

**DENIAL  
OF THE APPLICATION TO FORM THE ANGEL UNIT**

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

**September 10, 2012**

## TABLE OF CONTENTS

I.	INTRODUCTION AND DECISION SUMMARY	Page 3
II.	APPLICATION AND LEASE BACKGROUND	Page 3
III.	DISCUSSION OF DECISION CRITERIA	Pages 4-8
	A.    Decision Criteria Considered Under 11 AAC 83.303(b)	
	1. Environmental Costs and Benefits	
	2. Geologic and Engineering Characteristics and prior Exploration Activities	
	3. Plan of Exploration and Development	
	4. Economic Costs and Benefits to the State and Other Relevant Factors	
	B.    Decision Criteria Considered Under 11 AAC 83.303(a)	
	1. Promote the Conservation of All Natural Resources	
	2. The Prevention of Economic and Physical Waste	
	3. The Protection of All Parties of Interest, Including the State	
IV.	FINDINGS AND DECISION	Page 8-9
V.	ATTACHMENTS	
	1. Exhibit A, Proposed Angel Unit Tracts/leases	
	2. Exhibit B, Map of the Proposed Angel Unit Boundary	
	3. Exhibit G, Proposed Initial Unit Plan of Exploration	

## I. INTRODUCTION AND DECISION SUMMARY

The State of Alaska (State), Department of Natural Resources (DNR), Division of Oil and Gas (Division), received the Application for the Formation of the Angel Unit (Application) on May 24, 2012 from Linc Energy (Alaska) Inc. (Linc) as the proposed Angel Unit Operator. The Application was deemed complete under 11 AAC 83.306 on June 7, 2012. The Division gave notice of the proposed Angel Unit under 11 AAC 83.311 on June 10, 2012. The public comment period closed on July 10, 2012 and the Division received one comment.

The Division finds that the approval of the Application is not necessary or advisable to protect the public interest considering the provisions of AS 38.05.180(p) and 11 AAC 83.303. The Application is denied.

## II. APPLICATION AND LEASE BACKGROUND

Linc submitted the Application on May 24, 2012, 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 Application includes: Exhibit A, legally describing the proposed unit area, its leases, and ownership interests; Exhibit B, a map of the proposed unit; and Exhibit G, the Plan of Exploration (POE). The Application also includes confidential technical data.

The Division published a public notice in the Anchorage Daily News and the Mat-Su Valley Frontiersman on June 10, 2012, under 11 AAC 83.311. The notice was also published on the State of Alaska Public Notice website and the Division's website. The public notices invited interested parties and members of the public to submit comments on the Application. One comment was received from the Matanuska-Susitna Borough urging the Division to consider placing operational conditions on the unit approval to address potential impacts on nearby residential structures.

Linc proposed the following two leases for inclusion in the Angel Unit, comprising approximately 1,698.24 acres, as described in attachments 1 and 2. Both leases are held by Linc 100 percent. ADL 390581 has a seven year primary term and provides for 12.5 percent royalty share. MHT 9300061 has a five year primary term and provides for a 10.5 percent royalty share. Both leases expired May 31, 2012 and are held pending the Division's decision on the Application.

<b>Tract</b>	<b>Lease</b>	<b>Acres</b>	<b>Lease Expiration Date</b>
1	ADL 390581	1,406.18	5/31/2012
2	MHT9300061	292.06	5/31/2012
Total Acres Proposed		1,698.24	

### **III. DISCUSSION OF DECISION CRITERIA**

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). 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 DNR Commissioner (Commissioner) reviews applications related to units under 11 AAC 83.303 - 11 AAC 83.395. By memorandum dated December 21, 1998, the Commissioner delegated this authority to the Division Director. DNR 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, DNR 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 the DNR determines necessary or advisable to protect the public interest. 11 AAC 83.303(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. Decision Criteria considered under 11 AAC 83.303(b)**

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

The proposed Angel Unit is located South of W. Point Mackenzie Road in the vicinity of Point MacKenzie. Area residents may use this area for hunting and fishing. Oil and gas activity in the proposed unit area may affect some wildlife habitat and some hunting, fishing, and recreational activity. In approving sale of these leases, DNR has already determined that oil and gas activity in this area best serves the interests of the State.

When specific oil and gas activities are proposed, DNR will determine whether those activities, given mitigation measures to lessen or avoid adverse impacts, protect the public interest. Here, however, unit approval does not authorize any on-the-ground activity. Thus, this approval does not directly impact the environment. A plan of operations must be approved before any operations are conducted on a lease or in a unit, and that approval process involves assessment under the 11 AAC 83.303 criteria, including environmental costs and benefits. DNR develops lease stipulations through the lease sale process to mitigate the potential environmental impacts from oil and gas activities, and may, within limits, impose additional mitigation measures when approving a plan of operations. DNR also considers potential effects on the environment when permits to conduct exploration or development in the unit area are reviewed.

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

### **Regional Geology**

The Tertiary Cook Inlet basin is an elongate, northeast trending, fault bounded forearc basin that extends from the Matanuska Valley southward along the Alaska Peninsula. Extensive right lateral and dip slip motion has occurred along the northern and northwestern bounding faults resulting in multiple structural traps for hydrocarbon accumulation within the basin. Two major non-marine depositional systems comprise the Tertiary basin fill in the Cook Inlet basin, alluvial fan systems at the base overlain by axial fluvial systems. The alluvial fan systems developed along the arc and accretionary margins of the basin and carried sediment out into the actively subsiding basin. The axial fluvial systems migrated across the basin floor in relation to sediment input and topography. In the region of the proposed Angel Unit, Quaternary sediments unconformably overlie the Tyonek formation. The targeted reservoirs at the Angel Unit are the Tyonek and the Hemlock (or Hemlock equivalent) Formations.

The Tyonek Formation is composed of abundant coal, siltstone, and massively bedded fine to conglomerate sandstone. In the northern portion of the basin, porous sandstone called the Bell Island Sandstone may be found at the base of the Tyonek Formation. The Hemlock Formation is located beneath the Tyonek Formation and is typically comprised of sandstone and conglomerate.

### **Early Exploration History**

Oil and gas exploration within the upper Cook Inlet Basin began during the 1950's and was fueled by the discovery of oil in the Hemlock Formation at Swanson River in 1957 by Richfield Corporation and the discovery of gas in the Sterling Formation in the Kenai gas field in 1959 by Unocal. In the region of the proposed Angel Unit, there have been a handful of exploration wells that have been drilled and then plugged and abandoned: Pan Am Big Lake USA 1 (1968); Alaska Gulf 1 (1955); Susitna St Unit 1 (1964); and Linc Energy LEA 1 (2011). No tests were completed in the Big Lake USA 1, Susitna St Unit 1 or the Alaska Gulf 1. The Linc Energy LEA 1 well results are confidential; however, Linc Energy publically announced that the tests in the LEA 1 well proved the sands to be tight.

No wells exist within the proposed Angel Unit. One well, the Pan Am Big Lake 1, is located in the immediate vicinity of the proposed unit, approximately 2,000 feet east of the eastern boundary of the proposed unit. The well was drilled to a total depth of 6,026 feet and penetrated Quaternary gravels, the Tyonek Formation, Linc Energy's interpreted Hemlock Formation, and volcanic rock. No oil shows were mentioned in the mudlog or strip log. Gas shows were present in the coals in the Tyonek Formation. Gas shows are found between 3,800 feet and 3,950 feet in Linc Energy's interpreted Hemlock Formation. The mud log calls this interval sandstone. Resistivity values in these sands are low (10 ohmm) and there is minimal SP deflection.

## **Data Submission and Conclusions**

Linc Energy submitted the following technical data in support of their application: interpreted 2D seismic sections provided to Linc Energy by a GeoPetro consultant; discussion about Linc's issues with GeoPetro's seismic interpretation; three well log cross sections illustrating three different possible fault interpretations; a structure map of the Hemlock horizon; and petrophysical analyses for the LEA 1 and USA Big Lake 1 wells. Although publically available 2D seismic data covers the proposed Angel Unit, Linc Energy does not own a license to any of these data sets.

At this time, Linc Energy has not presented a structural trap that is reasonably defined and delineated, and therefore has not identified a potential hydrocarbon accumulation for the proposed Angel Unit. Linc Energy's proposed plan is to acquire new high-fold 2D and 3D seismic data over their proposed Angel Unit to clearly define a structural entrapping mechanism. Licensing an existing 2D survey or acquiring new seismic data are activities that do not require unitization and may be conducted on a lease-by-lease basis or without having interest in any lease.

### **3. Plan of Exploration and Development**

Linc submitted a Plan of Exploration (POE) on May 24, 2012 as part of the Application. Linc has proposed an initial three year POE consisting of two years of exploration and one year of development activities. Within one year of the approval date, Linc would prepare and complete a Geophysical Exploration Program and commence analysis of the newly acquired seismic data. By the second year anniversary date, Linc would commence to drill an exploration well. By the third year anniversary date, Linc would, if a Participating Area is approved, commence to make arrangements to install the infrastructure necessary for development.

Linc has not conducted exploration operations on these leases both of which would have expired if not for the Application. Unitizing the leases is not necessary to conduct the activities proposed in the POE. At this time, Linc has not yet sufficiently delineated their prospects and have yet to define specific drilling targets because they have yet to acquire good quality seismic coverage over the area. The proposed 3D geophysical exploration acquisition and delineation drilling do not require unitization and would not be conducted differently if the leases were not unitized.

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

The proposed POE does not propose activity that would result in greater economic benefit to the state if the leases were unitized than if the activities were conducted on a lease-by-lease basis. The activities proposed by Linc would not result in production sooner than if the same activities (seismic and drilling) were conducted on a lease-by-lease basis. Accordingly, unitization in this case offers no benefit to the State.

**B. Decision Criteria Considered Under 11 AAC 83.303(a)**

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

A unit may be formed under AS 38.05 .180(p) "[t]o conserve the natural resources of all or a part of an oil or gas pool, field, or like area." 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 formation of unit areas to develop hydrocarbon bearing reservoirs is a 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.

The proposed Angel Unit, however, cannot promote conservation of natural resources because there is no potential hydrocarbon accumulation or hydrocarbon bearing reservoir to be conserved by unitization. The activities proposed in the POE can be conducted on a lease-by-lease basis without jeopardizing the conservation objectives advanced by unitization. None of the activities proposed by Linc require unitization to efficiently recover oil and gas or minimize adverse impacts. Nor would unitization promote the conservation of other natural resources.

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

Economic waste is often referred to as the drilling of wells 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. Here, unitization would not prevent waste any more than conducting these activities on a lease-by-lease basis. The POE proposes to prepare and complete a Geophysical Exploration Program in year one and drill an exploration well in year two. Drilling one well within the proposed unit presents no threat of excessive drilling that makes it necessary to join the leases in a unit to avoid economic waste. Additionally, the use or dissipation of reservoir energy will not differ whether these proposed activities are carried out on individual leases or a unit, so there is no threat of physical waste favoring unitization.

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. The POE does not propose any activity that would be conducted any differently with unitization, as opposed to individual leases. Thus the Application does not present a potential for reduction of costs or physical waste through unitized operations that will expedite development of any reserves, or promote greater ultimate recovery of any oil and gas from the proposed unit area.

For these reasons, the proposed Angel Unit would not prevent economic or physical waste.

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

Linc would benefit from unitization of these leases including extension of the leases beyond their primary terms. Unitization would provide benefit to Linc in the extension of the primary term of both leases, which would have expired if not for the Application. Unitization would not, however, offer equal benefit or protections to 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). 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 and people's economic interests. Here, unitization will not encourage earlier delineation drilling activities upon the subject leases than if these activities were conducted on a lease-by-lease basis; it simply would provide an extension of the primary term for these leases. Drilling operations on any one of these leases would have also extended the drilled lease's primary term.

## **IV. FINDINGS AND DECISION**

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

State regulations define "conservation" for purposes of oil and gas leasing as "maximizing the efficient recovery of oil and gas and minimizing the adverse impacts on the surface and other resources." 11 AAC 83.395(1). For the reasons discussed above, Linc has not proposed any activity that would maximize efficient recovery when conducted on unitized lands any more than if the lands were single leases. Therefore, unitization in this case does not promote the conservation of all natural resources.

### **B. Promote the Prevention of Economic and Physical Waste**

Linc submitted confidential geological, geophysical, and engineering data to the Division in support of the Application. Linc proposes to complete a Geophysical Exploration Program and commence analysis of the newly acquired seismic data in the first year and commence to drill an exploration well in the second year. DNR finds the formation of the Angel Unit would not prevent economic or physical waste.

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

Since the leases proposed for inclusion in the Angel Unit are beyond their primary terms and are not in production or held by unitization, the area could be re-offered at lease sale by competitive

bid thereby enhancing competition amongst parties seeking to develop and produce oil and gas resources. Allowing Linc to unitize and hold a state lease without having identified a potential hydrocarbon accumulation is contrary to the public interest. To provide for unitization in this case would be contrary to the State's interest in promoting diligent exploration by its lessees. The only interest protected by granting unitization, is the lessees' interest in extending the lease terms to conduct exploration activities that could have otherwise been conducted on a lease-by-lease basis during the primary term.

Unitization is not in the best interest of the State for two reasons. First, Linc has not demonstrated the existence of a potential hydrocarbon accumulation to warrant the formation of a unit. Second, even if there were a potential accumulation the activities proposed in the POE do not ensure timely development of the States resources.

For the reasons discussed in this Findings and Decision, I hereby deny the Application because it is neither necessary nor advisable to protect the public interest.

A person affected by this decision may appeal it, in accordance with 11 AAC 02. Any appeal 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. An eligible person must first appeal 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

#### V. LIST OF ATTACHMENTS

1. Exhibit A, Proposed Angel Unit Leases
2. Exhibit B, Map of Proposed Angel Unit Boundary
3. Exhibit G, Proposed Initial Plan of Exploration

**ATTACHMENT 1: Exhibit A, Proposed Angel Unit Tracts/Leases**

**ANGEL UNIT AGREEMENT  
STATE OF ALASKA & ALASKA MENTAL HEALTH TRUST AUTHORITY**

**EXHIBIT "A"**

TRACT NO.	LEASE NO.	LEGAL DESCRIPTION	ACRES	ROYALTY	LESSEES OF RECORD	WORKING INTEREST	ORRI	
1	ADL-390581	T 15 N, R 04 W, Seward Meridian		12.50%	Linc Energy (Alaska), Inc.	100.00%	2.75% 0.9200000% 0.500000% 1.830000% 0.500000% 10.00000%	Pioneer Oil Company, Inc Highspeed Resources James C. Armstrong John C. Mackey Milam Natural Resources, LLC GeoPetro Alaska LLC
		Sec. 2 Surveyed Fractional Lots 1 thru 3, SW4NE4, NW4SE4 N2SW4SE4, SW4SW4SE4, SE4SE4SE4, E2SE4SW4, N2NE4SW4, SE4NW4, N2SW4NW4, S2NW4NW4 Total Acres	366.18					
		Sec. 3 Surveyed, S2N2NE4, S2NE4, NE4NE4SE4, W2SW4SE4 Total Acres	150.00					
		Sec. 10 Surveyed, S2N2NE4, NW4NW4NE4, S2NE4 Total Acres	290.00					
		Sec. 11 Surveyed, NE4NE4NE4, S2N2N2, NW4NW4NE4, S2N2 N2NE4NW4, Total Acres	600.00					
		Total Lease Acres	1,406.18					
2	MHT-9300061	T 15 N, R 04 W, Seward Meridian		*10.50%	Linc Energy (Alaska), Inc.	100.00%	2.75% 0.9200000% 0.500000% 1.830000% 0.500000% 10.00000%	Pioneer Oil Company Highspeed Resources James C. Armstrong John C. Mackey Milam Natural Resources, LLC GeoPetro Alaska LLC
		Sec. 2 Parcel						
		S50502	22.060					
		S50503	20.000					
		S50504	80.000					
		S50505	20.000					
		S50506	20.000					
		S50507	40.000					
		S50508	40.000					
		S50509	20.000					
		S50510	10.000					
		S50511	20.000					
		Total Acres	292.06					

**RECEIVED**

MAY 24 2012

DIVISION OF  
OIL AND GAS

<b>Sec. 3 Parcel</b>	
S50512	22.050
S50513	22.030
S50516	40.000
S50517	10.000
S50518	20.000
S50519	40.000
S50520	<u>20.000</u>
<b>Total Acres</b>	<b>174.080</b>
<b>Sec. 10 Parcel</b>	
S50524	10.000
S50525	<u>20.000</u>
<b>Total Acres</b>	<b>30.000</b>
<b>Sec. 11 Parcel</b>	
S50526	20.000
S50527	10.000
S50528	<u>10.000</u>
<b>Total Acres</b>	<b>40.000</b>
<b>Total Lease Acres</b>	<b>526.140</b>

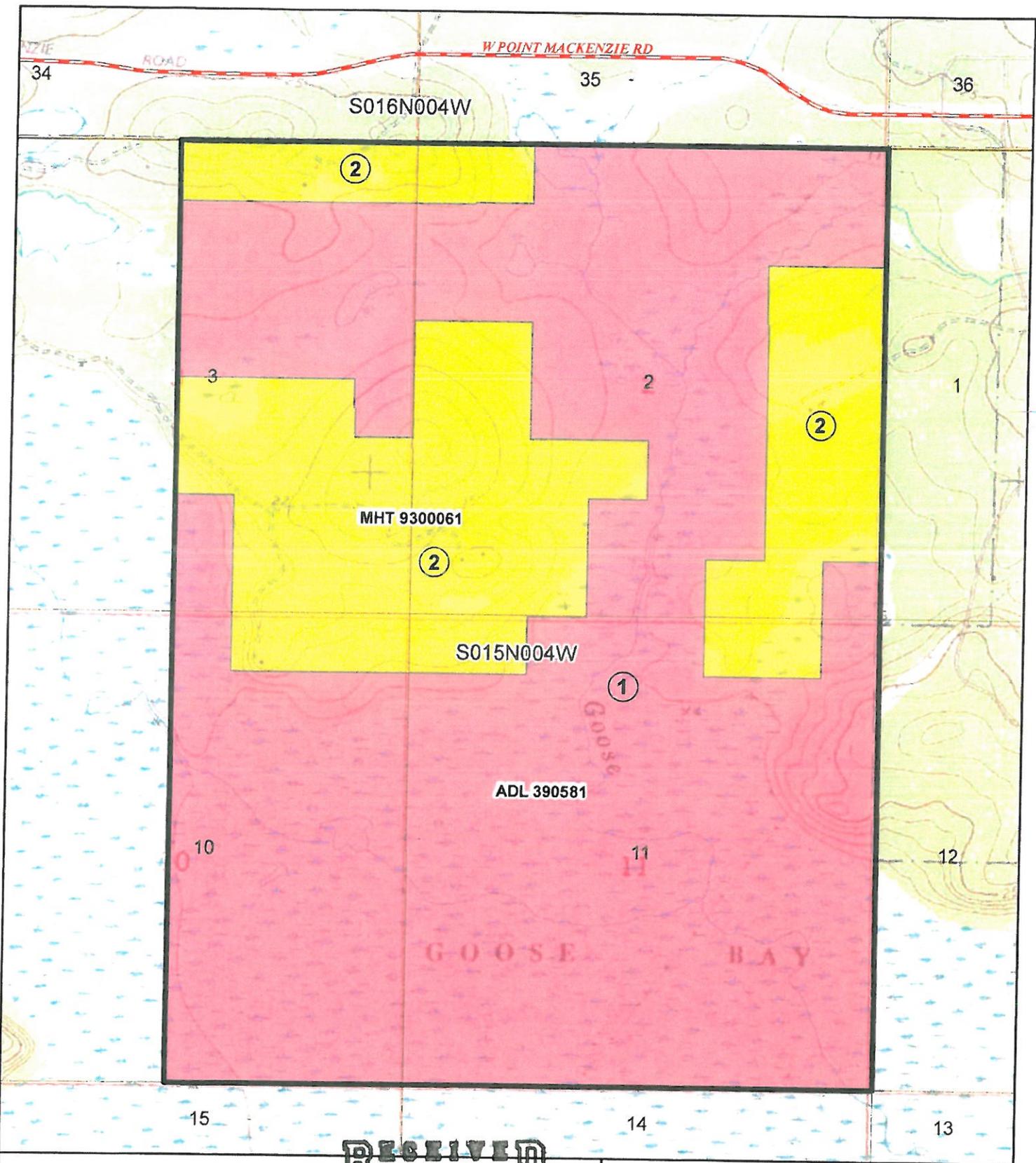
\*Increases to 12.5% after primary term.

**RECEIVED**

MAY 24 2012

**DIVISION OF  
OIL AND GAS**

**ATTACHMENT 2: Exhibit B, Proposed Angel Unit Map**



**RECEIVED**

MAY 24 2012

**DIVISION OF OIL AND GAS**



-  Angel Unit Boundary
-  Tract 1: ADL 390581, 1406.18 acres
-  Tract 2: MHT 9300061, 526.14 acres

**Exhibit B  
Angel Unit Agreement**



AK State Plane Zone 4 NAD83

**ATTACHMENT 3: Exhibit G, Proposed Initial Unit Plan (POE)**

## Angel Unit Agreement

### EXHIBIT "G"

## PLAN OF EXPLORATION

**RECEIVED**

MAY 24 2012

**DIVISION OF  
OIL AND GAS**

Linc Energy (Alaska), Inc. ("Linc") has, as a result of interpreting the data from drilling the LEA #1, a conventional natural gas exploration well, drilled by Linc on ADL #390588 in November 2010 and interpreting the data from four acquired seismic lines, identified a feature within the proposed Angel Unit that includes closure in both the Tyonek and Hemlock (or equivalent) horizons. At the Tyonek depth the structure appears largely as a southwest plunging nose with four-way dip closure at the crest. At the Hemlock (or equivalent) depth, the four-way dip closure appears to expand into a larger, more expansive closure. Linc's interpretation of the seismic data also indicates strong amplitude anomalies as well as apparent velocity-induced depressions of seismic reflectors over the crest of the feature. Both indicators would be expected in the presence of gas charged sands.

Drilled just to the north of the lands now proposed to be included in the Angel Unit, Linc's LEA #1 well tested three (3) sandstone intervals in the Tyonek Formation that had apparent gas shows. While gas was found, the well was not capable of commercial production. Just to the east of the proposed Angel Unit, the Lower Tyonek/Hemlock (or equivalent) horizon in the Big Lake USA #1 well, also exhibited several gas prone intervals.

Linc currently has a 100% Working Interest in five (5) Leases near or on the Pittman Anticline which comprise a total of approximately 14,758 acres. Linc proposes establishing the Angel Unit to include portions of only two of those leases; ADL-390581 and MHT-9300061. While the total gross acreage of those two leases is 9,957.34 acres, Linc proposes to establish the Angel Unit pursuant to 11 ACC 83.356 which requires that a unit must encompass the minimum area required to include all or part of one or more potential hydrocarbon accumulations. Consequently, the proposed acreage to be included in the Angel Unit is only 1,932.32 acres. These two (2) Leases encompass the extent of the seismic amplitude anomaly as interpreted by Linc with currently available data.

Since the seismic amplitude anomaly defines a structure that underlies two Leases, and one of the Leases is within and surrounded by the other Lease, unitization of both Leases is required in order to allow work on both Leases as if they were a single lease and to fully explore the structure and develop an exploration, production & development plan that will maximize production and not result in wasting the hydrocarbon resource. As the sole Working Interest Owner of the two Leases to be included within the Angel Unit, Linc proposes an initial three-year (3-year) Unit Plan consisting of two years of exploration and one year of development activities (Initial Unit Plan) for the Angel Unit. During the term of this Initial Unit Plan, in its capacity as the Angel Unit Operator, Linc plans to (1) prepare a Geophysical Exploration Program that will cover the unitized acreage, and the eastern extension of the structure imaged in the original, old vintage, seismic data, and acquire both 3D and 2D new data (2) drill an exploration well, (3) if drilling data indicates it to be appropriate, test the Tyonek/Hemlock (or

equivalent) interval in the exploration well (location of seismic amplitude anomaly), (4) if warranted by well test data, confirm through extended testing of the exploration well if commercial quantities of gas are present, (5) submit an application for approval of an Initial Participating Area (Initial PA) within the Angel Unit, and (6) commence construction of pipelines and other infrastructure to allow commercial gas production.

Linc, as the Angel Unit Operator, will undertake the following Initial Unit Plan:

Within the first two years of this Initial Unit Plan, the Angel Unit Operator will prepare a Geophysical Exploration Program and conduct a combined 3D and 2D seismic acquisition program, complete processing and evaluation of the data and if evaluation substantiates a prospective drill target the Angel Unit Operator will commence to drill an Exploration Well within the Unit Area.

**Year One: 2012-2013**

- I. By the first year anniversary of the date that the Angel Unit is approved, the Unit Operator will:
  - A. Prepare a Geophysical Exploration Program that will cover the unitized acreage, and the eastern extension of the structure imaged in the original, old vintage, seismic data. The Geophysical Exploration Program will include both 3D and 2D data acquisition with the 3D coverage being within the boundaries of the proposed Unit Area. The 2D line extensions will surround the core of the 3D coverage and extend to the east, beyond the boundary of the proposed Unit Area. The Geophysical Exploration Program will include a project schedule, line locations, number of shot points and data acquisition and interpretation methodology.
  - B. Contract with a geophysical exploration company qualified to do business in Alaska.
  - C. Obtain all permits necessary for the Geophysical Exploration Program detailed in I.A above, including the necessary bonding.
  - D. Complete the Geophysical Exploration Program, including both 3D and 2D data acquisition, described in item I.A above.
  - E. Commence analysis of the newly acquired seismic data to confirm existence and closure of the structure previously imaged in the original, old vintage, seismic data and determine if the structure is continuous to the east or if it rationalizes into two distinct lobes or structures.
  - F. Submit all data or geophysical information obtained to the Department of Natural Resources, Division of Oil and Gas and the Trust Land Office.
- II. If the Unit Operator fails to complete the first year commitments listed above the Angel Unit will terminate and:

- A. All Leases in the Angel Unit will terminate effective the date of the first year anniversary of when the Angel Unit is approved.
- B. The Unit Operator and the Working Interest Owner(s) will be released from all further obligations in this Initial Unit Plan.

**Year Two: 2013-2014**

- I. By the second year anniversary of the date that the Angel Unit is approved, the Unit Operator will commence to drill an Exploration Well that meets the following minimum criteria:
  - A. Drill to a bottom hole location within Tract 1 or Tract 2, i.e. ADL-390581, or MHT-9300061.
  - B. Drill a well to the Tyonek/Hemlock (or equivalent) gas sands, stratigraphically equivalent to the three (3) tested sandstone intervals in the Tyonek/Hemlock (or equivalent) section of the LEA #1 well that had apparent gas shows.
  - C. Log the well (GR or SP, Resistivity and Neutron/Density or Porosity: appropriate triple combo log).
  - D. Complete, suspend, or abandon the well.
  - E. If warranted by well test data, the Unit Operator will confirm through extended testing of the Exploration Well if commercial quantities of gas are present.
  - F. If extended testing of the well confirms commercial production is warranted, the Unit Operator will submit an application containing all information necessary to obtain approval from the proper authorities to establish a Participating Area (PA) within the Angel Unit.
- II. If the Unit Operator fails to complete the drilling of the 1<sup>st</sup> Exploration Well described in Section I above, by the second anniversary of the date that the Angel Unit is approved:
  - A. All Leases in the Angel Unit will terminate effective the second anniversary of the date that the Angel Unit is approved.
  - B. The Unit Operator and the Working Interest Owners will be released from all further obligations in this Initial Unit Plan.

### **Year Three: 2014-2015**

By the third year anniversary of the date that the Angel Unit is approved, if a Participating Area (PA) within the Angel Unit is approved by the proper authorities, the Unit Operator will commence to make arrangements to install the infrastructure necessary for development, including pipelines, as market circumstances allow.

#### **Initial Unit Plan General Provisions:**

- I. If the Angel Unit terminates for failure to fulfill any of the commitments in this Initial Unit Plan, the Working Interest Owner(s) will automatically surrender all expired State and Trust Authority acreage within the Unit Area, effective the day the Unit terminates.
- II. After fulfilling all of the obligations in this Initial Unit Plan, any Tract not having a portion of the Lease included in an approved Participating Area shall contract out of the Unit Area, unless there is a well certified capable of producing in paying quantities located on that Tract, and all portions of the Lease remaining in the Unit Area shall be subject to the terms and provisions of the Angel Unit Agreement.
- III. If acreage contracts out of the Angel Unit Area for failure to fulfill any of the commitments in this Initial Unit Plan, the Working Interest Owner(s) shall automatically surrender all expired Lease acreage that contracts out of the Angel Unit, effective the day the Unit contracts. The Commissioner and Executive Director may delay contraction of the Unit Area if warranted.
- IV. The Working Interest Owner(s) waive(s) the extension provision of 11 AAC 83.140 and Article 15.2 of the Angel Unit Agreement, and the notice and hearing provisions of 11 AAC 83.374 applicable to default and/or termination of the Angel Unit.