

Douglas A. Ducey  
Governor

State of Arizona  
**Oil and Gas Conservation Commission**

1110 W. Washington Street, Phoenix, AZ 85007

602-771-4501

[www.azogcc.az.gov](http://www.azogcc.az.gov)

Dennis L. Turner, Oil and Gas Administrator

Commissioners:

Frank Thorwald, Chair

Robert L. Wagner, Vice Chair

Stephen R. Cooper

William C. Feyerabend

J. Dale Nations, Ph.D.

**NOTICE OF COMBINED PUBLIC MEETING AND POSSIBLE EXECUTIVE SESSION  
ARIZONA OIL AND GAS CONSERVATION COMMISSION**

Pursuant to A.R.S. § 38-431.02, notice is hereby given to the members of the Arizona Oil and Gas Conservation Commission (OGCC or Commission) and to the general public that the OGCC will hold a meeting open to the public on **February 17, 2017, at 10:00 a.m. in Room 3100B**, third floor of the of the Arizona Department of Environmental Quality, 1110 W. Washington Street, Phoenix, Arizona.

**AGENDA:**

1. Call to order
2. Discuss and approve the meeting minutes of:
  - January 6, 2017 and
  - February 3, 2017
3. Ranger Development L.L.C. (Ranger) issues to be discussed and voted on by the Commission:
  - The Administrator will summarize the subject for discussion by the Commission
  - Discuss multiple zone completions and comingling production of helium gas from the Coconino Sandstone and Shinarump Conglomerate (Chinle Formation): Multiple Zone Completions (A.A.C. R12-7-116), Commingling of Production from Pools (A.A.C. R12-7-137) and Use of Vacuum Pumps (A.A.C. R12-7-139).
    - Discussion with Tony Hines, IACX/ Ranger about the operator's intent to do multiple zone completions, comingle production and use of vacuum pumps.
    - Discuss and vote on what additional requirements should be made for multiple zone completions, in accordance with A.A.C. R12-7-116
    - Discuss and vote on what additional requirements should be made for comingled production, in accordance with A.A.C. R12-7-137
    - Discuss and vote on what additional requirements should be made (if applicable) for use of vacuum pumps, in accordance with A.A.C. R12-7-139
    - The Commission may vote to hold an executive session for the purpose of obtaining legal advice from the Arizona Attorney General's Office on: 1) how to authorize/ approve Ranger activity after the fact of their multi-zone completions; 2) how to authorize/ approve after the fact Ranger's intent to comingle production in the Shinarump and Coconino units; or 3) whether to address these matters in a formal hearing first and then vote on them.
  - Discrepancies in proper names of wells – General discussion on well naming conventions; if necessary, the OGCC will vote on an agreed-upon well nomenclature that will be implemented with this meeting.

#### 4. Holbrook Energy wells

- Hortenstine 35-1 (Permit 919): recap of status, inspection by the OGCC Admin. & responsibilities of interested parties in accordance with A.A.C.R12-7-103(C).
  - Gordon LeBlanc, on behalf of Holbrook Energy, will present background history of the Hortenstine 35-1 and any other information he deems relevant
  - Ranger will discuss their plan for the well and present their letter of intent and Sundry Notice to the OGCC
- The OGCC will discuss, implement and/or vote on:
  - Forfeiture of Holbrook Energy's \$10,000 bond for the Hortenstine 35-1;
  - Appropriate procedure and forms to release/ forfeit the performance bond (\$10,000);
  - Appropriate procedure to transfer control of well from current operator to Ranger
  - Whether to transfer the bond to Ranger or allow the company to cover it under an existing blanket bond; and
  - Whether to allow Ranger to: 1) assume responsibility for the well; and 2) the company's intended scope of work on the well.
- Holbrook Energy 17-1 NZOG (Permit 924) well. Ownership recently changed to HNZ Holding, LLC and the operator changed to Arizona Energy Partners (AEP).
  - The Administrator will summarize the file contents and previous OGCC actions. In addition, the OGCC will consider any and all documents and materials provided by AEP.
  - The OGCC will vote on whether to approve the requested confidentiality of completion data for a period of one year, pursuant to A.A.C. R12-7-121(C).

#### 5. Kinder-Morgan – renewal of temporary abandonment status. The O & G Administrator received a letter from Kinder-Morgan dated January 19, 2017, in accordance with A.A.C. R12-7-125(B) demonstrating the future beneficial use of their wells in the St. Johns Gas Unit. The letter was requested by the OGCC, in support of continuing the blanket temporary abandonment status of those wells.

- The OGCC will discuss and vote on the matter of approving a 5 year extension to coincide with the Arizona State Land Department's recent renewal of the St. Johns gas unit.

#### 6. Five Year Rule Review Report: the Commission will discuss and vote on the following:

- Preliminary discussion of Commissioners' comments on report
  - Special meeting of OGCC (March 9<sup>th</sup>?) to review/ discuss/ approve the draft report content as final, for submittal to GRRC on or before March 24, 2017.
- The Commission may hold an executive session for the purpose of obtaining legal advice from the Commission's attorney on the approval steps for the Five Year Rule Review Report

#### 7. The Assistant Attorney General and the OGCC will discuss oil and gas drilling on Tribal lands:

- Issuing permits on OHNIR lands, who have only surface rights (no mineral rights);
- Issuing permits on Tribal lands where the landowner has only surface rights; and
- Issuing permits on Tribal lands where the landowner has surface and mineral rights.
- The Commission may vote to hold an executive session for the purpose of obtaining legal advice from their attorney on the matter of issuing drilling permits and collecting production data from producing wells on Tribal lands.

8. OGCC action items on the following procedures and rule interpretations; the OGCC will vote on all items that need approval:
  - Confidential status for certain trade secrets & proprietary information: A.R.S. § 44-1374
  - Accepting a blanket bond (A.A.C R12-7-103), such as, what criteria must be met, when submitted, when refunded or forfeited
  - Payments of performance bonds ((A.A.C R12-7-103)) of any kind are only accepted when they are part of an Application for a Permit to Drill or Re-enter
  - Review past practices of operators' compliance with completion reports (A.A.C. R12-7-121(A)): 1) how to interpret "the operator shall submit other well data to the Commission within 30 days of the date the work is done"; 2) determine if it is correct to link "completion operations" defined in A.R.S. § 27-551(2) with "date the work is done"; 3) acceptable electronic formats (*e.g.*, PDF, .LAS, .WCL, ... )
  - Inspections and inspection rights
    - Review draft Inspection & Inspection Rights Form; request Asst. Attorney General to review form for legal accuracy
9. Call to the public: This is the time for the public to comment. Members of the Commission may not discuss items that are not on the agenda. Therefore, action taken as a result of public comment will be limited to directing staff to study the matter or scheduling the matter for further discussion and decision at a later date.
10. Announcements
  - The next regularly scheduled meeting of March 31 may be moved to April 14, 2017. OGCC may discuss and possibly announce that the next meeting will be held in Tucson. The Commissioners need to see the limited space that remains for future drill cuttings and core in the basement of the former AZGS building, 416 West Congress, Tucson.

#### 11. Adjourn

Members of the Oil and Gas Conservation Commission will attend either in person or by telephone conference call. The public may be afforded an opportunity to comment on any agenda item; however, at the beginning of the meeting, the Commission may vote to set up a time limit on individual comments.

**NOTE:** The Oil and Gas Conservation Commission may vote to hold an Executive Session, pursuant to A.R.S. § 38-431 .03(A)(3) or (4), which will not be open to the public, to consult with its attorney and receive legal advice with respect to any regular agenda item listed on this agenda.

For additional information about this meeting, contact Dennis L. Turner, Oil and Gas Program Administrator, (602) 771-4501. A copy of the agenda and background material provided to Commission members (with the exception of material relating to possible executive sessions) is available for public inspection at the Arizona Department of Environmental Quality, Records Management Center, 1110 W. Washington Street, Phoenix, AZ 85007. Note also that the agenda items may be taken out of order.

To request an auxiliary aid or service for accessible communication, please contact Caroline Oppleman, (602) 771-2215 or [co2@azdeq.gov](mailto:co2@azdeq.gov) or dial 7-1-1 for TTY/TTD Services.



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**Public Meeting of the Oil & Gas Conservation Commission**

**10:00 a.m., Feb. 17, 2017, Room 3100B**

Name / Organization – please print	email	phone
Frank THORWALD		
TONY HINES	tonyhines@iacx.com	214-649-9104
Rick Zeise	RTPovey@AOL.com	303-748-4582
GORDON DUDLEY	GED@UNITEDHELIUM.COM	480-949-2755
Teresa Harris	teresa.harris@ATCassociates.com	602-723-4320
Thomas White	thomas-white@kinderberg.com	928 242 4133
Joe Dixon	jdixon@azland.gov	602-542-2685
Bob Wagner	rl.wagner@cox.net	602-318-0026
Gordon LeBlanc Jr.	gordon.leblanc.jr@gmail.com	602 487 6486
Rick Zeise	Rick.Zeise@azag.gov	602-542-8553
DALE NATIONS (by phone)		
STEVE COOPER		
ROBERT WAGNER		

# Pinta Dome and Navajo Springs Dome Typical Gas Analyses

<b>Field</b>	<b>PD/MD/NS</b>	<b>Pinta Dome</b>	<b>Navajo Springs</b>
<b>Component</b>	<b>Coconino</b>	<b>Shinarump</b>	<b>Shinarump</b>
<b>Helium</b>	<b>8.2%</b>	<b>6.5%</b>	<b>7.6%</b>
<b>Nitrogen</b>	<b>90.1</b>	<b>93.0</b>	<b>91.2</b>
<b>Carbon Dioxide</b>	<b>1.0</b>	<b>0.4</b>	<b>0.5</b>
<b>Methane</b>	<b>0.2</b>	<b>0.1</b>	<b>&lt; 0.1</b>
<b>Other</b>	<b>0.5</b>	<b>0.0</b>	<b>0.7</b>
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

## PINTA DOME HELIUM GAS RESERVES

By

John Masters, Chief Geologist  
Kerr-McGee Oil Industries  
Oklahoma City, Oklahoma

### I. Introduction

The Pinta Dome gas field represents a unique occurrence of high grade helium. Although the field contains less than 1% of total U.S. reserves it is nonetheless of considerable geologic interest for two reasons: (1) helium concentration in the gas is 8%, the highest concentration known in any field; (2) the presence of helium in the relatively unexplored expanse of central Arizona makes the discovery of additional reserves in the area an excellent possibility.

### II. Location

As shown in Fig. 1 the Pinta field is in Apache Co., Arizona, 35 miles northeast of Holbrook and 2 miles south of U. S. Highway 66 in Townships 19 and 20 North, Range 26 East. It is easily accessible over generally open, rolling country. The elevation averages 5700 feet and the climate is moderate.

### III. History of Development

Pinta was found and developed by a series of individuals and companies. As the field evolved larger amounts of capital were required in each stage of development and the property was passed to successively larger organizations.

Dorsey Hager, Silas C. Brown and perhaps other geologists had recognized the Pinta anticline by 1948 or earlier. Brown made a detailed geologic map and assembled leases on the structure which he turned to C. A. Martin & Assoc. of Phoenix, Arizona in 1948. The Martin group then made a drilling agreement with the Kipling Petroleum Co. who proceeded to spud the #1 Macie in 1950 (see Fig. 2). This well discovered a large flow of gas from the Coconino sand at 1035 feet. When the operators found that the gas would not burn they decided it was worthless and let the well blow wide open for several weeks. A big gas well makes a lot of noise, and this one was also spewing out mud and rocks so it made quite a spectacle. However, when the Bureau of Mines ran a helium test on the well and saw the analysis they demanded that the well be shut in. In 1951, Kipling spudded the #2 Macie and drilled it through the gas zone to 2517 feet but stuck the drill pipe and finally abandoned the well. By July, 1955, the Apache Oil and Helium Corporation had made a deal with Kipling to take over development of the property. They reworked the #2 Macie and during the operation the well blew out. The hole was filled with mud to hold the gas pressure and the well was again temporarily abandoned. Apache then located a third well, #3 Macie, and drilled it to 845 feet but abandoned it before penetrating the Coconino sand.

In 1956, Kerr-McGee Oil Ind., Inc. and associates made an agreement to complete the development of the field. At that time, the field had one capped gas well, one abandoned well with indicated commercial production, and one partially drilled well. Kerr-McGee proceeded to drill and complete the two abandoned wells, three more gas wells, and two dry holes which defined the field on the north and east sides. In 1959 Eastern Petroleum Corporation drilled three gas wells which filled in the field development and extended production to the southeast. They also drilled one dry hole which closed off the field on the west side. Three dry holes drilled by Sierra further defined the field limits on the southeast, south, and northwest.

The Pinta field is now fully developed except for the final unit well to be drilled by Kerr-McGee in SE 26-20N-26E. This well is scheduled early in 1961.

### IV. Geology

Pinta Dome is a small anticlinal structure which lies near the axis of a gentle regional syncline between the Defiance Uplift and the Mogollon Slope. The major tectonic divisions of the region are shown on Fig. 1. Several other anticlines similar in size to Pinta Dome are known in the general area and are also shown on Fig. 1. Most of these have been tested in the Coconino and found barren.

The surface rocks at Pinta are Chinle red beds. They overlie in descending order the Shinarump, Moenkopi and Coconino formations. Top of the Coconino is at an average depth of 1,000 feet. It is the principal reservoir formation of the field. The deepest well at Pinta was drilled through the Coconino and bottomed at 2517 feet in the Supai formation. There were no shows of oil or gas in the Supai.

Fig. 2 is a subsurface structure contour map of Pinta Dome drawn on top of the Coconino. This map was compiled from all well data in the area and was further controlled by a detailed plane table map of the surface outcrops. The structure is a simple dome with 40 feet of closure. A subsidiary high with 20 feet of closure is present to the southeast. A northeast trending fault with 50 feet of displacement separates the two highs. Note the sharply increased rate of dip on the northeast flank of the structure. In this area the dip reaches a maximum rate of 240 feet per mile, whereas the dip on the west side of the structure is only about 60 feet per mile. Our present understanding of the trap mechanics of this field indicates that the steep northeast dip is the critical factor at Pinta which makes it a productive field in contrast to several other anticlines in the area which are barren.

Fig. 3 is a cross-section which trends northeast across the field. Several formation markers and the top of the Coconino reservoir are shown as they arch over the anticline. The gas-water contact is indicated in each well. These wells, and others not shown on the cross-section, define a tilted gas-water contact which is a rather unusual situation, but one which we have mapped in several other Rocky Mountain fields.

The tilted water table at Pinta is indicative of a northeastward hydrodynamic gradient in the Coconino - which means, simply, that water is flowing slowly northeastward through the formation, rather than resting in static position. The northeastward flow creates a "drag" on the gas-water interface and causes the tilt. It is easy to see that if the dip on the northeast flank at Pinta had been less steep there would have been no effective trap closure. Similarly, if the water table tilt had been greater the trap would not have been closed. It is my belief that some of the other structures in the Pinta area are dry because they lack the necessary northeast dip.

Fig. 4 is a structure contour map of the gas-water contact. This map is equivalent to a hydrodynamic gradient map. You will note that the gas-water contact has the general form of a tilted plane with an elevation of 4770 at the southwest side of the field sloping and curving northeastward to an elevation of 4570. The plane is tilted somewhat differently on the southeast side of the fault due to influence of the fault on water flow. You will remember that Fig. 2 showed structure contour elevations on top of the Coconino, i.e., on top of the gas. Fig. 4 shows structure contour elevations on the gas-water contact, i.e., the base of the gas. By superimposing the two maps, we can calculate the thickness of the gas pay at any point in the field. Fig. 5 is the resultant map of that procedure showing thickness contours of the gas pay section. You will note that pay thickness reaches a maximum of 140' about one mile east of the structural center of the dome. Maximum pay thickness on the southeast closure is 40'. The pay thickness grades out to zero on the edges of the field and averages about 70' over the field area.

#### V. Pinta Field Reserves

There has been much speculation about the size of the helium reserve at Pinta. I have seen reports which called it the "world's largest known helium accumulation". This certainly is not true. We are perhaps indirectly to blame for some of the exaggerations about Pinta because it was necessary for us to keep the well information confidential for a long time. As often happens this caused many people to think we were hiding something big. However, all our well information has been a matter of public record for many months now so there is no longer any reason for misunderstanding. Although we do not ordinarily publish our reserve estimates, for perfectly good business reasons, in this case we think it advisable to set the record straight. From the well information, all of which is available for examination, we have calculated reservoir factors which yield the following basic data for computing gas reserves according to the standard engineering formulas:

<u>Reservoir Factor</u>		<u>Source</u>
Porosity	14%	Electric log analysis
Connate water	29%	Electric log analysis
Shut-in pressure	99.4 psig	Direct measurement
Reservoir pressure	115 psia	Computed from shut-in pressure
Reservoir temperature	89° F	Direct measurement
Gas gravity	0.90	Direct measurement

Reservoir Factor (Contd.)

Z factor	1.0
Recovery factor	85%
Reservoir acre feet	
Northwest segment	246,984
Southeast segment	24,851

Source (Contd.)

Computed from gas analysis  
 Computed from shut-in and abandonment pressure  
 Structure contour and water table maps

Insertion of the above factors into the gas reserve formulas gives the following results:

	Productive Reservoir Vol. (acre feet)	Gas in Place (Mcf)	Recoverable Gas - 85% (Mcf)
Northwest segment	246,984	7,952,885	6,759,950
Southeast segment	24,851	800,200	680,170
TOTAL	271,835	8,753,085	7,440,120

We have made 13 analyses of Pinta gas. The average analysis follows:

Helium	8.2%
Nitrogen	90.0
Methane	0.2
Other gases	1.6

100.0%

Note that the only valuable component of Pinta gas is helium. The nitrogen has no economic value at this location and the methane is negligible. This is an important economic factor. There are no valuable by-products to help offset the costs of processing.

The above data is summarized on the next page. Kerr-McGee engineers calculate that the Pinta field has recoverable reserves of 7.5 billion cubic feet of gas containing 8% helium. The recoverable reserve of pure helium is therefore 0.6 billion cubic feet. This is not a large reserve. The Bureau of Mines has set a well head price for the helium contained in the gas in the Texas Panhandle and at Shiprock, New Mexico of approximately \$2.00 per Mcf. Hence, the value of the helium reserve at Pinta at the well head is only \$1,200,000. Kerr-McGee owns approximately 95% of these reserves.

Summary of Pinta Field

Rec. gas reserves	7.5 billion cu. ft.
Helium content	8%
Rec. helium reserves	0.6 billion cu. ft.
Well head price	\$2.00/Mcf
Helium value	<u>\$1,200,000</u>

VI. Conclusions

Because of its relatively small size Pinta does not have great economic value. It does not represent the "ultimate reward" that companies are looking for in their exploration programs. However, because of the unusually high grade of 8% helium gas, Pinta may have real economic importance as a clue to the undeveloped helium potential of central Arizona.



# SHAMROCK GAS ANALYSIS, INC.



LABORATORY REFERENCE NUMBER : E37811.Q10510

IACX ENERGY, LLC.

ID: 33-1  
AREA: NOT/REC  
METER: APACHE 1402  
LEASE: APACHE 1402  
OPERATOR: NOT/REC  
STATION: 33-1  
SAMPLE DATE: 9/20/2016  
SAMPLE OF: GAS

LINE PRESSURE: 33 PSI  
LINE TEMPERATURE: 65.5 F  
CYLINDER NUMBER: 9193  
EFFECTIVE DATE: 9/1/2016  
SAMPLED BY: NOT/REC  
ANALYZED BY: BRENNAN  
ANALYZED DATE: 10/12/2016  
SAMPLE TYPE: SPOT

For: IACX ENERGY, LLC.  
Attn: ALEX JUDGE  
5400 LBJ FREEWAY, SUITE 460

DALLAS, TX 75240

Physical Properties per GPA 2145-09

Calculations per GPA 2172-09

Note: Zero = Less than detection limit

	<u>MOL%</u>	<u>GPM @ 14.65</u>
HYDROGEN	0.000	0.000
HELIUM	6.410	0.648
OXYGEN	0.000	0.000
NITROGEN	93.026	10.179
CARBON DIOXIDE	0.564	0.096
METHANE	0.000	0.000
ETHANE	0.000	0.000
PROPANE	0.000	0.000
ISOBUTANE	0.000	0.000
N-BUTANE	0.000	0.000
ISOPENTANE	0.000	0.000
N-PENTANE	0.000	0.000
HEXANES PLUS	0.000	0.000
	100.000	10.923

BTU	Vol. IDEAL Gas Fuel	Vol. Real Gas Fuel
BTU @ 14.65 PSIA ( DRY )	0.0	0.0
BTU @ 14.65 PSIA ( SAT. )	0.0	0.0
Specific Gravity	0.9172	0.9170
Compressibility ( Z )	0.9997	

## Gasoline Content ( Gallons Per Thousand - GPM )

Ethane & Heavier	0.000
Propane & Heavier	0.000
Butane & Heavier	0.000
Pentane & Heavier	0.000
Total 26 psi Reid V.P. Gasoline GPM	0.000

## Secondary BTU Psia Base

BTU @ 14.73 PSIA ( DRY )  
BTU @ 14.73 PSIA ( SAT. )  
Compressibility ( Z ) at 14.73 =

Vol. IDEAL Gas Fuel	Vol. Real Gas Fuel
0.0	0.0
0.0	0.0
0.9997	

Remarks: TIME SAMPLED: 1:00 P.M. TUBING & CASING  
Remarks: FLOW RATE: 413 MCF NO PREVIOUS BTU AVAILABLE



## ANALYSIS REPORT

Lab #: 510469 Job #: 28976 CO-74442 Co. Job#:  
Sample Name: Shinarump 765' - 805' Co. Lab#:  
Company: Twin Bridges LLC Cylinder: 1046  
API/Well:  
Container: Stainless Steel, 1L  
Field/Site Name: Ranger 31-1  
Location: Navajo Springs, AZ  
Formation:  
Sampling Point:  
Date Sampled: 5/02/2015 7:45 Date Received: 5/14/2015 Date Reported: 5/29/2015

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{15}\text{N}$ ‰
Carbon Monoxide -----	nd			
Helium -----	7.56			
Hydrogen -----	nd			
Argon -----	0.723			
Oxygen -----	nd			
Nitrogen -----	91.18			
Carbon Dioxide -----	0.50			
Methane -----	0.0358			
Ethane -----	0.0004			
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

Total BTU/cu.ft. dry @ 60deg F & 14.73psia, calculated: 0

Specific gravity, calculated: 0.910

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.



Sample Matrix: Gas  
 Sample Type: Spot  
 Preservative: N/A  
 Sample Container: 500 ml Cylinder  
                                 # 6099  
 Method(s): ASTM D 1945  
                 Gas Analysis by Gas  
                 Chromatography  
                 GPA 2145-09 - Calculations/  
                 Physical Constants  
                 GPA 2172 – Calculation of  
                 Gross Heating Value

Client: Gas Analysis Service  
 Project Location: Apache Co., AZ  
 Sample Id.: Ranger Development  
                                 Ranger 34-1  
 Sample Temp.: 70°F  
 Atmospheric Temp.: N/A  
 Pressure: 20 psig  
 Field Data: Flow Rate - 110 MCFD  
 Sample Date: 06/12/16 Time: 2:00 pm  
 Sampled By: J.D.  
 Analysis Date: 06/24/16 & 06/28/16  
 Analysis By: Trey Rogers

Lab #: 44899  
 Quality Control Report: 4213

### Analytical Results

<u>Gas Composition</u>	<u>Mol %</u>	<u>GPM</u>
Nitrogen (N2):	92.6376	10.1919
Carbon Dioxide (CO2):	0.0635	0.0108
Helium (He):	6.5482	0.6652
<u>Hydrocarbon Composition</u>	<u>Mol %</u>	<u>GPM</u>
Methane (CH4):	0.5045	0.0861
Ethane (C2H6):	0.1047	0.0280
Propane (C3H8):	0.0842	0.0232
Iso-Butane (C4H10):	0.0134	0.0044
N-Butane (C4H10):	0.0336	0.0106
Iso-Pentane (C5H12):	0.0029	0.0011
N-Pentane (C5H12):	0.0041	0.0015
Hexane+ (C6H14):	0.0033	0.0014
<b>Totals</b>	100.0000	11.0241

### Comments - Additional Data

BTU -dry ( BTU/ft <sup>3</sup> ):	11.1	Z-Comp. Factor-dry:	0.99973
BTU -water vapor sat.( BTU/ft <sup>3</sup> ):	10.9	Z-Comp. Factor-water vapor sat.:	0.99959
Specific Gravity -dry:	0.9123	14.73 psi Pressure Base	
Specific Gravity-water vapor sat.:	0.9074		
<u>Gasoline Content (GPM)</u>			
Ethane & Heavier	0.0702	Butane & Heavier	0.0190
Propane & Heavier	0.0422	Pentane & Heavier	0.0040

State Arizona Field Pinta Dome  
County Apache Name Santa Fe No. 13  
Well Owner Eastern Petroleum Company Date Completed 6-25-62  
Location: Sec. 31 T. 20N R. 27E Wellhead Pressure p.s.i.g. \_\_\_\_\_  
Open Flow MCF/D 1,300  
Producing Stratum: \_\_\_\_\_  
Depth to (feet): 977 Thickness (feet): \_\_\_\_\_

Stratigraphic Position of Producing Formation Coconino

By: Art Preston  
Sampled: Date: 6-25-62 Date of Run 7-10-62  
Mass Spectrometer Run No. 6521

Analysis:					
Methane	<u>0.1</u> %	Normal Pentane	<u>0.0</u> %	Oxygen	<u>0.5</u> %
Ethane	<u>0.0</u> %	Isopentane	<u>Trace</u> %	Argon	<u>0.8</u> %
Propane	<u>0.1</u> %	Cyclopentane	<u>0.0</u> %	Helium	<u>8.16</u> %
Normal Butane	<u>0.0</u> %	Hexanes Plus	<u>0.0</u> %	Hydrogen	<u>Trace</u> %
Isobutane	<u>Trace</u> %	Nitrogen	<u>89.6</u> %	H <sub>2</sub> S	<u>0.0</u> %
				CO <sub>2</sub>	<u>0.9</u> %
					<u>4</u> Total

Calculated gross B. t. u./cu. ft., dry at 60°F. and 30" mercury

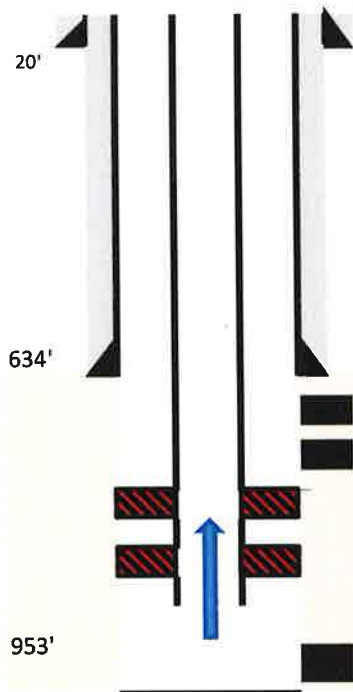
CHECK OF DATA: The well data are accurate!  
( ) Without correction  
( ) As corrected above

# Ranger Development LLC

Field:  
Feb. 17, 2017

Pinta Dome  
Apache Co, Arizona

Ranger 3-1 PD  
1117' FNL, 951' FWL, SEC 3, T19N, R26E



GL: ~5,739'

13-3/4" Hole; 10.75" conductor pipe @ 20' depth; cemented to Surface

8-3/4" Hole; 5-1/2" 15.5# J55 @ 634' depth, cemented to Surface

**Shinarump Formation - tight with < 2 mcf/d tested flow rate at <1psi during drilling.**  
670' - 810' depth; mixed sand and shale intervals

2.875" Tubing at 946' with a double cup packer set in open hole below Shinarump @ 911' on July 25, 2016

**Coconino Formation top @ ~942' - original test 247 mcf/d at 8 psi**  
4-3/4" Hole; open hole completion

June 23, 2016 - Initial production

July 25, 2016 - Cleaned out well and installed packer; 1 month of commingled open hole production but due to very low initial flow test rate and lack of good sands in the Shinarump all production is considered to be from the Coconino formation.

**February 15, 2016 checked TD and wellbore was clean of fill to original TD of 953'; FTP 6 psi; SICP 90 psi indicating packer is holding well; encountered 55' of salty Coconino water in the hole which was blown out and well put back on production.**

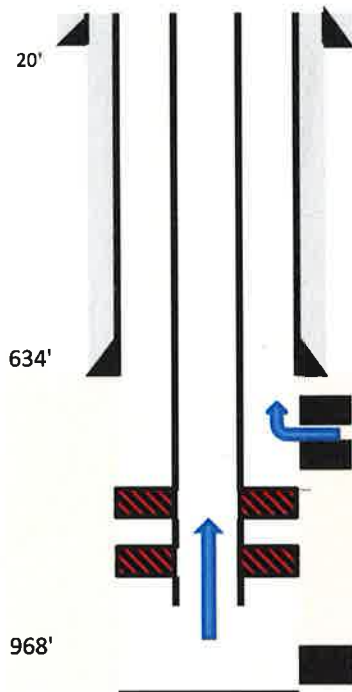


# Ranger Development LLC

Field:  
Feb. 17, 2017

Pinta Dome  
Apache Co, Arizona

Ranger 34-1 PD  
1416' FSL, 2607' FWL, SEC 34, T20N, R26E



GL: ~5,759'

13-3/4" Hole; 10.75" conductor pipe @ 20' depth; cemented to Surface

8-3/4" Hole; 5-1/2" 15.5# J55 @ 634' depth, cemented to Surface

**Shinarump Formation - original test 113 mcf/d 21.9 psi 1/2" plate during drilling.**  
694' - 809' depth; mixed sand and shale intervals

2.375" Tubing at 942' with a double cup packer set in open hole below Shinarump @ 906'

**Coconino Formation top @ ~955' - original commingled test 428 mcf/d at 35.9 psi 3/4" plate.**  
4-3/4" Hole; open hole completion

June 27, 2016 - Initial production

August 31, 2016 - Cleaned out well and installed double cup packer to isolate Shinarump which was making some fluid from the Coconino formation; 2 months of commingled production.

**February 16, 2016 ran flow test. Shinarump producing 30 mcf/d at 2 psi up casing. Coconino produced at 140 mcf/d at 9 psi. Each side had pressure building while other was flowing indicating good isolation with double cup packer. Cleaned out dry fill in well from 958'-968' covering Coconino - another indication that packer is isolating well from above.**

# APPLICATION FOR PERMIT TO DRILL OR RE-ENTER

APPLICATION TO DRILL ☒

RE-ENTER OLD WELL ☐

NAME OF COMPANY OR OPERATOR

Ranger Development LLC, 5400 LBJ Expressway, Suite 460, Dallas TX 75240 (972) 960-3212

Address

City

State

Phone Number

Drilling Contractor

not known at this time

Address

## DESCRIPTION OF WELL AND LEASE

Federal, State or Indian Lease Number, or if fee lease, name of lessor fee

Well number **Ranger 3-1**

Elevation (ground) **5739**

Nearest distance from proposed location to property or lease line:

**951'** feet

Distance from proposed location to nearest drilling, completed or applied for well on the same lease:

**N/A** feet

Number of acres in lease

**631.99 ACRES**

Number of wells on lease, including this well, completed in or drilling to this reservoir:

**1**

If lease purchased with one or more wells drilled, from whom purchased.

Name

Address

no prior wells on lease

Well location (give footage from section lines)  
**1117' FNL - 951' FWL**

Section - Township - Range or Block and Survey  
**SEC. 3, T-19-N, R-26-E, G & SRM**

Dedication per A.A.C. R12-7-104(A)(3)  
**all of 3-19n-26e**

Field and reservoir (if wildcat, so state)

**Pinta Dome**

County

**APACHE**

Distance in miles and direction from nearest town or post office

**N 46°E ~ 11 MILES TO CHAMBERS, AZ**

Proposed depth: **1,000'**

Rotary or cable tools

**Rotary**

Approximate date work will start

**Upon Approval**

Bond status **\$25,000 on file**  
Amount

Organization Report

On file **Yes**

Or attached

Filing Fee of \$25.00

Attached **Yes**

Remarks

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the:

**Consultant**

of the

**Ranger Development, LLC**

(company), and that I am authorized by said company to make this report; and that this

report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

Signature

**3-4-16**

**Brian Wood**

**(505) 466-8120**

**brian@permitswest.com**

Date

Mail completed form to:  
Oil and Gas Program Administrator  
Arizona Geological Survey  
418 W. Congress, #100  
Tucson, AZ 85701-1315

Permit Number: \_\_\_\_\_

Approval Date: \_\_\_\_\_

Approved By: \_\_\_\_\_


NOTICE: Before sending in this form be sure that you have given all information requested. Much unnecessary correspondence will thus be avoided.

## STATE OF ARIZONA OIL & GAS CONSERVATION COMMISSION

Application to Drill or Re-enter  
File Two Copies

Form No. 3

- Operator shall outline on the plat the acreage dedicated to the well in compliance with A.A.C. R12-7-107.
- A registered surveyor shall show on the plat the location of the well and certify this information in the space provided.
- ALL DISTANCES SHOWN ON THE PLAT MUST BE FROM THE OUTER BOUNDARIES OF THE SECTION.
- Is the operator the only owner in the dedicated acreage outlined on the plat below? YES ☒ NO ☐
- If the answer to question four is no, have the interests of all owners been consolidated by communitization agreement or otherwise?  
YES ☐ NO ☐ If answer is yes, give type of consolidation \_\_\_\_\_
- If the answer to question four is no, list all the owners and their respective interests below:

Owner	Land Description
<p>S 88°33'41"W ~ 2626.15'      S 88°33'23"W ~ 2626.08'</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>1117'</p> <p>951'</p> <p><b>RANGER 3 #1</b> Lat: 35.0789568°N Long: 109.5733041°W (NAD 83 DATUM)</p> </div> <div style="width: 5%; text-align: center;"> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">S 00°17'37"E ~ 5492.79'</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">N 00°39'39"W ~ 5251.64'</p> </div> <div style="width: 45%; text-align: center;"> <p><b>SECTION 3, TOWNSHIP 19 NORTH</b> <b>RANGE 26 EAST</b> <b>GILA &amp; SALT RIVER MERIDIAN</b></p> <div style="text-align: center;">  <p>12712 ROBERT L. POUNDS</p> <p>EXPIRES: 12/31/18</p> </div> </div> </div> <p style="text-align: center;">N 89°12'10"E ~ 5285.03'</p> <p style="text-align: center;">0 330 880 990 1320 1650 1980 2310 2640 2000 1500 1000 500</p>	
<p><b>CERTIFICATION</b> <b>(505) 466-8120</b></p> <p>I hereby certify that the information above is true and complete to the best of my knowledge and belief.</p> <p><i>Brian Wood</i></p> <p>Name <b>Brian Wood</b></p> <p>Position <b>Consultant</b></p> <p><b>Ranger Development, LLC</b></p> <p>Date <b>3-4-16</b></p> <p>I hereby certify that the well location shown on the plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.</p> <p>Date Surveyed <b>January 26, 2016</b></p> <p>Registered Land Surveyor <i>Robert L. Pounds</i> Robert L. Pounds</p> <p>Certificate No. <b>12712</b></p>	

**PROPOSED CASING PROGRAM**

Size of Casing	Weight	Grade & Type	Top	Bottom	Cementing Depths	Sacks Cement	Type
9.625"	36	J or K-55	GL	325'	GL - 325'	260 sx	Class G
7"	23 or 26	J-55	GL	675'	GL - 675'	105 sx	Prem. Light
open hole	N/A	N/A	675'	1000'	N/A	N/A	N/A



Ranger Development LLC  
Ranger 3-1  
1117' FNL & 951' FWL  
Sec. 3, T. 19 N., R. 26 E.  
Apache County, AZ

DRILL PLAN PAGE 1

1. ESTIMATED TOPS

Formation	TVD	Subsea
Chinle	000'	5739'
Shinarump Fm	674'	5065'
Shinarump Conglomerate	764'	4975'
Moenkopi	789'	4950'
Coconino	919'	4820'
TD	1000'	4739'

2. NOTABLE ZONES

Water could be found in the Chinle. Primary goal is the Coconino. Secondary goal is the Shinarump.

3. PRESSURE CONTROL

A 2000-psi BOP stack and choke system will be used. See attached typical diagram.

4. MUD PROGRAM

Hole will be drilled with mud to just above the Coconino. Coconino will be drilled with air. Mud and pit will comply with Arizona rule R12-7-108. A diversion ditch will be built on the uphill side of the pad.

5. CORES, TESTS, & LOGS

No coring is planned. FDC-CNL, sonic, resistivity, SP gamma ray, and caliper logs are planned.

Ranger Development LLC  
Ranger 3-1  
1117' FNL & 951' FWL  
Sec. 3, T. 19 N., R. 26 E.  
Apache County, AZ

DRILL PLAN PAGE 2

6. DOWN HOLE CONDITIONS

No H<sub>2</sub>S or abnormal high pressure or temperature is expected. In fact, the Coconino is expected to be under-pressured.

7. OTHER INFORMATION

The anticipated spud date is upon approval. It is expected it will take ≈1 week to drill the well.

# APPLICATION FOR PERMIT TO DRILL OR RE-ENTER

APPLICATION TO DRILL ☒

RE-ENTER OLD WELL ☐

NAME OF COMPANY OR OPERATOR

Ranger Development LLC, 5400 LBJ Expressway, Suite 460, Dallas TX 75240 (972) 960-3212

Address

City

State

Phone Number

Drilling Contractor not known at this time

Address

## DESCRIPTION OF WELL AND LEASE

Federal, State or Indian Lease Number, or if fee lease, name of lessor

State: 13-118076

Well number

Ranger 34-1

Elevation (ground)

5759'

Nearest distance from proposed location to property or lease line:

1416' feet

Distance from proposed location to nearest drilling, completed or applied-for well on the same lease:

N/A

feet

Number of acres in lease:

637.59 ACRES

Number of wells on lease, including this well, completed in or drilling to this reservoir:

1

If lease purchased with one or more wells drilled, from whom purchased.

Name

Address

both wells in Section 34 plugged prior to this lease issuance

Well location (give footage from section lines)

1416' FSL - 2607' FWL

Section - Township - Range or Block and Survey

SEC. 34, T-20-N, R-26-E, G & SRM

Dedication per A.A.G. R12-7-104(A)(3)

Field and reservoir (if wildcat, so state)

Pinta Dome

County

APACHE

Distance in miles and direction from nearest town or post office

S 46°W ~ 10.5 MILES FROM CHAMBERS, AZ

Proposed depth:

1,020'

Rotary or cable tools

Rotary

Approximate date work will start

Upon Approval

Bond status

\$25,000 on file

Organization Report

On file Yes

Or attached

Filing Fee of \$25.00

Attached Yes

Remarks

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the:

Consultant

of the

Ranger Development, LLC

(company), and that I am authorized by said company to make this report; and that this

report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

Signature

3-4-16

Date

Brian Wood

(505) 466-8120

brian@permitswest.com

Mail completed form to:  
Oil and Gas Program Administrator  
Arizona Geological Survey  
416 W. Congress, #100  
Tucson, AZ 85701-1315

Permit Number: \_\_\_\_\_

Approval Date: \_\_\_\_\_

Approved By: \_\_\_\_\_

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STATE OF ARIZONA  
OIL & GAS CONSERVATION COMMISSION

Application to Drill or Re-enter  
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Owner	Land Description

**CERTIFICATION**  
(505) 466-8120

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

*Brian Wood*

Name **Brian Wood**

Position **Consultant**

**Ranger Development, LLC**

Date **3-4-16**

I hereby certify that the well location shown on the plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed **February 16, 2016**

Registered Land Surveyor *Robert L. Pounds*

Robert L. Pounds

Certificate No. **12712**

**PROPOSED CASING PROGRAM**

Size of Casing	Weight	Grade & Type	Top	Bottom	Cementing Depths	Sacks Cement	Type
9.625"	36	J or K-55	GL	325'	GL - 325'	260 sx	Class G
7"	23or 26	J-55	GL	695'	GL - 695'	110 sx	Prem. Light
open hole	N/A	N/A	695'	1020'	N/A	N/A	N/A



Ranger Development LLC  
Ranger 34-1  
1416' FSL & 2607' FWL  
Sec. 34, T. 20 N., R. 26 E.  
Apache County, AZ

DRILL PLAN PAGE 1

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Ranger Development LLC  
Ranger 34-1  
1416' FSL & 2607' FWL  
Sec. 34, T. 20 N., R. 26 E.  
Apache County, AZ

DRILL PLAN PAGE 2

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7. OTHER INFORMATION

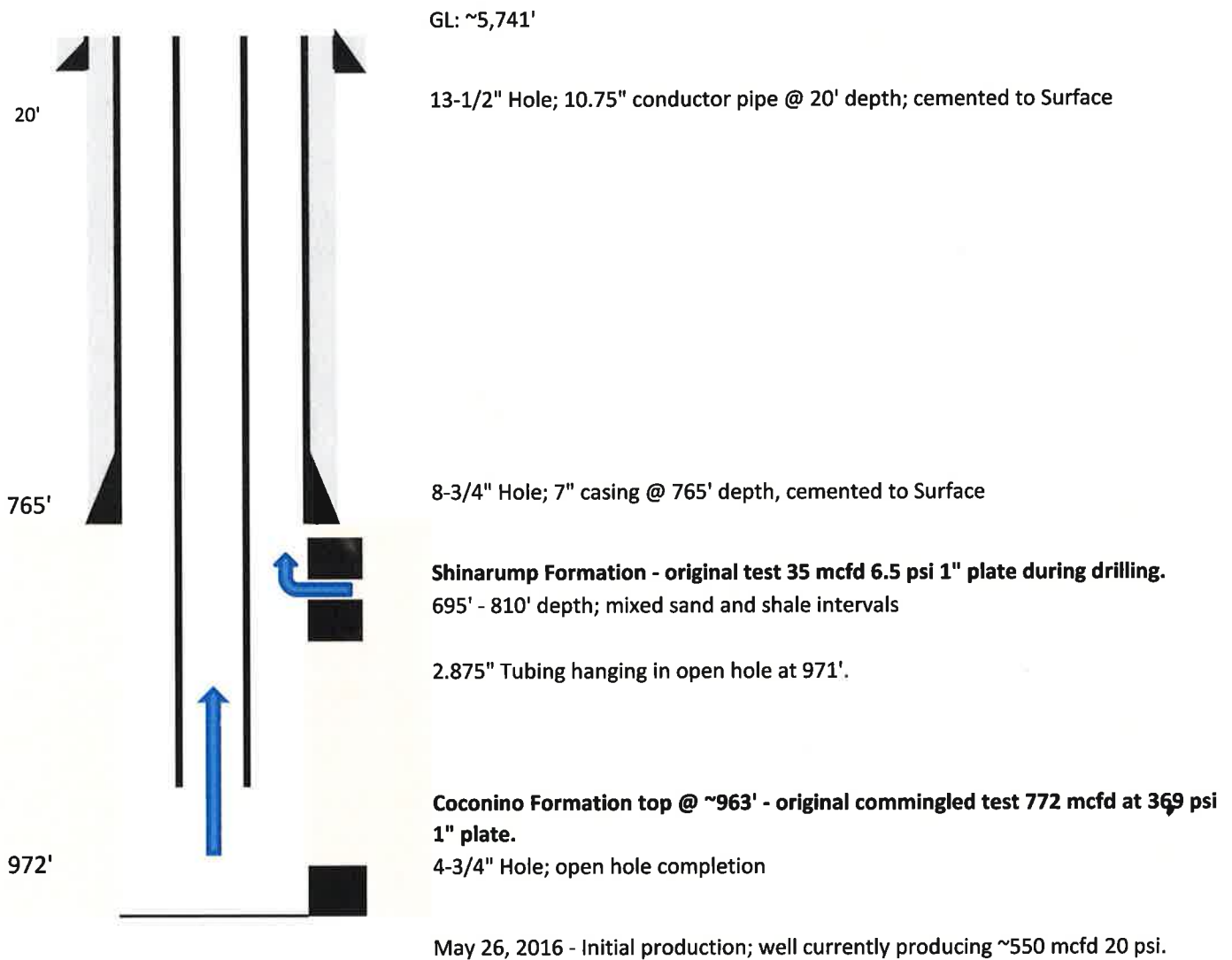
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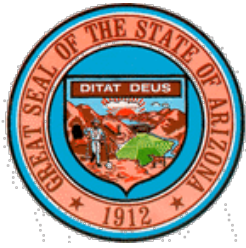
# Ranger Development LLC

Field:  
Feb. 17, 2017

Navajo Springs  
Apache Co, Arizona

Ranger 31-1 NS  
1660' FSL, 2180' FWL, SEC 31, T20N, R27E





Douglas A. Ducey  
Governor

State of Arizona  
**Oil and Gas Conservation Commission**  
1110 W. Washington Street, Phoenix, AZ 85007  
602-771-4501  
[www.azogcc.az.gov](http://www.azogcc.az.gov)  
Dennis L. Turner, Oil and Gas Administrator

Commissioners:  
Frank Thorwald, Chair  
Robert L. Wagner, Vice Chair  
Stephen R. Cooper  
William C. Feyerabend  
J. Dale Nations, Ph.D.

## NOTICE OF ADMINISTRATIVE DEFICIENCIES

**VIA EMAIL and CERTIFIED MAIL**

**RETURN RECEIPT REQUESTED**

February 17, 2017

**VIA EMAIL and U.S. MAIL**

Mr. Tony Hines  
Sr. Vice President of Operations  
IACX Energy/ Ranger Development LLC  
5400 LBJ Expressway, Suite 460  
Dallas, TX 75240

**RE: Incomplete Application for permit to drill: Fee Ranger 28-1 NS, LTF #65441; and  
Request for Supplemental Information for the #34-1 PD and #31-1 NS wells**

Dear Mr. Hines:

The Arizona Oil and Gas Conservation Commission (OGCC) is in receipt of Ranger Development LLC's (Ranger) Application to Drill the subject well, received on January 31, 2017.

The OGCC has completed its review of the subject application. **Under A.R.S. § 41-1074, the OGCC has determined your application is not administratively complete because it is missing information required by A.A.C. R12-7-116(B).** Based on our review, we determined that this well is a candidate for a multiple zone completion in the Coconino Sandstone and the Shinarump Formation.

This Notice suspends the time frame for the review of your application as of the date of this Notice. To complete this application and resume the time frame Ranger must provide the following missing information.

### **Required Information for an administratively complete application**

According to A.A.C. R12-7-116(B), Ranger shall submit following:

B. Operators shall file an application for multiple completion with the Commission and shall demonstrate the method to be used to keep the production streams separate. The application shall be accompanied by:

1. An electrical log or other acceptable log with tops and bottoms of formations or producing zones and perforated intervals shown and marked;



2. A diagrammatic sketch of the multiple completion installation indicating make, type, and setting depths of packer or packers;
3. A plat showing the location of the well and all offset wells and the names and addresses of operators of all leases offsetting acreage dedicated to applicant's well; and
4. Proof of mailing of application for multiple completion to all offset operators.

If there are no offset wells and operators, please include a statement to that effect in your response.

Ordinarily, a public hearing is required whenever a multiple zone completion is requested by an operator. However, A.A.C. R12-7-116(C) allows subsequent drilling applications with multiple zone completions to be approved administratively without a hearing, if production is in the same zones. Inasmuch as Ranger has made presentations in earlier hearings to produce in these same geologic units, no hearings will be required for the #28-1 NS or future wells, provided that:

- The applicant can show that the Commission has approved and listed the zones or reservoirs as required in subsection (A);
- The subsequent application(s) is filed as required in subsection (B); and
- The Commission receives no protest to the application after a 15-day holding period. A hearing shall be called if a protest is received.

Upon receipt of an administratively complete application for the #28-1 NS, I will post a 15 day public notice to establish the holding period. I will advise you of the date of the public notice in advance and of any resulting protests.

#### **Additional Information Required for Ranger wells #34-1 PD and #31-1 NS**

Specific data required by R12-7-116(B) for the multiple zone completions in the Ranger wells #34-1 PD and #31-1 NS was missing from previous applications. Please submit the following data for both wells:

1. A demonstration that the method to be used will keep the production streams separate;
2. An electrical log or other acceptable log with tops and bottoms of formations or producing zones and perforated intervals shown and marked;
3. A diagrammatic sketch of the multiple completion installation indicating make, type, and setting depths of packer or packers; and
4. For the #31-1 NS only, a plat showing the location of the well and all offset wells and the names and addresses of operators of all leases offsetting acreage dedicated to applicant's well.

If Ranger chooses to operate the #28-1 NS as a multi-completed well, the company shall "operate, produce, and maintain the well to prevent commingling of production from the separate sources of supply." As discussed in today's OGCC meeting, Ranger will report the separate production from the Coconino Sandstone and Shinarump Formation, calculated in MCF, as derived from percentages from the two formations. In today's meeting, the Commission accepted Ranger's position that separate metering of the two streams was not

feasible, but Ranger agreed to calculate the relative production based on percentages from prior measurements.

If there are no offset wells and operators, please include a statement to that effect in your response.

### **Consequences of Failure to Submit Required Information**

The documents listed above must be received by the Oil & Gas Program Administrator on or before February 28, 2017. Failure to submit any of the above required information by the deadline may result in a final decision to deny your application. As an alternative to providing the OGCC with all of the missing information identified above, you may respond to this Notice on or before February 28, 2017 with a "Notice of Intent to Rely on the Application Components as Submitted" in accordance with A.A.C. R18-1-205(B) and R18-1-520.

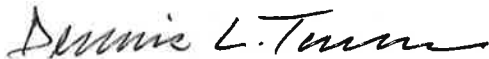
### **How to Submit**

Submit all of the information required by this letter in two formats: one hardcopy to the mailing address below and one PDF via email to [ogcc@azdeq.gov](mailto:ogcc@azdeq.gov).

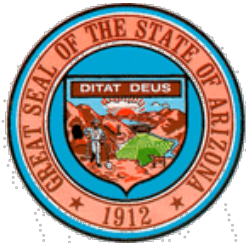
Dennis L. Turner  
Oil & Gas Administrator  
Arizona Department of Environmental Quality  
1110 W. Washington Street  
Phoenix, AZ 85007

Feel free to contact me at [ogcc@azdeq.gov](mailto:ogcc@azdeq.gov) or (602) 771 – 4501, if you have any questions.

Sincerely,



Dennis L. Turner  
Oil & Gas Program Administrator



Douglas A. Ducey  
Governor

State of Arizona  
**Oil and Gas Conservation Commission**

1110 W. Washington Street, Phoenix, AZ 85007  
602-771-4501

[www.azogcc.az.gov](http://www.azogcc.az.gov)

Dennis L. Turner, Oil and Gas Administrator

Commissioners:  
Frank Thorwald, Chair  
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Stephen R. Cooper  
William C. Feyerabend  
J. Dale Nations, Ph.D.

**VIA EMAIL and CERTIFIED MAIL**

**RETURN RECEIPT REQUESTED**

February 21, 2017

Mr. Tony Hines  
Sr. Vice President of Operations  
IACX Energy/ Ranger Development LLC  
5400 LBJ Expressway, Suite 460  
Dallas, TX 75240

Mr. Gordon LeBlanc LLC  
Arizona Energy Partners  
2999 N. 44th Street, Suite 620  
Phoenix, AZ 85018

**RE: Transfer of Ownership of the Hortenstine 35-1**

Gentlemen:

The Arizona Oil and Gas Conservation Commission (OGCC) met on February 17, 2017 to address the matter of the unauthorized abandonment of Holbrook Energy LLC's (Holbrook Energy) Hortenstine 35-1 well, originally spudded September 3, 2004.

**Required Information by the Arizona Oil and Gas Conservation Commission**

At the January 6, 2017 meeting, and again at the February 17, 2017 OGCC meeting, Ranger Development L.L.C. (Ranger) expressed an interest in taking control of the Hortenstine 35-1 well and assuming all responsibility for operation, maintenance and subsequent plugging and abandonment pursuant to statute and rule.

To facilitate this transaction, the OGCC looks to Ranger and Holbrook Energy to negotiate the transaction for a legal transfer of the Hortenstine 35-1. This will also confirm that the parties agreed that the transfer of ownership shall be completed not later than April 24, 2017. As a condition of the transfer, the OGCC will require Ranger to post a closure bond on the well.

Upon completion of the transaction, the OGCC will return the \$10,000 Holbrook Energy bond held for the Hortenstine 35-1 well. The OGCC will require a copy of the transfer agreement to evidence that the transaction has been completed.

### **Consequences of Failure to Submit the Required Information**

Failure of Ranger and Holbrook Energy to complete the transfer by April 24, 2017 will result in the OGCC revoking the performance bond for the Hortenstine 35-1 well and the State completing the plugging and abandonment of the well.

### **How to Submit**

OGCC requests the parties submit all of the information required by this letter in two formats: one hardcopy to the mailing address below and one PDF via email to [ogcc@azdeq.gov](mailto:ogcc@azdeq.gov).

Dennis L. Turner  
Oil & Gas Administrator  
Arizona Department of Environmental Quality  
1110 W. Washington Street  
Phoenix, AZ 85007

If you have any questions or wish to discuss further, please feel free to contact me at [ogcc@azdeq.gov](mailto:ogcc@azdeq.gov) or (602) 771 – 4501. Thank you for your anticipated courtesy and cooperation.

Sincerely,



Dennis L. Turner  
Oil & Gas Program Administrator

c. Frank Thorwald, Chairman, Arizona Oil and Gas Commerce Commission (via email only)