

**SOUTHERN MILUVEACH UNIT  
KACHEMACH UNIT**

**APPROVAL IN PART OF THE APPLICATION TO  
FORM THE SOUTHERN MILUVEACH UNIT**

Findings and Decision of the Director,  
Division of Oil and Gas Under a Delegation of Authority  
from the Commissioner,  
Department of Natural Resources, State of Alaska

**OCTOBER 28, 2011**

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## **I. INTRODUCTION AND DECISION SUMMARY**

The State of Alaska (state), Department of Natural Resources (DNR), Division of Oil and Gas (Division) received the initial Application for the Formation of the Southern Miluveach Unit (Application) from Brooks Range Petroleum Corporation (BRPC), as the proposed Southern Miluveach Unit Operator on December 15, 2010, and a revised Application on March 29, 2011. BRPC submitted confidential and public information as part of the Application that meet the requirements for a complete application under 11 AAC 83.306. The Division gave notice of the proposed Southern Miluveach Unit under 11 AAC 83.311 on June 24, 2011. The public comment period closed on July 28, 2011. No comments were received. On September 23, 2011, the DNR postponed its decision on the Application until October 28, 2011, to allow the working interest owners time to evaluate proposed changes.

“A unit must encompass the minimum area required to include all or part of one or more oil or gas reservoirs, or all or part of one of more potential hydrocarbon accumulations” 11 AAC 83.356(a). BRPC has submitted confidential geological, geophysical, and engineering data which demonstrate that the portion of the area approved for unit formation, as modified by this decision, includes all or part of an oil reservoir or potential hydrocarbon accumulation.

The Division finds that the approval of the Application, as modified by this decision into two smaller units, the new Southern Miluveach Unit and the Kachemach Unit, promotes conservation of all natural resources, promotes the prevention of economic and physical waste, and provides for the protection of all parties of interest, including the state. The Application to form the new Southern Miluveach Unit and the Kachemach Unit, in accordance with the criteria under 11 AAC 83.303, is approved as to the state land and the state’s interest in land it jointly owns with Arctic Slope Regional Corporation. This decision constitutes the written finding and decision required by 11 AAC 83.303 and is fully appealable.

## **II. APPLICATION**

BRPC submitted the initial Application to form the Southern Miluveach Unit (SMU) on December 15, 2010, and simultaneously paid the \$5,000.00 unit application filing fee, in accordance with 11 AAC 83.306 and 11 AAC 05.010(a)(10)(D), respectively. The Division found the Application incomplete on December 21, 2010. BRPC submitted a revised Application on March 29, 2011 modifying the proposed unit boundary, and changing the Initial Unit Plan. BRPC subsequently submitted a revised Initial Unit Plan on June 9, 2011. The Application was deemed complete on June 20, 2011. The Application includes Exhibit A (Attachment 1), a table legally describing the proposed unit area, its leases, and ownership interests; Exhibit B (Attachment 2), a map of the proposed unit boundary; Exhibit G (Attachment 3), the Initial Unit Plan with proposed development and exploration activities; revised Exhibit G, dated June 9, 2011 (Attachment 4); and the Southern Miluveach Unit Agreement, DNR’s Multiple Royalty Owner model unit form dated March 2011. The Application also includes the SMU Operating Agreements; confidential technical data; and an affidavit that all proper parties were invited to join the SMU Agreement.

The Division published a public notice in the “*Anchorage Daily News*” on June 26, 2011, and in the “*Arctic Sounder*” on June 27, 2011, under 11 AAC 83.311. Copies of the Application and the public notice were provided to interested parties. DNR provided public notice to the North Slope Borough, the City of Barrow, the City of Nuiqsut, the Kuukpiik Corporation, the Arctic Slope Regional Corporation, the Nuiqsut Postmaster, the Barrow Postmaster, the radio station KBRW in Barrow, as well as the Alaska Department of Environmental Conservation, the Alaska Department of Fish and Game, the Alaska Oil and Gas Conservation Commissioner, and the DNR Office of Habitat, Management and Permitting. The notice was published on the State of Alaska Public Notice website and the Division’s website on June 24, 2011. The public notices invited interested parties and members of the public to submit comments by July 28, 2011. No comments were received.

The Application as submitted did not meet the provisions of 11 AAC 83.303. After discussions with BRPC, the Commissioner proposed modifications to the Application, which if accepted by the working interest owners, would qualify a portion of the Application for approval. 11 AAC 83.316(b). To provide time for the working interest owners to evaluate the proposal, the DNR extended its written decision until October 28, 2011.

### III. LEASE BACKGROUND

BRPC proposed the following 40 leases for inclusion in the Southern Miluveach Unit comprising approximately 60,864.00 acres. The oil and gas interests in 11 leases are jointly owned with Arctic Slope Regional Corporation (ASRC), and management of those interests is governed by the 1991 Settlement Agreement between ASRC and the State of Alaska, as amended.

ADL No.	Total Acres	Effective Date	Expiration Date	State's Royalty Rate	ASRC's Royalty Rate	DNR Lease Form	Working Interest Ownership
390507	2,459.00	4/1/2004	3/31/2011	16.66667%	0.0%	DOG 200204 Rev 10/2003	AVCG 50%; Eni 50%
390502	2,469.00	5/1/2004	4/30/2011	16.66667%	0.0%	DOG 200204 Rev 10/2003	AVCG 50%; Eni 50%
391546	2,560.00	7/1/2010	6/30/2017	16.66667%	0.0%	DOG 200604, Rev 3/2009	AVCG 100%
391547	1,280.00	7/1/2010	6/30/2017	16.66667%	0.0%	DOG 200604, Rev 3/2009	AVCG 100%
390498*	640.00	5/1/2004	4/30/2011	8.496668%	8.170002%	DOG 200204AS, Rev. 10/2003	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
391925*	640.00	5/1/2004	4/30/2011	8.333335%	8.333335%	DOG 200204AS, Rev. 10/2003	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
391926	1,280.00	5/1/2004	4/30/2011	16.66667%	0.0%	DOG 200204AS, Rev. 10/2003	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
390499	640.00	5/1/2004	4/30/2011	16.66667%	0.0%	DOG 200204AS, Rev. 10/2003	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
391927*	640.00	5/1/2004	4/30/2011	8.360002%	8.306668%	DOG 200204AS, Rev. 10/2003	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
390501*	640.00	5/1/2004	4/30/2011	8.333335%	8.333335%	DOG 200204AS, Rev. 10/2003	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%



ADL No.	Total Acres	Effective Date	Expiration Date	State's Royalty Rate	ASRC's Royalty Rate	DNR Lease Form	Working Interest Ownership
391928	1,920.00	5/1/2004	4/30/2011	16.66667%	0.0%	DOG 200204AS, Rev. 10/2003	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
390500	2,560.00	5/1/2004	4/30/2011	16.66667%	0.0%	DOG 200204 Rev 10/2003	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
391448	1,239.00	6/1/2009	5/31/2014	16.66667%	0.0%	DOG 200604	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
391550	1,241.00	7/1/2010	6/30/2017	16.66667%	0.0%	DOG 200604, Rev 3/2009	AVCG 100%
391447	640.00	6/1/2009	5/31/2014	16.66667%	0.0%	DOG 200604	AVCG 100%
391549	1,920.00	7/1/2010	6/30/2017	16.66667%	0.0%	DOG 200604, Rev 3/2009	AVCG 100%
391548	1,920.00	7/1/2010	6/30/2017	16.66667%	0.0%	DOG 200604, Rev 3/2009	AVCG 100%
390690	640.00	7/1/2005	6/30/2012	16.66667%	0.0%	DOG 200204 Rev 10/2003	AVCG 24%; TG World 20%; Ramshorn 20%; BRDC 16%; Eni 20%
390691	2,560.00	7/1/2005	6/30/2012	16.66667%	0.0%	DOG 200204 Rev 10/2003	AVCG 24%; TG World 20%; Ramshorn 20%; BRDC 16%; Eni 20%
391551	1,920.00	7/1/2010	6/30/2017	16.66667%	0.0%	DOG 200604, Rev 3/2009	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
390692	640.00	7/1/2005	6/30/2012	16.66667%	0.0%	DOG 200204 Rev 10/2003	AVCG 24%; TG World 20%; Ramshorn 20%; BRDC 16%; Eni 20%
391552	2,491.00	7/1/2010	6/30/2017	16.66667%	0.0%	DOG 200604, Rev 3/2009	AVCG 100%
391446	2,560.00	6/1/2009	5/31/2014	16.66667%	0.0%	DOG 200604	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
391321	2,560.00	8/1/2008	7/31/2013	16.66667%	0.0%	DOG 200604	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
391206*	640.00	9/1/2007	8/31/2012	8.465002%	8.201668%	DOG 200604AS	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
391929*	604.00	9/1/2007	8/31/2012	8.333335%	8.333335%	DOG 200604AS	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
391930*	607.00	9/1/2007	8/31/2012	8.333335%	8.333335%	DOG 200604AS	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
391931	640.00	9/1/2007	8/31/2012	16.66667%	0.0%	DOG 200604AS	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
390482	1,889.00	4/1/2004	3/31/2011	16.66667%	0.0%	DOG 200204AS, Rev. 10/2003	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
391435	2,560.00	6/1/2009	5/31/2014	16.66667%	0.0%	DOG 200604	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
391434	2,560.00	6/1/2009	5/31/2014	16.66667%	0.0%	DOG 200604	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
391540	2,501.00	7/1/2010	6/30/2017	16.66667%	0.0%	DOG 200604, Rev 3/2009	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
390681	2,560.00	7/1/2005	6/30/2012	16.66667%	0.0%	DOG 200204 Rev 10/2003	AVCG 24%; TG World 20%; Ramshorn 20%; BRDC 16%; Eni 20%
390680	2,560.00	7/1/2005	6/30/2012	16.66667%	0.0%	DOG 200204 Rev 10/2003	AVCG 24%; TG World 20%; Ramshorn 20%; BRDC 16%; Eni 20%

ADL No.	Total Acres	Effective Date	Expiration Date	State's Royalty Rate	ASRC's Royalty Rate	DNR Lease Form	Working Interest Ownership
390682	1,280.00	7/1/2005	6/30/2012	16.66667%	0.0%	DOG 200204 Rev 10/2003	AVCG 24%; TG World 20%; Ramshorn 20%; BRDC 16%; Eni 20%
391932*	640.00	5/1/2004	4/30/2011	8.333335%	8.333335%	DOG 200204AS, Rev. 10/2003	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
391933*	640.00	5/1/2004	4/30/2011	8.333335%	8.333335%	DOG 200204AS, Rev. 10/2003	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
391932*	612.00	4/1/2004	3/31/2011	8.333335%	8.333335%	DOG 200204AS, Rev. 10/2003	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
390483*	1,232.00	4/1/2004	3/31/2011	8.333335%	8.333335%	DOG 200204AS, Rev. 10/2003	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%
391933	1,280.00	4/1/2004	3/31/2011	16.66667%	0.0%	DOG 200204AS, Rev. 10/2003	AVCG 30%; TG World 25%; Ramshorn 25%; BRDC 20%

\* Leases jointly owned with ASRC.

#### IV. DISCUSSION OF DECISION CRITERIA

The DNR Commissioner (Commissioner) reviews applications related to units under AS 38.05.180(p) and 11 AAC 83.303 – 11 AAC 83.395. By memorandum dated December 21, 1998, the Commissioner delegated this authority to the Director of the Division of Oil and Gas (Director).

A unit may be formed to conserve the natural resources of all or a part of an oil or gas pool, field, or like area when determined and certified to be necessary or advisable in the public interest. AS 38.05.180(p). The conservation of the natural resources of all or part of an oil or gas pool, field or like area means maximizing the efficient recovery of oil and gas and minimizing the adverse impacts on the surface and other resources. 11 AAC 83.395(1).

The Commissioner will approve a proposed unit upon a finding that it will (1) promote conservation of all natural resources, including all or part of an oil or gas pool, field, or like area; (2) promote the prevention of economic and physical waste; and (3) provide for the protection of all parties of interest including the state. 11 AAC 83.303(a).

In evaluating these three criteria, the Commissioner will consider (1) the environmental costs and benefits of unitized exploration or development; (2) the geological and engineering characteristics of the potential hydrocarbon accumulation or reservoir proposed for unitization; (3) prior exploration activities in the proposed unit area; (4) the applicant's plans for exploration or development of the unit area; (5) the economic costs and benefits to the state; and (6) any other relevant factors, including measures to mitigate impacts identified above, the Commissioner determines necessary or advisable to protect the public interest. 11 AAC 83.303(b).

The Division's review of the Application is based on the criteria set out in 11 AAC 83.303(a) and (b). A discussion of the subsection (b) criteria, as they apply to the Application, is set out directly below, followed by a discussion of the subsection (a) criteria.

## **A. Factors considered under 11 AAC 83.303(b)**

### **1. Environmental Costs and Benefits**

The proposed SMU is located on the North Slope of Alaska, onshore between the Kuparuk River Unit and Colville River Unit. This area is habitat for various mammals, waterfowl, and fish. Area residents may use this area for subsistence hunting and fishing. Oil and gas activity in the proposed unit area may affect some wildlife habitat and some subsistence activity. However, approval of the formation of the SMU has no direct environmental impact. This decision is an administrative action that does not authorize any on-the-ground activity.

DNR previously considered the environmental costs and benefits of activity on these leases when approving their sale. Alaska statutes require DNR to give public notice and issue a written finding before disposal of the state's oil and gas resources, such as the leases at issue here. AS 38.05.035(e), AS 38.05.945 and 11 AAC 82.415. In preparing a written decision before an oil and gas lease sale, the Commissioner may impose additional conditions or limitations beyond those imposed by law. AS 38.05.035(e). For these leases, DNR developed lease stipulations during the lease sale process to mitigate the potential environmental impacts from oil and gas activity. These stipulations apply throughout the life of the leases.

DNR will consider the environmental costs and benefits of more specific activities on these leases during the unit Plan of Operations and permit approval processes. Unit formation itself does not provide approval for activity on the land, and thus this decision does not create risk to the environment. The Unit Operator must obtain approval of Plans of Operations from the state and permits from various agencies on state leases before drilling a well or wells, or initiating development activities to produce reservoirs within the unit area. 11 AAC 83.346. Potential effects on the environment will be analyzed when permits to conduct exploration or development in the unit area are reviewed.

### **2. Geologic and Engineering Characteristics and Prior Exploration Activities**

Geologic, geophysical and engineering data submitted by BRPC to the Division in support of the Application to form the Southern Miluveach Unit included: well logs and published analyses from wells within the proposed unit and surrounding area, geologic cross sections, confidential well results, proprietary petrophysical analysis, and mapped horizons and interpretations of proprietary seismic data. All proprietary data and interpretations will be held confidential in accordance with AS 38.05.035(a)(8)(C).

As proposed in the Application, the SMU is divided into six exploration blocks, Northeast (NE), Southeast (SE), Northwest (NW), Southwest (SW), West (W) and South (S). After technical meetings with BRPC and review of the data submitted in support of the Application, DNR determined that the area proposed for inclusion within the SMU should be divided into two areas and considered individually. The two areas to be evaluated have been named the new Southern Miluveach Unit area (new SMU), in the SE block, and the Kachemach Unit area (KMU), in portions of the W and NW blocks.

The first exploration wells drilled in the area of the proposed SMU were the Colville #1 and Kookpuk #1 wells drilled in 1966 and 1967 respectively. The primary target in these early wells was the Paleozoic-age Lisburne Formation which both wells encountered, evaluated and deemed unsuccessful after reaching their total depth (TD) in Pre-Mississippian-age metamorphic argillite.

Since that time, producible hydrocarbons have been encountered in other stratigraphic intervals and developed in producing units and fields now surrounding the area of the proposed SMU. The Kuparuk River Unit adjacent to the east and southeast boundaries of the proposed SMU produces from both the Lower Cretaceous-age Kuparuk River Formation in the Kuparuk Participating Area (KPA) and the shallower Upper-Cretaceous Bermuda sands of the Seabee Formation in the Tarn Participating Area (TPA). To the west, the nearby Colville River Unit (CRU) produces from the Jurassic-age Alpine and Nechelik sands in the Kingak Formation, from isolated accumulations of the Lower Cretaceous-age Kuparuk C sand, and from Upper Cretaceous-age Nanuq sands in the Torok Formation and shallower Qannik sands in the Nanushuk Formation.

In addition to those wells associated with the above mentioned units and fields, numerous other exploration wells have been drilled within or in close proximity to the area of the proposed SMU. These wells have had varying success in encountering hydrocarbon bearing strata, but as of yet have not led to further developed production.

The Kookpuk #1 well was drilled in 1966/67 by Unocal to a total depth of 10,193' measured depth (MD) in the SW¼ Sec. 19, T11N, R7E, U.M., near the center of the proposed SMU. The well reached total depth in Pre-Mississippian-age argillite after drilling the complete Ellesmerian stratigraphic section. No production tests were attempted in this well. Two conventional cores were recovered from the well. Core #1 recovered 2' of siltstone from the top of the Triassic-age Shublik Formation between 8,028' and 8,030' MD. Core #2 recovered 16' of argillite from between 10,177' – 10,193' MD. Occasional trace oil shows were present in the shallower, Cretaceous-age Torok Formation between approximately 4,750' to 5,500' MD in the wellbore. Based upon analysis of cuttings samples, this interval was described as consisting predominantly of inter-bedded siltstone and shale with very-rare occurrence of very fine-grained sand. The sample description appears to be consistent with the well log response through this interval, as the deep resistivity curve is steady at approximately 4-5 ohms and the gamma ray curve consistently ranges from approximately 90 -105 api units.

The Colville River #1 well was drilled in 1993 by ARCO in NW¼ Sec. 17, T11N, R6E, U.M., just outside the northwest portion of the proposed SMU. The well drilled to a total depth of 7,300' MD (-7,254' sstvd). The original objective for the well was the Cretaceous-age sands within the Kuparuk Formation, which were unsuccessful. Weak oil shows were present up-hole, between approximately 5,700' and 6,050' MD (-5,654' to -6,003' sstvd) in thinly inter-bedded sandstone, siltstone, and shale in the basal portion of the Torok Formation. From rotary and percussion sidewall cores recovered in this interval, the sands were generally described as well cemented, very fine- to fine-grained, with occasional to medium-size grains. Measured porosity ranged from 9-18% and permeability ranged from less than 1 to 7 millidarcies. No production tests were attempted. The well was then deepened to penetrate Jurassic-age strata in the Kingak



Formation where it encountered inter-bedded siltstone and very fine- to fine-grained sandstone. Cuttings from this interval displayed weak to fair oil shows in the form of sample and cut fluorescence. No cores or production tests were attempted in this portion of the well.

In 2002 ConocoPhillips drilled the KRU-2L-03 well as an exploration step-out from the Tarn 2L drill site (DS-2L). The well was drilled to a total measured depth of 11,316 feet (-6,232' sstvd) at the bottom hole location in the SE¼ Sec. 11, T10N, R7E U.M. This location is in the southeast corner of the proposed SMU. The Primary target was the Cretaceous-age Kuparuk C sand. Based upon well logs and mud logs, the well encountered approximately 20' tvf of hydrocarbon bearing C sand between 10,986' to 11,032' MD (-6,087 to -6,107' sstvd). The sandstone was described from cuttings samples as consisting of poorly to moderately sorted very fine- to fine-grained quartz (85%) sand, with occasional medium sized grains and 15% siderite, mica, pyrite and other lithic grains. Samples displayed a light gold fluorescence, with instant bright yellow, streaming cut fluorescence and free oil on the surface and on the sand grains.

The KRU-2L-03 well was completed and perforated between 11,018' to 11,028' MD, then fracture stimulated with approximately 73,000 pounds of proppant. The well was never brought on production. ConocoPhillips stated that post-stimulation flow through a test separator was sparse and exhibited a heavy amount of tar. As a result, the well was shut-in and never tied into the surface facilities at DS-2L. ConocoPhillips ultimately gave up the lease (ADL 380049).

In 2003, ConocoPhillips drilled the Oberon #1 well in the SE¼ Sec. 9, T10N, R6E, U.M., approximately eight miles west of the 2L-03 well. Again, the primary target of this well was an expected accumulation of Kuparuk C preserved above the LCU. A secondary target was the Jurassic-age Alpine sands in the Kingak Formation. The well was drilled to a total measured depth of 7,580' (-7,428' sstvd) and bottomed in the Kingak formation below the Alpine sand interval. The Kuparuk C interval was encountered at 6,810' MD (-6,690' sstvd) in the well with no appreciable sand resolvable on the well logs. The mud logs described a thin, firm to hard sandy siltstone grading to lower fine-grained sandstone with common glauconite and siderite. Porosity was estimated to be poor due to the presence of clay matrix and siderite cement. This probably represents a thin transgressive lag atop the LCU. Samples exhibited approximately 10% pale yellow fluorescence and a weak, milky pale yellowish cut. The Alpine interval was penetrated between approximately 7,252' to 7,471' MD (-7,112 to -7,323' sstvd). Based upon well logs, the interval appears to be very fine grained and of poor reservoir quality. Deep resistivity measurements are consistently in the 3-5 ohm range and the gamma-ray measurements range from 75-90 api units. Estimated porosity from the density/neutron curves ranges from approximately 12-18%. Occasional weak oil shows were also present in the shallower Torok Formation, but the intervals appear to be of non-reservoir quality based on well logs and mud log descriptions. No core or production tests were gathered or attempted in this well.

BRPC began acquiring leases in the proposed SMU area in 2003. In 2005 they participated in the Ataruq #2 and #2A wells drilled by Kerr McGee. This well and sidetrack were drilled in the northeast corner of the proposed unit area. Ataruq #2 was drilled to a total measured depth of 7,400' (-6,022' sstvd) in the NE¼ Sec. 5, T11N, R8E U.M. The Ataruq #2A well was then sidetracked off the original wellbore to a bottom location approximately 1 mile west and drilled

to a total measured depth of 11,242' (-6,032' sstvd) in the NE¼ Sec. 6, T11N, R6E, U.M. Both wells achieved the objective of penetrating and evaluating the primary targets within Cretaceous-age Brookian submarine fans, and the deeper Lower Cretaceous Kuparuk Formation before reaching TD (total depth) in mudstone of the Early Cretaceous-age Miluveach Formation. Minor hydrocarbon shows were described on the mud logs within the Brookian interval in both wells. These intervals were generally sequences of inter-bedded siltstone, shale and thin sandstone. The sandstones ranged from very fine- to fine- in grain size, with occasional rare medium sized grains. In the Ataruq #2 well, a total of twenty-two rotary sidewall cores (RSWC) were recovered from three distinct Brookian intervals; eight from between 5,423' – 5,648' MD, nine from between 6,216' – 6,264' MD, and five from between 6,578' – 6,622' MD. A modular Dynamic Tester (MDT) tool recovered fluid samples from two of these zones. A sample from approximately 6,231' MD (-5,120' sstvd) recovered water with a measured draw-down mobility of approximately 2 millidarcies/centipoise viscosity (md/cp). A second sample from approximately 6,571' MD (-5,349' sstvd) recovered gas and 40 - 43 degree API oil (condensate) with a gas to oil ratio (GOR) of approximately 300,000 to 400,000 standard cubic feet of gas per stock tank barrel oil (scf/stb). The measured drawdown mobility of the lower sample point was 3.5 md/cp. Overall, 15 MDT pressure points in the Brookian section measured draw-down mobilities ranging from 0.09 – 3.5 md/cp and all but four points were less than 0.5 md/cp. The Kuparuk Formation identified in both wells exhibited no oil shows and did not appear to be of reservoir quality.

Multiple 3D seismic surveys have been shot in the past over portions of the SMU area by different companies. In 2008, BRPC acquired (shot) approximately 200 square miles of proprietary 3D seismic south and east of the Colville River Unit. This survey covers approximately the western half of the proposed SMU area. In 2011 BRPC acquired a license to the KRU WBA survey which covers the eastern half of the area. BRPC has identified numerous exploration prospects and leads from interpretation of the seismic data. The majority of the identified prospects are potential stratigraphic traps in Cretaceous-age, Brookian submarine fan deposits, but also include potential structural closures within Brookian top-set (shelf) strata and deeper stratigraphic prospects in the Lower Cretaceous Kuparuk Formation.

In 2011 BRPC drilled the North Tarn #1 well to a total measured depth of 6,223' MD (approximately -6,125' sstvd) in the SE¼ Sec. 2, T10N, R7E U.M. The bottom-hole location for this well is approximately 1 mile north of the KRU-2L-03 well drilled by ConocoPhillips in 2002. The primary target for the North Tarn #1 well was Cretaceous-age Brookian submarine-fan turbidite sands similar to those producing in the KRU Tarn PA approximately three miles to the south. A secondary deeper target was the hydrocarbon-bearing Kuparuk C sand originally penetrated, but never tested by the 2L-03 well. Although the results from the North Tarn #1 well are still confidential, BRPC did state that minor gas and oil shows were encountered in the targeted Brookian intervals, but were much lower permeability than expected.<sup>1</sup> BRPC further stated that the well encountered 20-25 ft of Kuparuk C sand with strong mud-gas shows with high oil-cut mud and gas flow to surface tanks.<sup>2</sup> The well experienced control issues for approximately seven days before mud losses and hydrocarbon flows from the Kuparuk Formation to surface tanks were stopped. Due to the well control issues, no well logs or core

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<sup>1</sup> Reported in an article published by the Petroleum News, April 24, 2011.

<sup>2</sup> Ibid.

samples were gathered across the Kuparuk Formation. The original well bore was plugged and then sidetracked approximately 600 ft to the northeast where it was suspended after setting intermediate casing at a measured depth of 6,086 feet, at the base of the Kalubik Formation, just above the Kuparuk C sand. BRPC plans to complete drilling the North Tarn #1A sidetrack and testing of the Kuparuk C sand during the up-coming drilling season in 2012.

Based upon review of geologic and geophysical data submitted in support of the Application, the Division has determined that the SE block in the SMU does contain an oil reservoir penetrated by the North Tarn #1 well within the C member of the Kuparuk Formation. Delineation drilling is needed to determine the commercial viability of the accumulation. BRPC has begun that delineation by drilling the North Tarn #1A sidetrack, and plans to complete the drilling and testing of this well and drill two other delineation wells during the up-coming winter season. BRPC expects that successful delineation will result in sanctioning of the "Mustang" development by October 1, 2012 with anticipated first production by 2015.

In addition to the Kuparuk accumulation in the SE block, BRPC has identified potential for structural closure of Brookian top-set strata within the Cretaceous-age Nanushuk Formation in the portions of the W and NW blocks. The Nanushuk Formation produces oil approximately eleven miles west of this area from the Qannik sands developed within the CRU. To the south of the CRU, the Tofkat #1 well and two sidetrack (Tofkat #1A and Tofkat #1B) wells, drilled by BRPC in 2008, encountered two intervals of hydrocarbon bearing strata within the Nanushuk Formation. All three Tofkat wells penetrated these hydrocarbon bearing zones in Section 15, T10N, R5E, U.M., approximately three miles west of the southwest portion of the proposed unit area. After encountering hydrocarbon shows while drilling, MDT logging was employed to retrieve oil samples and measure the drawdown mobility of the reservoir. A total of five oil samples were recovered from the two zones within the Nanushuk Formation. All the fluid samples were contaminated with oil-based drilling mud (OBM). After correcting for the OBM contamination, the estimated oil gravity from the two zones ranged from 14 – 23 degrees API. The measured drawdown mobility ranged from <1 to 7 md/cp (millidarcies per centipoise viscosity). No cores or production tests were attempted in the Tofkat wells. Although the Nanushuk sands appear to be hydrocarbon-bearing outside the CRU, oil and reservoir quality appear to be a significant risk to develop based on the Tofkat wells and needs to be further evaluated and tested by additional wells.

For comparison, the API gravity of the oil producing from sands in the Nanushuk Formation within the Qannik PA of the CRU range from 27-32 degrees API with a measured viscosity of approximately 2 cp. Porosity in the producing interval at CRU averages 20-25% and permeability ranges from 10-50 millidarcies.

### **3. Plans for Exploration and Development**

BRPC submitted an initial Unit Plan, as part of the revised Application, and met several times with the Division for technical presentations and discussion - November 30, 2010, March 29, June 1, July 13, September 1, 7, and 15, 2011. BRPC submitted a revised Unit Plan on June 9, 2011.



In the revised initial Unit Plan, Attachment 4, the SMU is divided into six exploration blocks, Northeast (NE), Southeast (SE), Northwest (NW), Southwest (SW), West (W) and South (S). BRPC proposed a five year Unit Plan with commitments to develop the SE block (Mustang prospect), and to drill three exploration wells in the NE, NW and SW blocks in 2014, 2015 and 2016, respectively. Exploration wells in the W and S block were proposed for 2018 and 2020. BRPC has not submitted another revised Unit Plan; however, through meetings with the Division, BRPC has committed to a more rigorous exploration and development plan for portions of the Application.

As proposed in the revised initial Unit Plan, BRPC activities do not justify including all the acreage in one unit; nor does drilling three wells in five years justify holding 60,864 acres for some future potential exploration. BRPC did however provide sufficient technical data to define potential hydrocarbon accumulations for the Division to consider two separate units with specific development and exploration requirements, provided BRPC commits to certain drilling and development obligations as set forth in this decision.

The Division proposes creating two units - the new Southern Miluveach Unit (SMU) in the SE block, and the Kachemach Unit (KMU) in a portion of the W and NW blocks, each with a specific Plan of Exploration (POE). The new SMU includes five state oil and gas leases, comprising approximately 8,960 acres. The KMU includes eleven state/ASRC oil and gas leases and seven state only oil and gas leases, comprising approximately 16,487 acres. Those leases or portions of leases not committed to the new SMU or KMU will expire at the end of their respective primary terms.

In order for the Division to approve formation of the new SMU and KMU, the initial POE for each unit requires the following commitments.

New Southern Miluveach Unit (Map, Attachment 5)

1. Complete the drilling and test the North Tarn #1A well in the Kuparuk formation. Complete, suspend or abandon the well by May 31, 2012.
2. Drill, evaluate and/or test the Mustang #1 well in the Kuparuk formation. Complete, suspend or abandon the well by May 31, 2012.
3. Drill, evaluate and/or test Mustang #2 well in the Kuparuk formation. Complete, suspend or abandon the well by May 31, 2012. This well can be a sidetrack from an existing well.
4. By October 1, 2012, the working interest owners (WIOs) must sanction the Mustang Project; and the Mustang Project must remain sanctioned by the WIOs to maintain the SMU in good standing. Sanctioning the Mustang Project means approving a 'Proposal to Develop' pursuant to Article 16 of the Southern Miluveach Unit Operating Agreement and providing the DNR documentation of such approval annually until sustained production is achieved.
5. BRPC will voluntarily terminate the SMU if the Mustang Development Project is not sanctioned, or if it fails to remain sanctioned by the WIOs.

6. Each year, submit an annual report by September 1<sup>st</sup> and schedule a meeting to discuss technical information and unit operations with Division staff. Annual reports must include details of the work completed over the previous year and plans for the following year.
7. The initial POE expires December 1, 2013.
8. Failure to meet any of the work commitments in the POE shall result in the automatic termination of the SMU, except as to tracts, or portion of tracts included in a participating area, or in a complete application to form a participating area.
9. If the unit terminates or a portion of the unit terminates for failure to meet a work commitment in the POE, the WIOs waive the extension provisions of 11 AAC 83.140 and Article 15.2, and the notice and hearing provisions of 11 AAC 83.374(c). Effective on the date the SMU terminates, the WIOs shall surrender all leases or portions of leases not in an approved participating area, or in an application to form a participating area within the SMU, whose primary terms have expired.

#### Kachemach Unit (Map, Attachment 6)

1. The KMU will be divided into two exploration blocks, Block A and B, as depicted on the unit map, Attachment 6.
2. By December 1, 2012, the working interest owners will commit to drilling two wells in Block A of the KMU, and will provide the bottom-hole locations, depths, and estimated dates drilling will commence.
3. Drill, evaluate and test one well in Block A targeting the Caribou trend (Brookian Sequence Boundary F). Test and evaluate other identified prospects penetrated by the well. Complete, suspend or abandon the well by May 31, 2013.
4. Drill, evaluate and test one well in Block A targeting the Moonlight trend (TP4-2 Nanushuk prospect). Test and evaluate other identified prospects penetrated by the well. Complete, suspend or abandon the well by May 31, 2013.
5. By December 1, 2013, the working interest owners will commit to drilling one well in Block B of the KMU, and will provide the bottom-hole location, depth, and estimated date drilling will commence.
6. All reasonable efforts will be taken to plan exploration wells to penetrate and fully evaluate multiple 'stacked' prospects.
7. Within three years after completing an exploration well, acreage within the potential hydrocarbon accumulation penetrated by the exploration well that is not in an approved participating area will be voluntarily contracted out of the unit agreement.
8. Each year, submit an annual report by September 1<sup>st</sup>, and schedule a meeting to discuss technical information and unit operations with Division and ASRC staff. Annual reports must include details of the work completed over the previous year and plans for the following year.
9. The initial POE expires December 1, 2013.
10. If all the commitments of the initial POE are met, a second POE must be submitted to the Division on or before October 1, 2013. The Division expects the 2<sup>nd</sup> POE to commit

to the same level of exploration activity and specifically to: Drill and test one well in Block B targeting the Moonlight trend (TP4-1 Nanushuk prospect). Test and evaluate other identified prospects penetrated by the well. Complete, suspend or abandon the well by May 31, 2014.

11. Failure to meet any of the work commitments in the POE shall result in the termination of the KMU, except as to tracts, or portion of tracts included in a participating area, or in a complete application to form a participating area.
12. If the unit terminates or a portion of the unit terminates, the WIOs waive the extension provisions of 11 AAC 83.140 and Article 15, and the notice and hearing provisions of 11 AAC 83.374(c). Effective on the date the KMU terminates, the WIOs shall surrender all leases or portions of leases not in an approved participating area, or in an application to form a participating area within the KMU, whose primary terms have expired.

BRPC must submit revised POEs for the new SMU and KMU incorporating the above commitments.

Adherence to these conditions will satisfy the performance standards and due diligence requirements that the Division and BRPC agreed to as a condition for the approval of the new SMU and KMU Agreements. Failure to meet the commitments set out in the approved initial Unit POEs will result in termination of the unit, except as to tracts or portion of tracts included in an approved participating area or included in an application to form a participating area.

Seventeen leases and a portion of two leases included in the Application do not meet the criteria for inclusion in either of the new unit areas. Four leases are beyond their primary term, and expire effective March 31, 2011; the other 15 leases can be explored within their respective remaining primary terms.

#### **4. The Economic Costs and Benefits to the State**

Formation of these units will provide economic benefit to the state through hydrocarbon assessment and production. The assessment of the hydrocarbon potential on these state lands will create jobs and in-state economic activity in the short-term. If the exploration activity is successful and leads to development, the state and its residents will enjoy royalty and tax revenues, and increased employment opportunities over the long term. Unitized operations will improve development of reservoirs beneath leases that may have variable or unknown productivity. Marginally economic reserves, which otherwise would not be produced on a lease-by-lease basis, can be produced through unitized operations in combination with more productive leases.

Formation of these units will cost the state revenue it could collect by re-leasing the property, but this cost can be partially offset by increased rental rates. The primary term of thirteen leases would have expired in 2011 if not for the pending unit application. The state foregoes revenue in the form of bonus bids by including these leases in the KMU. Absent inclusion in the KMU, these leases would have expired and the acreage would be available for the next lease sale. Leases committed to a unit approved by the Commissioner are automatically extended for so long as the lease remains committed to the unit; and “upon extension, the commissioner may

increase lease rentals so long as the increased rental rate does not exceed 150 percent of the rate for the preceding year.” AS 38.05.180(m). It is in the state’s best interest to increase the rental rate for those leases which would have expired, or which will expire before December 1, 2013, to the maximum extent allowed by law. Therefore, the lease rental rate will be increased from \$3.00 per acre to \$4.50 per acre effective on the anniversary date of the lease following the date of expiration of the primary term. Increasing the rental rate for immediately expiring leases, and leases expiring during the initial POE will partially offset potential lost revenue from bonus bids on the expired and re-offered acreage.

## **5. Amendments to the State Only Model Unit Agreement Form**

The revised SMU Agreement was submitted using the state model form for multiple royalty owners, revised March 2011, without modification. Since the new SMU only contains state land, BRPC and the working interest owners must execute a State Only Model Unit Agreement form, revised March 2011, without modifications beyond those required by this decision. Exhibits A, B and G must reflect the reduced unit area and agreed to obligations. BRPC must submit an updated Southern Miluveach Unit Operating Agreement.

The KMU contains both state and ASRC land. Therefore, BRPC and the working interest owners must execute a new Multiple Royalty Owner Unit Agreement form, revised March 2011, without modifications beyond those required by this decision. Exhibits A, B and G must reflect the reduced unit area and agreed to obligations. BRPC must submit an updated Kachemach Unit Operating Agreement.

## **6. Other Relevant Factors**

BRPC stated in the revised Initial Unit Plan that, “If BRPC is unable to fulfill any of the terms and commitments in the Initial Unit Plan, SMU terminates, except as to Tracts, or portions of Tracts included in an approved Participating Area or in an application for a Participating Area.” BRPC went on to state that, “Effective on April 1<sup>st</sup> of the year the SMU terminates, the WIOs shall surrender all Leases not in an approved Participating Area, or in an application for a Participating Area within the SMU, whose primary terms have expired.” And further that, “the WIOs waive the extension provisions of 11 AAC 83.140 and Article 15, and the notice and hearing provisions of 11 AAC 83.374.” BRPC’s offer to terminate the unit and surrender the expired leases demonstrates BRPC’s commitment to either do the work, or surrender the land. It is in the state’s interest to have its land developed or made readily available if a development does not materialize.

## **B. Decision Criteria under 11 AAC 83.303(a)**

### **1. Promote the Conservation of All Natural Resources**

The unitization of oil and gas reservoirs and the formation of unit areas to develop hydrocarbon-bearing reservoirs are well-accepted means of hydrocarbon conservation. Unitization, with development occurring under the terms of a unit agreement, can promote efficient evaluation and development of the state’s resources, and minimize impacts to the area’s cultural, biological, and environmental resources.

Formation of the new SMU and KMU, and implementing the POE's as described in Section IV.A.3 of this decision, promotes conservation of all natural resources. Environmental impacts will be reduced by developing reservoirs from shared facilities, which minimizes the surface footprint and protects the environment. Without the unit agreements, the lessee would be compelled to seek permits to drill wells on each individual lease in order to extend the leases beyond their primary terms. Review and approval of exploration and development permits under a unit agreement will also ensure that rational surface-use decisions are made without consideration of individual lease ownership or expense.

## **2. The Prevention of Economic and Physical Waste**

Unitization, as opposed to activity on a lease-by-lease basis, may prevent economic and physical waste. Economic waste can result if wells are drilled in excess of the number necessary for the efficient recovery of the oil and gas in place. Physical waste, among other things, includes the inefficient, excessive, or improper use of, or unnecessary dissipation of, reservoir energy. Unitization may also prevent economic and physical waste by eliminating redundant expenditures for a given level of production, or by avoiding loss of ultimate recovery with the adoption of a unified reservoir management plan. Formation of the new SMU and KMU prevents economic and physical waste by allowing the working interest owners to join together in exploration and drilling, to optimize surface locations, and to develop hydrocarbons in an efficient manner without regard to lease boundaries.

## **3. The Protection of All Parties of Interest, Including the State**

The people of Alaska have an interest in both the conservation of natural resources for human use and development of the state's oil and gas resources to maximize the economic and physical recovery of the resources. AS 38.05.180(a)(1); AS 44.37.020(a). It is further in the state's best interest to encourage assessment of oil and gas resources, recognize the costs of exploring in varied geographic regions, and minimize the adverse impact of exploration, development, production, and transportation activity. AS 38.05.180(a)(2).

Often, unitization increases the likelihood that exploration and development will occur earlier than without unitization as various leaseholders can collaborate on the joint exploration and development of the unit area as if it was a single lease. In that respect, unitization can further the state's and people's economic interests.

The Initial Unit Plan proposed exploration activities for portions of the unit that could be accomplished on a lease-by-lease basis. Two leases in the Northeast block that expire in 2011 are not proposed for exploration until 2014. The South block contains one lease that is proposed for exploration in 2020. This lease expires in 2012 and could be re-offered and developed within that time. The West block contains 15 leases that expire in 2011 and 2012, and one lease that expires in 2013, all of which are proposed for exploration in 2018. It is not in the state's or ASRC's interest to allow these leases to be held with no plans for drilling until 2018. However, if the changes to the initial POE for the SMU and KMU, as specified in Section IV.A.3 of this decision are accepted, it will protect the state's, ASRC's and the public's interests.



## V. FINDINGS AND DECISION

BRPC has the burden of demonstrating why approval of the Unit Agreement is necessary or advisable to protect the public interest. Unitization is not meant as a means to extend the expiration of an undrilled lease or leases, or as a vehicle to warehouse acreage. Unitization is an administrative procedure that consolidates the mineral royalty owners and the working interest owners in a pool or pools to permit the efficient planning and development of those resources. Unitization is designed to address conservation of natural resources, prevention of waste, and the protection of all parties, including the state.

While the Division believes that some of the exploration objectives as discussed in the Application could be achieved without a unit agreement, unitization in this case can protect the interest of all parties, particularly in conjunction with the use of exploration blocks in the Kachemach Unit, and strict adherence to work commitments under the prescribed timelines, for both the Kachemach and Southern Miluveach Units.

The Initial Unit Plan of Exploration, as discussed in Section IV.A.3, provides for the reasonable development and exploration of potential hydrocarbon accumulations in the unit area during the initial term of the SMU and KMU Agreements. If the WIOs sanction the development of a hydrocarbon reservoir or encounter additional accumulations of oil or gas in commercial quantities, the SMU and KMU Agreements will help prevent the waste of oil and gas, and increase the probability of recovering more hydrocarbons from the unit area.

The legislature intended that oil and gas leases maximize production, competition amongst producers, and local employment. Some of the leases proposed for inclusion in the Application do not meet the criteria for unit formation. To include these leases in the SMU or KMU is not in the state's best interest. Leases that would otherwise expire, but for unitization, can be reoffered at lease sale by competitive bid thereby enhancing competition amongst parties seeking to develop and produce oil and gas resources; and those with remaining primary term can be explored on a lease-by-lease basis.

I hereby make findings and impose conditions as follows.

1. The formation of two separate units, the new Southern Miluveach Unit and the Kachemach Unit, promote the conservation of all natural resources, including hydrocarbons, gravel, sand, water, wetlands, and valuable habitat. In the event of a commercial development of hydrocarbons, the unit agreement and approved plans of development thereunder will promote the prevention of economic and physical waste.
2. The new Southern Miluveach Unit and Kachemach Unit Agreements (Agreements), conditioned upon the performance of the Initial Plan of Exploration and adherence to the work commitment timelines specified in this decision, adequately and equitably protect the public interests.
3. The state's and ASRC's interests are protected by Article 13.2 of the Kachemach Unit Agreement, which provides for the automatic contraction of acreage if the Unit Operator

fails to drill a well specified in an approved Unit Plan in an Exploration Block by the date required, without judicial proceedings, except that any acreage that is contained within the boundary of an approved or pending participating area shall not be subject to contraction.

4. BRPC agreed that when an Exploration Block or any portion of an Exploration Block contracts out of the unit area, the working interest owners shall surrender all expired acreage that contracts out of the Unit, effective the date that the Unit contracts. Therefore, the Agreements adequately protect the state's and ASRC's interests.
5. The working interest owners agreed to waive the extension provisions of 1 AAC 83.140 and the unit agreement, and the notice and hearing provision of 11 AAC 83.374(c). The Agreements will be amended accordingly. Therefore, the Agreements adequately protect the state's interests.
6. The Agreements provide for expansion and contractions of the unit area in the future, as warranted by data obtained by exploration or otherwise. Therefore, the Agreements protect the public interest, the rights of the parties, and the correlative rights of adjacent land owners.
7. There is a potential for environmental impacts associated with reservoir development. All unit development must proceed according to an approved Plan of Operations. Before undertaking any specific operations, the Unit Operator must submit unit Plans of Operations to the Division and other appropriate local, state and federal agencies for review and approval. The Unit Operator may not commence any drilling or development operations until all agencies have granted the required permits. DNR may condition its approval of a unit Plan of Operations and other permits on performance of mitigation measures in addition to those in the modified leases and the revised unit agreements, if necessary or appropriate. Compliance with mitigation measures will minimize, reduce or completely avoid adverse environmental impacts.
8. The new Southern Miluveach Unit and Kachemach Unit Agreements meet the requirements of 11 AAC 83.303.
9. The Division complied with the public notice requirements of 11 AAC 83.311.
10. Brooks Range Petroleum Corporation is the designated operator of the Southern Miluveach Unit and the Kachemach Unit and has reasonable effective control of operations.
11. Within 30 days after this decision is signed by the Commissioner, BRPC will submit a revised Initial Unit Plan of Exploration for the new Southern Miluveach Unit and Kachemach Unit incorporating the terms and conditions specified in Section IV.A.3 and this decision.



12. If BRPC fails to fulfill any of the terms and commitments specified in the initial Unit POE, the WIOs will honor their commitment to surrender all expired Leases not in an approved Participating Area or in a complete application to form a Participating Area; and their commitment to waive the extension provision of 11 AAC 83.140 and Article 15, and the notice and hearing provisions of 11 AAC 83.374(c) and Article 20.
13. Article 17 of the new Southern Miluveach Unit and Kachemach Unit Agreements are amended to read:

17.1 This Agreement is subject to all applicable state and federal statutes and regulations in effect on the Effective Date of this Agreement, and insofar as is constitutionally permissible, to all statutes and regulations placed in effect after the Effective Date of this Agreement. A reference to a statute or regulation in this Agreement includes any change in that statute or regulation whether by amendment, repeal and replacement, or other means. This Agreement does not limit the power of the State of Alaska or the United States of America to enact and enforce legislation or to promulgate and enforce regulations affecting, directly or indirectly, the activities of the parties to this Agreement or the value of interests held under this Agreement. Notwithstanding the foregoing, the Working Interest Owners waive the provisions of 11 AAC 83.140 and the provisions of 11 AAC 83.374(c) for failure to comply with the terms of an approved Plan of Exploration.

14. Within 60 days after this decision is signed by the Commissioner, the working interest owners will submit a new Southern Miluveach Unit Agreement using the State Only Model Unit Agreement form dated March 2011 incorporating the amendment to Article 17. Exhibits A, B and G must be consistent with Section IV.A.3 and this decision. A complete Southern Miluveach Unit Agreement and Southern Miluveach Unit Operating Agreement, signed by all the working interest owners, must be submitted to the Division.
15. Within 60 days after this decision is signed by the Commissioner, the working interest owners will submit a new Kachemach Unit Agreement using the Multiple Royalty Owner Unit Agreement form dated March 2011 incorporating the amendment to Article 17. Exhibits A, B and G must be consistent with Section IV.A.3 and this decision. A complete Kachemach Unit Agreement and Kachemach Unit Operating Agreement, signed by all the working interest owners, must be submitted to the Division and ASRC.
16. The rental rate for those thirteen leases committed to the Kachemach Unit, which would have expired March 31, 2011 and April 30, 2011, will be increased from \$3.00 per acre to \$4.50 per acre effective April 1, 2011 and May 1, 2011, respectively.
17. The rental rate for those five leases committed to the Kachemach Unit, which will expire August 31, 2012 and July 31, 2013, will be increased from \$3.00 per acre to \$4.50 per acre effective September 1, 2012 and August 1, 2013, respectively.

18. The rental rate for the five leases committed to the Southern Miluveach Unit, which will expire June 30, 2012, will be increased from \$3.00 per acre to \$4.50 per acre effective July 1, 2012.
19. The rental rate increase is a permanent amendment to the lease rental rate, regardless of whether the lease remains committed to the unit.
20. ADL 390483 is segregated as to lands committed to the Kachemach Unit and those lands not committed to the Kachemach Unit. 11 AAC 83.373(a). Upon approval of this decision, that portion of ADL 390483 not committed to the unit is severed and that portion outside the unit terminates effective March 31, 2011.
21. ADL 391321 is segregated as to lands committed to the Kachemach Unit and those lands not committed to the Kachemach Unit. 11 AAC 83.373(a). Upon approval of this decision, that portion of ADL 391321 not committed to the unit is severed and that portion outside the unit continues in effect for the remainder of its primary term, and will expire July 31, 2013.
22. Seventeen leases proposed for unitization are not included in either the new Southern Miluveach Unit or the Kachemach Unit. Three of those leases are beyond their primary term. Upon approval of this decision, ADLs 390507 and 391933 expired effective March 31, 2011; and ADL 390502 expired effective April 30, 2011. The remaining 14 leases not committed to either unit shall remain in effect for the duration of their respective primary terms.
23. If a participating area is not approved by March 31, 2016, the unit will automatically expire.

Unitization of the area described below for the new Southern Miluveach Unit and the Kachemach Unit, protects all parties' interests, including the people of Alaska, who have an interest in the development of the state's oil and gas resources to maximize the economic and physical recovery of the resources.

(Continued on Next Page)

### New Southern Miluveach Unit

New Tract #	ADL #	Unitized Legal Description	Total Acres	Effective Date	Expiration Date
1	390690	<b>T. 11 N., R. 7 E., Umiat Meridian, Alaska.</b> Section 24, Unsurveyed, All, including the bed of the unnamed lake, 640.00 acres;	640.00	7/1/2005	6/30/2012
2	390691	<b>T. 11 N., R. 7 E., Umiat Meridian, Alaska.</b> Section 25, Unsurveyed, All, including the bed of the unnamed lake, 640.00 acres; Section 26, Unsurveyed, All, 640.00 acres; Section 35, Unsurveyed, All, including the bed of the Miluveach River, 640.00 acres; Section 36, Unsurveyed, All, including the bed of the unnamed lake, 640.00 acres;	2,560.00	7/1/2005	6/30/2012
3	390692	<b>T. 11 N., R. 7 E., Umiat Meridian, Alaska.</b> Section 34, Unsurveyed, All, including the bed of the Miluveach River, 640.00 acres;	640.00	7/1/2005	6/30/2012
4	390681	<b>T. 10 N., R. 7 E., Umiat Meridian, Alaska.</b> Section 3, Unsurveyed, All, including the beds of the unnamed lakes, 640.00 acres; Section 4, Unsurveyed, All, including the bed of the unnamed lake, 640.00 acres; Section 9, Unsurveyed, All, including the bed of the unnamed lake, 640.00 acres; Section 10, Unsurveyed, All, including the beds of the unnamed lakes, 640.00 acres;	2,560.00	7/1/2005	6/30/2012
5	390680	<b>T. 10 N., R. 7 E., Umiat Meridian, Alaska.</b> Section 1, Unsurveyed, All, 640.00 acres; Section 2, Unsurveyed, All, 640.00 acres; Section 11, Unsurveyed, All, 640.00 acres; Section 12, Unsurveyed, All, 640.00 acres;	2,560.00	7/1/2005	6/30/2012
<b>Total Acreage:</b>			<b>8,960.00</b>		

**Kachemach Unit**

<b>New Tract #</b>	<b>ADL #</b>	<b>Unitized Legal Description</b>	<b>Total Acres</b>	<b>Effective Date</b>	<b>Expiration Date</b>	<b>State ASRC</b>	<b>Block #</b>
<b>1</b>	391933	<b>T. 11 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 4, Surveyed, by Protraction, All, including the beds of all meanderable waterbodies, 640.00 acres;	640.00	5/1/2004	4/30/2011	State/ASRC	A
<b>2</b>	391932	<b>T. 11 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 3, Surveyed, by Protraction, All, 640.00 acres;	640.00	5/1/2004	4/30/2011	State/ASRC	A
<b>3</b>	391925	<b>T. 11 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 2, Surveyed, By Protraction, All, 640.00 acres;	640.00	5/1/2004	4/30/2011	State/ASRC	A
<b>4</b>	390498	<b>T. 11 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 1, Surveyed, By Protraction, All, including the beds of all meanderable waterbodies, 640.00 acres;	640.00	5/1/2004	4/30/2011	State/ASRC	A
<b>5</b>	391926	<b>T. 11 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 11, Surveyed, By Protraction, All, including the beds of all meanderable waterbodies, 640.00 acres; Section 12, Surveyed, By Protraction, All, including the beds of all meanderable waterbodies, 640.00 acres;	1,280.00	5/1/2004	4/30/2011	State Only	A
<b>6</b>	390499	<b>T. 11 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 10, Surveyed, By Protraction, All, including the beds of all meanderable waterbodies, 640.00 acres;	640.00	5/1/2004	4/30/2011	State Only	A
<b>7</b>	391927	<b>T. 11 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 9, Surveyed, By Protraction, All, including the beds of all meanderable waterbodies, 640.00 acres;	640.00	5/1/2004	4/30/2011	State/ASRC	A
<b>8</b>	390501	<b>T. 11 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 16, Surveyed, By Protraction, All, including the beds of all meanderable waterbodies, 640.00 acres;	640.00	5/1/2004	4/30/2011	State/ASRC	A
<b>9</b>	391928	<b>T. 11 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 15, Surveyed, By Protraction, All, including the beds of all meanderable waterbodies, 640.00 acres; Section 21, Surveyed, By Protraction, All, including the beds of all meanderable waterbodies, 640.00 acres; Section 22, Surveyed, By Protraction, All, including the beds of all meanderable waterbodies, 640.00 acres;	1,920.00	5/1/2004	4/30/2011	State Only	A

**Kachemach Unit**

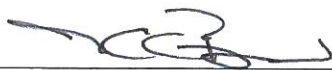
<b>New Tract #</b>	<b>ADL #</b>	<b>Unitized Legal Description</b>	<b>Total Acres</b>	<b>Effective Date</b>	<b>Expiration Date</b>	<b>State ASRC</b>	<b>Block #</b>
<b>10</b>	390500	<b>T. 11 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 13, Surveyed, By Protraction, All, including the beds of all meanderable waterbodies, 640.00 acres; Section 14, Surveyed, By Protraction, All, including the beds of all meanderable waterbodies, 640.00 acres; Section 23, Surveyed, By Protraction, All, including the beds of all meanderable waterbodies, 640.00 acres; Section 24, Surveyed, By Protraction, All, including the beds of all meanderable waterbodies, 640.00 acres;	2,560.00	5/1/2004	4/30/2011	State Only	A
<b>11</b>	391321	<b>T. 11 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 28, Surveyed by Protraction, All including the bed of the unnamed lake, 640.00 acres;	640.00	8/1/2008	7/31/2013	State Only	B
<b>12</b>	391206	<b>T. 11 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 29, Surveyed, by Protraction, All, including the bed of the unnamed lake and slough, 640.00 acres;	640.00	9/1/2007	8/31/2012	State/ASRC	B
<b>13</b>	391929	<b>T. 11 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 30, Surveyed, by Protraction, All, including the bed of the unnamed lake and slough, 604.00 acres;	604.00	9/1/2007	8/31/2012	State/ASRC	B
<b>14</b>	391930	<b>T. 11 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 31, Surveyed, All, including the bed of the unnamed lake, 607.00 acres;	607.00	9/1/2007	8/31/2012	State/ASRC	B
<b>15</b>	390930	<b>T. 11 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 32, Surveyed, All, 640.00 acres	640.00	9/1/2007	8/31/2012	State Only	B
<b>16</b>	390482	<b>T. 10 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 5, Surveyed, By Protraction, All, including the beds of all meanderable waterbodies, 640.00 acres; Section 6, Surveyed, By Protraction, All, including the beds of all meanderable waterbodies, 609.00 acres; Section 8, Surveyed, By Protraction, All, 640.00 acres;	1,889.00	4/1/2004	3/31/2011	State Only	B
<b>17</b>	390482	<b>T. 10 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 7, Surveyed, by Protraction, All, including the beds of all meanderable waterbodies, 612.00 acres;	612.00	4/1/2004	3/31/2011	State/ASRC	B
<b>18</b>	390483	<b>T. 10 N., R. 6 E., Umiat Meridian, Alaska.</b> Section 18, Surveyed, by Protraction, All, including the beds of all menaderable waterbodies, 615.00 acres;	615.00	4/1/2004	3/31/2011	State/ASRC	B

**Total Acreage: 16,487.00**



For the reasons discussed in this Findings and Decision, I hereby approve the new Southern Miluveach Unit Agreement, subject to the conditions set out in this Finding and Decision, effective March 31, 2011; and approve the Kachemach Unit Agreement, subject to the conditions set out in this Finding and Decision and with the concurrent approval from ASRC, effective March 31, 2011. If the working interest owners and BRPC do not submit a fully executed Southern Miluveach Unit Agreement and Kachemach Unit Agreement by December 27, 2011, this Finding and Decision becomes null and void on December 28, 2011.

An eligible person affected by this decision may request reconsideration of it, in accordance with 11 AAC 02. Any request for reconsideration must be received within 20 calendar days after the date of "issuance" of this decision, as defined in 11 AAC 02.040(c) and (d), and may be mailed or delivered to Daniel S. Sullivan, Commissioner, Department of Natural Resources, 550 W. 7th Avenue, Suite 1400, Anchorage, Alaska 99501; faxed to 1-907-269-8918; or sent by electronic mail to [dnr.appeals@alaska.gov](mailto:dnr.appeals@alaska.gov). This decision takes effect immediately. If reconsideration is not requested by the reconsideration deadline, this decision is a final administrative order and decision. If the commissioner does not act on a request for reconsideration within 30 days after issuance of this decision, the request for reconsideration is considered denied and this decision becomes a final administrative order and decision on the 31<sup>st</sup> day after issuance for the purposes of an appeal to Superior Court. An eligible person must first request reconsideration of this decision in accordance with 11 AAC 02 before appealing this decision to Superior Court. A copy of 11 AAC 02 may be obtained from any regional information office of the Department of Natural Resources.



W. C. Barron  
Director, Division of Oil and Gas

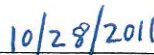


Date

I concur:



Daniel S. Sullivan  
Commissioner, Department of Natural Resources



Date

## VI. LIST OF ATTACHMENTS

1. Exhibit A, Proposed Southern Miluveach Unit Tracts/Leases, March 29, 2011
2. Exhibit B, Map of the Proposed Unit Boundary, March 29, 2011
3. Exhibit G, Proposed Initial Unit Plan, March 29, 2011
4. Exhibit G, Proposed Initial Unit Plan, Revised June 9, 2011
5. Map of the Modified Southern Miluveach Unit Boundary
6. Map of the Kachemach Unit Boundary

## Attachment 1

### **Exhibit A, Proposed Southern Miluveach Unit Tracts/Leases, March 29, 2011**



# Exhibit A

Attached to and made a part of the

## Southern Miluveach Unit

Tract #	ADL #	Legal Description	Total Acres	Effective Date	State of Alaska Royalty Interest	ASRC Royalty Interest	State / ASRC Mineral Rights	Overriding Royalty Interest	Working Interest
1	390507	T. 12 N., R. 8 E., Umiat Meridian, Alaska. Section 29, Unsurveyed, All, Including the Beds of All Meanderable Waterbodies, 640.00 Acres; Section 30, Unsurveyed, All, Including the Beds of All Meanderable Waterbodies, 588.00 Acres; Section 31, Unsurveyed, All, Including the Beds of All Meanderable Waterbodies, 591.00 Acres; Section 32, Unsurveyed, All, Including the Beds of All Meanderable Waterbodies, 640.00 Acres;	2,459.00	4/1/2004	16.666670%	<div>RECEIVED</div> <div>MAR 29 2011</div> <div>DIVISION OF OIL AND GAS</div>		Kerr McGee .25%	AVCG 50%
									ENI 50%
								AVCG 2.33333	
								Armstrong, et al 1.00000	
2	390502	T. 11 N., R. 8 E., Umiat Meridian, Alaska. Section 5, Unsurveyed, All, 640.00 Acres; Section 6, Unsurveyed, All, Including the Beds of All Meanderable Waterbodies, 593.00 Acres; Section 7, Unsurveyed, All, Including the Beds of All Meanderable Waterbodies, 596.00 Acres; Section 8, Unsurveyed, All, Including the Beds of All Meanderable Waterbodies, 640.00 Acres;	2,469.00	5/1/2004	16.666670%			Kerr McGee .25%	AVCG 50%
									ENI 50%
								Armstrong, et al 3.33333	
3	391546	T. 11 N., R. 7 E., Umiat Meridian, Alaska. Section 1, Unsurveyed, All, including the bed of the unnamed lake, 640.00 acres; Section 2, Unsurveyed, All, 640.00 acres; Section 11, Unsurveyed, All, including the beds of the unnamed lakes, 640.00 acres; Section 12, Unsurveyed, All, including the beds of the unnamed lakes, 640.00 acres;	2,560.00	7/1/2010	16.666670%				AVCG 30%
								Armstrong 1.66333	TG World 25%
								AVCG 1.50000	Ramshorn 25%
								AVCG, et al .17000	BRDC 20%
4	391547	T. 11 N., R. 7 E., Umiat Meridian, Alaska. Section 3, Unsurveyed, All, including the bed of the unnamed lake, 640.00 acres; Section 10, Unsurveyed, All, including the bed of the unnamed lake, 640.00 acres;	1,280.00	7/1/2010	16.666670%				AVCG 30%
								Armstrong 1.66333	TG World 25%
								AVCG 1.50000	Ramshorn 25%
								AVCG, et al .17000	BRDC 20%
5	390498	T. 11 N., R. 6 E., Umiat Meridian, Alaska. segment1 Section 1, Surveyed, By Protraction, All, Including The Beds Of All Meanderable Waterbodies, 640.00 Acres;	640.00	5/1/2004	8.496668%	8.170002%	50.98% / 49.02%		AVCG 30%
								Bachner, et al 2.00000	TG World 25%
								AVCG 1.33333	Ramshorn 25%
									BRDC 20%
6	390498	T. 11 N., R. 6 E., Umiat Meridian, Alaska. segment2 Section 2, Surveyed, By Protraction, All, 640.00 Acres;	640.00	5/1/2004	8.333335%	8.333335%	50% / 50%		AVCG 30%
								Bachner, et al 2.00000	TG World 25%
								AVCG 1.33333	Ramshorn 25%
									BRDC 20%
7	390498	T. 11 N., R. 6 E., Umiat Meridian, Alaska. segment3 Section 11, Surveyed, By Protraction, All, Including the Beds of All Meanderable Waterbodies, 640.00 Acres; Section 12, Surveyed, By Protraction, All, Including the Beds of All Meanderable Waterbodies, 640.00 Acres;	1,280.00	5/1/2004	16.666670%				AVCG 30%
								Bachner, et al 2.00000	TG World 25%
								AVCG 1.33333	Ramshorn 25%
									BRDC 20%
8	390499	T. 11 N., R. 6 E., Umiat Meridian, Alaska. segment 4 Section 10, Surveyed, By Protraction, All, Including the Beds of All Meanderable Waterbodies, 640.00 Acres;	640.00	5/1/2004	16.666670%				AVCG 30%
								Bachner, et al 2.00000	TG World 25%
								AVCG 1.33333	Ramshorn 25%
									BRDC 20%
9	390499	T. 11 N., R. 6 E., Umiat Meridian, Alaska. segment 3 Section 9, Surveyed, By Protraction, All, Including the Beds of All Meanderable Waterbodies, 640.00 Acres;	640.00	5/1/2004	8.360002%	8.306668%	50.16% / 49.84%		AVCG 30%
								Bachner, et al 2.00000	TG World 25%
								AVCG 1.33333	Ramshorn 25%
									BRDC 20%
10	390501	T. 11 N., R. 6 E., Umiat Meridian, Alaska. segment1 Section 16, Surveyed, By Protraction, All, Including The Beds Of All Meanderable Waterbodies, 640.00 Acres;	640.00	5/1/2004	8.333335%	8.333335%	50% / 50%		AVCG 30%
								Bachner, et al 2.00000	TG World 25%
								AVCG 1.33333	Ramshorn 25%
									BRDC 20%
11	390501	T. 11 N., R. 6 E., Umiat Meridian, Alaska. segment2 Section 15, Surveyed, By Protraction, All, Including The Beds Of All Meanderable Waterbodies, 640.00 Acres; Section 21, Surveyed, By Protraction, All, Including The Beds Of All Meanderable Waterbodies, 640.00 Acres; Section 22, Surveyed, By Protraction, All, Including The Beds Of All Meanderable Waterbodies, 640.00 Acres;	1,920.00	5/1/2004	16.666670%				AVCG 30%
								Bachner, et al 2.00000	TG World 25%
								AVCG 1.33333	Ramshorn 25%
									BRDC 20%

Tract #	ADL #	Legal Description	Total Acres	Effective Date	State of Alaska Royalty Interest	ASRC Royalty Interest	State / ASRC Mineral Rights	Overriding Royalty Interest	Working Interest
12	390500	T. 11 N., R. 6 E., Umiat Meridian, Alaska. Section 13, Surveyed, By Protraction, All, Including The Beds Of All Meanderable Waterbodies, 640.00 Acres; Section 14, Surveyed, By Protraction, All, Including The Beds Of All Meanderable Waterbodies, 640.00 Acres; Section 23, Surveyed, By Protraction, All, Including The Beds Of All Meanderable Waterbodies, 640.00 Acres; Section 24, Surveyed, By Protraction, All, Including The Beds Of All Meanderable Waterbodies, 640.00 Acres;	2,560.00	5/1/2004	16.666670%				AVCG 30%
								Bachner, et al 2.00000	TG World 25%
								AVCG 1.33333	Ramshorn 25%
									BRDC 20%
13	391448	T. 11 N., R. 7 E., Umiat Meridian, Alaska. Section 17, Unsurveyed, All, including the bed of the Miluveach River, 640.00 acres; Section 18, Unsurveyed, All, 599.00 acres;	1,239.00	6/1/2009	16.666670%				AVCG 30%
								Armstrong 3.33333	TG World 25%
								AVCG .29167	Ramshorn 25%
									BRDC 20%
14	391550	T. 11 N., R. 7 E., Umiat Meridian, Alaska. Section 19, Unsurveyed, All, including the beds of the unnamed lakes, 601.00 acres; Section 20, Unsurveyed, All, including the bed of the unnamed lake, 640.00 acres;	1,241.00	7/1/2010	16.666670%				AVCG 30%
								Armstrong 1.66333	TG World 25%
								AVCG 1.50000	Ramshorn 25%
								AVCG, et al .17000	BRDC 20%
15	391447	T. 11 N., R. 7 E., Umiat Meridian, Alaska. Section 16, Unsurveyed, All, including the bed of the Miluveach River, 640.00 acres;	640.00	6/1/2009	16.666670%				AVCG 30%
								Armstrong 1.66333	TG World 25%
								AVCG 1.50000	Ramshorn 25%
								AVCG, et al .17000	BRDC 20%
16	391549	T. 11 N., R. 7 E., Umiat Meridian, Alaska. Section 15, Unsurveyed, All, including the bed of the unnamed lake, 640.00 acres; Section 21, Unsurveyed, All, including the bed of the Miluveach River, 640.00 acres; Section 22, Unsurveyed, All, including the bed of the Miluveach River and the bed of the unnamed lake, 640.00 acres;	1,920.00	7/1/2010	16.666670%				AVCG 30%
								Armstrong 1.66333	TG World 25%
								AVCG 1.50000	Ramshorn 25%
								AVCG, et al .17000	BRDC 20%
17	391548	T. 11 N., R. 7 E., Umiat Meridian, Alaska. Section 13, Unsurveyed, All, 640.00 acres; Section 14, Unsurveyed, All, including the bed of the unnamed lake, 640.00 acres; Section 23, Unsurveyed, All, 640.00 acres;	1,920.00	7/1/2010	16.666670%				AVCG 30%
								Armstrong 1.66333	TG World 25%
								AVCG 1.50000	Ramshorn 25%
								AVCG, et al .17000	BRDC 20%
18	390690	T. 11 N., R. 7 E., Umiat Meridian, Alaska. Section 24, Unsurveyed, All, Including The Bed Of The Unnamed Lake, 640.00 Acres;	640.00	7/1/2005	16.666670%				AVCG 24%
								Armstrong 3.33333	TG World 20%
									Ramshorn 20%
									BRDC 16%
									ENI 20%
19	390691	T. 11 N., R. 7 E., Umiat Meridian, Alaska. Section 25, Unsurveyed, All, Including The Bed Of The Unnamed Lake, 640.00 Acres; Section 26, Unsurveyed, All, 640.00 Acres; Section 35, Unsurveyed, All, Including The Bed Of The Miluveach River, 640.00 Acres; Section 36, Unsurveyed, All, Including The Bed Of The Unnamed Lake, 640.00 Acres;	2,560.00	7/1/2005	16.666670%				AVCG 24%
								Armstrong 3.33333	TG World 20%
									Ramshorn 20%
									BRDC 16%
									ENI 20%
20	391551	T. 11 N., R. 7 E., Umiat Meridian, Alaska. Section 27, Unsurveyed, All, including the bed of the Miluveach River, 640.00 acres; Section 28, Unsurveyed, All, 640.00 acres; Section 33, Unsurveyed, All, including the bed of the unnamed lake, 640.00 acres;	1,920.00	7/1/2010	16.666670%				AVCG 30%
								AVCG 1.50000	TG World 25%
									Ramshorn 25%
									BRDC 20%
21	390692	T. 11 N., R. 7 E., Umiat Meridian, Alaska. Section 34, Unsurveyed, All, Including The Bed Of The Miluveach River, 640.00 Acres;	640.00	7/1/2005	16.666670%				AVCG 24%
								Armstrong 3.33333	TG World 20%
									Ramshorn 20%
									BRDC 16%
									ENI 20%

Tract #	ADL #	Legal Description	Total Acres	Effective Date	State of Alaska Royalty Interest	ASRC Royalty Interest	State / ASRC Mineral Rights	Overriding Royalty Interest	Working Interest
22	391552	T. 11 N., R. 7 E., Umiat Meridian, Alaska.	2,491.00	7/1/2010	16.666670%				AVCG 30%
		Section 29, Unsurveyed, All, 640.00 acres;						Armstrong 1.66333	TG World 25%
		Section 30, Unsurveyed, All, including the bed of the unnamed lake, 604.00 acres;						AVCG 1.50000	Ramshorn 25%
		Section 31, Unsurveyed, All, 607.00 acres;						AVCG, et al .17000	BRDC 20%
		Section 32, Unsurveyed, All, including the bed of the unnamed lake, 640.00 acres;							
23	391446	T. 11 N., R. 6 E., Umiat Meridian, Alaska.	2,560.00	6/1/2009	16.666670%				AVCG 30%
		Section 25, Surveyed, All, including the beds of the unnamed lakes, 640.00 acres;						Armstrong 3.33333	TG World 25%
		Section 26, Surveyed, All, including the beds of the unnamed lakes, 640.00 acres;						AVCG .29167	Ramshorn 25%
		Section 35, Surveyed, All, 640.00 acres;							BRDC 20%
		Section 36, Surveyed, All, including the bed of the unnamed lake, 640.00 acres;							
24	391321	T. 11 N., R. 6 E., Umiat Meridian, Alaska.	2,560.00	8/1/2008	16.666670%				AVCG 30%
		Section 27, Surveyed by Protraction, All including the beds of the unnamed lakes, 640.00 acres;						AVCG 1.50000	TG World 25%
		Section 28, Surveyed by Protraction, All including the bed of the unnamed lake, 640.00 acres;							Ramshorn 25%
		Section 33, Surveyed by Protraction, All including the bed of the unnamed lake, 640.00 acres;							BRDC 20%
		Section 34, Surveyed by Protraction, All including the bed of the unnamed lake, 640.00 acres;							
25	391206	T. 11 N., R. 6 E., Umiat Meridian, Alaska.	640.00	9/1/2007	8.465002%	8.201668%	50.79% / 49.21%		AVCG 30%
	segment1	Section 29, Surveyed, by protraction, all, including the bed of the unnamed lake and slough, 640.00 acres;						AVCG 1.50000	TG World 25%
									Ramshorn 25%
									BRDC 20%
26	391206	T. 11 N., R. 6 E., Umiat Meridian, Alaska.	604.00	9/1/2007	8.333335%	8.333335%	50% / 50%		AVCG 30%
	segment2	Section 30, Surveyed, by protraction, all, including the bed of the unnamed lake and slough, 604.00 acres;						AVCG 1.50000	TG World 25%
									Ramshorn 25%
									BRDC 20%
27	391206	T. 11 N., R. 6 E., Umiat Meridian, Alaska.	607.00	9/1/2007	8.333335%	8.333335%	50% / 50%		AVCG 30%
	segment3	Section 31, Surveyed, All, including the bed of the unnamed lake, 607.00 acres;						AVCG 1.50000	TG World 25%
									Ramshorn 25%
									BRDC 20%
28	391206	T. 11 N., R. 6 E., Umiat Meridian, Alaska.	640.00	9/1/2007	16.666670%				AVCG 30%
	segment4	Section 32, Surveyed, All, 640.00 acres						AVCG 1.50000	TG World 25%
									Ramshorn 25%
									BRDC 20%
29	390482	T. 10 N., R. 6 E., Umiat Meridian, Alaska.	1,889.00	4/1/2004	16.666670%				AVCG 30%
	segment 1	Section 5, Surveyed, By Protraction, All, Including The Beds Of All Meanderable Waterbodies, 640.00 Acres;						AVCG 3.33333	TG World 25%
		Section 6, Surveyed, By Protraction, All, Including The Beds Of All Meanderable Waterbodies, 609.00 Acres;							Ramshorn 25%
		Section 8, Surveyed, By Protraction, All, 640.00 Acres;							BRDC 20%
30	391435	T. 10 N., R. 6 E., Umiat Meridian, Alaska.	2,560.00	6/1/2009	16.666670%				AVCG 30%
		Section 3, Surveyed, All, including the bed of the unnamed lake, 640.00 acres;						Armstrong 3.33333	TG World 25%
		Section 4, Surveyed, All, including the bed of the unnamed lake, 640.00 acres;						AVCG .29167	Ramshorn 25%
		Section 9, Surveyed, All, including the beds of the unnamed lakes, 640.00 acres;							BRDC 20%
		Section 10, Surveyed, All, including the beds of the unnamed lakes, 640.00 acres;							
31	391434	T. 10 N., R. 6 E., Umiat Meridian, Alaska.	2,560.00	6/1/2009	16.666670%				AVCG 30%
		Section 1, Surveyed, All, including the beds of the Kachemach River and the unnamed lake, 640.00 acres;						Armstrong 3.33333	TG World 25%
		Section 2, Surveyed, All, including the beds of the unnamed lakes, 640.00 acres;						AVCG .29167	Ramshorn 25%
		Section 11, Surveyed, All, including the beds of the unnamed lakes, 640.00 acres;							BRDC 20%
		Section 12, Surveyed, All, including the beds of the unnamed lakes, 640.00 acres;							



Tract #	ADL #	Legal Description	Total Acres	Effective Date	State of Alaska Royalty Interest	ASRC Royalty Interest	State / ASRC Mineral Rights	Overriding Royalty Interest	Working Interest
32	391540	T. 010N., R. 007E., Umiat Meridian, Alaska. Section 5, Unsurveyed, All, 640.00 acres; Section 6, Unsurveyed, All, 609.00 acres; Section 7, Unsurveyed, All, 612.00 acres; Section 8, Unsurveyed, All, 640.00 acres;	2,501.00	7/1/2010	16.666670%				AVCG 30% Armstrong 1.66333 AVCG 1.50000 AVCG, et al .17000 BRDC 20%
33	390681	T. 010N., R. 007E., Umiat Meridian, Alaska. Section 3, Unsurveyed, All, Including The Beds Of The Unnamed Lakes, 640.00 Acres; Section 4, Unsurveyed, All, Including The Bed Of The Unnamed Lake, 640.00 Acres; Section 9, Unsurveyed, All, Including The Bed Of The Unnamed Lake, 640.00 Acres; Section 10, Unsurveyed, All, Including The Beds Of The Unnamed Lakes, 640.00 Acres;	2,560.00	7/1/2005	16.666670%				AVCG 24% Armstrong 3.33333 TG World 20% Ramshorn 20% BRDC 16% ENI 20%
34	390680	T. 010N., R. 007E., Umiat Meridian, Alaska. Section 1, Unsurveyed, All, 640.00 Acres; Section 2, Unsurveyed, All, 640.00 Acres; Section 11, Unsurveyed, All, 640.00 Acres; Section 12, Unsurveyed, All, 640.00 Acres;	2,560.00	7/1/2005	16.666670%				AVCG 24% Armstrong 3.33333 TG World 20% Ramshorn 20% BRDC 16% ENI 20%
35	390682	T. 010N., R. 007E., Umiat Meridian, Alaska. Section 17, Unsurveyed, All, 640.00 Acres; Section 20, Unsurveyed, All, 640.00 Acres;	1,280.00	9/1/2005	16.666670%				AVCG 24% Armstrong 3.33333 TG World 20% Ramshorn 20% BRDC 16% ENI 20%
36	390499	T. 11 N., R. 6 E., Umiat Meridian, Alaska. <i>SECTION 4, SURVEYED, BY PROTRACTION, ALL, INCLUDING THE BEDS OF ALL MEANDERABLE WATERBODIES, 640.00 ACRES;</i>	640.00	5/1/2004	8.333335%	8.333335%	50% / 50%		AVCG 30% Bachner, et al 2.00000 AVCG 1.33333 TG World 25% Ramshorn 25% BRDC 20%
37	390499	T. 11 N., R. 6 E., Umiat Meridian, Alaska. <i>SECTION 3, SURVEYED, BY PROTRACTION, ALL, 640.00 ACRES;</i>	640.00	5/1/2004	8.333335%	8.333335%	50% / 50%		AVCG 30% Bachner, et al 2.00000 AVCG 1.33333 TG World 25% Ramshorn 25% BRDC 20%
38	390482	T. 10 N., R. 6 E., Umiat Meridian, Alaska. <i>SECTION 7, SURVEYED, BY PROTRACTION, ALL, INCLUDING THE BEDS OF ALL MEANDERABLE WATERBODIES, 612.00 ACRES;</i>	612.00	4/1/2004	8.333335%	8.333335%	50% / 50%		AVCG 30% AVCG 3.33333 TG World 25% Ramshorn 25% BRDC 20%
39	390483	T. 10 N., R. 6 E., UMIAT MERIDIAN, ALASKA <i>SECTION 18, SURVEYED, BY PROTRACTION, ALL, INCLUDING THE BEDS OF ALL MENADERABLE WATERBODIES, 615.00 ACRES;</i>	615.00	4/1/2004	8.333335%	8.333335%	50% / 50%		AVCG 30% AVCG 3.33333 TG World 25% Ramshorn 25% BRDC 20%
40	390483	T. 10 N., R. 6 E., UMIAT MERIDIAN, ALASKA <i>SECTION 17, SURVEYED, BY PROTRACTION, ALL, 640.00 ACRES;</i> <i>SECTION 20, SURVEYED, BY PROTRACTION, ALL, INCLUDING THE BEDS OF ALL MEANDERABLE WATERBODIES, 640.00 ACRES</i>	1,280.00	4/1/2004	16.666670%				AVCG 30% AVCG 3.33333 TG World 25% Ramshorn 25% BRDC 20%
41	390483	T. 10 N., R. 6 E., UMIAT MERIDIAN, ALASKA <i>SECTION 19, SURVEYED, BY PROTRACTION, ALL, INCLUDING THE BEDS OF ALL MENADERABLE WATERBODIES, 617.00 ACRES</i>	617.00	4/1/2004	8.333335%	8.333335%	50% / 50%		AVCG 30% AVCG 3.33333 TG World 25% Ramshorn 25% BRDC 20%
Total Acreage:			60,864.00						
Bachner=	J. Andrew Bachner								
AVCG=	AVCG, LLC								
TG World=	TG World Energy Inc.								
Ramshorn=	Ramshorn Investments, Inc.								
BRDC=	Brooks Range Development Corporation								
Kerr McGee=	Kerr McGee								
ENI=	ENI Petroleum US LLC								
Armstrong=	70&148, William D Armstrong								

## Attachment 2

### **Exhibit B, Map of Proposed Southern Miluveach Unit Boundary, March 29, 2011**



# Exhibit B

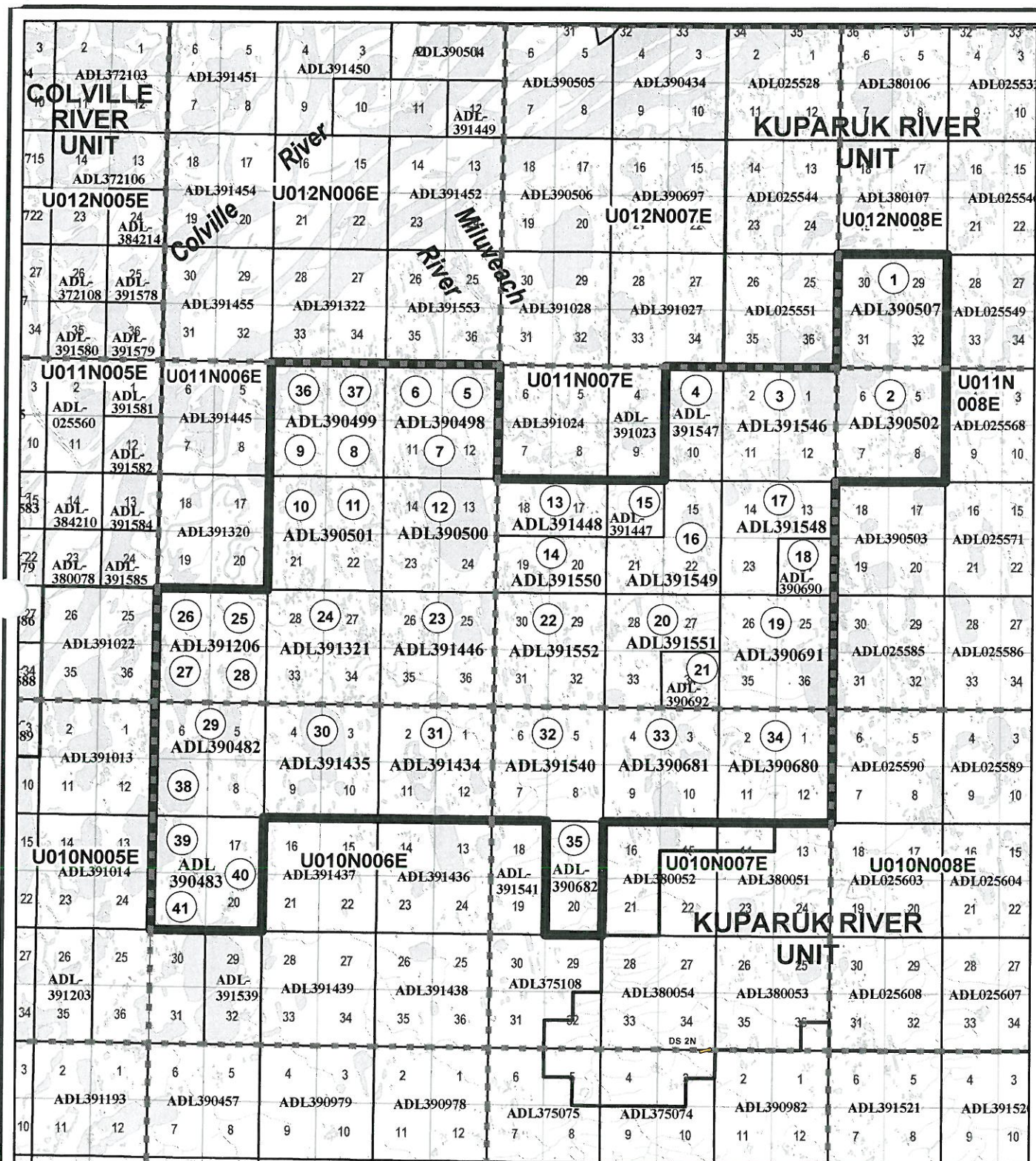
Attached to and made part of the

## Southern Miluveach Unit Agreement

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MAR 29 2011

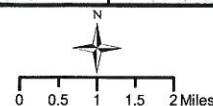
DIVISION OF  
OIL AND GAS



Brooks Range Petroleum Corporation

Southern Miluveach  
Unit Boundary

1 Tract Number



## Attachment 3

### **Exhibit G, Proposed Initial Unit Plan, March 29, 2011**

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MAR 29 2011

DIVISION OF  
OIL AND GAS

**Exhibit G**  
**Attached to and made a part of the**  
**Southern Miluveach Unit Agreement**  
**Revised Initial Unit Plan**

**1.0     INTRODUCTION**

This Initial Unit Plan is submitted to the Department of Natural Resources as required by Article 8 of the Southern Miluveach Unit Agreement, 11 AAC 83.341, and 11 AAC 83.343. The term of this Initial Unit Plan shall be for a period commencing on the Effective Date of the Unit Agreement and ending 10 years after the Effective Date of the Unit Agreement.

The Initial Unit Plan contains the initial Plan of Exploration which is required by Article 8, Section 8.1.1 of the Southern Miluveach Unit Agreement.

**2.0     INITIAL PLAN OF EXPLORATION**

The Working Interest Owners plan to proceed with the exploration activities described below as the initial Plan of Exploration within the Southern Miluveach Unit Area:

- a)     The Southern Miluveach Unit Area shall be divided in to four (4) acreage blocks hereinafter referred to as "Exploration Blocks" being as described below:

1.     NE Exploration Block:

Tract 01: ADL390507  
Tract 02: ADL390502  
Tract 03: ADL391546  
Tract 04: ADL391547  
Tract 15: ADL391447  
Tract 16: ADL391549  
Tract 17: ADL391548  
Tract 20: ADL391551

2.     NW Exploration Block:

Tract 05: ADL390498 (Segment 1)  
Tract 06: ADL390498 (Segment 2)  
Tract 07: ADL390498 (Segment 3)  
Tract 08: ADL390499 (Segment 4)  
Tract 09: ADL390499 (Segment 3)  
Tract 10: ADL390501 (Segment 1)  
Tract 11: ADL390501 (Segment 2)  
Tract 12: ADL390500  
Tract 13: ADL391448  
Tract 14: ADL391550  
Tract 22: ADL391552  
Tract 23: ADL391446  
Tract 36: ADL390499 (Segment 1)  
Tract 37: ADL390499 (Segment 2)

3.     SW Exploration Block:

Tract 24: ADL391321  
Tract 25: ADL391206 (Segment 1)  
Tract 26: ADL391206 (Segment 2)  
Tract 27: ADL391206 (Segment 3)  
Tract 28: ADL391206 (Segment 4)  
Tract 29: ADL390482 (Segment 1)  
Tract 30: ADL391435  
Tract 31: ADL391434  
Tract 32: ADL391540  
Tract 38: ADL390482 (Segment 2)  
Tract 39: ADL390483 (Segment 2)  
Tract 40: ADL390483 (Segment 1)  
Tract 41: ADL390483 (Segment 3)

4. SE Exploration Block:

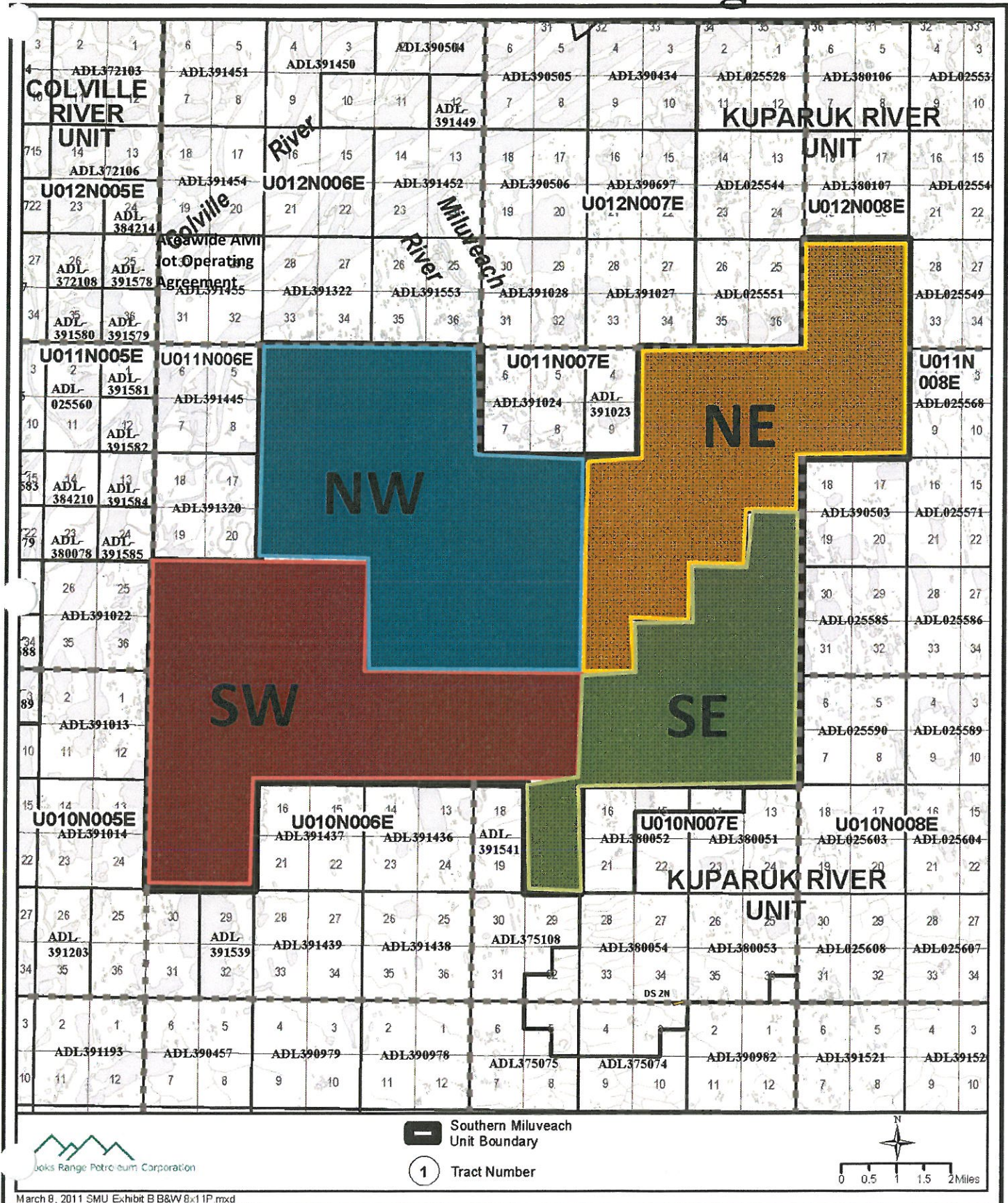
Tract 18: ADL390690  
Tract 19: ADL390691  
Tract 21: ADL390692  
Tract 33: ADL390681  
Tract 34: ADL390680  
Tract 35: ADL390682

- b) The first well drilled in each Exploration Block after the Southern Miluveach Unit Agreement application has been submitted to the Department of Natural Resources for approval shall hereinafter be defined as an "Exploration Wells."
- c) On or before March 15, 2012, the Working Interest Owners plan to commence drilling operations of the first (1<sup>st</sup>) Exploratory Well in one of the Exploration Blocks. Failure to commence drilling the 1<sup>st</sup> Exploration Well by March 15, 2012, shall result in the termination of the Southern Miluveach Unit, except as to Leases or portions of Leases included in a Participating Area.
- d) On or before March 15, 2014, the Working Interest Owners plan to commence drilling operations of the second (2<sup>nd</sup>) Exploratory Well in one of the undrilled Exploration Blocks. Failure to commence drilling the 2<sup>nd</sup> Exploration Well by March 15, 2014, shall result in the termination of the undrilled Exploration Blocks within the Southern Miluveach Unit Area, except as to Leases or portions of Leases included in a Participating Area.
- e) On or before March 15, 2016, the Working Interest Owners plan to commence drilling operations of the third (3<sup>rd</sup>) Exploratory Well in one of the undrilled Exploration Blocks. Failure to commence drilling the 3<sup>rd</sup> Exploration Well by March 15, 2016, shall result in the termination of the undrilled Exploration Blocks within the Southern Miluveach Unit Area, except as to Leases or portions of Leases included in a Participating Area.
- f) On or before March 15, 2018, the Working Interest Owners plan to commence drilling operations of the fourth (4<sup>th</sup>) Exploratory Well in one of the undrilled Exploration Blocks. Failure to commence drilling the 4<sup>th</sup> Exploration Well by March 15, 2018, shall result in the termination of the undrilled Exploration Blocks within the Southern Miluveach Unit Area, except as to Leases or portions of Leases included in a Participating Area.

- g) The Working Interest Owners may wish to acquire a 3D seismic data survey within the Southern Miluvealch Unit ("SMU 3D"). The SMU 3D would connect to the existing proprietary 3D seismic survey covering a portion of the west side of the Southern Miluvealch Unit, known as the North Island 3D, and extend back east toward the Kuparuk River Unit. The SMU 3D would cover a minimum of 80 square miles. If the SMU 3D is acquired then the pending Exploratory Well drilling requirement shall be extended for two additional years.



# Exhibit G – SMU Drilling Blocks



## Attachment 4

### **Exhibit G, Proposed Initial Unit Plan, Revised June 9, 2011**



**Exhibit G**  
**Attached to and made a part of the**  
**Southern Miluveach Unit Agreement**  
**Initial Unit Plan**  
(revised June 9, 2011)

**RECEIVED**

**JUN 09 2011**

**DIVISION OF  
OIL AND GAS**

**1.0     INTRODUCTION**

This Initial Unit Plan of the Southern Miluveach Unit (“SMU”) is submitted by Brooks Range Petroleum Corporation (“BRPC”), as Operator, to the Department of Natural Resources as required by Article 8 of the SMU Agreement, 11 AAC 83.341, and 11 AAC 83.343. This SMU Initial Unit Plan addresses the following:

- 1) proposed development activities for the unit, including plans to delineate all underlying oil or gas reservoirs, bring the reservoirs into production, and maintain and enhance production once established;
- 2) plans for the exploration or delineation of any land in the unit not included in a participating area;
- 3) details of the proposed operations for at least one year following submission of the plan; and
- 4) the surface location of proposed facilities, drill pads, roads, material sites, waste disposal sites, water supplies, and any other operation or facilities necessary for unit operations.

The term of this Initial Unit Plan shall be for a period commencing on the Effective Date of the SMU Agreement and ending on March 31, 2016, being five years after the Effective Date of the SMU Agreement, unless the unit terminates before that date, in which case, the Initial Unit Plan expires with the unit termination. If BRPC is unable to fulfill any of the terms and commitments in the Initial Unit Plan, SMU terminates, except as to Tracts or portions of Tracts included in an approved Participating Area or in an application for a Participating Area. Effective on April 1<sup>st</sup> of the year the SMU terminates, the WIOs shall surrender all Leases not in an approved Participating Area, or an application for a Participating Area within the SMU, whose primary terms have expired. Also effective as April 1<sup>st</sup> of the year the SMU terminates, the WIOs waive the extension provisions of 11 AAC 83.140 and Article 15, and the notice and hearing provision of 11 AAC 83.374

**2.0     PROPOSED DEVELOPMENT ACTIVITIES:**

BRPC hereby proposes the Mustang Development Project, subject to final working interest owner approval/sanctioning. The proposed Mustang Development Project will produce oil from the Mustang potential hydrocarbon accumulation, being a Kuparuk formation reservoir, located within the Southern Miluveach Unit. The Mustang potential hydrocarbon accumulation was encountered while drilling the North Tarn #1 well drilled during the 2011 winter drilling season. The proposed Mustang Development Project is close to existing Kuparuk River Unit infrastructure and the Alpine Pipeline, which is a

common carrier pipeline. Subject to finalization of the Mustang Development Project conceptual engineering, BRPC's current plan is to use stand alone processing facilities delivering sales quality crude into the common carrier Alpine Pipeline. The proposed Mustang Development Project will create a vital processing facility for the Southern Miluveach Unit, providing synergies which will lower the economic hurdle allowing other potential hydrocarbon accumulation within SMU to be developed. The other potential hydrocarbon accumulation are currently believed to be marginally economic and would not be developed without existing infrastructure and processing facility within SMU. Likewise, future development of the other potential hydrocarbon accumulation within SMU using the Mustang processing infrastructure will extend the economic life of Mustang production. The symbiotic relationship between all of the potential hydrocarbon accumulation within the SMU promotes the conservation of natural resources and prevents economic and physical waste.

Horizontal drilling technology and long-reach wells will be used to maximize production while minimizing surface impacts. Use of horizontal drilling technology will reduce the environmental impact of developments within the SMU.

The development plans for the SMU include the following commitments:

- a) By December 31, 2012, BRPC will have the permits in place for the proposed Mustang Development.
- b) By December 31, 2013, BRPC will apply to the Commissioner to form the Mustang Participating Area.
- c) By July 1, 2014, BRPC anticipates first production from the Mustang Participate Area.

By August 31 of each year, BRPC will submit an annual report to the Commissioner, and will schedule an annual meeting with the Division of Oil & Gas to present technical information and discuss unit operations. Ninety days before the expiration of the Initial Unit Plan, BRPC will submit a new Unit Plan.

## **2.0 PROPOSED EXPLORATION ACTIVITIES**

The Working Interest Owners ("WIOs") plan to proceed with the exploration activities described below within the SMU Area:

- a) The SMU Area shall be divided in to six (6) acreage blocks hereinafter referred to as "Exploration Blocks" being as described below:
  - 1. NE Exploration Block:
    - Tract 01: ADL390507
    - Tract 02: ADL390502
    - Tract 03: ADL391546
    - Tract 04: ADL391547

Tract 15: ADL391447  
Tract 16: ADL391549  
Tract 17: ADL391548  
Tract 20: ADL391551

2. NW Exploration Block:

Tract 05: ADL390498 (Segment 1)  
Tract 06: ADL390498 (Segment 2)  
Tract 07: ADL390498 (Segment 3)  
Tract 12: ADL390500  
Tract 13: ADL391448  
Tract 14: ADL391550  
Tract 22: ADL391552  
Tract 23: ADL391446

3. W Exploration Block:

Tract 08: ADL390499 (Segment 4)  
Tract 09: ADL390499 (Segment 3)  
Tract 10: ADL390501 (Segment 1)  
Tract 11: ADL390501 (Segment 2)  
Tract 24: ADL391321  
Tract 25: ADL391206 (Segment 1)  
Tract 26: ADL391206 (Segment 2)  
Tract 27: ADL391206 (Segment 3)  
Tract 28: ADL391206 (Segment 4)  
Tract 29: ADL390482 (Segment 1)  
Tract 36: ADL390499 (Segment 1)  
Tract 37: ADL390499 (Segment 2)  
Tract 38: ADL390482 (Segment 2)  
Tract 39: ADL390483 (Segment 2)  
Tract 40: ADL390483 (Segment 1)  
Tract 41: ADL390483 (Segment 3)

4. SW Exploration Block:

Tract 30: ADL391435  
Tract 31: ADL391434  
Tract 32: ADL391540

5. SE Exploration Block:

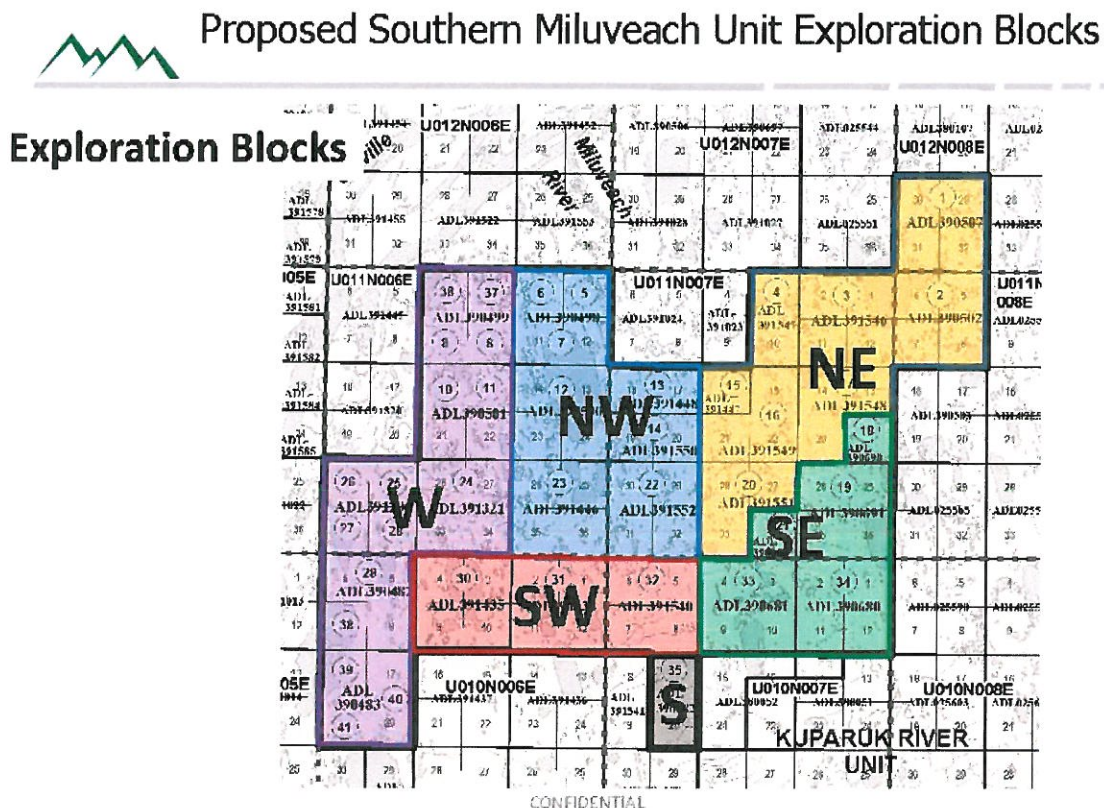
Tract 18: ADL390690  
Tract 19: ADL390691  
Tract 21: ADL390692  
Tract 33: ADL390681  
Tract 34: ADL390680

6. S Exploration Block:

Tract 35: ADL390682



- b) A map of the Exploration Blocks is attached below:



- c) The first well drilled in each Exploration Block after the SMU Agreement application has been submitted to the Department of Natural Resources for approval shall hereinafter be defined as an “Exploration Wells.”
- d) Before March 31, 2011, the WIOs commenced drilling operations of the North Tarn #1 Exploratory Well in the SE Exploration Block.
- e) On or before March 31, 2012, the WIOs plan to complete drilling operations of the North Tarn #1A Well in the SE Exploration Block. Failure to complete drilling the North Tarn #1A Well, or a similar well into the Kuparuk formation in said SE Exploration Block, by March 31, 2012, shall result in the contraction of the undrilled Exploration Blocks out of the SMU Area, except as to Leases or portions of Leases included in a Participating Area.
- f) On or before December 1, 2013, the WIOs plan to identify a bottom hole location and commit, in writing, to drill the second (2<sup>nd</sup>) Exploration Well in one of the undrilled Exploration Blocks. On or before March 31, 2014, the WIOs plan to commence drilling operations of the 2<sup>nd</sup> Exploratory Well in one of the undrilled Exploration Blocks. Failure to commence drilling the 2<sup>nd</sup> Exploration Well by March 31,

2014, shall result in the contraction of the undrilled Exploration Blocks out of the SMU Area, except as to Leases or portions of Leases included in a Participating Area.

- g) On or before December 1, 2014, the WIOs plan to identify a bottom hole location and commit, in writing, to drill the third (3<sup>rd</sup>) Exploration Well in one of the undrilled Exploration Blocks. On or before March 31, 2015, the WIOs plan to commence drilling operations of the 3<sup>rd</sup> Exploratory Well in one of the undrilled Exploration Blocks. Failure to commence drilling the 3<sup>rd</sup> Exploration Well by March 31, 2015, shall result in the contraction of the undrilled Exploration Blocks out of the SMU Area, except as to Leases or portions of Leases included in a Participating Area.
- h) On or before December 1, 2015, the WIOs plan to identify a bottom hole location and commit, in writing, to drill the fourth (4<sup>th</sup>) Exploration Well in one of the undrilled Exploration Blocks. On or before March 31, 2016, the WIOs plan to commence drilling operations of the 4<sup>th</sup> Exploratory Well in one of the undrilled Exploration Blocks. Failure to commence drilling the 4<sup>th</sup> Exploration Well by March 31, 2016, shall result in the contraction of the undrilled Exploration Blocks out of the SMU Area, except as to Leases or portions of Leases included in a Participating Area.
- i) On or before December 1, 2017, the WIOs plan to identify a bottom hole location and commit, in writing, to drill the fifth (5<sup>th</sup>) Exploration Well in one of the undrilled Exploration Blocks. On or before March 31, 2018, the WIOs plan to commence drilling operations of the 5<sup>th</sup> Exploratory Well in one of the undrilled Exploration Blocks. Failure to commence drilling the 5<sup>th</sup> Exploration Well by March 31, 2016, shall result in the contraction of the undrilled Exploration Blocks out of the SMU Area, except as to Leases or portions of Leases included in a Participating Area.
- j) On or before December 1, 2019, the WIOs plan to identify a bottom hole location and commit, in writing, to drill the sixth (6<sup>th</sup>) Exploration Well in one of the undrilled Exploration Blocks. On or before March 31, 2020, the WIOs plan to commence drilling operations of the 6<sup>th</sup> Exploratory Well in one of the undrilled Exploration Blocks. Failure to commence drilling the 6<sup>th</sup> Exploration Well by March 31, 2016, shall result in the contraction of the undrilled Exploration Blocks out of the SMU Area, except as to Leases or portions of Leases included in a Participating Area.
- k) The current priority of drilling Exploration Wells within SMU is as follows:
  - a. SE Exploration Block (Kuparuk formation, Tract 34, Section 2, T10N, R7E, U.M.)
  - b. NE Exploration Block (Kuparuk formation, Tract 2, Section 8, T11N, R8E, U.M.);



- c. NW Exploration Block (Brookian formation, F-4, Tract 12, Section 24, T11N, R6E, U.M.);
- d. SW Exploration Block (Brookian formation, F-5, Tract 30, Section 4, T10N, R6E, U.M.);
- e. W Exploration Block (Brookian formation, TP4-2, Tract 37, Section 4, T11N, R6E, U.M. ); and
- f. S Exploration Block (Brookian formation, G-1, Tract 35, Section 17, T10N, R7E, U.M.).

### **3.0 PROPOSED OPERATION ACTIVITIES**

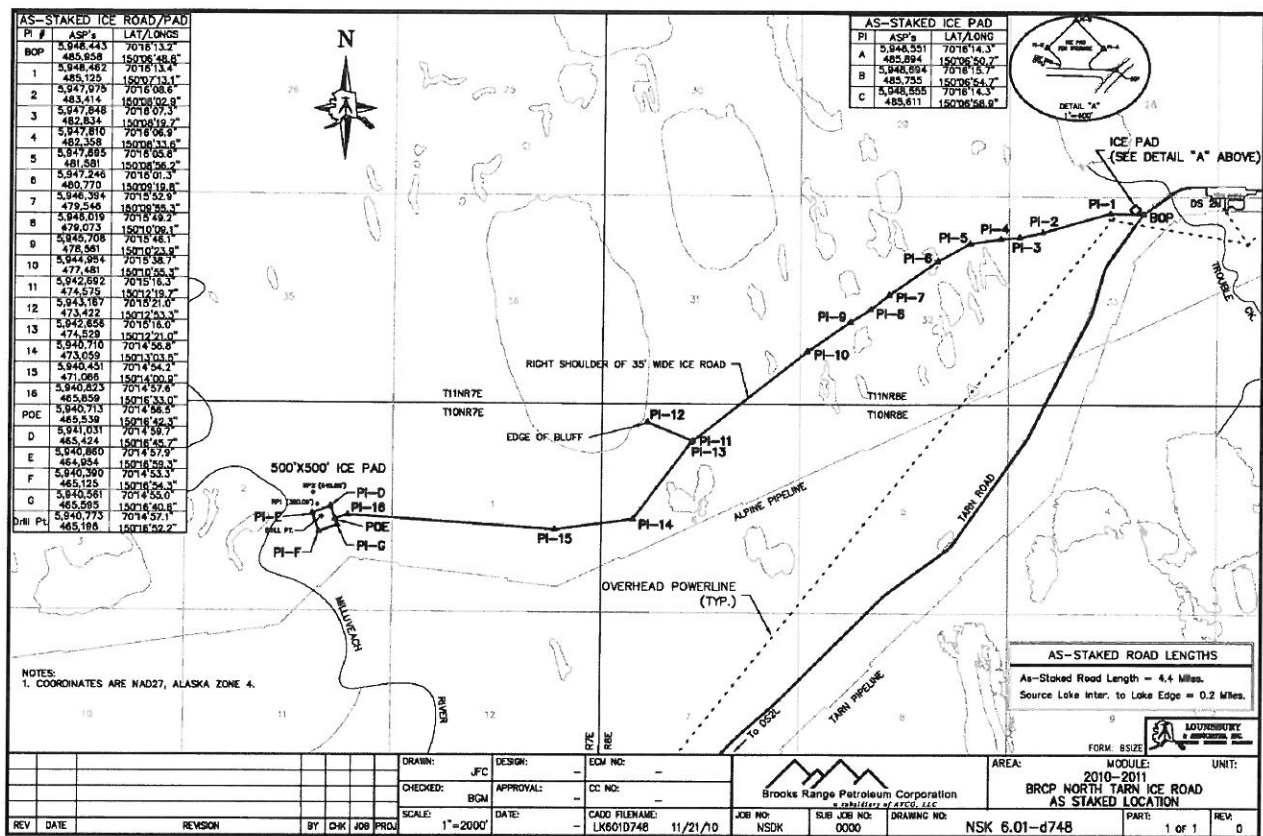
Before October 1, 2011, BRPC will submit a detailed Plan of Operations for the 2011/2012 winter exploration drilling season to the Alaska Department of Natural Resources, Division of Oil and Gas (DO&G) in support of its permit applications. Said Plan of Operations will focus on completion and testing of the North Tarn #1A well and the drilling of one to two delineation wells. Drilling activities will take place on the surface within SMU Tract 34, ADL390680, currently owned by Eni (20%), AVCG (24%), TG World (20%), Ramshorn (20%), and Brooks Range Development Corporation (16%). BRPC, a subsidiary of the AVCG, will be the operator for the proposed North Tarn Exploration Program.

The 2011-2012 SMU Operations Program would include the following major activities:

- Summer cleanup of winter exploration ice pad/road and summer field studies (survey, archeology, hydrology, & biology)
- Helicopter travel and landing to conduct site clearance field studies
- Traveling on tundra via Rolligon or similar tundra-approved vehicle to pre-pack ice road alignment;
- Clearing snow from 6 approved sources of water and ice;
- Collecting water and ice aggregate from approved sources;
- Constructing approximately 4 miles of ice road from existing KRU gravel roads to the ice pad location;
- Constructing the ice drill pad;
- Drilling the North Tarn 1A exploration well and one to two additional wells;
- Perform production flow test(s).

All required State of Alaska and North Slope Borough permits required for proposed 2011-2012 work will be prepared and submitted to appropriate agencies for the upcoming exploration season during the 3<sup>rd</sup> and 4<sup>th</sup> quarters of 2011.

Attached below is a map showing the proposed ice road and pad.



#### 4.0 SURFACE LOCATION OF PROPOSED FACILITIES

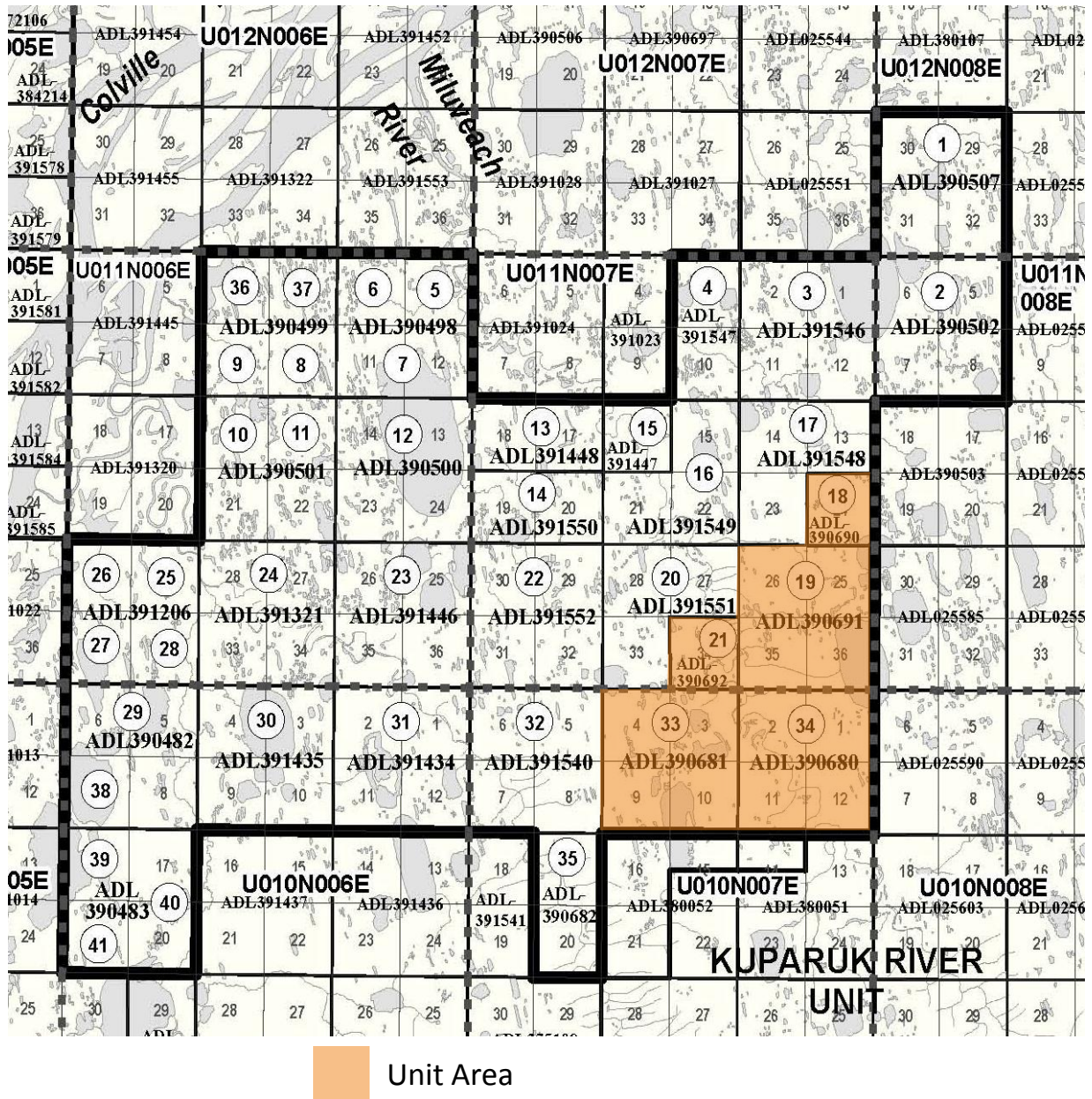
Attached above is a map showing the surface location of the proposed ice road and ice pad. Alternative routes for gravel road access to the proposed Mustang gravel drill pad will be evaluated during the summer of 2011. Attached below is a map showing the potential gravel material sites, and a map showing the Temporary Water Use Permits within SMU:





# Attachment 5

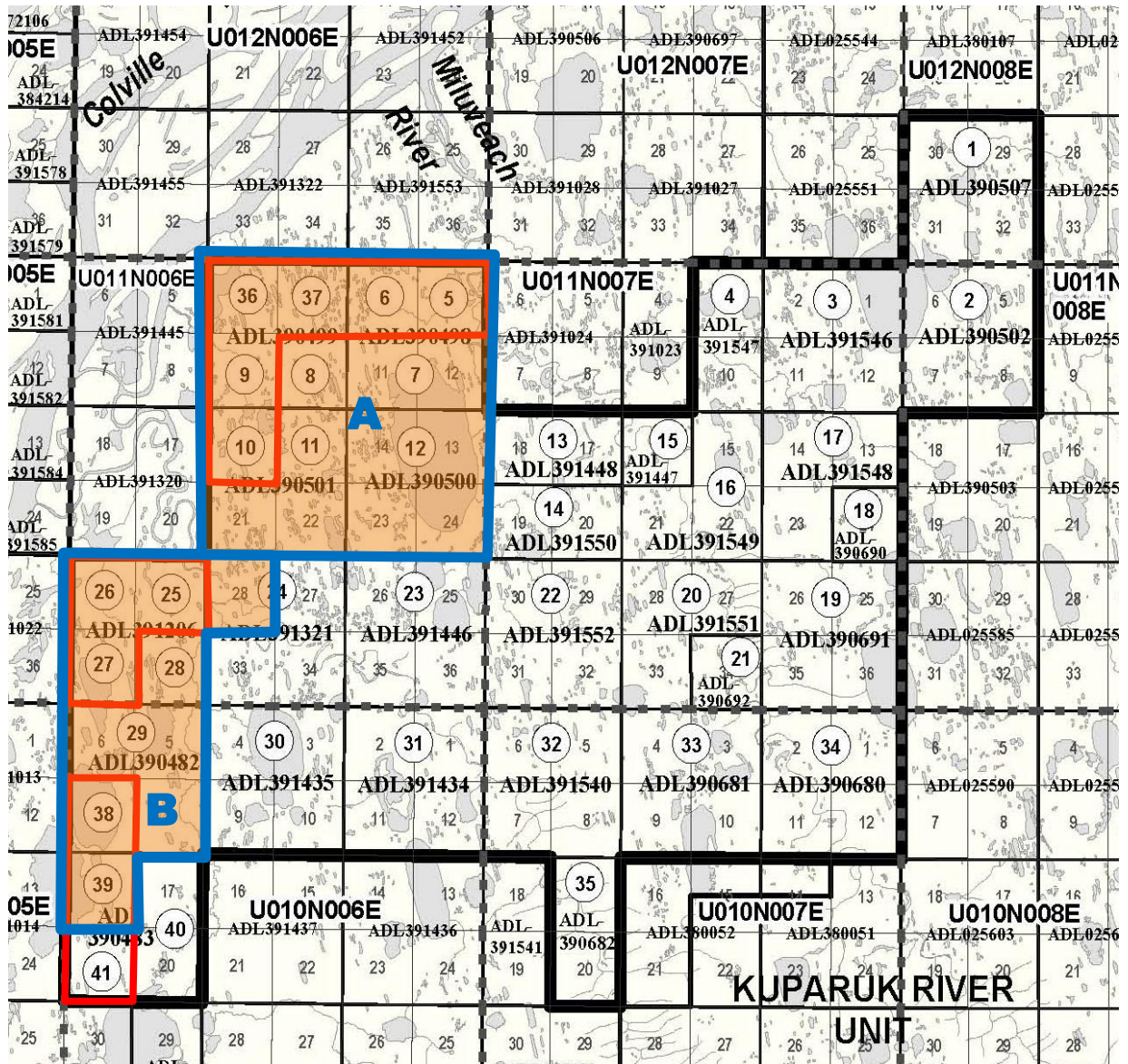
## Map of the New Southern Miluveach Unit Boundary





# Attachment 6

## Map of the Kachemach Unit Boundary



Exploration Blocks A and B

Unit Area

Joint State/ASRC Oil & Gas