

**APPROVAL OF THE 11<sup>TH</sup> EXPANSION OF THE KUPARUK RIVER UNIT**

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

**September 10, 2015**

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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), approved the 10<sup>th</sup> expansion of the Kuparuk River Unit (KRU) effective March 1, 2011. The Division received the Application for the 11<sup>th</sup> expansion of the KRU (Application), on May 21, 2015, from the KRU Operator, ConocoPhillips Alaska, Inc. (CPAI). The proposed KRU expansion area covers approximately 2560 acres. The approved expansion of the KRU includes approximately 2560 acres. Attachments 1 and 2 set out the proposed Exhibits A and B, and Attachments 3 and 4 set out the approved Exhibits A and B.

“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 or more potential hydrocarbon accumulations.” 11 AAC 83.356(a). CPAI has submitted confidential geological, geophysical, and engineering data which demonstrate that the area approved for a unit expansion includes all or part of an oil reservoir.

The Division finds that the 11<sup>th</sup> expansion of the KRU 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. AS 38.05.180(p); 11 AAC 83.303. I approve the Application under the terms and conditions of Section IV. The effective date of the 11<sup>th</sup> expansion of the KRU is July 1, 2015.

## **II. APPLICATION AND LEASE SUMMARY**

CPAI submitted the Application on May 21, 2015, and simultaneously paid the \$500.00 unit expansion application filing fee, in accordance with 11 AAC 83.306 and 11 AAC 05.010(a)(10)(D), respectively. CPAI requested that the expansion be effective July 1, 2015. The Application includes: Exhibit A (Attachment 1), legally describing the proposed expanded unit area, its lease, and ownership interests, and Exhibit B (Attachment 2), a map of the proposed expanded unit. CPAI also submitted evidence of notice to proper parties. The Application also included confidential economic and technical data.

The Division published a public notice in the *Anchorage Dispatch* on July 8, 2015 and in the *Arctic Sounder* on July 9, 2015, 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, City of Barrow, the City of Nuiqsut, the Kuukpik Corporation, the Arctic Slope Regional Corporation (ASRC), the Ukpeagvik Inupiat Corporation, the Native Villages of Barrow and Nuiqsut, the Inupiat Community of the North Slope, the Arctic Slope Native Association, the Nuiqsut, Barrow, and Fairbanks Postmasters, the radio station KBRW in Barrow, the Alaska Department of Environmental Conservation, the Alaska Department of Fish and Game, and the Alaska Oil and Gas Conservation Commissioner. The public notices invited interested parties and members of the public to submit comments by August 10, 2015. No comments were received.

The proposed expanded unit area is summarized below and fully described in Attachments 1 and 2.

Tract No.	Lease No.	Lease Date	Acres	Royalty	WIO	Seg	Description
168	392364	4/1/2013	2560	16.66667	CPAI 55.40237% BPXA 39.28223% CVX 4.95060% EMAP .36480%	1	T10N, R9E, UM, Alaska, Section 15, Unsurveyed, All including the bed of the Ugnuravik River, 640.00 acres; Section 16, Unsurveyed, All including the bed of the unnamed lake, 640.00 acres; Section 21, Unsurveyed, All including the bed of the Ugnuravik River, 640.00 acres; Section 22, Unsurveyed, All including the bed of the Ugnuravik River, 640.00 acres

### III. DISCUSSION OF DECISION CRITERIA

A unit may be expanded 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–.395. By memorandum dated September 30, 1999, the Commissioner approved a revision of Department Order 003 and delegated this authority to the Division Director.

The Commissioner will approve an expanded 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).

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 expansion 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. DNR develops lease stipulations through the lease sale process to mitigate the potential environmental impacts from oil and gas activity.

DNR also considers environmental issues during the lease sale process, and the unit Plan of Operations approval process. Alaska statutes require DNR to give public notice and issue a written finding before disposal of the state's oil and gas resources. AS 38.05.035(e); AS 38.05.945; 11 AAC 82.415. In the written best interest finding, the Commissioner may impose additional conditions or limitations beyond those imposed by law. AS 38.05.035(e).

Approval of the KRU expansion has no direct environmental impact. This decision is an administrative action and does not authorize any on-the-ground activity. The unit expansion does not entail any environmental costs in addition to those that may occur when permits and plans of operations to conduct lease-by-lease exploration or development are issued. The Unit Operator must obtain approval of a plan 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 are analyzed when permits to conduct exploration or development in the unit area are reviewed. CPAI is operating under an approved plan of operations and plan of development.

### **2. Geological and Engineering Characteristics**

The Kuparuk River Oil Pool was discovered in 1969 by the Sinclair Ugnu No. 1 well. This pool is the second largest on the Arctic Slope of Alaska, occupying approximately 500 square miles. It is defined as the accumulation of oil within the Kuparuk River Formation that is common to and correlating with the accumulation found in the ARCO West Sak River State No. 1 well between the measured depths of 6,474 and 6,880 feet. The requested 11th expansion of the Kuparuk River Unit (KRU) is in relation to the pending 12th expansion of the Kuparuk Participating Area (KPA) and is focused to the south of the 2F and 2G drill sites within the KRU and KPA. Based on the results of recent development wells drilled in the area, including four wells (2E-01, 2F-21, 2F-22, and 2G-17L1) currently producing from the Kuparuk River Formation under approved lease operations, CPAI has requested that the KRU be expanded to include lease ADL 392364 comprising approximately 2560 acres.

## **Characteristics of the Reservoir**

The Kuparuk River Formation is a sequence of clastic sediments deposited on a shallow marine shelf during Neocomian (Early Cretaceous) time. The formation is divided into Upper and Lower Members. These two Members are comprised of four informal units that are termed, in ascending order by depth, "A", "B", "C", and "D". The "A" and "C" units are the pay-bearing intervals within the KRU. The A unit exists throughout the pool area and consists of sandstone, siltstone, and mudstone in a series of regressive cycles that range up to 70 feet thick. When mapped in detail, these individual cycles form elongate bodies that strike northeast-southwest. Porosity and permeability values average to approximately 23% and 80 millidarcies (md), respectively. The A unit thins to the west where it is truncated by an intraformational unconformity that lies at the base of the C unit. The C unit is composed of glauconitic sandstone and siltstone with subordinate conglomerate and lesser shale. Bands of siderite-cemented sandstone are common. Porosity and permeability values average to approximately 21% and 90 md, respectively. Throughout the KRU, deposition of sand in the C unit appears to have been influenced by syndepositional, northwest-trending normal faults.

## **Current Activity and Production**

In 2013, the coil tubing drilling (CTD) horizontal lateral well (2G-17L1) was drilled into ADL 392364, which CPAI holds south of the current KRU boundary. This horizontal well targeted the Kuparuk C sand, which had historically under-performed in this area. Initial rates from this well exceeded 2,900 barrels of oil per day (bopd) and currently produce approximately 700-800 bopd. In late 2014, CPAI drilled an offsetting horizontal well (2F-22) in the C sand along the western boundary of the lease. Initial production rates exceeded 2,000 bopd and the well currently produces approximately 1,100 bopd. Two horizontal wells have been drilled within the lease targeting the lowermost Kuparuk A sand (A5); well 2E-01 came on production in January of 2015 at nearly 1,000 bopd and currently produces around 300 bopd, and well 2F-21 is the offsetting injection well that is currently being pre-produced at a rate of 100-200 bopd.

## **Conclusion**

The expansion of the KRU to include ADL 392364 is supported by the recently drilled wells and over 2,000 bopd that is currently being produced back to the KRU under an approved lease operation. CPAI has also submitted technical information and interpretation in the form of well data, production analysis, and seismic data that supports their interpretation of productive sands within the Kuparuk River Formation existing beyond the current boundaries of the KRU and KPA within the area requested for the KRU expansion.

## **3. Plan of Development**

The Division approved the 2015 KRU Plan of Development (POD) on July 30, 2015 for the period August 1, 2015 through July 31, 2016. During this timeframe, CPAI plans to:

- Drill 16 coiled tube drilling (CTD) sidetrack and seven rotary wells in the Kuparuk Participating Area.
- Develop the 2S drill site (DS-2S). This is the first new drill site in the KRU in 12 years.

- Drill five grassroots rotary wells in the Tarn Participating Area, and four new wells in the West Sak Participating Area.
- Use indigenous gas for injection to recover NGLs left behind and to provide benefit in lifting the oil to the surface within the well bore.
- Maintain facilities and infrastructure through repair or replacement of pipelines, turbines, and process control safety systems.

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

The expanded KRU will continue to provide economic benefits to the State through royalty and tax payments on production. Although, because the expansion area is already producing or contributing to production, there is no additional direct economic benefit. Unitized development conducted under the KRU Agreement provides for development of all the unitized leases as a single lease, rather than development conducted on a lease-by-lease basis. Unitized development maximizes oil and gas recovery, promotes conservation, prevents waste, and protects all of the parties of interest.

#### **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(9). The unitization of oil and gas reservoirs or accumulations and the formation and expansion of unit areas to develop hydrocarbon-bearing reservoirs or accumulations 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.

Expansion of an existing unit, with development occurring under the terms of a unit agreement, promotes efficient evaluation and development of the State’s resources, and minimizes impacts to the area’s cultural, biological, and environmental resources.

##### **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 is often referred to as the drilling of wells in excess of the number necessary for the efficient recovery or delineation 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. Annual approval of the KRU development activities as described in the future plans of development must also provide for the prevention of economic and physical waste.

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

The people of Alaska have an interest in the development of the State's oil and gas resources to maximize the economic and physical recovery of the resources, AS 38.05.180(a). Approval of the expansion under future annually approved plans of development will provide for continued review and approval of CPAI's plans to develop the KRU in a manner which will maximize economic and physical recovery. Combining interests and operating under the terms of the KRU Agreement and KRU Operating Agreement assures an equitable allocation of costs and revenues commensurate with the resources.

The KRU expansion protects the economic interests of the WIOs and the State. The expansion promotes the State's economic interests because hydrocarbon recovery will be maximized and additional production-based revenue will be derived from the increased production. Diligent exploration and development under a single approved unit plan without the complications of competing leasehold interests promotes the State's interest. Operating under the KRU Agreement provides for accurate reporting and record keeping, State approval of plans of exploration and development and operating procedures, royalty settlement, in-kind taking, and emergency storage of oil and gas, all of which will further the State's interest.

## **IV. FINDINGS AND DECISION**

### **A. The Conservation of All Natural Resources**

1. Expansion of the KRU will provide for continued development of the expansion area under the KRU Agreement and will maximize the efficient recovery of oil and gas and minimize the adverse impacts on the surface and other resources, including hydrocarbons, gravel, sand, water, wetlands, and valuable habitat.
2. The unitized development and operation of the leases in this expansion will reduce the amount of land and fish and wildlife habitat that would otherwise be disrupted by individual lease development. This reduction in environmental impacts and preservation of subsistence access is in the public interest.
3. There is potential for environmental impacts associated with development. All unit development must proceed according to an approved plan of development. Additionally, before undertaking any specific operations, the Unit Operator must submit a unit Plan of Operations to the Division and other appropriate state and local agencies for review and approval. The lessees 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 Agreement, if necessary or appropriate. Compliance with mitigation measures will minimize, reduce or completely avoid adverse environmental impacts.

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

1. CPAI submitted geological, geophysical, and engineering data to the Division in support of the Application. Division technical staff determined that the expanded KRU area encompasses all or part of one or more oil reservoir(s).
2. The available geological, geophysical, and engineering data justify including the proposed lands, as described in Section A.2 of this decision.
3. The production of hydrocarbons through the existing production and processing facilities reduces the environmental impact of the additional production. Using existing facilities will avoid unnecessary duplication of development efforts on and beneath the surface.

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

1. The unit expansion, as approved, 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.
2. The economic, geological, geophysical, and engineering data that CPAI provided reasonably justify the inclusion of the KRU expansion acreage under the terms of the applicable regulations governing formation, expansion, and operation of oil and gas units and participating areas (11 AAC 83.301 – 11 AAC 83.395) and the terms and conditions under which these lands were leased from the State. The State is currently receiving royalty from production from the lease acreage.
3. CPAI provided evidence of reasonable effort to obtain joinder of any proper party to the Agreement.
4. CPAI holds sufficient interest in the unit area to give reasonably effective control of operations.
5. The unit expansion meets the requirements of 11 AAC 83.303.
6. The Division complied with the public notice requirements of 11 AAC 83.311.
7. The unit expansion will not diminish access to public and navigable waters beyond those limitations (if any) imposed by law or already contained in the oil and gas leases covered by this decision.


8. The KRU Agreement provides for additional expansions and contractions of the unit area in the future, as warranted by data obtained by exploration or otherwise. The KRU Agreement thereby protects the public interest, the rights of the parties, and the correlative rights of adjacent landowners.
9. The approved expanded unit is effective July 1, 2015.
10. The lease approved for inclusion in the expanded Kuparuk River Unit is as follows:

Tract No.	Lease No.	Lease Date	Acres	Royalty	WIO	Seg	Description
168	392364	4/1/2013	2560	16.66667	CPAI 55.40237% BPXA 39.28223% CVX 4.95060% EMAP .36480%	1	T10N, R9E, UM, Alaska, Section 15, Unsurveyed, All including the bed of the Ugnuravik River, 640.00 acres; Section 16, Unsurveyed, All including the bed of the unnamed lake, 640.00 acres; Section 21, Unsurveyed, All including the bed of the Ugnuravik River, 640.00 acres; Section 22, Unsurveyed, All including the bed of the Ugnuravik River, 640.00 acres

11. CPAI will submit revised Exhibits A and B within 60 days of the issuance of this decision.

For the reasons discussed in this Findings and Decision, I hereby approve the 11<sup>th</sup> KRU unit expansion.

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 Mark D. Myers, 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.

  
 Corri A. Feige, Director  
 Division of Oil and Gas

9/10/15  
 Date

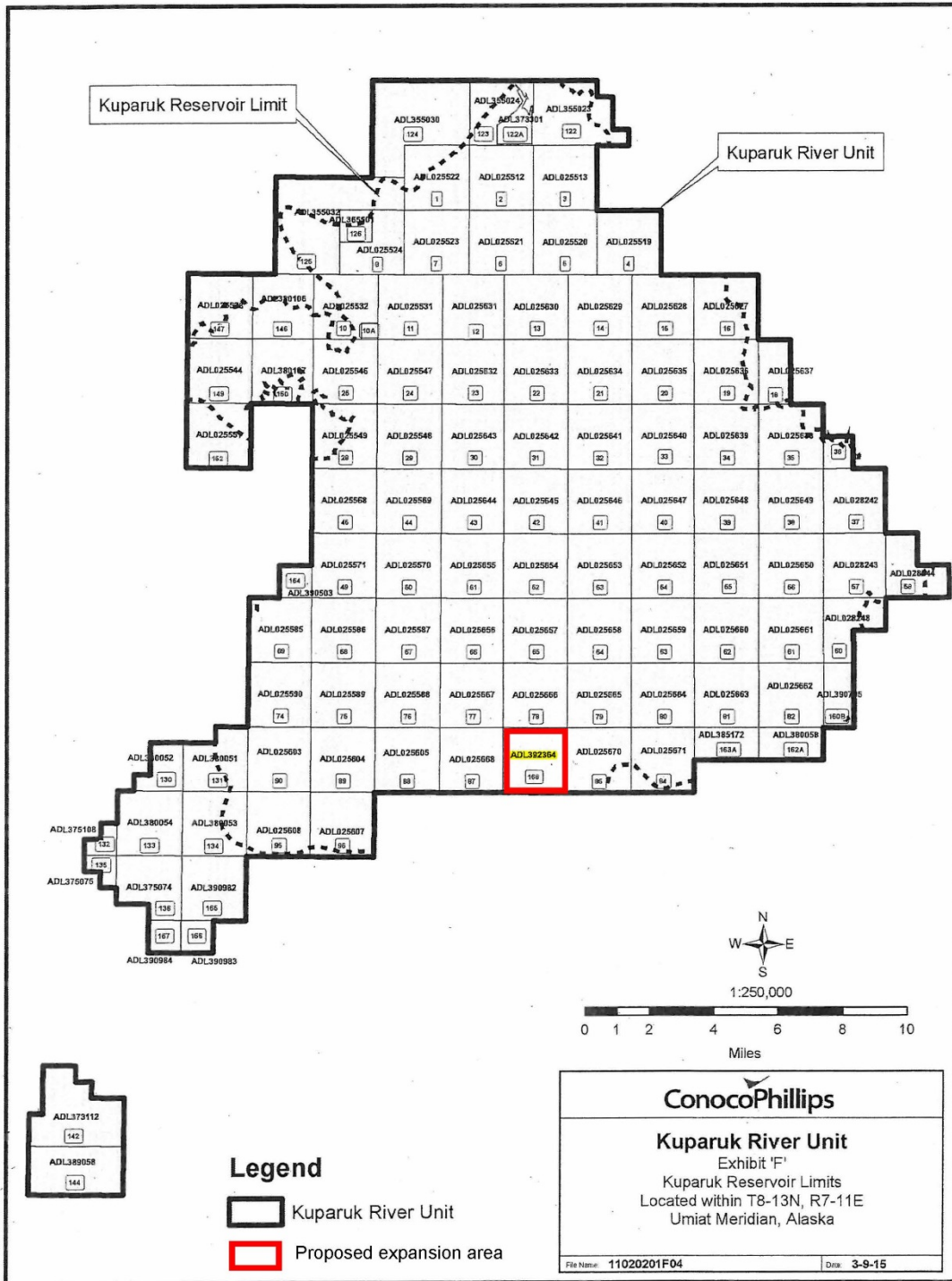
**V. ATTACHMENTS**

1. KRU Proposed Exhibit A  
Description of Lands within the Proposed Expanded Unit Area
2. KRU Proposed Exhibit B  
Map of the Proposed Expanded Unit Area
3. KRU Description of Lands within the Approved Expanded Unit Area
4. KRU Map of Approved Expanded Unit Area

1. Kuparuk River Unit Proposed Exhibit A  
 Description of Lands within the Proposed Unit Expansion Area

Tract	Lease No.	Legal Description	Lease Acres	Ownership
168	ADL 392364	T10N, R09E, UM, Alaska, Sec. 15, All; Sec. 16, All; Sec. 21, All; Sec. 22, All.	2,560	CPAI 55.40237% BP 39.28223% CVX 4.95060% EMAP 0.36480%

2. Kuparuk River Unit Proposed Exhibit B  
Map of Proposed Unit Expansion Area



3. Kuparuk River Unit Description of Lands within the Approved Expanded Unit

Tract No.	Lease No.	Lease Date	Acres	Royalty	WIO	Seg	Description
168	392364	4/1/2013	2560	16.66667	CPAI 55.40237% BPXA 39.28223% CVX 4.95060% EMAP .36480%	1	T10N, R9E, UM, Alaska, Section 15, Unsurveyed, All including the bed of the Ugnuravik River, 640.00 acres; Section 16, Unsurveyed, All including the bed of the unnamed lake, 640.00 acres; Section 21, Unsurveyed, All including the bed of the Ugnuravik River, 640.00 acres; Section 22, Unsurveyed, All including the bed of the Ugnuravik River, 640.00 acres

