# MEMORANDUM SUPPORTING REQUEST BY OCEANA AND UNIVERSITY OF CHICAGO ABRAMS ENVIRONMENTAL LAW CLINIC FOR FORMAL INVESTIGATION INTO DISCLOSURES MADE BY ROYAL DUTCH SHELL PLC ABOUT ITS U.S. ARCTIC OCEAN PROGRAM

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## I. INTRODUCTION[*]

Since 2005, Royal Dutch Shell plc (Shell) has spent billions of dollars pursuing oil and gas reserves under the U.S. Arctic Ocean. These efforts and the attendant government approvals have resulted in controversy, litigation, and substantial risk to the ocean environment and the company's investment. In its annual reports, however, Shell paints a rosy picture of its prospects and appears to omit important information regarding significant risks. The company's reports do not describe fully the legal impediments threatening Shell's U.S. Arctic program and the potential for significant impacts from a catastrophic spill.

Through its subsidiaries, Shell Gulf of Mexico, Inc. and Shell Offshore, Inc., Shell spent billions of dollars between 2005 and 2008 to purchase leases in the Chukchi and Beaufort seas, which are off the northern coast of Alaska. Since purchasing these leases, Shell has consistently identified the U.S. Arctic Ocean as a strategic priority for exploration, long-term production, and research and development. The company has also spent billions of dollars more—including expenditures to purchase, fabricate, and lease equipment—repeatedly seeking to drill exploration wells on some of its leases.

Shell's investment and push to explore have created significant controversy. The Arctic Ocean is home to iconic species of wildlife—including whales, walrus, and polar bears—and Arctic coastal communities have relied on the ocean for millennia. The Arctic is also a uniquely challenging place in which to mount a significant industrial undertaking; it is remote, subject to extreme weather conditions and darkness, and largely devoid of infrastructure. As a result, government plans, lease sales, and exploration approvals related to Shell's U.S. Arctic Ocean prospects have been subject to a series of court challenges brought by Alaska Native entities, local government bodies, and conservation organizations. Several of these lawsuits resulted in substantial delays that Shell itself has admitted threaten its Arctic Ocean program, and some could have resulted in Shell's leases—and, therefore, its investment—being voided. Nonetheless, it appears that Shell's annual reports have omitted disclosures regarding much of this material litigation.

Further, as was unfortunately demonstrated by the 2010 *Deepwater Horizon* tragedy in the Gulf of Mexico, exploration drilling creates the real risk of a catastrophic accident. The *Deepwater Horizon* exploded and sank, killing eleven people and causing millions of gallons of oil to spill, uncontrolled, into the Gulf over 89 days. A catastrophic spill in the Arctic Ocean could devastate sensitive ocean ecosystems and the communities that depend on them, and it would likely result in costs to Shell on the order of tens of billions of dollars. Shell's annual

[*] *Oceana is a non-profit, international conservation organization dedicated to maintaining and protecting the world's oceans, including the U.S. Arctic Ocean. Oceana has more than 600,000 members and supporters in the United States and worldwide. On behalf of those members, Oceana works to ensure that choices about the Arctic Ocean are based on science, preparedness, and a fair balancing of potential costs and benefits. The Abrams Environmental Law Clinic at the University of Chicago Law School uses innovative approaches for addressing pressing environmental problems, challenging polluters, holding government agencies accountable, and reforming regulations and laws. With the guidance of their supervisors, University of Chicago Law School students have leading roles in the clinic's efforts.*

reports, however, provide only boilerplate generalities about the potential for such an accident and state that the company has a sufficient plan for response and clean up. Shell does not appear to have disclosed that the techniques it proposes to use have not been tested fully in the Arctic nor that they are unlikely to be effective as Shell claims even if they can be deployed. Nor has Shell adequately detailed problems with its equipment and operations or provided an estimate of the likely cost to the company as the result of a spill or the manner in which it would finance that expense.

As Shell learned in 2012, these risks are not speculative. The company's efforts to drill exploration wells that year resulted in a series of equipment failures, legal violations, fines, and, ultimately, the grounding of a drill rig off an island near Kodiak, Alaska. A Coast Guard investigation determined that "the inadequate assessment and management of risks … was the most significant causal factor" of the grounding.[1] Despite these failures, Shell has asserted that its "2012 exploration drilling operations in the Arctic were conducted safely, and with no serious injuries or environmental impact."[2]

Shell appears to have fallen short of its obligations under the securities laws. The SEC should accordingly investigate the adequacy of Shell's disclosures and exercise its enforcement authority to ensure that Shell and other companies comply with these rules in the future.

## II. FACTUAL BACKGROUND

### A. The U.S. Arctic Ocean Is Important and Unique

Part of the U.S. Arctic Ocean, the Beaufort and Chukchi seas sit to the north and northwest of the Alaskan coast, respectively.[3] The seas mainly have been protected from large-scale industrial development "by sea ice, remoteness, and plentiful resources in other, more accessible regions."[4]

The waters of the Beaufort and Chukchi seas support diverse and important wildlife, including several currently endangered species and other candidates for listing.[5] For at least part

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[1] U.S. COAST GUARD, REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE MULTIPLE RELATED MARINE CASUALTIES AND GROUNDING OF THE MODU KULLUK ON DECEMBER 31, 2012, at 1 (Apr. 2, 2014 Comments) [hereinafter COAST GUARD KULLUK REPORT], *available at* http://www.uscg.mil/hq/cg5/cg545/docs/documents/Kulluk.pdf.

[2] *See* Sean Cockerham, *Administration Considers Whether to Allow Shell to Resume Arctic Oil Exploration*, MCCLATCHYDC, Nov. 27, 2013, http://www.mcclatchydc.com/2013/11/27/209993/administration-considers-whether.html (quoting Shell's proposed 2014 exploration plan).

[3] *See* Arctic Research and Policy Act, 15 U.S.C. § 4111.

[4] Michael LeVine et al., *Oil and Gas in America's Arctic Ocean: Past Problems Counsel Precaution*, 37 SEATTLE U. L. REV. 1271, 1271 (2014).

[5] *See* NAT'L OCEANIC & ATMOSPHERIC ADMIN., EFFECTS OF OIL AND GAS ACTIVITIES IN THE ARCTIC OCEAN: SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT, at Vol. 1, 3-54 to 3-139 (Mar. 2013) [hereinafter NOAA ARCTIC SDEIS], *available at* http://www.nmfs.noaa.gov/

of the year, residents include iconic mammals, such as polar bears, walruses, and whales (bowhead, beluga, and gray);[6] around a hundred species of birds;[7] and more than a hundred species of fish, including Arctic grayling, Arctic char, and all five species of Pacific salmon.[8]

The region also sustains vibrant coastal communities. The residents of these communities, who are mainly Iñupiat, have depended for millennia on the Arctic to provide food and material for clothing, boats, and other basic needs.[9] These subsistence resources, as well as the process of harvesting them, "are assigned the highest cultural value by the Iñupiat and provide a sense of identity."[10]

The region is also threatened by changing climate, "receding sea ice[,] and the growing world demand for resources…."[11] The Arctic region is warming at twice the rate of the rest of the planet, and this warming is causing significant changes that affect communities and wildlife and are contributing to a growing interest in the potential for industrial activities—including oil and gas exploration.[12]

### B. Shell Has Invested Billions of Dollars in Leases and Exploration Efforts in the Beaufort and Chukchi Seas

The U.S. Arctic Ocean is thought to lie above significant oil and gas deposits.[13] These resources—the majority of which are thought to be within the Outer Continental Shelf,[14] which

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pr/permits/eis/arctic.htm.

[6] *Id.* at 3-92.

[7] *Id.* at 3-81 to 3-83.

[8] *See* NOAA ARCTIC SDEIS, *supra* note 5, at Vol. 1, 3-59; N. PAC. FISHERY MGMT. COUNCIL, FISHERY MANAGEMENT PLAN FOR FISH RESOURCES OF THE ARCTIC MANAGEMENT AREA 56 (2009) [hereinafter N. PAC. FISHERY MGMT. COUNCIL], *available at* http://www.npfmc.org/wp-content/PDFdocuments/fmp/Arctic/ArcticFMP.pdf.

[9] *See* Harry Brower Jr. & Taqulik Hepa, *Subsistence Hunting Activities and the Inupiat Eskimo*, CULTURAL SURVIVAL (Fall 1998), *available at* http://www.culturalsurvival.org/publications/cultural-survival-quarterly/united-states/subsistence-hunting-activities-and-inupiat-es. These subsistence foods provide a substantial amount of everyday nutrition, comprising up to 50 percent of the total calories consumed in U.S. Arctic communities. LeVine et al., *supra* note 4, at 1274.

[10] NOAA ARCTIC SDEIS, *supra* note 7, at Vol. 1, 3-157.

[11] LeVine et al., *supra* note 4, at 1271.

[12] *The Emerging Arctic*, COUNCIL ON FOREIGN RELATIONS, http://www.cfr.org/arctic/emerging-arctic/p32620#!/ (last visited Apr. 25, 2015).

[13] *See, e.g.*, BUREAU OF OCEAN ENERGY MGMT., 2017-2022 OUTER CONTINENTAL SHELF OIL AND GAS LEASING DRAFT PROPOSED PROGRAM 5-3 (Jan. 2015) [hereinafter DRAFT FIVE-YEAR PROGRAM], *available at* http://www.boem.gov/2017-2022-DPP/ (stating that the lands beneath the Chukchi Sea could hold as much as 15.38 billion barrels of oil and 76.77 trillion cubic feet of

is under the control of the federal government—have attracted substantial interest and investment.

Pursuant to the Outer Continental Shelf Lands Act ("OCSLA"), the Department of the Interior ("DOI") makes these resources available for development using a four-stage process.[15] At the first stage, the Secretary of the Interior develops a nationwide five-year leasing program that establishes a schedule of proposed lease sales.[16] DOI then holds the scheduled sales, allowing companies to bid on lease tracts and obtain a conditional right "to explore, develop, and produce the oil and gas contained within the lease area."[17] At the third stage, companies are required to seek approvals from DOI to drill exploration wells on purchased leases.[18] Finally, if companies find resources justifying extraction, they must prepare and submit proposed plans for development.[19] In addition to OCSLA, various other federal statutes—including the National Environmental Policy Act ("NEPA"),[20] Clean Water Act,[21] Clean Air Act,[22] Oil Pollution Act of 1990,[23] Endangered Species Act,[24] and Marine Mammal Protection Act[25]—apply during this process.[26]

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natural gas, while the lands beneath the Beaufort Sea could contain as much as 8.22 billion barrels of oil and 27.64 trillion cubic feet of natural gas).

[14] Pursuant to the Submerged Lands Act, the federal government owns the Outer Continental Shelf from 3 nautical miles from shore to the end of the exclusive economic zone. *See Federal Offshore Lands*, BUREAU OF OCEAN ENERGY MGMT., http://www.boem.gov/Federal-Offshore-Lands/ (last visited Apr. 25, 2015) (describing the Submerged Lands Act and the Federal claim to the Outer Continental Shelf).

[15] *See* 43 U.S.C. §§ 1331, *et seq.*

[16] 43 U.S.C. § 1344(a).

[17] *Id.* § 1337(b)(4).

[18] *Id.* § 1340(c)(1).

[19] *Id.* § 1351(a).

[20] 42 U.S.C. §§ 4321, *et seq.*

[21] 33 U.S.C. §§ 1251, *et seq.*

[22] 42 U.S.C. §§ 7401, *et seq.*

[23] 33 U.S.C. §§ 2701, *et seq.*

[24] 16 U.S.C. §§ 1531, *et seq.*

[25] 16 U.S.C. §§ 1361, *et seq.*

[26] Prior to 2010, companies seeking to operate in the Arctic had to obtain Clean Air Act permits from the Environmental Protection Agency. *See* 42 U.S.C. § 7627(a)-(b). A legislative rider attached to the 2011 Omnibus Appropriations Act removed these requirements, and the authority to regulate air emissions from offshore activities in the Arctic Ocean was transferred to the Department of the Interior. *See* Consolidated Appropriations Act of 2012, Pub. L. No. 112-74, § 432, 125 Stat. 785, 1048-49 (2012).

In the 1980s and 1990s, a number of companies, including Shell,[27] spent billions of dollars purchasing leases and pursuing exploration.[28] The companies allowed most of their leases to expire; by 2000, companies owned no leases in federal waters in the Chukchi Sea and almost none in the Beaufort Sea.[29]

In 2004, Shell admitted to overstating its proven reserves significantly.[30] The scandal forced out the company's chairman and resulted in $150 million in fines.[31] In the wake of these difficulties, and in what one commentator described as an effort to "explore its way out of trouble," Shell invested heavily in leases in the Beaufort and Chukchi seas.[32] Shell outspent its competitors in sales held in 2005, 2007, and 2008, investing approximately $2.2 billion to acquire more than two million acres of leases.[33] In comparison, all of the company's

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[27] *See* Letter from Peter Slaiby, Vice President, Shell Alaska, to Mark Fesmire, Regional Director, BSEE 3 (July 10, 2014) [hereinafter SHELL SUSPENSION REQUEST] (attached as Exh. 1) (discussing the lease sales held by BOEM and its predecessors since 1979).

[28] *See* LeVine et al., *supra* note 4, at 1318-21; *see also Alaska Historical Data*, BUREAU OF OCEAN ENERGY MGMT., http://www.boem.gov/About-BOEM/BOEM-Regions/Alaska-Region/Historical-Data/Index.aspx (last visited Apr. 25, 2015) (stating that 30 wells have been drilled in the Beaufort Sea and five in the Chukchi Sea).

[29] "As of 2000, companies owned no leases in the Chukchi Sea and only five leases remained, encompassing less than 10,000 acres in the Beaufort Sea." LeVine et al., *supra* note 4, at 1321; *see also* OCEANA ET AL., FROZEN FUTURE: SHELL'S ONGOING GAMBLE IN THE U.S. ARCTIC 6 (2014) [hereinafter FROZEN FUTURE], *available at* http://oceana.org/sites/default/files/reports/Shells_Frozen_Future_2_25_14.pdf.

[30] *See* Mark Tran, *Shell Fined Over Reserves Scandal*, THE GUARDIAN, July 29, 2004, http://www.theguardian.com/business/2004/jul/29/oilandpetrol.news.

[31] *See* McKenzie Funk, *The Wreck of the Kulluk*, N.Y. TIMES MAGAZINE, Dec. 30, 2014, http://www.nytimes.com/2015/01/04/magazine/the-wreck-of-the-kulluk.html?_r=0.

[32] David Strahan, *If You're in a Hole, Merge. But Is It Too Late for BP and Shell?*, THE INDEPENDENT, July 15, 2007 ("Shell recently announced the start of a major drilling programme in the Beaufort Sea north of Alaska in the Arctic Ocean. The move raises the stakes in its strategy, post reserves scandal, of trying to explore its way out of trouble. But recent history suggests this plan is likely to fail.").

[33] *See* FROZEN FUTURE, *supra* note 29, at 6; LeVine et al., *supra* note 4, at 1325; Jon Birger, *Why Shell Is Betting Billions to Drill for Oil in Alaska*, FORTUNE, May 24, 2012, http://fortune.com/2012/05/24/why-shell-is-betting-billions-to-drill-for-oil-in-alaska/. Shell did not participate in the 2003 sale in the Beaufort Sea; in 2005, however—following its reserves scandal—the company did purchase 19 leases that EnCana had won during the sale in 2003. Kay Cashman, *Shell, ConocoPhillips Buy EnCana's Alaska Beaufort Sea OCS Leases*, PETROLEUM NEWS, Oct. 23, 2005, http://www.petroleumnews.com/pntruncate/14850948.shtml.

competitors—who were significantly outbid by Shell in several instances[34]—spent roughly $800 million in total on leases in the region.[35]

After purchasing its leases, Shell began seeking approvals to conduct exploration drilling on them. It has submitted a series of plans for drilling exploration wells in both the Beaufort Sea and the Chukchi Sea.[36] Along with these plans, the company has invested additional billions of dollars in preparation for drilling, including purchasing and retrofitting rigs and vessels.[37] In its most recent exploration plan, Shell requests the federal government's approval to drill up to six wells in the Chukchi Sea over several years, beginning in 2015.[38] Shell has said that, if allowed to proceed, it will spend $1 billion to support its efforts in 2015 alone.[39]

Although Shell has already spent more than $6 billion pursuing exploration in the Beaufort and Chukchi seas, this significant investment has yet to result in completion of a single exploration well.[40] As described in greater detail below, the company and the federal government have fallen short of various obligations, and the company has experienced a number of significant operational failures.[41]

In contrast to Shell, many of the other companies that invested in the Beaufort and Chukchi seas over the past 12 years have now either abandoned their efforts or put them on

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[34] For example, in the 2005 Lease Sale in the Beaufort Sea, "Armstrong bid an average of $13.90 an acre for some 89,500 acres; ConocoPhillips bid an average of $16.61 an acre for some 66,235 acres; North American bid an average of $22.04 an acre for some 80 acres; and Shell bid an average of $95.91 an acre for approximately 462,600 acres." Kristen Nelson, *Shell Dominates, Spends $44.4 million in $46.7 million Beaufort Sale with 86 Winning Bids*, PETROLEUM NEWS, Apr. 3, 2005, www.petroleumnews.com/pntruncate/197268618.shtml. In 2008 in Lease Sale 193 in the Chukchi Sea, "Shell bid more than $6,000 per acre, for a total of more than $34,000,000 for lease block 6913. The only other bidder, ConocoPhillips, bid just more than $10 per acre, for a total bid of slightly over $60,000." FROZEN FUTURE, *supra* note 29, at 6.

[35] *See* FROZEN FUTURE, *supra* note 29, at 6.

[36] *See* LeVine et al., *supra* note 4, at 1332, 1336-37, 1343.

[37] For example, Shell purchased the *Kulluk* drill rig in 2005 for an undisclosed amount and subsequently invested $292 million in retrofitting the rig to prepare for exploration in the Beaufort Sea. *See* Funk, *supra* note 31.

[38] *See* SHELL GULF OF MEXICO INC., REVISED OUTER CONTINENTAL SHELF LEASE EXPLORATION PLAN: CHUKCHI SEA, ALASKA, at 1-5 to 1-6 (Mar. 2015) [hereinafter SHELL 2015 EXPLORATION PLAN], *available at* http://www.boem.gov/uploadedFiles/BOEM/About_BOEM/BOEM_Regions/Alaska_Region/Leasing_and_Plans/Plans/2015-03-31-EP-Revision-2.pdf.

[39] *See Shell to Revive Plans to Drill in Arctic*, N.Y. TIMES, Jan. 29, 2015, http://www.nytimes.com/aponline/2015/01/29/business/ap-eu-britain-earns-royal-dutch-shell.html.

[40] *See* LeVine et al., supra note 4, at 1331-58.

[41] *See* Sections II.C and II.D, *infra*.

indefinite hold. Approximately half of the 1.4 million acres of leases in the Beaufort Sea have been allowed to expire;[42] in the Chukchi Sea, ConocoPhillips and Statoil have indefinitely suspended plans for exploration, and Total has walked away from its investment entirely.[43] Though the recent downturn in oil prices has caused companies to abandon their investments in other parts of the Arctic,[44] companies' choices to suspend plans and allow leases to expire in the U.S. Arctic Ocean all were made prior to the 2014 price collapse. ConocoPhillips, for example, suspended its planned exploration in April 2013.[45]

In sum, Shell has made a multi-billion dollar investment in an offshore area where the commercially viable production of hydrocarbons has never occurred and where other companies are allowing leases to expire and putting plans on hold in the face of unique challenges and costs.

### C. Shell's Arctic Program Has Resulted in Significant Problems and No Completed Wells

Shell sought approvals that would have allowed it to drill exploration wells in the Beaufort Sea in 2007, 2008, 2009, 2010, and 2012.[46] The company submitted exploration plans for the Chukchi Sea for 2010, 2012, and 2014; it has also submitted a plan for 2015.[47] As explained below, exploration activities did not occur at all in several of these years as a result of legal challenges brought by Alaska Native entities and conservation organizations, among other factors.[48] In 2012, however, Shell received the needed approvals to drill individual "top holes" in

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[42] For example, ConocoPhillips has allowed almost all of its Beaufort leases to expire. *See* Eric Lidji, *Conoco Phillips Giving up on Beaufort Leases*, ALASKA DISPATCH NEWS, Mar. 30, 2009, www.adn.com/2009/03/30/742207/conoco-phillips-giving-up-on-beaufort.html; *see generally* LeVine et al., *supra* note 4, at 1321.

[43] *See* Jennifer Dlouhy, *Oil Companies Forfeit Arctic Drilling Rights*, FUELFIX, July 30, 2014, http://fuelfix.com/blog/2014/07/30/oil-companies-forfeit-arctic-drilling-rights/; Guy Chazan, *Total Warns Against Oil Drilling in Arctic*, FINANCIAL TIMES, Sept. 25, 2012, http://www.ft.com/intl/cms/s/0/350be724-070a-11e2-92ef-00144feabdc0.html#axzz3YKyNhqyU.

[44] *See, e.g.*, Mikael Holter, *Statoil Puts Arctic Exploration on Hold After Oil-Price Plunge*, BLOOMBERG BUSINESS, Jan. 29, 2015, http://www.bloomberg.com/news/articles/2015-01-29/statoil-puts-arctic-exploration-on-hold-after-oil-price-plunge; *France's Total Swears Off Artic Oil Drilling, Putting Other Majors in Environmental Hot Seat*, BELLONA, Sept. 27, 2012, http://bellona.org/news/fossil-fuels/oil/2012-09-frances-total-swears-off-artic-oil-drilling-putting-other-majors-in-environmental-hot-seat.

[45] *See* Clifford Krauss, *ConocoPhillips Suspends Its Arctic Drilling Plans*, N.Y. TIMES, Apr. 10, 2013, http://www.nytimes.com/2013/04/11/business/energy-environment/conocophillips-suspends-arctic-drilling-plans.html?_r=0.

[46] *See* LeVine et al., *supra* note 4, at 1332, 1336-37, 1343.

[47] *Id.* at 1336-37, 1343, 1356-57; SHELL 2015 EXPLORATION PLAN, *supra* note 38.

[48] *See* Section II.D, *infra*.

the Chukchi and Beaufort seas.[49] The company was precluded from drilling into hydrocarbon-bearing zones due to its inability to certify and deploy certain spill-response equipment.[50] The government attributed that failure "to shortcomings in Shell's management and oversight of key contractors."[51] The results of Shell's efforts demonstrate both the risks inherent in mounting a large-scale industrial activity in the U.S. Arctic Ocean and the failure of the company to prepare appropriately.

Most spectacularly, Shell's drilling rig, the *Kulluk*, ran aground near Kodiak, Alaska after breaking free from a tow vessel during a significant but not unusual storm in late December 2012.[52] Shell had chosen to move the *Kulluk* across the Gulf of Alaska during December in order to avoid paying $6 million in Alaskan state taxes.[53] The accident required the Coast Guard to rescue eighteen men aboard the vessel.[54] It also drew significant attention to the difficulties of operating in the Arctic and to Shell's failure to appreciate them.[55] A series of poor decisions contributed to the grounding, which the Coast Guard ultimately attributed to "inadequate assessment and management of risks…."[56] As a result of the incident, the *Kulluk*—which Shell had purchased and refurbished—was dry-towed to Asia and scrapped.[57]

In addition to the grounding of the *Kulluk*, Shell also experienced significant difficulties with its drilling vessel, the *Noble Discoverer*. In its initial inspection, the Coast Guard identified 23 deficiencies with the vessel,[58] which later dragged anchor in Dutch Harbor and nearly grounded.[59] When the U.S. Environmental Protection Agency checked the vessel for compliance with its air permit, "[o]nly once in more than 60 tests [di]d the equipment m[eet] the [nitrogen-oxide] limit, and even then not under conditions approximating those in which the engines would

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[49] *See* U.S. DEP'T OF THE INTERIOR, REVIEW OF SHELL'S 2012 ALASKA OFFSHORE OIL AND GAS EXPLORATION PROGRAM at 16 (Mar. 8, 2013) [hereinafter DOI REVIEW OF SHELL'S 2012 ALASKA PROGRAM], *available at* http://www.doi.gov/news/pressreleases/upload/Shell-report-3-8-13-Final.pdf.

[50] *See id.* at 1.

[51] *Id.*

[52] *See* Funk, *supra* note 31.

[53] *Id.*

[54] *Id.*

[55] *See* DOI REVIEW OF SHELL'S 2012 ALASKA PROGRAM, *supra* note 49, at 29-30.

[56] COAST GUARD KULLUK REPORT, *supra* note 1, at 1 (Apr. 2, 2014 Comments).

[57] Funk, *supra* note 31.

[58] *Id.* at 20. The deficiencies were addressed, and the Coast Guard issued a certificate of compliance two weeks later. *See id.*

[59] *See id.* The vessel was undamaged but did not depart for the Chukchi until six weeks later. *See id.* at 21.

be functioning in the Arctic."[60] After the *Noble Discoverer* had finally made it to the Arctic Ocean, it was forced to detach from the bottom of the Chukchi Sea when a massive ice pack floated dangerously close;[61] this action contributed, in part, to violations of the company's air pollution permits.[62] There was a fire aboard the *Noble Discoverer* as the vessel made its way south from the Chukchi.[63] The vessel was towed to Seward and later taken to Asia for repairs.[64] While in Seward, the vessel was boarded by the Coast Guard and investigated for pollution and safety violations.[65] The Coast Guard put the vessel "under a Port State detention, a serious condition to prevent the rig from departing until corrective actions are implemented…."[66] Eventually, the *Noble Discoverer* was "loaded onto a heavy lift vessel to be dry-towed to Asia," and Noble Drilling, Shell's contractor, was fined more than $12 million.[67]

Shell also experienced substantial difficulties bringing its spill-response barge, the *Arctic Challenger*, into compliance with regulatory standards.[68] Prior to 2012, the *Challenger* had been inactive for about ten years and, in fact, was known mostly as a home for hundreds of birds.[69] In 2011, Shell began the process of retrofitting the barge for use as part of its response system; four months before the start of the drilling season, the *Arctic Challenger* was moved to a shipyard in

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[60] *See id.* at 25. In late 2012, the *Noble Discoverer* was cited by the Coast Guard for deficiencies and maintenance issues during an inspection of the drilling rig. *See* FROZEN FUTURE, *supra* note 29, at 23. The Coast Guard referred the case to the Department of Justice for potential violations of international marine vessel pollution. *See id.*

[61] *See* Dan Joling, *Drifting Sea Ice Halts Shell's Arctic Drilling*, ALASKA DISPATCH NEWS, Sept. 10, 2012, http://www.adn.com/article/20120910/drifting-sea-ice-halts-shells-arctic-drilling.

[62] *See* note 85, *infra.*

[63] DOI REVIEW OF SHELL'S 2012 ALASKA PROGRAM, *supra* note 49, at 28.

[64] *Id.* at 29.

[65] *Id.*

[66] *Id.*

[67] *Id.*; Funk, *supra* note 31.

[68] With its spill response plan, Shell committed to having an Arctic capping stack and containment system that includes: (1) a capping stack, (2) a containment dome that is subsea portion of the containment system, and (3) a surface portion of the containment system that includes a response barge. *See* SHELL, CHUKCHI SEA REGIONAL EXPLORATION PROGRAM OIL SPILL RESPONSE PLAN, at N-13 (May 2011) [hereinafter SHELL CHUKCHI OSRP], *available at* http://www.bsee.gov/uploadedFiles/BSEE/OSRP/Chukchi%20OSRP%20-%20February%202012.pdf. The capping stack is intended to prevent oil from being released into the ocean; the containment system will gather oil already in the water near the ocean floor and transport it to the surface for processing and storage. *See id.* at N-13 to N-14.

[69] DOI REVIEW OF SHELL'S 2012 ALASKA PROGRAM, *supra* note 49, at 29; Alex DeMarban, *Shell's Oil Spill–Containment Barge for Arctic Operations Was Once for the Birds*, ALASKA DISPATCH NEWS, Aug. 15, 2012, http://www.adn.com/article/shells-oil-spill-containment-barge-arctic-operations-was-once-birds.

Bellingham, Washington for retrofitting that would allow it to serve as a surface-support vessel for Shell's planned containment system.[70] "Shell personnel described [the contractor's] work on the [Arctic Containment System] during late 2011 and the first half of 2012 as a 'black box.'"[71] Shell "did not have naval or marine engineering expertise to advise on the *Arctic Challenger* refurbishment and to identify and troubleshoot problems alongside" its contractor.[72] Then, during the summer of 2012, the *Arctic Challenger* experienced electrical problems and issues with hydraulic-fluid discharge.[73] As a result of these difficulties, Shell's spill-response barge was not certified until October 2012.[74] According to DOI, the *Arctic Challenger*'s problems arose from "a lack of rigorous and direct contractor oversight" on Shell's part[75]—and this for a piece of equipment designed to limit environmental damage, and financial liability, in the event of an Arctic spill.[76]

Further contributing to Shell's problems in 2012 was the failed debut of the company's containment dome, which is designed to limit the dispersal of oil and gas from a compromised well.[77] Shell's containment dome was tested in Puget Sound, Washington, under conditions that were far more moderate than those found in Arctic waters.[78] Following the brief trial, the head of the Alaska office of the Bureau of Safety and Environmental Enforcement ("BSEE") reported that the dome had "breached like a whale" and that its top had been "crushed like a beer can."[79] Shell has yet to test its entire Arctic Containment System in the Arctic.[80]

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[70] *Id.* at 18.

[71] *Id*.

[72] *Id*.

[73] Kim Murphy, *Troubled Arctic Challenger Cited for Small Illegal Discharges*, L.A. TIMES, Aug. 13, 2012, http://articles.latimes.com/2012/aug/13/nation/la-na-nn-arctic-challenger-20120813; Kim Murphy, *Shell May Be Ready for the Arctic, But Its Oil Spill Barge Isn't*, L.A. TIMES, July 5, 2012, http://articles.latimes.com/2012/jul/05/nation/la-na-nn-arctic-drilling-shell-barge-20120705.

[74] DOI REVIEW OF SHELL'S 2012 ALASKA PROGRAM, *supra* note 49, at 19.

[75] *Id*. at 31.

[76] *Id.* at 18-19.

[77] *See* SHELL 2015 EXPLORATION PLAN, *supra* note 38, at 9-3 to 9-4.

[78] DOI REVIEW OF SHELL'S 2012 ALASKA PROGRAM, *supra* note 49, at 19.

[79] *Shell's Spill Containment Dome Was 'Crushed Like a Beer Can' in Sept. Testing*, ALASKA DISPATCH NEWS, Dec. 3, 2012, http://www.adn.com/article/20121203/shells-spill-containment-dome-was-crushed-beer-can-sept-testing.

[80] The inadequate testing of the well cap and containment dome speak to Shell's inability to predict its actual spill-response capability. The capping stack was tested at a relatively shallow depth, and was not required to simulate attachment to a wellhead and blowout preventer, as would be required in an actual spill. *See* DOI REVIEW OF SHELL'S 2012 ALASKA PROGRAM, *supra* note 49, at 19.

In addition to these problems, Shell sought a revision to one of its Clean Air Act permits.[81] Even after having its emission limits raised, the company violated permit requirements; the EPA accordingly issued notices of violation and a $1.1 million fine.[82]

Shell's significant problems in 2012 resulted in a series of government reports that raised serious questions about the company's ability to operate safely in the Arctic. The Coast Guard prepared a marine-casualty report looking specifically at the grounding of the *Kulluk*; its review faulted Shell for failing to assess or to manage the risks associated with its operations properly.[83] The Coast Guard also undertook a separate investigation into safety and pollution violations aboard the *Noble Discoverer* and *Kulluk*.[84] This investigation led to Noble—Shell's contractor—receiving a $12.2 million fine and other criminal penalties.[85]

Despite these problems, Shell plans to intensify its exploration efforts in Arctic waters. Beginning in 2015, Shell has proposed using two drilling vessels—the *Noble Discoverer* and the *Transocean Polar Pioneer*—to conduct simultaneous drilling operations in the Chukchi Sea.[86] This would be the first attempt to drill with two vessels simultaneously in the Chukchi.[87] Along with the drilling vessels, Shell plans to bring icebreakers, barges, tugs, aircraft, remotely operated vehicles, and other support equipment into the region.[88] Among other things, the company's operations would involve an estimated 40 helicopter flights per week and 30 trips by supply vessels per season.[89]

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[81] *See Shell Discoverer Air Permit—Chukchi Sea*, U.S. EPA, http://yosemite.epa.gov/R10/airpage.nsf/Permits/chukchiap (last visited Apr. 25, 2015).

[82] *See id.*; Lisa Demer, *EPA Fines Shell More than $1 Million for Pollution Violations in Alaska Arctic*, ALASKA DISPATCH NEWS, Sept. 5, 2013, www.adn.com/2013/09/05/3060253/epa-fines-shell-more-than-1-million.html.

[83] COAST GUARD KULLUK REPORT, *supra* note 1, at 1 (Apr. 2, 2014 Comments).

[84] DOI REVIEW OF SHELL'S 2012 ALASKA PROGRAM, *supra* note 49, at 29-30.

[85] Yereth Rosen, *Shell Drilling Contractor's Sentence Includes $12.2 Million Fine*, ALASKA DISPATCH NEWS, Dec. 19, 2014, http://www.adn.com/article/20141219/shell-drilling-contractors-sentence-includes-122-million-fine.

[86] *See* SHELL 2015 EXPLORATION PLAN, *supra* note 38, at 1-2.

[87] *See* BUREAU OF OCEAN ENERGY MGMT., ALASKA OCS REGION, CHUKCHI SEA EXPLORATION WELLS (Dec. 14, 2005), *available at* http://www.boem.gov/uploadedFiles/BOEM/About_BOEM/BOEM_Regions/Alaska_Region/Historical_Data/Exploration%20Wells%20Chukchi%20Sea.pdf.

[88] *See* SHELL 2015 EXPLORATION PLAN, *supra* note 38, at 1-2 to 1-5.

[89] *Id.* at 1-2.

### D. Shell's Arctic Program Has Encountered Significant Legal Impediments

Since Shell first purchased leases in 2005, there have been a number of court cases and administrative appeals challenging the lawfulness of various required government approvals.[90] These challenges have threatened Shell's program by creating significant delay and uncertainty and putting the company's leases at risk of rescission. Shell's annual reports, however, appear to have omitted adequate disclosures regarding many of these legal impediments.[91]

#### 1. *Challenge to Lease Sale 193*

Lease Sale 193, in 2008, was the first sale held in the Chukchi Sea in nearly two decades.[92] Prior to the sale, groups filed a lawsuit in federal court challenging the analysis underlying the sale and the government's decision to move forward.[93] When the sale took place, Shell purchased 275 leases for roughly $2.1 billion.[94]

The lawsuit proceeded in federal district court while Shell submitted a plan to conduct exploration drilling on some of the leases it had purchased.[95] The plaintiffs in the case argued that the government had violated NEPA and the Endangered Species Act in deciding to hold the sale and award leases.[96] They sought to have the lease sale vacated.[97]

In July 2010, the U.S. District Court for the District of Alaska found in favor of the plaintiffs.[98] The court concluded that the government had violated NEPA by failing to account properly for missing scientific information in its preparation of the environmental impact statement ("EIS") underlying the decision to hold the sale.[99] It declined to vacate the leases and instead remanded to the agency, enjoining activities—including Shell's planned exploration—while DOI engaged in additional environmental review.[100]

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[90] *See generally* LeVine et al., *supra* note 4, at 1328-30 (describing the process and litigation resulting concerning Lease Sale 193); *id.* at 1333-50 (describing administrative citations and challenges to Shell's exploration plans).

[91] *See* Section IV.A, *infra*.

[92] LeVine et al., *supra* note 4, at 1328.

[93] *See* Native Vill. of Point Hope v. Salazar, No. 1:08-cv-0004-RRB, 2010 WL 2943120, at *1 (D. Alaska July 21, 2010), *order clarified by* 2010 WL 3025163 (D. Alaska Aug. 2, 2010).

[94] DOI REVIEW OF SHELL'S 2012 ALASKA PROGRAM, *supra* note 49, at 9.

[95] *See* LeVine et al., *supra* note 4, at 1336-37.

[96] *Native Vill. of Point Hope*, 2010 WL 2943120, at *1.

[97] *See* Brief for Plaintiff at 6, Native Vill. of Point Hope v. Kempthorne, 730 F. Supp. 2d 1009 (D. Alaska 2010) (No. 1:08-cv-00004-RRB), 2009 WL 286791.

[98] *Native Vill. of Point Hope*, 2010 WL 2943120, at *7.

[99] *Id.* at *6.

[100] *Id.* at *7.

In February 2012, the district court upheld the government's supplemental EIS after determining that the agency had met NEPA requirements.[101] The plaintiffs appealed the district court's decision, arguing that the government had not complied with NEPA and that the lease sale should be vacated.[102] In January 2014, the Ninth Circuit Court of Appeals found in favor of the appellants.[103] The court determined that the government had premised its assessment of the lease sale's potential impacts on an arbitrary prediction of the likely activities that could result.[104] The appellate court remanded the case to the district court, which again enjoined activities on the leases.[105]

Shortly after the Ninth Circuit's decision, Shell announced that it would not seek to drill exploration wells in the summer of 2014, as it had planned.[106] Recently, DOI completed its second attempt at remedying the NEPA violations identified during the lawsuit.[107]

Throughout the Lease Sale 193 litigation and resulting remand processes, which lasted from 2008 through 2015, the plaintiffs sought to have the government's award of leases vacated, which would have voided Shell's substantial investment in the Chukchi Sea.[108] Nonetheless, it appears that Shell did not disclose this litigation or the risk it presented prior to the company's 2013 report—when Shell cited the court decision as the primary reason it would forego the 2014 drilling season.[109]

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[101] *See* Order Denying Motion for Summary Judgment, Native Vill. of Point Hope v. Salazar, No. 1:08-CV-0004-RRB (D. Alaska Feb. 13, 2013) (No. 269).

[102] *See* Brief of Appellants at 1-4, Native Vill. of Point Hope v. Jewell, 740 F.3d 489 (9th Cir. 2014) (No. 12-35287), 2012 WL 3105348.

[103] Native Vill. of Point Hope v. Jewell, 740 F.3d 489, 504 (9th Cir. 2014).

[104] *Id*. at 494.

[105] *See* Order in Light of Remand, Native Vill. of Point Hope v. Salazar, No. 1:08-CV-0004-RRB (D. Alaska Apr. 24, 2014).

[106] Steven Mufson, *Shell Says It Won't Drill in Alaska in 2014, Cites Court Challenge*, WASH. POST, Jan. 30, 2014, http://www.washingtonpost.com/business/economy/shell-says-it-wont-drill-in-alaska-in-2014-cites-court-challenge/2014/01/30/72dd06f8-89ab-11e3-916e-e01534b1e132_story.html.

[107] *Chukchi Sea Oil and Gas Lease Sale 193*, BUREAU OF OCEAN ENERGY MGMT., http://www.boem.gov/ak193/ (last visited Apr. 25, 2015).

[108] *See* Native Vill. of Point Hope v. Salazar, 730 F. Supp. 2d 1009, 1012 (D. Alaska 2010).

[109] ROYAL DUTCH SHELL PLC, ANNUAL REPORT AND FORM 20-F FOR THE YEAR ENDED DECEMBER 31, 2013, at 29, 56 (Mar. 13, 2014) [hereinafter SHELL 2013 ANNUAL REPORT], *available at* http://reports.shell.com/annual-report/2013/servicepages/downloads/files/entire_shell_ar13.pdf. Previous annual reports note the acquisition of the leases and mention seismic testing conducted but do not discuss this lawsuit. *See* ROYAL DUTCH SHELL PLC, ANNUAL REPORT AND FORM 20-F FOR THE YEAR ENDED DECEMBER 31, 2008, at 9 (Mar. 17, 2009) [hereinafter SHELL 2008 ANNUAL REPORT], *available at* http://shellnews.net/documents/

### 2. *Other Planning and Leasing Challenges*

Shell's silence regarding legal challenges does not appear to have been limited to Lease Sale 193. The company's reports also seem to have omitted information regarding an ultimately successful challenge to the government's 2007-2012 five-year leasing program, which authorized Lease Sale 193.[110] These cases, brought by the Native Village of Point Hope and several conservation organizations, were pending for nearly two years and resulted in an order remanding the leasing program to DOI for reconsideration.[111] Shell, however, appears not to have disclosed the case in its annual reports.[112]

Similarly, Shell's reports apparently failed to disclose a 2007 challenge to Lease Sale 202, which was brought by the North Slope Borough and Alaska Eskimo Whaling Commission.[113] Shell purchased many of its leases in the Beaufort Sea in Lease Sale 202 held in 2007,[114] and the plaintiffs sought to vacate the sale and, thereby, invalidate those leases.[115] After two years, the government eventually prevailed.[116] This case does not appear to have been disclosed.

### 3. *Challenges to Agency Approvals of Shell's Exploration Plans and Permits*

In addition to the litigation challenging the Arctic leases that have been purchased by Shell and other companies, there have also been court challenges regarding the agency approvals Shell has received in preparing to move forward with exploration in the region. The company, however, appears to have disclosed these proceedings only sporadically.

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2008_shell_annual_report_20f.pdf (stating that "[t]he Arctic's resources could significantly boost global supplies"); ROYAL DUTCH SHELL PLC, ANNUAL REPORT AND FORM 20-F FOR THE YEAR ENDED DECEMBER 31, 2009, at 1, 27 (Mar. 16, 2010) [hereinafter SHELL 2009 ANNUAL REPORT], *available at* http://s04.static-shell.com/content/dam/shell/static/investor/downloads/financial-information/reports/20f/2009-annual-report20fsec.pdf; ROYAL DUTCH SHELL PLC, ANNUAL REPORT AND FORM 20-F FOR THE YEAR ENDED DECEMBER 31, 2010, at 1, 26 (Mar. 15, 2011) [hereinafter SHELL 2010 ANNUAL REPORT], *available at* http://s00.static-shell.com/content/dam/shell/static/investor/downloads/financial-information/reports/20f/2010-annual-report20fsec.pdf.

[110] *See* Section IV.A.2, *infra*.

[111] Ctr. for Biological Diversity v. U.S. Dep't of the Interior, 563 F.3d 466, 489 (D.C. Cir. 2009).

[112] *See* Section IV.A.2, *infra*.

[113] N. Slope Borough v. Minerals Mgmt. Serv., 343 Fed. App'x 272, 274 (9th Cir. 2009).

[114] *See* SHELL SUSPENSION REQUEST, *supra* note 27, at 3 (noting that "Shell acquired all but a few of its Beaufort Sea leases" in Lease Sale 202 and a second sale).

[115] *See N. Slope Borough*, 343 Fed. App'x at 274.

[116] *See id.*

As noted above, DOI must approve a company's exploration plan before the company can proceed.[117] The Bureau of Ocean Energy Management ("BOEM") or its predecessor, the Minerals Management Service, approved plans submitted by Shell for proposed exploration activities that would have begun in 2007, 2010, and 2012.[118] Each of those approvals was challenged in the Ninth Circuit Court of Appeals.[119] The first of those challenges was successful and the latter two were not.[120] Shell disclosed the challenge to its 2007 and 2010 exploration plans, but appears not to have disclosed the challenge to its 2012 plan.[121]

In addition to an exploration plan, companies must have an approved oil spill response plan before beginning exploration.[122] The plan must show that the company is capable of "responding, to the maximum extent practicable, to a worst case discharge, and to a substantial threat of such a discharge, of oil…."[123] In 2012, Alaska Native groups and conservation organizations challenged BSEE's approval of Shell's response plans, arguing that the plans were

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[117] 43 U.S.C. § 1340(c)(1).

[118] *See* Alaska Wilderness League v. Kempthorne, 548 F.3d 815, 819 (9th Cir. 2008), *vacated and withdrawn*, 559 F.3d 916 (9th Cir. 2009), *dismissed as moot sub nom.* Alaska Wilderness League v. Salazar, 571 F.3d 859 (9th Cir. 2009) (addressing a challenge to the 2007 approval of Shell's Beaufort exploration plan); Native Vill. of Point Hope v. Salazar, 378 F. App'x 747, 748 (9th Cir. 2010) (addressing a challenge to Shell's 2010 exploration plans); Native Vill. of Point Hope v. Salazar, 680 F.3d 1123, 1128-29 (9th Cir. 2012) (addressing a challenge to Shell's 2012 exploration plan).

[119] *See Alaska Wilderness League*, 548 F.3d at 819; *Native Vill. of Point Hope*, 378 F. App'x at 748; *Native Village of Point Hope*, 680 F.3d at 1128-29.

[120] *See Alaska Wilderness League*, 548 F.3d at 835; *Native Vill. of Point Hope*, 378 F. App'x at 748; *Native Village of Point Hope*, 680 F.3d at 1135.

[121] *See* ROYAL DUTCH SHELL PLC, ANNUAL REPORT AND FORM 20-F FOR THE YEAR ENDED DECEMBER 31, 2014, at 30, 55 (Mar. 12, 2015) [hereinafter SHELL 2014 ANNUAL REPORT], *available at* http://s02.static-shell.com/content/dam/shell-new/local/corporate/corporate/downloads/pdf/investor/reports/2014/20f/2014-annual-report20fsec.pdf (discussing Alaska exploration and strategy but not 2012 litigation); SHELL 2013 ANNUAL REPORT, *supra* note 109, at 56 (discussing the challenges of its 2012 season without disclosing the respective litigation); ROYAL DUTCH SHELL PLC, ANNUAL REPORT AND FORM 20-F FOR THE YEAR ENDED DECEMBER 31, 2012 (Mar. 14, 2013) [hereinafter SHELL 2012 ANNUAL REPORT], *available at* http://s01.static-shell.com/content/dam/shell-new/local/corporate/corporate/downloads/pdf/investor/reports/2012/20f/2012-annual-report20fsec.pdf (failing to disclose 2012 litigation); SHELL 2009 ANNUAL REPORT, *supra* note 109, at 52 (discussing 2007 and 2010 legal actions).

[122] 33 U.S.C. § 1321(j)(5)(D)(iii) (providing that a response plan must "identify, and ensure … the availability of, private personnel and equipment necessary to remove to the maximum extent practicable a worst case discharge (including a discharge resulting from fire or explosion), and to mitigate or prevent a substantial threat of such a discharge").

[123] 33 U.S.C. § 1321(j)(5)(A)(i); *see also* 33 U.S.C. § 2735(a)(2).

inadequate; the case is currently pending in the Ninth Circuit.[124] While Shell has told investors that it has a "thorough spill response capability," it does not appear to have disclosed this litigation.[125]

Prior to a change in the Clean Air Act, companies were required to obtain air pollution permits from the Environmental Protection Agency ("EPA") before undertaking exploration activities.[126] EPA's award of these permits led to several challenges before both the Environmental Appeals Board (EAB), an administrative body, and the Ninth Circuit.[127] During the pendency of an appeal to the EAB, permits awarded by EPA are rendered invalid.[128] As a result, simply the act of filing an appeal prevented Shell from proceeding with exploration drilling. Appellants successfully petitioned the EAB to invalidate permits granted for Shell's proposed 2007 and 2010 exploration activities.[129] The 2012 permits were upheld by the EAB and, eventually, the Ninth Circuit Court of Appeals.[130] Shell only appears to have disclosed some of these proceedings.

### E. Shell Does Not Appear to Be Technically or Financially Prepared to Address a Catastrophic Oil Spill in the Arctic Ocean

In addition to the legal threats facing Shell's Arctic program, the exploration drilling proposed by the company brings with it the risk of a large oil spill—one for which the company does not appear fully prepared, technically or financially. A catastrophic spill could have devastating impacts on the Arctic Ocean and the communities dependent upon it. Severe conditions would exacerbate the challenges of responding, and a catastrophic spill would likely have a significant impact on Shell and its finances.

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[124] Alaska Wilderness League v. U.S. Dep't of the Interior, Nos. 13-35835 and 13-35866 (9th Cir.).

[125] *See* SHELL 2014 ANNUAL REPORT, *supra* note 121, at 55; SHELL 2013 ANNUAL REPORT, *supra* note 109, at 56; SHELL 2012 ANNUAL REPORT, *supra* note 121, at 49.

[126] *See* 42 U.S.C. § 7475(a)(1) (requiring certain "[m]ajor emitting facilities" to obtain permits establishing emission limitations); *id.* § 7627(a) (extending the "major emitting facilities" classifications to air pollution from activities on the Outer Continental Shelf).

[127] *See, e.g.*, In re Shell Gulf of Mexico, Inc. & Shell Offshore, Inc., 15 E.A.D. __ (EAB 2010), *available at* http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Appeal~Number/41B37138DABA5A54852578090072B80A/$File/Denying%20and%20Remanding....pdf; Resisting Envtl. Destruction on Indigenous Lands, REDOIL v. U.S. EPA, 716 F.3d 1155 (9th Cir. 2013).

[128] 40 C.F.R. § 124.19(f)(1).

[129] *See* In re Shell Offshore Inc., Kulluk Drilling Unit and Frontier Discoverer Drilling Unit, 13 E.A.D. 357, at 359, 360 (EAB 2007); In re Shell Gulf of Mexico, Inc., *supra* note 127, at 13, 15.

[130] *See* In re Shell Offshore, Inc., 15 E.A.D. __ (EAB 2012), *available at* http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Appeal~Number/148252B4723F0450852579D100714934/$File/Shell%20Kulluk.pdf; *REDOIL*, 716 F.3d at 1157-58; Alaska Wilderness League v. EPA, 727 F.3d 934, 935 (9th Cir. 2013).

### 1. *Oil Spills Occur During Offshore Oil and Gas Operations*

Oil spills are a reality of offshore exploration and production. During drilling, extraction, and transportation operations, oil can leak slowly or flow profusely due to design, equipment, and human failures.[131] Over the life of a single well, the probability of a small spill occurring from such activities is nearly 100 percent.[132] From 1964 to 2009, more than 2,800 minor and major spills from offshore oil and gas activities were reported.[133]

The federal government and Shell have both recognized that oil spills would be inevitable during Arctic operations. BOEM has estimated that 800 small spills will occur as a result of activities in the Chukchi Sea.[134] Shell's former Alaska vice president Pete Slaiby has acknowledged as much, saying: "There's no sugarcoating this…. If you ask me will there will ever be spills, I imagine there will be spills. No spill is OK."[135] BOEM has also determined that "there is a 75% chance" that "one or more large spills"—spills of a thousand barrels or more—will occur during operations in the Chukchi Sea.[136]

While catastrophic spills are much less likely, they do occur.[137] In addition to the *Deepwater Horizon* tragedy in 2010, there was the 2009 Montara spill in New Zealand's Timor

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[131] *See* PEW CHARITABLE TRUSTS, FACT SHEET: EXPLORATION AND DEVELOPMENT RISKS (Sept. 1, 2013), *available at* http://www.pewtrusts.org/en/research-and-analysis/fact-sheets/0001/01/01/exploration-and-development-risks; BUREAU OF OCEAN ENERGY MGMT., FINAL SECOND SUPPLEMENTAL ENVTL. IMPACT STATEMENT, CHUKCHI SEA PLANNING AREA OIL AND GAS LEASE SALE 193, at Vol. 1, 154-55 (Feb. 2015) [hereinafter LEASE SALE 193 FSSEIS], *available at* http://www.boem.gov/uploadedFiles/BOEM/About_BOEM/BOEM_Regions/Alaska_Region/Leasing_and_Plans/Leasing/Lease_Sales/Sale_193/2015_0127_LS193_Final_2nd_SEIS_Vol1.pdf.

[132] PEW CHARITABLE TRUSTS, *supra* note 131.

[133] DEP'T OF THE INTERIOR, UPDATE OF OCCURRENCE RATES FOR OFFSHORE OIL SPILLS 10-11 (June 2012), *available at* http://www.boem.gov/uploadedFiles/BOEM/Environmental_Stewardship/Environmental_Assessment/Oil_Spill_Modeling/AndersonMayesLabelle2012.pdf.

[134] LEASE SALE 193 FSSEIS, *supra* note 131, at Vol. 1, 155.

[135] May Abdalla, *The Alaskans Sitting on Billions of Barrels of Oil*, BBC NEWS, Nov. 29, 2012, http://www.bbc.com/news/magazine-20310752.

[136] LEASE SALE 193 FSSEIS, *supra* note 131, at Vol. 1, 156 ("[T]here is a 75% chance of one or more large spills occurring over the 77 years of the Scenario, and a 25% chance of no spills occurring.").

[137] BOEM defines a "catastrophic [Outer Continental Shelf] event" as "any high-volume, long-duration oil spill from a well blow-out, regardless of its cause (e.g., a hurricane, human error, terrorism)." BUREAU OF OCEAN ENERGY MGMT., ECONOMIC ANALYSIS METHODOLOGY FOR THE FIVE YEAR OCS OIL AND GAS LEASING PROGRAM FOR 2012-2017, at 38 (June 2012) [hereinafter BOEM ECONOMIC ANALYSIS], *available at* http://www.boem.gov/uploadedFiles/BOEM/Oil_and_Gas_Energy_Program/Leasing/Five_Year_Program/2012-2017_Five_Year_Program/

Sea;[138] the 1979 Ixtoc I spill in the Gulf of Mexico;[139] and the 1969 oil spill off the coast of Santa Barbara.[140] Importantly, and unfortunately, the *Deepwater Horizon* blowout demonstrated the results of a catastrophic accident during exploration drilling; BP was drilling an exploration well when the spill occurred—exactly what Shell is proposing to do in the Chukchi Sea.[141]

As explained below, the severity and remoteness of the Arctic Ocean would likely increase the potential for a catastrophic accident and hinder response.[142] The challenges presented by Arctic conditions "are not limited to the period of active drilling operations, but would create difficulties throughout all phases of an exploratory drilling program, including mobilization and demobilization."[143] As demonstrated by Shell's significant difficulties during the 2012 season, these are not abstract concerns.[144]

The impacts of a catastrophic spill would be significant. BOEM has estimated that a catastrophic accident in the Chukchi Sea, for instance, would result in approximately 1.3 to 2.5

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PFP%20EconMethodology.pdf. BOEM also recognizes the National Oil and Hazardous Substances Pollution Contingency Plan definition: "a 'spill of national significance,' or one that 'due to its severity, size, location, actual or potential impact on the public health and welfare or the environment, or the necessary response effort, is so complex that it requires extraordinary coordination of federal, state, local, and responsible party resources to contain and clean up the discharge.'" *Id.*

[138] Gabrielle Dunlevy, *New Push for Montara Oil Disaster Study*, THE AUSTRALIAN, June 11, 2014, http://www.theaustralian.com.au/news/latest-news/new-push-for-montara-oil-disaster-study/story-fn3dxix6-1226950910392.

[139] *Ixtoc I Oil Well*, WOODS HOLE OCEANOGRAPHIC INST., http://www.whoi.edu/oil/ixtoc-I (last visited Apr. 25, 2015).

[140] *See* NAT'L COMM'N ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING, DEEP WATER: THE GULF OIL DISASTER AND THE FUTURE OF OFFSHORE DRILLING 28-29 (Jan. 2011) [hereinafter NAT'L COMM'N REPORT], *available at* http://www.gpo.gov/fdsys/pkg/GPO-OILCOMMISSION/pdf/GPO-OILCOMMISSION.pdf (noting that "[a]lthough the well's blowout preventer worked, an inadequate well design allowed the hydrocarbons to escape through near-surface ruptures beneath the seafloor," thereby spilling between 80,000 and 100,000 barrels of oil to spill, which created "an 800-square-mile slick of oil that blackened an estimated 30 miles of California beaches and lethally soaked sea birds in the gooey mess").

[141] *Id.* at xiii.

[142] *See* Section II.E, *infra*.

[143] Oil and Gas and Sulphur Operations on the Outer Continental Shelf, Requirements for Exploratory Drilling on the Arctic Outer Continental Shelf, 80 Fed. Reg. 9916, 9928 (Feb. 24, 2015) (to be codified at 30 C.F.R. pt. 550).

[144] *See* Sections II.C and II.E.4, *infra*.

million barrels of oil being released to the Arctic environment.[145] Shell's oil spill response plans have assumed a smaller "worst-case discharge"—750,000 barrels.[146]

In recognition of the serious impacts that would result from a catastrophic spill, DOI recently proposed new safety and prevention regulations for operators drilling exploration wells in the Arctic Ocean.[147] As DOI explained, "[a]lthough the probability of a catastrophic oil spill is low, the *Deepwater Horizon* oil spill demonstrated that even such low probability events can have devastating economic and environmental results when they occur."[148]

### 2. *Extreme and Remote Conditions Would Pose Unique Challenges to Spill Response in the Arctic Ocean*

The extreme conditions in the Arctic—in particular, the difficult weather, variable sea ice, ocean currents, remoteness, and lack of infrastructure—would present immense obstacles to spill response. Industry research confirms, for instance, that oil spills behave much differently in sea ice and that changing conditions throughout the year complicate attempts to predict the behavior of spilled oil.[149] As explained below, moreover, the most common methods for responding to spills are highly unlikely to work in Arctic conditions.

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[145] Memorandum from Rance Wall, Regional Supervisor, to Regional Director 3 (Mar. 4, 2011). For comparison, the *Deepwater Horizon* spill released an estimated 4.9 million barrels of oil. *See* NAT'L COMM'N REPORT, *supra* note 140, at 167-68.

[146] SHELL 2015 EXPLORATION PLAN, *supra* note 38, at 8-2.

[147] Requirements for Exploratory Drilling on the Arctic Outer Continental Shelf, 80 Fed. Reg. at 9920.

[148] *Id.* The Department continued:

> Reducing the risks of Arctic offshore operations is particularly important because of the unique significance to Alaska Natives of the fish and marine mammals in the lands and waters around the Arctic OCS; those resources are critical components of the Alaska Natives' livelihood, and they rely on fishing and hunting for traditional cultural purposes and for subsistence. Similarly, many other Americans place a very high value on protecting the health of the ecosystem, including the sensitive environment and wildlife, of this largely frontier area. Thus, the impact of a catastrophic oil spill, while a remote possibility, would have extremely high cultural and societal costs, and prevention of such a catastrophe would have correspondingly high cultural and societal benefits.

*Id.*

[149] SINTEF MATERIALS AND CHEMISTRY, EXPERIMENTAL OIL RELEASE IN BROKEN ICE—A LARGE-SCALE FIELD VERIFICATION OF RESULTS FROM LABORATORY STUDIES OF OIL WEATHERING AND IGNITABILITY OF WEATHERED OIL SPILLS 6 (Apr. 20, 2010), *available at*

Weather would present significant challenges throughout the year. From late fall through winter, darkness, snow, and low temperatures would hinder response efforts.[150] Fog and low clouds would impede visibility.[151] In the late summer to early fall, the waters of the Beaufort and Chukchi seas are often rough.[152] And then the cold air and darkness return.

The conditions beneath the surface of the Arctic Ocean would pose additional difficulties. Beaufort and Chukchi currents can vary significantly due to rapid changes in currents in the wind.[153] The seas are also highly stratified, so that "oil that is trapped at depth will not be transported by surface circulation."[154] There are also eddies, which can "trap and transport packets of water, or (in the case of a spill) entrained oil, over hundreds of kilometers."[155] Storm surges can move "ocean water into low-lying coastal environments, bringing salt and contaminants (in the event of a spill) that can have negative impacts on nearshore and terrestrial ecosystems."[156]

Sea ice would create significant difficulties for any spill response. Oil spilled under "multiyear ice" can "take several seasons … to appear on the surface."[157] Ice can trap and concentrate oil.[158] It can also transport oil a significant distance.[159] Ice can make it more difficult

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http://www.sintef.no/globalassets/project/jip_oil_in_ice/dokumenter/publications/jip-rep-no-26-fex2009-weathering-isb-final.pdf.

[150] *See* LeVine et al., *supra* note 4, at 1296-97. Shell proposes to drill during the open-water season, which ends in October. *See* SHELL 2015 EXPLORATION PLAN, *supra* note 38, at 1-6. If a spill occurred late in the season, however, it could be left through the winter months. *See* LEASE SALE 193 FSSEIS, *supra* note 131, at Vol. 1, 573 ("[I]f a spill were to occur late in the open-water season, the liquid hydrocarbons may freeze into the sea ice, and remain overwinter without any extensive amount of weathering. If this were to happen, quantities of un-weathered oil could end up being transported to different areas in the Chukchi and Beaufort Seas and be released in the spring.").

[151] *See* LeVine et al., *supra* note 4, at 1296-97.

[152] *See id.*

[153] *See* NAT'L RESEARCH COUNCIL, RESPONDING TO OIL SPILLS IN THE U.S. ARCTIC MARINE ENVIRONMENT 25-27 (2014) [hereinafter NAT'L RESEARCH COUNCIL], *available at* http://www.nap.edu/catalog.php?record_id=18625 ("[C]omplex flow patterns … can reverse direction in a matter of hours and can vary significantly in both magnitude (0-85 km/day) and direction over spatial scales of less than 10 km.").

[154] *Id.* at 27.

[155] *Id.* ("Satellite measurements reveal that the surface distribution of the oil in the *Deepwater Horizon* spill was influenced by eddies in the Gulf of Mexico….").

[156] *Id.*

[157] *Id.* at 33.

[158] *Id.* at 33-34.

to determine where oil is,[160] and it may slow down or stop the "processes that affect traditional oil behavior in open water, like evaporation, emulsification, and natural dispersion."[161] Sea ice would accordingly create a number of challenges for spill response in the Arctic.

In combination, the Arctic's severe conditions would result in a "response gap"—times during which no method of response can be deployed effectively or safely.[162] Studies in the Canadian Beaufort Sea have shown that response efforts would be precluded about half the time in July, and 80 percent of the time in October.[163]

As the National Research Council has noted, "[t]he absence of infrastructure in the U.S. Arctic would [also] be a significant liability in the event of a large oil spill."[164] Far northern Alaska remains largely undeveloped and sparsely populated. The North Slope Borough, which lies south of the Beaufort and Chukchi seas, spans 88,000 square miles—roughly the size of the state of Utah—but has a population of only nine to ten thousand.[165] The few villages in the region are not connected by road to either each other or the rest of the state, relying instead on airports and small boat docks.[166] Limited infrastructure and housing would make it impossible to support the many workers that would be required to respond to a catastrophic spill.[167]

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[159] *Id.* at 32. Pack ice has been known to travel up to 50 kilometers per day, and there is one documented incident of pack ice traveling almost 2000 kilometers from mid-October to mid-May. *Id.*

[160] *Id.* at 94-99.

[161] *Id.* at 73.

[162] *See* LeVine et al., *supra* note 4, at 1302-03.

[163] *Id.* at 1302; *see also* NUKA RESEARCH AND PLANNING GROUP, ESTIMATING AN OIL SPILL RESPONSE GAP FOR THE U.S. ARCTIC OCEAN (Sept. 10, 2014), *available at* http://www.nukaresearch.com/files/140910_Arctic_RGA_Report_FNL.pdf.

[164] NAT'L RESEARCH COUNCIL, *supra* note 153, at 134.

[165] *See State & County QuickFacts: North Slope Borough, Alaska*, U.S. CENSUS BUREAU, http://quickfacts.census.gov/qfd/states/02/02185.html (last visited Apr. 25, 2015); *State & County QuickFacts: Utah*, U.S. CENSUS BUREAU, http://quickfacts.census.gov/qfd/states/49000.html (last visited Apr. 25, 2015). By way of contrast, approximately 45,000 people—nearly five times the population of the North Slope Borough—have participated in the *Deepwater Horizon* response. *See* NAT'L COMM'N REPORT, *supra* note 140, at 129.

[166] *See* U.S. ARMY CORPS OF ENG'RS, ALASKA DEEP-DRAFT ARCTIC PORT SYSTEM STUDY 37-38 (Mar. 2013), *available at* http://www.poa.usace.army.mil/Portals/34/docs/AKports/1ADDAPSReportweb.pdf. No deep-water port capable of supporting offshore development currently exists along the coast. *See id.* at 1.

[167] NAT'L RESEARCH COUNCIL, *supra* note 153, at 125 ("Spill responders and other personnel would find a severe shortage of housing, fresh water, food and catering, sewage handling and garbage removal facilities, communications infrastructure, ability to handle heavy equipment, supplies, and hospitals and medical support.").

The U.S. Coast Guard also does not have the needed resources in the region to address a major spill in the Arctic Ocean.[168] Coast Guard response equipment would have to be dispatched from Kodiak—approximately 1,000 miles to the south—if a spill occurred.[169] As the National Research Council summarized, "Coast Guard personnel, equipment, transportation, communication, navigation, and safety resources needed for oil spill response are not adequate for overseeing oil spill response in the Arctic."[170]

### 3. *Shell's Response Plan Is Unlikely to Prove as Effective as the Company Predicts*

In its legally required response plan,[171] Shell asserts that it would use mechanical oil-recovery methods—floating containment booms and skimmer boats—as the primary means of responding to a worst-case spill.[172] Shell also states that it would use chemical dispersants and "in-situ" burning.[173] Finally, after the *Deepwater Horizon* spill,[174] Shell developed the previously mentioned Arctic Containment System,[175] which is intended to prevent oil from being released after a blowout.[176]

While there remains much to be learned about how best to deploy oil spill countermeasures in the Arctic, it is clear that all of the foregoing environmental factors would undermine the methods on which Shell relies—mechanical recovery, in-situ burning, and dispersants.[177] As the National Commission on the BP *Deepwater Horizon* Oil Spill and

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[168] *Id.* at 121.

[169] *Id.*

[170] *Id.* at 133 ("The Coast Guard's efforts to support Arctic oil spill planning and response in the absence of a dedicated and adequate budget are admirable but not sustainable.").

[171] As previously noted, Shell is required under federal law to develop an oil-spill response plan demonstrating that it is capable of "responding, to the maximum extent practicable, to a worst case discharge, and to a substantial threat of such a discharge, of oil…." 33 U.S.C. § 1321(j)(5)(A)(i); *see also id.* § 1321(a)(24)(B) (defining "'worst case discharge' … in the case of an offshore facility" as "the largest foreseeable discharge in adverse weather conditions"). Among other things, the company's plan must "identify, and ensure by contract or other means approved … the availability of, private personnel and equipment necessary to remove to the maximum extent practicable a worst case discharge (including a discharge resulting from fire or explosion)." *Id.* § 1321(j)(5)(D)(iii).

[172] SHELL CHUKCHI OSRP, *supra* note 68, at 2.

[173] *Id.* at 2-57 to 2-58.

[174] *See* DOI REVIEW OF SHELL'S 2012 ALASKA PROGRAM, *supra* note 49, at 11-12.

[175] *See* SHELL CHUKCHI OSRP, *supra* note 68, at N-13 to N-14.

[176] *Id.*

[177] The challenges presented by Arctic conditions "are not limited to the period of active drilling operations, but would create difficulties throughout all phases of an exploratory drilling program,

Offshore Drilling concluded in 2011, "oil response methods from the Gulf of Mexico, or anywhere else, cannot simply be transferred to the Arctic."[178]

Despite real-world experience to the contrary, Shell assumes that its primary method of response—boom and skimmers—will be highly effective at removing spilled oil. The company's spill response plan is premised on an assumption that 95 percent of any oil spilled would be recovered either offshore or near shore using these techniques.[179] It the words of the company:

> To scale the potential shoreline response assets needed, and for planning purposes, Shell based these assets upon the assumption that 10 percent of the 25,000 [barrels of oil per day (bopd)] discharge escapes the primary offshore recovery efforts at the blowout. This unrecovered 2,500 bopd is assumed to drift toward the mainland. … It is assumed that half of the oil reaching the nearshore environment is recovered by the skimming systems dispatched from [Shell's nearshore oil spill response task force]. … The remaining 1,250 bopd are assumed to migrate toward the shoreline where [Shell's spill-response contractor] would mobilize personnel and equipment to intercept the oil and deploy boom for shoreline protection.[180]

As an initial matter, Shell's estimates far exceed the oil recovery achieved following spills in less demanding climates. For example, it was estimated after the *Deepwater Horizon* spill that only two to four percent of the discharged oil was collected using booms and skimmers.[181] Moreover, difficult weather and marine conditions in the Arctic would make it challenging to deploy boom and to operate skimmers.[182] While large sheets of ice might help to trap oil, broken pieces of floating ice would severely hamper Shell's ability to contain the slick with boom.[183] In-the-water tests in spring and fall 2000 showed that these techniques are not likely to be effective in the presence of even small amounts of ice.[184]

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including mobilization and demobilization." Proposed Requirements for Exploratory Drilling on the Arctic Outer Continental Shelf, 80 Fed. Reg. at 9928.

[178] *See* NAT'L COMM'N REPORT, *supra* note 140, at 303.

[179] *See* SHELL CHUKCHI OSRP, *supra* note 68, at 2-42.

[180] *Id.*

[181] NAT'L RESEARCH COUNCIL, *supra* note 153, at 91.

[182] *Id.* at 91-92.

[183] *Id.*

[184] TIM L. ROBERTSON & ELISE DECOLA, JOINT AGENCY EVALUATION OF THE SPRING AND FALL 2000 N. SLOPE BROKEN ICE EXERCISES 33-47 (Dec. 18, 2000) (attached as Exh. 2).

Although in-situ burning would be the only feasible means of responding to an oil spill from November to June in the Chukchi Sea,[185] it could only be effective under a limited set of circumstances.[186] Environmental conditions—wind, waves, temperature, visibility, and sea-ice coverage—would have to be moderate enough to allow for the deployment of equipment and ignition of the oil.[187] In-situ burning, in other words, will "only work in mild weather conditions."[188] In its Bureau-funded study of the response gap in the U.S. Arctic Ocean, the Nuka Research and Planning Group calculated that environmental conditions would accordingly preclude vessel-based in-situ burning 50 percent of the time in the Chukchi Sea and 54 percent of the time in the Beaufort Sea;[189] aerial in-situ burning would be precluded 68 percent of the time in the Chukchi Sea and 72 percent of the time in the Beaufort Sea.[190] Even if environmental

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[185] *See* NUKA RESEARCH, *supra* note 163, at iii (Fig. ES-1).

[186] The effectiveness of in-situ burning is limited under even ideal circumstances. *See* NAT'L COMM'N ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING, THE CHALLENGES OF OIL SPILL RESPONSE IN THE ARCTIC, DRAFT STAFF WORKING PAPER NO. 5, at 14-15 (Jan. 11, 2011) [hereinafter NAT'L COMM'N WORKING PAPER], *available at* http://permanent.access.gpo.gov/gpo179/Working%20Paper.Arctic.For%20Release_0.pdf ("As with all response techniques, the efficiency of in situ burning will vary widely. Efficiency rates of 90% were achieved in an experiment in Norway that simulated a tanker spill, … but a 1998 well blowout study estimated only 3.4-6.4% efficiency in fall freeze-up conditions on open water."); *Deluge of Oil Highlights Research and Technology Needs for Effective Cleanup of Oil Spills: Hearing Before the Subcomm. on Energy & Envt. of the H. Comm. on Sci. & Tech.*, 111th Cong. 3 (June 9, 2010) (written testimony of Dr. Jeffrey Short, Pac. Sci. Dir. for Oceana) [hereinafter *Short Testimony*] ("In general, burning is simply not capable of removing more than a small proportion of the oil released from large-scale discharges, except in cases where the oil is ignited at the onset by the accident producing the spill."), *available at* http://archives.democrats.science.house.gov/Media/file/Commdocs/hearings/2010/Energy/9jun/Short_Testimony.pdf. In the cover letter to its January 26, 2012 Oil Spill Response Plan, Shell says that it is not taking "regulatory credit for … in-situ burning when calculating its total volumetric capacity to respond to a [worst-case discharge]." *See* Letter from Shell's Susan Childs to BSEE's David M. Moore 3 (Jan. 26, 2012), *available at* http://www.bsee.gov/uploadedFiles/BSEE/OSRP/Chukchi%20OSRP%20-%20February%202012.pdf. Shell also claims, however, that in-situ burning of oil thicker than 2 to 3 millimeters can result in "50 to 66 percent removal efficiency," while in-situ burning of oil thicker than 10 millimeters "gives 90 percent removal efficiency." SHELL CHUKCHI OSRP, *supra* note 68, at E-9.

[187] *See* NAT'L COMM'N WORKING PAPER, *supra* note 186, at 14.

[188] *See Short Testimony*, *supra* note 186, at 3; *see also* NAT'L COMM'N WORKING PAPER, *supra* note 186, at 14 (noting that "[o]il is more difficult to ignite at lower temperatures").

[189] In the winter, vessel-based in-situ burning would be impossible 58 and 62 percent of the time, respectively, in the Chukchi Sea and Beaufort Sea; in the summer, it would be impossible 34 and 39 percent of the time, respectively. NUKA RESEARCH, *supra* note 163, at 58.

[190] In the winter, aerial in-situ burning would be impossible 75 and 77 percent of the time, respectively, in the Chukchi Sea and Beaufort Sea; in the summer, it would be impossible 56 and 62 of the time, respectively. *Id.* at 57.

conditions were appropriate for in-situ burning, a number of other conditions would have to be met.[191] Oil must be at least 2 millimeters thick to prevent a fire from self-extinguishing due to heat loss to the ocean;[192] when pieces of ice have accumulated in an area, a slick must be twice as thick to ignite.[193] Once ignited, a fire would spread more slowly, the burn rate would be half as fast, and there would be 50 to 100 percent more residue.[194]

The effective use of chemical dispersants also would likely be limited in the Arctic Ocean. "Dispersants do not remove the oil, but break it into very small droplets that mix into the water column, promoting degradation."[195] According to the Nuka Research and Planning Group, environmental conditions would permit aerial application of dispersants only 50 and 45 percent of the time between July and October in the Chukchi Sea and Beaufort Sea, respectively.[196] Environmental conditions would permit vessel-based application of dispersants 76 and 73 percent of the time between July and October in the Chukchi and Beaufort, respectively.[197] Between November and June, however, environmental conditions would allow the application of dispersants only about one to six percent of the time.[198]

Even if chemical dispersants could be applied in the wake of an Arctic spill, it is unclear if they would be effective. In a 2001 study that was later cited by the staff of the *Deepwater Horizon* commission, researchers "found that dispersants were less than 10% effective when applied to Alaska North Slope crude oil spilled on water at the temperature and salinity common in the estuaries and marine waters of Alaska."[199] When dispersants are able to break oil into small droplets, the droplets themselves must be able to biodegrade—something that is not certain to occur in the Arctic Ocean.[200] As one researcher put it, "[b]iodegradation is generally believed

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[191] The Nuka report explicitly did not look at weathering or slick thickness. *Id.* at 54. It also did not consider residue gathering. *Id.*

[192] *Short Testimony*, *supra* note 186, at 2.

[193] *See* NUKA RESEARCH, *supra* note 163, at 51, 53 ("The ignitability of oil slicks on water is affected by oil type, slick thickness, wind speed, emulsification of the oil, igniter strength, ambient temperatures, and sea state.").

[194] *See id.* at 53.

[195] *Id.* at 39.

[196] *Id.* at 48 (Fig. 16).

[197] *Id.* at 49 (Fig. 17).

[198] *Id.* at 48-49.

[199] NAT'L COMM'N WORKING PAPER, *supra* note 186, at 15. As the staff paper noted, "an MMS/ExxonMobil-sponsored project, based on testing at Ohmsett, the National Oil Spill Response Test Facility in New Jersey, concluded that dispersants could be effective in cold water." *Id.*

[200] *See* Kelly M. McFarlin et al., *Biodegradation of Dispersed Oil in Artic Seawater at -1 ºC*, 9 PLOS ONE e84297, at 1 (Jan. 2014), *available at* http://www.plosone.org/article/fetchObject.action?uri=info:doi/10.1371/journal.pone.0084297&representation=PDF.

to be the dominant process that removes petroleum compounds from the environment, but the process has not been thoroughly studied in the Arctic, and questions remain as to whether biodegradation is a significant process in cold conditions."[201]

Finally, chemical dispersants can "dramatically accelerate dissolution of the more toxic components of the oil they disperse[], which may expose sea life to higher risk of toxic effects."[202] In addition, dispersants may have toxic impacts on marine wildlife that consume them[203]—either directly or through their prey.[204] The bioaccumulation of chemical dispersants in bowhead whales could affect whether the Iñupiat continue or limit their whale harvests.[205] Little is known about the long-term, chronic effects of dispersant use, as most studies have focused on the chemicals' short-term acute effects.[206]

Moreover, as explained previously, Shell has experienced significant problems with its Arctic Containment System, which has never been fully tested in the Arctic.[207] Ultimately, none of the techniques Shell proposes to use are likely to be as effective as the company predicts.

#### 4. *Shell's Difficulties in the U.S. Arctic Increase Doubts about Its Ability to Respond Effectively to a Significant Spill*

As described above, Shell's U.S. Arctic program suffered a remarkable series of problems and setbacks in 2012.[208] Shell's troubles raise serious doubts about its ability to respond safely and effectively to a catastrophic Arctic spill.

In its review of Shell's 2012 Arctic operations, DOI found that the company's "difficulties have raised serious questions regarding its ability to operate safely and responsibly in the challenging and unpredictable conditions offshore Alaska."[209] The report described the company's troubling lack of preparation for Arctic exploration; its significant problems with contractors; and a failure by Shell to understand the severity of the issues it faced in the region.[210] Specifically, the report noted that "Shell entered the drilling season not fully prepared

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[201] *Id.*

[202] *Id.* at 7.

[203] *Short Testimony*, *supra* note 186, at 6; *see also* Letter from Harvard Emmett Environmental Law and Policy Clinic to Walter D. Cruickshank, Bureau of Ocean Energy Management 16-20 (Dec. 22, 2014) [hereinafter *Emmett Letter*], *available at* https://hlsenvironmentallaw.files.wordpress.com/2015/01/elpc-comments_boem-dsseis-chukchi-sea-final.pdf.

[204] *Emmett Letter*, *supra* note 203, at 18-19.

[205] *Id.* at 20-21.

[206] *See id.* at 14-15.

[207] *See* Section II.C, *supra*.

[208] *See id.*

[209] DOI REVIEW OF SHELL'S 2012 ALASKA PROGRAM, *supra* note 49, at 1.

[210] *Id.*

in terms of fabricating and testing certain critical systems and establishing the scope of its operational plans."[211] Shell's challenges, the report continued, "indicate serious deficiencies in [its] management of contractors, as well as its oversight and execution of operations in the extreme and unpredictable conditions offshore of Alaska."[212] Similarly, the Coast Guard report into the grounding of the *Kulluk* identified serious concerns with the company's oversight of contractors and risk management.[213] The issues outlined in these reports raise serious doubts about the company's ability to handle a catastrophic spill.

### F. A Catastrophic Oil Spill Would Have Significant Impacts on the Arctic Environment and Communities

A catastrophic spill would have devastating impacts on the Arctic ecosystem and coastal communities. The effects of a spill on the region's wildlife populations would be both immediate and acute, as demonstrated by the mortality events that have followed previous accidents.[214] The *Exxon Valdez* spill, for instance, caused a cascade of adverse impacts, even on terrestrial species.[215] For example, the bird populations around Prince William Sound suffered for years after the event.[216] Similar effects are now being seen in the Gulf of Mexico after the *Deepwater Horizon* spill.[217]

A significant spill would also result in long-term declines among fish species, particularly those that rely on the shallow waters of the coast, intertidal areas, and freshwater.[218] Moreover, an oil spill that remains beneath sea ice, impeding recovery efforts, could result in long-term degradation of essential fish habitat and acute effects on fish populations.[219]

Marine mammals would also be significantly affected by a catastrophic spill through "direct contact, inhalation, and ingestion" of oil, causing a "multitude of acute and chronic effects."[220] Bowhead whales, which are endangered, would be the most vulnerable to a spill in the Chukchi Sea,[221] but major impacts would be felt across species.[222]

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[211] *Id*.

[212] *Id*.

[213] COAST GUARD KULLUK REPORT, *supra* note 1.

[214] NOAA ARCTIC SDEIS, *supra* note 5, at Vol. 2, 4-425.

[215] *Id*. at 4-424; NAT'L RESEARCH COUNCIL, *supra* note 153, at 58.

[216] NAT'L RESEARCH COUNCIL, *supra* note 153, at 58.

[217] *Id.* at 60.

[218] NOAA ARCTIC SDEIS, *supra* note 5, at Vol. 2, 4-428 to 4-429.

[219] *Id*.

[220] *Id*. at Vol. 2, 4-433.

[221] *Id*. at Vol. 2, 4-438. The whales feed in the Chukchi from late summer through fall, and migrate westward throughout the fall season; during this time, they would be susceptible to direct contact with fresh oil and disruption from associated vessel activity. *Id*.

The impact of a catastrophic spill on the region's birds could be even more significant, "due to [oil's] toxicity to individuals and their prey and the amount of time these birds spend on the surface of marine and coastal waters."[223] Many species of marine and coastal birds depend on the Arctic ecosystem, with some relying on habitats in the area for much of the year.[224] As a result, a significant spill could have a major impact on the region's birds due to the "potential adverse effects to population levels, habitat, molting, and breeding areas, important habitat areas, toxicity to prey and individuals, and mortality of individuals."[225] All told, a catastrophic spill would have major effects on the Arctic's wildlife.[226]

Eight coastal communities rely on the Chukchi and Beaufort seas.[227] They depend on resources that include "bowhead whale, beluga whale, seals (bearded, ribbon, ringed, and spotted), walrus, polar bear, fish, migratory waterfowl (including their eggs), and caribou."[228] While acknowledging that "limited information" is available to make an accurate assessment, BOEM has estimated "that two entire years of Arctic marine mammal subsistence harvests and one and one-half years of Bowhead whale harvests would be lost" to a catastrophic spill.[229]

The effects of a catastrophic spill could extend well beyond immediate impacts to subsistence. In the aftermath of the *Exxon Valdez* spill, for instance, local villages experienced a long period of social, psychological, and economic disruption as a result of the response effort itself.[230] In the Arctic, "while local villagers would be employed in the cleanup for a catastrophic discharge event, it is likely that many additional workers would be necessary, placing stress on village facilities. An influx of outsiders is likely to result in some cultural conflict, stressing the local sociocultural systems."[231] According to an agency assessment, moreover, "'workforce changes and demographic changes could occur through consolidation of households to save money, placement of dependents with relatives beyond the village, and outmigration of wage

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[222] Beluga whales would be similarly vulnerable due to their congregation in Chukchi waters during the oil-exploration season. *Id*. at Vol. 2, 4-439. Four seal species that depend upon habitat in the Chukchi Sea would also experience major effects. *Id*. at Vol. 2, 4-440 to 4-441.

[223] *Id*. at Vol. 2, 4-430.

[224] *Id*.

[225] *Id*. at Vol. 2, 4-431.

[226] *Id.* at Vol. 1, ES-29 (concluding that a catastrophic oil spill in the Arctic Ocean would have "major adverse impacts to water quality; … ecosystem functions; marine and coastal birds; bowhead whales; [and] beluga whales").

[227] *Id.* at Vol. 1, ES-27.

[228] *Id.*

[229] BOEM ECONOMIC ANALYSIS, *supra* note 137, at 69; *see also* NOAA ARCTIC SDEIS, *supra* note 5, at Vol. 2, 4-425.

[230] NOAA ARCTIC SDEIS, *supra* note 5, at Vol. 2, 4-445.

[231] *Id*.

earners in search of employment' when subsistence-harvest patterns are disrupted for multiple years…."[232]

Given these difficulties, a catastrophic spill could have major impacts on public health, including disruption of subsistence harvest patterns and native diets.[233] Following a spill, moreover, emissions of pollutants such as nitrogen dioxide, carbon monoxide, sulfur dioxide, particulate matter, and volatile organic compounds are likely to be severe, contributing to "respiratory irritation, asthma, and exacerbations of chronic lung obstructive lung disease."[234] The influx of additional workers during the response effort would also place an additional strain on local health-care systems.[235]

### G. A Catastrophic Arctic Spill Would Likely Have Significant Impacts on Shell's Finances

The operational, environmental, and human costs that could come with a catastrophic Arctic spill would likely result in significant impacts on Shell's bottom line—perhaps on the order of tens of billions of dollars.

In developing its five-year leasing program, BOEM estimated the potential cost of catastrophic spills in the Chukchi and Beaufort seas. The agency's assessment focused on three categories of possible losses: natural-resource damages,[236] spill-containment and cleanup costs,[237] and the value of lost hydrocarbons.[238] In the Chukchi Sea, the Bureau estimated that a

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[232] *Id.* at Vol. 2, 4-446.

[233] *Id*. at Vol. 2, 4-448.

[234] *Id*.

[235] *Id.*

[236] BOEM ECONOMIC ANALYSIS, *supra* note 137, at 72 (Table 25). As calculated by the agency, natural-resource damages include the adverse impacts of a catastrophic spill on physical and biological resources, including coastal and marine habitats and wildlife. *See id.* at 54. Since no damage estimates are available for the Beaufort and Chukchi seas, BOEM doubled the dollar-per-barrel factor used for the Gulf of Mexico program area to $1,284, explaining that "[l]abor, materials, and transportation drive cleanup costs and each of these will be significantly more expensive in the Arctic." *Id.* at 68. In the Chukchi Sea, this amounted to approximately $1.8 billion for a low-volume catastrophic spill, and roughly $2.8 billion for a high-volume catastrophic spill; in the Beaufort Sea, it amounted to approximately $2.2 billion for a low-volume catastrophic spill, and roughly $5 billion for a high-volume catastrophic spill. *Id.* at 72 (Table 25).

[237] *Id.* In discussing potential cleanup and containment costs, BOEM noted that they:

> often represent the bulk of compensable damages resulting from marine oil spills. Clean-up costs can vary widely and are generally related to several factors including: the type of oil spilled, the physical characteristics of the spill location, water and weather conditions, the volume of spilled oil and the time (season).

low-volume catastrophic spill would impose approximately $10.07 billion in such costs, while a high-volume catastrophic spill would result in damages of roughly $15.75 billion.[239] In the Beaufort Sea, the Bureau estimated that a low-volume catastrophic spill would impose approximately $12.16 billion in such costs, and a high-volume catastrophic spill would result in damages of roughly $27.77 billion.[240]

While these figures are significant, they omit a number of additional costs that could be incurred by Shell in the wake of a catastrophic spill—including fines, litigation expenses, disbarment from government contracts, reputational damage, and the potential moratorium on drilling in the Arctic.[241] Given BP's experience following the *Deepwater Horizon* spill, these additional expenses could raise the cost of a catastrophic spill well beyond the Bureau's estimates.

With respect to fines, a number of statutes impose substantial penalties for oil spills and related legal violations.[242] The Department of Justice, for instance, may seek Clean Water Act

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> Economic resources dedicated to clean-up efforts represent losses to the economy, even if they often provide an injection of funds into the disrupted local economies, since they cannot be used in other constructive activities.

*Id.* at 55. Recognizing "the higher costs involved in the Arctic oil spill response," including the cost of moving resources from other parts of the United States, BOEM again doubled its projections from the Gulf of Mexico—estimating that the costs of containment and cleanup could reach $5,714 per barrel in the Beaufort and Chukchi seas. *Id.* at 71. In the Chukchi Sea, this amounted to $8 billion for a low-volume catastrophic spill, and roughly $12.6 billion for a high-volume catastrophic spill; in the Beaufort Sea, it amounted to approximately $9.7 billion for a low-volume catastrophic spill and $22.3 billion for a high-volume catastrophic spill. *Id.* at 72 (Table 25).

[238] *Id.* In calculating the value of lost hydrocarbons, BOEM broadly considered all economic-activity costs, which includes the value of the oil and gas that is spilled. *Id.* at 54-55. BOEM estimated the value of hydrocarbons lost in a catastrophic spill at $100 per barrel, which includes any lost natural gas. *Id.* at 72 (Table 25). In the Chukchi Sea, this amounted to $140 million for a low-volume catastrophic spill, and $220 million for a high-volume catastrophic spill; in the Beaufort Sea, it amounted to $170 million for a low-volume catastrophic spill, and $390 million for a high-volume catastrophic spill. *Id.*

[239] *Id.* For the Chukchi Sea, the agency defined a low-volume catastrophic spill as one in which 1.4 million barrels are released, and a high-volume catastrophic spill as one in which 2.2 million barrels are released. *Id.*

[240] *Id.* For the Beaufort Sea, the agency defined a low-volume catastrophic spill as one in which 1.7 million barrels are released, and a high-volume catastrophic spill as one in which 3.9 million barrels are released. *Id.*

[241] In fact, the government's analysis contains the following caveat: "Impacts not quantified include other health effects, commercial shipping, other impacts to the OCS oil and gas industry, property values, recreational and commercial fishing, and other consumer price impacts." *Id.*

[242] *Id.* at 55.

fines of up to $25,000 per day or $1,000 per barrel of oil spilled;[243] in cases of gross negligence or willful misconduct, "a civil penalty of not less than $100,000, and not more than $3,000 per barrel of oil" must be imposed.[244] For its *Deepwater Horizon* spill, BP is accordingly facing Clean Water Act penalties of up to $13.7 billion.[245] In addition, BP agreed to pay the government $525 million in civil penalties for securities violations and approximately $4 billion to settle criminal claims.[246] Again, BOEM did not include these kinds of fines and penalties in its estimate of costs; like BP, however, Shell could potentially incur such expenses following a catastrophic Arctic spill.

The litigation costs resulting from a catastrophic spill could also be substantial. The legal battles regarding Exxon's liability for its spill in Prince William Sound lasted twenty years.[247] BP remains in litigation following its 2010 spill in the Gulf of Mexico.[248] While it is not known how much BP has spent on attorneys' fees, the company did agree to pay up to $600 million to cover legal and administrative costs—including those of the Plaintiffs' Steering Committee, which led the private-party lawsuit against BP.[249]

A catastrophic oil spill could also result in Shell's disbarment from government contracts. In the wake of *Deepwater Horizon* spill, for example, EPA suspended BP Exploration and Production, Inc., and a number of affiliated companies, from certain government contracting activities.[250] While the agency eventually reached a conditional agreement with BP to lift the

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[243] 33 U.S.C. § 1321(b)(7)(A).

[244] *Id.* § 1321(b)(7)(D).

[245] BP, ANNUAL REPORT AND FORM 20-F 2014, at 36 (2015) [hereinafter BP 2014 ANNUAL REPORT], *available at* http://www.bp.com/content/dam/bp/pdf/investors/BP_Annual_Report_and_Form_20F_2014.pdf.

[246] *Id.* at 37; BP, ANNUAL REPORT AND FORM 20-F 2012, at 24 (2012) [hereinafter BP 2012 ANNUAL REPORT], *available at* http://www.bp.com/content/dam/bp/pdf/investors/BP_Annual_Report_and_Form_20F_2012.pdf.

[247] *See* Exxon Shipping Co. v. Baker, 554 U.S. 471 (2008) (addressing liability questions stemming from the 1989 spill).

[248] *See* BP 2014 ANNUAL REPORT, *supra* note 245, at 36-38.

[249] *See* Preliminary Approval Order at 10, In re: Oil Spill by the Oil Rig "Deepwater Horizon" in the Gulf of Mexico, on April 20, 2010, No. 2:10-md-02179-CJB-SS (E.D. La. May 2, 2012) ("BP has agreed to pay any award for common benefit and/or Rule 23(h) attorneys' fees, as determined by the Court, up to $600 million."), *available at* http://www.deepwaterhorizoneconomicsettlement.com/docs/PreliminaryApprovalOrder(EconomicSettlement)5212.pdf.

[250] BP, ANNUAL REPORT AND FORM 20-F 2013, at 39-40 (2014), *available at* http://www.bp.com/content/dam/bp/pdf/investors/BP_Annual_Report_and_Form_20F_2013.pdf.

suspension and disbarment,[251] the risk remains that it would completely disbar a company from government contracts in the event of a future catastrophic spill. The potential cost of a temporary or permanent disbarment from government contracts could be significant.

A catastrophic oil spill, moreover, could severely damage Shell's reputation. BP, for example, apparently spent at least $500 million to minimize the public-relations damage caused by its *Deepwater Horizon* spill, and to repair its relationships with customers.[252] Such reputational costs were not included in BOEM's estimates.

A catastrophic spill also could result in a moratorium on all drilling activity in the Arctic. Following the *Deepwater Horizon* spill, the Secretary of the Interior declared a six-month moratorium on all deepwater drilling on the Outer Continental Shelf and declined to allow Shell to move forward with its planned exploration drilling in the Arctic Ocean.[253] A catastrophic spill in the Beaufort or Chukchi sea could result in a lengthy, or even permanent, moratorium on drilling in the U.S. Arctic, which would diminish or entirely eliminate the value of Shell's investment.

All told, a catastrophic Arctic spill could impose tens of billions of dollars in costs on Shell. In the five years since the *Deepwater Horizon* tragedy, BP is reported to have "taken a charge of $42.2 billion…."[254] Like BP, Shell would be responsible for paying for cleanup, natural-resource damages, fines, and penalties, and litigation-related expenses. It could be disbarred from government contracts for a period of time. It might experience reputational damage and a lowered share price. And it would likely face a temporary or permanent ban on further exploration in the Beaufort and Chukchi seas.

## III. LEGAL BACKGROUND

The Securities Exchange Act of 1934 "was designed to protect investors against manipulation of stock prices" by imposing "extensive disclosure requirements" on companies with publicly traded securities.[255] As the Supreme Court explained in *Basic Inc. v. Levinson*,

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[251] JONATHAN L. RAMSEUR & CURRY L. HAGERTY, CONG. RESEARCH SERV., R42942, *DEEPWATER HORIZON* OIL SPILL: RECENT ACTIVITIES AND ONGOING DEVELOPMENTS (2014), *available at* http://www.fas.org/sgp/crs/misc/R42942.pdf.

[252] Trefis Team, *BP Goes for Public Relations Makeover to Get Beyond Gulf Spill*, FORBES, Feb. 7, 2012, http://www.forbes.com/sites/greatspeculations/2012/02/07/bp-goes-for-public-relations-makeover-to-get-beyond-gulf-spill/.

[253] *See* U.S. DEP'T OF THE INTERIOR, INCREASED SAFETY MEASURES FOR ENERGY DEV. ON THE OUTER CONTINENTAL SHELF (May 27, 2010), *available at* http://www.doi.gov/deepwaterhorizon/loader.cfm?csModule=security/getfile&PageID=33598.

[254] *See* Clifford Krauss and Stanley Reed, *Leaner BP Blanches at Bill for Cleanup*, N.Y. TIMES, July 11, 2013, http://www.nytimes.com/2013/07/12/business/energy-environment/bp-appealing-settlement-on-gulf-disaster-payments.html (reporting that "BP has taken a charge of $42.2 billion for cleanup costs, fines and other compensation").

[255] Basic Inc. v. Levinson, 485 U.S. 224, 230 (1988).

these requirements rest on a basic truth: "'There cannot be honest markets without honest publicity. Manipulation and dishonest practices of the market place thrive upon mystery and secrecy.'"[256] The "'fundamental purpose' of the Act," in other words, lies in "implementing a 'philosophy of full disclosure.'"[257]

The Exchange Act requires every issuer of a registered security to file an annual report with the SEC "in accordance with such rules and regulations as the Commission may prescribe as necessary or appropriate for the proper protection of investors and to ensure fair dealing in the security…."[258] Under SEC rules, a foreign private issuer like Shell may prepare its annual report using Form 20-F.[259] Among other things, Form 20-F requires a company "to summarize key information about the company's financial condition, capitalization and risk factors" (Item 3); "to provide information about the company's business operations, the products it makes or the services it provides, and the factors that affect the business" (Item 4); and "to provide management's explanation of factors that have affected the company's financial condition and results of operations for the historical periods covered by the financial statements, and management's assessment of factors and trends which are anticipated to have a material effect on the company's financial condition and results of operations in future periods" (Item 5).[260]

A number of Form 20-F's specific disclosure requirements are of particular relevance to Shell's oil and gas operations in the U.S. Arctic. Under Item 3, for instance, a company is required to "prominently disclose risk factors that are specific to the company or its industry and make an offering speculative or one of high risk"—such as "the nature of the business in which it is engaged or proposes to engage" and the "pending expiration of material patents, trademarks or contracts….."[261] Under Item 4, a company must disclose "the material effects of government regulations on the company's business"; provide "information regarding any material tangible fixed assets, including leased properties"; and "describe any environmental issues that may affect the company's utilization of [its] assets."[262] Under Item 5, a company:

> should discuss, for at least the current financial year, any known trends, uncertainties, demands, commitments or events that are reasonably likely to have a material effect on the company's net sales or revenues, income from continuing operations, profitability, liquidity or capital resources, or that would cause reported

[256] *Id.* (quoting H.R. REP. NO. 1383, at 11 (1934)).

[257] *Id.* (quoting Santa Fe Indus., Inc. v. Green, 430 U.S. 462, 477-78 (1977)) (internal quotations omitted).

[258] 15 U.S.C. § 78m(a) (Exchange Act Section 13(a)).

[259] *See* 17 C.F.R. § 249.220f(a).

[260] *See* U.S. SEC, Form 20-F, at 10, 12, 15, *available at* http://www.sec.gov/about/forms/form20-f.pdf.

[261] *Id.* at 11 (Item 3.D).

[262] *Id.* (Items 4.B.8 and 4.D).

> financial information not necessarily to be indicative of future operating results or financial condition.[263]

And finally, under Item 8, a company's consolidated financial statements must provide the Commission and investors with:

> information on any legal or arbitration proceedings, including those relating to bankruptcy, receivership or similar proceedings and those involving any third party, which may have, or have had in the recent past, significant effects on the company's financial position or profitability. This includes governmental proceedings pending or known to be contemplated.[264]

A foreign private issuer's inclusion of false or misleading statements in its annual reports may result in liability under the Exchange Act. Under Rule 10b-5, which implements Section 10(b) of the statute, it is unlawful for any person:

> directly or indirectly, by the use of any means or instrumentality of interstate commerce, or of the mails or of any facility of any national securities exchange, … [t]o make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in the light of the circumstances under which they were made, not misleading, … in connection with the purchase or sale of any security.[265]

To prove a violation of Rule 10b-5, the Commission must demonstrate that the defendant "(1) made a false statement or omission (2) of material fact (3) with scienter (4) in connection with the purchase or sale of securities."[266]

False statements and omissions can also subject foreign private issuers to liability under Section 17(a) of the Securities Act of 1933.[267] Section 17(a) makes it unlawful for any person:

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[263] *Id.* at 16 (Item 5.D).

[264] *Id.* at 23 (8.A.7).

[265] 17 C.F.R. § 240.10b-5; *see also* 15 U.S.C. § 78j(b) (Section 10(b)) ("It shall be unlawful for any person, directly or indirectly, by the use of any means or instrumentality of interstate commerce or of the mails, or of any facility of any national securities exchange … [t]o use or employ, in connection with the purchase or sale of any security registered on a national securities exchange … any manipulative or deceptive device or contrivance in contravention of such rules and regulations as the Commission may prescribe as necessary or appropriate in the public interest or for the protection of investors.").

[266] McConville v. SEC, 465 F.3d 780, 786 (7th Cir. 2006), *as amended on denial of reh'g* (Jan. 17, 2007).

[267] 15 U.S.C. § 77q(a).

> in the offer or sale of any securities … by the use of any means or instruments of transportation or communication in interstate commerce or by use of the mails, directly or indirectly (1) to employ any device, scheme, or artifice to defraud, or (2) to obtain money or property by means of any untrue statement of a material fact or any omission to state a material fact necessary in order to make the statements made, in light of the circumstances under which they were made, not misleading; or (3) to engage in any transaction, practice, or course of business which operates or would operate as a fraud or deceit upon the purchaser.[268]

While Section 17(a) generally shares the same legal standard as Section 10(b) and Rule 10b-5,[269] the Supreme Court has held that actions brought under Section 17(a)(2) and (a)(3) do not require a showing of scienter.[270]

## IV. SHELL'S ANNUAL REPORTS DO NOT FULLY DISCLOSE THE RISKS ASSOCIATED WITH THE COMPANY'S U.S. ARCTIC PROGRAM

Shell's annual reports present, at best, an incomplete picture of the company's U.S. Arctic program. In 2009, after investing more than $2 billion into hundreds of leases in the Beaufort and Chukchi seas, Shell reported to investors that "[t]he Arctic's resources could significantly boost global supplies and we will develop them safely and responsibly, recognising the need to protect the environment and work in partnership with local communities."[271] Now, more than six years and at least $4 billion dollars later, legal difficulties appear to threaten the viability of Shell's Arctic Ocean program, and it seems that the company—despite its assurances—is not prepared to contend with a catastrophic spill. Rather than fully disclosing these concerns, however, Shell has continued to provide investors with promising reports about the substantial investments it has made in the Beaufort and Chukchi seas.[272] In omitting important information regarding the legal challenges that threaten its Arctic program and the

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[268] *Id.*

[269] SEC v. Levine, 671 F. Supp. 2d 14, 27 (D.D.C. 2009) ("Proving a violation of Section 17(a) of the Securities Act requires essentially the same showing [as Section 10(b) of the Exchange Act and Rule 10b-5], but in the offer or sale, rather than in connection with the purchase or sale, of a security.").

[270] Aaron v. SEC, 446 U.S. 680, 695-700 (1980).

[271] SHELL 2008 ANNUAL REPORT, *supra* note 109, at 9.

[272] *See, e.g.*, SHELL 2014 ANNUAL REPORT, *supra* note 121, at 30 (stating that Shell holds "more than 410 federal leases for exploration in the Beaufort and Chukchi seas in Alaska" and "anticipate[s]" that the Department of the Interior will remedy legal issues related to many of the leases "in sufficient time to allow us to pursue our plans to drill in 2015"); *id.* at 15 (describing the Arctic as one of the company's "'future opportunities' … where we believe large reserves positions could potentially become available, with the pace of development driven by market and local operating conditions, as well as the regulatory environment").

financial consequences of a catastrophic spill, Shell appears to have fallen short of its obligations under the federal securities laws.

### A. Shell's Annual Reports Have Omitted Important Information Regarding the Legal Challenges that Threaten Its Arctic Ocean Program

Though litigation, governmental enforcement actions, and regulatory requirements have posed an ongoing threat to the company's Arctic program, Shell's annual reports have omitted important information regarding the legal impediments to its operations. Even the company's after-the-fact disclosures, moreover, seem not to acknowledge the extent to which Shell's U.S. Arctic investments have been jeopardized by legal developments. Given Shell's obligation to disclose both "the material effects of government regulations on the company's business"[273] and any legal proceedings "which may have, or have had in the recent past, significant effects on the company's financial position or profitability," it appears that these omissions should not be allowed.[274]

#### 1. *According to Shell, Legal Challenges Have Created a Significant Threat to the Company's Arctic Program*

The legal challenges faced by Shell's U.S. Arctic program were recently described in dramatic terms by the company itself—in a "proprietary and confidential" request to DOI.[275] According to Shell's July 10, 2014 letter, which requests a five-year suspension of operations for its leases in the region,[276] lawsuits alone have "contributed to the loss" of five Arctic drilling

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[273] Form 20-F, *supra* note 260, at 13 (Item 4.B.8).

[274] *Id.* at 23 (Item 8.A.7); *see also, e.g., id.* at 16 (Item 5.D) (providing that a company's report "should discuss, for at least the current financial year, any known … uncertainties … or events that are reasonably likely to have a material effect on the company's net sales or revenues, income from continuing operations, profitability, liquidity or capital resources, or that would cause reported financial information not necessarily to be indicative of future operating results or financial condition").

[275] *See* SHELL SUSPENSION REQUEST, *supra* note 27, at 3-5. Shell's nonpublic statements to the Department of the Interior did not satisfy its disclosure obligations under the securities laws. *See* In re Pfizer Inc. Sec. Litig., 584 F. Supp. 2d 621, 636-37 (S.D.N.Y. 2008) (concluding that the defendants had "incorrectly presume[d] that disclosure to the FDA is equivalent to disclosure to the market" in arguing that "because they disclosed the studies [at issue] to the FDA, they did not conceal them in violation of any obligations imposed by the securities laws").

[276] The relevant regulations allow the government to grant a suspension of active leases in certain circumstances, including "[w]hen necessary to allow for inordinate delays encountered in obtaining required permits or consents, including administrative or judicial challenges or appeals." 30 C.F.R. § 250.172(e). Though its letter is not clear, Shell appears to premise its request on some combination of that provision and a subsequent regulation allowing for a suspension to be granted "when necessary to allow you time to begin drilling or other operations when you are prevented by reasons beyond your control, such as unexpected weather, unavoidable accidents, or drilling rig delays." *Id.* § 250.175(a); SHELL SUSPENSION REQUEST, *supra* note 27, at 1; *see also* Letter from Susan Murray, Deputy Vice President, Pacific, Oceana,

seasons in the past eight years.[277] Ongoing regulatory difficulties have raised additional impediments. "Contributing to the loss of each drilling season from 2007 through 2011," the company wrote, "Shell also was continually confronted by complicated processes and lengthy delays (including two remands to correct agency deficiencies) in obtaining its air permits from the Environmental Protection Agency…."[278] The combined effect of these legal troubles apparently has been significant. According to the company's suspension request:

> The unanticipated delays and unique Alaska Arctic OCS conditions have substantially prejudiced Shell's plans to explore its prospects within existing primary lease terms. The current timeframe for the Beaufort prospects is very short, almost all leases will expire in 2017. The circumstance in the Chukchi Sea is not substantially different; Shell has a portfolio covering several prospects with at best six abbreviated drilling seasons before those leases expire. … In Shell's circumstances, the totality of all the various delays and unanticipated circumstances has precluded, and likely will further thwart, Shell's ability to exercise its lease rights and proceed with exploration and development before most of those leases expire.[279]

In its letter to DOI, Shell also noted the effects that future lawsuits and regulations could have on its Arctic operations. According to Shell, "[e]ven if BOEM and BSEE were to promptly approve

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to Mark Fesmire, Alaska Region Director, BSEE (Feb. 27, 2015) (attached as Exh. 3). Shell's request for a suspension was not made public or disclosed to investors; Oceana obtained it via a request for documents pursuant to the Freedom of Information Act.

[277] *See* SHELL SUSPENSION REQUEST, *supra* note 27, at 3-4 (asserting that the 2007, 2008, 2009, 2011, and 2014 drilling seasons had been frustrated by the courts' decisions in *Alaska Wilderness League v. Kempthorne*, 548 F.3d at 815, which vacated the Mineral Management Service's approval of Shell's exploration plan for the Beaufort Sea; *Center for Biological Diversity v. U.S. Department of the Interior*, 563 F.3d at 466, which required a reevaluation of the Department's five-year leasing program for the Outer Continental Shelf; *Native Village of Point Hope v. Salazar*, 730 F. Supp. 2d at 1009, which remanded the Department's 2008 lease-sale decision for the Chukchi Sea; and *Native Village of Point Hope v. Jewell*, 740 F.3d at 489, which identified additional deficiencies with Lease Sale 193).

[278] *Id.* at 4.

[279] *Id.* at 9; *see also, e.g.*, *id.* at 1-2 ("[S]ubsequent to lease issuance and notwithstanding Shell's considerable investment, significant additional factors have materialized to further constrain the available operating window, and Shell's ability to fully utilize it. These include, but are not limited to … multiple time-consuming federal court and administrative challenges, appeals, and remands, based upon findings that the Government had failed adequately to carry out its legal obligations, resulting in repeated prohibitions against Shell's engagement in exploratory operations, often on the eve of such operations, and often after Shell had expended hundreds of millions of dollars in preparatory work, most of which it has not been able to recoup or redeploy….").

[exploration plans] and [applications for permits to drill], further challenges to those approvals are anticipated"—raising the possibility that "Shell's operational opportunities would be significantly constrained," again, in the region.[280] All told, the legal issues encumbering Shell's Arctic assets have, in the company's own words, "rendered realization of that portfolio infeasible within the leases' primary terms."[281]

Shell has voiced similar concerns in court filings. For example, in a lawsuit the company filed against 13 conservation organizations in 2012, Shell stated that its "exploration activities could be stymied, and a significant portion of its investment lost" as the result of a challenge to the government's approval of the company's spill-response plan.[282] Similarly, in 2009, Shell argued to the Ninth Circuit that a stay pending the court's review of the challenged exploration plan approval:

> would jeopardize not only the 2010 season, but also the long-term viability of [Shell's] Alaskan offshore exploration and development efforts. Because [Shell] has access to the lease tracts at issue in this litigation only during the ten-year term of the leases, continued delay means the leases may expire before exploration can commence, with no guarantee of lease renewal. … And because successful exploration is a prerequisite to further oil and gas development projects, delay reduces [Shell's] opportunity to find other viable oil deposits and to bring its leases into production.[283]

The company also contended that "a stay of [the federal government's approval] decision w[ould] not only cast a cloud of uncertainty over [Shell's] exploration efforts, but [would] also have a chilling effect on future exploration efforts by others."[284] The company further asserted that "hundreds of millions of dollars" had already been committed and that some or all of it would be lost if the company was not allowed to proceed.[285]

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[280] *Id.* at 6-7.

[281] *Id.* at 3.

[282] Complaint ¶ 5, Shell Gulf of Mexico Inc. v. Ctr. for Biological Diversity, Inc., No. 3:12CV00048 (D. Alaska Feb. 29, 2012), 2012 WL 662516. This case, in which Shell sought a declaratory judgment validating the government approvals, was eventually dismissed by the Ninth Circuit Court of Appeals for lack of a justiciable case or controversy between Shell and the defendant conservation organizations. Shell Gulf of Mexico Inc. v. Ctr. for Biological Diversity, Inc., 771 F.3d 632, 638 (9th Cir. 2014).

[283] Shell Offshore Inc.'s Urgent Motion Under Circuit Rule 27-3(b) for Determination that Petitioners Are Not Entitled to a Stay Pending Review at 38, Native Vill. of Point Hope v. Salazar, 378 Fed. App'x 747 (9th Cir. 2010) (No. 09-73942) (citing Declaration of Peter Slaiby).

[284] *Id.* at 43.

[285] *Id.* at 37-40. Ultimately, the district-court decision invalidating Lease Sale 193, an appeal of Shell's Clean Air Act permits, and government action in the wake of the *Deepwater Horizon*

Finally, some of these cases individually threatened Shell's entire Arctic program. In the challenges to lease sales 193 and 202, the plaintiffs sought to have the sales vacated and Shell's leases rescinded.[286] If that had occurred, Shell's investment might have been lost, and its program would have been halted. Shell recognized the significance of this threat. Chandler T. Wilhelm, Alaska Exploration Manager for Shell Exploration & Production Company, stated in a 2008 declaration supporting Shell's motion to intervene in the challenge to Chukchi Lease Sale 193 that the company's right to leases in the Chukchi Sea—for which it had bid, and eventually paid, more than $2.1 billion—had been "placed directly in interest in this litigation, in which the Plaintiffs seek to set aside OCS Lease Sale 193, or in the alternative, an injunction against any action in furtherance of the leases."[287] Mr. Wilhelm went on to describe Shell's investments and stated:

> Plaintiffs have requested the Court either to set aside the leases or enjoin further action to implement the leases. Either outcome would impair [Shell's] property interests and negate [Shell's] significant investment of time and resources.[288]

Nonetheless, Shell appears not to have mentioned the pending challenge to Lease Sale 193 in its annual reports for seven years.[289]

#### 2. *Shell's Annual Reports Have Not Fully Disclosed the Significant Legal Threats Facing the Company's U.S. Arctic Operations*

Despite the significance of the legal impediments facing Shell's Arctic program, the company does not appear to have disclosed them fully or in a timely manner in its annual reports. Of Shell's omissions on this front, most striking is its apparent silence regarding the court challenge to Lease Sale 193—the source of all of the company's leases in the Chukchi Sea.[290] In the lawsuit, Alaska Native and conservation groups sought to void all of the leases issued in the sale, including Shell's, in their entirety.[291] For more than six years, however, Shell appears to

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disaster combined to prevent Shell from proceeding in 2010. *See* LeVine et al., *supra* note 4, at 1340.

[286] *See* Second Amended and Supplemental Complaint, Native Vill. of Point Hope v. Kempthorne, No. 1:08-cv-0004-RRB, 2010 WL 2943120 (D. Alaska July 21, 2010), 2008 WL 4758422 (challenge to Lease Sale 193); *N. Slope Borough*, 343 Fed. App'x at 274-75 (challenge to Lease Sale 202).

[287] Declaration of Chandler T. Wilhelm ¶ 8, Native Vill. of Point Hope v. Kempthorne, No. 1:08-cv-0004-RRB, 2010 WL 2943120 (D. Alaska July 21, 2010) (attached as Exh. 4).

[288] *Id.* ¶ 10.

[289] *See* Section IV.A.2, *infra*.

[290] *See* SHELL 2013 ANNUAL REPORT, *supra* note 109, at 29, 56 (disclosing the litigation only after an adverse appellate decision had been issued).

[291] *See* Second Amended and Supplemental Complaint, Native Vill. of Point Hope v. Kempthorne, No. 1:08-cv-0004-RRB, 2010 WL 2943120 (D. Alaska July 21, 2010), 2008 WL

have made no mention of the lawsuit in its annual reports—choosing to emphasize, instead, that it had been "awarded 275 of the 302 blocks it bid for" in the contested sale.[292] The company did not disclose the plaintiffs' victory in federal district court in 2010 or the subsequent remand.[293] When the litigants in the case prevailed again in the Ninth Circuit Court of Appeals—the second time the analysis underlying the sale had been invalidated—Shell acknowledged the significant implications of the lawsuit, which included a suspension of the company's Arctic operations.[294]

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4758422 (requesting that the court "[e]nter appropriate injunctive relief to ensure that the Defendants comply with NEPA and the ESA and to prevent irreparable harm to the Plaintiffs and to the environment until such compliance occurs, including by requiring Defendants to rescind any leases issued pursuant to lease sale 193").

[292] SHELL 2008 ANNUAL REPORT, *supra* note 109, at 21; *see also, e.g.*, SHELL 2012 ANNUAL REPORT, *supra* note 125, at 27 (reiterating that the company has "more than 410 federal leases for exploration in the Beaufort and Chukchi seas in Alaska"—most of them from Lease Sale 193); SHELL 2008 ANNUAL REPORT, *supra* note 109, at 9 ("We made 11 notable discoveries of potential resources and secured rights to some 40,000 $km^2$ of exploration acreage – an area around the size of the Netherlands – including 275 blocks in the Chukchi Sea off Alaska. … The Arctic's resources could significantly boost global supplies and we will develop them safely and responsibly, recognising the need to protect the environment and work in partnership with local communities."); *id.* at 28 ("Seismic exploration in the Beaufort and Chukchi Seas was conducted in 2008 under a renewed agreement protecting subsistence whaling, important to the local native culture. This followed the US Minerals Management Services [sic] (MMS) award of 275 Chukchi Sea exploration blocks to Shell, which was high bidder in lease sale 193 early in 2008."); ROYAL DUTCH SHELL PLC, ANNUAL REPORT AND FORM 20-F FOR THE YEAR ENDED DECEMBER 31, 2007, at 22 (Mar. 17, 2008) [hereinafter SHELL 2007 ANNUAL REPORT], *available at* http://s07.static-shell.com/content/dam/shell/static/investor/downloads/financial-information/reports/2007/2007-annual-report.pdf ("In early 2008, Shell was announced as the apparent high bidder on 275 of the 302 blocks it bid in Lease Sale 193. The blocks are located in the Chukchi Sea, offshore Alaska, and their award is pending review and final decision by the US Minerals Management Service.").

[293] *See Native Vill. of Point Hope*, 730 F. Supp. 2d at 1019.

[294] *Native Vill. of Point Hope*, 740 F.3d at 505 (invalidating the environmental impact statement underlying Lease Sale 193); SHELL 2013 ANNUAL REPORT, *supra* note 109, at 8 (Chief Executive Officer's Review: "In Alaska, we decided to suspend our exploration programme for 2014 following a court ruling against a government department. The ruling raised obstacles to offshore drilling there."); *id.* at 29 ("A recent US Ninth Circuit Court decision against the Department of the Interior raises obstacles to our plans for drilling offshore Alaska. As a result, we have decided to suspend our exploration programme for Alaska for 2014, and we will continue to review the situation as we develop our plans for 2015."); *id.* at 56 ("A US Ninth Circuit Court decision against the Department of the Interior in January 2014 raises obstacles to our plans for drilling offshore Alaska. As a result, we have decided to suspend our exploration programme for Alaska for 2014. We will look to relevant agencies and the court to resolve their open legal issues as quickly as possible, and review our options in going forward. If the legal and regulatory obstacles are sufficiently resolved, the next steps of our exploration programme will be

At times, Shell's annual reports appear to have omitted even after-the-fact disclosures regarding the company's legal troubles. In 2009, the D.C. Circuit remanded the 2007-2012 five-year leasing program.[295] While the D.C. Circuit's decision does not appear to have been mentioned in the company's annual reports, Shell later acknowledged—in its nonpublic suspension request—that the court's order had "contributed to the loss of the 2009 season."[296]

Instead of detailed legal disclosures, Shell's annual reports appear to have relied upon vague and uninformative boilerplate. The company's general statement on "Legal Proceedings and Other Contingencies," for instance, does little more than acknowledge the existence of litigation, regulations, and other legal hurdles.[297] "In the ordinary course of business," the most recent version of the statement declares:

> Shell subsidiaries are subject to a number of other loss contingencies arising from litigation and claims brought by governmental and private parties. The operations and earnings of Shell subsidiaries continue, from time to time, to be affected to varying degrees by political, legislative, fiscal and regulatory developments, including those relating to the protection of the environment and indigenous groups in the countries in which they operate. The industries in which Shell subsidiaries are engaged are also subject to physical risks of various types. The nature and frequency of these developments and events, as well as their effect on future operations and earnings, are unpredictable. While these matters are not expected to have a material impact on Shell, no assurance can be provided.[298]

Earlier iterations of the company's annual filings contain nearly identical language.[299]

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determined by the readiness of our offshore Alaska fleet and the timeline to secure necessary permits.").

[295] *Ctr. for Biological Diversity*, 563 F.3d at 471-72; SHELL SUSPENSION REQUEST, *supra* note 27, at 3.

[296] SHELL SUSPENSION REQUEST, *supra* note 27, at 3 ("Additionally, in the legal challenge to the five-year program pursuant to which the Chukchi Sea leases were issued, the D.C. Circuit in 2009 found the program inadequate, and remanded it to the Department for a re-evaluation and re-ranking of the program areas' environmental sensitivities, and for a determination whether that re-ranking called for any revisions in the timing or location of OCS lease sales. … The Government represented to the Court that it would not allow any drilling operations to proceed on the leases until it had performed that re-evaluation and re-ranking. This further unexpected delay ultimately contributed to the loss of the 2009 season.").

[297] SHELL 2014 ANNUAL REPORT, *supra* note 121, at 140.

[298] *Id.*

[299] *See* SHELL 2013 ANNUAL REPORT, *supra* note 109, at 137; SHELL 2012 ANNUAL REPORT, *supra* note 121, at 136; ROYAL DUTCH SHELL PLC, ANNUAL REPORT AND FORM 20-F FOR THE

### B. Shell's Annual Reports Have Omitted Important Information Regarding the Potential Impacts of a Catastrophic Arctic Spill

In addition to being threatened by legal challenges, Shell's operations in the Arctic also create the risk of a catastrophic spill. The *Deepwater Horizon* disaster demonstrated the potential for such a spill during exploration drilling and the potential magnitude of the impacts to the company. Nevertheless, it appears that Shell has failed to fully disclose these potential impacts or the company's seemingly insufficient preparedness, both technical and financial, for such an event.[300]

#### 1. *Shell's Statements Regarding Its Ability to Respond Effectively to an Arctic Spill Are Incomplete*

As previously explained, responding effectively to a catastrophic spill in the Arctic Ocean would be difficult.[301] According to a 2012 Lloyd's study, "cleaning up any oil spill in the Arctic, particularly in ice-covered areas, would present multiple obstacles which together constitute a unique and hard-to-manage risk…."[302]

Nonetheless, Shell appears to have provided investors with an overly confident portrait of its spill-response capacity, despite the company's "duty to speak the full truth."[303] Three years

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YEAR ENDED DECEMBER 31, 2011, at 139 (Mar. 15, 2012) [hereinafter SHELL 2011 ANNUAL REPORT], *available at* http://reports.shell.com/annual-report/2011/servicepages/downloads/files/entire_shell_20f_11.pdf; SHELL 2010 ANNUAL REPORT, *supra* note 109, at 137; SHELL 2009 ANNUAL REPORT, *supra* note 109, at 138; SHELL 2008 ANNUAL REPORT, *supra* note 109, at 155.

[300] In a May 1, 2012 letter, the Center for Biological Diversity brought this issue to the Commission's attention and asked that the agency "investigate Shell's statements and require Shell to provide accurate and complete information to the public and its investors about its dangerous Arctic proposals." Letter from Miyoko Sakashita, Oceans Director, Center for Biological Diversity, to Mary L. Schapiro, Chair, U.S. Securities and Exchange Commission 1, 4 (May 1, 2012), *available at* http://www.biologicaldiversity.org/programs/public_lands/energy/dirty_energy_development/oil_and_gas/arctic/pdfs/SEC_Letter__v6_.pdf. No action appears to have been taken on the Center's request.

[301] *See* Section II.E, *supra*.

[302] LLOYD'S, ARCTIC OPENING: OPPORTUNITY AND RISK IN THE HIGH NORTH 39 (2012), *available at* http://www.lloyds.com/~/media/files/news%20and%20insight/360%20risk%20insight/arctic_risk_report_webview.pdf#search='arctic%20risk%20report'.

[303] First Va. Bankshares v. Benson, 559 F.2d 1307, 1317 (5th Cir. 1977) ("[A] duty to speak the full truth arises when a defendant undertakes to say anything."); *see also, e.g.*, Meyer v. Jinkosolar Holdings Co., Ltd., 761 F.3d 245, 250 (2d Cir. 2014) ("[O]nce a company speaks on an issue or topic, there is a duty to tell the whole truth."); Berson v. Applied Signal Tech., Inc., 527 F.3d 982, 987 (9th Cir. 2008) ("Had defendants released no backlog reports, their failure to mention the stop-work orders might not have misled anyone. But once defendants chose to tout the company's backlog, they were bound to do so in a manner that wouldn't mislead investors as

ago, following the failure of its containment dome and the grounding of the *Kulluk*, Shell reported that it "ha[d] developed a thorough oil spill response capability that includes capping and containment equipment, and oil spill response vessels."[304] This capacity, the company declared, was the result of "almost 50 years in Alaska" and "a number of years of work to lay the foundations for the responsible development of the [Arctic's] potential resources."[305] Shell has repeated these statements in subsequent reports, suggesting that there is little reason for concern regarding the company's operations and investments in the Arctic Ocean.[306]

As explained above, however, Shell's "thorough oil spill response capability" is dependent upon mechanical recovery methods that worked poorly in the Gulf of Mexico and would likely fare worse in the Arctic Ocean.[307] The use of containment boom, skimmer boats, and dispersants, for instance, would likely be hampered by the region's severe weather and sea ice during much of the year.[308] In-situ burning would be similarly limited, as it can "only work in mild weather conditions."[309]

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to what that backlog consisted of. We cannot say, as a matter of law, that defendants fulfilled this duty.").

[304] SHELL 2012 ANNUAL REPORT, *supra* note 121, at 49; *see also, e.g.*, *id.* at 48 ("Shell business units are responsible for organising and executing oil spill responses in line with Shell guidelines as well as with national legislation. All our offshore installations have plans in place to respond to a spill. These plans detail response strategies and techniques, available equipment, and trained personnel and contacts. We are able to call upon significant resources such as containment booms, collection vessels and aircraft. We are also able to draw upon the contracted services of oil spill response organisations, if required. We conduct regular exercises to ensure these plans remain effective. … In addition, Shell is operating the Subsea Well Response Project, an industry cooperative effort to enhance global well-containment capabilities.").

[305] *Id.* at 49.

[306] SHELL 2013 ANNUAL REPORT, *supra* note 109, at 56; SHELL 2014 ANNUAL REPORT, *supra* note 121, at 55; *see also, e.g.*, SHELL 2014 ANNUAL REPORT, *supra* note 121, at 53 ("All our offshore installations have plans in place to respond to a spill. These plans detail response strategies and techniques, available equipment, and trained personnel and contracts. We are able to call upon significant resources such as containment booms, collection vessels and aircraft. We are also able to draw upon the contracted services of oil spill response organisations, if required. We conduct regular exercises that seek to ensure these plans remain effective. We have further developed our capability to respond to spills to water, and maintain a Global Response Support Network to support worldwide response capability. This is also supported by our global Oil Spill Excellence Center, which tests local capability, and maintains Shell's capability globally to respond to a significant incident.").

[307] SHELL 2012 ANNUAL REPORT, *supra* note 121, at 49; Section II.E, *supra*.

[308] Section II.E, *supra*.

[309] *See Short Testimony*, *supra* note 186, at 3; *see also* NAT'L COMM'N WORKING PAPER, *supra* note 186, at 14 (noting that "[o]il is more difficult to ignite at lower temperatures").

These obstacles would be compounded by Arctic realities, including a small population, few roads, little equipment, and no deepwater port.[310] As Shell emphasized last year in its request to DOI, "[t]he immense logistics to drill in the Alaska [Outer Continental Shelf] … dwarf those required in the Gulf of Mexico."[311] Even if the required resources were available, moreover, the significant "response gap" would make it impossible to undertake a cleanup operation during much of the year.[312]

The problems that have marked Shell's own efforts in the region offer additional reason for concern. As DOI concluded in a 2013 review, "Shell's difficulties have raised serious questions regarding its ability to operate safely and responsibly in the challenging and unpredictable conditions offshore Alaska."[313]

The statements in Shell's annual reports regarding the company's Arctic Containment System also appear to have omitted important information. In its 2012 report, the company noted that "during the first full-scale deployment test of our containment dome, the dome was damaged. We have since put in place a comprehensive plan to repair and modify the dome."[314] In describing its effort as a "full-scale deployment test," however, Shell did not acknowledge that the exercise took place in the relatively moderate waters of Seattle's Puget Sound.[315] And in reporting only that "the dome was damaged," Shell seems to have diminished the magnitude of its failure. As DOI explained:

> Shortly after midnight on September 15, the containment dome, which had been positioned at a depth of more than 100 feet, rose rapidly through the water and breached the surface. A few minutes later, the tanks providing buoyancy to the dome vented, and the dome quickly plunged. It sank too rapidly to allow for pressure equalization, and the upper chambers of the dome were crushed.[316]

With its most recent report, Shell has assured investors that its Arctic Containment System has been improved. According to the company's March 12, 2015 filing:

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[310] *See* Section II.E, *supra*.

[311] SHELL SUSPENSION REQUEST, *supra* note 27, at 6; *see also, e.g.*, *id.* at 2 ("[T]he OCS Alaska is a region where exploration and development must be undertaken in circumstances dramatically different than in the current Gulf of Mexico context.").

[312] *See* Section II.E, *supra*.

[313] DOI REVIEW OF SHELL'S 2012 ALASKA PROGRAM, *supra* note 49, at 1. *See also* COAST GUARD KULLUK REPORT, *supra* note 1, at 1 (Apr. 2, 2014 Comments) (finding that "the inadequate assessment and management of risks … was the most significant causal factor" of the grounding of the *Kulluk*).

[314] SHELL 2012 ANNUAL REPORT, *supra* note 121, at 49.

[315] *See* DOI REVIEW OF SHELL'S 2012 ALASKA PROGRAM, *supra* note 49, at 19.

[316] *Id.*

> To prepare for drilling off the coast of Alaska, we have developed a well intervention and oil spill response capability that includes capping and oil spill response vessels. The Arctic Containment System has been modified since 2012 and is expected to be available for the 2015 drilling season. Improvements have also been made to emergency response assets and additional equipment has been purchased to enhance response capabilities based on the lessons learned during the 2012 season. Maintenance and inventory of critical spare parts for the oil spill response equipment have been enhanced by utilising a dedicated maintenance and storage facility in Anchorage. We have a range of equipment and vessels necessary to respond to a spill 24 hours a day in case a spill happens during our exploration season in Alaska in 2015.[317]

The report does not appear to acknowledge that the equipment promised by Shell has not been tested in the region—and that the company had previously rejected underwater well capping as unproven and "not feasible" in the Arctic Ocean.[318]

Given the severity of the Arctic's climate and the extent of the company's difficulties in 2012, Shell's annual reports seem to omit important information regarding the problems raised by the risk of a catastrophic spill.[319] As the Second Circuit has noted, "[o]ne cannot, for example, disclose in a securities offering a business's peculiar risk of fire, the installation of a comprehensive sprinkler system to reduce fire danger, and omit the fact that the system has been found to be inoperable, without misleading investors."[320] Indeed, BP was sued for making such statements prior to the *Deepwater Horizon* spill. In 2010, numerous plaintiffs filed cases under

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[317] SHELL 2014 ANNUAL REPORT, *supra* note 121, at 55.

[318] *See* SHELL OFFSHORE INC., BEAUFORT SEA REG'L EXPLORATION OIL DISCHARGE PREVENTION AND CONTINGENCY PLAN 4-3 (Jan. 2010), *available at* http://www.boem.gov/uploadedFiles/BOEM/Oil_and_Gas_Energy_Program/Plans/Regional_Plans/Alaska_Exploration_Plans/2012_Shell_Beaufort_EP/2010_BF_rev1.pdf ("Well capping is not feasible for offshore wells from moored vessels with BOPE sitting below the mud line in a well cellar (glory hole)…."); *id.* at 4-5 to 4-6 (Table 4-1) (stating that "[p]roven technology is not available" for well capping).

[319] SHELL 2014 ANNUAL REPORT, *supra* note 121, at 55; *see also* SHELL 2013 ANNUAL REPORT, *supra* note 109, at 56 ("To prepare for drilling off the coast of Alaska, we have developed a thorough oil spill response capability that includes capping and containment equipment, and oil spill response vessels."); SHELL 2012 ANNUAL REPORT, *supra* note 121, at 49 (same). *Cf.* Ross v. Career Educ. Corp., No. 12 C 276, 2012 WL 5363431, at *7 (N.D. Ill. Oct. 30, 2012) ("Given the nature of [the company's] tainted past, defendants' statements about the company's current status—that it had eliminated its significant regulatory issues—could have misled a reasonable investor to believe that [the company] had remedied the practice that led to those problems….").

[320] *Jinkosolar Holdings Co., Ltd.*, 761 F.3d at 251 ("A generic warning of a risk will not suffice when undisclosed facts on the ground would substantially affect a reasonable investor's calculations of probability.").

the Exchange Act claiming that BP's safety efforts were inadequate and that the company had created a misleading perception for investors. [321] In the words of the district court:

> Despite the string of ill-advised decisions and the warning signs leading up to the Deepwater Horizon disaster, BP disseminated positive public representations … concerning its process safety programs, its risk management infrastructure, its spill response capabilities, and the Company's prioritization of safety in the Gulf.[322]

### 2. *Shell's Statements Regarding the Financial Implications of a Catastrophic Arctic Spill Appear Incomplete*

Despite BP's recent experience in the Gulf of Mexico and available projections for the Arctic, Shell's annual reports appear to include incomplete statements regarding the potential costs of a catastrophic spill and how the company would manage them.

As previously noted, BOEM has estimated that a low-volume catastrophic spill in the Chukchi Sea would impose approximately $10.07 billion in social and environmental costs, while a high-volume spill would result in damages of roughly $15.75 billion; in the Beaufort Sea, BOEM estimated that a low-volume catastrophic spill would impose approximately $12.16 billion in social and environmental costs, while a high-volume spill would result in damages of roughly $27.77 billion.[323] Importantly, these figures exclude a number of additional costs that could arise as the result of a spill—including fines, litigation expenses, reputational damage, and the loss of the company's ability to do business in the United States.[324] The potential cost of spill-related fines alone could be significant. In the past five years, BP has paid $4.5 billion in penalties for the *Deepwater Horizon* disaster; following a federal court's finding of gross negligence and willful misconduct in September 2014, the company now faces up to $13.7 billion in additional fines under the Clean Water Act.[325]

Rather than informing investors of the potential costs of an Arctic spill and its plan for dealing with them, Shell appears to rely, again, on sweeping boilerplate. According to the

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[321] In re BP p.l.c. Sec. Litig., 852 F. Supp. 2d 767, 774, 820 (S.D. Tex. 2012) (ultimately dismissing claims for failure to adequately plead scienter).

[322] *Id.* at 777-78. *Cf.* Warshaw v. Xoma Corp., 74 F.3d 955, 959 (9th Cir. 1996) ("Plaintiffs allege in the Complaint that Xoma knew, based on its clinical studies, that [its drug] might not work and would never be approved by the FDA. Despite these facts, the Complaint asserts, Xoma made misleading, optimistic public statements that the … FDA-approval process [for the drug] was progressing positively. For instance, in response to market fears about FDA approval, Xoma's president flatly stated that 'everything [was] going fine.' … Such general statements of optimism, when taken in context, may form a basis for a securities fraud claim….").

[323] BOEM ECONOMIC ANALYSIS, *supra* note 137, at 43 (Table 13).

[324] *See* Section II.G, *supra*.

[325] *See* BP 2014 ANNUAL REPORT, *supra* note 245, at 36-38.

company's statement regarding "health, safety, security and environment" risks, or "HSSE," for example:

> We have operations, including oil and gas production, transport and shipping of hydrocarbons, and refining, in difficult geographies or climate zones, as well as environmentally sensitive regions, such as the Arctic or maritime environments, especially in deep water. These and other operations expose the communities in which we work and us to the risk, among others, of major process safety incidents, effects of natural disasters, earth tremors, social unrest, personal health and safety lapses, and crime. If a major HSSE risk materialises, such as an explosion or hydrocarbon spill, this could result in injuries, loss of life, environmental harm, disruption to business activities and, depending on their cause and severity, material damage to our reputation, exclusion from bidding on mineral rights and eventually loss of licence to operate. In certain circumstances, liability could be imposed without regard to Shell's fault in the matter. Requirements governing HSSE matters often change and are likely to become more stringent over time. The operator could be asked to adjust its future production plan, as we have seen in the Netherlands, impacting production and costs. We could incur significant additional costs in the future complying with such requirements or as a result of violations of, or liabilities under, HSSE laws and regulations, such as fines, penalties, clean-up costs and third-party claims.[326]

In the similar language of Shell's section on "Spills":

> Large spills of crude oil, oil products and chemicals associated with our operations can result in major clean-up costs as well as fines and other damages. They can also affect our licence to operate and harm our reputation. We have clear requirements and procedures designed to prevent spills, and our asset integrity programmes include the design, maintenance and operation of spill containment facilities.[327]

In short, it appears that an investor in search of numbers, or even an estimated order of magnitude, would come away empty handed.

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[326] SHELL 2014 ANNUAL REPORT, *supra* note 121, at 12; *see also, e.g.*, SHELL 2013 ANNUAL REPORT, *supra* note 109, at 12; SHELL 2012 ANNUAL REPORT, *supra* note 121, at 14; SHELL 2011 ANNUAL REPORT, *supra* note 299, at 14; SHELL 2010 ANNUAL REPORT, *supra* note 109, at 14.

[327] SHELL 2014 ANNUAL REPORT, *supra* note 272, at 53; *see also, e.g.*, SHELL 2013 ANNUAL REPORT, *supra* note 109, at 55; SHELL 2012 ANNUAL REPORT, *supra* note 125, at 48; SHELL 2011 ANNUAL REPORT, *supra* note 299, at 51; SHELL 2010 ANNUAL REPORT, *supra* note 109, at 51.

In a 2012 statement to Britain's House of Commons Environmental Audit Committee, Shell executives explained the company's failure to estimate the costs of a major Arctic spill, stating that the company did "not apply a figure to it because our responsibility, as a responsible operator, is to protect the environment and to clean it up, and we are going to do whatever it takes regardless of the cost to clean it up."[328] However, the fact that Shell is obligated to clean up any Arctic spill—assuming this is even possible—is only part of what investors should be told; the potential liability Shell would face as the result of such an incident, and how it would manage such an expense, is similarly important.[329]

### C. Shell's Disclosures Have Fallen Short of Those Offered by Some of Its Competitors

Shell's disclosures have fallen short of those offered by some of its competitors, underscoring the limitations of the company's annual reports. Most notably, Shell's apparent silence regarding the legal challenges to Lease Sale 193 and DOI's five-year leasing program stands in contrast to the disclosures made by ConocoPhillips. In its Form 10-K for 2009, ConocoPhillips noted that it had acquired "98 blocks in the Chukchi Sea" during the February 2008 sale "for total bid payments of $506 million."[330] The company went on to explain, however, that its leases had been brought into question by litigation. "Various special interest groups," ConocoPhillips reported:

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[328] ENVIRONMENTAL AUDIT COMMITTEE, PROTECTING THE ARCTIC, MINUTES OF EVIDENCE, 2012-13 H.C. 171 (U.K.), *available at* http://www.publications.parliament.uk/pa/cm201213/cmselect/cmenvaud/171/120314.htm.

[329] *See* Endo v. Albertine, 812 F. Supp. 1479, 1486 (N.D. Ill. 1993), *reconsideration denied*, 1995 WL 170030 (N.D. Ill. Apr. 7, 1995) ("In essence, the alleged misstatement is the claim in the Prospectus that the Company had 'adequately provided for' its tax liabilities. The fact that the Company 'had historically borrowed' does not complete the purported 'half truth' of the claim in the Prospectus. It may be important to the reasonable investor to know whether or not Fruit of the Loom intended to borrow over $100 million to pay its tax liabilities. As it currently stands, there is nothing in the Prospectus to indicate that Fruit of the Loom would need to borrow funds to cover this liability. One reasonable assumption that can be made after reading that the Company 'adequately provided for any additional taxes and interest' is that existing funds had already been allocated. When dealing with a debt in excess of $100 million, it is material whether or not additional borrowing is necessary to pay it off. In any case, at this point in the litigation, the court cannot say that no reasonable investor would consider this information important."). *Cf.* SEC v. Tex. Gulf Sulphur Co., 401 F.2d 833, 849-50 (2d. Cir. 1968) (concluding that "knowledge of the possibility, which surely was more than marginal, of the existence of a mine of the vast magnitude indicated by [a] remarkably rich drill core located rather close to the surface … within the confines of a large anomaly … might well have affected the price of [the defendant company's] stock and would certainly have been an important fact to a reasonable, if speculative, investor in deciding whether he should buy, sell, or hold").

[330] CONOCOPHILLIPS, FORM 10-K FOR THE FISCAL YEAR ENDED DECEMBER 31, 2009, at 4 (Feb. 25, 2010), *available at* http://www.sec.gov/Archives/edgar/data/1163165/000095012310017187/h69477e10vk.htm.

> have brought two separate lawsuits challenging (1) the DOI's entire OCS leasing program, and (2) the Chukchi Sea lease sale conducted by the DOI under that program. In the first suit, the Court ordered the DOI to reconsider one aspect of its OCS leasing program. The results of the DOI's reconsideration are expected during the first quarter of 2010. In the second suit, briefs have been filed on behalf of the defendants, including the DOI, in support of the Chukchi Sea lease sale, and a decision is expected later in 2010. We continue to progress plans for drilling an exploration well on our Chukchi Sea leases no earlier than 2012.[331]

ConocoPhillips included similar disclosures in subsequent reports. In its 10-K for 2010, the company noted that "[d]ue to continued pending litigation and associated injunctions, our plans for drilling an exploration well on our Chukchi Sea leases remain under review."[332] In its 2011 10-K, ConocoPhillips stated that "[w]e plan to drill an exploration well on our Chukchi Sea leasehold in 2014, subject to the outcome of pending litigation challenging Lease Sale 193 and the receipt of required regulatory permits."[333] And in its 10-K for 2012, the company reported that "[w]e plan to drill an exploration well on our Devil's Paw prospect [in the Chukchi Sea] in 2014, subject to the outcome of pending litigation challenging Lease Sale 193 and the receipt of required regulatory permits."[334]

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[331] *Id.*

[332] CONOCOPHILLIPS, FORM 10-K FOR THE FISCAL YEAR ENDED DECEMBER 31, 2010, at 4 (Feb. 23, 2011), *available at* http://www.sec.gov/Archives/edgar/data/1163165/000095012311016957/h76276e10vk.htm ("In a February 2008 lease sale conducted by the U. S. Department of Interior (DOI) under the Outer Continental Shelf (OCS) Lands Act, we successfully bid and were awarded 10-year-primary-term leases on 98 blocks in the Chukchi Sea, for total bid payments of $506 million. Various special interest groups have brought two separate lawsuits challenging (1) the DOI's entire OCS leasing program, and (2) the Chukchi Sea lease sale conducted by the DOI under that program. Due to continued pending litigation and associated injunctions, our plans for drilling an exploration well on our Chukchi Sea leases remain under review.").

[333] CONOCOPHILLIPS, FORM 10-K FOR THE FISCAL YEAR ENDED DECEMBER 31, 2011, at 5 (Feb. 21, 2012), *available at* http://www.sec.gov/Archives/edgar/data/1163165/000119312512070636/d267896d10k.htm ("In the February 2008 Outer Continental Shelf (OCS) Lease Sale 193, we successfully bid and were awarded 10-year-primary-term leases on 98 blocks in the Chukchi Sea. We plan to drill an exploration well on our Chukchi Sea leasehold in 2014, subject to the outcome of pending litigation challenging Lease Sale 193 and the receipt of required regulatory permits.").

[334] CONOCOPHILLIPS, FORM 10-K FOR THE FISCAL YEAR ENDED DECEMBER 31, 2012, at 5 (Feb. 19, 2013), *available at* http://www.sec.gov/Archives/edgar/data/1163165/000119312513065426/d452384d10k.htm ("In the February 2008 Outer Continental Shelf (OCS) Lease Sale 193, we successfully bid and were awarded 10-year-primary-term leases on 98 blocks in the Chukchi Sea. We plan to drill an exploration well on our Devil's Paw prospect in 2014, subject to the outcome

As previously noted, ConocoPhillips ultimately determined, in April 2013, that its Arctic program should be put on hold.[335] As the company explained in its 10-K for that year, "we suspended our plans to drill an exploration well in the Chukchi Sea in 2014, in light of the uncertainties of evolving federal regulatory requirements and operational permitting standards. Once these requirements are clarified and better defined, we will re-evaluate plans for drilling in the Chukchi Sea."[336]

For its part, BP has also provided investors with detailed information about lawsuits and related liabilities. In its 2014 annual report, the company detailed not only the extent of the litigation and costs resulting from the *Deepwater Horizon* spill, but also the environmental regulations in the United States and Europe that may result in future legal challenges.[337] BP's report also offered information about other legal issues facing the company.[338]

While it does not appear that other companies have provided investors with prospective estimates about the magnitude of risk from a catastrophic accident in the Arctic Ocean, or the manner in which such a loss would be addressed, only Shell is actively seeking approvals to drill in the Chukchi Sea. As previously noted, Shell has also made affirmative statements about the sufficiency of its response capabilities.

## V. SHELL'S INCOMPLETE STATEMENTS REGARDING ITS ARCTIC PROGRAM APPEAR TO BE MATERIAL TO INVESTORS

Given the severity of the risks associated with the company's Alaska operations and the degree to which it is relying on its Arctic leases, Shell's omissions appear to be "material" within the meaning of the securities laws.[339]

As the Supreme Court explained in *Basic Inc. v. Levinson*, "materiality depends on the significance the reasonable investor would place on the withheld or misrepresented information."[340] An omission will be deemed "material" when there is "a substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as

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of pending litigation challenging Lease Sale 193 and the receipt of required regulatory permits.").

[335] *See* CONOCOPHILLIPS, FORM 10-K FOR THE FISCAL YEAR ENDED DECEMBER 31, 2013, at 6 (Feb. 25, 2014), *available at* http://www.sec.gov/Archives/edgar/data/1163165/000119312514066358/d665238d10k.htm.

[336] *Id.*

[337] *See* BP 2014 ANNUAL REPORT, *supra* note 245, at 36-38, 225-37.

[338] *See id*. at 237-39.

[339] *See* 17 C.F.R. § 240.10b-5(b); *Levine*, 671 F. Supp. 2d at 27 (noting that "Section 17(a) of the Securities Act requires essentially the same showing" as Section 10(b) of the Exchange Act and Rule 10b-5).

[340] 485 U.S. at 240.

having significantly altered the total mix of information made available."[341] Where "contingent or speculative information or events" are at issue, materiality "'will depend at any given time upon a balancing of both the indicated probability that the event will occur and the anticipated magnitude of the event in light of the totality of the company activity.'"[342]

### A. Given the Company's Extraordinary Investments in the Region, Reasonable Investors Would Likely View the Legal Challenges Facing Shell's Arctic Program as Significant

In light of the company's large investments in the Arctic Ocean and reliance on the potential oil reserves there, a reasonable investor likely would consider the legal challenges threatening Shell's program to be important in making investment decisions. Information about potential legal impediments, therefore, appears to be "material" and subject to disclosure.[343]

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[341] *Id.* at 231-32 (internal quotation marks omitted); *see also* 17 C.F.R. § 240.12b-2 ("The term 'material,' when used to qualify a requirement for the furnishing of information as to any subject, limits the information required to those matters to which there is a substantial likelihood that a reasonable investor would attach importance in determining whether to buy or sell the securities registered.").

[342] *Id.* at 238 (quoting *Tex. Gulf Sulphur Co.*, 401 F.2d at 849); *see also, e.g.*, Lormand v. US Unwired, Inc., 565 F.3d 228, 248 (5th Cir. 2009) ("The omission of a known risk, its probability of materialization, and its anticipated magnitude, are usually material to any disclosure discussing the prospective result from a future course of action."); SEC v. Geon Indus., Inc., 531 F.2d 39, 47 (2d Cir. 1976) (noting that *Texas Gulf Sulphur* "makes clear that not only the probability of an event but also the magnitude of its potential impact on a company's fortunes are relevant to the determination of materiality").

[343] *See Basic Inc.*, 485 U.S. at 231-32 (internal quotation marks omitted); *see also, e.g.*, Pub. Pension Fund Grp. v. KV Pharm. Co., 679 F.3d 972, 982 (8th Cir. 2012) (when the Food and Drug Administration issues an unfavorable inspection report, there is "a risk that the FDA may take corrective action" and "thus a company is obligated to assess the seriousness of the risk and disclose such information to potential investors if it also represents it is in compliance with FDA regulations and [current good manufacturing practices]"); Gulf & W. Indus., Inc. v. Great Atl. & Pac. Tea Co., Inc., 476 F.2d 687, 697 (2d Cir. 1973) (affirming the grant of a preliminary injunction where a company had apparently "omitted to state certain material facts indicating that there [we]re substantial antitrust obstacles" to its tender offer given the "strong likelihood of antitrust litigation to prevent unlawful foreclosure of competition" in the relevant industry; "[t]he facts that, at the time it announced its tender offer, an antitrust action had not been commenced against [the company], and that its liability was uncertain, d[id] not excuse [the company's] failure to disclose all these relevant circumstances so that … shareholders could weigh them in reaching their decision whether or not to tender their shares"); RMED Int'l, Inc. v. Sloan's Supermarkets, Inc., 185 F. Supp. 2d 389, 401-02 (S.D.N.Y. 2002) (holding that "plaintiffs ha[d] put forth sufficient evidence for a reasonable jury to conclude that the defendants' non-disclosure of the [Federal Trade Commission] investigation, in a number of public filings, constituted repeated misstatements, or omissions, of a material fact").

First, Shell's Arctic program has involved an extraordinary, significant, and ongoing investment of capital by the company, and legal challenges have the potential to render that investment void. In the past decade, Shell has led the oil industry's push for offshore drilling in the U.S. Arctic, having acquired hundreds of leases in the Beaufort and Chukchi seas at rates exceeding those paid by its competitors.[344]

Shell's investments in the Arctic have not been limited to the costs of the company's leases. According to its nonpublic request for a suspension of operations in the region, Shell has "also invested substantial resources in 2D and 3D seismic survey datasets to delineate potential resources. Upon obtaining its leases," moreover, "Shell invested in and intended to conduct exploratory drilling on numerous prospects in the Beaufort and Chukchi Seas."[345] All told, in the words of the company, "Shell remains the first and only company to have invested over $6 billion in rigs and assets to enable exploration in the current Alaska OCS lease cycle, yet still has been precluded from achieving a single exploration well to date."[346] The company has stated its intention to spend another $1 billion pursuing exploration in 2015.[347]

The investment is a significant component of Shell's overall acquisitions and exploration spending. Shell's 2008 purchase of leases in the Chukchi Sea, for example, accounted for over one-quarter of Shell's global acquisition costs that year, and nearly a third of acquisition costs in the Americas.[348] In 2012, Shell planned to spend $1 billion on exploration in Alaska; that year, the company reported spending approximately $4.9 billion on the United States as a whole and $8.7 billion globally.[349]

Second, Shell appears to be relying on its operations in the Beaufort and Chukchi seas to provide a significant source of future income. Since its major Alaskan acquisitions began in 2008, Shell's annual filings have consistently identified the Arctic as a strategic priority for exploration, long-term production, and research and development.[350]

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[344] *See* Section II.B, *supra.*

[345] SHELL SUSPENSION REQUEST, *supra* note 27, at 3.

[346] *Id.*; *see also, e.g.*, *id.* at 1 ("To date, Shell has committed more than $6 billion to secure and pursue its OCS leases. As [BSEE] has previously recognized, 'Shell alone has diligently demonstrated an applied interest in and intent to pursue exploration drilling of oil and gas prospects in the Arctic frontier over the last several years.'").

[347] *See Shell to Revive Plans to Drill in Arctic*, *supra* note 39.

[348] *See* SHELL 2008 ANNUAL REPORT, *supra* note 109, at 157.

[349] *See* Eduard Gismatullin, *Shell Suffers Alaska Oil Drilling Setback After Dome Damage*, BLOOMBERGBUSINESS, Sept. 17, 2012, http://www.bloomberg.com/news/2012-09-17/shell-won-t-drill-for-oil-in-alaska-this-year-after-dome-damaged.html; *see also* SHELL 2012 ANNUAL REPORT, *supra* note 121, at 151 (oil and gas exploration and production activity costs).

[350] The company's 2008 report outlined a "More Upstream, Profitable Downstream" approach focused in part on pursing growth via long-term investments, and presented the Arctic as one such investment. SHELL 2008 ANNUAL REPORT, *supra* note 109, at 9, 11. The report also

Third, given the size of its investments in the region, Shell also appears to be relying on the Arctic Ocean to provide the company with proved reserves. "Proved oil and gas reserves … are the total estimated quantities of oil and gas … that geoscience and engineering data demonstrate, with reasonable certainty, to be recoverable in future years from known reservoirs … under existing economic conditions, operating methods and government regulations."[351] Because oil companies are dependent upon access to resources that can be economically extracted, proved reserves provide a "crucial" indicator of Shell's future performance.[352] As Shell summarized in its 2014 report:

> Future oil and gas production will depend on our access to new proved reserves through exploration, negotiations with governments and other owners of proved reserves and acquisitions, as well as developing and applying new technologies and recovery processes to existing fields and mines. Failure to replace proved reserves could result in lower future production, cash flow and earnings.[353]

In its most recent analysis, BOEM relies on an estimate that Chukchi Sea Lease Sale 193 will result in production of 4.3 billion barrels of oil and up to 2.2 trillion cubic feet of natural gas.[354] Shell has reported proved undeveloped reserves in North America of 235 million barrels of oil and 958 thousand million standard cubic feet of natural gas.[355] It accordingly appears that a significant find in the Chukchi Sea—even if only a small portion of the total production predicted by the government—would be important in bolstering the company's reserves.

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highlighted the need to advance exploration technology in order to access resources in "frontier locations such as ultra-deep water and the Arctic…." *Id*. at 54. Shell's 2009 annual report drew attention to Shell's technological developments in pursuit of Arctic resources. SHELL 2009 ANNUAL REPORT, *supra* note 109, at 6. In 2010, the company emphasized its development of "'technological firsts'" directed at Arctic exploration. SHELL 2010 ANNUAL REPORT, *supra* note 109, at 18. Shell emphasized the Arctic as a long-term opportunity in its 2012 report, both in its "Business Review" and "Chairman's Message." SHELL 2012 ANNUAL REPORT, *supra* note 121, at 5, 18. And in its 2013 and 2014 annual reports, Shell continued to identify the Arctic as a long-term strategic priority for the company. SHELL 2013 ANNUAL REPORT, *supra* note 109, at 15; SHELL 2014 ANNUAL REPORT, *supra* note 121, at 15.

[351] SHELL 2014 ANNUAL REPORT, *supra* note 121, at 21.

[352] *See id.*

[353] *Id.* at 11.

[354] *See* U.S. DEP'T OF THE INTERIOR, CHUKCHI SEA OUTER CONTINENTAL SHELF OIL AND GAS LEASE SALE 193 RECORD OF DECISION 2 (Mar. 2015), *available at* http://www.boem.gov/uploadedFiles/BOEM/About_BOEM/BOEM_Regions/Alaska_Region/Leasing_and_Plans/Leasing/Lease_Sales/Sale_193/03-31-2015-LS193-ROD-Second-SEIS.pdf.

[355] SHELL 2014 ANNUAL REPORT, *supra* note 121, at 144, 148.

Further, Shell's apparent need to prove reserves must be viewed in light of the company's history. In 2004, Shell admitted "that it had overstated its proved reserves by 4.47 billion barrels of oil, or 22 percent," resulting in a dramatic decline in the company's stock price and $150 million in fines.[356] Shell's subsequent investment in the Beaufort and Chukchi seas has been described as the company's effort "to explore its way out of trouble."[357] Given the apparent importance of Shell's Arctic program to the company and its investors, the legal challenges that threaten the program's viability would appear to be material and subject to disclosure.[358]

### B. Reasonable Investors Would Likely View the Projected Costs of a Catastrophic Spill as Significant

Because a catastrophic spill in the Arctic Ocean could have a dramatic effect on Shell's bottom line, it is also likely that a reasonable investor would view the projected costs of such a spill and information regarding Shell's response capabilities as significant.[359]

As previously explained, Shell could incur costs running into the tens of billions of dollars in the aftermath of a catastrophic spill.[360] In 2014, Shell's earnings were $19 billion.[361] The total costs of a catastrophic spill in the Arctic could accordingly exceed the company's yearly profits—a fact that a reasonable investor would likely deem significant, however unlikely such a spill may be. Indeed, Shell could be required to take extreme financial measures in the

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[356] *See* Funk, *supra* note 31.

[357] Strahan, *supra* note 32 ("Shell recently announced the start of a major drilling programme in the Beaufort Sea north of Alaska in the Arctic Ocean. The move raises the stakes in its strategy, post reserves scandal, of trying to explore its way out of trouble. But recent history suggests this plan is likely to fail."); *see also* Steve Hawkes, *Huge Shell Drilling Programme Heralds Scramble for the Arctic*, THE TIMES (LONDON), July 6, 2007, at 44 ("After the reserves scandal three years ago, when Shell admitted overstating the proven reserves on its books by 20 per cent, the group has increased its exploration budget to £ 1 billion a year and halved the number of countries on its list of prospects. It is spending nearly £ 500 million a year on researching new seismic and production techniques, such as gas injection. The group believes that its experience in the Sakhalin offshore field in the far east of Russia has given it vital experience in dealing with ice flows and Arctic conditions.").

[358] *Cf.* Litwin v. Blackstone Grp., L.P., 634 F.3d 706, 720 (2d Cir. 2011) ("SAB No. 99 … provides that one factor affecting qualitative materiality is whether the misstatement or omission relates to a segment that plays a 'significant role' in the registrant's business. … In this case, Blackstone makes clear in its offering documents that Corporate Private Equity is its flagship segment, playing a significant role in the company's history, operations, and value.").

[359] *See Basic Inc.*, 485 U.S. at 231-32 (internal quotation marks omitted).

[360] *See* Section II.G, *supra*.

[361] *See* Press Release, Royal Dutch Shell plc, Shell Corrects Fourth Quarter and Full Year 2014 (FIFO) Results, CCS Earnings Unchanged (Jan. 30, 2015), *available at* http://www.shell.com/global/aboutshell/media/news-and-media-releases/2015/shell-corrects-fourth-quarter-and-full-year-2014.html.

wake of an Arctic spill. As the company noted in its most recent annual report, "Shell insurance subsidiaries provide hazard insurance coverage to Shell entities. While from time to time the insurance subsidiaries may seek reinsurance for some of their risk exposures, such reinsurance would not provide any material coverage in the event of an incident like BP Deepwater Horizon."[362]

A catastrophic Arctic spill, in short, could fall directly onto Shell's balance sheet, eating up available cash; cutting into profits; and, in light of BP's experience after the *Deepwater Horizon* disaster, potentially forcing the sale of valuable assets.[363] Though such a spill might be unlikely, Shell should fully disclose the risk given its apparent materiality to investors.

## VI. SHELL'S INCOMPLETE STATEMENTS APPEAR TO HAVE BEEN MADE IN CONNECTION WITH THE SALE OF SECURITIES WITH SCIENTER

Shell's incomplete statements regarding its Arctic program also appear to have been made in connection with the sale of securities and with the required scienter.[364]

With respect to the first of these requirements, "[t]he Supreme Court has held that the 'in connection with' element is a broad and flexible standard and that any activity 'touching [the] sale of securities' will suffice."[365] Where, as here, a company disseminated its statements "in a document such as a[n] … annual report ... on which an investor would presumably rely," this standard appears to be satisfied.[366]

With respect to the second requirement, the Supreme Court has defined "scienter" under the securities laws as "a mental state embracing intent to deceive, manipulate, or defraud."[367]

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[362] SHELL 2014 ANNUAL REPORT, *supra* note 121, at 12.

[363] In order to pay financial penalties and address longer-lasting financial impacts, BP may have been forced to sell assets worth $38 billion. *See* Alex Chamberlin, *Why the Deepwater Horizon Spill May Have Led to BP's Restructuring*, MARKET REALIST, Sept. 10, 2014, http://marketrealist.com/2014/09/deepwater-horizon-spill-may-led-bps-restructuring/.

[364] *See McConville*, 465 F.3d at 786; *see also Aaron*, 446 U.S. at 697 ("[T]he language of § 17(a) requires scienter under § 17(a)(1), but not under § 17(a)(2) or § 17(a)(3).").

[365] *Levine*, 671 F. Supp. 2d at 31 (quoting Superintendent of Ins. v. Bankers Life & Cas. Co., 404 U.S. 6, 12-13 (1971)) (addressing Section 10(b)); *see also id.* ("The standard for violating § 17(a) is the same, when the material misstatement or omission of material facts is in the offer or sale of securities.").

[366] SEC v. Rana Research, Inc., 8 F.3d 1358, 1362 (9th Cir. 1993) ("Where the fraud alleged involves public dissemination in a document such as a press release, annual report, investment prospectus or other such document on which an investor would presumably rely, the 'in connection with' requirement is generally met by proof of the means of dissemination and the materiality of the misrepresentation or omission.").

[367] Ernst & Ernst v. Hochfelder, 425 U.S. 185, 193 n.12 (1976) (private action for damages); *see also Aaron*, 446 U.S. at 691 (holding that proof of scienter is required in a Section 10(b) and Rule 10b-5 enforcement action by the Commission).

While the federal appellate courts are in agreement that reckless falsehoods and omissions may satisfy the scienter requirement, the standard for recklessness varies by circuit.[368] "A popular definition of recklessness in this context," however, "is 'an extreme departure from the standards of ordinary care ... to the extent that the danger was either known to the defendant or so obvious that the defendant must have been aware of it.'"[369] This definition creates an objective standard where evidence of the circumstances existing at the time of the misconduct may impute knowledge of the risk of harm.

Based on the company's nonpublic request to DOI and its court filings, Shell is aware of the legal challenges facing its Arctic program and the significance of the threat they pose.[370] The company is also familiar with the difficulties of operating in the Arctic.[371] Finally, Shell knows of the extraordinary costs faced by BP after the *Deepwater Horizon* spill—costs the company alluded to in its most recent report.[372]

## VII. CONCLUSION

For the foregoing reasons, the SEC should investigate Shell's apparent reporting violations and enforce the requirements of the securities laws in order to ensure that Shell and other companies comply in the future.

[368] Tellabs, Inc. v. Makor Issues & Rights, Ltd., 551 U.S. 308, 319 n.3 (2007) ("Every Court of Appeals that has considered the issue has held that a plaintiff may meet the scienter requirement by showing that the defendant acted intentionally or recklessly, though the Circuits differ on the degree of recklessness required.").

[369] Makor Issues & Rights, Ltd. v. Tellabs Inc., 513 F.3d 702, 704 (7th Cir. 2008) (quoting In re Scholastic Corp. Sec. Lit., 252 F.3d 63, 76 (2d Cir. 2001)).

[370] *See* Section IV.A.1, *supra.*

[371] *See* Sections II.C and II.E.4, *supra.*

[372] SHELL 2014 ANNUAL REPORT, *supra* note 121, at 12.

MEMORANDUM SUPPORTING REQUEST BY OCEANA AND UNIVERSITY OF CHICAGO ABRAMS ENVIRONMENTAL LAW CLINIC FOR FORMAL INVESTIGATION INTO DISCLOSURES MADE BY ROYAL DUTCH SHELL PLC ABOUT ITS U.S. ARCTIC OCEAN PROGRAM

**Exhibit 1:**

Letter from Peter Slaiby, Vice President, Shell Alaska, to Mark Fesmire, Regional Director, BSEE (July 10, 2014)

Proprietary Data

**Shell Exploration & Production**

RECEIVED
JUL 10 2014
Regional Director, Alaska OCS
Bureau of Safety and Environmental Enforcement
Anchorage, Alaska

Mark Fesmire
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**Shell**
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July 10, 2014

**Re: Shell Offshore Inc. and Shell Gulf of Mexico Inc. request for an initial five-year Suspension of Operations for their Outer Continental Shelf oil and gas leases in the Beaufort Sea and Chukchi Sea**

Dear Mr. Fesmire,

Pursuant to the Secretary of the Interior's authority under the Outer Continental Shelf Lands Act ("OCSLA"), 43 U.S.C. § 1334(a), to "administer the provisions of this subchapter relating to the leasing of the outer Continental Shelf..." and to prescribe regulations for the "suspension or temporary prohibition of any operation or activity... in the national interest, to facilitate proper development of a lease...", and Bureau of Safety and Environmental Enforcement ("BSEE") regulations at 30 C.F.R. §§ 250.168-.177, Shell Offshore Inc. and Shell Gulf of Mexico Inc. (individually and collectively "Shell") request an initial five-year Suspension of Operations ("SOO") for their Outer Continental Shelf ("OCS") oil and gas leases in the Beaufort Sea and Chukchi Sea offshore Alaska. A complete list of the leases subject to this SOO request, comprising several prospects, is attached as Exhibit A.

## Summary of SOO Request

Shell acquired almost all of its Beaufort Sea lease portfolio in 2005 and 2007 lease sales, and its Chukchi lease portfolio in a 2008 lease sale. To date, Shell has committed more than $6 billion to secure and pursue its OCS leases. As the agency has previously recognized, "Shell alone has diligently demonstrated an applied interest in and intent to pursue exploration drilling of oil and gas prospects in the Arctic frontier over the last several years." Yet, despite Shell's best efforts and demonstrated diligence, circumstances beyond Shell's control have prevented, and are continuing to prevent, Shell from completing even the first exploration well in either area.

The heavy constraints on Shell's ability to explore its leases in the Alaska OCS context differ markedly from other OCS lease operations. Regulatory restrictions on seasonal transit dates to mobilize to the leases, coupled with weather/sea ice conditions, significantly truncate opportunities to conduct operations during the 10-year primary lease term. This already compressed time period places an upfront premium on orderly planning and timely operations. Nevertheless, subsequent to lease issuance and notwithstanding Shell's considerable investment, significant additional factors

have materialized to further constrain the available operating window, and Shell's ability to fully utilize it. These include, but are not limited to:

- multiple time-consuming federal court and administrative challenges, appeals, and remands, based upon findings that the Government had failed adequately to carry out its legal obligations, resulting in repeated prohibitions against Shell's engagement in exploratory operations, often on the eve of such operations, and often after Shell had expended hundreds of millions of dollars in preparatory work, most of which it has not been able to recoup or redeploy
- BSEE's unexpected and unprecedented determination to introduce a fixed operational time constraint on drilling into a prospective reservoir zone, specifically the September 24 cut-off in the approved Chukchi Exploration Plan
- accommodation of Alaska Native whaling season in the Beaufort Sea
- limited Arctic-viable and regulatory-compliant drilling rigs
- BSEE's announced intention to develop new, comprehensive operating regulations specific to all future drilling operations on the Alaska OCS

Circumstances Shell could not have anticipated at the time it acquired its leases significantly impede Shell's utilization of its lease rights to proceed with exploration and development of its Alaska leases before they are due to expire. Even in the event that the legal and regulatory obstacles were immediately resolved, prudent exploration is now severely challenged prior to the current lease expiration dates for Shell's lease portfolio, particularly in the Beaufort Sea where all but two leases will expire no later than 2017. This is due to the repeated erected barriers to exploratory activities, the already severe disruption to Shell's exploratory efforts, limited rig availability, brief operating windows, and the unusually long lead times required to mobilize activities in Alaska. Compounding this problem, Shell cannot feasibly "catch up" for the time lost on the Alaska OCS by simply shifting resources to the earliest-expiring leases; rather, the reality of its present situation has compelled Shell to fundamentally reconceive its plan for its overall Alaska OCS portfolio.

The above distinctions demonstrate that the OCS Alaska is a region where exploration and development must be undertaken in circumstances dramatically different than in the current Gulf of Mexico context. As such, in responding to Shell's SOO request the Secretary of the Interior and BSEE should exercise the full breadth of OCSLA's suspension authority. The requested five-year suspensions have strong justification and are readily within the scope of the agency's existing statutory and regulatory authority.

Importantly, against the backdrop of the events that have transpired to date, it would be entirely inappropriate for BSEE to wait to consider SOOs until the end of the lease terms as in the Gulf of Mexico context; the SOOs need to be granted now, when Shell must make significant financial decisions that will entail additional expenditures running into the hundreds of millions of dollars. Compared to the Gulf of Mexico OCS, the assets required for Alaska Arctic OCS exploration, both rigs and supporting logistical assets, are extremely scarce and not readily available. Multi-year lead times are required to both modify existing non-Arctic assets where possible, or to construct new assets. Furthermore, since they are specifically commissioned for the Arctic, these assets do not have a broad marketability in non-Arctic contexts, making cost recoupment risky.

Shell remains the first and only company to have invested over $6 billion in rigs and assets to enable exploration in the current Alaska OCS lease cycle, yet still has been precluded from achieving a single exploration well to date. To support the further investment of funds required to continue exploring in the Alaska Arctic OCS, the Government, as a responsible lessor, should provide Shell sufficient assurance that the current lease portfolio will remain available for exploration, development, and ultimately production. The Government may readily provide that needed assurance by granting the requested SOOs.

In addition to previous approved plans to explore, Shell has developed an updated reasonable schedule of work, attached as Exhibit B, illustrating how Shell intends to continue its pursuit of Alaska OCS exploration and development if BSEE grants the SOOs. This schedule is predicated upon no further unforeseen delays.

**Despite Its Concerted Efforts to Explore Alaska OCS Prospects, Shell Has Encountered Numerous and Unexpected Delays Ever Since Its Leases Were Issued**

The Bureau of Ocean Energy Management ("BOEM") and its predecessor agencies held lease sales in the Arctic OCS (*i.e.*, Chukchi & Beaufort Seas) in 1979, 1982, 1984, 1988, 1991, 1996, 1998, 2003, 2005, 2007, and 2008. Shell acquired all but a few of its Beaufort Sea leases in Lease Sale 195 in 2005 and Lease Sale 202 in 2007. The bonus bids paid for these leases were $44 million and $39 million respectively. Shell acquired its Chukchi Sea leases in Lease Sale 193 in 2008, paying approximately $2.1 billion in bonus bids. Shell also invested substantial resources in 2D and 3D seismic survey datasets to delineate potential resources. Upon obtaining its leases, Shell invested in and intended to conduct exploratory drilling on numerous prospects in the Beaufort and Chukchi Seas.

Despite its diligent efforts, however, an interminable series of external delays forced deferral of Shell's exploratory drilling program across its Alaska Arctic OCS prospects and ultimately rendered realization of that portfolio infeasible within the leases' primary terms.

**Loss of the 2007 and 2008 Drilling Seasons.** Shell initially anticipated drilling its first exploration wells in 2007, on its then-newly acquired Beaufort Sea leases. An early roadblock occurred in August 2007 when the Ninth Circuit enjoined the Minerals Management Service's ("MMS") approval of Shell's Beaufort Sea Exploration Plan ("EP"), and subsequently vacated that approval in November 2008. The court ruled, *inter alia*, that MMS failed to meet its obligations under the Administrative Procedure Act and the National Environmental Policy Act ("NEPA"). *Alaska Wilderness League v. Kempthorne*, 548 F.3d 815 (9th Cir. 2008). This unexpected delay contributed to the loss of the 2007 and 2008 Beaufort Sea drilling seasons.

**Loss of the 2009 Drilling Season.** Additionally, in the legal challenge to the five-year program pursuant to which the Chukchi Sea leases were issued, the D.C. Circuit in 2009 found the program inadequate, and remanded it to the Department for a re-evaluation and re-ranking of the program areas' environmental sensitivities, and for a determination whether that re-ranking called for any revisions in the timing or location of OCS lease sales. *Ctr. For Biological Diversity v. U.S. DOI*, 563 F.3d 466 (D.C. Cir. 2009). The Government represented to the Court that it would not allow any drilling operations to proceed on the leases until it had performed that re-evaluation and re-ranking. This further unexpected delay ultimately contributed to the loss of the 2009 season.

**Loss of the 2010 Drilling Season.** In light of the Government's statement that it was targeting completion of the new environmental sensitivity analysis by the summer of 2009, and that a final decision would be issued by the end of November 2009, Shell proceeded in good faith with its preparations to conduct exploratory drilling in 2010, during the already limited summer drilling season. This required the Company to invest heavily in retaining and securing key assets – including mobile drilling units and logistical support vessels, purchase of necessary equipment and supplies, and recruitment and training of staff and contractors for Arctic operations.

However, notwithstanding its previous representations, the Department did not issue the draft Secretarial decision until March 31, 2010 – many months after its prior indications – and invited the submittal of comments through May 3, 2010. Then, in the wake of the Deepwater Horizon oil spill, the Department announced a halt to its consideration of Shell's permits in both the Chukchi Sea and Beaufort Sea in the summer of 2010, even though that drilling would be in shallow water and such operations could and would have been carried out in an environmentally and operationally sound manner. This further unexpected delay ultimately contributed to the loss of the 2010 season. A significant proportion of Shell's expenditures in preparation for that drilling were sunk costs that can never be recovered in the ordinary course.

**Loss of the 2011 Drilling Season.** Yet another roadblock occurred in July 2010 when the U.S. District Court for the District of Alaska held that the Department had not fulfilled all of its NEPA obligations in connection with the 2008 Chukchi Sea lease sale, and remanded the issue to the Department to correct those deficiencies, leading the Department to suspend all Chukchi Sea leases pending completion of its obligations under the remand order. *Native Village of Point Hope v. Salazar*, 730 F. Supp. 2d 1009 (D. Alaska 2010). BOEM's subsequent delays in completing those obligations ultimately contributed to the loss of the 2011 drilling season – a fifth consecutive season being lost to unexpected delays beyond Shell's control, with very significant (several billion dollars) investment having been accrued to no avail.

**Air Permitting Delays.** Contributing to the loss of each drilling season from 2007 through 2011, Shell also was continually confronted by complicated processes and lengthy delays (including two remands to correct agency deficiencies) in obtaining its air permits from the Environmental Protection Agency ("EPA"), which at the time had air quality jurisdiction over the Alaska OCS. Shell encountered these delays despite its open and good faith accommodation of EPA's stated preferences for the type and content of those permits.

**Loss of the 2014 Drilling Season, and Ongoing External Delays and Obstacles.** Although Shell was able to conduct preliminary exploratory drilling in the 2012 drilling season, its plans to return to its leases to continue exploration drilling activities in 2014 in the Chukchi Sea have been rendered impossible by (a) the Ninth Circuit's recent ruling in January 2014 that deficiencies in the Environmental Impact Statement for the Chukchi Sea 2008 lease sale require yet another remand to BOEM for additional analysis, and (b) the practical reality that BOEM's completion of its remand and reissuance of actionable permits would not occur in time to drill in 2014. *See Native Village of Point Hope v. Jewell*, No. 12-35287, slip op. at 33 (9th Cir. Jan. 22, 2014); *see also* Federal Def's First Bimonthly Status Report Pursuant to Remand Order, ECF No. 284, *Native Village of Point Hope v. Jewell,* No. 1:08-cv-00004-RRB (May 23, 2014). Indeed, BOEM only accomplished the first step, issuance of a Notice of Intent to prepare an SEIS, on June 20, 2014. This represents a sixth season being lost to unexpected delays beyond Shell's control.

In summary, as soon as its leases were issued, Shell immediately worked collaboratively with federal and State agencies and Alaska Native stakeholders. Shell has carried out its obligations as lessee diligently, expeditiously, and in good faith, spending more than $6 billion in total in doing so. Shell has fully responded to agency requests and stakeholder concerns by amending its already robust submissions and accepting additional onerous encumbrances on its planned operations. No other company has expended this extraordinary level of effort in the Arctic OCS. Nevertheless, Shell has lost six drilling seasons largely due to the Government's failure to satisfactorily carry out its obligations in the first instance or to promptly rectify the situation. Most importantly, due to the unique circumstances in the Arctic and the sharply limited operating windows, the few short annual drilling seasons that remain are inadequate to make up for the many years that Shell has lost largely due to circumstances beyond Shell's control.

This lost time has not been adequately compensated by the limited, short-term suspensions Shell has received to date. This is because, as further discussed below, each delay did not merely defer Shell's drilling schedule by the equivalent length of time. Rather, the on-again/off-again governmental delays significantly impacted Shell's fundamental ability to execute a sustainable strategy. With each stoppage, Shell was required to reassess which (if any) prospects remained feasible for exploration within the remaining primary lease terms. Given the serial nature of Alaska OCS exploration, the loss of one drilling season effectively meant that multiple entire prospects could not be timely explored as originally planned. That is, unlike in the Gulf of Mexico, idle rigs or equipment could not simply be repurposed to another location. Shell also could not readily recommence operations and "catch up"; preparedness, investment, and asset mobilization under Arctic conditions demand decision-making and actions sometimes years in advance of actual operations. The suspensions provided to date also fail to reflect the attendant uncertainty and often additional requirements that must be absorbed to resolve the cause of the delay. Thus, for each drilling season lost in the Alaska OCS, a longer reciprocal SOO is needed to restore the value of that time period.

The limited remaining primary terms and lack of certainty on whether additional time may be granted on the leaseholds pose a significant challenge to Shell's ability to continue to invest in Alaska OCS. Suspending the leases for five years now would provide Shell assurance that any further investment of the billions of dollars and effort to proceed with exploration and development will not be lost due to expiration of the remaining lease portfolio that would be necessary to support a commercial development.

**The Delays Have Been Exacerbated by Alaska OCS Conditions Differing Markedly from the Gulf of Mexico and Warranting Separate Consideration**

BSEE cannot apply its typical Gulf of Mexico SOO approach to leases in the Arctic Alaska OCS because the conditions Shell faces in the Beaufort Sea and the Chukchi Sea are dramatically different than those in any other OCS area. Due to sea ice conditions most of the year, any exploration drilling activity is limited to at most three to four months per year. Some years the sea ice precludes any drilling operations at all. While this sharply abbreviated drilling window significantly differentiates the Gulf of Mexico OCS, the Alaska OCS limitations do not stop there. Rather, at the time Shell acquired its leases, Shell could not have predicted the multiple additional restrictions unique to the Alaska OCS, including new regulatory requirements, which would further significantly impair Shell's ability to conduct its exploratory drilling campaign across its various prospects.

For example, in Shell's previously-approved EP for the Chukchi Sea, BOEM has introduced an effective 38-day "Blackout Period" precluding drilling into hydrocarbon zones during the latter few weeks of the available drilling season. In a year of suboptimal ice conditions, this limitation may dramatically reduce the available Chukchi season and means it now could take two seasons to drill to hydrocarbon-bearing zones for each well undertaken. This limitation that BOEM included for the first time – ever, anywhere – in Shell's Chukchi Sea EP approval constitutes a significant operational constraint.

For Shell's Beaufort Sea leases, the available drilling season has been abbreviated further due to Shell's accommodation for Native community traditional whaling activities. This accommodation significantly reduces the already limited drilling season. Shell has also accommodated the Alaska Native stakeholders' strong request for "zero discharge" operations in Camden Bay in the Beaufort Sea. This places an additional lead time burden on associated upgrades to any rigs that would be considered for the Beaufort Sea. BSEE should account for this factor in considering Shell's SOO request.

The Gulf of Mexico is different in other ways that warrant tailored considerations for the grant of an SOO for Shell's Alaska leases. Even for what would be considered "frontier operations," basic infrastructure exists in the Gulf of Mexico – frontier areas are just in deeper water or deeper target depths. In contrast, Shell must start from scratch to create the infrastructure, or rely on *very* long supply lines (e.g. from Seattle), for what is truly a frontier operation in the Arctic Alaska OCS. That basic infrastructure, particularly if exploration is successful and leads to development, will include shore bases that are used to send supplies, warehouses that stock supplies, manufacturers that are located near shore bases, support boats, helicopters, personnel, pipelines, gas processing plants, etc. Almost none of this infrastructure currently exists.

The immense logistics to drill in the Alaska OCS also dwarf those required in the Gulf of Mexico. For this effort, Shell must dedicate two Arctic-suitable rigs as well as more than 25 associated Arctic capable support vessels. The full burden on Shell consists of not only the acquisition and mobilization of these assets customized to the Alaska OCS, but also the correspondingly long lead times. This is particularly true in the Beaufort Sea, where it may take years to fabricate or modify rigs and equipment sufficient to execute a sustained drilling campaign. But those decisions and huge investment would have to be made now, with lease expiration effectively looming. Particularly against the backdrop of events chronicled above, the Government, as a reasonable lessor, should at this point issue SOOs to facilitate those decisions and assure that any customized vessels and equipment which come online may actually be deployed in exploring Shell's portfolio of Alaska OCS prospects.

Limited rig availability in the Alaska OCS now and for the foreseeable future also means that exploration in that region necessarily must occur serially, not in parallel like in the Gulf of Mexico where rig availability is plentiful. The delay in drilling the first exploration well in both the Beaufort Sea and Chukchi Sea areas necessarily has delayed drilling all subsequent wells/leases. A Gulf of Mexico lessee can plan its drilling queue well in advance with measurable and certain timing and cost. In Alaska there remain only three drilling seasons from now to lease expiration in 2017 in the Beaufort Sea, and only six before lease expiration in 2020 in the Chukchi Sea. But there is one pair of Arctic-capable rigs now (both of which have been made available by Shell alone). Even if BOEM and BSEE were to promptly approve EPs and APDs, further challenges to those approvals are

anticipated. Without the requested SOOs, Shell's operational opportunities would be significantly constrained.

(b) (4)

[redacted]

Thus, Shell must retain the flexibility that a large lease inventory provides in both of the Alaska frontier areas since the exact prospects that will be drilled will likely change as the exploratory drilling program progresses. There are also future efficiencies to be gained by obtaining valuable experience in drilling initial wells. The planning and operational requirements for drilling in the Alaska OCS only heighten the need for deliberate decision-making in selecting optimal initial well locations and avoiding the drilling of unnecessary exploration wells. Shell had specifically designed an efficient exploration and appraisal strategy, but it is no longer viable due to the six seasons lost to circumstances beyond Shell's control. Even if more rigs and assets were somehow available it would not be operationally efficient to have three, four, or more rigs drilling concurrently against the ticking of the lease expiration clock, with drilling of unnecessary wells. SOOs will enable responsible and efficient exploration and appraisal on the currently leased Alaska OCS blocks. After discoveries are made, Shell can reduce the scope of its lease inventory and use exploratory/development units to preserve prospects with Suspensions of Production to provide the time necessary to commence production.

Lastly, as a further example of the significant differences and uncertainties faced by Alaska OCS lessees compared to those operating in the Gulf of Mexico, BSEE has announced an intention to issue new operating regulations for Arctic Alaska. This further warrants an SOO for Shell's leases at this time. Shell cannot reasonably be expected to proceed with long-term contracting, or design and construction, of new rigs and other vessels and equipment when the specifications or operating standards may change before those assets can be placed in service. There is no spot market available for those assets, so Shell would need to contract for specialized vessels well in advance or in some cases fabricate much of this new equipment. And much of this incremental investment, e.g., in a Beaufort-suitable rig, would be entirely wasted if drilling were precluded by lease expiration.

**BSEE Has Existing Authority to Grant Shell's Requested Suspensions**

OCSLA provides the Secretary with broad authority to suspend the terms of OCS leases in the national interest. This authority has no express time limitation. Specifically, OCSLA authorizes the Secretary to "administer the provisions of this subchapter relating to leasing of the outer Continental Shelf" and, in particular, to issue regulations "for the suspension... of any operation or activity, including production, pursuant to any lease or permit (A) at the request of a lessee, in the national interest, to facilitate proper development of a lease... by a period equivalent to the period of such suspension...." A granted suspension stops the running of the initial lease term for the period of the suspension. 43 U.S.C. § 1334(a)(1).

BSEE regulations at 30 C.F.R. §§ 250.168-.177 implement the Secretary's OCSLA suspension authority. The first section provides BSEE with broad suspension authority: "You may request approval of a suspension... for all or any part of a lease or unit area." 30 C.F.R. § 250.168. The common theme in BSEE's suspension regulations and various granted suspensions is the agency's recognition that lease terms should be suspended for periods when a lessee cannot enjoy its lease rights for reasons beyond its control. That is certainly the case here. As an illustrative example, 30 C.F.R. § 250.172(e) addresses suspensions for inordinate delays encountered in obtaining required permits or consents, including those caused by administrative or judicial *challenges*. (This is a different justification than § 250.172(a) and reflects the delays and uncertainties caused by the challenges themselves, regardless of their outcomes.) The occurrence of the multiple challenges Shell has endured to date, and the delay and uncertainty they occasion, as well as delays in obtaining required consents from EPA and BOEM/BSEE, collectively meet this justification for a suspension.

Demonstrating the breadth and flexibility of its statutory suspension authority, BSEE has recognized the need to grant suspensions in a variety of circumstances. For example:

- BSEE broadly granted requested suspensions for dozens of deepwater lessees that were potentially subject to operating delays following the Deepwater Horizon incident. BSEE did so without strict adherence to its normal SOO process and criteria.
- BSEE's authority to suspend the Alaska Arctic OCS leases due to annual sea ice limitations and accommodation of hunting and wildlife issues is analogous to that recognized by the Interior Board of Land Appeals and federal courts, *i.e.*, when a seasonal operating restriction limits when lease operations may be conducted, then the lease is suspended for the duration of the restriction. *Copper Valley Machine Works, Inc. v. Andrus*, 653 F.2d 595 (D.C. Cir. 1981).
- BSEE regularly suspends the running of the terms of numerous OCS leases in the Eastern Gulf of Mexico when the lessees are prohibited from enjoying their lease rights during military exercises.

The historical and present circumstances impeding Shell's exploratory efforts similarly warrant the exercise of BSEE's existing statutory and regulatory authority to grant SOOs.

## SOOs Should Be Granted Now

For Gulf of Mexico leases, BSEE prefers that operators wait until lease expiration is imminent before requesting an SOO since circumstances may change that will eliminate the need for a suspension before the lease expires. That is not a statutory limitation or regulatory requirement, however. Rather, BSEE's timing preference is guidance embodied in NTL 2000-G17 that has a logical foundation for the types of suspension requests typically submitted by operators in the Gulf of Mexico. This context and logic are not appropriate for the Alaska OCS.

The unanticipated delays and unique Alaska Arctic OCS conditions have substantially prejudiced Shell's plans to explore its prospects within existing primary lease terms. The current timeframe for the Beaufort prospects is very short, almost all leases will expire in 2017. The circumstance in the Chukchi Sea is not substantially different; Shell has a portfolio covering several prospects with at best six abbreviated drilling seasons before those leases expire. In both the Beaufort Sea and the Chukchi Sea, there has been a history of multiple delays beyond Shell's control. The Government should now use its suspension authority to provide Shell with reasonable assurance that Shell will be able to complete sufficient exploratory activities to make development decisions within its portfolio. This concern is further compounded because there is no assurance that future Arctic OCS lease sales will occur.

Shell is therefore requesting the certainty of a five-year suspension for its Alaska OCS portfolio, now, in order to provide adequate opportunity for proper exploration of its portfolio, including several prospects of high interest, and for subsequent development of any commercially viable discoveries.

Developing the Arctic Alaska OCS's potentially enormous reserves is plainly in the national interest. In addition to the additional domestic oil and gas resources, Arctic production will provide high-paying and long-term jobs, significant local, State, and federal tax and royalty revenues, and a new source of oil for a throughput-starved Trans-Alaska Pipeline System.

(b) (4) [redacted]

## Conclusion

The short-term suspensions Shell has received to date for the Alaska OCS do not begin to reflect the extent of the actual delays Shell suffered resulting from court decisions and agency delays. In Shell's circumstances, the totality of all the various delays and unanticipated circumstances has precluded, and likely will further thwart, Shell's ability to exercise its lease rights and proceed with exploration and development before most of those leases expire. BSEE has the authority to grant suspensions, in the national interest, for the proper development of Shell's leases, and in keeping with its obligation to act in good faith in its dealings with its counterparty Shell. Granting Shell's SOO request now for its Beaufort Sea and Chukchi Sea leases is entirely consistent with and promotes OCSLA's purposes.

If you have any questions please contact me at (907) 646-7210 or at Pete.Slaiby@Shell.com.

Sincerely,

Peter E. Slaiby
Vice President, Shell Alaska

*Attachments:*

Exhibit A- List of Chukchi and Beaufort Sea Leases

Exhibit B- Notional Exploration Program with 5 years SOO

# Exhibit A
## List of Chukchi and Beaufort Sea Leases

Proprietary Data

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Blizzard | POSEY 6161 | Y2171 |
| Blizzard | POSEY 6259 | Y2185 |
| Blizzard | POSEY 6261 | Y2187 |
| Blizzard | POSEY 6359 | Y2204 |
| Blizzard | POSEY 6360 | Y2205 |
| Blizzard | POSEY 6409 | Y2212 |
| Blizzard | POSEY 6410 | Y2213 |
| Blizzard | POSEY 6459 | Y2220 |
| Blizzard | POSEY 6508 | Y2226 |
| Blizzard | POSEY 6558 | Y2233 |
| Blizzard | POSEY 6608 | Y2241 |
| Blizzard | POSEY 6658 | Y2248 |
| Blizzard | POSEY 6708 | Y2261 |
| Blizzard | POSEY 6757 | Y2274 |
| Blizzard | POSEY 6807 | Y2290 |
| Blizzard | POSEY 6856 | Y2304 |
| Blizzard | POSEY 6905 | Y2317 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Bluefoot | KARO 6363 | Y2021 |
| Bluefoot | KARO 6364 | Y2022 |
| Bluefoot | KARO 6413 | Y2026 |
| Bluefoot | KARO 6414 | Y2027 |
| Bluefoot | KARO 6415 | Y2028 |
| Bluefoot | KARO 6462 | Y2031 |
| Bluefoot | KARO 6463 | Y2032 |
| Bluefoot | KARO 6464 | Y2033 |
| Bluefoot | KARO 6465 | Y2034 |
| Bluefoot | KARO 6512 | Y2038 |
| Bluefoot | KARO 6513 | Y2039 |
| Bluefoot | KARO 6514 | Y2040 |
| Bluefoot | KARO 6515 | Y2041 |
| Bluefoot | KARO 6516 | Y2042 |
| Bluefoot | KARO 6562 | Y2048 |
| Bluefoot | KARO 6563 | Y2049 |
| Bluefoot | KARO 6564 | Y2050 |
| Bluefoot | KARO 6565 | Y2051 |
| Bluefoot | KARO 6612 | Y2057 |
| Bluefoot | KARO 6613 | Y2058 |
| Bluefoot | KARO 6614 | Y2059 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Hot Dog | POSEY 6671 | Y2255 |
| Hot Dog | POSEY 6721 | Y2269 |
| Hot Dog | POSEY 6672 | Y2256 |
| Hot Dog | POSEY 6722 | Y2270 |
| Hot Dog | POSEY 6771 | Y2286 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Honeyguide | TISON 6819 | Y1959 |
| Honeyguide | TISON 6820 | Y1960 |
| Honeyguide | TISON 6821 | Y1961 |
| Honeyguide | TISON 6822 | Y1962 |
| Honeyguide | TISON 6868 | Y1963 |
| Honeyguide | TISON 6869 | Y1964 |
| Honeyguide | TISON 6870 | Y1965 |
| Honeyguide | TISON 6871 | Y1966 |
| Honeyguide | TISON 6872 | Y1967 |
| Honeyguide | TISON 6918 | Y1968 |
| Honeyguide | TISON 6919 | Y1969 |
| Honeyguide | TISON 6920 | Y1970 |
| Honeyguide | TISON 6921 | Y1971 |
| Honeyguide | TISON 6922 | Y1972 |
| Honeyguide | TISON 6968 | Y1973 |
| Honeyguide | TISON 6969 | Y1974 |
| Honeyguide | TISON 6970 | Y1975 |
| Honeyguide | TISON 6971 | Y1976 |
| Honeyguide | TISON 6972 | Y1977 |
| Honeyguide | TISON 7018 | Y1978 |
| Honeyguide | TISON 7019 | Y1979 |
| Honeyguide | TISON 7020 | Y1980 |
| Honeyguide | TISON 7021 | Y1981 |
| Honeyguide | TISON 7022 | Y1982 |
| Honeyguide | TISON 7023 | Y1983 |
| Honeyguide | TISON 7068 | Y1984 |
| Honeyguide | TISON 7069 | Y1985 |
| Honeyguide | TISON 7072 | Y1986 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Burger | POSEY 6713 | Y2266 |
| Burger | POSEY 6714 | Y2267 |
| Burger | POSEY 6715 | Y2268 |
| Burger | POSEY 6761 | Y2277 |
| Burger | POSEY 6762 | Y2278 |
| Burger | POSEY 6763 | Y2279 |
| Burger | POSEY 6764 | Y2280 |
| Burger | POSEY 6765 | Y2281 |
| Burger | POSEY 6766 | Y2282 |
| Burger | POSEY 6811 | Y2293 |
| Burger | POSEY 6812 | Y2294 |
| Burger | POSEY 6813 | Y2295 |
| Burger | POSEY 6814 | Y2296 |
| Burger | POSEY 6815 | Y2297 |
| Burger | POSEY 6816 | Y2298 |
| Burger | POSEY 6817 | Y2299 |
| Burger | POSEY 6862 | Y2308 |
| Burger | POSEY 6863 | Y2309 |
| Burger | POSEY 6864 | Y2310 |
| Burger | POSEY 6865 | Y2311 |
| Burger | POSEY 6866 | Y2312 |
| Burger | POSEY 6912 | Y2321 |
| Burger | POSEY 6913 | Y2322 |
| Burger | POSEY 6914 | Y2323 |
| Burger | POSEY 6915 | Y2324 |
| Burger | POSEY 6916 | Y2325 |
| Burger | POSEY 6962 | Y2334 |
| Burger | POSEY 6963 | Y2335 |
| Burger | POSEY 6964 | Y2336 |
| Burger | POSEY 6965 | Y2337 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Calico | KARO 6105 | Y1987 |
| Calico | KARO 6106 | Y1988 |
| Calico | KARO 6155 | Y1990 |
| Calico | KARO 6156 | Y1991 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Caramel | KARO 6712 | Y2074 |
| Caramel | KARO 6761 | Y2084 |
| Caramel | KARO 6762 | Y2085 |
| Caramel | KARO 6810 | Y2094 |
| Caramel | KARO 6811 | Y2095 |
| Caramel | KARO 6860 | Y2107 |
| Caramel | KARO 6861 | Y2108 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Freezit | POSEY 6114 | Y2167 |
| Freezit | POSEY 6115 | Y2168 |
| Freezit | POSEY 6163 | Y2172 |
| Freezit | POSEY 6164 | Y2173 |
| Freezit | POSEY 6165 | Y2174 |
| Freezit | POSEY 6213 | Y2180 |
| Freezit | POSEY 6214 | Y2181 |
| Freezit | POSEY 6215 | Y2182 |
| Freezit | POSEY 6263 | Y2189 |
| Freezit | POSEY 6264 | Y2190 |
| Freezit | POSEY 6265 | Y2191 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Iron Thunder | POSEY 6220 | Y2183 |
| Iron Thunder | POSEY 6270 | Y2192 |
| Iron Thunder | POSEY 6271 | Y2193 |
| Iron Thunder | POSEY 6321 | Y2200 |
| Iron Thunder | POSEY 6322 | Y2201 |
| Iron Thunder | POSEY 6371 | Y2210 |
| Iron Thunder | POSEY 6372 | Y2211 |
| Iron Thunder | POSEY 6422 | Y2218 |
| Iron Thunder | POSEY 6423 | Y2219 |
| Iron Thunder | HANNA SHOAL 6352 | Y2342 |
| Iron Thunder | HANNA SHOAL 6401 | Y2343 |
| Iron Thunder | HANNA SHOAL 6402 | Y2344 |
| Iron Thunder | HANNA SHOAL 6452 | Y2345 |
| Iron Thunder | HANNA SHOAL 6453 | Y2346 |
| Iron Thunder | HANNA SHOAL 6503 | Y2347 |
| Iron Thunder | HANNA SHOAL 6504 | Y2348 |
| Iron Thunder | HANNA SHOAL 6554 | Y2349 |
| Iron Thunder | HANNA SHOAL 6604 | Y2350 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Crackerjack | KARO 6568 | Y2053 |
| Crackerjack | KARO 6569 | Y2054 |
| Crackerjack | KARO 6617 | Y2062 |
| Crackerjack | KARO 6618 | Y2063 |
| Crackerjack | KARO 6667 | Y2068 |
| Crackerjack | KARO 6668 | Y2069 |
| Crackerjack | KARO 6716 | Y2076 |
| Crackerjack | KARO 6717 | Y2077 |
| Crackerjack | KARO 6765 | Y2086 |
| Crackerjack | KARO 6766 | Y2087 |
| Crackerjack | KARO 6767 | Y2088 |
| Crackerjack | KARO 6813 | Y2097 |
| Crackerjack | KARO 6815 | Y2099 |
| Crackerjack | KARO 6816 | Y2100 |
| Crackerjack | KARO 6817 | Y2101 |
| Crackerjack | KARO 6863 | Y2110 |
| Crackerjack | KARO 6864 | Y2111 |
| Crackerjack | KARO 6865 | Y2112 |
| Crackerjack | KARO 6866 | Y2113 |
| Crackerjack | KARO 6912 | Y2123 |
| Crackerjack | KARO 6913 | Y2124 |
| Crackerjack | KARO 6914 | Y2125 |
| Crackerjack | KARO 6915 | Y2126 |
| Crackerjack | KARO 6916 | Y2127 |
| Crackerjack | KARO 6961 | Y2136 |
| Crackerjack | KARO 6962 | Y2137 |
| Crackerjack | KARO 6963 | Y2138 |
| Crackerjack | KARO 6964 | Y2139 |
| Crackerjack | KARO 6965 | Y2140 |
| Crackerjack | KARO 7010 | Y2145 |
| Crackerjack | KARO 7011 | Y2146 |
| Crackerjack | KARO 7012 | Y2147 |
| Crackerjack | KARO 7013 | Y2148 |
| Crackerjack | KARO 7014 | Y2149 |
| Crackerjack | KARO 7060 | Y2154 |
| Crackerjack | KARO 7061 | Y2155 |
| Crackerjack | KARO 7062 | Y2156 |
| Crackerjack | KARO 7063 | Y2157 |
| Crackerjack | KARO 7109 | Y2161 |
| Crackerjack | KARO 7110 | Y2162 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Kakapo | COLBERT 6721 | Y2421 |
| Kakapo | COLBERT 6722 | Y2422 |
| Kakapo | COLBERT 6723 | Y2423 |
| Kakapo | COLBERT 6771 | Y2425 |
| Kakapo | COLBERT 6772 | Y2426 |
| Kakapo | COLBERT 6773 | Y2427 |
| Kakapo | COLBERT 6823 | Y2428 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| King | KARO 6855 | Y2106 |
| King | KARO 6905 | Y2118 |
| King | KARO 6954 | Y2129 |
| King | KARO 6955 | Y2130 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Klondike | KARO 7119 | Y2163 |
| Klondike | COLBERT 6017 | Y2355 |
| Klondike | COLBERT 6018 | Y2356 |
| Klondike | COLBERT 6020 | Y2357 |
| Klondike | COLBERT 6067 | Y2367 |
| Klondike | COLBERT 6068 | Y2368 |
| Klondike | COLBERT 6070 | Y2370 |
| Klondike | COLBERT 6219 | Y2393 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Lowrey | KARO 6161 | Y1993 |
| Lowrey | KARO 6162 | Y1994 |
| Lowrey | KARO 6211 | Y2004 |
| Lowrey | KARO 6212 | Y2005 |
| Lowrey | KARO 6261 | Y2013 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Kryptos | KARO 6567 | Y2052 |
| Kryptos | KARO 6615 | Y2060 |
| Kryptos | KARO 6616 | Y2061 |
| Kryptos | KARO 6665 | Y2066 |
| Kryptos | KARO 6666 | Y2067 |
| Kryptos | KARO 6715 | Y2075 |
| Kryptos | KARO 6812 | Y2096 |
| Kryptos | KARO 6814 | Y2098 |
| Kryptos | KARO 6862 | Y2109 |
| Kryptos | KARO 6908 | Y2119 |
| Kryptos | KARO 6909 | Y2120 |
| Kryptos | KARO 6910 | Y2121 |
| Kryptos | KARO 6911 | Y2122 |
| Kryptos | KARO 6956 | Y2131 |
| Kryptos | KARO 6957 | Y2132 |
| Kryptos | KARO 6958 | Y2133 |
| Kryptos | KARO 6959 | Y2134 |
| Kryptos | KARO 6960 | Y2135 |
| Kryptos | KARO 7006 | Y2141 |
| Kryptos | KARO 7007 | Y2142 |
| Kryptos | KARO 7008 | Y2143 |
| Kryptos | KARO 7009 | Y2144 |
| Kryptos | KARO 7056 | Y2150 |
| Kryptos | KARO 7057 | Y2151 |
| Kryptos | KARO 7058 | Y2152 |
| Kryptos | KARO 7059 | Y2153 |
| Kryptos | KARO 7106 | Y2158 |
| Kryptos | KARO 7107 | Y2159 |
| Kryptos | KARO 7108 | Y2160 |
| Kryptos | COLBERT 6007 | Y2351 |
| Kryptos | COLBERT 6056 | Y2362 |
| Kryptos | COLBERT 6057 | Y2363 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Shoehorn Shoot | COLBERT 6560 | Y2412 |
| Shoehorn Shoot | COLBERT 6561 | Y2413 |
| Shoehorn Shoot | COLBERT 6609 | Y2414 |
| Shoehorn Shoot | COLBERT 6610 | Y2415 |
| Shoehorn Shoot | COLBERT 6611 | Y2416 |
| Shoehorn Shoot | COLBERT 6658 | Y2417 |
| Shoehorn Shoot | COLBERT 6659 | Y2418 |
| Shoehorn Shoot | COLBERT 6660 | Y2419 |
| Shoehorn Shoot | COLBERT 6709 | Y2420 |
| Shoehorn Shoot | COLBERT 6759 | Y2424 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Sockeye | KARO 6705 | Y2072 |
| Sockeye | KARO 6706 | Y2073 |
| Sockeye | KARO 6753 | Y2080 |
| Sockeye | KARO 6754 | Y2081 |
| Sockeye | KARO 6755 | Y2082 |
| Sockeye | KARO 6756 | Y2083 |
| Sockeye | KARO 6803 | Y2091 |
| Sockeye | KARO 6804 | Y2092 |
| Sockeye | KARO 6805 | Y2093 |
| Sockeye | KARO 6853 | Y2104 |
| Sockeye | KARO 6854 | Y2105 |
| Sockeye | KARO 6903 | Y2116 |
| Sockeye | KARO 6904 | Y2117 |
| Sockeye | KARO 6953 | Y2128 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Takahe | KARO 6418 | Y2029 |
| Takahe | KARO 6419 | Y2030 |
| Takahe | KARO 6467 | Y2035 |
| Takahe | KARO 6468 | Y2036 |
| Takahe | KARO 6469 | Y2037 |
| Takahe | KARO 6517 | Y2043 |
| Takahe | KARO 6518 | Y2044 |
| Takahe | KARO 6519 | Y2045 |


# Exhibit A
## List of Chukchi and Beaufort Sea Leases

PROPRIETARY AND CONFIDENTIAL - COMMERCIAL BUSINESS INFORMATION

# Exhibit A
## List of Chukchi and Beaufort Sea Leases

Proprietary Data

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Sivulliq | FLAXMAN ISLAND 6657 | Y1804 |
| Sivulliq | FLAXMAN ISLAND 6658 | Y1805 |
| Sivulliq | FLAXMAN ISLAND 6659 | Y1806 |
| Sivulliq | FLAXMAN ISLAND 6707 | Y1807 |
| Sivulliq | FLAXMAN ISLAND 6708 | Y1808 |
| Sivulliq | FLAXMAN ISLAND 6709 | Y1809 |
| Sivulliq | FLAXMAN ISLAND 6757 | Y1812 |
| Sivulliq | FLAXMAN ISLAND 6758 | Y1813 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Slippery Rock | BEECHEY POINT 6307 | Y1776 |
| Slippery Rock | BEECHEY POINT 6308 | Y1777 |
| Slippery Rock | BEECHEY POINT 6309 | Y1778 |
| Slippery Rock | BEECHEY POINT 6360 | Y1786 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Anago West | BEECHEY POINT 6356 | Y1783 |
| Anago West | BEECHEY POINT 6358 | Y1784 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Kuvlum | FLAXMAN ISLAND 6712 | Y1810 |
| Kuvlum | FLAXMAN ISLAND 6713 | Y1811 |
| Kuvlum | FLAXMAN ISLAND 6764 | Y1816 |
| Kuvlum | FLAXMAN ISLAND 6814 | Y1822 |
| Kuvlum | FLAXMAN ISLAND 6815 | Y1823 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Olympia | FLAXMAN ISLAND 6773 | Y1820 |
| Olympia | FLAXMAN ISLAND 6774 | Y1821 |
| Olympia | FLAXMAN ISLAND 6822 | Y1826 |
| Olympia | FLAXMAN ISLAND 6823 | Y1827 |
| Olympia | FLAXMAN ISLAND 6824 | Y1828 |
| Olympia | FLAXMAN ISLAND 6873 | Y1833 |
| Olympia | FLAXMAN ISLAND 6874 | Y1834 |
| Olympia | FLAXMAN ISLAND 6923 | Y1837 |
| Olympia | FLAXMAN ISLAND 6924 | Y1838 |
| Olympia | BARTER ISLAND 6751 | Y1839 |
| Olympia | BARTER ISLAND 6752 | Y1840 |
| Olympia | BARTER ISLAND 6801 | Y1841 |
| Olympia | BARTER ISLAND 6802 | Y1842 |
| Olympia | BARTER ISLAND 6851 | Y1843 |
| Olympia | BARTER ISLAND 6901 | Y1844 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Cornell | HARRISON BAY 6222 | Y1743 |
| Cornell | HARRISON BAY 6223 | Y1744 |
| Cornell | HARRISON BAY 6272 | Y1745 |
| Cornell | HARRISON BAY 6273 | Y1746 |
| Cornell | EECHEY POINT 6251 & 630 | Y1765 |
| Cornell | BEECHEY POINT 6252 | Y1766 |
| Cornell | BEECHEY POINT 6302 | Y1771 |
| Cornell | HARRISON BAY 6221 | Y1857 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Candlestick | HARRISON BAY 6173 | Y1742 |
| Candlestick | BEECHEY POINT 6152 | Y1761 |
| Candlestick | BEECHEY POINT 6202 | Y1762 |
| Candlestick | BEECHEY POINT 6203 | Y1763 |
| Candlestick | BEECHEY POINT 6204 | Y1764 |
| Candlestick | BEECHEY POINT 6253 | Y1767 |
| Candlestick | BEECHEY POINT 6254 | Y1768 |
| Candlestick | BEECHEY POINT 6255 | Y1769 |
| Candlestick | BEECHEY POINT 6256 | Y1770 |
| Candlestick | BEECHEY POINT 6304 | Y1773 |
| Candlestick | BEECHEY POINT 6305 | Y1774 |
| Candlestick | BEECHEY POINT 6306 | Y1775 |
| Candlestick | BEECHEY POINT 6355 | Y1782 |
| Candlestick | BEECHEY POINT 6404 | Y1787 |
| Candlestick | BEECHEY POINT 6406 | Y1788 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Saturn | BEECHEY POINT 6359 | Y1785 |
| Saturn | BEECHEY POINT 6409 | Y1789 |
| Saturn | BEECHEY POINT 6410 | Y1790 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Mauya | HARRISON BAY 6421 | Y1703 |
| Mauya | BEECHEY POINT 6352 | Y1704 |
| Mauya | BEECHEY POINT 6402 & 6403 | Y1705 |
| Mauya | HARRISON BAY 6371 | Y1751 |
| Mauya | HARRISON BAY 6372 | Y1752 |
| Mauya | HARRISON BAY 6373 | Y1753 |
| Mauya | HARRISON BAY 6374 & 6424 | Y1754 |
| Mauya | HARRISON BAY 6422 | Y1756 |
| Mauya | HARRISON BAY 6423 | Y1757 |
| Mauya | BEECHEY POINT 6303 | Y1772 |
| Mauya | BEECHEY POINT 6351 & 6401 | Y1779 |
| Mauya | BEECHEY POINT 6353 | Y1780 |
| Mauya | BEECHEY POINT 6354 | Y1781 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Ayak | FLAXMAN ISLAND 6560 | Y1937 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Kanik | FLAXMAN ISLAND 6259 | Y1889 |
| Kanik | FLAXMAN ISLAND 6308 | Y1895 |
| Kanik | FLAXMAN ISLAND 6309 | Y1896 |
| Kanik | FLAXMAN ISLAND 6310 | Y1897 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Mavsa | FLAXMAN ISLAND 6406 | Y1912 |
| Mavsa | FLAXMAN ISLAND 6407 | Y1913 |
| Mavsa | FLAXMAN ISLAND 6457 | Y1921 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Milik | FLAXMAN ISLAND 6459 | Y1923 |
| Milik | FLAXMAN ISLAND 6460 | Y1924 |
| Milik | FLAXMAN ISLAND 6461 | Y1925 |
| Milik | FLAXMAN ISLAND 6510 | Y1930 |
| Milik | FLAXMAN ISLAND 6511 | Y1931 |
| Milik | FLAXMAN ISLAND 6512 | Y1932 |
| Milik | FLAXMAN ISLAND 6561 | Y1938 |
| Milik | FLAXMAN ISLAND 6562 | Y1939 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Outer High | BEECHEY POINT 6009 | Y1865 |
| Outer High | BEECHEY POINT 6010 | Y1866 |
| Outer High | BEECHEY POINT 6011 | Y1867 |
| Outer High | BEECHEY POINT 6012 | Y1868 |
| Outer High | BEECHEY POINT 6058 | Y1869 |
| Outer High | BEECHEY POINT 6059 | Y1870 |
| Outer High | BEECHEY POINT 6060 | Y1871 |
| Outer High | BEECHEY POINT 6061 | Y1872 |
| Outer High | BEECHEY POINT 6062 | Y1873 |
| Outer High | BEECHEY POINT 6063 | Y1874 |
| Outer High | BEECHEY POINT 6064 | Y1875 |
| Outer High | BEECHEY POINT 6065 | Y1876 |
| Outer High | BEECHEY POINT 6066 | Y1877 |
| Outer High | BEECHEY POINT 6067 | Y1878 |
| Outer High | BEECHEY POINT 6068 | Y1879 |
| Outer High | BEECHEY POINT 6114 | Y1880 |
| Outer High | BEECHEY POINT 6115 | Y1881 |
| Outer High | BEECHEY POINT 6116 | Y1882 |
| Outer High | BEECHEY POINT 6117 | Y1883 |
| Outer High | BEECHEY POINT 6118 | Y1884 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Pukak | FLAXMAN ISLAND 6611 | Y1942 |
| Pukak | FLAXMAN ISLAND 6612 | Y1943 |
| Pukak | FLAXMAN ISLAND 6662 | Y1945 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Schrader-Extension | HARRISON BAY 6321 | Y1748 |
| Schrader-Extension | HARRISON BAY 6322 | Y1749 |
| Schrader-Extension | HARRISON BAY 6323 | Y1750 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Snowball | FLAXMAN ISLAND 6359 | Y1906 |
| Snowball | FLAXMAN ISLAND 6409 | Y1915 |
| Snowball | FLAXMAN ISLAND 6410 | Y1916 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Torpedo | FLAXMAN ISLAND 6508 | Y1929 |
| Torpedo | FLAXMAN ISLAND 6558 | Y1935 |
| Torpedo | FLAXMAN ISLAND 6559 | Y1936 |
| Torpedo | FLAXMAN ISLAND 6609 | Y1940 |
| Torpedo | FLAXMAN ISLAND 6610 | Y1941 |
| Torpedo | FLAXMAN ISLAND 6660 | Y1944 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Vico | HARRISON BAY 6369 | Y1699 |
| Vico | HARRISON BAY 6370 | Y1700 |
| Vico | HARRISON BAY 6419 | Y1701 |
| Vico | HARRISON BAY 6420 | Y1702 |
| Vico | HARRISON BAY 6320 | Y1747 |
| Vico | HARRISON BAY 6418 | Y1755 |
| Vico | HARRISON BAY 6468 | Y1758 |
| Vico | HARRISON BAY 6469 | Y1759 |
| Vico | HARRISON BAY 6518 & 6519 | Y1760 |

| Prospect | Lessor Name | Lease Number |
|---|---|---|
| Kup C | BEECHEY POINT 6411 | Y1791 |
| Kup C | BEECHEY POINT 6412 | Y1792 |
| Kup C | BEECHEY POINT 6460 | Y1793 |
| Kup C | BEECHEY POINT 6461 | Y1794 |
| Kup C | BEECHEY POINT 6462 | Y1795 |
| Kup C | BEECHEY POINT 6463 | Y1796 |
| Kup C | BEECHEY POINT 6512 | Y1799 |
| Kup C | BEECHEY POINT 6513 | Y1800 |


# Exhibit A
List of Chukchi and Beaufort Sea Leases

(b) (4)

MEMORANDUM SUPPORTING REQUEST BY OCEANA AND UNIVERSITY OF CHICAGO ABRAMS ENVIRONMENTAL LAW CLINIC FOR FORMAL INVESTIGATION INTO DISCLOSURES MADE BY ROYAL DUTCH SHELL PLC ABOUT ITS U.S. ARCTIC OCEAN PROGRAM

**Exhibit 2:**

Tim L. Robertson & Elise DeCola, Joint Agency Evaluation of the Spring and Fall 2000 N. Slope Broken Ice Exercises (Dec. 18, 2000)

# JOINT AGENCY EVALUATION OF THE SPRING AND FALL 2000 NORTH SLOPE BROKEN ICE EXERCISES

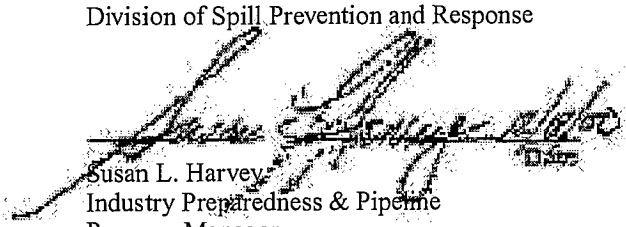
**DECEMBER 18, 2000**

Prepared By

Tim L. Robertson
and
Elise DeCola

# Joint Agency Evaluation of the Spring and Fall 2000 North Slope Broken Ice Exercises

Alaska Department of Environmental Conservation
Division of Spill Prevention and Response



Susan L. Harvey
Industry Preparedness & Pipeline
Program Manager

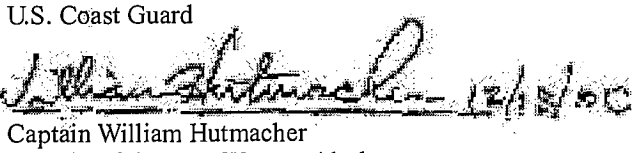
U.S. Department of the Interior
Minerals Management Service

Jeffery Walker
Regional Supervisor
Field Operations

North Slope Borough

Rex Okakok
Planning Director

U.S. Coast Guard



Captain William Hutmacher
Captain of the Port, Western Alaska

Alaska Department of Natural Resources

Marty Rutherford
Deputy Commissioner

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## EXECUTIVE SUMMARY

During the Spring and Fall of 2000, a series of exercises were held to evaluate oil spill response capabilities on the North Slope during broken ice conditions. The exercises were conducted by BP Exploration (BPXA) to test the response tactics and strategies contained in their contingency plans for their North Slope Operations. The exercises involved the deployment and operation of spill response equipment in broken ice conditions ranging from 30% to 70% coverage of the ocean surface to determine if the tactics would demonstrate effective recovery and to establish Realistic Maximum Response Operational Limits (RMROL) in the broken ice environment.

The Alaska Department of Environmental Conservation (ADEC) and the Minerals Management Service (MMS) provided primary oversight during these exercises, with participation from other local, state and federal agencies, including the North Slope Borough (NSB), the Alaska Department of Natural Resources (ADNR) and the U.S. Coast Guard (USCG). Each agency dispatched personnel to participate in the exercises as evaluators and observers during the two exercise trial periods. This report summarizes those observations and evaluates the outcome of each exercise trial.

The spring and fall trials were designed to satisfy conditions of approval for the BPXA North Slope contingency plans, to address deficiencies documented during the Fall 1999 North Slope Response Tactics exercises, and to establish a baseline for performance of open water response equipment and tactics in broken ice conditions. The outcomes of these trials identified limitations in the broken ice response system and provided a baseline for equipment operations in certain spring and fall ice conditions.

The trials established RMROLs for the broken ice response tactics tested. The trial outcomes indicated that the response tactic R-19A barge-based recovery system is valid in spring ice conditions of up to 10% coverage, or up to 30% coverage if ice conditions fall within certain parameters and ice management tactics are used to reduce ice concentrations down to 10% at the skimmer. The fall trials indicated that the RMROL in the fall is trace ice coverage.

Many of the trial outcomes highlighted the need for additional testing or research and development to improve response efficiencies and meet the response planning standard (RPS) required by state law. The findings in this report identify key issues that might be evaluated during future trials. The report also suggests several options for revising the BPXA contingency plan to comply with applicable planning requirements, and discusses other potential actions that may be taken to address the limitations of mechanical spill response techniques in responding to oil spills during broken ice conditions.

# JOINT AGENCY EVALUATION OF THE SPRING AND FALL 2000 NORTH SLOPE BROKEN ICE EXERCISES

## INTRODUCTION

During the spring and fall of 2000, BP Exploration Alaska (BPXA) and Alaska Clean Seas (ACS) participated in a series of exercises designed to evaluate mechanical oil spill response capabilities on the North Slope during broken ice conditions. The exercises tested the response tactics and strategies contained or referenced in BPXA's Northstar Operations, Endicott Operations, Prudhoe Bay Western Operating Area, Prudhoe Bay Eastern Operating Area, and Greater Point McIntyre Area Oil Discharge Prevention and Contingency Plans (C-plans). The Alaska Department of Environmental Conservation (ADEC) has jurisdiction over all these C-plans. The Minerals Management Service (MMS) has jurisdiction over the Northstar and Endicott C-Plans. Thus, ADEC and MMS provided primary oversight during these exercises, with participation from other local, state and federal agencies, including the North Slope Borough (NSB), the Alaska Department of Natural Resources (DNR) and the US Coast Guard (USCG).

### Purpose

The purpose of the 2000 North Slope Broken Ice Exercises was to test the deployment and operation of spill response equipment, in broken ice conditions ranging from 30% to 70% coverage of the ocean surface. The tests were used to determine if the tactics would demonstrate effective recovery in these conditions and were also used to establish Realistic Maximum Response Operational Limits (RMROL). The exercises were used to satisfy Conditions of Approval for the BPXA North Slope C-plans, address deficiencies documented by ADEC and MMS during the Fall 1999 North Slope Response Tactics exercises, and establish a baseline for performance of open water response equipment and tactics in broken ice conditions (as described in the C-plans).[1]

The Spring 2000 response exercises were conducted in two phases. Phase 1, which took place from July 10 - 15, 2000, involved deploying equipment and practicing tactics to allow spill response team members to refresh their skills with equipment and learn to deploy and operate new equipment. During Phase 1, responders configured and installed much of the response equipment required to carry out the exercise tactics. Federal, state, and local agency representatives, as well as industry observers, were given an opportunity to become familiar with the equipment and tactics to be tested during Phase 2.[2]

Phase 2 of the exercises ran from July 16-24, 2000 and consisted of formal field trials of the tactics and equipment selected for use in broken ice oil spill response, particularly testing the

[1] ADEC and MMS, 1999, "Alaska Department of Environmental Conservation and Mineral Management Service Joint Evaluation: Fall 1999 North Slope Drills and Exercises Response Tactics for BP Exploration's Northstar, Prudhoe Bay Western Operating Area and Endicott Operations and ARCO's Prudhoe Bay Unit and Greater Point McIntye Area." This report is referred to herein as the "DEC/MMS 1999 Evaluation".

[2] Minerals Management Service, 2000, Memorandum dated September 12, 2000, from Christy Bohl, Environmental Protection Specialist, to Jeff Walker, Regional Supervisor Field Operations.

overall effectiveness of the R-19A barge-based response tactic as described in the Alaska Clean Seas Technical Manual (ACS TM) and cited in the BPXA North Slope C-plans.[3]

The Fall 2000 response exercises occurred during the autumn freeze-up, which occurred during late September and early October, 2000. These exercises focused on mooring and lightering the response barge and testing the R-19A tactic in the fall slush ice conditions to determine the RMROL for equipment.

**Background**

In the fall of 1998,[4] BPXA submitted to ADEC and MMS applications for approval of the Northstar Operations, Endicott Operations, Prudhoe Bay Western Operating Area, Prudhoe Bay Eastern Operating Area, and Greater Point McIntyre Area C-plans.[5] The Northstar Operations C-plan submission contained response scenarios to demonstrate compliance with the Response Planning Standard (RPS) for a production facility.[6] The response scenarios included a blowout at a Northstar production well to broken ice during fall freeze-up and spring break-up. These scenarios relied upon two proposed barge-based recovery systems capable of deploying LORI LSC-3 skimmers to meet the RPS in offshore ice conditions.

The BPXA submission also included the ACS TM as a supporting document to describe response tactics and resources. Response tactic R-19A in the ACS TM specifically detailed the equipment and configuration of the barge-based recovery system for broken ice, including the Lori LSC-3 skimmers.

In February 1999, ADEC approved the BPXA North Slope C-plan applications, with the ACS TM as a referenced document, imposing the following Conditions of Approval relevant to the RPS for spill response in broken ice conditions:[7]

- Condition of Approval No. 1 required that BPXA Northstar Operations C-plan demonstrate the response capabilities and deployment times for three response barges to perform as described in the ACS TM during broken ice and frozen sea conditions. Condition of Approval No. 1 of the other BPXA North Slope C-plans required the same demonstration of broken ice response capabilities for two response barges.

- Condition of Approval No. 3 for all North Slope C-plans required that BPXA hold specific exercises to assess and refine the capability to execute broken ice spill response. The two main elements specified in Condition 3 were:

  - Test the LORI LSC-3 skimmer in fall slush and brash ice conditions to determine its susceptibility to freezing and clogging and its suitability for broken ice service.

[3] Minerals Management Service, 2000, Memorandum dated September 12, 2000, from Christy Bohl, Environmental Protection Specialist, to Jeff Walker, Regional Supervisor Field Operations.
[4] Because ADEC and MMS review contingency plans on different cycles, the submission dates to each agency varied slightly. The C-plans were submitted to ADEC in September, 1998.
[5] As required by AS 46.030.030.
[6] AS 46.04.030(k)(2) and 18 AAC 75.434.
[7] AS 46.03.030.

- Conduct tests of the barge-based response system in fall and spring broken ice conditions to establish its operational limits.

Condition 5(d) for all the BPXA North Slope C-plans defined the broken ice season for the purpose of the other Conditions of Approval.[8] While exact dates varied for each plan according to its geographic location, this Condition of Approval generally defined spring broken ice conditions as those which exist until the ice concentration remains at less than 30% for a period of 48 continuous hours and for a distance of 0.5 miles, as viewed in all directions adjacent to the facility. Fall breakup was defined as the period commencing when the ice concentration remains at 30% or more for a period of 48 continuous hours and for a distance of 0.5 miles as viewed in all directions adjacent to the facility and proceeding until the ice is aggregated and contiguous with shore based ice with an ice thickness of 18 inches or more in each of the four cardinal compass directions adjacent to the facility.

**Fall 1999 Broken Ice Spill Response Exercises**

BPXA and ACS conducted the exercises specified in these Conditions of Approval during the fall of 1999.[9] During those 1999 exercises, BPXA intended to execute Tactic R-19A from the ACS Manual, to demonstrate the capability to respond to a blowout at a Northstar production well during spring or fall broken ice.[10] However, due to weather constraints, the Fall 1999 exercises actually tested Tactics R-19 and R-17 from the ACS Manual, both of which dealt with open water response tactics. Testing of R-19A was delayed because initial ice concentrations were too low. Unfortunately, the opportunity to test R-19A was never realized, as ice conditions progressed too quickly to continuous coverage. Instead, the responders tested the ice-breaking capabilities of the barge *Endeavor*.

ADEC and MMS observed and evaluated the 1999 exercises, and in January 2000 issued a report (ADEC/MMS 1999 Evaluation) summarizing their observations. This report outlined several deficiencies that, in ADEC's estimation, amounted to violations of the 1999 conditions of approval for the BPXA North Slope C-plans. These deficiencies, which provided the focus for the 2000 exercises, included the following:

- The primary response barge, *Endeavor*, was not equipped to immediately deploy two LORI LSC-3 skimmers as described in Tactic R-19A.
- The barge *Beaufort 20* could not be effectively deployed to the spill site within 24 hours, as described in Northstar Operations C-plan, because the support tug *Arctic Tern* lacked adequate power to propel the barge through fall broken ice. As the *Beaufort 20* is outfitted to carry essential workboats, mini-barges, and response equipment, its absence indicated a serious lack of response readiness.
- Shoals present near West Dock during the Fall 1999 exercises impeded the barge *Endeavor* and support tugs from being immediately available for deployment offshore for response operations. These shoals would have also hampered recovery operations by preventing laden barges to offload recovered liquids at West Dock, as specified in the Northstar Operations C-plan.

[8] Pending development of a more specific broken ice monitoring program.
[9] September 8, 1999 to October 20, 1999.
[10] As required by AS 46.04.030(k)(2) and 18 AAC 75.434.

- The Fall 1999 exercises demonstrated that the existing response barge systems did not match the response equipment described by the scenarios and required by the approved contingency plans for ARCO's Prudhoe Bay Unit and Greater Point McIntyre Areas and BPXA's Prudhoe Bay Western Operating Area, Endicott, and Northstar.

The ADEC/MMS 1999 Evaluation recommended that BP acquire the necessary equipment and perform additional exercises to address the deficiencies described above, in order to meet the 1999 Conditions of Approval.

**Compliance Order by Consent**

On May 3, 2000, in response to the deficiencies noted in the ADEC/MMS 1999 Evaluation, ADEC and BPXA entered into a Compliance Order by Consent (COBC).[11] The COBC built upon the recommendations in the ADEC/MMS Evaluation of the Fall 1999 exercises and established a number of remedial measures to be accomplished through the subsequent broken ice exercises to be held during the spring and fall of 2000. The COBC provided that drilling into oil bearing strata would not be scheduled through the spring, summer and fall broken ice and open water seasons until remedial measures were addressed and approved by ADEC. The following remedial measures, specified in the COBC, relate to the 2000 broken ice exercises:

- The *Endeavor* barge must be equipped with two LORI LSC-3 skimmers or equivalent skimmers capable of being immediately deployed from the deck. These skimmers must be deployed in the water and functionally tested. Two additional LORI LSC-3 skimmers, or their equivalent, with flotation, must be available for deployment from the *Beaufort 20* barge within 24 hours, and successful deployment of these skimmers from the barge must be demonstrated.

- BPXA must provide adequate tug capability to power the *Beaufort 20* barge so that it can be mobilized for offshore response in broken ice conditions according to the specifications set forth by ADEC.[12]

- BPXA must conduct field testing to demonstrate rapid and effective offshore access at West Dock for response vessels and barges. BPXA must also demonstrate the capability to offload recovered liquids at West Dock in a manner sufficient to sustain response operations and meet the RPS in the approved C-plan.

- BPXA must submit C-plan revisions by April 1, 2001, revising the Northstar blowout scenarios during spring and fall broken ice to reflect the response equipment required under Condition of Approval 1.

- BPXA must conduct tests of the LORI LSC-3 skimmer, or its equivalent, to assess oil recovery performance in broken ice, in accordance with the parameters set forth by ADEC in the COBC.[13]

[11] Consent Order No. 00-162-50-1456 in the matter of State of Alaska, Department of Environmental Conservation, Complainant vs. BP Exploration (Alaska), Inc., Respondent.
[12] Refer to COBC, page 6, for these specifications.
[13] Refer to COBC, page 7, for these specifications

- BPXA must conduct tests in Spring and Fall 2000 to determine realistic downtime in various ice conditions and evaluate the effect of ice on skimmer operational time and throughput efficiency.
- BPXA must prepare and submit by April 1, 2001, documentation to evaluate whether or not the North Slope response equipment, including vessels, represents best available technology for spill response in spring and fall ice conditions.

**2000 Exercise Objectives**

The 2000 North Slope Broken Ice Response Exercises were designed to address the deficiencies identified in the ADEC/MMS 1999 Evaluation Report, to satisfy the COA and to address the remedial measures prescribed in the COBC. Key objectives of the 2000 exercises included the following:[14]

- To determine the realistic maximum response operating limitation for the execution of tactic R-19A in increasing ice concentrations by ascertaining the upper limit of ice conditions for the effective deployment of skimmers, workboats and boom systems specified in the tactic. Specifically, to determine the circumstances under which equipment and vessels cannot be used for recovery operations in various ice conditions.
- To determine the maximum response operating limitations of the R-19A tactic when assisted by ice management[15] using field testing techniques for managing ice in order to reduce the ice concentration below the RMOL of tactic R-19A alone.
- To demonstrate that the barges and equipment on the barges *Beaufort* 20 and *Endeavor* are functionally identical.
- To demonstrate tug capability to power a fully laden *Beaufort* 20/21 barge so that it can be mobilized for offshore response in broken ice.
- To demonstrate rapid and effective offshore access to West Dock for response vessels and barges.
- To demonstrate the capability to lighter a fully laden barge to a shore-based facility.
- To conduct functional tests for the LORI LSC-3 skimmer, or its equivalent, in slush or brash ice to determine its recovery efficiency.
- To establish a baseline set of data indicating the effectiveness of this response tactic and its associated equipment in varying broken ice conditions.

Performance standards and test protocols for each of the objectives are described in greater detail in subsequent sections of this report.

[14] Note that formal exercise objectives were never officially formalized by the agencies and participants prior to the exercises. While the exercise design team did develop a list of tests to be performed and the group generally accepted this list, it was never formally approved as a list of objectives. Moreover, in the span of time between the final exercise planning meeting (May 22, 2000) and the July trials, the structure and schedule of the tests to be performed deviated from the original list drafted by the design team. ADEC asserts that several tests that had been prioritized by the department were not actually included in the final scope of exercises performed.

[15] Ice management is not included as part of the R-19A Tactic currently cited in the BPXA North Slope C-plans. BPXA incorporated ice management in broken ice conditions to meet the ADEC C-Plan Conditions of Approval.

## OBSERVATIONS

This section summarizes the observations made during all stages of the Spring and Fall 2000 exercises, and the outcome of these observations relevant to the exercise test criteria and contingency plan Conditions of Approval (COA). The information in this section was collected either through written notes and reports or verbal interviews.

Table 1 lists the exercise participants whose observations were used to compile this section.

### Scope of Trials

The scope of tests during the exercises incorporated most of the objectives listed in the Introduction to this report. However, it is important to note that in all the planning documentation developed, there is no one definitive description of exercise scope and objectives. By comparison, the list of objectives in the Introduction to this report, which reflects the priorities of ADEC and MMS, is generally consistent with the scope identified in the Protocols,[16] the list of objectives developed by the exercise design team, the COA, and the COBC. The major differences among these accounts reflect a difference in priorities and perspectives among participating agencies and organizations.

#### Spring 2000

According to the Test Recording Protocols published by Alaska Clean Seas,[17] the Spring 2000 exercises were planned to include the following trials:

- Exercise tactic R-19A, including transit, deployment, skimming, and ice management components;
- Maneuver the mini-barge through broken ice;
- Push and turn *Beaufort 20* barge through broken ice;
- Test communications and aircraft support for vessel access to a spill site;
- Test crew change-out and parts delivery;
- Mobilize a hovercraft;
- Demonstrate barge offloading to shore-based facility; and
- Test ice and weather forecasting.

[16] IT Alaska, Inc., "Spring Test Recording Protocols, Year 2000, Alaska North Slope," prepared for Alaska Clean Seas, July 10, 2000 and IT Alaska, Inc., "Data Recording Protocols for Oil Spill Response Equipment Tests, Alaska Beaufort Sea, Fall 2000," prepared for Alaska Clean Seas, October 5, 2000.
[17] IT Alaska, Inc., "Spring Test Recording Protocols, Year 2000, Alaska North Slope," prepared for Alaska Clean Seas, July 10, 2000.

Table 1. Key observers at the Spring and Fall North Slope Broken Ice Exercises.

| NAME | AFFILIATION | ROLE DURING EXERCISE | S[18] | F[19] |
|---|---|---|---|---|
| **Agency Observers** | | | | |
| Christy Bohl | MMS | Data recorder | F | F |
| Kris O'Connor | ADNR | Data recorder | F | |
| LT Joe Higgins | USCG | Data recorder | F | F |
| MST2 Tracey Lambert | USCG | Data recorder | F | F |
| MST3 Jeremy Whalen | USCG | Data recorder | F | |
| Ned Arey | NSB | Observer | P | |
| Gary Folley | ADEC[20] | Observer | P | |
| Mike Munger | ADEC[4] | Observer | P | |
| Tom DeRuyter | ADEC[4] | Observer | P | F |
| Kirsten Ballard | ADEC[4] | Observer | P | P |
| Robert Watkins | ADEC[4] | Observer | P | |
| Scot Tiernan | ADEC[4] | Observer | P | |
| Ted Moore | ADEC[4] | Observer | P | P |
| Lester Leatherberry | ADEC[4] | Observer | P | |
| Betty Schorr | ADEC[4] | Observer | P | |
| Jeff Conn | ADEC[4] | Observer | P | |
| Ed Meggert | ADEC[4] | Observer | | F |
| Amanda Stark | ADEC[4] | Observer | | F |
| Lydia Miner | ADEC[4] | Observer | | P |
| Clara Crosby | ADEC[4] | Observer | P | |
| | | | | |
| **Other Observers** | | | | |
| Ed Thompson | BPXA | Exercise Coordinator | F | |
| Jim McHale | ACS | On-Scene Commander | F | F |
| Dr. Mike Bronson | IT Alaska, Inc. | Lead Data Recorder | P | P |
| Steve Potter | S. L. Ross | Ice and sea recorder | F | |
| Charlie Hopson | NSB | Ice and sea recorder | F | F |
| Janet Platt | BPXA | Data recorder | P | |
| Bob Randall | Trustees for Alaska | Observer | P | |
| Sara Callahan | Sierra Club | Observer | P | P |
| Dr. Igor Appel | Fairweather, Inc. | Aerial ice observer | F | |
| Ted Barnett | Lone Wolf | Video recorder | F | F |
| Melanie Duchin | Greenpeace | Observer | P | |
| Pinkie Thompson | BP Exploration | Observer | P | |
| Jenna App | Trustees for Alaska | Observer | | P |
| Pam Miller | Arctic Connections | Observer | P | |
| Shana Kane | IT Alaska, Inc. | Data recorder | P | |

[18] A "F" in this column indicates that the observer was present full-time during the Spring exercises; a "P" indicates the observer was present for some, but not all, of the days that the trials were conducted.
[19] A "F" in this column indicates that the observer was present full-time during the Fall exercises; a "P" indicates the observer was present for some, but not all, of the days that the trials were conducted.
[20] Note that ADEC observers were rotated throughout the exercise period.

### Fall 2000

The Fall 2000 Exercises involved operating a barge-based containment and recovery task force in newly formed sea ice in the Beaufort Sea near Prudhoe Bay and Northstar Production Island. The Fall 2000 Test program was planned to include the following trials:

- Determine the operating limits of tactic R-19 workboats, skimmers and boom associated with freeze-up ice conditions;[21]
- Measure R-19 equipment down-time associated with freeze-up ice conditions;[22]
- Demonstrate the capability to maneuver a laden barge to the offloading point/floating dock;
- Demonstrate the laden *Beaufort 20* offload pumping rates;
- Demonstrate that the Bay Boat side-mounted LORI skimmers had adequate modifications to the hydraulics; and
- Demonstrate the Bay Boat side-mounted LORI skimmers could be operated with a separate power pack.

## Exercise Schedule

### Spring 2000

The Spring 2000 tests were held July 10-27, 2000 in Beaufort Sea waters from Prudhoe Bay northward to the Arctic pack ice. The period from July 10-15 was devoted primarily to assembling equipment and providing training to responders and observers.[23] The remainder of the exercise period was devoted to trials to measure the operating limitations of several types of on-water equipment in broken ice.[24]

During the trials period, the schedule and scope of each day's activities were determined by the Task Force Leader based on assessments of ice conditions. The availability of broken ice affected both the test schedule and the daily objectives.[25] Exercise tests were only performed when the Task Force Leader determined that "ice targets," broken ice conditions approximating a specific percentage of sea surface coverage, were appropriate.[26] The Spring 2000 test schedule is summarized in Table 2.

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[21] IT Alaska, Inc., "Data Recording Protocol for Oil Spill Response Equipment Tests, Alaska Beaufort sea, Fall 2000," prepared for Alaska Clean Seas, October 5, 2000.
[22] IT Alaska, Inc., "Data Recording Protocol for Oil Spill Response Equipment Tests, Alaska Beaufort sea, Fall 2000," prepared for Alaska Clean Seas, October 5, 2000.
[23] Minerals Management Service, 2000, Memorandum dated September 12, 2000, from Christy Bohl, Environmental Protection Specialist, to Jeff Walker, Regional Supervisor Field Operations.
[24] IT Alaska, Inc., "Spring Test Recording Protocols, Year 2000, Alaska North Slope," prepared for Alaska Clean Seas, July 10, 2000.
[25] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.
[26] IT Alaska, Inc., "Spring Test Recording Protocols, Year 2000, Alaska North Slope," prepared for Alaska Clean Seas, July 10, 2000.

Table 2. Schedule of Spring 2000 tests.[27]

| DATE | MAJOR ACTIVITY |
|---|---|
| July 10-15 | Equipment manufacture, preparation and assembly. Responder and observer training. Familiarization with equipment and tactics. |
| July 16-20 | Timed trials of fully deployed R-19A task force transiting broken ice north of Prudhoe Bay. |
| July 19 | Mini-barges transited in broken ice. |
| July 21 | *Arctic Endeavor* deployed as R-19A, made a 2-mile move and a 180° turn in broken ice. |
| July 22 | Mini-barge transits continued. Laden *Beaufort 20* transited broken ice. |
| July 23 | *Arctic Endeavor* advanced with R-19A task force for full 12-hour shift. Helicopter guided the barge to an ice target for deployment. Crew changed out. |
| July 24 | Laden *Beaufort 20* transited broken ice. Helicopter guided the tugs through leads in heavy ice. |
| July 25 | Hovercraft mobilization began. Pilots described environmental limitations for aircraft support of task force. |
| July 26, 27 | Mini-barges transited during broken ice. |

**Fall 2000**

The Fall 2000 exercises took place in late September and early October, 2000, during the period of fall freeze-up. The Fall 2000 test schedule is summarized in Table 3.

Table 3. Schedule of Fall 2000 tests.

| DATE | MAJOR ACTIVITY |
|---|---|
| September 28-30 | Mooring *Beaufort 21*; Pumping Tests and Lightering Exercises |
| October 9-12 | Exercise tactic R-19A in Fall slush ice conditions to determine RMROL for equipment and measure down time caused by various ice concentrations. |

## Overview of Test Criteria For Trials

**Spring 2000**

A design team, consisting of representatives from ADEC, ADNR, NSB, USCG, ACS, Crowley Marine Services, ARCO, MMS, and BPXA, met four times prior to the Spring 2000 trials to identify the major tests to be conducted during the exercises. According to the report of the exercise design team's final meeting, held May 22, 2000, eleven major tests were to be

[27] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.

conducted during the exercises. The purpose and scope of these tests set forth by the design team included the requirements established in the contingency plan COA.

***1. Deployment of the R-19A tactic in various spring ice conditions.***

The purposes of this test were defined as follows:[28]

- Determine the ability to deliver support craft offshore.
- Determine when the configuration must move from parallel to tandem and if ice concentration is the only controlling factor.
- Determine the Spring RMROL for the tactic and which component(s) establish the limit.
- Test the ability of the system to maneuver through small and large position changes.
- Measure the time to deploy the system from time underway to full deployment.
- Measure downtime in 12-hour utilization demonstration.

***2. Use the lightering barge (*Beaufort 20 *or* Beaufort 21*) to test the access to designated offload areas.***

The purpose of this test was to determine if the lightering barge, fully laden, can access the mooring area, and offload its contents in sufficient time to meet RPS.

***3. Ice management using vessels to move large ice floes away from R-19A and using various techniques and maneuvers to prevent ice from entering the boom.***[29]

The purpose of this test was to determine what factors limit the operation of the ice management system and to develop and improve techniques.

***4. Move the mini-barges between the detached units and the large support barge in various broken ice conditions.***

The purpose of this test was to determine the average speed in which both laden and unladen mini-barges could transit an area in various conditions to establish or verify RMROL's.

***5. Transit the unladen barge* Beaufort 20 *through spring ice conditions with two tug configurations using the River Class Tugs and one Point Class Tug.***

The purpose of this test was to determine the ability of the *Beaufort 20* to maneuver in leads and to determine the ability to push its way through various concentrations of wind driven broken ice. ADEC required that this test take place over a 12-hour time period to demonstrate the capability to sustain operations.

[28] Exercise design team report dated May 22, 2000, and Condition of Approval 3(b).

[29] It is important to note that the Ice Management process is not included in the R-19A tactic currently in place in the ACS Technical Manual. The concept of ice management was introduced during the planning meetings for the Spring and Fall 2000 trials, to try to improve response efficiency and address problems identified during the 1999 broken ice drills.

*6. Transit the barge* **Endeavor** *through spring ice conditions.*

The purpose of this test was to determine the ability of the *Endeavor* to maneuver in leads and to determine the ability to push its way through various concentrations of wind driven broken ice.

***7. Demonstrate field support using various small craft to deliver personnel and equipment to the offshore task force and to support offshore task force on scene.***

The purposes of this test were defined as follows:

- Demonstrate the ability to swap out a full shift over a 5-hour period.
- Evaluate the change out plan and demonstrate the ability to deliver spare parts offshore.
- Test a surprise spare part delivery from on slope supplies.

***8. Evaluate command, control, communications and aircraft spotting.***

The purposes of this test were defined as follows:

- Determine what factors limit the use of spotter aircraft.
- Develop the ability of spotter aircraft to direct task force to oil spill site.
- Test the ability of spotter aircraft to direct task force through leads.
- Test the ability of spotter aircraft to conduct video surveillance and deliver video.
- Test the ability of shore based communications to communicate with the offshore task force and to deliver information from an Emergency Operations Center (EOC).

***9. Support the spring exercise by providing appropriate Meteorological and Ice Monitoring and Forecasting Services.***

The lessons learned from this evolution will be used to finish development of a response ice and weather forecasting and monitoring system. The coverage area for a general marine weather forecast will be the entire Prudhoe Bay region. Ice observations and ice trajectory analysis and reports will focus on specific test sites between Endicott and Oliktok. The design team provided the following parameters for testing this evolution:

- Provide a qualified on-site ice observer to provide routine weather and ice briefings to Project Command Staff during testing. The Ice Observer should have experience on the North Slope and be familiar with weather patterns and ice behavior within the Coverage Area.
- Provide products and services to support ice monitoring and ice and weather prediction during the trials, as follows:
- During the week leading to breakup: daily forecasts with the latest projections on expected break-up based on the deteriorated condition of the ice, cumulative thawing-degree days, forecast winds, and aerial reconnaissance to produce maps showing substantial cracking of the fast ice.
- Leading up to the date of the Spring Exercise: regional ice data with daily map products of latest ice conditions and expected changes in the next 24 and 48 hours. The decision from the Command Center regarding the initiation of the Spring Exercise will depend primarily on forecast products and results from aerial reconnaissance supplied by Contractor personnel.

- During the testing program: daily weather and ice forecasts by 0600 the morning of the tests. The Ice Observer will be on board the tug/barge to provide ice coverage determination.
- As part of the post-analysis of the Spring Exercise: Contractor shall document the actual ice conditions (e.g., ice concentration, floe size) that occurred during each phase of the exercise.

***10. Activate the hovercraft as required by the Conditions of Approval for the Contingency Plans.***

The purpose of this test was to ensure the hovercraft is ready for use within 72 hours.

***11. Test tactic R-17 as a subset of tactic R-19A.***

The purposes of this evolution were as follows:

- Test the maneuverability of the skimming system in various conditions of broken ice to determine what ice coverage limits the use.
- Determine the ability of the small boats to release ice that is captured in the boom.

**Fall 2000**

The goals of the Fall testing program were designed to answer questions about the effect of ice on the equipment's operational periods. These questions address several planning assumptions regarding responses in freeze-up conditions that are incorporated into current oil spill contingency plans. The assumptions involve boom length and skimmer type in tactic R-19 and the affects of ice in Variable 15B, "Guidance for Preparing Marine Response Scenarios," that are described in Volume 1 of the Alaska Clean Seas Technical Manual.

Tests undertaken during the Fall 2000 trials included the following:

***1. Test capability to maneuver a laden barge to offloading point.***

The purpose of this test was to demonstrate the ability to transit a laden barge to the short-term docking point, which will be in use for the next 3-5 years. This test will involve both the laden *Endeavor* and the laden *Beaufort 20/21,* and will test their ability to carry out the alternative (short-term) lightering plan to dock near STP. This test was intended to demonstrate that these laden barges are able to access the short-term docking location.[30]

***2. Test capability to offload a laden barge.***

The purpose of this test was to demonstrate the ability to offload a laden barge during fall freeze-up conditions. The following parameters were identified for this test:[31]

- Demonstrate the capability to manage offloaded fluid as part of the COBC test.

[30] Written correspondence between Mr. Robert Watkins, ADEC, and Mr. Nick Glover, BP Exploration Alaska, dated September 12, 2000 and September 25, 2000.
[31] Written correspondence between Mr. Robert Watkins, ADEC, and Mr. Nick Glover, BP Exploration Alaska, dated September 12, 2000 and September 25, 2000.

- Test the capability to offload at a 4,000 barrels per hour rate.
- Use seawater to demonstrate barge offloading, but also perform smaller scale emulsion lightering and pumping demonstrations to assess pumping and disposal capability rates of a viscous oil emulsion in fall freeze-up conditions.
- Simulate barge offload to vacuum trucks, tanks and a constructed pit to gauge on-shore transfer rates for recovered fluids.
- Test short-term plan for barge docking near the STP.
- Include the barges *Endeavor* and *Beaufort 20/21* in the tests to verify the capability to sustain offload rates that ensure the storage capacity of these three barges is adequate for RPS.

***3. Test R-19 barge transit.***

The purpose of this test was to exercise different combinations of skimmers and boom in various ice targets. The following parameters were identified for this test:[32]

- Each R-19 barge transit trial would exercise one combination of skimmers and boom in one to three ice targets. A transit is defined by its starting and ending latitude, longitude and time. A trial begins and ends upon the announcement of the Task Force Leader or the Exercise Coordinator. Trials will be conducted only as part of a formally defined transit.
- In the earlier trials, the booms will have lengths of 1,500 feet and a pair of weir skimmers will be deployed. The booms will then be shortened for a series of trials. A third round of trials will involve the longer boom and the pontoon LORI skimmers. The last round of trials will involve shortened booms and pontoon LORIs.
- The Task Force Leader was designated to select the ice targets for the task force transits. In the trials, the task force was to transit in an oil containment and recovery mode. The mode should involve:
  - an R-19 configuration described in the ACS Technical Manual or a planned modification;
  - speeds that maintain boom conformance with minimal entrainment (i.e., <0.8 knots); and
  - boom sweeps 0.25 to 0.4 of the boom length.
- When ice clogs the pontoon LORI hopper, the warm air plenum is to be used to loosen and remove the obstructing ice. The skimmer operators could also use water spray to remove obstructing ice from the pontoon LORI and the LSC-3 LORI.

[32] IT Alaska, Inc., "Data Recording Protocol for Oil Spill Response Equipment Tests, Alaska Beaufort sea, Fall 2000," prepared for Alaska Clean Seas, October 5, 2000.

- Transits will have lengths of 1 NM. However, the Task Force Leader may exercise discretion to shorten or lengthen transits to target appropriate ice conditions and concentrations. Changes in transit length may also be made to avoid sea surface conditions that fall outside the testing targets and to take opportunities to collect more data to fulfill an objective.

- To reach ice target areas, two tugs can break a path through solid ice with the barge. However, a single tug will push the barge in the trial transits.

***4. Exercise R-17 Bay class workboats with LORI skimmer.***

The purpose of this test was to exercise a pair of Bay Class workboats with a J-boom and a LORI skimmer in the detached configuration described in Tactic R-17. The following parameters were defined for this test:[33]

- The lead workboat will use a skimmer that is plumbed into the vessel's hydraulics with adjustments to better isolate the skimmer's power from variations in the vessel's power demands. The configuration will transit up to three ice targets.

- The detached J configuration, which is not part of the R-19 task force, will be tested independently of the barge systems.

- The tests will include a Bay Boat carrying a power pack that operates the skimmer hydraulics independently of the vessel hydraulics.[34]

***5. Identify downtime and operational limits.***

The purpose of this test was to identify the operational time and downtime for the equipment in various ice conditions. Downtime is defined as the period of time in the course of the trial during which a piece of equipment no longer operates in a mode suitable to contain or recover oil. Downtime indicates the operating limit of the equipment. The low end of downtime's range is zero. Downtime is zero when the equipment remains in modes capable of containing or recovering oil throughout the trial.[35]

***6. Categorize ice conditions.***

The purpose of this portion of the exercise was to categorize ice conditions by percentage of coverage within the boom containment area. For the purposes of this trial, ice conditions were described as follows:[36]

- Trace amounts of grease ice: Condition 1.
- Nilas or thin, new and young ice: Condition 2.

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[33] IT Alaska, Inc., "Data Recording Protocol for Oil Spill Response Equipment Tests, Alaska Beaufort sea, Fall 2000," prepared for Alaska Clean Seas, October 5, 2000.
[34] Consent Order No. 00-162-50-1456 in the matter of State of Alaska, Department of Environmental Conservation, Complainant vs. BP Exploration (Alaska), Inc., Respondent.
[35] IT Alaska, Inc., "Data Recording Protocol for Oil Spill Response Equipment Tests, Alaska Beaufort sea, Fall 2000," prepared for Alaska Clean Seas, October 5, 2000.
[36] IT Alaska, Inc., "Data Recording Protocol for Oil Spill Response Equipment Tests, Alaska Beaufort sea, Fall 2000," prepared for Alaska Clean Seas, October 5, 2000.

- Slush ice: Condition 2.
- Transient ice conditions and occurrences of open water caused by wind of 20 knots or greater: Condition 3.
- Stable, fast or consolidated ice: Condition 4.

## Observations of Exercise Trials

This section describes the activities that occurred during both spring and fall exercise sessions, in chronological order.

### Spring 2000 Sessions

#### *July 10-15: Initial preparations and equipment assembly.*

The first several days of the exercise were used to manufacture and prepare equipment and to test gear, prior to the actual exercise trials. On July 10, the barges *Arctic Endeavor* and *Beaufort 20* were freed from the shorefast ice.[37] Ice deflectors were fitted and the bay class boats practiced shuttling through the ice.[38] Responders practiced deploying the booms and LORI skimmers. Data recorders were given overviews of how basic equipment functions and were trained in the use of data recording sheets.[39] Several ice surveys were conducted to assess ice coverage in the vicinity.

Daily debriefs during this period focused on identifying equipment and systems that required additional refinement prior to the beginning of the trials. Some of the issues identified in those meetings re-emerged as problems during the exercise trials in later weeks and during the fall trials.[40] They discussed, for example, the need to adjust the gap between the Ro-Boom, Broken Ice Deflector System (BIDS) and LORI-mounted boom so it fit better behind the BIDS, enabling it to catch more oil when not releasing ice-chunks.

On July 13, the *Arctic Endeavor* maneuvered with its portside BIDS and floating LORI deployed, to test the barge-mounted recovery system in ice.[41] The system was observed to handle ice chunks up to approximately the length of a "Volkswagen® bug", with a thickness of 2-3 feet.

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[37] Ted Moore, ADEC, Observer notes, July 10, 2000.

[38] The ice deflectors required re-design in order to perform as intended. On July 11, the ice deflectors were removed from the *Endeavor* so that the rear support arm could be redesigned. Refitting and testing took place over the course of the 11th and the 12th. The first tests of the retrofitted arms were performed late at night on the 11th in open water conditions. The following day, all observers were able to inspect the improvements to the ice deflector, although only the port side was installed and practiced that day. The starboard side was completed and demonstrated later. Technically, the barges were not response ready until both ice deflectors had been installed. Clara Crosby and Jeff Conn, ADEC, Observer notes, July 11, 2000 and Kirsten Ballard and John Brown, ADEC, Observer report, July 12, 2000.

[39] Clara Crosby and Jeff Conn, ADEC, Observer notes, July 11, 2000.

[40] Kirsten Ballard and John Brown, ADEC, Observer report, July 12, 2000. See also subsequent discussions regarding Tactics R-19A and R-17 in the Observations section of this report.

[41] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.

Larger pieces of ice[42] disturbed the Ro-Boom, dented the deflection bracket and lifted the skimmer out of the water.[43]

On July 14, the starboard BIDS had not been manufactured yet, so it was not yet ready for placement in the system. The deflection brackets on the *Endeavor's* hull still required strengthening.[44] The day's activities focused on crew training as responders practiced boom placement in front of the LORI skimmer. Observers noted that the boom attachment point to the *Endeavor* was causing the boom to be held either too close and above the water or too far out from the side of the barge to direct oil, if any had been present, into the skimmer.[45]

On July 15, the last day before the startup of the actual trials, a test run of the complete R-19A configuration was conducted in open water. Boom placement in front of LORI Skimmer and the horizontal bracing on the ice deflector was practiced, with ice continuing to lift the boom and reduce encounter rates.[46] The barge did encounter ice pieces, and smaller floes (up to 10x10 feet) hit the deflector and were moved aside as designed. Larger floes went under the boom near the deflection bracket, suggesting that some of the ice will move through the boom pocket bringing oil with it.[47]

[42] In this case, a 40' by 30' piece of ice "took out the ro-boom, dented the lower bar of the deflection bracket and lifted the skimmer out of the water about a foot," according to Kirsten Ballard and John Brown, ADEC, Observers Report, July 12, 2000.

[43] Essentially, only a very narrow range of sizes and shapes of ice were able to pass through the system without causing disruption or damage. Kirsten Ballard and John Brown, ADEC, Observers Report, July 13, 2000.

[44] Robert Watkins, ADEC, Field notes, July 14, 2000.

[45] Tom DeRuyter, ADEC, "Observational Report for July 14, 2000." It is important to remember that no oil was present in the water during these equipment trials, so that the behavior of oil with respect to the various equipment configurations and ice concentrations must be presumed based upon other observed conditions. However, the presence of ice may be considered as one indication of the probably movement and activity of oil on the water, as ice has a similar buoyancy to most crude oils and the movement of ice, during both the spring when it is in small pieces and the fall when it is "grease" ice, approximates the presence of oil on the water. Kirsten Ballard, interview with authors, October 25, 2000.

[46] See discussion in footnote 46, regarding suppositions about oil behavior and "encounter rates" during the trials. All discussions of oil behavior (containment, encounter rates, etc.) are based on assumptions since no oil was present during the trials.

[47] Tom DeRuyter, ADEC, "Observational Report for July 15, 2000."

***July 16-20: Timed trials of R-19A Task Force transiting broken ice.***

On July 16, trials of the R-19A task force were conducted in trace to 10% ice conditions.[48] There were problems with the boom system due to a number of factors. As had occurred during the first phase of the exercise, the approximately 20-foot gap between the Ro-Boom and the barge allowed both ice and presumably oil to escape.[49] Ice also went under the pillows of the Ro-Boom. The horizontal grates, at the water line on the BIDS, were blocking surface flow and diverting ice and water along the deflector away from the skimmer. The boats towing the boom also had trouble keeping the J-shape configuration since ice avoidance made maintaining a constant course difficult.[50]

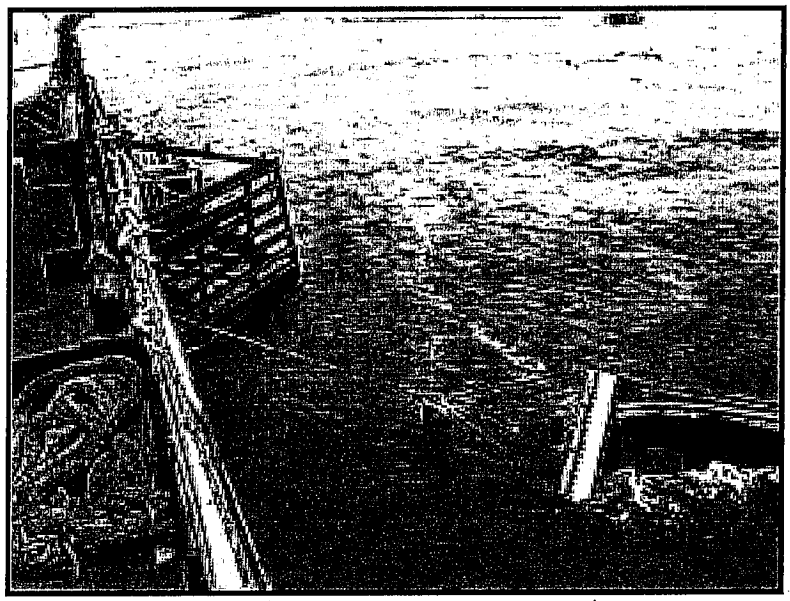

Figure 1. Photograph showing gap between the Ro-Boom and barge, which allowed ice to escape.

Overall, the system experienced periods of significantly reduced efficiency during this day's operation. A couple of the operational problems noted earlier had yet to be corrected. Specifically, the stabilizing horizontal bars in the BIDS had not yet been modified to allow the bar to perform properly as a deflection barrier.[51] Also, the problems with loss of containment through the gaps between the Ro-boom and barge, as described above, had not been fixed.[52] ACS did address one problem by fixing a line to the upper point of the Ro-boom end cap so that the boom could be flipped over to release ice.[53]

On July 17, the R-19A test continued in areas of higher ice concentrations. Ice estimates varied from 10 – 70% over the course of the day. Observers had differing opinions on ice concentrations, underscoring the variability of ice concentrations based on when and from where the ice was viewed. There was general agreement that R-19A tactics were largely unsuccessful at concentrations where ice was not managed to concentrations of 10% or below at the skimmer intake. The R-19A system was generally overwhelmed, even with active ice management, when ice concentrations exceeded 30%.[54]

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[48] Ice concentration estimates are annotated in observations by Steve Potter of S.L. Ross.
[49] Minerals Management Service, 2000, Memorandum dated September 12, 2000, from Christy Bohl, Environmental Protection Specialist, to Jeff Walker, Regional Supervisor Field Operations.
[50] Mike Munger and Scot Tiernan, ADEC, Observers Report, July 16, 2000.
[51] This was due to a scheduling problem with welders that day.
[52] Mike Munger and Scot Tiernan, ADEC, Observers Report, July 16, 2000.
[53] Kris O'Connor, ADNR, Observer notes from July 16, 2000.
[54] Christy Bohl, MMS, November 26, 2000.

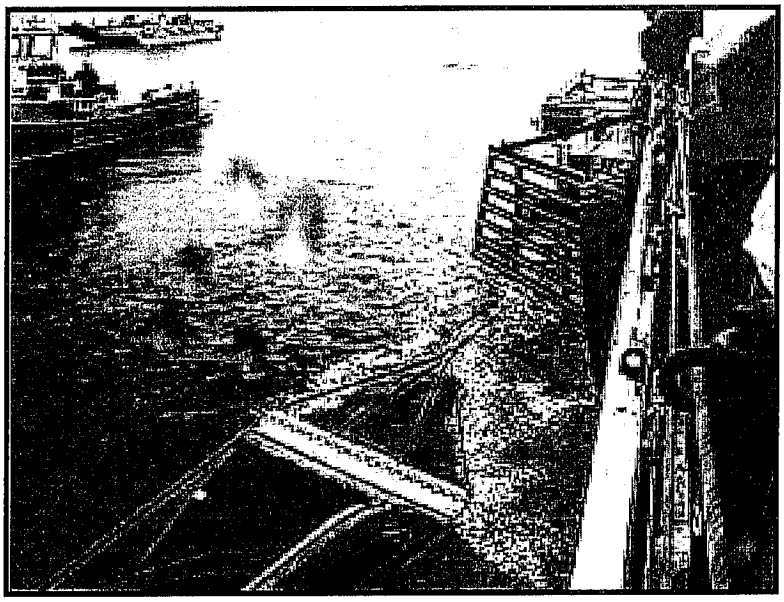

Figure 2. Photograph showing first popcorn test where the grate on the BIDS deflected popcorn past the skimmer.

Popcorn was scattered on the water and used to simulate the movement of oil through the containment system. The popcorn was used to determine whether oil would make it from the J-boom pocket, past the BIDS, and into the LORI brushes. The first popcorn test confirmed that the BIDS grate at the waterline deflected popcorn away from the skimmer.[55] The BIDS was then raised so that there was no grate at the waterline. Subsequent popcorn tests performed showed that the BIDS deflected ice but allowed popcorn to enter the skimmer setup. The majority of the popcorn moved through the grates and reached the skimmer intake, though some was still deflected away from the skimmer.[56]

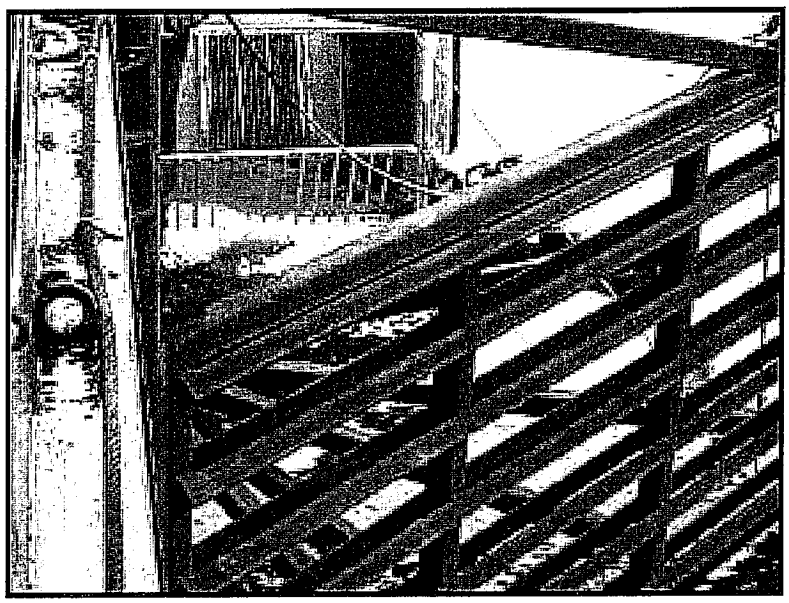

Figure 3. Photograph showing second popcorn test, after the BIDS was raised, allowing the popcorn to reach the skimmer.

[55] It is important to note that, during the first test, the popcorn was placed on the water inside the boom, and therefore does not provide an accurate estimate of a recovery rate for the system as a whole.
[56] Kris O'Connor, ADNR, Observer notes from July 17, 2000.

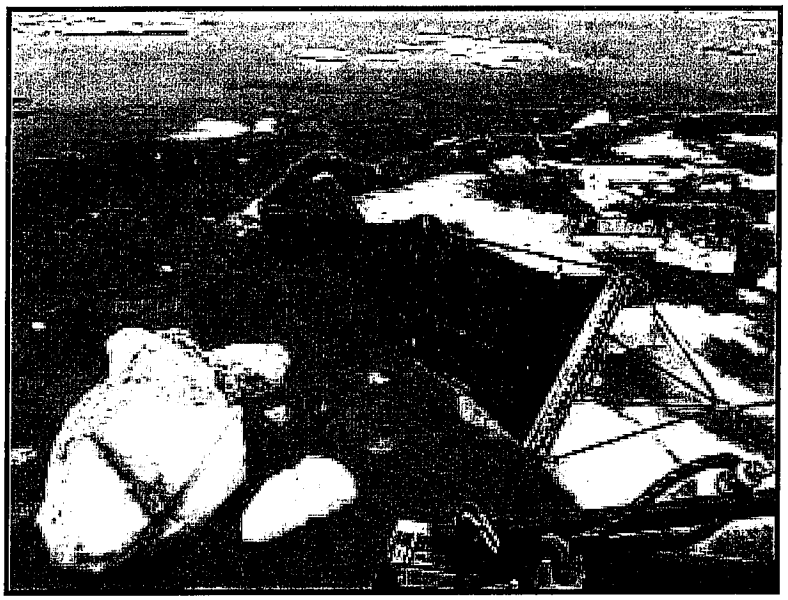

Figure 4. Photograph showing boom failure due to ice flowing under the boom.

During the tests on July 18, ice was allowed to freely enter the boom area with no ice management. Ice flowed under the port side boom causing it to twist at least three rotations, resulting in failure of the containment system.[57] During similar tests on July 17, the starboard Ro-boom also became entangled with ice and was damaged.[58]

Spare parts delivery, to replace equipment that had been damaged during the trials, was successfully accomplished on July 17 and July 19.

On the 19th, a different type of containment boom was tested because the exposed tension-chain of the Ro-Boom had been observed to be hanging up on the ice when the boom was riding over ice, causing the boom to lose contact with the water surface and thus reduce efficiency. Nordan boom, with the tension chain enclosed, was tested in place of the Ro-Boom. Observers noted several problems with the Nordan boom. The rough surface texture made it more difficult to slide over the ice; the bridle-connector tore when ice accumulated in the boom, and at least one of the "pillows" had holes.[59] Half of the holed pillow sank below the water's surface but the boom rode vertically instead of laying on its side as the Ro-Boom had done.[60]

[57] Scot Tiernan, ADEC, Observer notes, July 18, 2000.
[58] Kris O'Connor, ADNR, Observer notes from July 18, 2000.
[59] These holes weren't repaired because the equipment had already been deployed and it would not have been time efficient to have pulled them from the water. ACS also had replacement boom available to use as a backup. One representative of the North Slope Borough noted that the condition of the pillows is relevant because it reflects a state of disrepair that was observed for some of the equipment. It was not material to the success or failure of the exercise. Representatives of ADNR and USCG disagree with this point, because they saw no evidence to support it.
John Kotula, John Brown, Scot Tiernan and Kirsten Ballard, ADEC, Observer notes, July 19, 2000.
[60] Kris O'Connor, ADNR, Observer notes July 19, 2000.

The width of the containment swath, or the distance between the two lead boats pulling the boom, varied from 0 to 200 feet as the boats maneuvered to avoid ice. Variation in the swath width is expected for this tactic, but makes it difficult to determine the oil encounter rate. Overall, the average swath width was less than expected by ADEC for this tactic.[61]

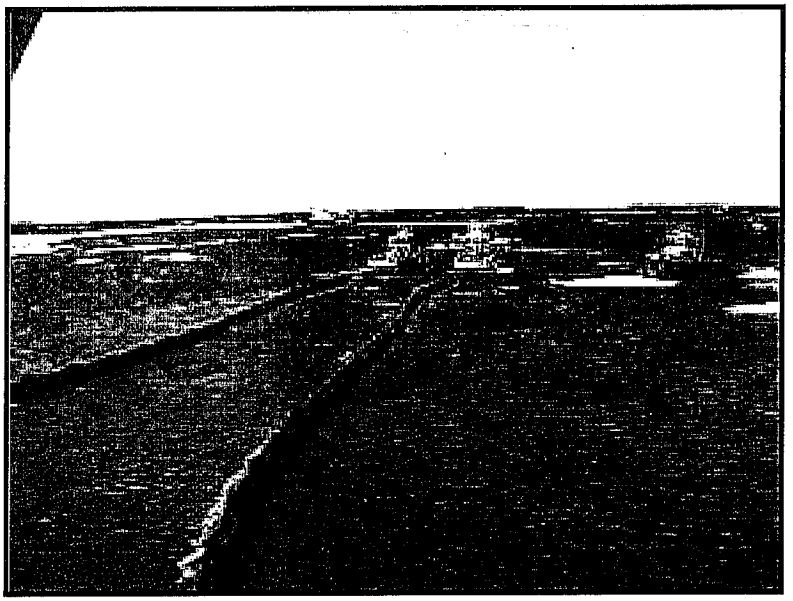

Figure 5. Photograph showing the two lead boats closing the boom swath to avoid ice containment.

In addition to these minor complications with the containment boom, observers also noted problems with the skimming system. On the port side LORI, both boomlets had torn due to an ice encounter. The tow-point connector plates on two of the skimmers also bent because of ice encounters, and several observers felt this could create problems while changing the boom or could cause damage to the skimmers themselves.[62] However, ACS reported that they had extra skimmer boom available for use if necessary.[63]

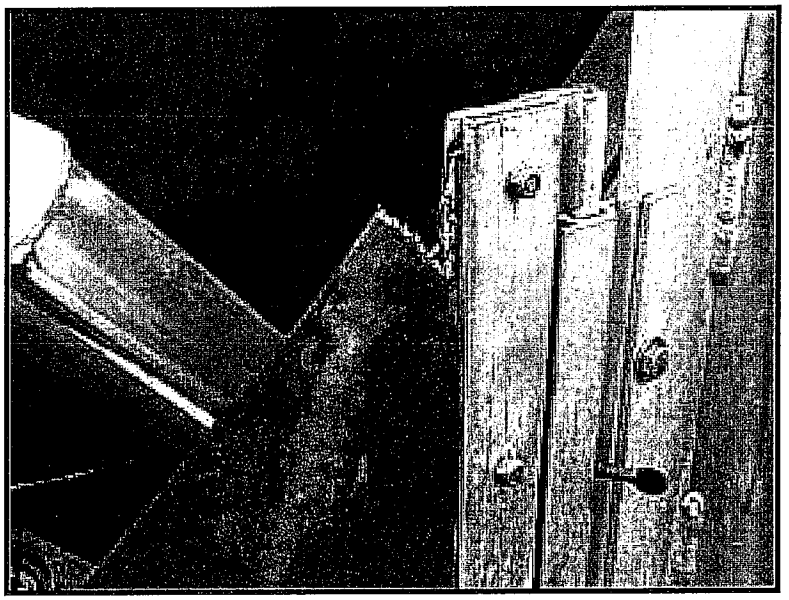

Figure 6. Photograph showing torn boomlet skirt, due to ice.

On July 20, additional tests of the *Arctic Endeavor* with the BIDS and LORI skimmer deployed indicated that ice pieces longer than 20 feet lifted the boom and frequently obstructed the BIDS.[64] A coordinated 180° turn while keeping in R-19A formation was attempted but was not successful.[65] The maneuver was

[61] ADEC's expectations were based on the assumptions presented in the c-plan scenarios and the descriptions in the ACS Tactics Manual. Robert Watkins, ADEC, personal communication, November 21, 2000.
[62] John Kotula, John Brown, Scot Tiernan and Kirsten Ballard, ADEC, Observer notes, July 19, 2000.
[63] Kris O'Connor, ADNR, fax to Tim Robertson, December 8, 2000.
[64] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.
[65] One of the J-boom boats suffered multiple failures of their equipment shortly before the turn was started: the weld where the boom attaches to the skimmer came undone "like a zipper," due to a collision with ice; the

cumbersome, time consuming and reduced skimming efficiency.[66] The rationale for attempting the coordinated turn was to increase skimming time by avoiding the need to stop skimming operations, drop the boom configuration, then turn and reset the boom configuration, thus incurring significant downtime.[67] Another objective on the 20th was to coordinate aerial ice-spotting operations with the barge. The overflight found an area of generally 30% ice in the location where the R-19A tests and 180° turn took place. Ice encountered by the R-19 task force varied from an operational standpoint to 10% or less.[68]

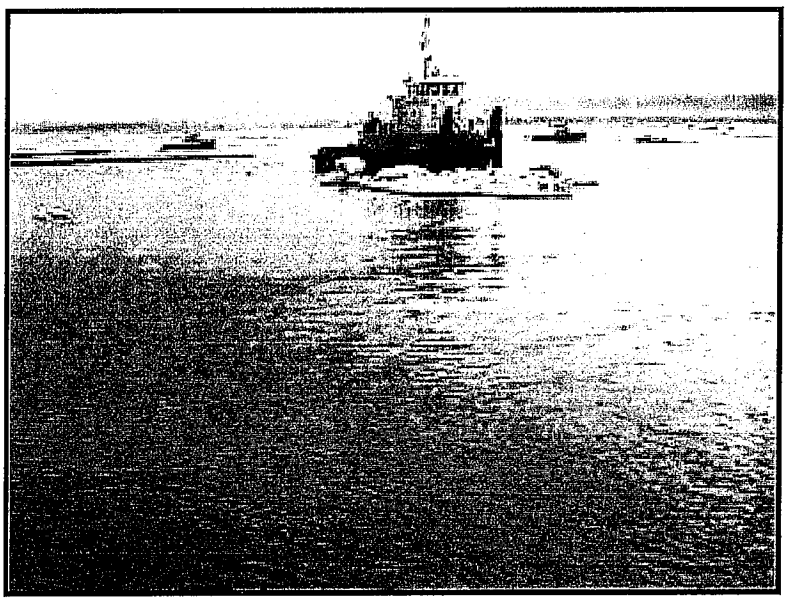

Figure 7. Photograph showing ice management.

The detached J configurations continued to be plagued with "ice management" problems that put ice in their path when they were following the barge. This problem can probably be blamed, at least in part, on the fact that the J-boom systems were not allowed to maneuver freely because they were required to adhere strictly to the positions described in tactic R-19A. In adhering to the prescribed configuration, they were not able to practice any ice avoidance. Several observers concluded that the J-boom skimming systems appeared to be most effective when allowed to operate independently in open leads.[69]

A third popcorn test was conducted. Two large bags of popcorn were spread in front of the barge. An estimated 98% of the popcorn that went down the side of the barge, went into the skimmer booms and a large quantity of that was picked up by the skimmer.[70] An undetermined amount of popcorn was entrained under the barge.

skimming boat's port engine failed; and they had to drop out of formation. The lead boom boats for the barge used too much power and pulled the boom over and the boom clogged with ice. The starboard turn caused the port side boom to fail because of excessive speed, power and ice accumulation. The starboard side boom formed a pocket during the turn, which accumulated significant amounts of ice. John Kotula, John Brown and Kirsten Ballard, ADEC, Observer notes, July 20, 2000.

[66]Minerals Management Service, 2000, Memorandum dated September 12, 2000, from Christy Bohl, Environmental Protection Specialist, to Jeff Walker, Regional Supervisor Field Operations.

[67] While there was no explicit expectation that this turn could be accomplished, ADEC representatives felt that the expectation was implied in the scenarios because the estimated down-times for R-19A are so low.

[68] John Kotula, John Brown and Kirsten Ballard, ADEC, Observer notes, July 20, 2000 indicate ice concentrations of trace to 10%. Observer notes from Kris O'Connor of ADNR note that ice concentrations were consistently 10%.

[69] John Kotula, John Brown and Kirsten Ballard, ADEC, Observer notes, July 20, 2000.

[70] Kris O'Connor, ADNR, Observer notes, July 20, 2000.

***July 19: Mini-barge transit in broken ice.***

On the 19th, ice conditions of 50-70% were sought for the mini-barge shuttling trials. Mini-barge transits that day were successful in conditions up to 70% coverage.

***July 21:* Arctic Endeavor *deployment and 180° turn.***

Three exercises were conducted on the 21st. R-19A equipment was deployed in 50% ice coverage (managed or otherwise), a 180° coordinated turn[71] was performed in trace ice and in 50% ice, and the R-19A configuration attempted to transit through 50% ice and to re-deploy equipment. The equipment deployment and 180° turn were successful, but the transit started late so that only a partial demobilization and transit could be completed.[72]

One of the detached J-boom boats continued to suffer mechanical engine problems that caused reduced power.

In exercising the barge-based tactic, a section of Ro-Boom was flipped over in large ice, twisting the boom and causing a downtime of just over an hour for the port side recovery system. The boom boats also continued to have problems maintaining anything more than a 200-foot swath width. Even in trace ice conditions, the swath width specified in the ACS TM could not be maintained for more than a few minutes at a time as the boom boats maneuvered to avoid ice.[73]

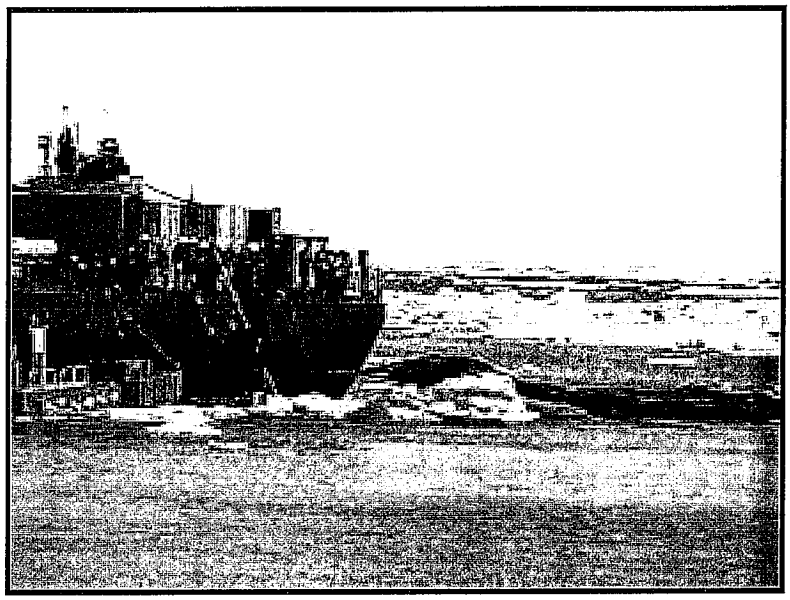

Figure 8. Photograph showing a section of boom flipped over by a large piece of ice.

Observers also noted that the crane was negatively impacting the BIDS because when the boom swung to one side, the BIDS system on the opposite side would drop several inches causing the BIDS to deflect surface water away from the skimmer. However, these were short-term interruptions and were corrected very quickly, causing a maximum of no more than five minutes of downtime.[74]

As part of the R-19A testing on the 21st, ACS conducted a speed run through ice concentrations in excess of 50%. The skimmers and BIDS were placed on the deck and the barge released the booms. The detached J's released their booms and pulled the skimmers on-board. The barge assumed a lead position and made an approximate 2-mile location change at speeds of

[71] This was the second attempt at a 180° turn, following the failed attempt on July 20th.
[72] John Brown and Kirsten Ballard, ADEC, Observer notes, July 21, 2000.
[73] John Brown and Kirsten Ballard, ADEC, Observer notes, July 21, 2000.
[74] LT Joe Higgins, USCG, interview with authors, November 22, 2000.

up to 7 knots. The support vessels followed behind the barge. The barge encountered ice chunks over 100' across, and successfully pushed passed or over them.[75]

***July 21 & 22: Mini-barge transits.***

Figure 9. Photograph showing mini-barge transit in broken ice.

Mini-barge transit times, for both laden and unladen vessels, were tested over a 3,000 foot (1/2 nautical mile) course through different broken ice conditions. Transit times were recorded for each trial and later compared. Broken ice condition estimates varied from 30% to 70%. Observers noted that the trials went smoothly in all ice conditions and that this component of the system appeared to work well in all conditions, except when towing a laden mini-barge on the hip in 70% ice.[76] At one point, the vessel-barge hip tow became temporarily "hung up" on a large ice floe. The vessel master had to perform forward-reverse maneuvers to free the vessel and barge.

***July 23:* Arctic Endeavor *deployed with R-19A task force and crew change. Helicopter spotting test.***

The purpose of this trial was to deploy all equipment and vessels necessary to successfully execute tactic 19A in 30 – 70% broken ice conditions. The R-19A task force was fully deployed and in an oil recovery mode in broken ice after approximately 4 1/2hours. The task force got underway at the West Dock and deployed at an area 12.5 miles NNW of the dock.[77] However, ice conditions were generally much lower than the targeted 30-70%.[78]

The boom attachment to the barge was unable to be quickly adjusted for both height and distance from the barge to allow ice to flow through the system and to maximize any potential oil feeding into the skimmer.[79]

Crew relief was tested on the 23rd as well, and was found to fall within the 5 hour planning standard set in the contingency plan.[80] However, during the shift change, complete shift briefings

[75] Minerals Management Service, 2000, Memorandum dated September 12, 2000, from Christy Bohl, Environmental Protection Specialist, to Jeff Walker, Regional Supervisor Field Operations.
[76] Tom DeRuyter, ADEC, Observational report, July 22, 2000.
[77] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.
[78] Observer notes from Mike Bronson, IT Alaska Inc., for July 23 indicate ice concentrations in the 20-30% range.
[79] Tom DeRuyter, ADEC, Observational report, July 23, 2000 and John Brown and Kirsten Ballard, ADEC, Observer notes, July 21, 2000.

were not accomplished between the departing and the arriving crews. This led to some confusion among the relieving crews about the tasks at hand.[81] The relief crew on the detached "J" was unaware of the communications channels and of the mini-barge change out schedule. This resulted in a 4 hour delay of the mini-barge change out, which was supposed to take place every hour.[82] However, some of this delay was due to weather according to the USCG observer onboard.[83] There were also problems with manifest procedures.

### *July 24: Laden* Beaufort 20 *transit through broken ice.*

Target ice concentrations for this exercise were 70%, however actual conditions encountered ranged from 50 – 90%. The exercise took place near the edge of the pack ice where the ice consisted of large pans and smooth, weathered pieces. Because of safety considerations,[84] the barge was forced to follow leads through the ice, but it successfully negotiated some fairly large pieces of ice.[85]

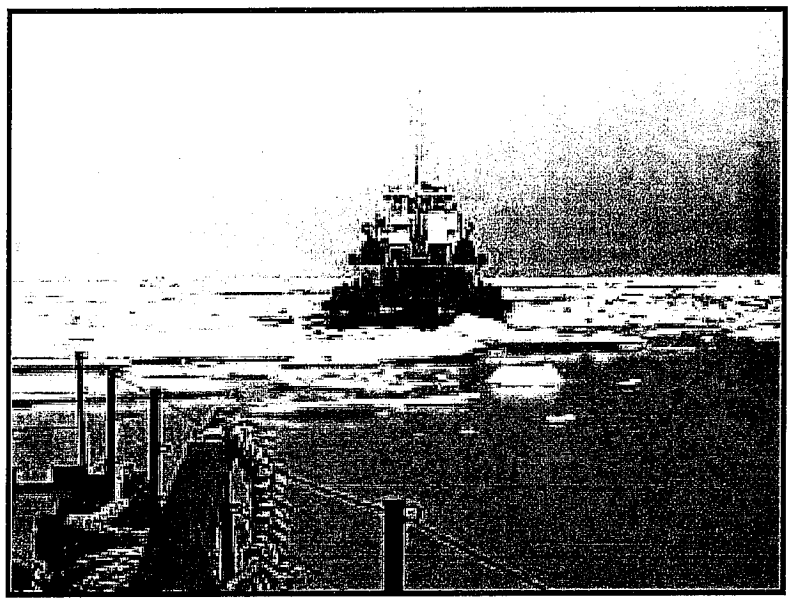

Figure 10. Photograph taken from *Beaufort 20* barge showing transit through broken ice.

Maneuverability with one Point class tug was somewhat limited compared to maneuverability with two River class tugs. In 70% ice and with a single Point class tug, the barge needed assistance from one of the River class tugs for steerage and for additional power to break through some of the ice. It was also necessary for one of the River class tugs to scout ahead for openings. The *Beaufort 20* could not be maneuvered through 70% broken ice with just one Point class tug, without assistance from additional tugs. However, at one point the tug captain demonstrated a creative maneuver when he used a large pan of ice as a pivot point to accomplish a turn.[86]

[80] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.
[81] Christy Bohl, MMS, LT Joe Higgins, USCG, and Ted Moore, ADEC, interview with authors, November 21, 2000.
[82] Ted Moore, ADEC, email to authors, December 3, 2000.
[83] Joe Higgins, USCG, communication to authors, December 9, 2000.
[84] These included the size and concentration of the ice, paired with the fact that the *Beaufort 20* is an ice enforced barge but is not an ice breaker. By comparison, the *Arctic Endeavor* can successfully charge through thicker ice concentrations.
[85] ADEC, 2000, Memorandum dated August 25 from Ted Moore, Environmental Specialist, to Susan Harvey, Program Manager, and Robert Watkins, Section Manager.
[86] Lt. Joe Higgins, USCG, personal communication, November 20, 2000.

The barge was able to successfully transit and perform the necessary maneuvers being pushed by two River class tugs. However, it was again necessary for the *Point Thompson* tug to scout ahead, and on occasion perform some ice management while in the configuration.[87]

***July 25: Hovercraft mobilization and aircraft support limitations tested.***

The unannounced Hovercraft mobilization exercise was initiated at 1305 hours on the 25th. The mobilization was complete at 1335 on the 26th for an elapsed time of 24 hours and 30 minutes, and the hovercraft was considered operational at that time.[88]

***July 26-27: Mini-barge transit through broken ice.***

This exercise started in calm, clear weather, but shortly after the exercise began the winds picked up from the Northeast. By the end of the exercise the winds were approximately 20 knots and the sea states had reached 2 – 3 feet, which was considered the equipment's RMROL. The bay boats had little difficulty in maneuvering the mini-barges through 30 percent broken ice whether loaded or empty, towed, on the hip, or pushed. The 2 feet seas created the most difficulty for the exercise. The boat operators considered maneuvering the mini-barge tied on the hip or by pushing it to be unsafe in 2 feet seas.[89]

**Fall 2000 Sessions**

***September 28-30:* Beaufort 21 *Barge mooring and lightering.***

On September 28, the barge *Beaufort 21* was successfully moored alongside barge 210. The *Beaufort* started approximately 1/2 mile offshore and was maneuvered by a point class and a River class tug.[90]

On September 29, lightering exercises began. Crews rigged pumps for a fluid (sea water) discharge exercise. The discharge hoses were tied off to ladders, railings, and other appurtenances of the barge, and their placement in many cases allowed some of the discharge fluids to spill on to the deck of the barge, rather than completely off the barge and into the ocean. Discharge of the seawater overboard was how BPXA and ACS were to simulate the lightering of recovered oil/water to the other barge. During a spill event, the product on the *Barge 210* would then be transported to a shore based offloading point for offloading and treatment. The *Barge 210* would then return to the mooring area to again receive recovered product from the recovery barge to repeat the cycle throughout a spill response.

The test protocol involved starting the pumps one at a time until all 8 were operating, which took approximately 15 minutes. Within a half-hour, three of the pumps had to be shut down because of hydraulic oil leaks in the cargo holds. This test did not demonstrate the required

[87] ADEC, 2000, Memorandum dated August 25 from Ted Moore, Environmental Specialist, to Susan Harvey, Program Manager, and Robert Watkins, Section Manager.
[88] ADEC, 2000, Memorandum dated August 25 from Ted Moore, Environmental Specialist, to Susan Harvey, Program Manager, and Robert Watkins, Section Manager.
[89] ADEC, 2000, Memorandum dated August 25 from Ted Moore, Environmental Specialist, to Susan Harvey, Program Manager, and Robert Watkins, Section Manager.
[90] ADEC, 2000, Memorandum dated October 4 from Ted Moore, Environmental Specialist, to Robert Watkins, Section Manager.

offload capacity. The pump rate on the barge could not be maintained, and the required infrastructure for shoreside transfer was not in place.[91] The exercise coordinators canceled this test because a small reportable spill occurred during the testing.

Later, limited pumping resumed to attempt to estimate a pumping rate. At the daily debrief, the discharge rate for each DESMI 250 pump was estimated to be between 450 and 460 barrels/hour at 30 psi head pressure of sea water.

***October 8-12: R-17 and R-19 tactics.***

The remainder of the Fall 2000 testing was focused on R-17 and R-19 tactics.

On October 8, a briefing was held but no trials were actually conducted. On October 9, both bay boats were deployed to test the attached boom configurations described in R-19. Each boat began deployment of 1500 feet of boom on each side of the barge. The deployment of the boom was complicated by the extremely icy conditions present, the extra layers of clothing worn by the deck crew and the wear and poor repair of the boom connectors which created difficulty in connecting the sections (3 x 500 feet) together.[92] The USCG notes that they did not observe wear and poor repair of the boom connectors, but that the connectors were jammed with ice and snow, which created the difficulty in connection.

[91] The decision not to have set up a temporary oil storage facility at the barge docking location was because the USCG would not allow a barge to facility transfer of oil at that time. Because the trial was not an emergency situation, the USCG would not waive regulatory requirements. BPXA could not meet those requirements in the timeframe allowed by the trial. The USCG did not preclude the transfer of seawater.

[92] Ted Moore and Kirsten Ballard, "North Slope Fall 2000 Barge Trials Oil Spill Response Equipment Tests Field Report," October 8-12, 2000.

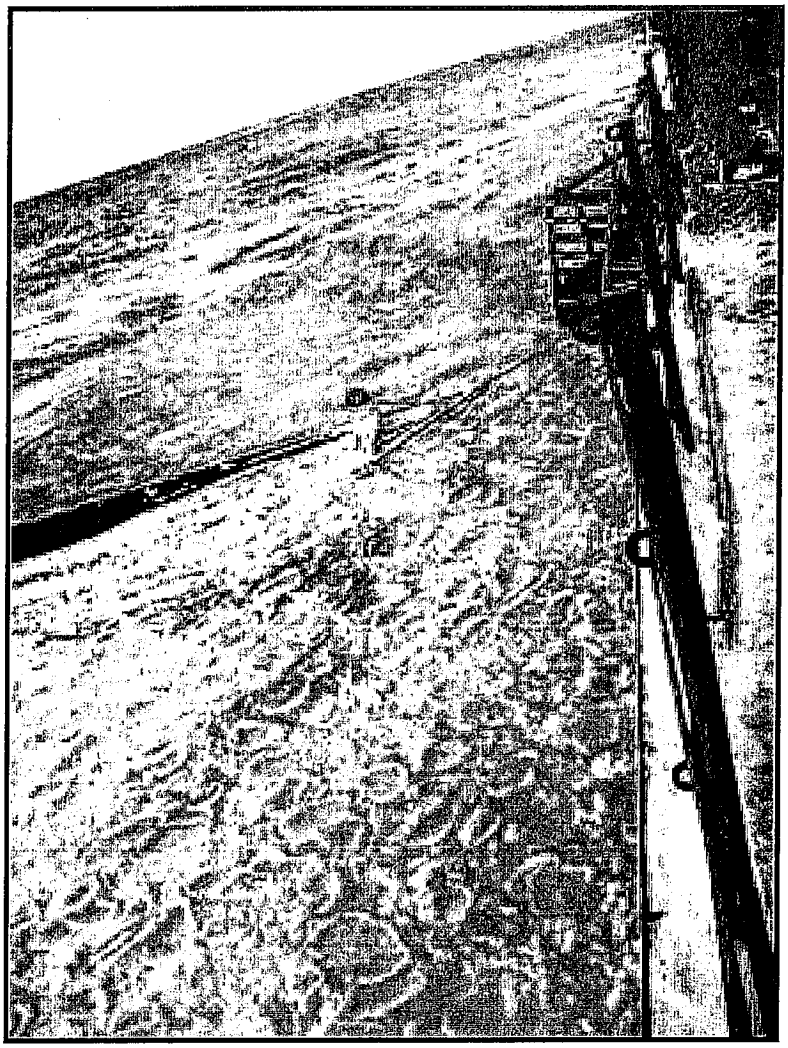

Figure 11. Photograph showing ice accumulation in the boom during fall trials.

Slush ice was the only ice condition encountered on October 9. Therefore, this was the only ice condition for which LORI operation data was collected. The slush ice, regardless of its concentration, would coalesce into an ice-dam at the face of the skimmer, clogging the system. The slush ice also accumulated between the BIDS and the grates of the LORI inside the boomlets. The brushes of the LORI moved well, picked up some ice bits into the hopper, and did not stop moving or clog with ice for the duration of their operation in the slushy ice that had accumulated in front of the skimmer. There was a gap between the boom and the BIDS that allowed ice to pass between the end of the large pocket boom and the skimmer's boomlets, thus missing the skimmer altogether.[93]

Observers noted that the BIDS seemed to deflect the skim of ice away from the LORI. The BIDS helped to hold the ice in place between the LORI and the BIDS just as it had with larger chunks of ice in the July tests.[94] Data recorders noted that the LORI brushes and skimmer pumps performed without freezing up. The BIDS also formed an ice barrier when ice collected and froze on the deflector bars.[95]

Low light transit and response equipment deployment and recovery was demonstrated.[96]

On October 10, equipment deployment generally went more smoothly than the previous day, except for the Transrec skimmer, which was not operational due to a frozen hose.[97] A

[93] Ted Moore and Kirsten Ballard, "North Slope Fall 2000 Barge Trials Oil Spill Response Equipment Tests Field Report," October 8-12, 2000.
[94] Ted Moore and Kirsten Ballard, "North Slope Fall 2000 Barge Trials Oil Spill Response Equipment Tests Field Report," October 8-12, 2000.
[95] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Fall 2000," prepared for Alaska Clean Seas, October 27, 2000.
[96] Joe Higgins, USCG, personal communication with authors, December 18, 2000.
[97] Ted Moore and Kirsten Ballard, "North Slope Fall 2000 Barge Trials Oil Spill Response Equipment Tests Field Report," October 8-12, 2000.

popcorn test was performed to help determine how much ice was passing from behind the BIDS into the LORI, how much oil might be able to reach the LORI brushes, and whether the ice buildup was moving towards the skimmer brushes or not. The popcorn test indicated that the ice effectively isolated the skimmers.[98] The popcorn collected along the leading edge of the ice mass in the R-boom and the boomlets and failed to reach the skimmer intakes.[99]

A 1,000 feet swath width was maintained with the 1,500 feet of boom that was deployed on each side.[100] However, the Bay boats experienced some operational difficulty in towing the 1,500 feet of boom.[101] The Bay boats required full power to tow and maneuver the 1,500 feet boom arrays.

Entrainment of ice from the boom pockets (in front of the bridle-line and the weir skimmer zone of the boom) was evident as ice bits popped up behind the boom. As the mass of ice in the Ro-boom area increased to more than 100 square feet, the capability of the towboat to hold the boom in place decreased. The combination of the ice accumulation and the 1,500 feet of Ro-boom resulted in a larger angle between the barge hull and the boom apex, so that the drag of the ice and boom precluded the boat from maintaining the desired boom angle relative to the barge hull and path of movement.[102]

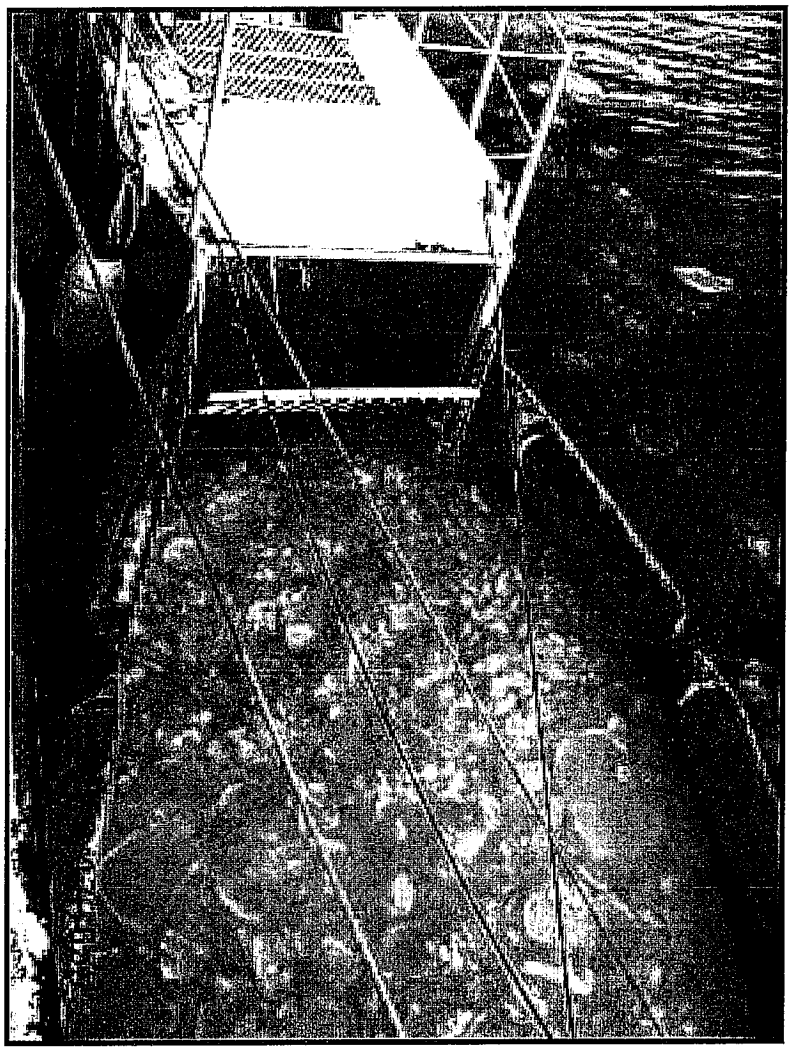

Figure 12. Photograph showing ice accumulation blocking the LORI skimmer during the fall trials.

ADEC observers noted that the Walosep skimmer was not

[98] The USCG notes that popcorn is not a perfect simulation of real oil. It is not a liquid and therefore is captured by ice that a liquid (like oil) might flow through.
[99] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Fall 2000," prepared for Alaska Clean Seas, October 27, 2000.
[100] This was measured with range finders and radar.
[101] Ted Moore and Kirsten Ballard, "North Slope Fall 2000 Barge Trials Oil Spill Response Equipment Tests Field Report," October 8-12, 2000.
[102] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Fall 2000," prepared for Alaska Clean Seas, October 27, 2000.

placed in the optimal skimming location in the pocket of the boom, but rather was deployed near the location where the LORI skimmer is usually placed.[103] Overall, the Walosep skimmer worked in grease and loose slush ice, but not pancake ice.

During the October 11 trials, the boom-gap between the BIDS and the bridle of the boom was smaller and it appeared to direct the surface water flow into the BIDS more effectively than it did the previous day. However, once the ice-dam filled the space between the BIDS and the LORI inlet, ice, therefore, presumably oil, was deflected from the skimmer intake.

The LORIs were tested in the remaining ice conditions needed to complete data collection. At one point, the LORIs on the barge filled with ice, and cold water wash was used to flush them. While the washing was observed to reduce the ice volume,[104] it was not determined whether this reduction in apparent volume represented successful flushing or just a compacting of the ice/water combination.[105] Other observers pointed out that flushing adds a considerable amount of water primary storage.[106] When the LORI skimmers were full of this ice/water mixture, they listed aft and the boomlet skirt was barely in the water. This both lifted the brushes up, but not out of the water, and allowed ice to entrain under the boomlets' skirts. The Desmi pumps did move some of the slush through the discharge hose, but did not effectively empty the hopper of the slushy ice.[107]

In testing the R-17 detached J configuration, the LORI remained operational and did not clog with ice at the intake. However, in grease ice, both LORIs' hoppers filled with slush. The external heat that was applied to the J-Boat LORI without a cover, and the cold water wash (<100 gallon per minute for 14 minutes), was ineffective in reducing the apparent volume or melting the slush. The cold water wash reduced the accumulation of slush in the hopper by about 1/3.[108] External heat was completely ineffective. In pancake ice, the ice accumulated in front of the intake as it did on the barge, blocking the brushes from any potential oil they might encounter. The brushes did not jam and the hopper did not fill with ice under the pancake ice condition.[109]

ADEC Personnel and ACS representatives discussed the tests of the external power pack in the field and determined that no further tests were necessary. It was later determined that the external power pack could not have been tested anyway due to possible safety issues in putting the 4500 pound unit on the deck of a bay boat and the resulting instability.[110] This test was postponed

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[103] Ted Moore and Kirsten Ballard, "North Slope Fall 2000 Barge Trials Oil Spill Response Equipment Tests Field Report," October 8-12, 2000.

[104] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Fall 2000," prepared for Alaska Clean Seas, October 27, 2000.

[105] Volumetric measurements were not taken, but one observer described the phenomenon as filling a glass with ice-chips and then adding some water. The ice sloughed down into the water and its relative volume decreased due to the surface tension of the water filling the air spaces between the ice chips. For example, a glass full of ice can reduced to 2/3 full of an ice-water mixture. Ted Moore and Kirsten Ballard, "North Slope Fall 2000 Barge Trials Oil Spill Response Equipment Tests Field Report," October 8-12, 2000.

[106] LT Joe Higgins, USCG, interview with authors, November 21, 2000.

[107] Ted Moore and Kirsten Ballard, "North Slope Fall 2000 Barge Trials Oil Spill Response Equipment Tests Field Report," October 8-12, 2000.

[108] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Fall 2000," prepared for Alaska Clean Seas, October 27, 2000.

[109] Ted Moore and Kirsten Ballard, "North Slope Fall 2000 Barge Trials Oil Spill Response Equipment Tests Field Report," October 8-12, 2000.

[110] On October 13, 2000, ACS managed to configure and demonstrate the LORI skimmer operation with a large/heavy external power pack. While it was successfully demonstrated that the power pack could operate the LORI independent of the boat's hydraulics, the boat was tethered to the dock and personnel refused to operate the

until the spring, due to increasing ice concentrations and the need to adapt and re-plumb a smaller power pack to test.[111]

Additional skimmer tests were also held on October 11 and 12. Skimmer tests were originally scheduled for the Walosep and the Transrec. However, the Transrec was not functional during the trial period and therefore could not be tested. Observers hypothesized that the Transrec would experience similar problems to the Walosep – isolation due to ice buildup in the skimming pocket of the boom.[112]

## Other Observations

### Response Equipment and Vessel Capabilities

Observers from the North Slope Borough noted that the condition of some of the response equipment used during the trials may have contributed to efficiency problems. Specifically, they noted that some of the equipment was 10 to 15 years old, and that the age of the equipment caused it to work less efficiently.[113] Observers from the USCG disagree with this assessment, because they felt the failures they saw would have occurred even with new equipment.[114]

Observers also noted that the types of propulsion systems used on many of the smaller response vessels were not appropriate for operations in grease ice and certain broken ice conditions.[115] At times, even the Crowley tug and barge had difficulty maneuvering in the ice conditions encountered. The representative of the North Slope Borough observed that some of the pilots who participated in the trials required additional training for operating in arctic ice conditions.[116] Observers from the USCG did not see specific documentation of facts to support this observation. They note that an Alaska Native ice expert, Charlie Hopson, was brought to supplement the tug operators and the tug operators that the USCG observed had considerable experience operating in ice.[117]

vessel/power pack configuration away from the dock because of vessel stability. This configuration was determined not to be a feasible option for powering the LORI skimmer.

[111] Ted Moore and Kirsten Ballard, "North Slope Fall 2000 Barge Trials Oil Spill Response Equipment Tests Field Report," October 8-12, 2000.

[112] Ted Moore and Kirsten Ballard, "North Slope Fall 2000 Barge Trials Oil Spill Response Equipment Tests Field Report," October 8-12, 2000.

[113] Ned Arey, NSB, interview with authors, November 21, 2000.

[114] Joe Higgins, USCG, communication with authors, December 9, 2000.

[115] In particular, jet boats have propulsion problems in these conditions. ACS is aware of this and has indicated that they will swap out the ocean response vessels accordingly.

[116] Ned Arey, NSB, Interview with authors, November 21, 2000.

[117] Joe Higgins, USCG, communication with authors, December 9, 2000.

## Spring Ice Conditions and Ice Estimation

Figure 13. Aerial photograph showing spring ice conditions on the Beaufort Sea.

Spring 2000 ice conditions consisted primarily of large ice floes, hundreds of feet in lateral size. Because there were no major storms to break the ice into smaller pieces, the ice conditions described in the BPXA Northstar C-plan - small chunks of ice piled together in high concentrations over large areas - were not encountered.[118]

Broken pieces of ice, many larger than 20 feet across, moved with the wind and would often pile up to 100% concentration. Ice conditions below 90% and above trace were temporary and occurred only on a small scale immediately after the wind shifted. These frequent shifts in ice concentration complicated the testing process because prevailing winds could significantly increase or decrease the concentration in a given area over a short period of time.[119]

The thawing process also impacted ice conditions as melt pools would leave large, subsurface ice shelves around each floe, so that the total ice coverage both above and below the surface was much greater than the ice coverage above the water line. These conditions complicated the ice estimation process, especially from afar, while estimating from the bridge of a vessel. This did not complicate the ice estimation process from the airborne ice expert. These conditions also complicated ice management because often times a vessel would attempt to push what appeared to be an isolated floe and would instead discover that is was part of a much larger floe, hundreds of feet across.[120]

The ice estimation process was further complicated by differences in opinion of various observers regarding observed ice concentrations. For example, during the July 22 mini-barge trials, two ice observers estimated percent coverage for one of the trials at 70, while another observer estimated only 30 to 40 percent coverage for the same transit.[121] Observers had differing levels of ice observation experience, training and time on-scene, ranging from one day to three weeks. Ice conditions also changed extremely quickly from an operational standpoint, adding to the variance in ice coverage estimations.

[118] Ed Thompson, Spring Barge Testing Program First Look, July 27, 2000.
[119] Ed Thompson, Spring Barge Testing Program First Look, July 27, 2000.
[120] Ed Thompson, Spring Barge Testing Program First Look, July 27, 2000.
[121] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.

## Data Recording

Observers and evaluators participating in the 2000 North Slope trials relied on two different approaches to data recording during the exercises. Representatives of ACS, BPXA, and several of the state and federal agencies used a set of quantitative data recording protocols, developed and designed to capture equipment downtime measurements by focusing on each distinct component of the response system individually. Some of these observers also recorded general observations. Conversely, representatives of ADEC and several other observing groups and agencies used a more qualitative system of measurement, focusing on the response system as a whole and assessing overall effectiveness in that manner.

While there was differences among the evaluating agencies regarding the merits of the qualitative vs. quantitative evaluation methods, the resulting conclusions of each system were quite similar. The majority of the tactics and equipment exercised were not effective in broken ice oil spill response.

## EVALUATIONS AND OUTCOMES

This section describes the outcome of the exercise test criteria identified for each drill session (Spring and Fall), based on the planned scope of each test and the requirements set forth in the contingency plan COA. The outcomes of some of these tests addressed the questions identified in the COA and drill test criteria. They also identified limitations in the broken ice response system and provided a baseline for equipment operations in certain spring and fall ice conditions. Many of these outcomes highlighted the need for additional testing or research and development to improve response efficiencies and meet the RPS.

### Spring 2000

#### *1. Deployment of the R-19A tactic in various spring ice conditions.*

The purposes of this test were to determine downtime due to ice interference; determine when the configuration must change from parallel to tandem; measure deployment time; test maneuverability of the configuration through position changes; and determine the spring RMROL.

Overall, the observations under the conditions that existed during the spring tests indicated that the general operating limit for the R-19A containment and recovery systems was ice coverage up to 30%,[122] managed down to 10% before it reaches the skimmer. In general, ice interference caused reduced effectiveness to the R-19A system.[123] Once ice concentrations passed 30%, the system quickly became overwhelmed and collapsed.[124]

Significant downtime was observed due to the effects of ice on the system. Swath width became out of conformance as the booms were maneuvered to avoid ice; boom failures occurred; ice became trapped in boom pockets and boom containment areas; and ice obstructed the LORI skimmer grate intake.[125] Observers agreed that the barge-based containment and skimming system was obstructed by pieces of ice longer than 20 feet.[126]

Oil recovery effectiveness under the R-19A tactic was affected by a number of factors, including downtime for both the J-boom and barge systems due to ice interference. Loss of boom angles occurred at speeds greater than 1 knot, waves greater than 2 feet, and winds greater than 20 knots.[127] One observer noted that the tug and barge had difficulties maintaining low speeds and at

[122] If ice chunks are large like they were during spring trials. In ice conditions of many smaller pieces, the operating limit may be even lower.
[123] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.
[124] Minerals Management Service, 2000, Memorandum dated September 12, 2000, from Christy Bohl, Environmental Protection Specialist, to Jeff Walker, Regional Supervisor Field Operations.
[125] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.
[126] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.
[127] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.

times ran in excess of 1 knot. These advanced speeds caused ice to entrain under the boom, which indicates that oil would also have been entraining.[128]

The deflectors were successful in keeping ice out of the skimmer system. However, there were other problems with the BIDS. At times, it had problems at the waterline and required adjustments. Until the BIDS were raised, the horizontal bracing on the BIDS, which was at the water's surface, had a tendency to divert any oil away from the skimmer, as indicated by the movement of sea-foam, small ice bits, and the first popcorn test. Also, of the two small booms that deflected oil into the skimmers downstream of the BIDS, where the inside boom failed to adequately seal to the side of the barge until the mount was changed. On the Port side the gap between the barge and the boom varied to a distance or approximately 2 feet, allowing significant amounts of ice and presumably oil to bypass the skimmer.[129]

The detached J-booms containment and recovery systems were only observed to operate at maximum effectiveness in open water or ice-free leads. In heavier concentrations of ice, they were unable to maintain the necessary speed and proper configuration because the tow vessels were required to maneuver radically and occasionally drop their boom greatly reducing the system effectiveness. Ice management practices actually aggravated these conditions, sending more ice down-current to the J-boom skimming systems, rendering them even less effective. Even under relatively low ice concentrations, the ice tended to close in behind the tug and barge and indicated that the formation depicted in the R-19A tactic is not appropriate for broken ice conditions.[130]

Two types of turning the entire tactic were attempted to determine which was the more effective way of maneuvering, a wheel-turn while fully deployed, and a small radius pivot-turn where the boom configuration was dropped before commencing the turn. During the wheel-turn, the J-boom positioning was compromised while the R-19A configuration executed a 180° turn while maintaining a fully deployed configuration. During the turn, it was difficult to maintain the position of the detached J-booms, and the swath width of the barge was greatly diminished. Ice management became more complicated because the boats clearing the path had a much larger area to police and had to push the ice greater distances to maintain the <10% ice concentration in front of the barge. The wheel-turn maneuver proved to be ineffective and time consuming, greatly reducing skimming efficiency. The 180° small radius pivot-turn proved to be a more effective means of executing an about face direction change.[131]

The average time required for full deployment of the R-19A task force was measured at four and a half hours after departing the dock and transiting approximately 12.5 miles. Ice conditions varied during these transits.[132]

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[128] Minerals Management Service, 2000, Memorandum dated September 12, 2000, from Christy Bohl, Environmental Protection Specialist, to Jeff Walker, Regional Supervisor Field Operations.
[129] ADEC, Memorandum from Ted Moore, Environmental Specialist, to Susan Harvey, Program Manager, and Robert Watkins, Section Manager, dated August 25, 2000.
[130] John Kotula, John Brown, Scot Tiernan and Kirsten Ballard, ADEC, Observer notes, July 19, 2000.
[131] Minerals Management Service, 2000, Memorandum dated September 12, 2000, from Christy Bohl, Environmental Protection Specialist, to Jeff Walker, Regional Supervisor Field Operations.
[132] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.

The outcomes of this test indicate the following:

- Without ice management, the R-19A tactic is a valid response strategy in open water or trace ice conditions only. For oil spill recovery in conditions exceeding 10% ice coverage, this tactic is not viable and alternative tactics should be investigated.
- With ice management, when ice conditions consist primarily of large ice chunks, tactic R-19A is valid in ice concentrations up to 30%, as long as they are managed down to 10% at the skimmer. . However, the actions of the ice management vessels may both deflect oil from the recovery system, and/or mix oil into the water column with the prop wash, further reducing the encounter rate of the tactic.
- Problems moderating vessel speeds cause entrainment of oil under the containment boom when in a "J" configuration.[133] If this tactic is to be used in these conditions, ACS must find a way to reduce the barge speed and moderate tug speeds or else identify alternate booming configurations or equipment that will still function at speeds above .8 knots.
- The upper limits of operability for this system, as currently described in the ACS TM should be adjusted downward to reflect the lower operating limits established for the barge-based recovery system during the spring trials.

***2. Use the lightering barge (*Beaufort 20 *or* Beaufort 21*) to test the access to designated offload areas.***

During the fall exercise the *Beaufort 20* was successfully maneuvered to the designated offload area. However, the exercise did not demonstrate that the vessel had access to a location with an offloading capacity to handle the 4,000 barrels per hour offloading rate indicated in the contingency plan. The outcome of this test indicates the following:

- A lightering barge such as the *Beaufort 20* can be maneuvered to an offload area.
- The offloading area used in the trial did not have sufficient infrastructure to handle the offload capacity specified in the contingency plan.
- The exercise did not demonstrate the entire lightering and oil/water transfer system as described in the contingency plan.

***3. Ice management using vessels to move large ice floes away from R-19A and using various techniques and maneuvers to prevent ice from entering the boom.***

The purpose of this test was to determine the viability and potential improvement of oil recovery operations when using a work boat to keep ice out of skimmers and boom.[134] Under the ice conditions that prevailed during the exercise period (generally between 30-50%), ice management vessels were generally capable of reducing ice coverage to 10 percent and less in the boom sweeps. The Point class tug pushed ice floes as large as 800 to 1,000 feet long. The barge-

[133] Barge speeds were seen to advance up to 2 knots. Towboat speeds fluctuated during maneuvers. Fluctuation in speed for both types of vessels caused problems with boom encounter rates and containment efficiency.
[134] COA 3(b).

based booms were capable of guiding pieces as long as 45 feet down the length of the boom to the apex.[135]

The goal of ice management was to limit the concentration of ice entering the skimming configuration to less than 10% and to keep individual pieces smaller than 6 feet. During one trial, ice management was limited to removing only pieces of ice larger than 20 feet out of the skimming path and allowing in excess of 10% ice to enter the barge skimming system. The system was overwhelmed within minutes of this ice encountering the booms and deflection components.[136]

An unresolved issue concerned the effects of propeller wash (prop wash) from the ice management and other vessels operating in the slick area. Because ice management vessels must transit through the oil in order to accomplish their objectives, they may deflect oil and/or churn the oil up with their prop wash, potentially causing it to emulsify to a larger extent than would occur naturally.[137] The prop wash from the bay-class vessels was observed to extend 200 to 300 feet behind them, and also to push surface water outside the boom collection area. The prop wash behind the Point Barrow was estimated to extend 2-3 times as far as that of the bay boats.[138] During the trials, the ice management boats practiced procedures to minimize the number of transits in front of the barge system, thus reducing the potential emulsification. They were able to reduce the number of transits, however the ice management vessels could not completely eliminate this activity.[139] The actual effect that the vessels would have on the concentrations of oil that would have been present is unknown.

Another common observation was that ice management did not extend to the detached J-boom skimming systems when they stayed in the R-19A configuration. Ice management vessels were effective in removing large pieces of ice from the path of the advancing barge, but ice management stopped as soon as these pieces had been cleared from the barge path so that they were encountered by the detached J-boom skimming systems. On at least one occasion, the detached skimming system was completely shut down and trapped by this ice because responders were instructed to hold the position described in the ACS TM.[140]

The outcomes of this exercise indicated the following:

- In order for ice management to be effective in improving oil recovery operations using tactic R-19A, ice management vessels must limit the concentration of ice reaching the skimmer to less than 10% and must ensure that the ice pieces that remain in the recovery swath are of an appropriate size and type to be handled by the system. [141]

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[135] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.
[136] Minerals Management Service, 2000, Memorandum dated September 12, 2000, from Christy Bohl, Environmental Protection Specialist, to Jeff Walker, Regional Supervisor Field Operations.
[137] Minerals Management Service, 2000, Memorandum dated September 12, 2000, from Christy Bohl, Environmental Protection Specialist, to Jeff Walker, Regional Supervisor Field Operations.
[138] John Brown and Kirsten Ballard, ADEC, Observer notes, July 21, 2000.
[139] John Kotula, John Brown, Scot Tiernan and Kirsten Ballard, ADEC, Observer notes, July 19, 2000.
[140] Minerals Management Service, 2000, Memorandum dated September 12, 2000, from Christy Bohl, Environmental Protection Specialist, to Jeff Walker, Regional Supervisor Field Operations.
[141] The parameters for ice sizes and type vary, in terms of the ability to handle them. In the trial, ice pieces larger than 20 feet generally overwhelmed the system, unless the ice pieces were old and easily broke into pieces.

- For the most part, larger pieces of solid ice (over 20') overwhelmed the barge-based skimming system.
- The R-19A tactic described in the ACS TM should be modified to give detached-J vessels the freedom to move to ice-free areas and to maximize encounter rates.
- Propeller wash from ice management and other response vessels may enhance emulsification and deflection of spilled oil and therefore reduce recovery system efficiency.

***4. Move the mini-barges between the detached units and the large support barge in various broken ice conditions.***

The purpose of this test was to determine the average speed in which both laden and unladen mini-barges could transit an area in various ice conditions to establish or verify RMROL's. The capability to transit mini-barges, both laden and unladen, was successfully demonstrated in a variety of ice conditions ranging to over 50% coverage. The mean transit speed of mini-barge shuttles was determined to be 4 knots. Transit speed was reduced with increased ice coverage.[142] This test worked well in all conditions except when a laden mini-barge was towed on the hip in 70% ice. During this trial, transit times were acceptable, but the vessel-barge configuration became "hung up" on a large ice floe but was able to quickly free itself and complete the transit.[143] Boat operators considered maneuvering with the barge in the hip position to be unsafe in 2-foot sea conditions. RMROL was established at above 70% ice coverage or in 2-foot seas.

The outcome of these tests may be summarized as follows:

- The purpose of this test was successfully accomplished. The average mini-barge transit speeds were determined and an RMROL was established for mini-barge transits.
- The test indicated that certain tow configurations (in particular the hip configuration) were not effective in higher ice concentrations.

***5. Transit the unladen barge* Beaufort 20 *through spring ice conditions with two tug configurations using the River class tugs and one Point class tug.***

The purpose of this test was to determine the ability of the *Beaufort 20* to maneuver in leads and to determine the ability to push its way through various concentrations of wind-driven broken ice. The *Beaufort* 20 was exercised in ice concentrations ranging from 50 – 90%. By following leads through the ice, the barge was able to successfully negotiate an area of large pans and smooth, weathered pieces.

Increased ice conditions were associated with slower transit speeds and slower turns for the laden barge. An increase in ice coverage from 30 -50 % led to a two-thirds reduction in transit speed. Transit speeds for the *Beaufort 20,* laden with seawater and carrying R-19A equipment on

[142] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.
[143] Tom DeRuyter, ADEC, Observational report, July 22, 2000.

deck, ranged from 0.75 to 3.5 knots in broken ice. The time required to turn the barge 180° also increased with increasing ice concentrations.

The Point class tug pushed the barge 50 percent faster than a pair of smaller River class tugs did. However, in 70% ice, the barge could not be maneuvered with a single Point class tug, requiring an additional tug to maintain steering and provide sufficient power. The additional tug was also used to scout ahead and perform ice management.[144]

The outcome of these tests may be summarized as follows:

- The purpose of this test was successfully accomplished. Transit speeds for the laden *Beaufort 20*, outfitted with R-19A equipment, was measured in varying ice conditions.
- The adequacy of the Point and River class tugs to power the *Beaufort 20* was established. This issue was raised in the COBC because initial documentation provided to ADEC was found by the Department to be inconclusive. The field trials, establishing that the tugs were adequately powered to maneuver the *Beaufort 20*, proved this point more conclusively.

***6. Transit the barge* Endeavor *through spring ice conditions while fully deployed for Tactic R-19A.***

The purpose of this test was to determine the ability of the *Endeavor* to maneuver in leads and to determine the ability to push its way through various concentrations of spring ice (30-70%). Fully deployed for Tactic R-19A, the *Endeavor* was able to perform a 180° turn with two exceptions. The boom boats had to narrow the gap between them and make the turn in relatively close formation. The detached J-boom skimming systems went out of position until after the turn was complete. Observers noted that the ice conditions during this trial were 30%, the very low end of the targeted 30-70% range.[145]

A coordinated 180° turn, while rigidly maintaining the R-19A formation, was attempted, but was not successful.[146] The rationale for attempting this turn was to increase skimming time by avoiding the need to remove the equipment and incur additional downtime. There was no expectation that this could be accomplished. This wheel-turn was conducted to see if it could be done or not, and was proven to be impractical.

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[144] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.

[145] Mike Bronson, Observer notes/data sheet, July 23, 2000, and Tom DeRuyter, ADEC, Observational report, July 23, 2000.

[146] One of the J-boom boats suffered multiple failures of their equipment shortly before the turn was started: the weld where the boom attaches to the skimmer came undone "like a zipper", due to a collision with ice; the skimming boat's port engine failed; and they had to drop out of formation. The lead boom boats for the barge used too much power and pulled the boom over and the boom clogged with ice. The starboard turn caused the port side boom to fail because of excessive speed, power and ice accumulation. The starboard side boom formed a pocket during the turn, which accumulated significant amounts of ice. John Kotula, John Brown and Kirsten Ballard, ADEC, Observer notes, July 20, 2000.

The outcome of this test indicated the following:

- Given that the RMROL for the system was established at 30% ice concentrations, the requirement to transit through 30 to 70% ice no longer applies.
- The inability to accomplish a 180° turn while in configuration suggests that additional downtime may need to be calculated into in the R-19A tactic. The downtime estimates for this tactic in the ACS TM will require adjustment.

***7. Demonstrate field support using various small craft to deliver personnel and equipment to the offshore task force and to support offshore task force on scene.***

The purposes of this test were to demonstrate the ability to swap out a full shift over a 5-hour period, evaluate the change-out plan and demonstrate the ability to deliver spare parts offshore, and to test a surprise spare part delivery from on-slope supplies.

Spare parts delivery was tested on July 17 and July 19. In the first case, replacement boom was delivered within 2.3 hours. In the second, spare engine filters were delivered within 1 hour.[147]

Crew relief was tested on July 23, when crews were swapped among the *Hawk, Mikkelsen Bay, Agviq,* and *Deployer.* Elapsed time from the West Dock to the relief crew's arrival at their deck stations was 2.75 hours. Elapsed time from West Dock departure to the arrival of the first shift personnel at West Dock was 4.25 hours.[148] In addition to Short Notice Response Team personnel, ACS utilized personnel from out of region sources. However, there were problems with shift briefings during crew change. Some of the incoming crews were not fully briefed on some of the requirements for the trials, causing a period of sporadic mini-barge transfers[149] during the second shift.[150] Members of Cook Inlet Spill Prevention and Response Inc. (CISPRI) and Alyeska Pipeline Service Company's Ship Escort and Response Vessel Service (SERVS) came from the Cook Inlet and Prince William Sound areas to augment the response activities.[151]

The outcome of this test met the trial goals.

- Crew change-out was accomplished within the time frame specified in the contingency plan. However, information transfer was incomplete during crew transfer.
- Spare parts delivery was established.

***8. Evaluate command, control, communications and aircraft spotting.***

The purposes of this test were to identify the factors that limit the use of spotter aircraft; use spotter aircraft to direct task forces to the spill site; use spotter aircraft to conduct video

[147] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.
[148] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.
[149] Severe weather was also a contribution factor to the sporadic transfers of mini-barges.
[150] Ted Moore, ADEC.
[151] Minerals Management Service, 2000, Memorandum dated September 12, 2000, from Christy Bohl, Environmental Protection Specialist, to Jeff Walker, Regional Supervisor Field Operations.

surveillance and deliver video; and test communications between shore-based operations and offshore task forces.

Helicopter guidance was observed to be most useful in targeting ice from one-quarter to 2 nautical miles from the task force. Within 1,000 to 2,000 feet, the tug wheelhouse offered the most useful view of the ice for steering the barge. Ice farther than a mile or two from the barge and reported by the helicopter frequently changed location or concentration by the time the barge arrived.[152]

Several observers noted that coastal fog banks had the potential to severely limit aircraft and vessel spotting capabilities.[153] The use of spotter aircraft was limited due to the presence of fog, which usually occurred frequently through the exercise's duration early in the day and did not allow the aerial observers to see the ocean below them.[154] These limitations were not tested as part of the exercise protocols. The fixed-wing aircraft pilot noted that flying conditions must allow 1 mile visibility clear of clouds. Helicopter pilots indicated that they need 3 miles visibility with a definite horizon and a 500-foot ceiling offshore, and that mist or haze that obscures the horizon precludes offshore flights for safety reasons.[155]

Radio communications were accomplished between shore-based units and both vessels and aircraft, when it was attempted.[156] The communication and coordination between the barge and vessels needs improvement to encompass the entire on-water operation and provide an overall view of the equipment on the water to ensure that maximum skimming efficiency s achieved.[157]

The time required to make a videotape and deliver it to the shore base was measured at 1 hour 40 minutes.[158]

The outcome of this test satisfied the following trial goals:

- Coastal fog conditions, which are common on the North Slope during the spring months, were found to significantly limit the use of spotter aircraft. Both the helicopter and fixed wing pilots provided general parameters for when they could and could not fly, but these tests were not directly part of the trial. The high level of variability in weather and visibility suggested that spotter aircraft may not provide a reliable means for spotting during certain conditions.
- Communications between the aircraft and on-water operations were accomplished but did not serve the intended purpose of improving

[152] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.
[153] Interview with authors.
[154] Minerals Management Service, 2000, Memorandum dated September 12, 2000, from Christy Bohl, Environmental Protection Specialist, to Jeff Walker, Regional Supervisor Field Operations.
[155] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.
[156] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.
[157] Minerals Management Service, 2000, Memorandum dated September 12, 2000, from Christy Bohl, Environmental Protection Specialist, to Jeff Walker, Regional Supervisor Field Operations.
[158] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.

encounter rates or skimming efficiency.[159] This process requires additional practice and improved coordination.

- The ability to make a videotape and deliver it to a shore-based unit was demonstrated.

### *9. Support the spring exercise by providing appropriate Meteorological and Ice Monitoring and Forecasting Services.*

The purpose of this test was to use an on-site ice observer to provide routine weather and ice briefings to Project Command Staff during testing, and to provide daily forecasts and projections during the week of breakup and during the testing. This test was also to involve the compilation of daily ice maps and predictions leading up to the date of the Spring Exercises.

Ice survey information was gathered by aerial observers who initially produced hand-drawn maps and later produced computer-based drawings.

During the trials, ice conditions changed frequently and quickly. The ice forecasts delivered by the ACS ice expert were not always the basis for selecting daily test locations, since his forecasts and observations tended to be the most dated/delayed and therefore the most likely to have changed by the time the task force received them. Ice detection/spotting methods included both aerial overflights and on-water observations. The final decision on exercise location was made by the tug skipper and barge master after reviewing all information available to them.[160] It is important to note that during an actual spill the responders would be seeking oil foremost.

The outcome of this test was:

- Ice monitoring and forecasting data were not regularly recorded and distributed to on-water response teams. Because ice conditions changed so quickly, the dated ice monitoring information was not useful.

### *10. Activate the hovercraft as required by the Conditions of Approval for the Contingency Plans.*

An unannounced test confirmed that the hovercraft could be mobilized in slightly more than 24 hours, well within the 72-hour requirement, meeting the purpose of this exercise test.

- The outcome of this test met the exercise criteria.

### *11. Test tactic R-17 as a subset of tactic R-19A.*

The purposes of this trial were to test the maneuverability of the R-17 skimming system in various conditions of broken ice, to determine what ice coverage limits the use of this system, and to determine the ability of the small boats to release ice that is captured in the boom. Tactic R-17, which is a sub-component of R-19A, involves an independent vessel-based skimming system

[159] Minerals Management Service, 2000, Memorandum dated September 12, 2000, from Christy Bohl, Environmental Protection Specialist, to Jeff Walker, Regional Supervisor Field Operations.
[160] Christy Bohl, MMS, LT Joe Higgins, USCG, and Ted Moore, ADEC, interview with authors, November 22, 2000.

with J-boom configurations attached to Bay Boats and functioning independently of the R-19A barge, one on each side (port and starboard).

The port detached J-boom system experienced approximately 20% downtime during the 12-hour test, due to ice-related and other factors, such as equipment malfunctions or complications.[161] The starboard J-boom skimming system experienced approximately 10% downtime.[162] While the detached J-boom systems were operating, there were times of reduced efficiency when the vessels maneuvered to avoid ice.[163]

The type of ice encountered was an important factor in setting the upper limit of operability for the R-17 tactic. The system could generally handle ice pieces up to 6 feet in size, and could successfully maneuver around larger pieces. The RMROL for this system was not definitively established, but was generally considered to be higher than for R-19A.[164]

Ice factors that caused J-boom skimming systems to become non-functional for an undetermined amount of time include ice becoming caught in the boom pocket, ice passing both over and under the boom, losing the J-shape of the boom while maneuvering to avoid ice, and ice obstructing the skimmer.[165] Additional downtime may have occurred due to the ice management vessels' directing ice into the path of the boats.

The outcome of this test indicates the following:

- The R-17 tactic is not functional in conditions above 10% ice, and the ice management tactics used during the drill did not effectively manage the ice encountered by the Bay Boats J-boom skimming systems.
- With room to maneuver the detached J skimming systems around large ice chunks or areas of high ice concentration, tactic R-17 may actually be effectively deployed in conditions above 10% ice coverage.[166]

**Fall 2000**

***1. Capability to maneuver a laden barge to offloading point.***

The purpose of this test was to demonstrate the ability to transit a laden barge to the short-term docking point, which will be in use for the next 3-5 years. The barge Beaufort 21 was

[161] Refer back to the observations for July 16-20, earlier in this section, for a more complete description of these complications.
[162] Note that this down time estimate, as reported in IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000, does not specify whether the down time was incurred when the skimmer was not operating or whether it reflects the time when the vessel was out of formation.
[163] Robert Watkins, ADEC.
[164] Christy Bohl, MMS, LT Joe Higgins, USCG, and Ted Moore, ADEC, interview with authors, November 22, 2000.
[165] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Spring 2000," prepared for Alaska Clean Seas, October 17, 2000.
[166] The size and type of ice pieces encounters will affect the upper limit of operability for this system.

successfully moored alongside barge 210. The Beaufort started approximately 1/2 mile offshore and was maneuvered by a Point class and a River class tug.167

The outcome of this test was successful.

- The exercise criterion was satisfied when the barge *Beaufort 21* was successfully moored alongside barge 210.

***2. Capability to offload a laden barge.***

The purpose of this test was to demonstrate the capability to offload recovered liquid from laden barges and lighter to an appropriate shore-based facility in such a manner so as to sustain response operations and meet the RPS for the approved C-plan. The test called for a demonstration of 4,000 barrels per hour offload rate. The test was to include the barges *Endeavor* and *Beaufort 20/21* to ensure the storage capacity of these barges is adequate for RPS.[168]

This test did not demonstrate the required offload capacity, for several reasons. The pump rate on the barge could not be maintained, and the required infrastructure for shoreside transfer was not in place. Because of contaminated cargo tanks and the occurrence of a reportable spill, this test was cancelled before it was completed.

The outcome of this test did not meet the test criteria:

- Shoreside infrastructure was not present to receive offloaded liquids at the capacity specified in the contingency plan. The shoreside infrastructure was not present because the USCG required a permit to be obtained for a vessel to shore transfer of hydrocarbons. The USCG would not have preclude a vessel to shore transfer of seawater.

- The pump rate on the barge could not be maintained at a level sufficient to meet the offload rates described in the contingency plan.

***3. R-19 barge transit.***

Each trial consisted of a barge transit involving a particular combination of boom length, skimmer type and ice type. A total of eight transits were run using LORI brush skimmers and the Walosep weir skimmer with 1500' and 500' boom lengths in varying ice conditions. As written in the testing plan, each transit was supposed to run for one hour. Only the first transit was run for the scheduled hour. Following this transit, it was discovered that once the boom pocket and skimmer intake became inundated with ice, the system was effectively shutdown. The remaining transits generally ran 30 minutes or less because the skimmers became isolated by accumulated ice within minutes of initiating the run.

At the daily debriefs observers agreed that for all barge-based skimming operations, isolation of the LORI skimmers by a buildup of ice eventually rendered the system ineffective, whether the skimmers continued pumping water and ice or the brushes were moving. The group

[167] ADEC, 2000, Memorandum dated October 4 from Ted Moore, Environmental Specialist, to Robert Watkins, Section Manager.
[168] Written correspondence between Mr. Robert Watkins, ADEC, and Mr. Nick Glover, BP Exploration Alaska, dated September 12, 2000 and September 25, 2000.

agreed that this ice-dam effect would likely exclude oil from the collection zone of the skimmers.169 The weir skimmers were observed to be effective in ice conditions up through loose slush. The weir skimmers pumped the loose slush readily. It was only when pancake or solid chunks of ice were encountered that the weir skimmer became isolated from surface oil and rendered ineffective.170

The length of the boom affected the way the ice was managed in the boom pocket and skimming zone. The amount of drag in the water and the weight of the ice buildup made it increasingly difficult to flush the ice collecting in the boom. 171 The Bay boats strained172 and were eventually unable to flush the ice so they were forced to dump the ice by towing the boom back around it.173

Overall, the equipment configuration demonstrated, as it did in July, that without an effective means to manage and process ice this tactic is ineffective for meeting the facilities' response planning standard. Once the tactic includes an effective means to process ice and the equipment deficiencies have been addressed, this response tactic could be quantitatively evaluated under varying ice conditions.174

The outcome of this test was as follows:

- The system does not function as intended in fall ice conditions. The presence of any fall ice at all constitutes RMROL, with the exception of the weir skimmers, which work up through loose slush conditions.

### *4. R-17 Bay class workboats with LORI skimmer.*

The purpose of this test was to exercise a Bay class workboat with a J-boom and a LORI skimmer in the detached configuration described in Tactic R-17. This exercise was to test the power system for the skimmer, first by plumbing it into the vessel's hydraulics and then using a Bay Boat with a separate power pack that operates the skimmer hydraulics independently of the vessel hydraulics.[175]

The hydraulic system for the LORI brushes was improved from the fall 1999 tests. By reconfiguring the hydraulic system, which included some bypass valves, the operation of the LORI improved. Hydraulics on the bay boat side-mounted skimmer worked within reasonable operational limits with the present system modifications without a separate power pack.[176] Through several maneuvers, which included speeding up, slowing down and turning, only the

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[169] Ted Moore and Kirsten Ballard, "North Slope Fall 2000 Barge Trials Oil Spill Response Equipment Tests Field Report," October 8-12, 2000.
[170] Joe Higgins, USCG, communication with authors, December 9, 2000.
[171] IT Alaska, Inc., "Oil Spill Response Equipment Tests in the Alaska Beaufort Sea, Fall 2000," prepared for Alaska Clean Seas, October 27, 2000.
[172] They were required to operate their engines at maximum rpms.
[173] Joe Higgins, USCG, communication with authors, December 9, 2000.
[174] Ted Moore and Kirsten Ballard, "North Slope Fall 2000 Barge Trials Oil Spill Response Equipment Tests Field Report," October 8-12, 2000.
[175] IT Alaska, Inc., "Data Recording Protocol for Oil Spill Response Equipment Tests, Alaska Beaufort sea, Fall 2000," prepared for Alaska Clean Seas, October 5, 2000. Consent Order No. 00-162-50-1456 in the matter of State of Alaska, Department of Environmental Conservation, Complainant vs. BP Exploration (Alaska), Inc., Respondent.
[176] Ed Meggert, ADEC, "Report on 2000 North Slope Fall Testing," October 16, 2000.

steering seemed to affect the brush speed. When the steering was activated, the brushes of the LORI would speed up somewhat. The LORI brushes and the skimmer pumps and hoses performed without freezing up.

The tests did not include a demonstration of the LORI Skimmer operation with a separate power pack, because when the power pack was mounted on the Bay Boat the vessel became unstable. Although this test was technically performed anyway, with the vessel tethered to the dock, this does not amount to a satisfactory demonstration of the COBC requirements.[177] However, several observers noted that the earlier demonstrations running the LORI skimmer off the revamped vessel hydraulics met the intent of this requirement.[178]

The outcomes of this test were as follows:

- The test did not meet the COBC requirement to test a separate power pack, but did demonstrate that modifications to the vessel hydraulic system would allow for operation of the LORI skimmer.
- The LORI brushes and the skimmer pumps and hoses performed without freezing up. However, at times when the steering was engaged on turns, the brushes would speed up slightly.

***5. Downtime and operational limits.***

The purpose of this test was to identify the operational time and downtime for the equipment in various ice conditions.

The Trans-rec skimmers did not function due to mechanical problems, therefore downtime was not directly measured. However, it was extrapolated that the Transrec would experience similar problems to the Walosep – isolation due to pancake ice buildup in the skimming pocket of the boom. The LORI skimmers did function, but were ineffective because they quickly clogged with ice, except in the detached J's, where the limiting factor was the hopper.[179]

According to the ADEC observers on-scene, RMROL for response in fall ice conditions was at trace ice coverage.[180]

The test objectives were accomplished:

- RMROL for response in fall ice conditions was established at trace ice coverage.
- The barge-based skimming system in R-19A suffers major problems in even trace ice conditions (with the exception of the weir skimmers, which worked up through loose slush conditions), and is not a stand-alone response option in fall ice conditions.

[177] Ted Moore and Kirsten Ballard, "North Slope Fall 2000 Barge Trials Oil Spill Response Equipment Tests Field Report," October 8-12, 2000.
[178] Christy Bohl, MMS and LT Joe Higgins, USCG, interview with authors, November 22, 2000.
[179] LT Joe Higgins, USCG, November 22, 2000.
[180] Ted Moore, ADEC, interview with author.

### *6. Ice Conditions*

The purpose of this portion of the exercise was to categorize ice conditions by percentage of coverage within the boom containment area.

The fall ice conditions proved extremely challenging for the operation of most open-water response equipment. Because the slushy, newly formed ice would pack up around most response devices, the encounter rates were effectively reduced to nothing and the response systems were ineffective.[181] One observer noted that the percentage of ice present was not a valid measure of RMOL for skimmers, because no matter what the percentage of ice encountered by the boom configuration it would concentrate to 100% at the skimmer.[182]

The Weir skimmers were observed to be successful in pumping slush ice, as long as the ice did not compact.[183]

This exercise was effective in identifying ice concentrations within the boom containment area, and the following outcomes were noted:

- Ice coverage during fall conditions cannot be used to measure RMROL for the skimmers, because regardless of the percentage of ice coverage, the newly formed fall ice tends to concentrate to 100% at the skimmer.

[181] Ted Moore, ADEC, interview with author.
[182] Ed Meggert, ADEC, "Report on 2000 North Slope Fall Testing," October 16, 2000.
[183] Christy Bohl, MMS, LT Joe Higgins, USCG, and Ted Moore, ADEC, interview with authors, November 22, 2000

## FINDINGS

The 2000 North Slope broken ice response trials were valuable field tests to determine whether traditional open water spill response tactics and equipment could be modified for use in fall freeze-up and spring break-up conditions. The trials identified many mechanical response limitations in broken ice conditions.

The Realistic Maximum Response Operating Limits (RMROL) for the R-19A barge based recovery system was determined to be:

- ~0-1% in fall ice conditions (varies with ice type),
- ~10% spring ice concentrations, without ice management,
- ~30% spring ice concentrations, with extensive ice management.

## RECOMMENDED ACTIONS

The Joint Agency Evaluations makes the following four recommendations for actions based on the outcomes of the Spring and Fall 2000 North Slope Broken Ice Exercises:

1. The tactics, scenarios and equipment cited in the North Slope C-plans and ACS TM require significant revisions to more accurately reflect the mechanical response limitations identified in the field test.

    a. Broken ice response tactics (R-19A and sub-tactics) should be revised in the ACS TM to reflect the actual operating limits observed during the trials, including the following:

        - RMROL of trace to 10% ice coverage.
        - Need for ice management to operate barge-based recovery system in spring ice conditions.
        - Reduced skimmer efficiencies in various ice conditions.

    b. Response scenarios in the North Slope C-plans should be revised to reflect the actual operating limits observed during the trials.

2. Additional research, development and field trials should be identified through coordination between the industry, agencies and NSB to develop additional tactics and response strategies that could expand mechanical response in broken ice conditions.

3. Federal and State Agencies should meet with the affected C-Plan planholders to develop a more detailed action plan. That plan should include evaluation of both improved prevention and response capabilities.

MEMORANDUM SUPPORTING REQUEST BY OCEANA AND UNIVERSITY OF CHICAGO ABRAMS ENVIRONMENTAL LAW CLINIC FOR FORMAL INVESTIGATION INTO DISCLOSURES MADE BY ROYAL DUTCH SHELL PLC ABOUT ITS U.S. ARCTIC OCEAN PROGRAM

**Exhibit 3:**

Letter from Susan Murray, Deputy Vice President, Pacific, Oceana, to Mark Fesmire, Alaska Region Director, BSEE (Feb. 27, 2015)

OCEANA Protecting the World's Oceans

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February 27, 2015

Mr. Mark Fesmire
Alaska Region Director
Bureau of Safety and Environmental Enforcement
3801 Centerpoint Drive, Suite 500
Anchorage, AK 99503

Dear Mr. Fesmire:

On June 10, 2014, Shell Offshore, Inc. and Shell Gulf of Mexico, Inc. (collectively, "Shell") submitted to the Bureau of Safety and Environmental Enforcement (BSEE) a "request for an initial five-year Suspension of Operations for their Outer Continental Shelf oil and gas leases in the Beaufort Sea and Chukchi Sea."[1] Shell's request does not comport with the regulatory requirements for a Suspension of Operations (SOO), fails to recognize the company's substantial role in its own failures, and should be denied in its entirety. When Shell—one of the most sophisticated companies in the world—invested billions of dollars to purchase leases in the Beaufort and Chukchi seas, it was aware, or certainly should have been, of the ten-year term of the leases, potential problems with government analyses and permitting, challenges inherent in operating in the Arctic Ocean, and substantial opposition to its proposed activities. BSEE owes the company no special treatment and should not bend the rules to grant the requested suspension.

Statoil and ConocoPhillips have submitted parallel requests—though premised in part on different arguments—for suspensions of their leases in the Chukchi Sea. Your agency already has correctly denied ConocoPhillips' request, and proceedings related to that request currently are stayed before the Interior Bureau of Land Appeals.[2]

The Outer Continental Shelf Lands Act (OCSLA) directs the Secretary of the Interior to promulgate regulations "for the suspension or temporary prohibition of any operation or activity, including production, pursuant to any lease or permit (A) at the request of a lessee, in the national interest, to facilitate proper development of a lease or to allow for the construction or negotiation for use of

[1] Letter from Peter Slaiby, Shell to Mark Fesmire, BSEE re: Shell Offshore Inc. and Shell Gulf of Mexico Inc. request for an initial five-year Suspension of Operations (July 10, 2014) (SOO Request). Oceana obtained this document pursuant to a Freedom of Information Act (FOIA) request submitted to BSEE on July 7, 2014. As an initial matter, Oceana encourages BSEE to make documents like the SOO Request available to the public when submitted. Public participation in government processes depends on timely access to important information, and BSEE should not wait for FOIA requests that require disclosure to make correspondence like this available. Moreover, BSEE has redacted portions of the SOO Request pursuant to FOIA Exemption 4, which protects confidential business information. *See* 5 U.S.C. § 552(b)(4). On February 26, 2015, Oceana submitted an appeal to BSEE on the grounds that the agency has not justified withholding the portions of the letter that have been redacted.

[2] *See* Letter from Michael Faust, ConocoPhillips to Mark Fesmire, BSEE, re: Request for Suspension of Operations, ConocoPhillips Chukchi Sea Leases (November 11, 2013); Letter from Mark Fesmire, BSEE, to Michael Faust, ConocoPhillips, re: Request for Suspension of Operations, ConocoPhillips Chukchi Sea Leases (Sale 193) (March 24, 2014) (denying ConocoPhillips' request for an SOO) (hereinafter, "ConocoPhillips SOO Denial"); Letter from Erik Andreas, BSEE, to Interior Board of Land Appeals, re: ConocoPhillips Company, Chukchi Sea Leases (Sale 193), Notice of Appeal; Letter from Bill Shoellhorn, Statoil, to Brian Salerno, BSEE (July 3, 2014).

transportation facilities . . . ."[3] The regulations must allow for "the extension of any permit or lease affected by suspension . . . by a period equivalent to the period of such suspension or prohibition."[4]

The regulations implementing that directive allow BSEE to grant an SOO in any of five circumstances:

a) When necessary to comply with judicial decrees prohibiting any activities or the permitting of those activities. The effective date of the suspension will be the effective date required by the action of the court;
b) When activities pose a threat of serious, irreparable, or immediate harm or damage. This would include a threat to life (including fish and other aquatic life), property, any mineral deposit, or the marine, coastal, or human environment. BSEE may require you to do a site-specific study (see § 250.177(a))[;]
c) When necessary for the installation of safety or environmental protection equipment;
d) When necessary to carry out the requirements of NEPA or to conduct an environmental analysis; or
e) When necessary to allow for inordinate delays encountered in obtaining required permits or consents, including administrative or judicial challenges or appeals.[5]

Though its letter is not clear, Shell only appears to premise its request on some combination of subsection e) and a subsequent regulation allowing for an SOO to be granted "when necessary to allow you time to begin drilling or other operations when you are prevented by reasons beyond your control, such as unexpected weather, unavoidable accidents, or drilling rig delays."[6] These provisions do not allow BSEE to grant an SOO for Shell's Arctic Ocean leases.[7]

According to Shell, suspension is warranted based on:

- multiple time-consuming federal court and administrative challenges, appeals, and remands, based upon findings that the Government had failed adequately to carry out its legal obligations, resulting in repeated prohibitions against Shell's engagement in exploratory operations, often on the eve of such operations, and often after Shell had expended hundreds of millions of dollars in preparatory work, most of which it has not been able to recoup or redeploy

[3] 43 U.S.C. § 1334(a)(1)(A). The statute also requires regulations allowing for suspension "if there is a threat of serious, irreparable, or immediate harm or damage to life (including fish and other aquatic life), to property, to any mineral deposits (in areas leased or not leased), or to the marine, coastal, or human environment…." *Id.* § 1334(a)(1)(B).
[4] *Id.* § 1334(a)(1). The provision continues, "[N]o permit or lease shall be so extended when such suspension or prohibition is the result of gross negligence or willful violation of such lease or permit, or of regulations issued with respect to such lease or permit." *Id.* To the extent, therefore, that Shell's activities resulted in an SOO, it may be that the SOO should not extend the term of the company's leases.
[5] 30 C.F.R. § 250.172.
[6] *Id.* § 250.172(a). Shell does not specify which subsections might give BSEE the authority to grant its SOO request, instead simply citing the entire regulatory section. *See e.g.*, SOO Request at 1 & 8 (citing 30 C.F.R. §§ 250.168-.177 and referring to § 250.172(e) as an "illustrative example").
[7] If, in fact, Shell relies on other regulatory authority, its arguments would be similarly unpersuasive. For example, in addition to rejecting the company's other arguments, BSEE determined that neither section 30 C.F.R. § 250.172(b) nor § (c) justified ConocoPhillips' request for an SOO. *See* ConocoPhillips SOO Denial at 2. The reasons provided in that denial are equally applicable here.

- BSEE's unexpected and unprecedented determination to introduce a fixed operational time constraint on drilling into a prospective reservoir zone, specifically the September 24 cut-off in the approved Chukchi Exploration Plan
- accommodation of Alaska Native whaling season in the Beaufort Sea
- limited Arctic-viable and regulatory-compliant drilling rigs
- BSEE's announced intention to develop new, comprehensive operating regulations specific to all future drilling operations on the Alaska OCS[8]

It describes these factors as creating "[c]ircumstances Shell could not have anticipated at the time it acquired its leases [that] significantly impede Shell's utilization of its lease rights to proceed with exploration and development of its Alaska leases before they are due to expire."[9]

Primarily, Shell appears to argue that an SOO is warranted to account for delays in its exploration program that resulted from successful court challenges to government plans, lease sales, and approvals. Specifically, the company contends that it "lost" six exploration seasons due to successful litigation challenging: 1) approval of its 2007-09 Beaufort Sea Exploration Plan; 2) the 2007-2012 Five-Year Leasing Program; and 3) Chukchi Sea Lease Sale 193.[10] It also points to the Secretary of the Interior's decision not to grant approvals necessary for exploration in the wake of the *Deepwater Horizon* accident and to appeals to the Environmental Appeals Board of EPA's grant of Clean Air Act permits as reasons that exploration was precluded.[11]

These court cases, even if they could support an SOO, were not "circumstances Shell could not have anticipated at the time it acquired its leases." Strong opposition among Alaska Native entities, local governments, and conservation organizations to leasing and exploration in the Chukchi and Beaufort seas has not been a secret. Shell certainly was aware, or should have been, of that opposition and the likelihood that litigation would result. Further, five-year leasing programs and Arctic Ocean lease sales have been challenged regularly in court.[12] More specifically, the lawsuit challenging Chukchi Sea Lease Sale 193 was filed before the sale was held, and shortly after filing the suit, the plaintiffs sent a letter to the Department of Justice identifying several of the deficiencies in the analysis and requesting that the sale be delayed.[13]

Moreover, Shell should have been aware of the deficiencies in the analyses that led courts and the Environmental Appeals Board to invalidate government decisions. The plaintiffs (or appellants) in each of those suits participated in the public process related to those decisions. That participation included submitting comments to the relevant agency in which the substantive deficiencies were identified. The arguments presented in the relevant court cases and appeals are based on the problems detailed in those letters. Shell is one of the most sophisticated companies in the world. If the deficiencies in the government's analysis were apparent to Alaska Native entities and conservation organizations, they

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[8] Shell SOO at 2.
[9] *Id.*
[10] *See* Shell SOO Request at 3-4 (referencing *Alaska Wilderness League v. Kempthorne*, 548 F.3d 815 (9th Cir. 2008), *Ctr. for Biol. Div. v. Dep't of Interior*, 563 F.3d 466 (D.C. Cir. 2009); *Native Village of Pt. Hope v. Salazar*, 730 F. Supp. 2d 1009 (D. Alaska 2010); and *Native Village. of Pt. Hope v. Jewell*, 740 F.3d 489 (9th Cir. Jan. 22, 2014).
[11] *Id.* at 4.
[12] *See* Michael LeVine et al., *Oil and Gas in America's Arctic Ocean: Past Problems Counsel Precaution*, 37 Seattle L. Rev. 1271, 1313-21 (2014).
[13] *See* Letter from to (2008).

certainly should have been apparent to Shell. Accordingly, the successful cases should not have been entirely "unanticipated."

Further, Shell fails entirely to take responsibility for its own failures. Notably, the company simply does not mention 2012 or 2013 as "lost" years. It does not mention the myriad of problems it encountered in 2012, culminating in the grounding of the *Kulluk*. Shell also fails to acknowledge that the new prevention and response regulations applicable to all Arctic Ocean drilling operations are, in large part, the result of the company's own mistakes in 2012 that demonstrated the need for those regulations.[14]

Nor does it accept responsibility for pushing forward based on insufficient preparation and deficient government analyses. Shell was not forced to purchase leases or push for approval of its exploration proposals. Another course—in which the company encouraged the government to fully and fairly evaluate all potential impacts and risks before selling leases or approving exploration—was available to Shell.

Further, Shell does not explain how these delays justify a five-year suspension in either the Beaufort or Chukchi seas. Suspensions were granted in the past to account for Shell's inability to pursue exploration as a result of the court cases referenced above. In fact, leases in the Chukchi Sea are currently suspended. Rather than providing any specific justification for the length of the extension sought, Shell simply claims that "lost time has not been adequately compensated by the limited, short-term suspensions Shell has received to date" and that "[t]he short-term suspensions Shell has received to date for the Alaska OCS do not begin to reflect the extent of the actual delays Shell suffered resulting from court decisions and agency delays."[15] Even if those statements are true, they do not create new authority under which BSEE may grant an SOO or alleviate Shell of its obligation to justify the length of the suspension it seeks.

The other factors cited by Shell to justify a five-year suspension are no more persuasive. Neither the "operational time constraint" nor new safety and prevention regulations referenced by Shell contributed to the company's inability to complete exploration since purchasing leases. In fact, BSEE rejected precisely this argument in denying ConocoPhillips' SOO request, concluding that "the planned development of generally-applicable, Arctic-specific standards[] does not prevent you from submitting an exploration plan . . . and beginning drilling or other operations."[16]

Shell also contends that an SOO is warranted because "the available drilling season has been abbreviated further due to Shell's accommodation for Native community traditional whaling activities. This accommodation significantly reduces the already limited drilling season."[17] Any "accommodations" Shell may have made in the past have not been the cause of its failed exploration efforts, and Shell certainly should have anticipated needing to meet its statutory obligation to protect subsistence uses in the area. None of these efforts justify an SOO.

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[14] U.S. Dep't of the Interior, Review of Shell's 2012 Alaska Offshore Oil and Gas Exploration Program 6-7 (2013), *available at* http://www.doi.gov/news/pressreleases/upload/Shell-report-3-8-13-Final.pdf.
[15] Shell SOO at 5&9.
[16] ConocoPhillips SOO Denial at 2. The "operational time constraint" referenced by Shell appears to refer to the requirement that drilling operations cease with sufficient time to allow for completion of a relief well, if one were necessary, before the end of the season. This requirement is included in the draft "Requirements for Exploratory Drilling on the Arctic Outer Continental Shelf" released by BOEM and BSEE on February 20, 2015. *See* Department of the Interior, Oil and Gas and Sulphur Operations on the Outer Continental Shelf—Requirements for Exploratory Drilling on the Arctic Outer Continental Shelf, *available at* http://www.bsee.gov/uploadedFiles/Proposed%20Arctic%20Drilling%20Rule.pdf.
[17] Shell SOO at 6.

Shell's reliance on the difficulties of operating in the Arctic Ocean, the paucity of available rigs, and other logistical challenges are no more persuasive.[18] It is undeniably true—as Shell, unfortunately, learned in 2012—that the Arctic Ocean is a difficult and remote place to operate and that there is a limited supply of equipment capable of withstanding the elements. Shell, however, was well aware of these challenges when it purchased leases and decided to pursue exploration. The company has repeatedly assured the government and public that it is capable of operating safely in the Arctic Ocean; in part, these assurances have been based on the fact that the company drilled exploration wells in the U.S. Arctic Ocean in the past. It should not be able now to rely on challenges in meeting those commitments to justify an SOO.

Moreover, Shell's request, particularly as it relates to its Chukchi Sea leases, is untimely. Here, Shell's Chukchi leases will not expire until at least 2019 and are currently suspended. As BSEE noted in concluding that ConocoPhillips' SOO request was "not ripe," Shell seeks "what effectively would be a 50 percent extension of the primary term of its leases less than halfway through that term."[19]

Operating in the Arctic Ocean is dangerous, controversial, and logistically challenging. Those facts, however, do not allow BSEE to bend its rules to grant Shell an unjustified extension of its leases. Shell knew the rules and realities when it purchased the leases it now owns, and BSEE should not give special treatment to the company. We encourage BSEE to follow the example it set by denying ConocoPhillips' SOO Request and deny Shell's as well.

Thank you again, and we look forward to working with you on this and other issues.

Sincerely,

Susan Murray
Deputy Vice President, Pacific
Oceana

cc: Tommy Beaudreau, Chief of Staff, Secretary of the Interior
Brian Salerno, Director, Bureau of Safety and Environmental Enforcement

[18] Shell SOO Request at 6-7.
[19] ConocoPhillips SOO Denial at 2.

MEMORANDUM SUPPORTING REQUEST BY OCEANA AND UNIVERSITY OF CHICAGO ABRAMS ENVIRONMENTAL LAW CLINIC FOR FORMAL INVESTIGATION INTO DISCLOSURES MADE BY ROYAL DUTCH SHELL PLC ABOUT ITS U.S. ARCTIC OCEAN PROGRAM

**Exhibit 4:**

Declaration of Chandler T. Wilhelm, Native Vill. of Point Hope v. Kempthorne, No. 1:08-cv-0004-RRB, 2010 WL 2943120 (D. Alaska July 21, 2010)

Kyle W. Parker
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*Attorneys for Shell Gulf of Mexico Inc.*

**IN THE UNITED STATES DISTRICT COURT**
**FOR THE DISTRICT OF ALASKA**

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|---|---|
| NATIVE VILLAGE OF POINT HOPE, *et al.*,<br><br>Plaintiffs,<br><br>v.<br><br>DIRK KEMPTHORNE, *et al.*,<br><br>Defendants. | Case No. 1:08-CV-0004-RRB |

**DECLARATION OF CHANDLER T. WILHELM**
**28 U.S.C. § 1746**

1. My name is Chandler T. Wilhelm. I have first-hand experience with, and personal knowledge of, the facts and matters discussed in this declaration.

2. I am the Alaska Exploration Manager for Shell Exploration & Production Company ("SEPCo"). SEPCo's principal office is in Houston, Texas. SEPCo and Shell Gulf of Mexico Inc. ("SGOMI"), the high bidder for the federal oil and gas leases described more fully below, have a rapidly expanding presence in Alaska, which includes an office in Anchorage. SEPCo and SGOMI are wholly owned subsidiaries of Shell Oil Company ("Shell").

3. I am a professional petroleum geologist with approximately 25 years of experience working in the oil and gas exploration and production industry. I hold the following degrees: B.A., 1979, Geology, Pomona College; M.S., 1983, Geological Sciences, University of Colorado; Certificate of Completion, 1997, Global Finance Program, University of Texas Graduate School of Business. I have been employed by Shell or its affiliates since 1983.

4. As Alaska Exploration Manager for SEPCo, I direct execution of the Alaska exploration program. I manage and oversee administration of Shell's Alaska oil and gas lease portfolio, participate in decisions on investments in new oil and gas leases, and oversee execution of seismic and drilling operations. I have a staff of approximately 40 technical professionals in Houston and Anchorage who work as a part of my team. In addition, I work closely with the Government and External Affairs staff in Anchorage, Houston, and Washington, D.C., to ensure that Shell conducts its business in Alaska with appropriate attention to stakeholder issues and in compliance with all applicable local, state and federal laws, as well as Shell standards.

5. I make this declaration in support of SGOMI's request to intervene in the above-captioned litigation. SGOMI has substantial interests that are directly and significantly affected by this litigation, as I discuss further below. No other party to this appeal represents the company's interests in this case. SGOMI desires to participate in this appeal as a party to protect its interests. I believe that its participation will be helpful and beneficial to the court and the process generally, and that this participation will aid in the development of a more complete record in this case. This motion to intervene is not brought for purpose of delay or any other improper purpose.

6. In addition to the leases acquired in Chukchi Sea Oil and Gas Lease Sale 193 ("OCS Lease Sale 193") which I will describe in the next paragraph, SGOMI acquired 49 leases in the Beaufort Sea Oil and Gas Lease Sale 202 in 2007 with a total bonus value of $39.3 million. Shell Offshore Inc. ("SOI"), a subsidiary of Shell and an affiliate of SGOMI, holds interests in 130 federal oil and gas leases located in the Beaufort Sea off the North Slope of Alaska.

7. On February 6, 2008, the U.S. Department of Interior, Minerals Management Service ("MMS") held Chukchi Sea Oil and Gas Lease Sale 193 ("OCS Lease Sale 193"). OCS Lease Sale 193 was a competitive oil and gas lease sale covering federal lands off-shore of the Northwest coast of Alaska in the Chukchi Sea. SGOMI participated in OCS Lease Sale 193, bidding on a total of 302 leases for a total bid amount of $2.2 billion. SGOMI was the apparent high bidder on 275 leases, with apparent high bids totaling $2,117,821,183.

8. On or about March 5, 2008, SGOMI was formally awarded 47 leases by the Department of Interior. This was the first group of leases from the OCS Lease Sale 193 to be formally awarded to SGOMI. SGOMI expects that the remaining 228 leases will be awarded over the next several months. The total bid amount for these 47 leases was $117,451,573.68. As the holder of these 47 leases arising out of OCS Lease Sale 193, SGOMI has acquired immediate rights under the Outer Continental Shelf Lands Act. These rights are placed directly in interest in this litigation, in which the Plaintiffs seek to set aside OCS Lease Sale 193, or in the alternative, an injunction against any action in furtherance of the leases.

9. A significant amount of time and resources has been invested in several critical areas to prepare for OCS Lease Sale 193. First, beginning in February 2004, a technical team was assigned to study exploration and development opportunities in the Chukchi Sea, including the retrieval and study of massive amounts of 2-D seismic data that was originally acquired in the

1970s and the 1980s. Second, two full seasons of 3-D seismic acquisition in the Chukchi Sea were conducted in 2006 and 2007 to enable study of the geology and to identify the most promising tracts offered in the sale area. This 3-D seismic analysis involved securing permits from the MMS, the National Marine Fisheries Service and the United States Fish and Wildlife Service. Third, an enormous financial commitment has been made to assemble the only arctic-capable drilling and oil spill response fleet in the United States. This investment in arctic-capable ships, supply vessels and rigs was made with the expectation that this fleet would be utilized for exploration and development in both the Beaufort Sea and the Chukchi Sea. Finally, because each of the 302 leases on which SGOMI bid have their own unique geology, personnel spent thousands of hours evaluating data and developing and running hundreds of subsurface and economic models to justify the decision to bid $2.2 billion at OCS Lease Sale 193. Taken together, nearly $100 million has been spent in preparation for SGOMI's participation in OCS Lease Sale 193.

10. Plaintiffs have requested the Court either to set aside the leases or enjoin further action to implement the leases. Either outcome would impair SGOMI's property interests and negate SGOMI's significant investment of time and resources.

11. SGOMI has a substantial interest in ensuring that OCS Lease Sale 193 is upheld and protecting its bidding strategy. In addition to the risk posed to SGOMI's property interests in the leases themselves, Plaintiffs' lawsuit also presents a risk to SGOMI's valuable business information. In preparation for OCS Lease Sale 193, SGOMI initiated a bidding strategy that was informed by more than four years of work and substantial scientific and economic research. SGOMI's bidding strategy, as well as the tracts of land that SGOMI believes are the most valuable, are now public knowledge. If the leases were to be rescinded as Plaintiffs request,

SGOMI would be harmed because the knowledge it acquired during the four years leading up to for OCS Lease Sale 193 would hold considerably less value and would be available to competitors in any subsequent re-bids.

12. Even if the court does not set aside OCS Lease Sale 193, any delays in exploration or development caused by this lawsuit will also harm SGOMI, decreasing the value of its interests in the leases and potentially impeding their exploration and any subsequent development. Any periods of significant delay increase the risk of declines in the value of SGOMI's interest, and increase the costs of exploration and development. If delays are sufficiently long or if impediments sufficiently extreme, SGOMI may be completely prevented from exploring and developing its offshore federal leases. In such a situation, SGOMI would receive no benefit from the substantial investments it has have already made in OCS Lease Sale 193.

13. I declare under penalty of perjury that the foregoing is true and correct.

Executed on March 10, 2008.

Chandler T. Wilhelm

Chandler T. Wilhelm