequent Natural Resource Damage Assessment (NRDA) preparedness. Currently,

NOAA has one permanent Scientific Support Coordinator located in Anchorage, who actively participates in spill readiness exercises, and is working to improve data on the Artic environment and toxicity of hazardous materials. Over the last 25 years NOAA has assisted in over 100 oil spill drills and over 200 spill responses in Alaska, advising the USCG on oil trajectories, oil fate and weathering, use of spill countermeasures such as *in situ* burning and dispersants, and consideration of environmental impacts. NOAA also established the Alaska Joint Assessment Team in 2011 to build relationships between agencies and industry parties and reach consensus on protocols to facilitate implementation of NRDA, should an assessment become necessary.

In preparation for a potential Arctic oil spill, NOAA and its partners have developed an Environmental Response Management Application (ERMA) for the Arctic region, the same interactive online mapping tool used during the *Deepwater Horizon* oil spill response. ERMA is a web-based GIS tool that assists both emergency responders and environmental resource managers in dealing with incidents that may harm the environment. ERMA integrates and synthesizes data into a single interactive map, providing a quick visualization of the situation and improving communication and coordination among responders and environmental stakeholders. ERMA was selected by the USCG as the Common Operational Picture for the *Deepwater Horizon* spill incident because it allowed data access across responding agencies and provided a simple interface by which to visualize response operations and relevant socio-economic and environmental data. ERMA is a proven operational system and continues to be enhanced through strong Federal, state, and industry partnerships. Arctic ERMA was developed in partnership with NOAA, the Oil Spill Recovery Institute, the University of New Hampshire, and the Department of the Interior's (DOI) Bureau of Safety and Environmental Enforcement (BSEE). On July 31, NOAA and BSEE jointly announced the launch of Arctic ERMA for public access. ERMA, the University of Alaska-Fairbanks, and AOOS are also working together to ingest, share, and make data publicly available.

Monitoring Species and Climate Change

Collecting and integrating biological, physical, and chemical information is essential for managing existing and emerging fisheries, developing models to assess risk of action or inaction, monitoring invasive species and detecting ongoing and future ecosystem changes in the complex Arctic region. To that end, NOAA is partnering with the University of Alaska and the Bureau of Ocean Energy Management (BOEM) to provide baseline information on the abundance and distribution of Arctic marine species and their habitats through an Arctic Ecosystem Integrated Survey. NOAA has also initiated the Distributed Biological Observatory program to provide biological and environmental sampling to track the ongoing shifts in ecosystem structure associated with climate change. NOAA also initiated a two-year survey of ice-associated seals in cooperation with Russian scientists in the western Arctic in 2012. These surveys will provide the first comprehensive estimate of abundance for four species of seals and will serve as a baseline for trend analyses in the future.

NOAA's Participation in Recent Oil and Gas Activity

On July 12, 2011, the President issued Executive Order 13580 to establish an Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska (IAWG). The working group's purpose is 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 the U.S. Arctic Outer Continental Shelf. The IAWG, chaired by DOI, has effectively facilitated interagency coordination and communication among the numerous government agencies charged with permitting activities, as well as State, local, and Alaska Native partners, related to oil and gas development.

Over the past eighteen months, the IAWG and its weekly staff meetings have helped to keep Federal permitting agencies synchronized and up-to-speed on permitting activities carried out by fellow regulatory agencies, thereby effectively improving the efficiency of the permitting process. NOAA has worked closely with this group since its inception. We have also strengthened our coordination with industry, Alaska Natives, and other stakeholders to improve our science-based decision-making.

Additionally, working closely with the State of Alaska, Alaska Natives, and local communities, the IAWG will prepare a report to the President by the end of 2012 to address key components of an "Integrated Arctic Management" framework for evaluating potential infrastructure development in the Arctic. NOAA is playing an integral role in this effort.

In May 2011, Dr. Lubchenco signed a Memorandum of Understanding between NOAA and the Bureau of Ocean Energy Management, Regulation, and Enforcement, now the BOEM and the BSEE, to ensure that decision-making relating to the development of outer continental shelf energy resources is based on the relevant scientific information and expertise of both agencies in order to fulfill the stewardship and conservation of living marine resources and ecosystems responsibilities that fall under the agencies' respective authorities. Leveraging relationships such as this to build sustained observations will enable Alaska researchers to study the effects of oil and gas exploration, sea ice loss, ocean acidification, and sea surface temperature warming on Arctic ecosystems over time. This information will also inform NOAA's ecosystem stewardship, private sector economic development, and USCG and U.S. Navy missions.

In May 2011, Shell filed its Marine Mammal Protection Act (MMPA) incidental harassment authorization applications for exploratory drilling programs in the Beaufort and Chukchi Seas. Using the best available information, NOAA conducted careful analyses of potential impacts to marine mammals and published notices of proposed incidental harassment authorizations for public comment in November 2011.

In August 2011, Dr. Lubchenco signed an agreement with Shell Exploration & Production, ConocoPhillips, and Statoil USA E&P Inc. to enhance collaboration on ocean, coastal, and climate science for the Arctic. The agreement calls for sharing a number of scientific data sets for this largely frontier region, including weather and ocean observations, biological information, and sea ice and sea floor mapping studies. In June 2012, all parties signed the first of three Annexes to the agreement. This first annex lays out protocols for sharing meteorological, oceanographic, and sea ice data. Already, NOAA has seen a 50 percent increase in the number of marine weather observations coming in from Arctic waters as a result of this agreement. These data will enhance the Arctic regional climatology analyses and historical, quality-controlled World Ocean Database developed by NOAA scientists. Follow-on annexes are being drafted to address protocols for sharing biological and hydrographic data.

In the fall of 2011, NOAA began working with DOI and partner agencies to review and provide comments on Shell's Chukchi Sea and Beaufort Sea Oil Spill Response Plans. This important dialogue with DOI and industry on the Oil Spill Response Plans led to changes in the plan that addressed NOAA's concerns on oil trajectory modeling and supported a drilling season length that allows for adequate oil spill response. NOAA looks forward to continuing the ongoing dialogue with our Federal partners and industry to support safe offshore development in Alaska.

In January 2012, NOAA convened an independent peer-review panel, including scientists from the North Slope Borough, representatives from the potentially impacted Alaska Native subsistence hunting groups, and academics to review Shell's marine mammal monitoring plans. This review was discussed in detail during the annual Open Water Meeting in March 2012 here in Anchorage. This public meeting, which is sponsored by NOAA and has been held annually since 1994, includes participants from Federal, industry, and local government agencies, potentially impacted Alaska Native organizations and communities, and other interested parties. The Open Water Meeting provides a productive and open forum for the discussion of upcoming industry activities in the Arctic, results of marine mammal mitigation monitoring programs from previous seasons, and methods for minimizing impacts to marine mammals and subsistence uses from upcoming industry activities.

In the Spring of 2012, NOAA assembled a prioritized list of additional staff training, resources, and research needed to assist the USCG with a smarter, safer and more efficient Arctic oil spill response. This effort resulted in a partnership with DOI's BSEE to expedite and enhance the development of the ERMA, the same interactive online mapping tool used in the Gulf of Mexico during the *Deepwater Horizon* oil spill response. We thank BSEE for their recognition of the need for this important tool and willingness to partner.

As the first Arctic exploratory drilling season since the early 1990s was becoming a reality, May was a very busy month for all Federal agencies involved, including NOAA. NOAA issued MMPA incidental harassment authorizations to Shell Offshore Inc. to take small numbers of marine mammals incidental to conducting an offshore drilling program in the Beaufort and Chukchi Seas during the 2012 open water season (July 1, 2012 through October 31, 2012), participated in Shell's tabletop oil spill drill here in Anchorage, Alaska which simulated the worst case discharge scenario for the Chukchi Sea, and conducted a workshop in Kotzebue, Alaska on ERMA and how a natural resource damage assessment would be carried out in the aftermath of an Arctic oil spill.

In August 2012, Shell submitted a request to DOI's BOEM to extend their drilling season based on Shell's prediction for sea ice encroachment and freeze-up at their Chukchi Sea prospect. BOEM, in the spirit of coordination, and through the communication lines widened by the creation of the Interagency Alaska Permitting Working Group, sought the expertise of NOAA's climate, sea ice, and weather programs to fully understand and consider the implications of Shell's request. The exercise was a lesson in interagency communication that can be carried into the highly anticipated 2013 season.

Lessons Learned

The work carried out by NOAA staff leading up to and during the 2012 Arctic drilling season has been commendable and thorough. Nonetheless, we would be remiss if we did not reflect on the last 18 months and identify lessons learned.

The primary lessons learned for NOAA at this early after-action phase are:

1. the need to consider the *variability of the rapidly changing Arctic and shifting historical baseline* when making forward-looking decisions,
2. the need to recognize and appropriately weigh the *economic, social, and environmental impact* that oil and gas development has on the State, especially North Slope communities and Alaskan Natives, and
3. the need to increase existing collaboration and communication to improve *integrated science-based decision-making* and process efficiency.

Federal investments are needed as we plan for energy companies to move from exploratory activities into, what is anticipated to be, high-volume production over the coming decades. In short:

1. We need to improve our understanding of how this rapidly changing Arctic environment can sustain industrial pressures through enhanced environmental observations to support the best science-based decisions related to weather and sea ice forecasting, and ecosystem and community stewardship.
2. We need more access to research platforms and ship time, that will improve our observation and knowledge of the increasingly dynamic Arctic environment, and
3. We need to improve our understanding of how oil and potential oil spill response methods, such as dispersants, will behave and impact Arctic species.

The U.S. Arctic is a remote place with harsh conditions. Conducting research in the highly variable Arctic environment poses safety risks and requires specialized equipment, training, and vessels. Continuing to seek innovative partnerships and leveraging existing resources will allow us to carry out our Arctic mission in a manner that is safer, smarter, and more efficient.

Conclusion

NOAA is striving to streamline and bring its diverse capabilities to bear on the many cultural, environmental, economic, and national security issues emerging as a result of rapid changes in the Arctic. The breadth and complexity of these impacts require a concerted, systematic and rapid effort with partners from international to local levels. NOAA's scientific capabilities are being deployed to increase understanding of climate and other key environmental trends, to predict the ecosystem response to those trends, and to offer the technical expertise needed to develop policy options and management strategies for mitigation and adaptation to the environmental challenges in the Arctic region. NOAA's service capabilities are supporting safety and security needs for fishing, marine mammal protection, marine and other modes of transportation, energy, infrastructure, and mineral exploration in the unique Arctic environment. The choices we make today will have pivotal impacts on the future state of the Arctic and the well-being of its coastal communities. There is a great deal of work to be done, and NOAA, in collaboration with our partners, is committed to strengthening Arctic science and stewardship, and providing the information, products, and services needed by our Arctic stakeholders.

Thank you, Mr. Chairman, for the opportunity to appear before you today. I look forward to answering any questions that you or the Committee may have.

Senator BEGICH. Thank you very much, all three of your, for your testimony.

For the audience, the way the process works is I have some questions. There will be some interaction, and then there will be an-

other panel that will come on, and you will see the similar process that will occur.

So again, thank you all very much.

Let me first start with Undersecretary Hayes. There are two parts. First, you did answer it to a certain extent, and that is how the interagency working group has kind of moved the process a little bit smoother and faster. Shell has kind of been the guinea pig so far and has been able to go through all the pluses and minuses in that, and we know Conoco Phillips is now lining up for their next opportunity in the Arctic, as well as Stat Oil in the future.

How do you think—will this continue on a path that will move the permitting process forward in a smooth effort? I know Shell experienced both the old style and the new style, and I know we'll hear in a little bit about how we felt about the newer approach. But how will that improve the process and the cost for the next two companies that are clearly moving forward in the Arctic?

Mr. HAYES. Senator, I think that time will tell, but my prediction is that the processes that we have put in place and the proof of concept that we have seen here over the last year in terms of coordination on the Federal side will continue and will redouble to the benefit of not only Stat Oil and Conoco Phillips but other companies interested in getting permits.

I should say that we have applied this model onshore as well. In recent weeks in particular, weeks and months, there have been a lot of questions about Federal permitting of Exxon Mobil's Point Thompson project, and prior to that Conoco Phillip's CD5 project in the NPRA, and our interagency group on both of those has gotten together and is ensuring that the agencies with equities have been coordinating and helping ensure a single Federal voice.

I should say that this model is something that the President has adopted more generally. He issued an executive order on major infrastructure projects that applies throughout the country that is based largely on this model of the Federal Government coming together and not having agencies sort of seriatim look at the same project in their silos.

It's the way we should do business as a government. It is a real government reform effort. We're proud of it, and we want to make it work. We will need everyone's help in order to continue this process.

I should say also we've had very good support with the State of Alaska in terms of coordinating with the state in that regard as well and have a good interaction with them on these issues.

Senator BEGICH. I guess this year was kind of the beginning of what's ahead of us in the Arctic, and I think we've had discussions about this on the record and off the record about what the magnitude of the potential is there, and I think this effort that you all were talking about in regards to a broader look and how that report at the end of the year will be presented to the President.

One of the concerns that pops up any time you go into a broad sweep, is will that then cause delay because now there is this bigger picture, that suddenly a group that's already moving through the system gets caught up in? How do you see that interacting with movement by Shell, by Conoco, by Stat and others to develop the Arctic?

I like the approach of seeing the whole picture, because then you don't have these multiple competitions of air shed permits and, while they are here, how does this oil spill technology work? Is it just siloed out for Shell? Is it siloed out for Conoco? Can we merge this effort?

So I understand that part. But the concern we're starting to hear is that as the group's work gets completed, will that be an obstacle that says to some of these folks now you've got to start over, or I'm sorry, we can't do this? Can you explain how that connection works?

Mr. HAYES. I think the hope, Senator, and expectation is that this process will provide more clarity for all interested parties. I'll use the analogy of the new 5-year plan that our department put out for offshore activities over the next 5-year period. We identified an area to the northeast of Barrow in the offshore that we have excluded from future drilling, future lease sales, because of subsistence needs by the Barrow community and the whaling community. We think it's better to provide that big-picture clarity. We're not going to be leasing in this area. That enables companies to make good decisions and to not, frankly, waste their efforts in putting together bids for areas that are high-conflict areas.

That's the hope more generally, that when we look at things on a landscape-level basis, we can provide more clarity for all the interested parties and permitting can go more quickly. I will just very quickly mention that on Friday, tomorrow, the Secretary is going to be announcing a final decision on how we're permitting large utility-scale solar projects in the southwest, a similar concept. Look at the landscape level, identify——

Senator BEGICH. What we're doing here, this concept of bringing everyone——

Mr. HAYES. Yes, bringing everyone together, talk about the entire landscape, identify the areas that make the most sense for development, provide the incentives and the clear pathway for development there, and for the areas that are sensitive and important for subsistence, for environmental sensitivities, don't look to those areas. So I think it's just a common-sense way to proceed, but it's going to require a lot of input from everybody to get it right, and that's what we're committed to do.

Senator BEGICH. Let me ask you a couple more quick questions, and then I'll move to the Admiral in a second. These are related, but it's more about the long term. As exploration moves forward, as I said, my statement was it's not a question of if we're drilling, it's how we do it right. Is that a fair statement of how the Obama Administration views what we're doing in the Arctic? Because some people are concerned—I'll be very blunt with you—that once election occurs, we'll pause for a moment. Let's assume re-election occurs, and then suddenly everything reverses. That's a question we hear rumbling out there, and I like always to get stuff on the record and just clear the deck and move forward. So can you give me a sense of that?

And then also we know that in 2015 we have some lease opportunities, and 2017. Give me your sense of how to recognize that Arctic development is happening, it's just a question of how we do it. That's how I always talk about it. Can you respond to that?

Mr. HAYES. I'll respond, Senator, by saying that Shell and a number of other companies have leases that they have entered into with the U.S. Government that give them certain development rights subject to permitting responsibilities. It's our responsibility under the law to implement those permitting processes, and we will continue to do that. That is our responsibility.

In terms of future sales, as we have indicated in our five-year plan, we are open to additional sales in the Arctic under the President's 5-year plan. We are looking forward to continuing to get more science, and also get the experience based on the current activity to help inform whether and when and how those lease sales, potential lease sales would occur.

Senator BEGICH. And the last one is, just in fairness to all the folks who are here to be able to answer questions, but let me ask you one last one. It's on NPRA. As you know, exploration is just a piece of the puzzle, and that's an important piece because we have to figure out what's there and how to manage it in that process. That but leads us to the real future, which is the development, how to develop it the right way and getting access to that product.

So if it's available and it's commercially viable, it will have to come, as we know, through a pipe through the NPRA in some form, Chukchi through the east to west pipe, and Beaufort north to south in some form. As you know, there have been concerns. We've had conversations. You've been very forthright with us in terms of what stages they are going through.

Give me your sense of the ability, because obviously companies are concerned, if they strike a successful find, it doesn't matter if you can't get it to market. The concern is are we going to be able to ensure, through the National Petroleum Reserve, access to the major line north-south, from Prudhoe down to Valdez, moving oil? That's fundamental. I know you're in the draft stage, so there's a limitation. I know you've got parameters you must work within here, but maybe you can give us a sense of how we can ensure the next phase. It is really the most important phase because you can score all you want, know what's there, but if you can't move it to market, it's irrelevant. We want to move it to market. So give me your thoughts on that.

Mr. HAYES. Sure, Senator. As you know, we are heading toward a new, final, comprehensive plan for the 23 million-acre National Petroleum Reserve Alaska. We expect to finalize the environmental impact statement and the record of decision by the end of the year. The preferred alternative that the Secretary has already discussed anticipates a potential pipeline across the NPRA. The plan is flexible enough to allow such a pipeline to occur. Obviously, as we have explained, a pipeline proposal itself would need to be the subject of a comprehensive environmental analysis on its own terms.

Senator BEGICH. An EIS.

Mr. HAYES. An EIS. But the final NPRA comprehensive plan will be flexible enough to allow a pipeline to be built consistent with the parameters of the plan, and we will look forward to having an open dialogue with companies that are interested in developing such a pipeline.

Senator BEGICH. And east-west, north-south.

Mr. HAYES. Yes.

Senator BEGICH. Both we have to pull down.

Mr. HAYES. Yes.

Senator BEGICH. OK. Thank you very much for those comments.

Admiral, I know you've given a presentation to many people. You have a great presentation, great slides on that. Give me your sense of—you know, the big concern we always hear from people is we're not prepared, we are unable to assist if there is an issue. But based on the rules of the game, the Interior itself has limitations on activity and drilling and so forth. But overall, if you could say here are the one, two, three things you really learned that we have to look forward to next year, but really about long-term development, because exploration is just seasonal and a little bit of activity in the sense of the broader, as more and more companies do business up there in the sense of oil and gas exploration.

So what are the one or two things that really you said, OK, this is where we've got to hone in for next year and down the road, not only equipment-wise but maybe even how you approach the issue of Arctic Shield? Do you have some thoughts there?

Admiral OSTEBO. That's the million dollar question here, sir, in a lot of ways.

Senator BEGICH. A millions of dollars question.

[Laughter.]

Admiral OSTEBO. Yes, sir. As you know, from the beginning we looked at Arctic Shield 2012, and now as that comes to a conclusion here in the next several weeks, we have a very extensive lessons learned process that we engaged in way back when we began this effort almost a year ago so that we could capture the lessons learned, get a good idea of what are the real requirements, what are the drivers in the long run so we can match our capability and capacity to meet the future needs in the Arctic.

A couple of things that we learned this summer. One is, and you've heard me say this before, the drilling activity is just part of the activity that's going on in the Arctic. If you took that out of the equation, the Coast Guard would still have a need to be in the Arctic. There would still be a national interest in the Arctic because the activities that are taking place outside of that, vessel traffic——

Senator BEGICH. Unrelated to oil and gas.

Admiral OSTEBO. Unrelated to oil and gas. The amount of traffic that is going through the Arctic, including the Bering, which, frankly, is part of the Arctic, is moving forward at a rate that it doubles every 2 or 3 years.

Senator BEGICH. How many ships are now moving through there? I remember you gave me the data once.

Admiral OSTEBO. Right. We had anticipated, had Shell stepped up and was able to do their full season, that we would have had about 1,000 ships. AIS-carried ships go through the Bering Strait. It looks like we'll probably end up at about 750, maybe 800 this——

Senator BEGICH. Which are oil and gas related, and others.

Admiral OSTEBO. And others, and the major "and others" is that Northern Sea route over Russia. I just came back from Russia. I was there last week, and in talking to them, they have huge concerns about this. They're making a major infrastructure investment

on their side. We talked a lot about the Bering Strait and the need for vessel traffic separation and situational awareness in there, demand awareness.

But the specific question, what did we learn so far this summer, I'll give you the preview for that. There are three phrases to the Coast Guard presence in the Arctic. There's the offshore piece, which is critical. As you saw with the national security cutter, that's really the capability that I think we need to have in the long run out there. It gives us the ability to reduce our shore site infrastructure and capability because we have such a capable asset offshore.

Senator BEGICH. It's a moving city.

Admiral OSTEBO. It's a moving city. Second, as you know, it has national asset capability out there. That is critically important, and that, matched up with our icebreakers, provide the right offshore presence, I think, in the long run.

An air picture is critical. We have to have the number one asset, because of the distances and the criticality of being able to move from one spot to another, the distance between the two drill sites and their distance offshore, we learned that the HH–60 helicopter is a critical asset up there this summer. As you mentioned, we had a number of search and rescue cases and a number of people are alive today on the North Slope because we were there for this activity, some of them engaged in the activities that Shell was doing, some of them in subsistence work, some of them in regular commercial activity offshore. But the Coast Guard presence there made a difference in their lives and in their families.

The third piece I would say is the structural pieces that go into making all this happens, communications and logistics in the Arctic. What we found out this summer that I think—and I've talked a lot with NorthCom about this—is bandwidth communications, and that capability in the Arctic would not only benefit the Coast Guard but every player that's up there, including the communities themselves, whether that's a fiber optic capability to Barrow that allows them connectivity to the rest of the planet and doesn't limit us in our ability to respond.

I go back to my experience with the Exxon Valdez, 9/11, the *Deepwater Horizon,* Hurricane Katrina. The first thing that's lost in one of those major calamities in situational awareness is the ability to communicate, bandwidth, the ability to communicate and get information out to everybody else. I think that would be a critical need in the Arctic, and we learned that this summer. We had a communications detachment up there, and in order to stay connected with the offshore activities, our helicopters, for the safety of our crews and for the management of the cases, that's a critical piece.

So I'd say those three pieces are where we need to make a long-term investment and look to the future, the offshore piece, the air picture, and then the supporting activities for those few response capabilities.

Senator BEGICH. Let me ask you, again, in a broader sense of the Coast Guard, and I know you have limitations in what you can say or not say here because there are budgetary issues, but let me ask you this. As you moved assets to Arctic Shield, obviously within the

Coast Guard family nationwide, there was shifting that had to occur to supplement or ensure that you had the right capacity there. Is that a fair statement?

Admiral OSTEBO. Yes, sir, that is.

Senator BEGICH. In your analysis you're going to do, are you going to look not only at the Arctic but the bigger tradeoffs you have to make, and if so, what does that mean to the Coast Guard budget and what we need to consider long term? Again, my mindset is we're drilling. Ten years from now, development is going to hit. How are we prepared for asset deployment in that process?

So as you're doing that, are you looking at this broader picture where the Coast Guard Command in D.C. understands that it's not just an Alaska issue but it's a national issue and a benefit to all of us if we do this right? Is that a fair——

Admiral OSTEBO. Yes, sir. A couple of ways I look at this, and the way the Coast Guard has been approaching this, first off, this isn't a one-off summer. It isn't like we do this operation this summer and we all go away and do something else. This is, as you said, an opening up. This is a critical moment that is going to define the Coast Guard's presence in the Arctic, and the U.S. Government's presence up there, for a whole lot of reasons, well into the future. So it's not a one-off summer.

Two, it's clear that we had to rob Peter to pay Paul for this summer, but we did not sacrifice readiness in other locations, and that's critical. I'll give you a good example. I mentioned that the HH–60 helicopter was a critical asset that had to be in the Arctic. Well, those helicopters, in order to do that, really came from our Cordova deployment site. How we fixed that was I took H–65 helicopters, our short-range helicopters and primarily our ship-based helicopters, I put those in Cordova. So we had response capability there all summer long, but we didn't have the same capability there. So we didn't tradeoff our ability to respond, and we didn't tradeoff our readiness to meet the requirements that Congress has given us for Cordova and the constituents that we have there. But we did trade capacity and overall capability to move that somewhere else.

The same thing with national security cutters. As you know, we're out there on Bertholf. If she wasn't in the Arctic, it wasn't like she was going to be sitting around doing nothing. Her plan was to be in East PAC.

Senator BEGICH. Or chasing somebody.

Admiral OSTEBO. Yes. So she would have been down in East PAC doing counter-narcotic and drug work, national defense and law enforcement work out of hemisphere. That was the mission that we had to take her off to put her on here.

So while the Coast Guard maintained our readiness throughout this district and throughout the United States, we did have to shift capability around to put it up there. We received, obviously, on short notice, no new capability to go to the Arctic. We took what we had and we applied it to the highest threat, and I'm glad we did.

Senator BEGICH. Will you have, after your analysis, and I know you guys do an incredible—always after missions, you have this process you go through, and it's a very methodical process. Will you

have a presentation at some point, or maybe we can encourage it, something that occurs that says, OK, if we had XYZ additional, it would help us, not necessarily because you're going to have the mission in the Arctic, but make sure we're additionally covered in future needs, other areas to augment that? Is that part of that?

And the reason I ask you that is it's a budget thing, but you don't build a ship overnight. You don't go down to the Home Depot and pick one up. So we want to think about this longer term, especially as I envision, as Under Secretary Hayes continues to work on the Arctic issues, you're going to end up three, four, who knows how many companies, with lots of ships active up there, which means your need will increase, but we don't want to lower the capacity of what's going on not only in Alaska but the rest of the country.

So will that be part of it in the sense of saying here's what we think we'll need 5 years out from now, eight years out from now, 10 years out, to make sure we're covered?

Admiral OSTEBO. Yes, sir. I think a critical element of that that will help address that is a focus on the Coast Guard's shipbuilding program. As you've heard Admiral Papp say and our Secretary say, we have a shipbuilding program that needs to move forward. The national security cutter is a key aspect of that, and getting that built out to its full extent will clearly provide us with the capability and capacity to have a national security cutter operating in the Arctic or providing the presence when our icebreaker isn't up there. So I think that's critical.

Our report actually will provide that overall view so it will be clear to everybody where we took the assets to make this year's summer event happen. I'm on a timeline to have that available before December. So we're working very quickly with NorthCom to put that together, and I will present that, and that will be available to you, sir, shortly thereafter.

Senator BEGICH. Fantastic. Thank you very much.

I have a quick question for you, Ms. Furgione, and that is—and you mentioned it, and it kind of intrigued me a little bit, and that is—well, it's kind of a two part question. One is we know, because of the delay of getting the satellite systems fully operational—and I will put that on the House in Congress, who didn't fund it, as the Senate wanted to do, in that 1 year. When you take a piece out of a funding stream for satellites, it's not like you can just pop them up anytime. There's a thing called the orbit and a few other little details you have to actually work toward.

But knowing that, we know there's going to be a gap of some sort, but also your comment that on the sea ice analysis, I think you're operational 5 days a week, if I remember what you said there. To get that to seven days a week, when activity in the Arctic is especially occurring with oil and gas, are you folks preparing something that can give Congress direction on what you need to make that happen? Because, obviously, unless I don't know the oil and gas thing that well, they don't stop at 5 days. They are a 7 days/24 hours cycle, though in a period.

So is there a way to—are you going to lay out what this will mean, and cost, and how we can make sure that happens? And then will that gap, that second part of the question, that gap in the

satellite, will we be able to compensate for that enough? What's the plan to take care of that gap? And I think that's a 2016 gap; I'm not sure, if I remember right.

Ms. FURGIONE. So your question is dynamic and complex, just like Arctic sea ice. So one of the things in particular I always said when I was up here forecasting the weather, my forecast was always right because we didn't have the observations to validate the forecast.

[Laughter.]

Ms. FURGIONE. And that's critical. So when you're talking about, yes, our forecasts are 24 hours a day, 7 days a week, everyone needs forecasts. When you wake up, you need to know what you're going to put on to even get the kids to the bus stop, and it's more important when you look at the criticality of weather forecasts and sea ice forecasts for those who operate and depend on it for their livelihood.

So one of the things in particular, we do have the partnership and the MOU we signed with the oil industry to make sure that we're——

Senator BEGICH. Which was historic.

Ms. FURGIONE. Yes, and that was great. It was actually an expansion from what we were already doing in the Gulf of Mexico, and I had been dying to get it up here in Alaska so we can have additional observations. So those in situ observations that we receive from the oil industry, as well as other observations, will help.

What we really need is the coupled atmospheric ocean and ice model, and that model requires the observations that I talked about, and also the satellite imagery and sounding data that we need. But it also will require the National Weather Service to have better forecasts on winds and waves.

So while we saw the lowest sea ice minimum this year, folks were, like, why was it so difficult to pinpoint where that ice was going to be? So any one particular storm system can modify where the ice is going to be. So we really need these models. We need the forecasts. We need the observations. We need the satellite imagery to have a better understanding of where the ice is right now and where the ice is going to be in the future.

So I kind of had a complex response to your complex question, but we do have a plan. We developed NOAA's Arctic Vision and Strategy document, and we will continue to have additional information on what we will need to actually meet the needs of our customers here in the Arctic.

Senator BEGICH. And that satellite gap, how will you handle that, or do you think it's minimal to a point where you can still feel comfortable with what information is going to be flowing, especially in the Arctic? Because that's really where the potential gap problem is. Give me your thought there.

Ms. FURGIONE. The gap is serious. It would be obviously much better if we didn't have to think about a gap, but without that, it's critical in forecasting the sea ice. We need that fuller orbiting satellite capability. We obviously have the geostationary capability, and we have back-up for that, but we don't have back-up on the fuller orbiting satellites.

We can work with our other partners, internationally even, to obtain as much information as possible, but ideally we need to rely on the information that we can provide ourselves domestically.

Senator BEGICH. And let me kind of wrap it, if I can, back to Under Secretary Hayes, or both of you can answer this. As you do your coordinated effort with the oil and gas industry, this gap—because again, as I kind of visualize it, by 2015, 2016, if things move properly here, you will have at least three companies operating in some form or another in exploration there.

Are you working—and I don't know who wants to answer this first—to make sure that industry is brought in now? Because, as I kind of forecast out, using a weather word, forecasting out, if we keep the theory that it's not a question of if it's going to be developed, it's happening. So it's more about the how, is that happening now at this level?

And maybe it's not part of the first mission. We're so worried about exploration right now, but I'm thinking long term.

Mr. HAYES. Well, I think the dialogue has begun because of the questions about how late in the season it's safe to engage in drilling activity, and that goes directly to really weather and sea ice formation questions, and NOAA has been very helpful to the interagency group in providing advice, and there's been a dialogue already between Shell and us and NOAA on that question, and it underscores the point you're making, which is the capability of NOAA through its satellite activity and other projection capabilities is absolutely critically important to this entire endeavor.

Ms. FURGIONE. And my response to that is that we work closely with all the partners to make sure that our requirements on satellite information is available, and also what would be the impacts if we don't have that information. So that's even more critical to understand what the impacts would be.

As we move forward with the forecasting capability, again it's critical to have that satellite information available to advance our modeling and our forecasts to save lives and livelihoods.

Senator BEGICH. Let me, if I can, close with this panel. I appreciate you all being here, and the next panel especially. We have a bad habit, to be very frank, with in the Senate—I can't speak about the House because they have their own hearing process. But we always need to respond to some incident. Then we have a big hearing, and then we all run around and grab you all and hammer on your heads, and then you go back and try to figure out what is the crisis solution here, and then we all sit around trying to pass laws that later we have to fix that we did in a crisis.

The goal for today is not to only talk about what's going on and get that in the discussion, in a similar discussion we just had, and I'm doing this more for edification of the audience here and folks that might be interested in this, is to do this in a different approach because the Arctic is significant. As the Admiral described, if oil and gas was out of it, there are still these hundreds of vessels moving through the Bering Sea and the Arctic, and we need weather and information. It has impact to what you're doing from a larger perspective, the Federal Government, and all the other things that are going on. What I hope is, as we move forward on oil and

gas issues, that kind of opens up the discussion on many other fronts.

Admiral, you and I have talked a lot about the Bering Sea and that 50-mile little stretch. We spend a lot of time about the Suez Canal and the Panama Canal. We have no clue, no clue what's coming through that 50-mile area. When you're talking about potentially 1,000 ships, and a portion are oil and gas, but the rest are who knows what, it leaves us in question. And also for you on your end, there are a lot of potential problems if they don't know what's happening weather-wise.

So I want to thank you in a broader perspective. And for oil and gas, if you just kind of close your eyes and say 10 years from now, what does it look like, what we see today is just—and this is playing with some words—it's the tip of the iceberg. It really is. There's so much that's going to happen there. So the work that you all are doing on this interagency group, I'm hoping not only continues—and it sounds like you've expanded a little, which I think is great. It's not just about oil and gas. It's a broader sweep of the Arctic and what's happening there, and oil and gas is a big player because it brings a lot of capital and resources and attention, but there's so much other stuff going on there.

So I can't say enough of your guys' efforts on a day to day basis, and being part of this hearing today, to help elevate it. But as I think about 10 years from now, if I'm here or someone is here talking about how we are doing on development, that we will have a great story to tell because of some of the things we're doing right now, not when a crisis occurs or some incident occurs but right now.

So thank you for your willingness to participate in this. I hope this was as fun as flying in a helicopter. Admiral, I tried to make you feel that breeze coming through.

Admiral OSTEBO. Yes, sir.

Senator BEGICH. Thank you all very much for the first panel. Thank you.

We'll now rearrange the deck here, get the next panel up. We thank you all for being patient here. People can stretch for a minute or two while we get ready here.

[Pause.]

Senator BEGICH. Let me go ahead, if I can. Thank you all very much. Thank you for your patience. We ran longer on the first panel. We apologize. We appreciate everyone being patient. Let me go ahead and quickly just move right to the second panel.

Our first speaker will be Pete Slaiby, who is the Vice President of Exploration and Production for Shell Alaska.

Pete, let me go ahead and turn to you, and then we'll just go down the road here.

STATEMENT OF PETER E. SLAIBY, VICE PRESIDENT, SHELL ALASKA

Mr. SLAIBY. Well, thank you very much.

Senator BEGICH. Is your microphone on? Make sure the green button—there we go. Perfect.

Mr. SLAIBY. Well, thank you very much, Mr. Chairman. I'm very pleased to be here today. For the first time in more than 20 years,

Shell turned the drill bit in the Chukchi and Beaufort Seas. This milestone is really the first step in bringing oil and gas production resources from Alaska's offshore into production.

I had the opportunity this week to travel to the Noble Discoverer drill ship, and after a number of years, obviously it's a pretty satisfying trip for me, and I just wanted to express as well that we were very, very happy with what we saw with respect to how things are working through the various regulatory processes.

As I explained to you earlier, Senator, our ability to work with the communities, to have the marine mammal observers on board ship as part of the crew and part of the process was very gratifying, as well as our own ability to engage in a live broadcast. We brought CNN offshore, and they were able to do a live broadcast from the Discoverer on both the national and international programs.

The bottom line of all of this: for Shell, it has been a journey, and I do think that we are heading down the right road. I have felt over the last 18 months a real change in course and a sense of optimism that we are heading in the right direction.

However, like anything else, it can be improved. But before discussing the recommendations, there are several points I would like to make.

First, I want to acknowledge the other witnesses on the panels today and the important roles they played in progressing our program. The Coast Guard, DOI, NOAA, North Slope Borough, UIC, State of Alaska are only a few of the governmental agencies and private corporations who have helped us on this journey. Without their support, we couldn't be here.

Second, Alaska's OCS likely holds world-class volumes of oil and gas. Developing these resources will be an economic engine for decades to come, creating tens of thousands of jobs and actually ensuring that the Trans-Alaskan Pipeline continues. The oil will benefit the nation, and Alaska as well, ensuring that there's revenue for the government and jobs for the folks who are here in Alaska. This is no doubt going to be a generational event.

My third point is that Shell is committed to a safe and environmentally responsible program. Since 2006, Shell has worked with Federal and state agencies, local governments, and many residents and private organizations to develop a program that meets the highest technical, operational, environmental, and ethical standards. It's no secret we thought we would finally drill into oil-bearing zones this year, and we are disappointed that the season didn't turn out as planned. Instead, Shell's 2012 program focused on top holes. This means we'll excavate mud line cellars—I think everybody now is becoming familiar with the lingo—drill to about 1,500 feet, and then temporarily cap the wells.

Let me talk about why we weren't able to drill these exploration wells down into their objectives over the summer. One of our constraints has been our Arctic containment system. This is a fourth-line contingency response system for the very remote possibility of a blowout.

The system was the first of its kind —we call it Serial Number 1—and we had limited time to get the job done. The design concept, however, is solid. We will have the system completed, cer-

tified, and approved for 2013. In fact, we just recently received a certificate of inspection, COI, from the Coast Guard, and over the weekend the American Bureau of Shipping gave the Arctic Challenger, its class.

Unfortunately, the Arctic containment system dome was damaged during the deployment test on September 15th, and a subsequent investigation has revealed that there are still some areas for work. Our investigation determined that a faulty electrical connection associated with one of the valves caused a valve to open, which caused the rapid descent and ultimate damage to the dome. Safety systems insured that the dome did not hit bottom, but buoyancy chambers were damaged. We have put in place a comprehensive program to make the necessary repairs and to bolster our operating procedures.

In the 2013 open water season, we'll finish the wells that we begin this year and we'll drill these wells into what we hope will be oil-bearing zones.

Now if I could get to the recommendations, Mr. Chairman. Based on our experience, we believe that the regulations can be strengthened, and I've got three areas I think we should ultimately work on.

First and foremost, we all need to work to ensure that permitting agencies are under one roof. I think the process is in place, and we have seen major steps this year, I can really differentiate between past years. But having all of the agencies under one roof is a huge advantage with us. Our concern will be the sustainability of this process. We recognize that others will come and follow us. How are we able to sustain this level of involvement with very, very senior leaders in the government?

Second, Federal agencies will need to have substantial resources to make decisions in a timely manner. Shell paid $2.2 billion for its leases, and I don't think it's an exaggeration to say that we expect the agencies that will administer this work to be funded at an appropriate level that allows us to move forward with the investments. We believe that this should be part of moving forward.

And third, we believe that the regulations must be based on fact and science. Our Alaska project, rightfully so, should be subject to intense scrutiny by regulators and the public. We have no objections to that. Good science should and must play a role. Advancing science in the long run is critical to our success. But all too often, incorrect facts and faulty science have played a role in decision-making, and the agency requirements have changed in the middle of the game. This should not happen.

Further, the litigation system needs reforming. Revenue sharing for the State of Alaska should be enacted, and the leases that we have in our Alaska offshore should be extended for longer terms.

These are all subjects for a future discussion. Regardless of where you stand on Shell's project, or anyone else's project for that matter, I think we can all agree that these baseline expectations are reasonable and should be put into place. It's not just a good idea for Shell. It's a good idea for any stewardship to advance Alaska's energy positions, as well as the needs of the Nation. Thank you very much.

[The prepared statement of Mr. Slaiby follows:]

PREPARED STATEMENT OF PETER E. SLAIBY, VICE PRESIDENT, SHELL ALASKA

Mr. Chairman, I am Pete Slaiby, Vice President of Shell Alaska. I am pleased to be here today to share with the Committee the lessons Shell has learned in moving forward to explore our leases in Alaska's Outer Continental Shelf (OCS).

Alaska's OCS contains untapped world-class resource volumes. On Sunday, September 9, Shell took the first step to developing those resources, when crews aboard the Noble Discoverer began drilling at Shell's "Burger" prospect in the Chukchi Sea. It has taken years of effort to get to this point. It is a critical step in the journey to ensure that Alaska's vast resources are developed for the benefit of the Nation.

In my testimony I will discuss:

- Alaska's vast offshore resource potential and the benefits of developing those resources.
- Shell's Alaska operations with a focus on 2012 operations and plans for 2013 and beyond.
- Key lessons we have learned in recent years and recommended changes that policymakers should make.

Alaska OCS—World Class Potential

We, like the U.S. Geological Survey, believe the Arctic holds vast resources. More than 500 exploratory, production, and disposal wells have been drilled in the Arctic waters off Alaska, Canada, Norway and Russia. In Alaska's OCS, following Federal OCS lease sales in the 1980s and 1990s, more than 35 wells were safely drilled in the Beaufort Sea and Chukchi Sea.

Alaska's offshore likely holds one of the most prolific, undeveloped conventional hydrocarbon basins in the world. Conservative government estimates are that Alaska's OCS holds 27 billion barrels of oil and over 120 trillion cubic feet of gas.

To illustrate the magnitude of this estimate, consider that Alaska's OCS is estimated to hold two-and-a-half times what has been produced in the Gulf of Mexico since 1990; and at least one-third more oil than has been produced to date in Prudhoe Bay over the past 30 years.

One independent assessment has concluded that an average of about 700,000 barrels of oil per day for 40 years could be produced if Alaska's Beaufort and Chukchi Sea were developed. The study found that Alaska OCS oil production would peak in 2030 at 1.45 million barrels per day and that natural gas production would peak in 2050 at 2.1 billion cubic feet of gas per day.

The Benefits of Developing the Alaska Offshore

Developing Alaska's offshore oil and gas resources will have many benefits in Alaska and throughout the Nation. Resource development is an economic engine with an enormous economic multiplier effect that can last for decades.

- *Creates Jobs and Government Revenue:* Developing Alaska's OCS and the associated infrastructure will be an enormous job creator. It is no exaggeration to say that development will be a genuine, long-term economic stimulus plan.

  In 2010, Northern Economics and the Institute for Social and Economic Research (ISER) at the University of Alaska evaluated the economic benefits of developing Alaska's OCS resources, and found:

  New Jobs:

  - An average of 54,700 jobs per year sustained for 50 years. Peak employment during development of more than 91,000.

  Payroll Paid:

  - Total payroll will be $145 Billion through 2057.
  - Employees in Alaska will receive $63 Billion.
  - Employees in the rest of the U.S. will receive $82 Billion.

  Government Revenue Generated:

  - Total government revenue will be $193 Billion through 2057.
  - Federal revenue will be $167 Billion.
  - State of Alaska revenue will be $15 Billion, with $4 Billion to local governments.
  - Other states would receive $6.5 Billion.

- *Extends the Operating Life of TAPS (Trans Alaska Pipeline System):* Developing the oil in Alaska's OCS would ensure the long-term viability of TAPS, which

is a critical energy supply line. TAPS brings about 600,000 barrels of oil per day to market, equivalent to 11 percent of the Nation's domestic supply. But this is a fraction of the 2.1 million barrels per day that TAPS delivered at its peak.

TAPS throughput is declining, because production in Prudhoe Bay has fallen significantly in recent decades. Unless new Alaska oil resources are developed, oil throughput into TAPS will continue to decline, and eventually the pipeline will shut down. The implications of this are serious.

We have already witnessed what life without TAPS would mean. In 2011, TAPS was temporarily shut down. This had an immediate impact on crude prices, jeopardized the continuity of the U.S. West Coast refinery infrastructure, and over a longer time frame could ultimately result in increased reliance on Russian crude supplies. Unless new oil resources in Alaska are developed, TAPS future is uncertain.

Note too that new pipelines will be needed to bring offshore oil to TAPS. These new pipelines will enable the development of satellite oil fields in Northern Alaska, including the National Petroleum Reserve-Alaska (NPR–A). Those fields are currently "stranded" due to lack of infrastructure and could become economic to develop.

History of Shell in Alaska

Shell has a long history in Alaska's offshore. Beginning in 1964, Shell produced in state waters at Cook Inlet for more than 30 years. In the late 1970s and mid-1980s, Shell drilled exploration wells offshore in the Gulf of Alaska, St. George Basin and the Bering Sea.

In the late 1980s and early 1990s, Shell acquired Federal leases in Alaska's OCS. We drilled exploration wells in the Beaufort Sea and four of the five exploration wells drilled at that time in the Chukchi Sea. We found oil and gas, but chose not to proceed to development. Instead, we plugged and abandoned those exploratory wells for economic reasons—including the fact that TAPS was already running near capacity.

Since 2005, the Federal Government has held several more OCS lease sales in Alaska. Shell participated in these sales and is now the majority leaseholder in the Alaska OCS. Shell paid nearly $2.2 Billion for ten-year leases in the Beaufort and Chukchi Seas.

Over the years, Shell has invested an additional $2.5 Billion and seven years preparing for and assembling the assets to execute an exploration drilling program with unparalleled mitigation and safety measures.

Shell's work includes multiple years of 3D seismic data collection, first-of-its-kind baseline science, shallow hazard surveys, geotechnical programs, numerous social investment initiatives, and hundreds of meetings with North Slope residents.

Shell firmly believes that scientific investigation of the impacts of oil and gas activities on environmental resources is required to establish a truly sustainable business model. Since our return to Alaska in 2005, Shell has championed the establishment of a new frontier of scientific study in the Arctic and invested millions of dollars. The potential for oil and gas exploration and development in this important region has been a catalyst for extensive Arctic studies and research programs. At a time when federally funded scientific research is under budget constraints, Shell has played a critical role in working with partners and stakeholders to advance the investment in Arctic research and to establish a new baseline understanding of the ecosystems of the Chukchi and Beaufort seas.

Shell Alaska: 2012 Exploration Program

This year, Shell will drill as many "top holes" as possible in the Chukchi and Beaufort Seas during the short open water season. This means that we will not drill into oil reservoirs. Instead, we will drill the top part of a well to around 1,500 feet and then cap the well. We will return in 2013 to drill and evaluate potential hydrocarbon zones. The time spent working on the wells this year will reduce the time necessary in 2013 to complete and fully evaluate the wells.

Shell is committed to employing world-class technology and experience to ensure a safe, environmentally responsible Arctic exploration program—one that has the smallest possible footprint and no significant negative impacts on North Slope stakeholders or traditional subsistence hunting activities. Aspects of the 2012 program have been under evaluation by Federal agencies since 2006. At every step, Shell has worked with Federal agencies, the State of Alaska, local governments and residents to develop a program that achieves the highest technical, operational and environmental standards.

It is this commitment to the highest standards that led us to focus on top holes in 2012. We made the decision not drill into oil zones this year based on our assessment in early September about the readiness of our voluntary dedicated first-of-its-kind Arctic containment system and operating constraints.

The operating constraints are largely about ice and weather, both of which played a role in delaying our mobilization in 2012. Although 2012 had record low summer ice across the entire Arctic, our program was nonetheless impacted by ice. Multi-year sea-ice near our leases was slow to melt and remained in the Chukchi Sea in the vicinity of our Burger drilling location throughout summer. In addition, storm systems occurred during the time that our fleet was transiting to Alaska and during the time vessel anchoring was planned. This resulted in significant lost operating and drilling days in 2012. Our decision not to drill into oil zones this year demonstrates that we reacted to ice and weather in a safe and responsible manner.

Now, let me describe briefly the components of our exploration program and the multi-year effort that led up to 2012. Then, I will describe our 2012 operations.

There are three main components to the exploration program and physical assets deployed:

- First, we have two drilling rigs and multiple support ships. Both drilling rigs have undergone several years of engineering upgrades, including extensive upgrades to meet extremely stringent air emissions regulations required by EPA.
- Second, we have assembled a 100 percent Shell-dedicated oil spill response capability that provides multiple barriers and responses to the very unlikely event of an oil spill or leak.
- Third, we have developed and implemented a sophisticated logistics plan that provides for re-supply and transportation of the vessels themselves, the equipment needed to drill wells, and the personnel required to operate the program.

As we were assembling these physical assets, we managed several other critical and essential elements to our program. For example:

- There was a multi-year process to obtain dozens of permits and approvals needed to operate. Numerous government regulatory agencies were involved; and many frustrating delays and set-backs occurred.
- There were many legal challenges to our permits, which created significant uncertainty around our program and, in some cases, actual delay.
- There was an intense outreach effort to stakeholders, particularly to the residents and communities on the North Slope of Alaska who have a keen interest in understanding the program and providing input.
- There were unlawful vessel boardings that posed a threat to people and the environment as well as to our assets. I would like to expand on this. We respect and welcome a dialogue and debate about Arctic development, both through the government's public process and through our own engagement efforts. However, once a decision has been made to approve our program, interference that is unsafe and illegal should not occur and should not be tolerated. Unfortunately, we experienced such actions during our mobilization this year.

Our program in the Arctic is impressive and unparalleled. In addition to mobilizing two drill ships, more than twenty support vessels, an approved capping stack, and other redundant oil-spill response equipment we have:

- Fully trained approximately 1,800 personnel.
- Located a Search and Rescue helicopter on site in Barrow.
- Conducted coastal observation over-flights for marine mammals in both the Beaufort and Chukchi Seas.
- Hired and trained 160 Protected Species Observers, who are deployed on vessels and aircraft.
- Established and fully staffed 11 Communications Centers along the North Slope.
- Hired and trained 11 Subsistence Advisors and eight Community Liaisons Advisors, who are on site in coastal villages from St. Lawrence Island to Kaktovik.
- Hired, trained and deployed Oil Spill Response personnel.
- Put in service a dedicated 737 fixed-wing aircraft for crew changes.

It is important to note that an exploration program, unlike a development and production program, is a temporary, short-term operation. In the Alaska OCS, an exploration program includes drilling multiple wells. Each are anticipated to take approximately 30 days to complete and then the well will be permanently plugged

and abandoned and the site cleared. Shell's exploration program will meet or exceed all applicable regulatory requirements for the protection of health, safety and the environment.

We strive to be the best neighbors possible within the communities in which we work. For example, we have chartered a crew-change plane to avoid disrupting the existing flights in and out of Barrow. We have dedicated camps to quarter personnel to avoid flooding local markets and inflating the cost of living in communities that are already in tight supply. We have Communication Centers and Subsistence Advisors to assure that our activities are aligned with subsistence activities. Efforts such as these help ensure that our Alaska OCS development is sustainable.

Finally, our 2012 program also includes a significantly expanded data-gathering data program so that we can develop a comprehensive understanding of the coastal and onshore environments of the North Slope and identify viable development opportunities, including where future production infrastructure can be sited, such as pipelines, staging areas, and pumping stations. This program included:

- Surveying an area of more than 21,000 square miles (roughly the size of West Virginia) to understand the physical, biological, and social environment.
- Collecting various types of scientific information in more than 1,000 survey areas, transects, and study plots within the National Petroleum Reserve—Alaska.
- Conducting hydraulic assessments of 62 rivers and 20 lakes.
- Conducting vegetation/wildlife habitat assessments on 176 assessment plots and assessing coastal fish and bird populations.
- Working with the Bureau of Land Management to develop consistent data collection and assessment protocols and fill data needs.

These onshore studies are being integrated with preliminary engineering and design efforts to identify infrastructure construction requirements. While this program required extensive use of helicopters to deploy investigators across this large area, we worked extensively with local stakeholders and subsistence hunting communities to reduce the potential for impacts.

Shell Alaska: 2013 and Beyond

For 2013, our approved Exploration Plan allows for a similar fleet and personnel deployment, so that we can drill wells and make hydrocarbon discoveries. We plan to complete several wells in the Chukchi Sea and one to two wells in the Beaufort Sea to prove Alaska's hydrocarbon potential, and then move to verify the size and scope of resource. The lessons learned from 2012's complex logistics fleet and personnel deployment are significant. Shell is already incorporating these lessons into our even more robust 2013 plans.

Well results in 2013 will dictate individual project success for further pursuit, or potentially, shift us to explore the remainder of our portfolio in both the Chukchi and Beaufort Seas. It is important to recognize we have 413 lease blocks in our Alaska offshore portfolio and paid a total of $2.2 Billion between 2005 and 2008 for the right to explore and develop these leases. We are paying escalating annual lease rentals to the Federal Government. Total rentals paid in 2013 will be nearly $8 million. While we are committed to continuing our exploration efforts, there is recognition of the untenable nature of exploring and confirming commercial energy resources within the 10-year lease term in the offshore Arctic. To have a sustainable program, these plans must be evaluated well in advance of lease expiry.

Lessons Learned and Recommendations

We have learned many lessons over the last seven years in Alaska. Today I want to focus on the often frustrating experience with navigating the uncertain process governing exploration, and also provide a few recommendations concerning the regulatory and legal processes, and Arctic lease terms. Stated simply, the status quo is neither workable nor defensible, and it is putting the development of Alaska's offshore resources at risk.

Improve the Regulatory Process

To put it bluntly, the regulatory process for drilling in Alaska is broken; it is not efficient, it results in unnecessary and costly delays, and it needs to be fixed. And we at Shell believe that it can be—and must be—fixed. We are willing to work with government agencies to accomplish this, based upon what we have learned and experienced over the last seven years. As we have said over a number of years, rigor is still required, but rigor can be delivered more efficiently. To put things in context, Shell paid the Federal Government $2.2 billion for leases in the Chukchi and Beaufort Seas. Prior to offering these leases, the government spent years doing in-depth

environmental analyses. While the Federal Government should not just hand Shell its permits and approvals without Shell making the required health, safety and environmental showings, we did reasonably expect that following the government's comprehensive environmental studies and its decision to offer the leases, that the necessary government permits and approvals to explore and develop the leases would follow in an orderly manner. That has not been our experience, and it has deprived us of our ability to exercise our rights under leases that we paid significant amounts of money to secure.

I also want to make clear that fault does not always lie with the regulators themselves; it is the inefficient and broken regulatory process that is most often to blame. Over the years, we have worked with many individuals at state and Federal regulatory agencies that are extraordinarily dedicated public servants and have worked intensely on our program. That is much appreciated.

But the fact remains that the regulatory system for offshore Alaska operations is flawed. The most fundamental flaw, which I will discuss in more detail, is that the regulatory process lacks certainty. Shell, like all other regulated businesses, needs to know the *"rules of the game" up front, and these rules must be clear and cannot constantly change.* Shell is more than willing to play by the rules; to have a robust and thorough permitting process; and to adhere to the highest environmental standards. But the way that regulatory agencies apply their standards, regulations and statutes should be clear and consistent, and the permitting process should be transparent, so that lease holders like Shell will know with certainty both what the requirements for drilling plans are, and that if these requirements are met, drilling can proceed.

A second problem is that there is a lack of coordination by the many agencies that regulate drilling activities within the Arctic, both between the various agencies, and, at times, even within the same agency. A mechanism must be put into place to require that regulatory agencies properly coordinate to avoid unnecessary, timely and costly delays. Congress has done this in many other circumstances, and should do so here as well.

To improve the regulatory process I have three recommendations:

1. *Federal permitting for Alaska energy development and infrastructure should be done by a single office.* To date, our project has required many permits from multiple Federal agencies. The current process is cumbersome, inefficient, and leads to duplication of work and effort (on both the part of the agencies and Shell). There is a lack of communication among and between the many agencies. Under the current system, the process is neither clear nor certain, and the quality of decisionmaking could suffer.

   The need for coordination was recognized by our Alaska senators in legislation and the Administration in July 2011, when the Federal Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska was created to ensure that Arctic energy decisions related to drilling projects were coordinated across some 11 Federal departments and agencies. This was a welcome development led by Assistant Secretary David Hayes.

   But I believe this is not enough to efficiently meet the growing demands of a project that will require years of sustained effort. Going forward, Shell and possibly other companies will collectively need hundreds of government reviews, approvals and permits annually. Under the current multi-agency regulatory process, this will not work.

   Just as important, the government should be organized in a manner that ensures a cohesive approach to developing Alaska's energy resources. We have seen the National Oceanic and Atmospheric Administration issue an Arctic Environmental Impact Statement with little consultation or coordination with other agencies. We have a new National Petroleum Reserve Alaska (NPRA) management plan from Bureau of Land Management that will make pipeline construction through NPRA to TAPS a regulatory challenge, because it includes provisions that hinder stream and river crossings, complicating the construction of energy infrastructure.

   The Federal Government made the decision to sell Alaska OCS leases with the intent of assessing and evaluating the resources potential to inform decisions about future development. The government accepted $2.2 Billion from Shell in lease bids. It should have a coordinated, cohesive plan to make that a reality. Instead we have multiple agencies each with a separate piece of the regulatory puzzle that are not always working in a coordinated fashion toward a clear and common goal. We believe that in order to facilitate an orderly and efficient

process, all regulatory approvals should be handled by a single office with clear coordination and consultation requirements and clear deadlines.

Canada is moving to "one project, one review" in order to streamline the regulatory process for *all major economic projects.* The reforms consolidate the number of regulatory bodies responsible for reviews and set binding timelines for regulatory decisions. In announcing the reforms, a top government official said, "It will help prevent the long delays in reviewing major economic projects that kill potential jobs and stall economic growth by putting valuable investment at risk." Many state public service commissions have a similar approach, where a single siting board issues all of the permits and approvals required for an energy generation project.

To bring certainty, efficiency, clarity and coordination to the process of permitting Alaska energy projects, I recommend a "one-stop" permitting office for Alaska's offshore projects. This could be done any number of ways. For example,

- All Federal review, approval and permitting work for developing Alaska's energy resources and related infrastructure could be done in a single office based in Alaska. That office should include the range of experts needed for both the offshore exploration and development and the onshore infrastructure. Such an office was proposed in legislation that Senator Begich and Senator Murkowski introduced recently.

Or

- Even better, Congress should consider creating a dedicated, focused regulatory body for Alaska's offshore oil and gas projects. The compelling reasons to take this step include the size of the resource; the economic benefits of development for the nation; and the critical need for the resource to reach the TAPS pipeline and ultimately, the market in a timely manner.

2. *Federal agencies must be fully resourced, coordinated, and must deliver decisions in a timely manner.* We cannot forget that the Federal Government held a lease sale and Shell paid $2.2 billion with the reasonable expectation that the Federal Government would have adequate, trained staff with appropriate expertise and direction to execute the program in a timely manner. Failure to provide such support undermines confidence in the offshore leasing program and denies lessees of the benefit of their bargain. .

   To the extent that there is not "one-stop" permitting, Congress should take action to assure that regulatory agencies are fully coordinated, have deadlines in place for reviewing and processing permit applications, and are held accountable when they fail to meet such milestones. In the new transportation authorization, MAP–21, agencies that miss permitting deadlines can lose part of their budget. When the private sector invests billions of dollars in projects that will create economic activity and jobs, enhance energy security, and improve the Nation's infrastructure, there is a real cost if regulatory agencies fail to coordinate and deliver (or reject) needed approvals and permits in a reasonable and timely manner.

   And lack of resources at the agencies cannot be an acceptable excuse for delayed permitting and approvals. In this time of tight budgets, policymakers should authorize and direct agencies to retain outside experts with funds provided by applicants. This is not new for many agencies, and can be accomplished through arms-length funding and with pre-approved independent third-party contractors.

3. *Regulatory requirements must be based on facts and science; and absent some compelling reason, those requirements should not change "in the middle of the game."* Our Alaska project is subject to intense scrutiny by regulators and by the public, as it should be. Some who oppose the project, however, deal with information not based on fact or science. While such opposition—whether in the media or behind closed doors—will always exist, regulatory agencies cannot allow incorrect facts or faulty science to influence their decisionmaking.

   Shell is committed to advancing the scientific understanding of the Arctic and the technology used in the Arctic. Some argue that there is insufficient scientific data regarding the Arctic and, therefore, exploration in the Chukchi and Beaufort Seas should not go forward. In reality, the available scientific data is more than adequate to identify and evaluate the impacts of an exploration program that is, by definition, a short-term, temporary operation.

Regulatory decisions that assess the capabilities of our equipment and assets must be based on accurate facts. For example, we have gone to considerable expense to assemble a suite of vessels and other assets that are capable of operating in Arctic conditions well into the fall. What is the point of having such equipment if we are not given the chance to use it in our operations?

Improve the Litigation System

The system allows multiple lawsuits on a single project, which can keep a project in litigation for more than a decade. When a single, major project needs dozens, maybe hundreds of government approvals and permits, each approval and each permit is an opportunity for a potential lawsuit by those seeking to stop the project. Project opponent often use the environmental laws under which permits are issued to challenge projects for reasons wholly unrelated to protecting the environment. These lawsuits have the potential to deter investment and economic growth.

This problem is not unique to Shell, and should concern all of us. There is a better way. For example, Congress passed legislation aimed at reducing the uncertainty that litigation can bring to Federal transportation projects. Congress reduced the time in which an opponent must file suit from six years to five months. Under this simple reform, no one loses the opportunity to have his day in court, but potential plaintiffs can no longer "lie in wait" for years before bringing legal action. Policymakers should make such reforms apply more broadly, so that the right to go to court is preserved while at the same time ensuring that the legal process does not stymie economic growth and investment.

For example, Congress could:

- Change the statute of limitations period for legal challenges from six years to sixty days;
- Set a deadline for adjudication of challenges or require that courts give energy projects priority on dockets;
- Require that all project challenges be brought directly in the District Court closest to the project location.

Revenue Sharing

Current law provides that revenue from Gulf of Mexico leases is shared with the Gulf States of Alabama, Louisiana, Mississippi and Texas. Alaska should also share have revenue sharing rights. It is only fair. Congress should approve legislation that gives Alaska a portion of the Federal revenue generated by production on current and future leases.

Extend Arctic Lease Terms

Our Arctic offshore leases have a ten-year term. This is too short. Shell has worked diligently to prosecute its leases, but has experienced substantial and unanticipated delays due to a broken permitting process and to litigation. Further, the exploration window in the Arctic is short. While exploration in the Gulf of Mexico can be done 12 months a year, the exploration drilling season in the Arctic is typically about three or four months. We urge policymakers to provide longer lease terms for future Arctic leases. But we also need a remedy for existing leases that we have earnestly pursued; many of these are well into their term without even initial well results. Unless addressed, a number of Arctic leases will expire before they have had a fair chance to be explored.

Summary of Recommendations

In summary, the statutes and regulations applicable to developing Alaska's offshore resources and to bring those resources to market should be administered by a single, dedicated body based in Alaska. The regulatory framework should be clear and consistent. The regulatory process should be properly funded, efficient and robust. The process should lead to timely decisions. Permitting for oil and gas activity must be done thoroughly and to the letter of the law, and the litigation process should be controlled. Regardless of one's views on oil and gas development, anything less than this should not be tolerated.

I am happy to answer any questions.

Senator BEGICH. Thank you very much.

Let me now go to Jacob Adams, the Chief Administrative Officer for the North Slope Borough.

Jacob, good to see you again.

STATEMENT OF JACOB ADAMS, CHIEF ADMINISTRATIVE OFFICER, NORTH SLOPE BOROUGH

Mr. ADAMS. Good morning, Senator Begich. My name is Jacob Adams, and I am the Chief Administrative Officer for the North Slope Borough. I appreciate the opportunity to testify about the challenges and opportunities that Alaska Native communities face as a result of offshore oil and gas development.

As most of you know, the North Slope Borough is the local unit of government for the Arctic region of Alaska, an area slightly larger than the State of Utah. Lately there has been a lot of attention directed toward Arctic issues. And with that focus, a cacophony of voices espousing myriad viewpoints have arisen. It is my hope today to provide this committee with a well-balanced perspective on the issue of Arctic offshore oil and gas development.

It is estimated that there are upwards of 20-plus billion barrels of recoverable oil in Arctic Alaska's outer continental shelf. This represents one of the largest potential finds for the state and the Nation since Prudhoe Bay in the 1960s. So to understand the kinds of opportunities that could exist for Alaska Native communities with a potential discovery of this magnitude, one need only look at history.

The discovery of oil at Prudhoe Bay brought immeasurable amounts of change to the Native communities of Alaska's North Slope. Sod huts turned into permanent houses. Schools, airports, roads, and utility systems were erected. The North Slope Borough, along with the Native corporations, were formed in the early 1970s. In short, over the course of a few decades, a semi-nomadic people subsisting off the land and abundant resources of the land and sea were catapulted into modern 20th century society.

This, of course, presented new challenges and opportunities for Alaska Natives, and with the prospect of OCS development, we find ourselves again, potentially, on the threshold of another era of unprecedented change.

One of the greatest benefits associated with Prudhoe Bay was the fact that it occurred largely on state land. Royalty and tax revenues flowed into the state and local coffers, benefiting our people tremendously. This is a fact that all Alaskans were reminded of last week with the payment of our annual Permanent Fund dividends.

But without Congressional action, OCS development may offer little, if any, of the benefits that we have seen with prior onshore development. I see this as one of the greatest challenges facing the people of the North Slope. And it seems difficult for the Federal Government to justify why the people of Alaska are not entitled to the same economic benefits as the residents of the Gulf Coast states.

This is especially true given our people's physical and cultural reliance on the Bowhead whale and other important marine mammals. We bear the majority of the risks of what can go wrong with OCS development and receive little direct benefit. Congress should act to ensure that royalty revenue received from OCS development is shared with local communities to help mitigate the negative impacts of oil development.

Part of the frustration expressed by Alaska Natives towards OCS development is attributable to the fact that we do not feel that we have been offered a seat at the decisionmaking table. While local representatives of Federal agencies often reach out to Alaska Native communities and solicit concerns, leadership in Washington, D.C. seems prone to ignore local input in the pursuit of political agendas. The Federal Government must give more than lip service to local involvement, and meaningful reforms need to be made to the government's tribal consultation policies.

Another critical issue associated with OCS development is how the oil discovered will be brought to market. If industry decides to ship oil by tanker, the potential for an oil-related catastrophe impacting marine subsistence resources will increase and the opportunities to glean even indirect economic benefits will decrease dramatically.

It is imperative that the Federal Government encourage and support an oil pipeline from OCS development areas into the Trans-Alaska Pipeline. This will mitigate potential impacts to critical marine subsistence resources and maximize the amount of economic benefit gleaned by the local peoples of the North Slope and Alaska.

For this reason, it is essential that the Federal Government make management decisions for the NPRA that will not foreclose this opportunity. The Mayor of the North Slope Borough, Charlotte Brower, recently raised concerns over Secretary Salazar's preferred alternative for the NPRA, and I want to reiterate those concerns this morning. It is not in our people's best interest, nor is it common sense, for the Federal Government to effectively foreclose such a large area of the NPRA from the development of oil and gas infrastructure before we all have a better understanding of the economic and technical feasibility of potential pipeline corridors through NPRA.

It would be better if the Federal Government would focus on making management decisions that go to the heart of some of our immediate concerns such as investing the resources necessary to have a year-round presence of Coast Guard personnel on the North Slope. This year we've had hundreds of ships and thousands of mariners operating in the Beaufort and Chukchi Seas. A couple of Coast Guard helicopters and a handful of Coastguardsmen is not sufficient to police and provide effective emergency coverage for such a large area. But we applaud the Coast Guard for being here this summer. It is a first for the Coast Guard and Northern Alaska.

In addition, there must be greater investment in upgraded communication systems such as radio and fiber-optic, ports that can handle deep-draft vessels and icebreakers. It is imperative that Congress act soon to provide funding for such investments before we are overtaken by the pace that OCS oil and gas development is occurring.

Another area in which Alaska Natives may realize tremendous opportunities from OCS development comes through our Native corporations. As an example, Olgoonik Corporation is moving forward on its plan to develop the infrastructure in their community necessary to support OCS development in Wainwright. The Arctic Slope Regional Corporation has also positioned itself to provide

services in support of OCS development. Other villages and Native corporations stand to gain as development moves forward.

We are also encouraged by the responsible and measured approach undertaken by Shell during this drilling season. It comes as no surprise to us that ice floes and the often unpredictable nature of the Arctic dictated the retreat of Shell's drilling rig during the late summer. But Shell's patience and willingness to forgo drilling into hydrocarbon-bearing zones this year, and to refrain from drilling during the fall whaling season, testify to Shell's commitment to conduct its operations in a safe and responsible way. We applaud those efforts by Shell.

To conclude, OCS development presents a plethora of opportunities and challenges to Alaska Native communities. While we appreciate the opportunity to talk about these issues before this committee, we feel that we must be provided more opportunities to have a seat at the table when it comes to making OCS management decisions. Until that time, we will continue to be wary of any decisions that are not inclusive of local input and involvement. Thank you.

[The prepared statement of Mr. Adams follows:]

PREPARED STATEMENT OF JACOB ADAMS, CHIEF ADMINISTRATIVE OFFICER, NORTH SLOPE BOROUGH

Good Morning, Sen. Begich, Committee members. My name is Jacob Adams and I am the Chief Administrative Officer for the North Slope Borough.

It is a pleasure to testify today about the challenges and opportunities that Alaska Native communities face as a result of offshore oil & gas development. As most of you know, the North Slope Borough is the local unit of government for the Arctic region of Alaska-an area slightly larger than the state of Utah.

Lately there has been a lot of attention directed towards Arctic issues. And with that focus, a cacophony of voices espousing myriad viewpoints have arisen. It is my hope today to provide this Committee with a well-balanced perspective on the issue of Arctic offshore oil & gas development.

It is estimated that there are upwards of 20 billion barrels of recoverable oil in Arctic Alaska's outer-continental shelf. This represents one of the largest potential finds for the state and the Nation since Prudhoe Bay in the 1960s. And so to understand the kinds of opportunities that could exist for Alaska Native communities with a potential discovery of this magnitude, one need only look at history.

The discovery of oil at Prudhoe Bay brought immeasurable amounts of change to the Native communities of Alaska's North Slope. Sod huts turned into permanent houses. Schools, airports, roads, and utility systems were erected. Native corporations were formed along with the North Slope Borough. In short, over the course of a few decades, a semi-nomadic people subsisting off the abundant resources of the land and sea, were catapulted into modern 20th century society.

This of course presented new challenges and opportunities for Alaska Native communities. And with the prospect of OCS development, we find ourselves again, potentially, on the threshold of another era of unprecedented change.

One of the greatest benefits associated with Prudhoe Bay was the fact that it occurred largely on state land. Royalty and tax revenues flowed into state and local coffers-benefitting our people tremendously. This is a fact that all Alaskans were reminded of last week with the payment of our Permanent Fund dividends.

But without Congressional action, OCS development may offer little if any of the benefits that we have seen with prior onshore development.

I see this as one of the greatest challenges facing the people of the North Slope. And it seems difficult for the Federal Government to justify why the people of Alaska are not entitled to the same economic benefits as the residents of Gulf Coast states. This is especially true given our people's physical and cultural reliance on the Bowhead whale and other important marine mammals. We bear the majority of the risks of what can go wrong with OCS development and receive little direct benefit. Congress should act to ensure that royalty revenue received from OCS development is shared with local communities to help mitigate the negative impacts of development.

Part of the frustration expressed by Alaska Natives towards OCS development is attributable to the fact that we do not feel that we have been offered a seat at the decision-making table. While local representatives of Federal agencies often reach out to Native communities and solicit concerns, leadership in Washington, D.C. seems prone to ignore local input in the pursuit of political agendas. The Federal Government must give more than lip service to local involvement and meaningful reforms need to be made to the government's tribal consultation policies.

Another critical issue associated with OCS development is how the oil discovered will be brought to market. If industry decides to ship oil by tanker, the potential for an oil-related catastrophe impacting marine subsistence resources will increase and the opportunities to glean even indirect economic benefits will decrease dramatically.

It is imperative that the Federal Government encourage and support an oil pipeline from OCS development areas into the Trans-Alaska Pipeline. This will mitigate potential impacts to critical marine subsistence resources and maximize the amount of economic benefit gleaned by the local peoples of the North Slope and Alaska.

For this reason, it is essential that the Federal Government make management decisions for the NPR–A that will not foreclose this opportunity. The Mayor of the North Slope Borough, Charlotte Brower, recently raised concerns over Secretary Salazar's preferred alternative for the NPR–A, and I want to reiterate those concerns this morning. It is not in our people's best interest, nor is it common sense, for the Federal Government to effectively foreclose such a large area of the NPR–A from the development of oil & gas infrastructure before we all have a better understanding of the economic and technical feasibility of potential pipeline corridors.

It would be better instead if the Federal Government would focus on making management decisions that go to the heart of some of our immediate concerns such as investing the resources necessary to have a year-round presence of Coast Guard personnel on the North Slope. This year we've had hundreds of ships and thousands of mariners operating in the Beaufort and Chukchi Seas. A couple of Coast Guard helicopters and a handful of Coastguardsman is not sufficient to police and provide effective emergency coverage for such a large area. But we applaud the Coast Guard for being here this summer.

In addition, there must be greater investment in upgraded communication systems (radio and fiber-optic), ports that can handle deep-draft vessels, and icebreakers. It is imperative that Congress act soon to provide funding for such investments before we are overtaken by the pace that OCS oil & gas development is occurring.

Another area in which Alaska Natives may realize tremendous opportunities from OCS development comes through our Native Corporations. As an example, Olgoonik Corporation is moving forward on its plan to develop the infrastructure necessary to support OCS development in the village of Wainwright. The Arctic Slope Regional Corporation has also positioned itself to provide services in support of OCS development. Other village and Native corporations stand to gain as development moves forward.

We are also encouraged by the responsible and measured approach undertaken by Shell during this drilling season. It comes as no surprise to us that ice floes and the oft-unpredictable nature of the Arctic dictated the retreat of Shell's drilling rig during the late summer. But Shell's patience and willingness to forgo drilling into hydrocarbon-bearing zones this year, and to refrain from drilling during the fall whaling season, testify to Shell's commitment to conduct its operations in a safe and responsible way. And we applaud those efforts.

To conclude, OCS development presents a plethora of opportunities and challenges to Alaska Native communities. And while we appreciate the opportunities to talk about these issues before this committee, we feel that we must be provided more opportunities to have a seat at the table when it comes to making OCS management decisions. Until that time, we will continue to be wary of any decisions that are not inclusive of local input and involvement. Thank you.

Senator BEGICH. Thank you, Mr. Adams. Thank you.

The next person we have is Edith Vorderstrasse—I always struggle a little bit with that—Consulting Division Manager of UIC.

Please.

STATEMENT OF EDITH VORDERSTRASSE, CONSULTING DIVISION MANAGER, UMIAQ, UKPEAĠVIK IÑUPIAT CORPORATION (UIC)

Ms. VORDERSTRASSE. Good morning, Senator. Thank you for giving us this opportunity to testify before the Subcommittee. My name is Edith Vorderstrasse, and I am the Consulting Division Manager of UMIAQ, a subsidiary of Ukpeaġvik Iñupiat Corporation, known as UIC.

UIC was created under the Alaska Native Settlement Act in 1972 to serve the social and economic interests of the Iñupiat people of the community of Barrow, Alaska, the northernmost community in the United States. I am Iñupiaq, a UIC shareholder and an Arctic Slope Regional Corporation shareholder, and have served Barrow residents in a variety of capacities, including former Mayor of the City of Barrow and former President of UIC.

The life of the 21st century Iñupiat is a complicated balancing act between preserving our culture and developing opportunities for the benefit of our people. If offshore oil production occurs in the Chukchi Sea or Beaufort Sea, the oil industry needs to build a strong, enduring alliance with the Iñupiat people.

After over 35 years of oil production on the North Slope, there has been no significant long-term effort for contracting with Alaska Native corporations or for the employment of North Slope residents, the people most directly affected by the oil production facilities. Local contracting and employment must be the cornerstones upon which future oil production is based in order to build a beneficial alliance with Iñupiat communities. There is no reason that the Iñupiat, an Alaska Native people, should accept the disproportionately adverse risks of offshore oil production without receiving the benefits it can also bring. Anything less than this effort would violate the Federal standards of environmental justice.

UIC supports oil and gas development, both onshore and offshore. The Board of Directors provided us with this guidance: "In our interactions with the oil and gas industry, we will leverage our position to benefit the Ukpeaġvik Iñupiat Corporation Family of Companies, its shareholders, and the community. We acknowledge the inevitability of exploration and development by the oil and gas industry, and we will support exploration and development activities as long as they are done in a way that ensures protection and preservation of the Iñupiat culture and our subsistence way of life; economic benefit for our community; employment for our shareholders and their families; and contract opportunities for our companies."

I am here to talk about lessons we have learned during the development of Shell's exploration program for the Chukchi and Beaufort Seas this season. UMIAQ is one of several companies Shell has engaged. The results have been good for both companies and should continue. We believe Shell has effectively engaged Iñupiat communities because they have listened to their concerns, made meaningful changes to their plans, and kept the promises that they made. As a result, Shell has formed a strong relationship with Alaska Native corporations for this venture, but it should be much stronger.

Following the guidelines given by our Board of Directors, more can be done in three specific areas to strengthen the alliance between the oil industry, Alaska Native corporations and Federal regulators.

Impact assistance to communities. Both Wainwright and Barrow have experienced extraordinary demands on their existing infrastructure to accommodate Shell's offshore efforts. Other communities have also had significant challenges placed on their local resources to accommodate the oil industry stakeholder engagement efforts. In some cases housing, the electrical generation capacity, water and sewer demands will soon outstrip the local communities' ability to provide the service.

The Federal Government should also make available a revolving loan fund that will enable those communities to address their infrastructure demands. And I believe in this area, revenue sharing should be a part of the OCS leases because it will provide impact aid for the communities that are impacted by it.

Part of this impact is not knowing what Federal facilities will be needed to accommodate for offshore oil production and the increasing amount of marine traffic on the Arctic Ocean. The Coast Guard has indicated they will return to the Arctic but have yet to say when or where. Where will they home port a cutter or base their aircraft?

In the meantime, icebreakers from the People's Republic of China, South Korea, Russia, Canada, Finland and Sweden travel the Arctic Ocean virtually unchecked by the United States. Even if we had a mind to do so, our sole active icebreaker, the *Healy,* is hardly up to the challenge. The lack of a U.S. maritime presence on the Arctic Ocean and the failure of the Senate to ratify the Law of the Sea treaty to protect American coastal interests appear to concede territory to other Arctic Nations. Because of the lack of facilities or established presence, we are concerned that the United States has failed to recognize the Arctic as the new geopolitical frontier that it is becoming.

Our concern is that unless we know what is coming from the Federal Government, we will not know if the ocean that we hunt and fish from will continue to be a safe source for our food.

Long-term contracting opportunities. While Shell has done an outstanding job working with Alaska Native corporations to deliver an exploration program, there have been no similar in-depth efforts by other offshore oil and gas leaseholders in their effort to develop the Chukchi or Beaufort Sea. One reason Shell has been able to mount a successful effort to drill offshore is that they have effectively engaged the expertise provided by the Alaska Native corporations. The knowledge the Alaska Native corporations have to effectively communicate with the population and regulators has played a major part in Shell's success.

While initially Shell seemed happy to simply go through the motions and simulate stakeholder engagement, the reality was that it took true understanding with the assistance of the Alaska Native corporations to get the job done right. Shell's model of working with Alaska Native corporations on a long-term and continuing basis should be the standard for the industry.

Workforce development is number three. One of the frustratingly persistent problems with oil and gas development is the inability for Alaska Natives to achieve meaningful long-term employment with the oil and gas companies operating on the North Slope. This is despite the presence of these companies for almost 50 years. While some companies begin with the best of intentions, these efforts soon dwindle or disappear after production is established.

We believe the efforts fail because of the lack of a long-term commitment to Alaska Native employment and the fact that most new fields operate with a smaller work force. A smaller workforce means that most operators find the workforce development process onerous and would rather pay to hire a trained employee from Texas or Oklahoma than train an Alaska Native or anyone else from Alaska.

We believe the Alaska Native development and hire issue is crucial to Arctic offshore oil and gas production because it brings Arctic experts into a workforce that are well compensated. While the smaller workforce for a new field may be an issue, an effort to form a training consortium for Alaska Natives would quite reasonably address hiring locally. This training consortium would be operated in Alaska and be a single source where oil producers could hire all workers needed in Alaska. We also believe that the North Slope operators should require their subcontractors to hire from this training consortium.

An example of how this training consortium would have been helpful is when one of Shell's subcontractors had a request to hire 10 North Slope residents for work on their vessels. Because the company was not familiar with Alaska or how to effectively recruit employees from the North Slope communities, they were only able to recruit one person from the North Slope and filled the other nine vacancies with people from Texas and Louisiana. If this consortium were in place, all of their hires would have come from the North Slope.

I hope that you will take these lessons learned back with you and recognize that offshore oil and gas development presents enormous opportunities to get it right, to work with Native Americans in a balanced way that is both positive and productive. It is also a wake-up call to the United States to establish a decisive presence in the Arctic that cannot be challenged.

We represent an Alaska Native corporation, but we are also Iñupiat and embody all that goes with it, which includes compassion, respect for elders, one another and nature, knowledge of our language, love for our children, knowledge of our family tree, hunting traditions, sharing, cooperation, humility, resolution of conflict, hard work, humor and spirituality. Our corporation recognizes that finding balance between the goals of economic opportunity and preserving our way of life will require compromise, diligence, creative thinking, open communications and a lot of hard work. Thank you for this opportunity.

[The prepared statement of Ms. Vorderstrasse follows:]

PREPARED STATEMENT OF EDITH VORDERSTRASEE, CONSULTING DIVISION MANAGER, UMIAQ, UKPEAĠVIK IÑUPIAT CORPORATION (UIC)

Good Morning Senators, my name is Edith Vorderstrasse and I am the Consulting Division Manager for UMIAQ, a subsidiary of Ukpeaġvik Iñupiat Corporation (commonly known as UIC).

UIC was created under the Alaska Native Claims Settlement Act in 1972 to serve the social and economic interests of the Iñupiat people from the community of Barrow, Alaska—the northernmost community in the United States. I am Iñupiaq, a UIC and Arctic Slope Regional Corporation shareholder, and have served Barrow residents in variety of capacities, including former Mayor of the City of Barrow and former President of UIC.

The life of the 21st Century Iñupiat is a complicated balancing act between preserving our culture and developing opportunities for the benefit of our people. If offshore oil production occurs in the Chukchi or Beaufort Seas, the oil industry needs to build a strong, enduring alliance with the Iñupiat people. After over 35 years of oil production on the North Slope, there has still been no significant long term effort for contracting with Alaska Native Corporations or for the employment of North Slope residents—the people most directly affected by the oil production facilities. Local contracting and employment must be the cornerstones upon which future oil production is based in order to build a beneficial alliance with Iñupiat communities. There is no reason that the Iñupiat, an Alaska Native people, should accept the disproportionately adverse risks of offshore oil production without receiving the benefits it can also bring. Anything less than this effort would violate the Federal standards for Environmental Justice.

UIC supports oil and gas development, both onshore and offshore. The Board of Directors provided us with this guidance,

"In our interactions with the oil and gas industry, we will leverage our position to benefit the Ukpeaġvik Iñupiat Corporation Family of Companies, its shareholders, and the community. We acknowledge the inevitability of exploration and development by the oil and gas industry and we will support exploration and development activities as long as they are done in a way that ensures:

- *Protection and preservation of the Iñupiat culture and subsistence lifestyle;*
- *Economic benefit for our community;*
- *Employment for our shareholders and their families; and*
- *Contract opportunities for our companies."*

I am here to talk about lessons we have learned during the development of Shell's Exploration Program for the Chukchi and Beaufort Seas this season. UMIAQ is one of several companies Shell has engaged. The results have been good for both companies and should continue. We believe Shell has effectively engaged Iñupiat communities because they have listened to their concerns, made meaningful changes to their plans and kept the promises they have made. As a result, Shell has formed a strong relationship with Alaska Native Corporations for this venture, but it should be much stronger.

Following the guidance given by our Board of Directors, more can be done in three specific areas to strengthen this alliance between the oil industry, Alaska Native Corporations and Federal regulators.

1. *Impact Assistance to Local Communities*—Both Wainwright and Barrow have experienced extraordinary demands on their existing infrastructure to accommodate Shell's offshore efforts. Other communities have also had significant challenges placed on their local resources to accommodate the oil industry stakeholder engagement efforts. In some cases housing, the electrical generation capacity, water and sewer demands will soon outstrip the local communities' ability to provide the service. The Federal Government should make available a revolving loan fund that will enable these communities address their infrastructural demands in a timely manner. The revenue sharing would certainly help the impacted communities.

   Part of this impact is not knowing what Federal facilities will be needed to accommodate for offshore oil production and the increasing amount of marine traffic on the Arctic Ocean. The Coast Guard has indicated they will return to the Arctic but have yet to say when or where—where will they home port a cutter or base their aircraft? In the meantime, icebreakers from the People's Republic of China, South Korea, Russia, Canada, Finland and Sweden travel the Arctic Ocean virtually unchecked by the United States. Even if we had a mind to do so, our sole active icebreaker, the *Healy,* is hardly up to the chal-

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Our concern is that unless we know what is coming from the Federal Government, we will not know if the ocean that we hunt and fish from will continue to be a safe source for our food.

2. *Long Term Contracting Opportunities*—While Shell has done an outstanding job working with Alaska Native Corporations to deliver an exploration program, there have been no similar in-depth efforts by other offshore oil & gas lease holders in their effort to develop their Chukchi or Beaufort leases. One reason Shell has been able to mount a successful effort to drill offshore is that they have effectively engaged the expertise provided by the Alaska Native Corporations.

   The knowledge the Alaska Native Corporations have to effectively communicate with the population and regulators has played a major part in Shell's success. While initially Shell seemed happy to simply go through the motions and simulate stakeholder engagement, the reality was that it took true understanding with the assistance of the Alaska Native Corporations to get the job done right. The Shell model of working with Alaska Native Corporations on a long term and continuing basis should be the standard for the industry.

3. *Workforce Development*—One of the frustratingly persistent problems with oil and gas development is the inability for Alaska Natives to achieve meaningful long-term employment with the oil and gas companies operating on the North Slope. This is despite the presence of these companies for almost 50 years. While some companies begin with the best of intentions, these efforts soon dwindle or disappear after production is established. We believe the efforts fail because of the lack of a long term commitment to Alaska Native employment and the fact that most new fields operate with a smaller workforce. A smaller workforce means that most operators find the workforce development process onerous and would rather pay to hire a trained employee from Texas or Oklahoma than train an Alaska Native or anyone else from Alaska.

   We believe the Alaska Native development and hire issue is crucial to Arctic offshore oil and gas production because it brings Arctic experts into a workforce that are well compensated. While the smaller workforce for a new field may be an issue, an effort to form a training consortium for Alaska Natives would quite reasonably address hiring locally. This training consortium would be operated in Alaska and be a single source where oil producers could hire all workers needed in Alaska. We also believe that the North Slope operators should require their subcontractors to hire from this training consortium.

   An example of how this training consortium would have been helpful is when one of Shell's subcontractors had a request to hire 10 North Slope residents for work on their vessels. Because the company was not familiar with Alaska or how to effectively recruit employees from the North Slope communities, they were only able to recruit one person from the North Slope and filled the other nine vacancies with people from Texas and Louisiana. If this consortium were in place, all of their hires would have come from the North Slope.

I hope that you will take these lessons learned back with you and recognize that offshore oil and gas development presents enormous opportunities to get it right—to work with Native Americans in a balanced way that is both positive and productive. It is also a wakeup call to the United States to establish a decisive presence in the Arctic that cannot be challenged.

We represent an Alaska Native Corporation, but we are also Iñupiat and embody all that goes with it—which includes compassion, respect for elders, one another and nature, knowledge of our language, love for our children, knowledge of our family tree, hunting traditions, sharing, cooperation, humility, resolution of conflict, hard work, humor and spirituality. Our corporation recognizes that finding balance between the goals of economic opportunity and preserving our way of life will require compromise, diligence, creative thinking, open communications and a lot of hard work.

Senator BEGICH. Thank you very much. Thank you for your very thoughtful testimony and your information. Each one of you, your recommendations, are very helpful.

I'm going to keep my questions brief only because of time, but let me first say for the last panel and this panel, I have some additional questions which I will give to the record. That may come to you and ask for written response, so be prepared for that.

But first, if I can ask you this, Mr. Slaiby, in regards to drilling, I think I know the answer to this, but I want to put it on the record. I know there are questions out there, did you really drill, or did you dig a hole? I mean, what I understand about the pilot holes you drill, and drilling is drilling, and next year you'll be drilling again. I just want to make sure I'm clear on that because I've had some people ask me, well, they dug a mud hole; what does that mean? Because now we're getting more and more familiar with your terms, this is when we want to make sure it's clear. Then I had some other very direct questions in regards to the development.

Mr. SLAIBY. Unequivocally, we drilled this year. I've been in the business for 32 years, so I don't have to be fact-checked on that one. The important part of this for us is that with these wells, about half the work is in the first 1,500 feet of the well.

Senator BEGICH. Which is what you were doing this year.

Mr. SLAIBY. Yes, what we were doing this year, because we do construct a mud line cellar, which is about a 22 foot in diameter by a 40 foot bore hole constructed on the sea floor, and then we run a 30 inch and 20 inch casing inside of that. It's hugely time-consuming. But from that point, drilling forward to the termination of the well is only another 10 days of work.

Senator BEGICH. OK. Thank you very much. Let me ask you, and you did have three recommendations. One was on the permitting agencies, the change that kind of occurred, and I'm assuming the interagency group made a big difference in kind of bringing all these bodies together. I have pending legislation that makes that permanent, and I want to just see if that's where you were headed because my worry always is what happens next. I think it's great that Under Secretary Hayes is there. He gets it about coordinating all this. But what happens next?

You have a relationship. Even when he's yelling at you, you can still talk to him. But you have a relationship. Is your issue there, let's make this process of oil and gas development in the Arctic more permanent? So that whatever happens in the future, whatever company, whatever administration, whatever U.S. Senator, the same process continues. Is that what you're kind of referring to? I just want to make sure I'm clear on that.

Mr. SLAIBY. Precisely. The Deputy Secretary was very helpful and assembled people who were key in moving us forward. As I say, night and day difference between the two processes. Our concern and my concern specifically is sustainability, of being able to have that access to Deputy Secretary levels for Shell, for Conoco Phillips, for Stat Oil. I strongly question whether that level would be sustainable as we move forward.

Senator BEGICH. And if I could pause, I have a couple more questions to ask the other two witnesses. My assumption is you would

have that same response, that you want that high level of ability to interact with the issues that you bring up rather than 14 or 15 layers down. Is that a fair statement? Is that a fair statement that you want to have that kind of high level of interaction?

Mr. ADAMS. I think that's important for the North Slope Borough and the communities of the North Slope to have access to high-level people that make management decisions about what's happening in the OCS. Quite often, it takes so long for decisions to be made that sometimes we're running up against time, but the Arctic doesn't have much time.

Senator BEGICH. Edith?

Ms. VORDERSTRASSE. It is critical that our communities have the opportunity to be at the forefront. That is one of the reasons why UIC said we need to be involved from the get-go.

Senator BEGICH. You need to be at the table.

Ms. VORDERSTRASSE. We need to be at the table so we know what is coming to our communities and what form of protection that we may be able to provide or suggestions to the agencies that are making decisions on behalf of our ocean.

Senator BEGICH. Very good.

Mr. Slaiby, let me ask you, you had some challenges this year equipment-wise with production, and your explanation, I was interested in hearing about the dome. But, I mean, you were testing it, right? That was the purpose, to find out what might go wrong, and you found out very quickly, which is better there than later.

Here is the question I hear from people all the time. Take the dome or the containment vessel, or the other incident when the rig cut loose a little bit. People get concerned that is that the precursor to what they see in the future in the sense of the Arctic, and I'd like you to respond to that.

But also, I know Shell has done, on an international level, when they do testing of their equipment, a live oil spill, we don't do that in this country. So I'm interested in your response to that, because I'm a believer that you should do some live-managed oil spill, just like down in Juneau they did a fire controlled management of a house for practice and training. A guy donated the house, which I thought was very interesting, and got it burnt down. OK.

So I guess it's a two-part. One, how do you alleviate these concerns when you had a couple of things going on? And then, we don't want testing of the spill equipment in a spill. I am one of those believers that think we need to have a controlled environment. I know that makes people nervous, that we don't want to put anything in the ocean. Well, better to train on that than not.

Your comments on the concern that people have? Because I know you've done it in other countries, the live spill management.

Mr. SLAIBY. If I could, Senator, addressing the two parts of the question.

Senator BEGICH. Sure.

Mr. SLAIBY. One of the things I do want to bring into the conversation, and I know Admiral Ostebo also acknowledged, is that we've trained 2,000 people, deployed 20 vessels, two drilling rigs, three helicopters, three fixed-wing aircraft, and continue to operate. So, we've had a very, very successful year. I'm pleased with the operational aspects of that.

With respect to the dome and the anchor dragging, no incident is our goal, but occasionally we will see things, and that's why we designed mitigation behind the incident. We had a number of mitigants in place in Dutch Harbor when the Discoverer dragged anchor. The mitigants worked, and they worked very quickly. Within 22 minutes, the incident was under control.

Second, on the containment dome, as you quite rightly point out, it was Serial Number 1. There were incidents, and after we saw the incidents, we went through it from top to bottom until we got confidence. I strongly believe we have to be our own hardest critic. I know you get a lot of questions, but it really has to start with us. We have looked at it from top to bottom and believe that the process on the dome itself is game changing. An ability to separate oil and gas and water on top of a flowing well or a pipeline or other incident is something that this industry has needed since 1979.

So, we are still bullish on this process. We've had some deployment issues, mechanical and operational. We will work through those.

With respect to oil spill and water, we participated in a joint industry program, a JIP, for example, recently in Svalbard in the north of Norway where oil was put in the water. There is a second part of this JIP that will again involve putting oil in water and testing the effectiveness of oil spill response equipment.

We have drilled, not literally but practiced, on a number of exercises with Coast Guard, with NOAA, with EPA, State of Alaska. I am very pleased with how that has worked, both in the tabletop drills we've done, the four grade drills that we've done, and the deployment exercises that we've done down in Prince William Sound.

So I do believe we're ready. We have assurance that although the Challenger didn't travel up to Alaska, every other bit of the oil spill resource was deployed and available from the moment we started to drill.

Senator BEGICH. Very good.

Let me pause here because we just have a few more minutes. I want to get a couple more questions in to other folks, and then I might have one more, but I definitely have some that I want to submit on the record.

First, two comments. I agree with what everyone said in regards to revenue sharing. That is a critical piece, and I know each one of your own entities have supported that effort, so I thank you for that. We're working double time. We have legislation pending. We brought another—a Democrat up here who is on the Energy Committee who is the next in line to be the Chairman of that Committee. If Senator Murkowski is not the Chair, he will be the Chair. It's critical for him to understand. I think there's a lot better understanding of how revenue sharing will happen here.

And I also agree with you on the Law of the Sea. This is a critical piece, for us to understand our own sovereignty and making sure it's part of the equation.

Let me ask, if I can, in regards first to Jacob and your comment which is very interesting—actually, you both had it, Edith and Jacob, in regards to more local participation and input in the process, not midway through. And I'll hold Shell off here for a second because Shell has been very aggressive, as you both have testified,

in making sure that happens. But your issues are to make sure it happens more with others, as well as Federal agencies.

But the comment I heard you make, Jacob, and I think I know what you're saying here but I want to make sure I'm correct, and that's on tribal consultation. Sometimes I think the Federal Government has a narrow focus of what tribal consultation is, and that's the tribes only. And because Alaska is unique, we have regional, village and local communities that are kind of missed in that. Is that what I was hearing? I want to make sure I'm on the same path with you, because I agree with that. I think there's a misunderstanding sometimes of the Federal Government on this end.

Mr. ADAMS. Yes. I think that needs to be expanded because there are more than tribes on the North Slope. The North Slope Borough has been a major fighter in the efforts to get the message across to the United States Government about our concerns about OCS development and other governmental activities, and it provides a voice for the people collectively.

I'd like to say that we must, or Congress must make every effort to allow North Slope Borough and other organizations to have a seat at the table to help make management decisions affecting the lives of the people of the North Slope.

Senator BEGICH. Thank you, Jacob. Let me ask you one more question. I think this is more to reemphasize the point. Your point on oil and gas is if you're going to move oil, pipeline versus tanker, pipeline is the better approach. Is that what I heard?

Mr. ADAMS. That's always been the position of the North Slope Borough, that there must be a pipeline. We believe that tankers are riskier than pipelines, and across NPRA the pipeline. This would also afford more economic opportunities for our people, jobs and revenues for the local government, because North Slope Borough is very dependent on the production of oil.

Senator BEGICH. Very good.

Let me ask Edith. You had mentioned something interesting that I'm anxious to work with you a little bit on, and that is the whole idea of employment and training and connectivity. Shell is a good example, where they reach out. I know Kensington Mine, a mining company, is doing a good job. Red Dog is doing a good job. There are models out there that seem to be working, and there are some that aren't so good.

I've heard from some people, that there's not enough qualified people there. These people have told me, "We can't find them, they don't want to work," or whatever the list is. I don't believe that, but that's what I hear. Give me your response to that. How do you feel about the ability within the region and within Alaska? Because our target is obviously the region first, but also Alaska. So give me your thoughts on that.

Ms. VORDERSTRASSE. In reference to training or finding qualified individuals, I think throughout the State of Alaska there are probably a handful, more than a handful for the type of work that is required in offshore. And addressing the training needs of our communities, we are trying hard with UIC. I'm going to speak about UIC and what we're doing.

In fact, we just did a training program, and we had seven or ten individuals attending this OSHA training in Barrow. We're going through a training phase because we know the demand that is going to be placed on our village corporation, any of our communities. We're reaching out to the communities that are close to Barrow so that we give them these opportunities. We are reaching out to the corporations and saying do you have anyone who may wish to join our training? We're working with the college to try to provide additional training that is needed. The MMO program has been successful. We have community liaison officers, and we also have subsistence advisors who we go through training on them so that we can provide the industry local employment.

But the other thing that we are faced with is, just as any other community, being clean and drug free. That is a concern, and we are trying to provide and telling our shareholders, our descendants and what not, that you must be clean in order to be able to work for the industry, and not just for the industry. It is becoming the national standard.

And so the more we can provide training, not just in our areas but here in Fairbanks and Anchorage, for any of our shareholders of any regional or village corporation, is going to be of great demand.

Senator BEGICH. I just saw a great programming that KIC is doing, and it's exactly what you just described. It's about employment, which is important, about certification and all of that, but there's another piece, which is how to make sure you have a healthy lifestyle, because the industry may be mining oil and gas, but these industries are much different than in years past. So they require a much higher standard, and KIC I think is an interesting example of a mining industry that I saw just in the southeast.

Let me ask, if I can, Mr. Slaiby, in regards to employment, are you, from Shell or the industry, are you folks sitting down and saying, okay, over the next 10 years' exploration period and development period, these are the kinds of jobs we will need to fill, and then trying to figure out how do we get people at the table, maybe UIC or North Slope Borough, or whoever it might be from the state, obviously, and the Federal Government. How do we do that?

From an industry standpoint is that effort happening?

Mr. SLAIBY. Yes. Yes, it is. And I'll couch it under a statement that I think really rings true for any business anywhere. Unless everybody is successful in this operation, none of us will be successful, and that success has to extend to economic justice inside the communities as well. I truly believe that.

So what we are doing is really looking at a slice of the community to work through. We've been a key sponsor of such things as the Avant-Garde Learning Alliance that is qualifying teachers' aides to take a more active role in education here in Alaska. I think the average time for an out-of-state teacher to stay active in community is, let's say, a year and a half. So building up and really aiming at fifth grade, which is the level we use, for folks to stay in school, to get the education, to become part of the program, is only going to be beneficial for Shell and other industries as well, because we've got to make sure that there is that level of success in the communities that we work on.

When we see disparity in other places in the world that we work on, you're building on a house of sand and it's a recipe for troubles later on. So we are completely aligned with making that happen.

Senator BEGICH. Very good. I've been given a note which tells me that my time has expired, and that's better than me expiring, which is very important.

So first let me say to this panel, thank you very much. Thanks for the testimony. I do have some additional questions.

Do we keep this open for any period of time?

We'll keep the record open for 14 days for additional questions that will be submitted, and hopefully for additional responses you can all give.

But I can't say enough for taking your time to come out here again, to have this conversation about what we need to do, and I appreciate this panel for their recommendations from a community perspective. The first panel was more about broader policy and what we should be doing. This was more about what on the ground specifically—and I will take this to heart, and again, as part of the congressional record, this will be part of the record and the ability for us to kind of keep moving forward.

Thank you all very much. This hearing is closed.

[Whereupon, at 11:58 a.m., the hearing was adjourned.]

A P P E N D I X

UNITED STATES SENATE
Washington, DC, September 21, 2012

Hon. KEN SALAZAR,
Secretary,
U.S. Department of Interior,
Washington, DC.

Dear Secretary Salazar:

We write to comment on the Department of Interior's (DOI) 2012–2017 Outer Continental Shelf Oil (OCS) and Gas Leasing Program. Our comments focus specifically on the Arctic Ocean. We strongly urge DOI not to include Arctic lease sales until there is a thorough examination of the scientific, economic, and social factors that could be affected by expanded drilling and a comprehensive review is made of how oil and gas activities will be conducted without harming the Arctic ecosystem or creating opportunities for subsistence.

In the 2012–2017 program, BOEM did not include areas off of the Pacific coast, Atlantic coast, or the North Aleutian Basin for leasing. BOEM stated it did not include these regions because of local recommendations, and a lack of infrastructure and preparedness. These considerations are even more pertinent for the Arctic, making the proposed Arctic leasing rather perplexing.

Challenges with infrastructure and spill response are unprecedented in the Arctic's remote, undeveloped region: the Arctic Ocean is characterized by hurricane-force storms, 20-foot swells, sea ice up to 25 feet thick, sub-zero temperatures and months-long darkness. Moreover, the Arctic has extremely limited infrastructure (there are no roads or deep water ports and only a handful of small airports) and the nearest Coast Guard station is 1,000 miles away. In the event of an oil spill the response may be too slow and irreversible damage to ecosystems and species could result. Consequently, we strongly disagree that leases in the Arctic Ocean should be included in the 2012–2017 program.

We recognize that throughout the plan, BOEM states a commitment to finding ways of mitigating and eliminating environmental and subsistence conflict. However, the Arctic is a unique environment with significant hurdles that relevant agencies must fully address before leasing decisions are finalized in the region for the upcoming five-year plan. While difficult, making the right decisions now is imperative for sound long-term planning in the Arctic regarding to shipping, infrastructure and environmental protections.

Government and non-governmental entities have emphasized these concerns. In April, President Obama's National Oil Spill Commission released a progress report on its initial recommendations and concluded, "Although there has been some progress in implementing the Commission's recommendations concerning frontier areas, we feel strongly that additional work must be done to understand the ecosystems of the Arctic and to establish the infrastructure necessary to protect this vulnerable and valuable region," In addition, last summer the U.S. Geological Survey released a report on the Arctic finding that major gaps in scientific understanding of the Arctic region make it "difficult, if not impossible" to make informed decisions about oil and gas development in the Arctic Ocean.

Long-term strategies for oil exploration need to be developed in the context of a full and open public process. Thus, we urge DOI to establish a clear and robust process that includes public participation with emphasis on input from communities most affected. We recommend that DOI should:

- Make future Arctic lease sales contingent upon the development, implementation, and use of a comprehensive, integrated scientific research and monitoring program.
- Make future Arctic lease sales conditional upon the demonstration of effective oil spill response capability and preparedness.

- Expand existing deferrals for areas known to be important for subsistence or ecological reasons, such as Hanna Shoal and Barrow Canyon.

Because these recommendations have not been sufficiently addressed, and for the reasons outlined above, we strongly urge DOI to remove Arctic leases from the 2012–2017 program.

Sincerely,

JEFFREY A. MERKLEY
United States Senator

RICHARD DURBIN
United States Senator

PATRICK LEAHY
United States Senator

BARBARA BOXER
United States Senator

FRANK R. LAUTENBERG
United States Senator

SHELDON WHITEHOUSE
United States Senator

RESPONSE TO WRITTEN QUESTION SUBMITTED BY HON. BARBARA BOXER TO HON. DAVID J. HAYES

Ensuring Safe and Responsible Drilling

Question. On September 21, 2012, I joined five of my Senate colleagues in sending a letter to Secretary Salazar urging him to ensure that certain conditions have been met before drilling commences in the Arctic: comprehensive scientific research and monitoring, effective oil spill response capability, and an expansion of deferrals for areas known to have significant subsistence or ecological values. I would like to request that this letter be entered into the record.

What actions is the Department of the Interior taking to ensure that we have sufficient scientific information about this region and adequate safeguards to guarantee that drilling can proceed safely and responsibly?

Answer. The Department is actively engaged in efforts to support the Administration's commitment to facilitating a comprehensive, science-based approach to energy policy in the rapidly changing Arctic. Much of the existing scientific information on the Arctic is conducted by the Bureau of Ocean Energy Management's (BOEM) Environmental Studies Program, which is designed to provide the agency with information about potential impacts of energy development and how to avoid or mitigate effects on the human, marine, and coastal environments. A major portion of the ESP is conducted collaboratively with our partners, including Federal and State agencies, academic institutions, Alaskan Native organizations, and others. BOEM and its predecessor agencies have funded more than $400 million in studies concerning the Alaska Outer Continental Shelf since 1990. This has resulted in more than 500 different study reports, as well as more than 300 peer-reviewed publications.

Collecting, synthesizing and delivering relevant data on the Arctic to decisionmakers is a top priority for the Administration. On April 4, 2013, the Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska, which I chair, released a report to the President titled *Managing for the Future in a Rapidly Changing Arctic* that describes how Arctic residents are dealing with rapid, climate change-induced impacts to resources and traditional ways of life. At the same time, new economic activities and opportunities are emerging—notably oil and gas, marine transportation, tourism and mining. Several Departmental bureaus brought their expertise to the development of this report, including BOEM, the Bureau of Land Management, the Bureau of Safety and Environmental Enforcement (BSEE), U.S. Fish and Wildlife Service, National Park Service, and the U.S. Geological Survey.

The report includes the launch of a new government website, the Arctic Science Portal, *http://www.arctic.gov/portal/,* giving decisionmakers and interested parties easier access to scientific information about the Arctic on topics such as sea ice, fisheries, oil spill research, and many others. The portal connects researchers, decision makers and the public with Arctic information and is a key component of the safe and responsible exploration and development of Alaska's vast resources while preserving the region's rich ecosystems that will sustain future generations.

Finally, both BOEM and BSEE have taken effective regulatory steps to ensure that offshore oil and gas exploration in the Arctic is conducted safely and responsibly, and is subject to strong oversight. For example, the bureaus placed a number of stringent Arctic-specific conditions and standards on Shell's 2012 drilling program, and Shell was also required to provide expanded information and modeling as part of their Oil Spill Response Plans. The Department is incorporating lessons learned from the 2012 season into its comprehensive program for the review of the

future proposals for oil and gas exploration offshore Alaska, as well as continuing partnerships developed with other governmental agencies for oversight and information sharing. And, among other things, BOEM and BSEE have undertaken a joint rulemaking to further codify and establish standards specific to offshore operations in the Alaska Outer Continental Shelf.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. BARBARA BOXER TO REAR ADMIRAL THOMAS P. OSTEBO

Question 1. Developing an oil spill response capability is especially challenging given the quick-changing conditions in the Arctic. A recent report by the Center for American Progress, "Putting a Freeze on Arctic Ocean Drilling," demonstrates the lack of appropriate infrastructure and facilities to respond to an oil spill in this remote region, and I request that this report be placed in the record. With the nearest Coast Guard station nearly 1,000 miles away, it could take eight hours for a helicopter to respond to an incident in the Arctic and even longer for Coast Guard cutters. As oil production increases in the Arctic in the coming years, what steps is the Coast Guard taking to reduce response times in case of an incident in the Arctic?

Answer. In addition to Coast Guard ships and aircraft that have long patrolled the Arctic, Coast Guard's most capable surface vessel, a National Security Cutter, will be deployed this summer to conduct various missions, including those with a time-sensitive response element (*i.e.,* search and rescue). Coast Guard will also continue evaluating the feasibility of establishing a forward operating location by deploying our helicopter and personnel to Kotzebue at the Alaska National Guard hangar located there. Deploying our helicopter and personnel to Kotzebue will give us an opportunity to leverage existing infrastructure and will strategically position us to conduct operations and effectively respond to maritime emergencies.

The Coast Guard Federal On-Scene Coordinator (FOSC) is responsible for oversight and direction of any coastal Arctic oil spill, including ensuring the Responsible Party (RP) mobilizes resources and conducts a timely and effective response. As required by their offshore Oil Spill Response Plans (OSRP), which are reviewed by the Coast Guard and approved by the Bureau of Safety and Environmental Enforcement (BSEE), industry will pre-position oil spill response vessels and crews, as well as other private sector resources near the proposed drilling sites and ensure these assets are ready to respond to any oil spill incident that occurs during the warmer, ice-free summer drilling season. Additional response equipment is located throughout Alaska and the U.S., and can be deployed into the affected area in the event of a spill.

Question 2. One of the primary concerns with a spill in that region is the possibility of oil being trapped in ice. I understand you have been participating in oil-in-ice research since 2010, but as oil production continues in the coming years, what types of technology will be available to address this concern?

Answer. The U.S. Coast Guard Research, Development, Test & Evaluation (RDT&E) Program has been conducting oil-in-ice response research since 2010. The Coast Guard has conducted three demonstrations in the Great Lakes region as well as a demonstration in the Arctic region as part of the Coast Guard's Arctic Shield 2012 exercise. The results to date include the identification of operational performance gaps, documentation of existing response technology efficacy and lessons learned, and practical response experience for both Coast Guard and commercial responders.

As part of these demonstrations, the Coast Guard evaluated existing response equipment such as heated skimmers and a cold-weather modified Spilled Oil Recovery System (SORS). The Coast Guard assessed operational tactics, such as the use of ice flows to herd oil for collection purposes, and then analyzed the efficacy of unconventional response equipment such as a barge for equipment staging and deployment, as well as a tethered aerostat, a Remotely Operated Vehicle (ROV) and an Unmanned Underwater Vehicle (UUV) for oil detection and observation.

The Coast Guard plans to continue pursuing collaboration opportunities for oil-in-ice research with entities such as the Department of Homeland Security's Science and Technology Directorate, the DHS Maritime, Island and Remote and Extreme Environment Security Center of Excellence, the Department of the Interior's Bureau of Safety and Environmental Enforcement, U.S. Northern Command, the Interagency Coordinating Committee on Oil Pollution Research and industry.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. BARBARA BOXER TO PETER E. SLAIBY

Question 1. Given the unique natural characteristics of the Arctic environment, such as ice floes and ocean swells, what tools are you utilizing to address these unique challenges?

Answer. Observations and long term characterization programs of oceanic, atmospheric, (together known as Metocean) and ice conditions are integral components of Shell's exploration and development plans and serve to advise accurate operational forecasting and validate numerical models. Since Shell's resumption of exploration activities in the Alaskan offshore in 2005, ice and current monitoring instruments have been deployed annually. In 2008, a real-time reporting meteorological buoy was deployed at the Burger prospect in the Chukchi Sea during the open water season. In the following years, the meteorological buoy program has expanded to a total of five seasonally deployed buoys. Additionally, Shell sought to leverage the spatial advantage of its marine vessels and trained personnel to provide field observations of ice and Metocean conditions directly to Shell's ice and weather forecast team.

Shell understands the value of the ice and Metocean measurement programs internally and to the greater science and research communities and Shell led its industry partners to establish a formal agreement with NOAA to share these data and cultivate collaboration. To date, historic and real-time data sets have been openly shared and professional collaboration has been realized in weekly teleconferences between Shell and National Weather Service (NWS) forecasters and NOAA taking the lead on managing the field observers as part of the VOS (Volunteer Observing Ship) program. In a time of Federal budget constraints and the sequester, access to the industry data has served to augment and potentially enhance the NWS forecasting ability, which benefits public safety.

Shell Ice and Weather Advisory Center

Shell developed and operates the Shell Ice and Weather Advisory Center (SIWAC), which is an integrated forecasting service tailored to the needs and demands of Shell's field operations in Alaska. Started in 2007, SIWAC has evolved to be the most comprehensive and focused ice and weather operation covering the offshore and coastal areas from the Gulf of Alaska to the Canadian Beaufort. Nationally operated ice and weather forecasting offices are not chartered to supply the level of service and quality of products necessary to make effective and efficient operational decisions and ensure that the demanding safety standards required by Shell for personnel, environment, and assets are met. The products and services provided by SIWAC contribute valuable information for defining opportunity windows, logistical movements, and seasonal openings and closings. SIWAC was designed to meet these needs by employing a dedicated team of expert Arctic forecasters with unmatched access to tools and field data. These experts, available around the clock during the operational season, are fully integrated into the operations process and directly engage Shell leadership, project managers, planners, and field personnel, ensuring that forecast products and services are fit for purpose.

SIWAC consists of a team of six full time Arctic-experienced forecasters (2 ice forecasters and 4 meteorologists) that work in rotations 24/7 to provide continuous coverage for Shell during the operational season. In addition, there are numerous personnel who provide support services to the forecasters, such as satellite tasking, IT and web services, and research specialists. A core operational philosophy of the SIWAC program is that the ice and weather are intricately linked; therefore the ice and weather forecasters sit together and produce their respective products collaboratively.

There is a constant stream of information available to develop the detailed and frequent forecast products. Among this information is high resolution RADARSAT2 satellite imagery, which is unaffected by lack of sunlight or cloud cover. Strategically placed Metocean buoys are deployed seasonally in the Chukchi and Beaufort Seas to report near real time measurements of atmospheric and oceanic parameters such as winds and temperatures. A network of field observers placed on Shell operated vessels provide routine reporting of local weather, sea, and ice conditions. Position reporting buoys are deployed to track movement of the pack ice. And Shell cosponsors an array of UAF-operated HF Radar sites that map the ocean currents over wide areas of the Beaufort and Chukchi Seas. Additionally, SIWAC accesses publically available data and products to advise forecasting such as MODIS and AVHRR satellite data, nationally operated weather stations, and numerical models.

State of the art technologies play a central role in the forecasting process. Data received are manipulated in specialized geospatial software tools and bespoke forecast models. Advanced web mapping techniques are used to composite select data

sets into a Common Operating Picture that displays relevant environmental information in an interactive map in context with vessel and prospect positions.

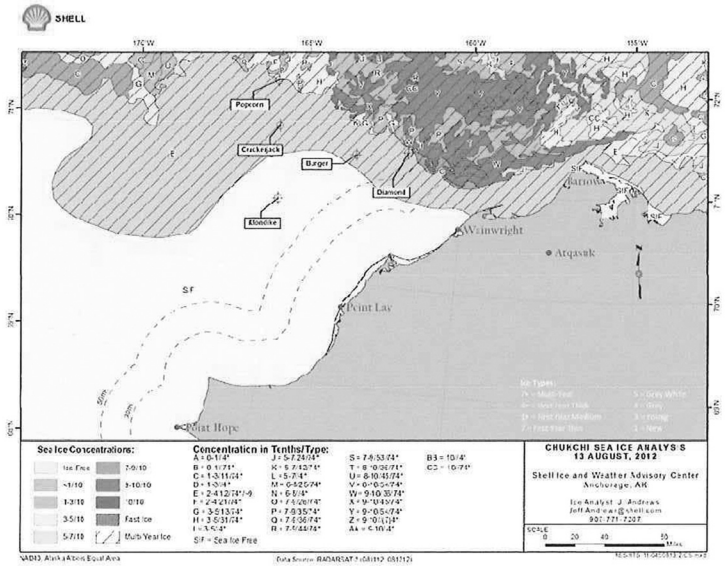

Figure 1. SIWAC sea ice chart for August 13, 2012 illustrating the detail that goes into every chart.

SIWAC's team and significant resources produce frequent, highly detailed sea ice charts and accurate site-specific weather forecasts. Figure 1 illustrates the exceptional detail that goes into every SlWAC sea ice chart. Polygons are drawn around ice of similar concentration and characteristics, giving operations, mariners, and Shell Leadership guidance for executing field plans. On the weather side, the sea ice chart is ingested into the proprietary forecast Grid Editor model to produce more accurate wave fields. In addition, all relevant data pertaining to the meteorological conditions, such as atmospheric pressure and winds, as measured by the Metocean buoys and reported by field observers, are applied in the Grid Editor resulting in a high-resolution, locally corrected gridded field of key meteorological parameters, which is directly used to develop the weather forecasts reported to operations.

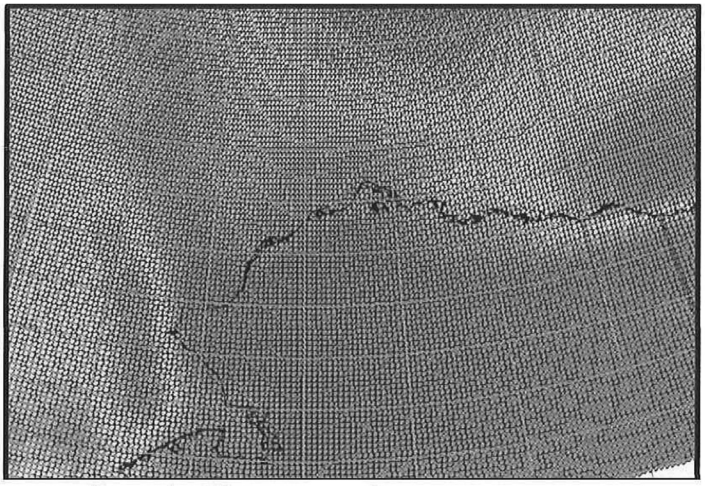

Figure 2. SIWAC Grid Editor output for wind speed.

The accuracy of the ice and weather forecast products generated by the SIWAC team is constantly validated against measurements and observations to assure the quality and reliability of the information that gets considered by operations. Candid evaluations of the SIWAC program are performed at the close of the operational season, which summarizes the key events and looks for areas of improvement.

In 2012, Shell entered into a collaborative agreement with the National Oceanographic and Atmospheric Administration (NOAA). Under this agreement, Shell has shared both near real-time and archived environmental data, such as buoy data and sea ice charts, with NOAA offices, which has had the immediate effect of improving forecast products produced by NOAA for the U.S. Arctic. Data submitted to NOAA become available to the general public and researchers. Additionally, the agreement fosters true bidirectional cooperation that was reali zed through twice-weekly teleconferences between Shell and NOAA forecasters and NOAA inducting Shell field personnel into their VOS (Volunteer Observing Ship) ice and weather observing program.

While SIWAC is primarily an operational support program, its products and services are valuable to a wide range of subsequent users within Shell. As field data are collected and products are produced, they are archived in a geospatial system. These archives become sources of data to develop low-uncertainty statistics and validate models to create, for instance, design criteria for development.

Areas for Improvement

SIWAC is now in its seventh year of operation and has seen refinement in its processes and products over the course, however there are areas recognized for amplification or improvement:

- Continue to develop continuity strategy—Incorporate student interns, recent graduates, and/or early career individuals into the program to develop the next generation of forecasters.
- Improve fatigue management—Strive to reduce length of workday for the forecasters by increasing the staffing level.
- Improve colocation strategy—Goal is to provide seamless transition to remote, redundant facility in event of local disaster or utility outage.
- Expand Ice Management support—Feedback from internal stakeholders pointed to the need for expanded sea ice surveillance during break up and periods of potentially threatening mobile ice. This would be accomplished through more frequent and higher resolution satellite imagery and possibly aerial overflights.
- Continue to develop NOAA collaboration—Explore synergistic areas for greater collaboration, while continuing successful elements, such as the VOS program and frequent teleconferences.

Question 2. Please explain exactly what happened in the incident with the containment dome, how it could have been prevented, and what steps you are taking to assure the public that you are exercising the greatest amount of caution when you proceed with drilling in the future.

The first-of-its-kind Arctic Containment System (ACS) is the fourth-tier of response in the unlikely event that there is a well control event during exploration drilling. The ACS would be called upon only if the blow-out preventer, shear rams and capping stack are all unsuccessful in a source-control scenario.

The ACS is stationed on a 310-foot barge, the Arctic Challenger. Part of the ACS is a dome-like apparatus that would be lowered into the sea above a leaking wellhead. The dome would funnel the hydrocarbons into a hose that is attached to the top of the dome. The hose would take the hydrocarbons to the barge where specialized equipment would separate the water and hydrocarbons.

During an initial test deployment in September 2012, a faulty electrical connection caused a valve to open. This in turn caused the dome to descend quickly. Safety systems ensured that the dome did not hit the sea floor; but the rapid descent and sudden pressure change damaged the buoyancy chambers.

Following a full evaluation of the incident, Shell developed a comprehensive plan to redesign the dome and to provide redundant backup systems. The successful deployment of the new dome was witnessed and acknowledged by the Department of the Interior's Bureau of Safety and Environmental Enforcement (BSEE) in 2013.

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