

# Oil and Gas Activity Forecast Beaufort Sea 2012-2027

Prepared for  
BREA Results Forum Inuvik  
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# Purpose of the Activity Forecast

- Intended to provide a general description of potential future oil and gas activities in the Beaufort Sea
- Focus was short to medium timeframe (15 years)
- To provide BREA Steering Committee, working groups and arctic researchers with a common forecast for assessing priorities, scope and timing of research
- Intended to help with understanding the implications of BREA research findings

# Topics Covered in the Activity Forecast

- History of Oil and Gas Industry in the Region
- Drilling Platforms Developed for the Region
- Wells Drilled in the Beaufort Sea
- The Cycle of Offshore Exploration and Development
- Regulatory Regime and Rights Management
- Timeline for a Generalized Development Project
- Description of Potential Future Industry Activities
- Forecast of Exploration and Development 2012-2027
- Mackenzie Delta-Beaufort Sea Resource Potential

# History

- Onshore exploration began in Mackenzie Delta / Beaufort Sea in 1957
- Offshore drilling began in 1972
- Total Canadian Arctic offshore wells drilled = 142
- Beaufort Sea offshore wells drilled = 92
- Last Beaufort Sea offshore well drilled 2005-2006

# Extremely Harsh Drilling Environment

**Canmar Explorer 1 and  
Icebreaker being forced off  
station by heavy ice  
October 1978  
Source:  
Gulf Canada Resources**



# Industry Operated Successfully by Developing Innovative Drilling Platforms and Techniques

- Drilling from Artificial Islands
- Caisson Drilling Structures
- Floating Drillships
- Floating Drilling Platforms
- Spray Ice Islands

**Concrete Caisson**  
**Tarsuit Caisson**  
**Source:**  
**G.W. Timco**



**Single Steel  
Drilling Caisson  
Source:  
G.W. Timco**



**Kulluk  
Conical Floating  
Drilling Platform  
Source:  
Gulf Canada Resources**



# Historical Oil and Gas Activity Canadian Beaufort Sea

Molikpaq  
Mobile Arctic Caisson  
Source:  
Gulf Canada Resources



WELL NAME	WELL OPERATOR	WELL SPUD DATE	RIG RELEASE	DRILLING PLATFORM	WATER DEPTH (M)
<b>NUKTAK C-22</b>	Imperial	16-Dec-1972	8-Mar-1973	Land on Hooper Is	NA
<b>IMMERK B-48</b>	Imperial	17-Sep-1973	22-Dec-1973	Sacrificial Beach Is	3
<b>ADGO F-28</b>	Imperial	28-Dec-1973	19-Mar-1974	Sandbag Retained Is	2
<b>PULLEN E-17</b>	Imperial	21-Apr-1974	11-Jul-1974	Sandbag Retained Is	2
<b>UNARK L-24</b>	Sun	26-Sep-1974	24-May1975	Hauled Island	2
<b>PELLY B-35</b>	Sun	5-Oct-1974	14-Feb-1975	Hauled Island	2
<b>ADGO P-25</b>	Imperial	2-Jan-1975	28-Mar-1975	Sandbag Retained Is	2
<b>NETSERK B-44</b>	Imperial	6-Jan-1975	8-Jun-1975	Sandbag Retained Is	5
<b>ADGO C-15</b>	Imperial	21-Apr-1975	25-Jul-1975	Sandbag Retained Is	2
<b>IKATTOK J-17</b>	Imperial	10-Jul-1975	28-Feb-1976	Sandbag Retained Is	2
<b>NETSERK F-40</b>	Imperial	8-Nov-1975	9-May-1976	Sandbag Retained Is	8
<b>SARPIK B-35</b>	Imperial	2-Apr-1976	4-Sep-1976	Sandbag Retained Is	4
<b>KOPANOAR D-14</b>	Dome	8-Aug-1976	26-Sep-1976	Canmar Explorer 3	60
<b>TINGMIARK K-91</b>	Dome	11-Aug-1976	18-Oct-1977	Canmar Explorer 1/3	28
<b>NEKTORALIK K-59</b>	Dome	23-Sep-1976	17-Oct-1977	Canmar Explorer 2/3	64

WELL NAME	WELL OPERATOR	WELL SPUD DATE	RIG RELEASE	DRILLING PLATFORM	WATER DEPTH (M)
<b>KOPANOAR M-13</b>	Dome	27-Sep-1976	10-Sep-1979	Canmar Explorer 3	57
<b>KUGMALLIT H-59</b>	Imperial	30-Sep-1976	10-Nov-1976	Sandbag Retained Is	5
<b>ARNAK L-30</b>	Imperial	5-Oct-1976	16-Mar-1977	Sacrificial Beach Is	9
<b>UNARK 2L-24</b>	Sun	19-Oct-1976	8-May-1977	Hauled Island	2
<b>KANNERK G-42</b>	Imperial	30-Mar-1977	14-May-1977	Sacrificial Beach Is	8
<b>UKALERK C-50</b>	Dome	18-Jul-1977	3-Oct-1977	Canmar Explorer 1	42
<b>KAGLULIK A-75</b>	Dome	19-Jul-1977	6-Aug-1978	Canmar Explorer 3	39
<b>NERLERK M-98</b>	Dome	4-Oct-1977	28-Aug-1982	Canmar Explorer 1/3	52
<b>ISSERK E-27</b>	Imperial	4-Dec-1977	5-May-1978	Sacrificial Beach Is	13
<b>NATSEK E-56</b>	Dome	10-Jul-1978	8-Oct-1979	Canmar Explorer 2-4	34
<b>UKALERK 2C-50</b>	Dome	10-Aug-1978	11-Oct-1979	Canmar Explorer 1	42
<b>TARSIUT A-25</b>	Dome	18-Oct-1978	28-Jul-1980	Canmar Explorer 3	20
<b>KAGLULIK M-64</b>	Dome	3-Nov-1978	10-Jul-1979	Canmar Explorer 2	27
<b>ADGO J-27</b>	Esso	5-Apr-1979	7-Aug-1979	Sandbag Retained Is	2
<b>KENALOOAK J-94</b>	Dome	20-Sep-1979	1-Nov-1982	Canmar Explorer 2-4	68

WELL NAME	WELL OPERATOR	WELL SPUD DATE	RIG RELEASE	DRILLING PLATFORM	WATER DEPTH (M)
<b>KOPANOAR L-34</b>	Dome	11-Oct-1979	26-Nov-1979	Canmar Explorer 2	58
<b>KOAKOAK O-22</b>	Dome	5-Nov-1979	31-Oct-1981	Canmar Explorer 1/2	49
<b>KOPANOAR 2L-34</b>	Dome	26-Nov-1979	28-Nov-1979	Canmar Explorer 4	56
<b>ISSUNGNAK O-61</b>	Imperial	6-Feb-1980	8-Jul-1980	Sacrificial Beach Is	37
<b>KILANNAK A-77</b>	Dome	23-Jun-1980	4-Sep-1981	Canmar Explorer 3	38
<b>ORVILRUK O-03</b>	Dome	9-Jul-1980	16-Sep-1980	Canmar Explorer 1	60
<b>KOPANOAR I-44</b>	Dome	10-Jul-1980	1-Aug-1980	Canmar Explorer 4	59
<b>KOPANOAR 2I-44</b>	Dome	2-Aug-1980	28-Oct-1981	Canmar Explorer 2	58
<b>ISSUNGNAK 2O-61</b>	Imperial	2-Oct-1980	13-Aug-1981	Sacrificial Beach Is	19
<b>N. ISSUNGNAK L-86</b>	Gulf	17-Jul-1981	17-Oct-1981	Canmar Explorer 2	26
<b>ALERK P-23</b>	Imperial	21-Sep-1981	24-Dec-1981	Sacrificial Beach Is	12
<b>IRKALUK B-35</b>	Dome	27-Sep-1981	4-Oct-1982	Canmar Explorer 4/2	58
<b>E. TARSUUT N-44</b>	Gulf	10-Dec-1981	7-Jun-1982	Concrete Caisson	19
<b>W. ATKINSON L-17</b>	Imperial	1-May-1982	25-Jun-1982	Sandbag Retained Is	7
<b>E. TARSUUT N-44A</b>	Gulf	8-Jun-1982	19-Sep-1982	Concrete Caisson	19

WELL NAME	WELL OPERATOR	WELL SPUD DATE	RIG RELEASE	DRILLING PLATFORM	WATER DEPTH (M)
<b>KIGGAVIK A-43</b>	Gulf	21-Jul-1982	17-Oct-1982	Canmar Explorer 1	18
<b>AIVERK I-45</b>	Dome	5-Oct-1982	23-Oct-1982	Canmar Explorer 2	62
<b>AIVERK 2I-45</b>	Dome	3-Nov-1982	11-Oct-1984	Canmar Explorer 4/1	61
<b>ITİYOK I-27</b>	Imperial	5-Nov-1982	2-May-1983	Sacrificial Beach Is	14
<b>UVILUK P-66</b>	Dome	10-Nov-1982	21-May1983	SSDC	30
<b>NATIAK O-44</b>	Dome	16-Jul-1983	25-Sep-1984	Canmar Explorer 2	44
<b>HAVIK B-41</b>	Dome	17-Jul-1983	24-Aug-1986	Canmar Explorer 1	35
<b>SIULIK I-05</b>	Dome	25-Jul-1983	18-Oct-1984	Canmar Explorer 4	52
<b>ARLUK E-90</b>	Dome	30-Jul-1983	13-Oct-1985	Canmar Explorer 3	57
<b>PITSIULAK A-05</b>	Gulf	22-Aug-1983	26-Jul-1984	Kulluk	27
<b>KADLUK O-07</b>	Imperial	25-Sep-1983	24-Apr-1984	CRI	14
<b>AMAULIGAK I-44</b>	Gulf	7-Oct-1983	15-Nov-1983	Kulluk	20
<b>KOGYUK N-67</b>	Gulf	28-Oct-1983	30-Jan-1984	SSDC	28
<b>AMAULIGAK J-44</b>	Gulf	16-Nov-1983	23-Sep-1984	Kulluk	31
<b>AMERK O-09</b>	Imperial	22-Aug-1984	3-Mar-1985	CRI	26

WELL NAME	WELL OPERATOR	WELL SPUD DATE	RIG RELEASE	DRILLING PLATFORM	WATER DEPTH (M)
<b>W. TARSUUT P-45</b>	Gulf	25-Sep-1984	24-Dec-1984	Molikpaq	22
<b>NERLERK J-67</b>	Dome	26-Sep-1984	24-Oct-1985	Kulluk	45
<b>ADGO H-29</b>	Imperial	27-Sep-1984	12-Jan-1985	Sandbag Retained Is	3
<b>NIPTERK L-19</b>	Imperial	3-Oct-1984	23-Mar-1985	Sacrificial Beach Is	11
<b>AKPAK P-35</b>	Gulf	17-Oct-1984	8-Nov-1985	Kulluk	41
<b>NIPTERK L-19A</b>	Imperial	21-Apr-1985	15-Jul-1985	Sacrificial Beach Is	11
<b>AKPAK 2P-35</b>	Gulf	8-Jul-1985	14-Aug-1985	Kulluk	41
<b>ADLARTOK P-09</b>	Dome	8-Aug-1985	17-Oct-1985	Canmar Explorer 3	68
<b>EDLOK M-56</b>	Dome	10-Aug-1985	18-Sep-1985	Canmar Explorer 4	32
<b>AMAULIGAK I-65</b>	Gulf	24-Sep-1985	21-Jan-1986	Molikpaq	23
<b>ADGO G-24</b>	Imperial	7-Oct-1985	7-Jan-1986	Sandbag Retained Is	2
<b>AAGNERK E-56</b>	Gulf	28-Oct-1985	26-Jun-1986	Kulluk	20
<b>MINUK I-53</b>	Imperial	27-Nov-1985	2-May-1986	Sacrificial Beach Is	15
<b>NORTH ELLICE L-39</b>	Chevron	25-Jan-1986	20-Apr-1986	Sandbag Retained Is	2
<b>AMAULIGAK I-65A</b>	Gulf	28-Jan-1986	20-Mar-1986	Molikpaq	23
<b>AMAULIGAK I-65B</b>	Gulf	20-Mar-1986	19-Sep-1986	Molikpaq	23

WELL NAME	WELL OPERATOR	WELL SPUD DATE	RIG RELEASE	DRILLING PLATFORM	WATER DEPTH (M)
<b>ARNAK K-06</b>	Imperial	27-Apr-1986	12-Aug-1986	Sacrificial Beach Is	8
<b>KAUBVIK I-43</b>	Imperial	22-Oct-1986	10-Jan-1987	CRI	18
<b>ANGASAK L-03</b>	Trillium	24-Feb-1987	12-Apr-1987	Spray Ice Island	5
<b>AMAULIGAK F-24</b>	Gulf	1-Oct-1987	12-Aug-1988	Molikpaq	32
<b>AMAULIGAK 2F-24</b>	Gulf	22-Dec-1987	29-Jan-1988	Molikpaq	32
<b>AMAULIGAK 2F-24A</b>	Gulf	30-Jan-1988	17-Feb-1988	Molikpaq	32
<b>AMAULIGAK 2F-24B</b>	Gulf	15-Apr-1988	7-Aug-1988	Molikpaq	32
<b>AMAULIGAK O-86</b>	Gulf	30-Jun-1988	26-Aug-1988	Kulluk	20
<b>AMAULIGAK CH NO.1</b>	Gulf	12-Aug-1988	7-Sep-1988	Molikpaq	32
<b>AMAULIGAK 2F-24BST</b>	Gulf	27-Jun-1988	7-Aug-1988	Molikpaq	32
<b>NIPTERK P-32</b>	Esso	21-Feb-1989	20-Apr-1989	Spray Ice Island	7
<b>IMMIUGAK N-05</b>	Gulf	1-Jun-1989	10-Jun-1989	Kulluk	32
<b>IMMIUGAK A-06</b>	Gulf	16-Jun-1989	22-Sep-1989	Kulluk	53
<b>KINGARK J-54</b>	Amoco	18-Jul-1989	10-Oct-1989	Canmar Explorer 1	59
<b>ISSERK I-15</b>	Imperial	11-Nov-1989	8-Jan-1990	Molikpaq	12
<b>BAKTOGA G-10</b>	Devon	5-Dec-2005	10-Mar-2006	SDC	12

# Beaufort Sea Exploration Results

- A number of oil and gas discoveries were made by the mid 1980s
- The most significant discovery was the Amauligak oil and gas field
- Alaska North Slope characterized by fewer large prolific fields
- Mackenzie Delta/Beaufort Sea characterized by numerous smaller widely scattered reserves
- Billions invested in exploration of Canadian High Arctic but no significant commercial production

# Mackenzie Delta and Beaufort Sea Oil and Gas Resource Potential

Resource	Current Estimate
Discovered Recoverable Oil Resource	- 1 to 1.2bb (159 to 183 10 <sup>6</sup> m <sup>3</sup> )
Total Recoverable Oil Resource	- 10.6bb (1691 10 <sup>6</sup> m <sup>3</sup> )
Discovered Marketable Gas Resource	- 9 to 10.4Tcf (254.8 to 294.5 10 <sup>9</sup> m <sup>3</sup> )
Ultimate Marketable Gas Resource	- 56.9Tcf (1611.2 10 <sup>9</sup> m <sup>3</sup> )

◆ It is important to note that the deep shelf and slope areas of the Beaufort Sea are not included in these estimates and have the potential to hold large reserves

# Generalized Beaufort Sea Development Project Schedule

Activity	Estimated Timing
Reserves Assessment Market Assessment Conceptual Engineering Economic Modeling Budgeting Assessment of Regulatory Environment Feasibility Study	0.5 - 1.5 years
Reservoir Engineering Drilling and Completions Engineering Cost and Schedule Engineering Public and Regulatory Consultation	0.5 - 1.5 years
Environmental Fieldwork Engineering Fieldwork	1 - 3 years
Construction Engineering Design Business and Economics Analysis Development Plan Environmental Impact Assessment Socio-economic Impact Assessment Decommissioning and Abandonment Plan	1 - 2 years
Public Regulatory Review Processes Regulatory Approvals Permitting	2 - 5 years

# Generalized Beaufort Sea Development Project Schedule

Activity	Estimated Timing
Public Regulatory Review Processes Regulatory Approvals Permitting	2 - 5 years
Detailed Design Procurement and Construction of Infrastructure Development Drilling Procurement and Construction of Facilities Facility Start-up/Commissioning	5 - 7 years
<b>TOTAL Median Estimated Development Timeframe</b>	<b>14 years</b>
<b>TOTAL Estimated Development Timeframe Reduced 30% for Concurrent Work</b>	<b>10 years</b>

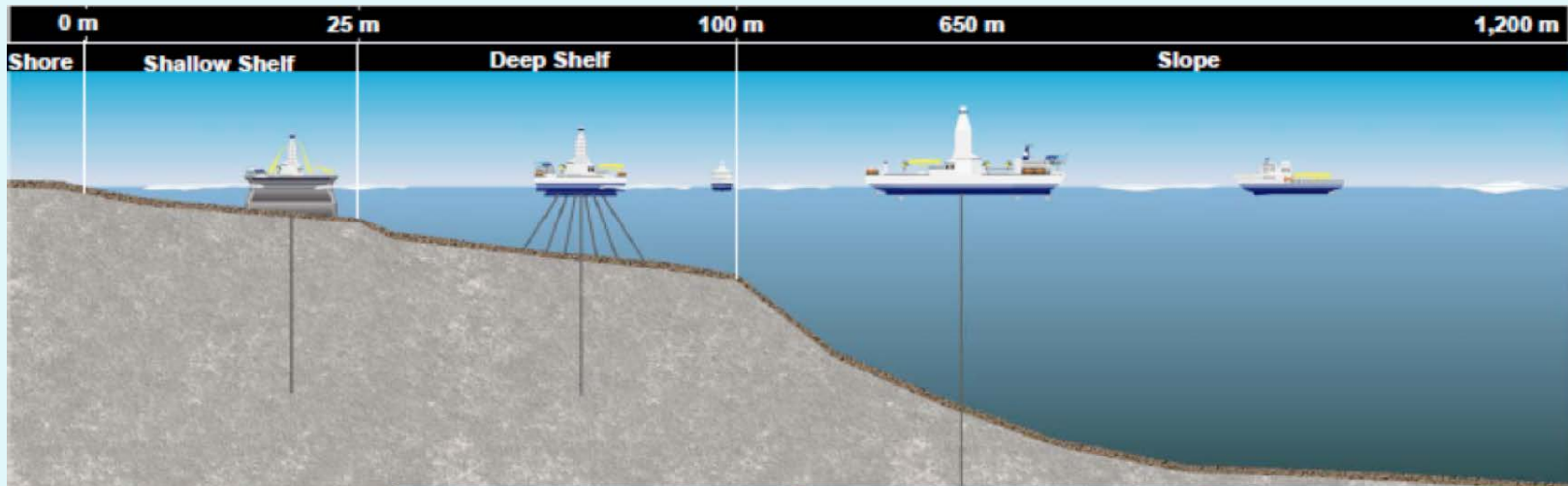
# Potential Future Oil and Gas Activities

Activity	Details
<b>2D and 3D Seismic – near shore</b>	<ul style="list-style-type: none"> <li>• Vibroseis vehicles on ice which must be frozen to the bottom</li> <li>• Airguns and geophones drilled through the ice in &lt;20m water depth, one airgun or receiver per hole</li> <li>• Shot holes drilled through the ice in &lt;20m water depth with charge size limited by Department of Fisheries and Oceans pressure restrictions</li> <li>• Ocean bottom cables with mini airguns used during open water season in &lt;70m water depths</li> </ul>
<b>2D and 3D offshore seismic - deep water</b>	<ul style="list-style-type: none"> <li>• Seismic vessels using airgun arrays and streamers during the open water season in &gt;20m water depths</li> </ul>
<b>Wellsite surveys</b>	<ul style="list-style-type: none"> <li>• High resolution seismic and geotechnical surveys</li> </ul>
<b>Exploration drilling - landfast ice zone</b>	<ul style="list-style-type: none"> <li>• Drilling from spray ice pads grounded in &lt;15m water depths</li> <li>• Drilling from spray ice pads floating in &gt;15m water depth within the land fast ice zone</li> <li>• Construction of ice roads to shore</li> </ul>
<b>Offshore exploration drilling - shallow water zone (including land fast ice zone)</b>	<ul style="list-style-type: none"> <li>• Drilling from gravel or sand islands in &lt;20m water depth with a surface blowout preventer (BOP) and up to 12 month season</li> <li>• Drilling from gravity based structures (GBS) like the Caisson Retained Island (CRI), or the Concrete Island Drilling System (CIDS) in &lt;20m water depth with a surface BOP and a 12 month season</li> </ul>
<b>Offshore exploration drilling - deep water zone</b>	<ul style="list-style-type: none"> <li>• Drilling from GBS like the Steel Drilling Caisson (SDC) or the Molikpaq in &gt;10m to &lt;40m water depths, with a surface BOP and up to 12 month season</li> <li>• Drilling from floating drill ships like the Kulluk in &gt;15m water depths with a subsea BOP and a 3-6 month season</li> </ul>
<b>Offshore drilling support</b>	<ul style="list-style-type: none"> <li>• Small and heavy lift helicopters</li> <li>• Supply vessels and barges</li> <li>• Ice breakers for towing, anchor handling, and ice management</li> <li>• Spill response vessels and equipment</li> <li>• Marine maintenance facilities (i.e. floating drydocks)</li> </ul>
<b>Offshore development - shallow water zone</b>	<ul style="list-style-type: none"> <li>• Gravel islands in &lt;20m water depths</li> <li>• Causeways or subsea pipelines to shore</li> </ul>
<b>Offshore development - shallow water zone</b>	<ul style="list-style-type: none"> <li>• A GBS in &lt;60m water depths</li> <li>• The GBS may need an ocean bottom excavation and sand or gravel foundation</li> <li>• Directionally drilled production wells from GBS</li> <li>• Subsea pipelines to shore</li> </ul>

# Potential Future Oil and Gas Activities

Activity	Details
<b>Offshore development - deep water zone</b>	<ul style="list-style-type: none"> <li>• floating development drilling</li> <li>• subsea wells and satellite well clusters in &gt;60m water depths with subsea gathering lines</li> <li>• subsea pipelines to onshore processing facilities</li> </ul>
<b>Offshore development - deep water zone</b>	<ul style="list-style-type: none"> <li>• floating development drilling</li> <li>• subsea wells and satellite well clusters in &gt;60m water depths with subsea gathering pipelines to the GBS which is located in &lt;60m water depths <b>and</b></li> <li>• subsea pipelines to shore <b>or</b></li> <li>• crude oil storage on the GBS, with ice breaking crude oil tanker off take</li> </ul>
<b>Offshore development - deep water zone</b>	<ul style="list-style-type: none"> <li>• floating development drilling</li> <li>• subsea wells and satellite well clusters in &gt;60m water depths with subsea gathering pipelines to the GBS which is located in &lt;60m water depths and</li> <li>• subsea pipelines to shore with;</li> <li>• Liquefied Natural Gas (LNG) facility onshore, and ice breaking LNG tanker off take</li> </ul>
<b>Subsea oil, gas and Natural Gas Liquids gathering and transportation pipelines</b>	<ul style="list-style-type: none"> <li>• Dredging, pipe laying, hydro testing, backfilling of trenches</li> <li>• Pipeline landfalls either trenched onto shore or directionally drilled from shore</li> </ul>
<b>Offshore production support</b>	<ul style="list-style-type: none"> <li>• Small and heavy lift helicopters</li> <li>• Icebreakers for ice management</li> <li>• Supply vessels, with oil spill response capability and barges</li> <li>• Marine Maintenance Facilities (i.e. floating dry docks) and other repair shops</li> <li>• Floating well workover, wireline and other well servicing equipment</li> <li>• Marine and logistics bases, including diesel storage and storage for oil spill equipment</li> <li>• Helicopter support bases</li> <li>• Camps with offices, control room and medical facilities</li> <li>• Multiple storage and warehousing facilities for companies providing drilling and production support services</li> </ul>
<b>Inspections</b>	<ul style="list-style-type: none"> <li>• Subsea Remote Operated Vehicle (ROV) inspections of pipelines, the GBS and subsea satellites</li> <li>• Subsea multi-beam and side scanning sonar inspections of pipelines, the GBS and subsea satellites</li> <li>• Diver inspections of pipelines, GBS and subsea satellites</li> </ul>
<b>Abandonment activities</b>	<ul style="list-style-type: none"> <li>• This area is uncertain at this time. Abandonment and reclamation are regulated and industry will work with regulators to develop appropriate plans</li> </ul>

# Typical Drilling Platforms



Factors	Shallow Shelf	Deep Shelf	Slope
Water Depth	▪ 0 m–25 m	▪ 25 m–100 m	▪ 100 m–1,200 m
Ice	▪ land-fast, first-year ice ▪ limited multi-year ice	▪ multi-year ice intrusions	▪ multi-year ice present
Type of Offshore Drilling Rig	▪ bottom-founded and moored drilling	▪ moored drilling	▪ dynamically positioned drilling
Open Water Season	▪ 85 days	▪ 70 days	▪ 50 days
Winter Season	▪ 120 days	▪ None	▪ none

# Forecast Methodology

- The forecast attempts to provide a plausible description of the future based on current assumptions
- Companies working on exploration and development projects were interviewed
- Basic assumptions were developed and reviewed with industry
- Important to recognize that numerous ever-changing factors may significantly affect the forecast

# Forecast Base Assumptions

- Assumed it will take an additional 2 or 3 years for the preparation and regulatory review of the first offshore drilling application, purporting to meet the NEB's equivalency requirement in its Same Season Relief Well Policy
- Assumed holders of Exploration Licenses issued prior to NEB Offshore Drilling Review would be granted 2 to 3 years relief on their work commitments
- Assumed it will take 3 to 4 years to design and build a purpose built drillship for deep shelf and deep slope drilling

# Forecast Base Assumptions

- MGP was assumed to proceed on a delayed timeline with production starting in 2018
- The existing Beaufort Sea discoveries were assumed to provide the most likely near term development opportunities
- Assumed that few new offshore Exploration Licenses would be issued within the 15 year forecast timeframe

**Aboriginal Affairs and Northern Development Canada** / **Affaires autochtones et Développement du Nord Canada**

**Northern Oil and Gas Branch** / **Direction générale du pétrole et du gaz du Nord**  
**Oil & Gas Dispositions** / **Dispositions des droits pétroliers et gaziers**  
 Beaufort Sea & Mackenzie Delta / Mer de Beaufort et delta du Mackenzie  
 November 2012 / Novembre 2012

- Exploration Licence / Permis de prospection
- Significant Discovery Licence / Atestation de découverte importante
- Production Licence / Licence de production
- Area subject to work prohibition / Région sujette à décrets d'interaction
- Subsurface and surface owners are Aboriginal / Les autochtones sont propriétaires de la surface et du sous-sol
- Surface owners are Aboriginal / Les autochtones sont propriétaires de la surface
- Pipelines / Pipelines
- Kendall Island Bird Sanctuary / Refuge d'oiseaux de l'île Kendall

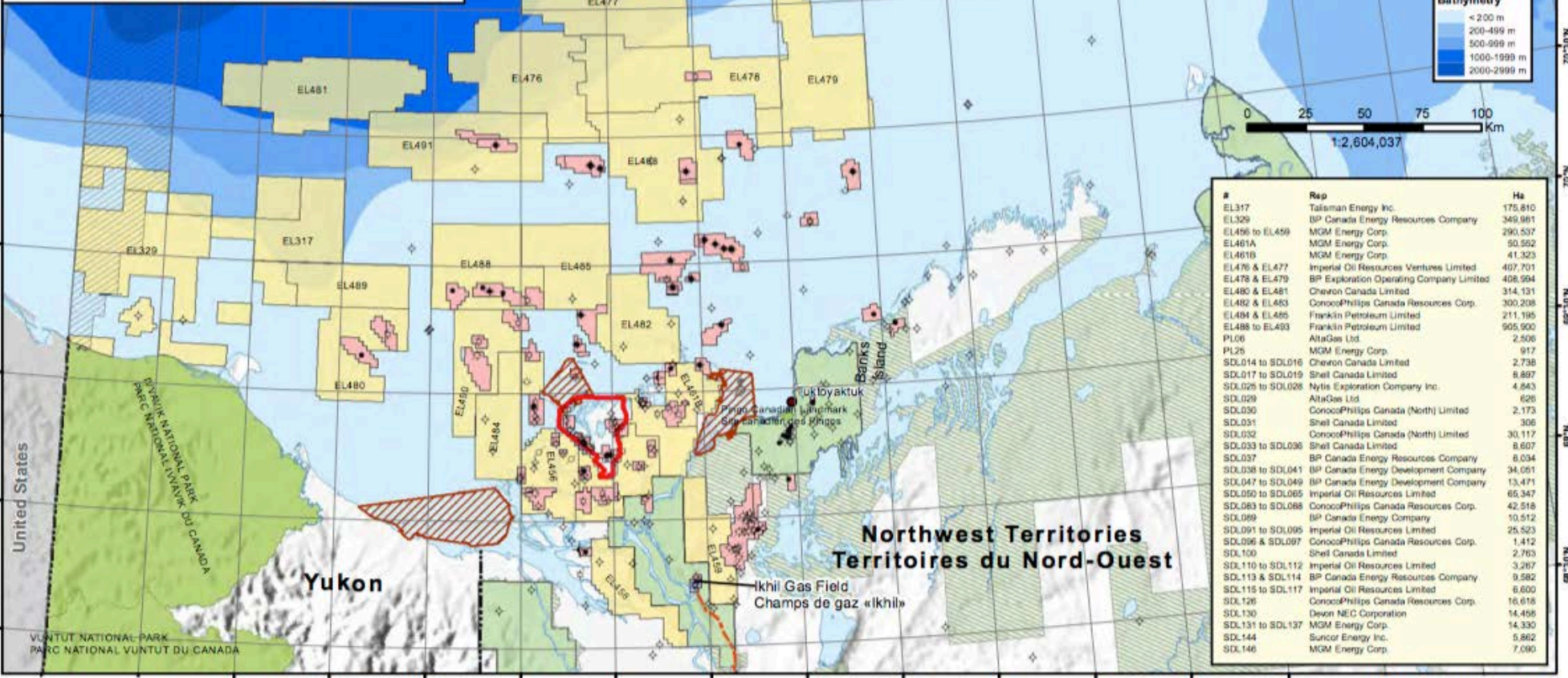
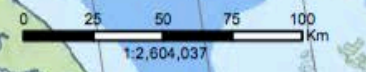
**Wells / puits**

- Proposed or Drilling / projeté ou en cours
- Oil Discovery / découverte de pétrole
- Gas Discovery / découverte de gaz
- Oil & Gas Discovery / découverte de gaz et pétrole
- Oil Show / trace de pétrole
- Gas Show / trace de gaz
- Oil & Gas Show / trace de pétrole et de gaz
- Oil, Gas, or Water Injection / injection de pétrole, de gaz, ou d'eau
- Suspended / suspendu
- Abandoned / abandonné
- Oil Suspended / Abandoned / pétrole suspendu / abandonné
- Gas Suspended / Abandoned / gaz suspendu / abandonné
- Oil & Gas Suspended / Abandoned / pétrole et gaz suspendu / abandonné

*well symbols in red indicate recent drilling / les symboles de puits en rouge indiquent un forage récent*



**Beaufort Sea**  
**Mer de Beaufort**



#	Rep	Ha
EL317	Talisman Energy Inc.	175,810
EL329	BP Canada Energy Resources Company	349,981
EL456 to EL459	MGM Energy Corp.	290,537
EL461A	MGM Energy Corp.	50,552
EL461B	MGM Energy Corp.	41,323
EL475 & EL477	Imperial Oil Resources Ventures Limited	407,701
EL475 & EL479	BP Exploration Operating Company Limited	408,594
EL480 & EL481	Chevron Canada Limited	314,151
EL482 & EL483	ConocoPhillips Canada Resources Corp.	300,208
EL484 & EL485	Franklin Petroleum Limited	211,195
EL488 to EL493	Franklin Petroleum Limited	905,900
PL06	AltaGas Ltd.	2,506
PL25	MGM Energy Corp.	917
SDL014 to SDL016	Chevron Canada Limited	2,736
SDL017 to SDL019	Shell Canada Limited	8,867
SDL025 to SDL028	Nyris Exploration Company Inc.	4,843
SDL029	AltaGas Ltd.	626
SDL030	ConocoPhillips Canada (North) Limited	2,173
SDL031	Shell Canada Limited	306
SDL032	ConocoPhillips Canada (North) Limited	30,117
SDL033 to SDL036	Shell Canada Limited	8,607
SDL037	BP Canada Energy Resources Company	8,034
SDL038 to SDL041	BP Canada Energy Development Company	34,051
SDL047 to SDL049	BP Canada Energy Development Company	13,471
SDL050 to SDL065	Imperial Oil Resources Limited	65,347
SDL063 to SDL068	ConocoPhillips Canada Resources Corp.	42,516
SDL069	BP Canada Energy Company	10,512
SDL091 to SDL095	Imperial Oil Resources Limited	25,523
SDL096 & SDL097	ConocoPhillips Canada Resources Corp.	1,412
SDL100	Shell Canada Limited	2,763
SDL110 to SDL112	Imperial Oil Resources Limited	3,267
SDL113 & SDL114	BP Canada Energy Resources Company	9,562
SDL115 to SDL117	Imperial Oil Resources Limited	6,600
SDL126	ConocoPhillips Canada Resources Corp.	16,616
SDL130	Devon NEC Corporation	14,456
SDL131 to SDL137	MGM Energy Corp.	14,330
SDL144	Suncor Energy Inc.	5,862
SDL146	MGM Energy Corp.	7,090

# Current Beaufort Sea Exploration Licenses

License	Area (ha)	Company	Effective Date	Well to be Drilling by	Expiry Date	Work Bid Amount (\$)
EL476 was 446	205,321	Imperial	01-Sept-2012	2015	31-July-2019 was 2016	585,000,000
EL477 was 449	202,380	Imperial	01-Sept-2012	2016	30-Sept-2020 was 2017	12,084,131
EL478 was 451	205,359	BP	01-Sept-2012	2015	31-Aug-2019 was 2017	15,100,000
EL479 was 453	203,635	BP	01-Sept-2012	2016	30-Sept-2020 was 2017	1,100,000
EL480 was 448	108,185	Chevron	01-Sept-2012	2015	31-Oct-2019 was 2016	1,010,100
EL481 was 460	205,946	Chevron	01-Sept-2012	2017	31-Aug-2021 was 2020	103,300,000
EL482 was 447	103,711	ConocoPhillips	29-Aug-2012	2015	28-June-2019 was 2016	12,084,131
EL483 was 452	196,497	ConocoPhillips	01-Sept-2012	2016	20-Sept-2020 was 2017	2,543,896

◆ Replacement exploration licenses were issued, with 1 to 3 year extended terms due to time operators spent participating in the NEB Arctic Offshore Drilling Review

# Current Beaufort Sea Exploration Licenses

License	Area (ha)	Company	Effective Date	Well to be Drilling by	Expiry Date	Work Bid Amount (\$)
EL484 was 464	90,381	Franklin	01-Sept-2012	2017	31-Aug-2021 was 2020	1,000,000
EL485 was 465	120,814	Franklin	01-Sept-2012	2017	31-Aug-2021 was 2020	1,000,000
EL488	134,142	Franklin	06-Mar-2013	2018	05-Mar-2022	1,251,088
EL489	93,483	Franklin	06-Mar-2013	2018	05-Mar-2022	1,251,088
EL490	99,324	Franklin	06-Mar-2013	2018	05-Mar-2022	1,251,088
EL491	201,101	Franklin	06-Mar-2013	2018	05-Mar-2022	1,251,088
EL492	187,200	Franklin	06-Mar-2013	2018	05-Mar-2022	1,251,088
EL493	190,650	Franklin	06-Mar-2013	2018	05-Mar-2022	1,251,088

◆ Replacement exploration licenses were issued, with 1 to 3 year extended terms due to time operators spent participating in the NEB Arctic Offshore Drilling Review

# Latest Arctic Class Drillship Stena DrillMax Ice



# Summary of Offshore Oil and Gas Activity 2012-2027

Activity	Predicted Timing or Intensity
2D Seismic Surveys	- sporadic 1 or 2 per year
3D Seismic Surveys	- on each EL a few years prior to drilling
Wellsite Seismic Surveys	- prior to spudding each well
Mackenzie Gas Project	- start-up 2018
Discovered Offshore Gas tie-ins to MGP	- first tie-in 2025, 1 or 2 per year after
Shallow Shelf Exploration Wells	- one or two per year starting in 2016
Deep Shelf and Slope Exploration Wells	- first well 2018, next wells 2021 and 2025
Shallow Shelf Oil Production	- first potential drilling/construction 2020

# Recent Developments

- Replacement Exploration Licenses with 1 to 3yr extended terms were issued due to NEB Arctic Offshore Drilling Review
- MGP confirmed not commercial at this time
- Imperial Oil Resources Ventures filed Project Information Package (PIP) Dec. 2012 for EL476 and EL477
  - PIP filing targets for Environmental Impact Statement 3rd. qtr. 2013 and Drilling Operations Authorization late 2014
  - PIP indicates the issue of the NEB's equivalency to Same Season Relief Well capability needs resolution

# Recent Developments

- ConocoPhillips in 2<sup>nd</sup> year of a 3 year feasibility study on Development of the Amauligak Project
- Chevron Canada processing recent seismic on EL480 and EL481
- Franklin Petroleum a new entrant to the Beaufort Sea has acquired 8 Exploration Licenses
  - Exploration licenses issued in 2013 will result in ongoing summer seismic programs for the next few years
- The Beaufort Sea Oil and Gas Activity Forecast update for 2013-2028 to be completed March 31, 2013