

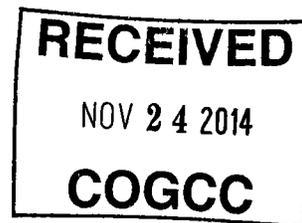


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11.24.14

## 511 DOCUMENTS

BEFORE THE OIL AND GAS CONSERVATION COMMISSION  
OF THE STATE OF COLORADO



IN THE MATTER OF THE APPLICATION OF EOG ) CAUSE NO. 421  
RESOURCES, INC. FOR AN ORDER TO ESTABLISH )  
TWELVE (12) APPROXIMATE 1280-ACRE DRILLING ) DOCKET NO. 1412-SP-2201  
AND SPACING UNITS WITH WELL LOCATION RULES )  
FOR THE CODELL FORMATION OF CERTAIN )  
DESCRIBED LANDS LOCATED IN TOWNSHIPS 11 )  
AND 12 NORTH, RANGE 63 WEST, AN UNNAMED )  
FIELD, WELD COUNTY, COLORADO )  
)

**REQUEST FOR RECOMMENDATION OF  
APPROVAL OF APPLICATION WITHOUT A HEARING**

EOG Resources, Inc. ("Applicant"), by and through its undersigned attorneys, hereby requests pursuant to Rule 511.a. of the Rules of Regulations of the Colorado Oil and Gas Conservation Commission for the Director to recommend approval of its October 16, 2014, verified application, amended November 18, 2014 ("Application"), and the supporting exhibits without a hearing.

Applicant requests that the above-captioned matter be approved based upon: (i) the merits of the Application, and (ii) Applicant's sworn written testimony verifying sufficient facts along with exhibits that adequately support the relief requested in the Application. To Applicant's information and belief, no protests were timely filed in this matter.

WHEREFORE, Applicant requests that its request for a recommendation for approval of its Application without a hearing be granted.

DATED this 24<sup>th</sup> day of November, 2014.

Respectfully submitted,

EOG RESOURCES, INC.

By: Jamie L. Jost

Jamie L. Jost  
Joseph M. Evers  
Jost & Shelton Energy Group, P.C.  
Attorneys for Applicant  
1675 Larimer Street, Suite 420  
Denver, CO 80202  
(720) 379-1812

# **EOG RESOURCES , INC.**

Cause No. 421  
Docket No. 1412-SP-2201

**EOG Resources, Inc.**  
**Jason McLaren - Land Testimony**  
Cause 421; Docket No. 1412-SP-2201  
Drilling and Spacing Unit Application – Codell Formation  
Unnamed Field, Weld County, Colorado

December 2014 Colorado Oil and Gas Conservation Commission Hearing

My name is Jason McLaren, and I am currently employed as a Landman for EOG Resources, Inc. (“Applicant”). I graduated from Emory University in 1995 and the University of Wyoming College of Law in 2000 with a J.D. I have over 12 years of experience in oil and gas land work. I am familiar with the lands subject to, and matters set forth in, the verified application dated October 16, 2014 (“Application”).

In support of Applicant’s Application and my sworn testimony herein, I am submitting six (6) exhibits. This testimony and exhibits provide the supporting basis for approval of the Applicant’s request for an order to establish twelve (12) approximate 1280-acre drilling and spacing units and authorize one (1) horizontal well within each unit in order to efficiently and economically recover the oil, gas and associated hydrocarbons within said 1280-acre drilling and spacing unit from the Codell Formation underlying the below-described lands (“Application Lands”):

Township 11 North, Range 63 West, 6TH P.M. – DSU #1  
Section 7: ALL  
Section 18: ALL

Township 11 North, Range 63 West, 6TH P.M. – DSU #2  
Section 8: ALL  
Section 17: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #3  
Section 20: ALL  
Section 29: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #4  
Section 21: ALL  
Section 28: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #5  
Section 22: ALL  
Section 27: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #6  
Section 23: ALL  
Section 26: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #7  
Section 24: ALL  
Section 25: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #8  
Section 31: ALL

Township 11 North, Range 63 West, 6TH P.M.  
Section 6: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #9  
Section 32: ALL

Township 11 North, Range 63 West, 6TH P.M.  
Section 5: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #10  
Section 33: ALL

Township 11 North, Range 63 West, 6TH P.M.  
Section 4: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #11  
Section 34: ALL

Township 11 North, Range 63 West, 6TH P.M.  
Section 3: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #12  
Section 36: ALL

Township 11 North, Range 63 West, 6TH P.M.  
Section 1: ALL

Weld County, Colorado

**Exhibit 1: Leasehold Ownership Map:**

Exhibit 1 is a map showing the location of the Application Lands and Applicant's leasehold interest. The following parties own leasehold or unleased mineral interests in the Application Lands:

<b><u>INTEREST OWNER(S)</u></b>	<b><u>UNIT WI</u></b>
EOG Resources, Inc.	76.5326%
Other Working Interest Owners	23.4674%
TOTAL:	100.0000%

**Exhibit 2: Mineral Ownership Map:**

Exhibit 2 is a map showing the mineral ownership of the Application Lands, which is owned entirely in fee but for 640 acres owned by the State of Colorado in section 36, T12N R63W.

**Exhibit 3: Surface Ownership Map:**

Exhibit 3 is a map showing the surface ownership of the Application Lands, which is owned entirely in fee but for 640 acres owned by the State of Colorado in section 36, T12N R63W.

**Exhibit 4: Topographic Map:**

Exhibit 4 is a map showing the topography of the Application Lands. Approval of the Application for a drilling and spacing unit would allow for a less impactful surface development plan.

**Exhibit 5: Aerial Map:**

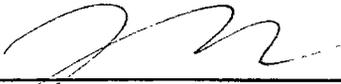
Exhibit 5 is an aerial map showing of the Application Lands.

**Exhibit 6: Interested Parties:**

Exhibit 6 is a list of the interested parties within the Application Lands. Based upon our examination of relevant documents, all of the interested parties received proper notice. As of the date of this testimony, the Applicant is not aware of any unresolved protests or objections to the Application.

**Affirmation**

The matters described herein were all conducted under my direction and control. I hereby swear that to the best of my knowledge and belief, all of the matters set forth herein and in the exhibits are true, correct, and accurate.

  
\_\_\_\_\_  
Jason McLaren, Landman  
EOG Resources, Inc.

STATE OF COLORADO                    )  
  ) ss.  
CITY AND COUNTY OF DENVER        )

The foregoing instrument was subscribed and sworn to before me this 24<sup>th</sup> day of November 2014, by Jason McLaren, Landman for EOG Resources, Inc.

Witness my hand and official seal.

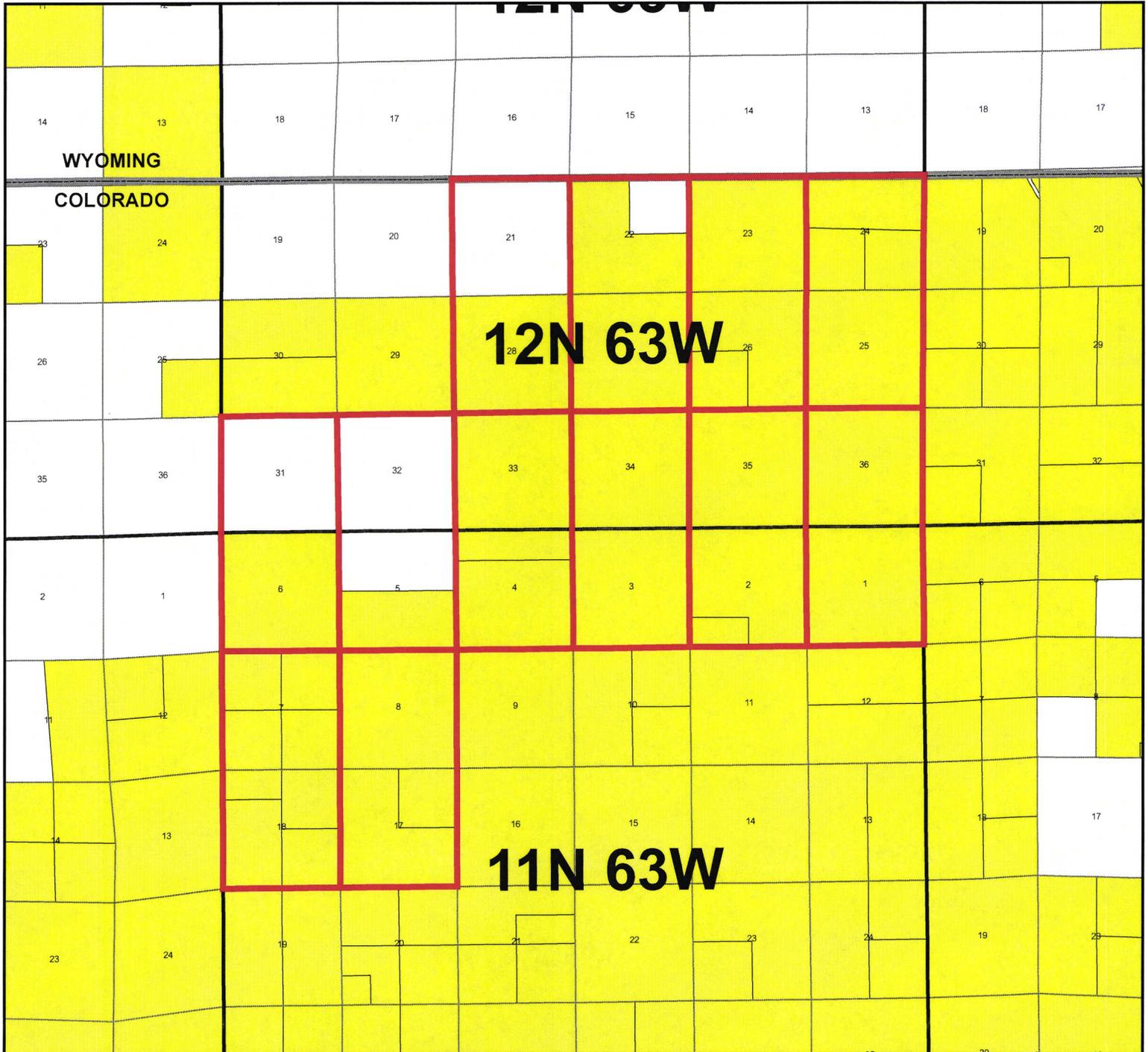
My commission expires: June 11, 2018

  
\_\_\_\_\_  
Notary Public

ALEXANDRA KAY IVES  
NOTARY PUBLIC  
STATE OF COLORADO  
NOTARY ID 20144023239  
COMMISSION EXPIRES JUN. 11, 2018

# Lease Ownership Map Proposed Approx. 1280 ac Spacing Units

Township 12 North, Range 63 West, 6th PM and  
Township 11 North, Range 63 West, 6th PM  
Weld County, CO



### Legend

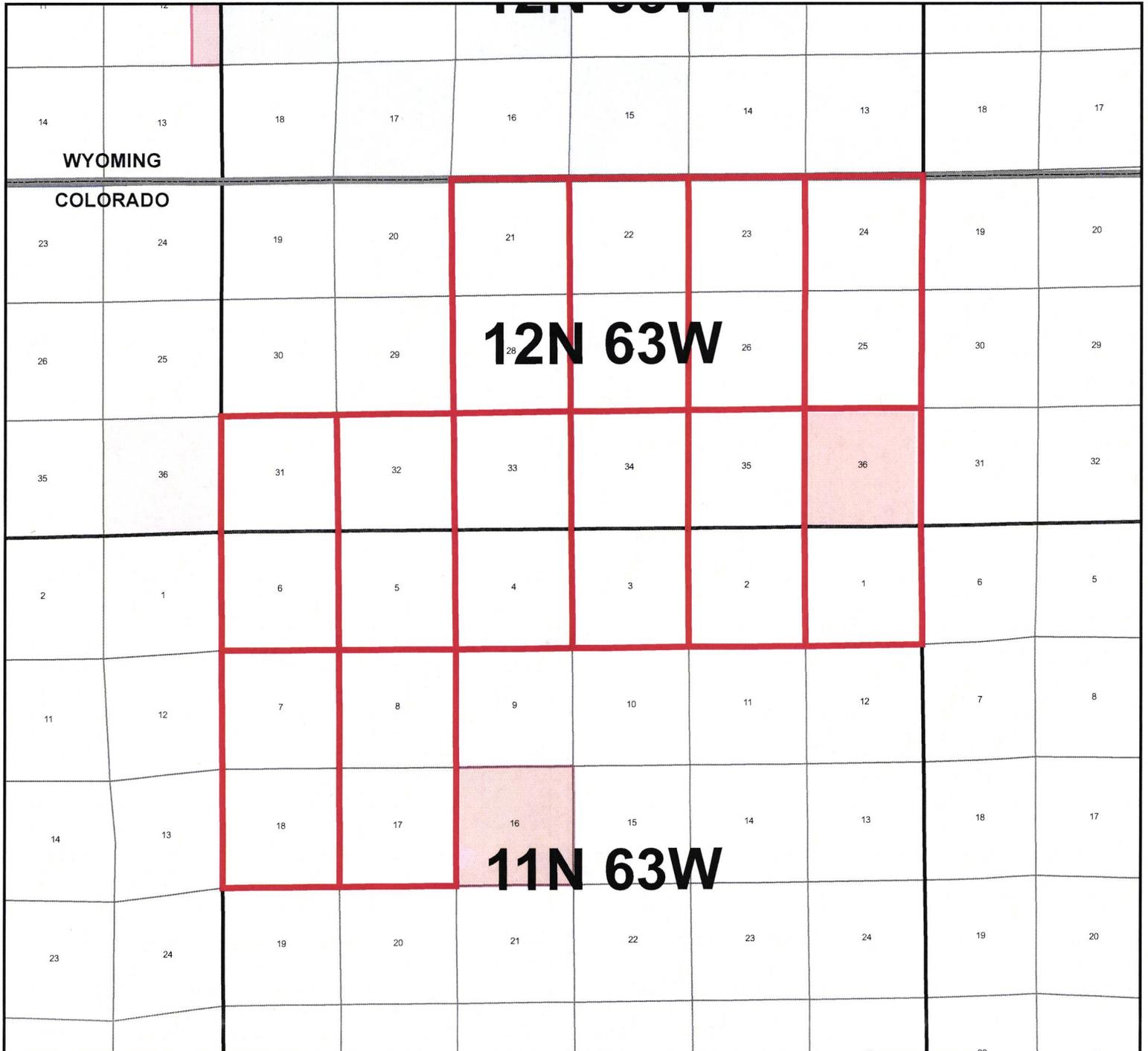
-  Proposed Codell 1280 Spacing
-  EOG Leasehold

**Codell Formation  
Exhibit L1  
December 15 & 16, 2014**

# Mineral Ownership Map

## Proposed Approx. 1280 ac Spacing Units

Township 12 North, Range 63 West, 6th PM and  
 Township 11 North, Range 63 West, 6th PM  
 Weld County, CO



### Legend

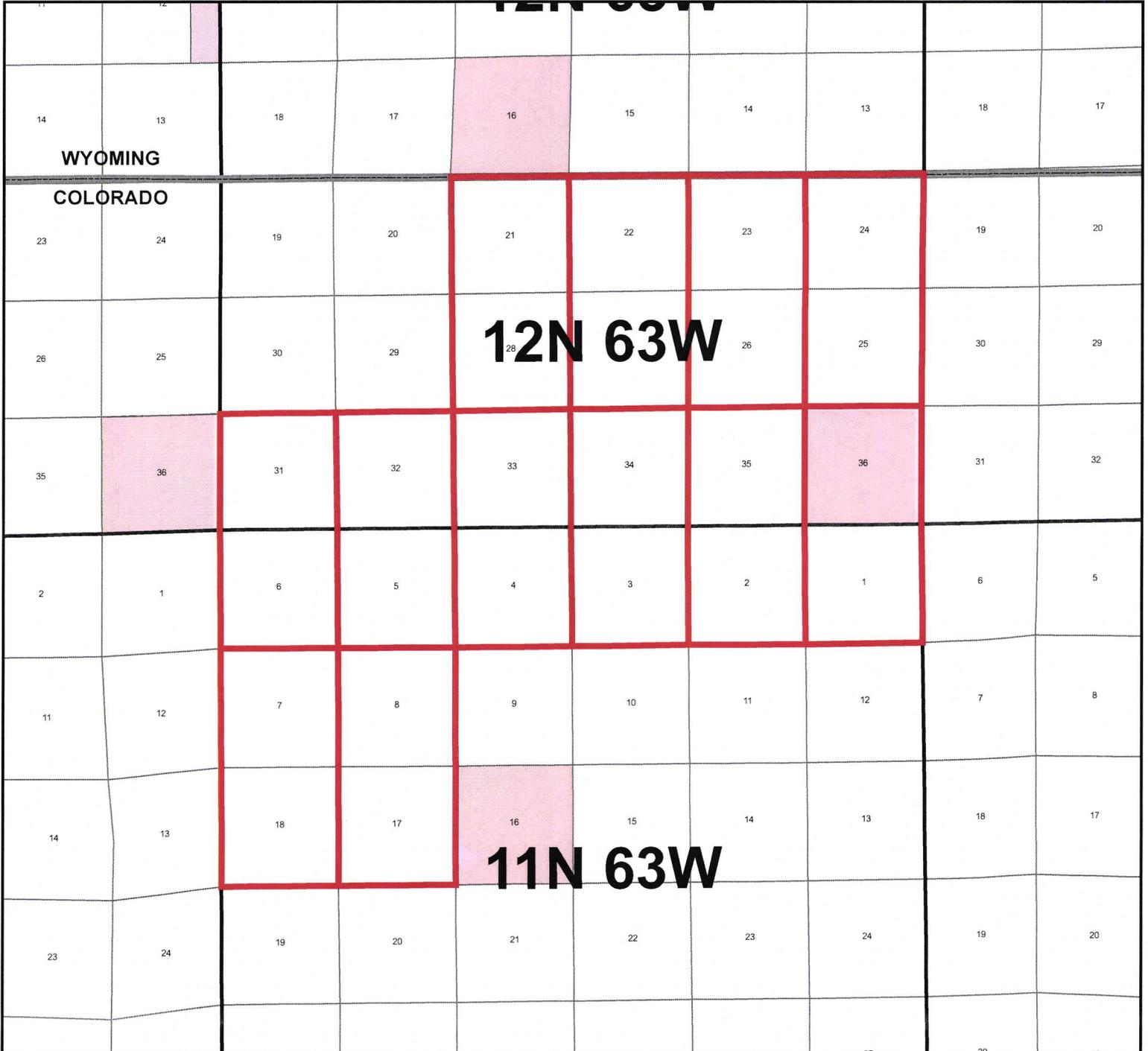
- Proposed Codell 1280 Spacing
- Federal Leased Minerals
- State Leased Minerals
- Federal Unleased Minerals
- State Unleased Minerals
- Fee Minerals

**Codell Formation**  
**Exhibit L2**  
**December 15 & 16, 2014**

# Surface Ownership Map

## Proposed Approx. 1280 ac Spacing Units

Township 12 North, Range 63 West, 6th PM and  
 Township 11 North, Range 63 West, 6th PM  
 Weld County, CO



### Legend

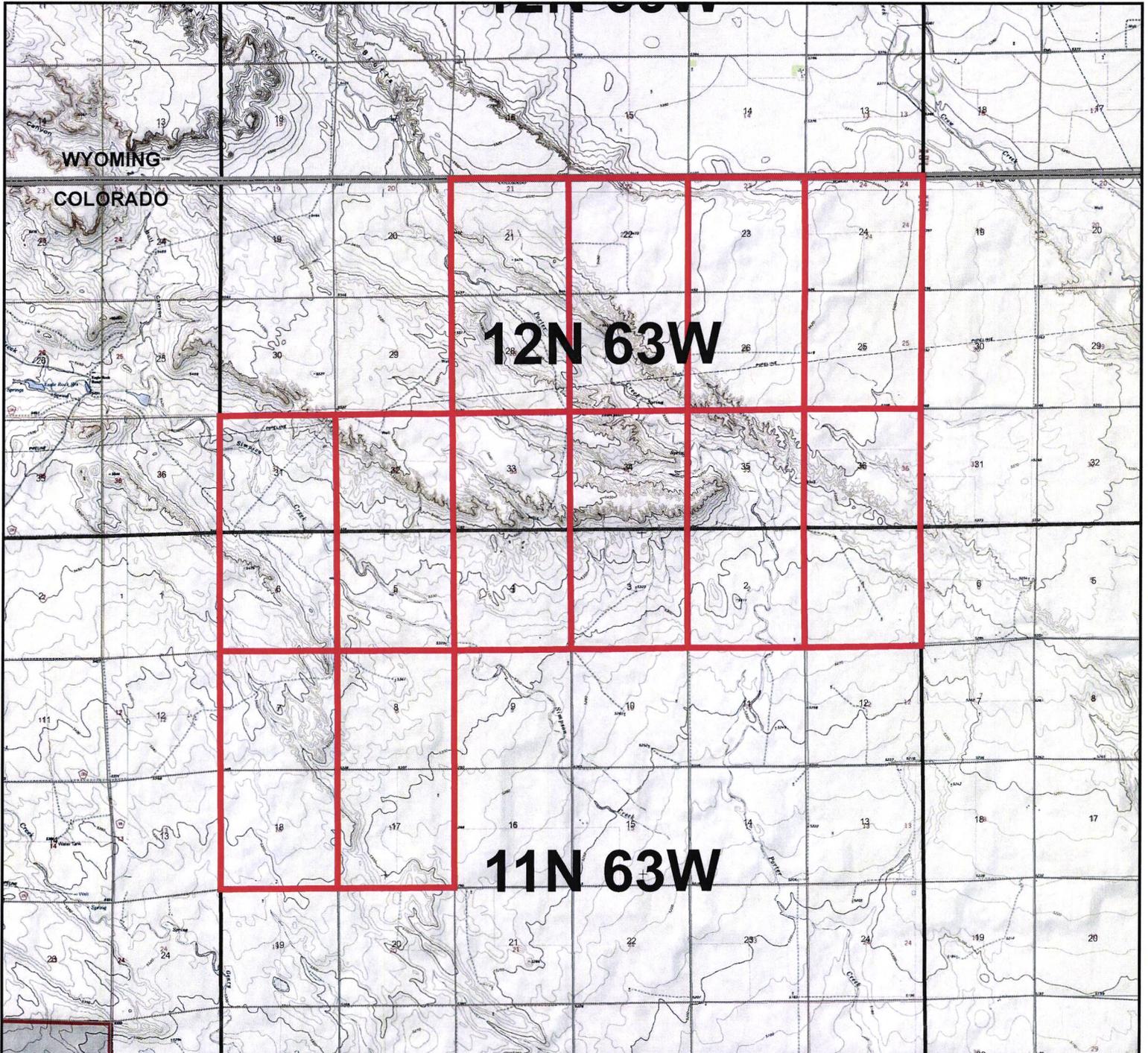
- Proposed Codell 1280 Spacing
- Federal Surface Ownership
- State Surface Ownership
- Private Surface Ownership

**Codell Formation**  
**Exhibit L3**  
**December 15 & 16, 2014**

# Topographical Map

## Proposed Approx. 1280 ac Spacing Units

Township 12 North, Range 63 West, 6th PM and  
Township 11 North, Range 63 West, 6th PM  
Weld County, CO



### Legend

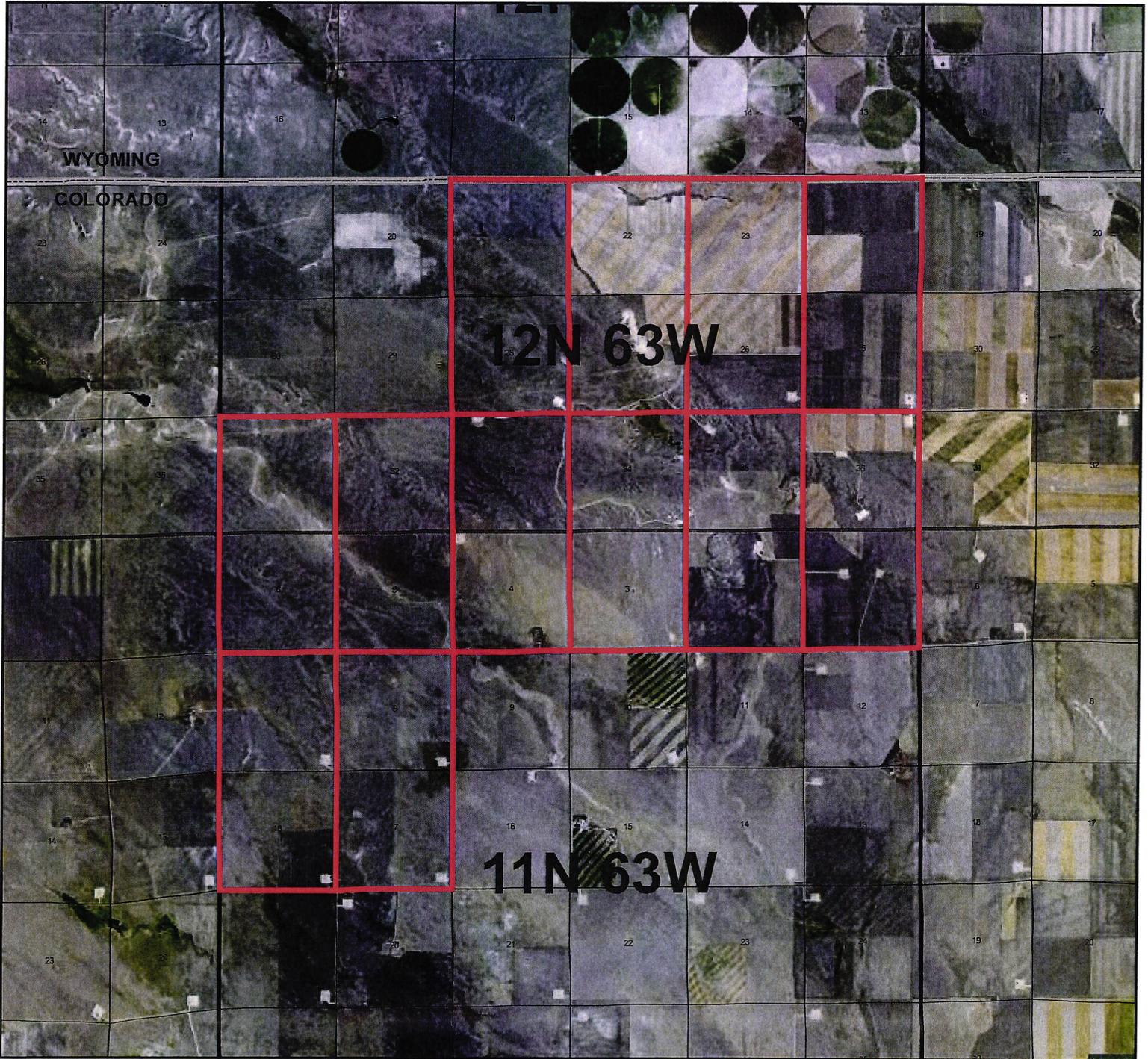
 Proposed Codell 1280 Spacing

**Codell Formation**  
**Exhibit L4**  
**December 15 & 16, 2014**

# Aerial Map

## Proposed Approx. 1280 ac Spacing Units

Township 12 North, Range 63 West, 6th PM and  
Township 11 North, Range 63 West, 6th PM  
Weld County, CO



### Legend

 Proposed Codell 1280 Spacing

Codell Formation  
Exhibit L5

December 15 & 16, 2014

Exhibit 6  
Interested Party List  
SP-Blanket Spacing App 1280 acre DSU

EOG Resources, Inc.  
600 17th Street, Suite 1000N  
Denver, CO 80202

Anadarko E&P Company, LP  
PO Box 1330  
Houston, TX 77251-1330

Chesapeake Exploration, LLC  
PO Box 18496  
Oklahoma City, OK 73154

The Lutheran Home  
530 South 26th Street  
Omaha, NB 68105

Sonya J. McFall  
2170 Pacific Street  
Gering, NB 69341

Bill Barrett Corporation  
1099 18th Street, Suite 2300  
Denver, CO 80202

Susan F. Breeden  
2702 19th Street Drive, #17  
Greeley, CO 80634

Heirs of John E. Faris,  
who appear to be George E. Faris  
Address Unknown

McElvain Energy Fund 2010, LLC  
1050 17th Street, Suite 1800  
Denver, CO 80265

Heirs of Vera M. Faris Christensen,  
who appear to be Eldon Christensen,  
Vernon Christensen,  
and Karen Christensen  
Address Unknown

Heirs of Jack E. Lacy,  
who appear to be Reno Lacy  
Address Unknown

Sundance Energy, Inc.  
633 17th Street, Suite 1950  
Denver, CO 80202

Heirs of Glen Faris  
Address Unknown  
Wellington, CO

School District No. 85  
Weld County  
C/O Colorado State Board of Education  
201 East Colfax Avenue  
Denver, CO 80203

Cox Ranches LLC  
PO Box 47  
Cheyenne, WY 82003-0047

Bold Resources, LLC  
6615 W. Rowland Avenue  
Littleton, CO 80128

Noble Energy, Inc.  
1625 Broadway, Ste. 2200  
Denver, CO 80202-4725

Chesapeake Exploration, LLC  
PO Box 18496  
Oklahoma City, OK 73154

OOGC America, Inc.  
11700 Katy Freeway, Suite 280  
Houston, TX 77079

EOG Resources, Inc.  
PO Box 4362  
Houston, TX 77210-4362

Karen R. Haley Revocable Trust  
Karen R. Haley, Trustee  
5685 South Bellaire Court  
Greenwood Village, CO 80121

Cox Ranches Partnership I  
PO Box 47  
Cheyenne, WY 82003-0047

Audrey Tibbetts,  
formerly Audrey Beckley  
PO Box 296  
Jamestown, CA 95327

Kent Kuster  
Colorado Department of Public Health & Environment  
4300 Cherry Creek Drive South  
Denver, CO 80246-1530

Tom Schreiner  
Energy Liaison  
Colorado Parks and Wildlife  
Northeast Regional Office  
6060 Broadway  
Denver, CO 80216

Tom Parko  
Weld County  
1555 North 17<sup>th</sup> Street  
Greeley, CO 80631

**EOG RESOURCES, INC.**

**Danny Frederick, Reservoir Engineer – Engineering Testimony**

Codell Formation

December 15-16, 2014 Colorado Oil and Gas Conservation Commission Hearing

My name is Danny Frederick. I am currently employed as a reservoir engineer with EOG Resources, Inc. (“EOG”) I have over 20 years experience in reservoir engineering, production operations and related matters and am familiar with the matters set forth in the December 15-16, 2014 verified application (“Application”) and with the engineering conditions with respect to the following lands (“Application Lands”):

Township 11 North, Range 63 West, 6TH P.M. – DSU #1

Section 7: ALL

Section 18: ALL

Township 11 North, Range 63 West, 6TH P.M. – DSU #2

Section 8: ALL

Section 17: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #3

Section 20: ALL

Section 29: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #4

Section 21: ALL

Section 28: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #5

Section 22: ALL

Section 27: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #6

Section 23: ALL

Section 26: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #7

Section 24: ALL

Section 25: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #8

Section 31: ALL

Township 11 North, Range 63 West, 6TH P.M.

Section 6: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #9

Section 32: ALL

Township 11 North, Range 63 West, 6TH P.M.

Section 5: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #10  
Section 33: ALL

Township 11 North, Range 63 West, 6TH P.M.  
Section 4: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #11  
Section 34: ALL

Township 11 North, Range 63 West, 6TH P.M.  
Section 3: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #12  
Section 36: ALL

Township 11 North, Range 63 West, 6TH P.M.  
Section 1: ALL

Weld County, Colorado

In support of EOG's Application in the above-referenced docket, I am submitting five (5) exhibits. The exhibits are attached to my sworn testimony and form the basis for EOG's Application to gain approval to establish twelve (12) approximate 1280-acre drilling and spacing units in the Application Lands.

### **Drainage and Economic Calculations**

EOG believes that horizontal drilling and completing of the Codell Formation with long laterals in 1280 spacing units is the most efficient way to develop the resource potential. The following is a summary of the attached exhibits.

#### E1 Summary of Drainage Area Calculations for 7 Codell horizontal wells

- For each well, show cumulative and forecast ultimate oil and gas production from decline curve analysis
- Porosity feet from geologic maps and log analysis
- Drainage area is calculated for each well using the first equation. Use EUR, porosity feet, Recovery Factor, Water saturation, Oil formation volume factor and calculate area.
- Drainage radius is calculated for each well using the 2<sup>nd</sup> equation –Joshi equation. Using drainage area from previous step and lateral length, solve for drainage radius.
- The average drainage radius for these 7 Codell horizontal wells is 358'

#### E2 Drainage calculation for 9000' lateral

- Next step is to estimate the drainage area for the wells with a 9000' lateral length.
- Using a 9000' lateral length, and the average drainage radius value of 358', derived from the 7 horizontal wells in the previous exhibit, I calculate a drainage area of 157 acres

#### E3 Codell Spacing Summary

- This exhibit summarizes the information in the previous exhibits and calculates total drainage area for the requested number of wells:

- Seven horizontal Codell wells with sufficient production data exist in the study area and have an average estimated drainage radius of 358 feet
- The estimated area that can be drained with 1 extended lateral HZ Codell well is 157 acres
- The estimated area that can be drained with 1 extended lateral HZ Codell wells is 157 acres, which is smaller than requested approx. 1280 acre spacing unit
- One horizontal Codell well in the proposed spacing unit is necessary to prevent waste and will not adversely impact correlative rights

#### E4-5 Production plots for wells used in drainage calculations

- Show daily oil rate in BOPD for the month in green, gas rate in MCFD in red, water rate in BWPD in blue
- Fit line and EUR

#### Notes on Joshi Method

- I am utilizing the Joshi method for estimating horizontal well drainage
- Method uses the drainage radius expected from a vertical well along with the lateral length of the horizontal well
- The drainage area is a cigar shaped area with a width of 2 times the radius and a length equal to the completed lateral length, PLUS a semicircle on each end with the same radius

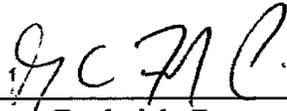
Economics were run using completed well costs of \$10,015,000 for the Jubilee 103-0433H well, the type curve of which is presented in the attached exhibits, and EOG's operating cost assumptions. The single well economics meet the Company's requirements for these wells.

Based upon my engineering analysis, 1280-acre drilling and spacing units will help promote efficient drainage, protect correlative rights and avoid waste. EOG does not believe that granting this Application will adversely affect correlative rights.

The matters described herein were all conducted under my direction and control. To the best of my knowledge and belief, all of the matters set forth herein, my testimony and in the exhibits are true, correct and accurate.

I respectfully request that, in addition to the testimony provided here, the Commission take administrative notice of the testimony and exhibits presented by EOG Resources, Inc. in.

Dated this 20th day of November, 2014.



Danny Frederick, Reservoir Engineer  
EOG Resources, Inc.

STATE OF COLORADO )  
 ) ss.  
CITY AND COUNTY OF DENVER )

The foregoing instrument was subscribed and sworn to before me this 21st day of November, 2014 by Danny Frederick, Reservoir Engineer, for EOG Resources, Inc.

Witness my hand and official seal.

My commission expires: June 11, 2018



Notary Public

ALEXANDRA KAY IVES NOTARY PUBLIC STATE OF COLORADO NOTARY ID 20144023239 COMMISSION EXPIRES JUN. 11, 2018
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# Summary of Existing Codell Horizontal Wells Within Study Area Calculated Drainage Area

Well	API #	Location	Oil	Gas	Oil	Porosity-FT (feet)	Estimated Drained Area (acres)	Completed Lateral Length (feet)	Drainage Radius (feet)
			Cumulative Production (bbls)	Cumulative Production (mcf)	EUR (bbls)				
DEWEY 7-9-1CH	49021210020000	15N-65W-7	30,895	41,044	95,903	4.0	35	3,666	189
ROAD RUNNER 1-6H	49021209660000	15N-64W-5	42,247	23,287	68,873	3.7	27	4,077	134
WARREN 17-1CH	49021209830000	15N-65W-17	68,836	37,019	277,190	3.8	103	3,624	506
JUBILEE 80-09H	49021209760000	13N-65W-9	81,989	67,449	274,514	3.0	131	3,764	602
JUBILEE 103-0433H	49021210120000	13N-65W-4	117,941	73,633	487,362	3.0	233	9,315	498
REDSTONE 2-1-1CH	49021209670000	13N-65W-1	57,355	55,206	170,319	3.0	81	9,452	181
TOMAHAWK 1-30H	49021208770000	14N-64W-30	69,981	114,992	193,539	3.4	82	3,894	395
<b>Average</b>									<b>358</b>

## Equations Used:

$$OOIP = EUR / RF$$

$$Area = OOIP * B_o / 7758 / h / por / (1-S_w)$$

$$B_o = 1.3$$

$$S_w = 0.35$$

$$RF = 0.18$$

OOIP = original oil in place (BBL)  
 RF = recovery factor (fraction)  
 EUR = estimated ultimate recovery (BBL)  
 Area = drainage area (acres)  
 B<sub>o</sub> = formation volume factor (rbv/STB)  
 h = thickness, (ft)  
 por = porosity (fraction)  
 S<sub>w</sub> = water saturation (fraction)

## Joshi Equation for Horizontal Drainage Area

$$D = (PI * r^2 + 2r * L) / 43560$$

r = Effective Drainage Radius from Wellbore, ft

L = Completed Lateral Length, ft

D = Drainage Area for Horizontal Well

# Estimated Drainage for Proposed 9000' Codell Horizontal Well

## Horizontal Well Drainage Area

Joshi Method

r = effective drainage area from vertical well, ft

L = lateral length, ft

D = drainage area for horizontal well

$$D = (\pi * r^2 + 2r * L) / 43560$$

r = 358 ft

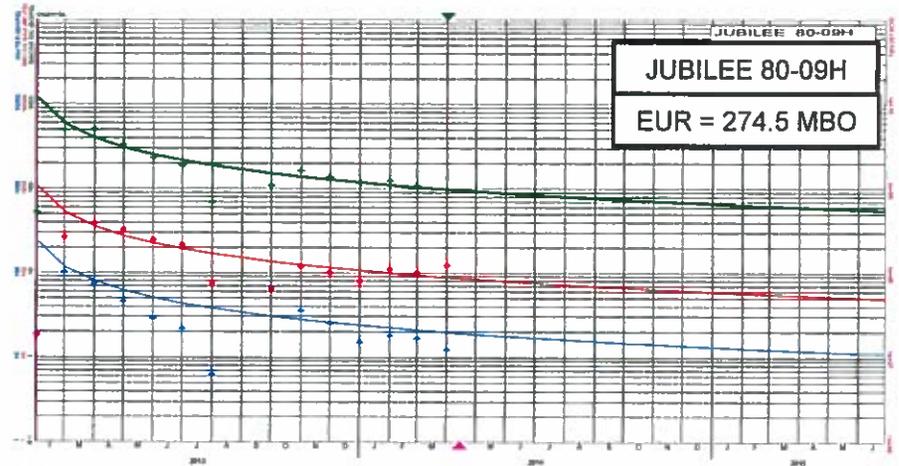
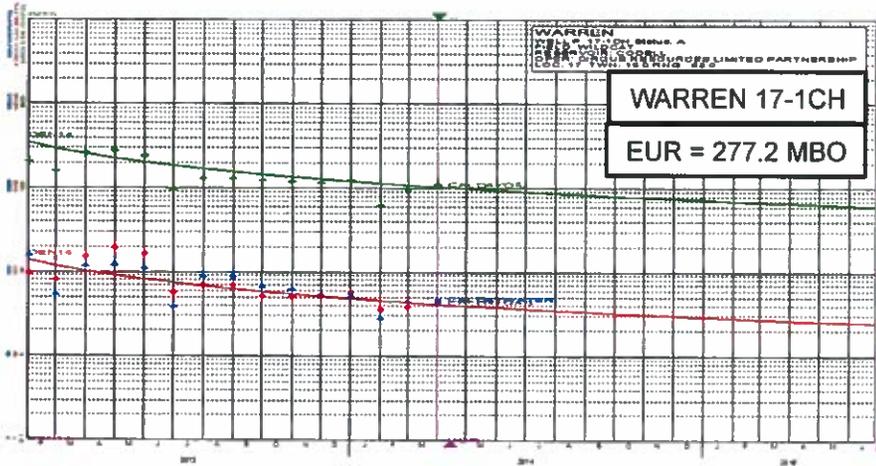
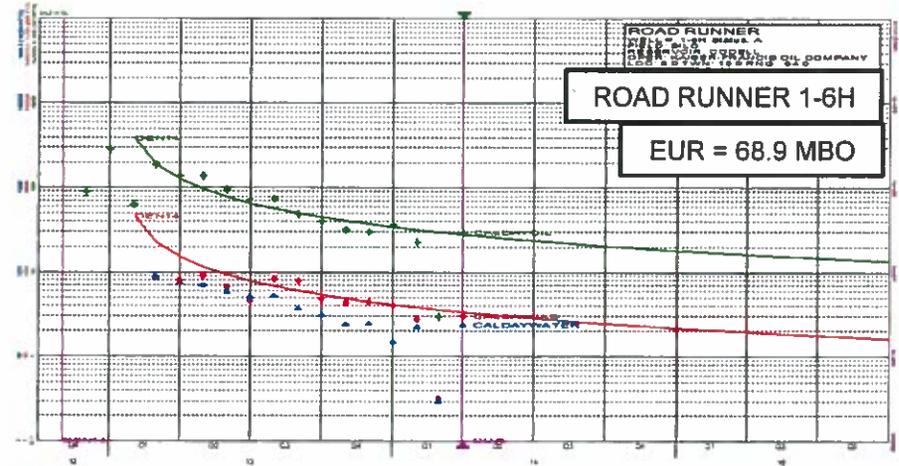
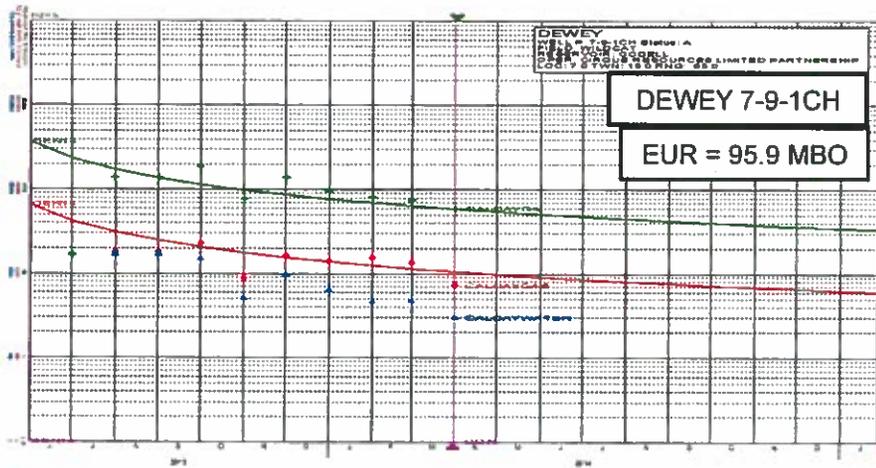
L = 9000 ft

D = 157 acres

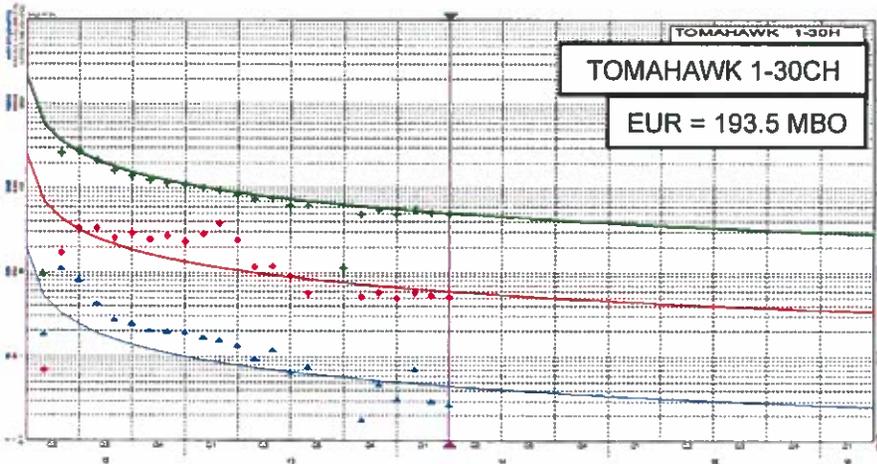
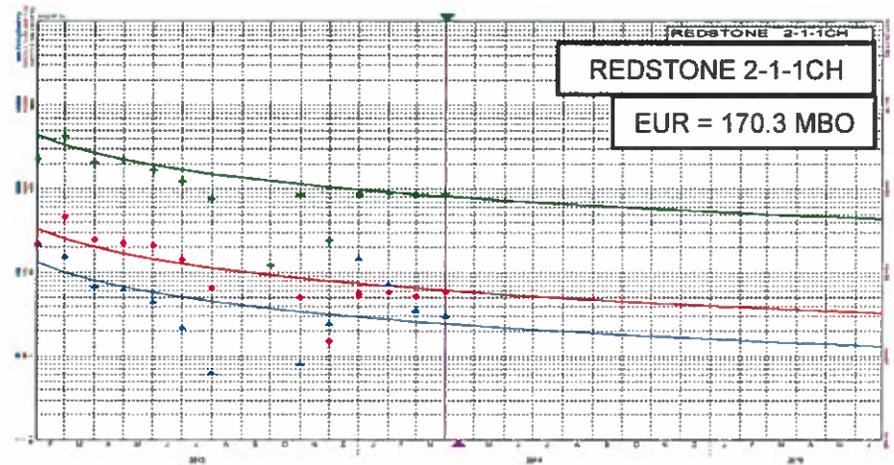
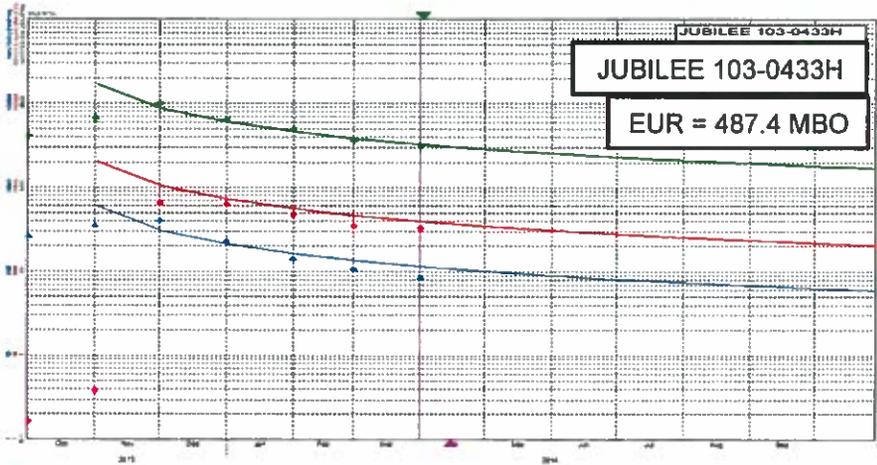
# Codell Spacing Summary

- Seven (7) horizontal Codell wells in study area have an average drainage radius of 358 feet
- The estimated area that can be efficiently drained with one extended lateral horizontal Codell well is 157 acres
- The estimated area that can be efficiently drained with one (1) extended lateral horizontal Codell wells is 157 acres, which is smaller than the approximate 1280 acre spacing unit
- One (1) horizontal Codell wells in the proposed 1280 acre drilling and spacing unit are necessary to prevent waste and will not adversely impact correlative rights

# Codell Production Plot



# Codell Production Plot



# **EOG RESOURCES, INC.**

## **Matthew L. Nobles Petroleum Geologist – Geological Testimony**

### **Colorado Oil and Gas Conservation Commission Hearing**

My name is Matthew L. Nobles, and I am currently employed as a Petroleum Geologist for EOG Resources, Inc. (“EOG”). I graduated from Colorado School of Mines with a Bachelor’s in Geological Engineering in 2011.

I have over 3.5 years of experience in the oil and gas industry. I am familiar with the lands subject to, and the matters set forth in the November 2014, verified application (“Application”).

In support of EOG’s Application in the above-referenced docket, I am submitting four (4) exhibits. The exhibits are attached to my sworn testimony and form the basis for EOG’s Application to gain approval to drill and complete one (1) horizontal well for the Niobrara Formation in the requested 1280-acre drilling and spacing unit covering the following lands (the “Application Lands”):

Township 11 North, Range 63 West, 6TH P.M. – DSU #1  
Section 7: ALL  
Section 18: ALL

Township 11 North, Range 63 West, 6TH P.M. – DSU #2  
Section 8: ALL  
Section 17: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #3  
Section 20: ALL  
Section 29: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #4  
Section 21: ALL  
Section 28: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #5  
Section 22: ALL  
Section 27: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #6

Section 23: ALL  
Section 26: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #7  
Section 24: ALL  
Section 25: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #8  
Section 31: ALL

Township 11 North, Range 63 West, 6TH P.M.  
Section 6: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #9  
Section 32: ALL

Township 11 North, Range 63 West, 6TH P.M.  
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Township 12 North, Range 63 West, 6TH P.M. – DSU #10  
Section 33: ALL

Township 11 North, Range 63 West, 6TH P.M.  
Section 4: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #11  
Section 34: ALL

Township 11 North, Range 63 West, 6TH P.M.  
Section 3: ALL

Township 12 North, Range 63 West, 6TH P.M. – DSU #12  
Section 36: ALL

Township 11 North, Range 63 West, 6TH P.M.  
Section 1: ALL

Weld County, Colorado

The Codell Formation is a laminated to highly burrowed sandstone deposited in the Western Interior Seaway during Cretaceous time. The Codell thins from North to South over the proposed spaced area.

Four geology exhibits were prepared and presented as follows:

***I. Exhibit G-1 – (Structure Map-C.I.=100')***

Exhibit G-1 is a subsea structure map constructed on the top of the Codell Formation. The regional dip is approximately 50°/mile to the west across the proposed spaced area.

***II. Exhibit G-2 – (Isopach Map-C.I.=2)***

Exhibit G-2 is an isopach map of the total Codell Formation. Total thickness ranges from approximately 17'-23', with the thickest area in the northern portion of the proposed spaced area.

***III. Exhibit G-3 – (Codell-Type Log)***

Exhibit G-3 is an AIT type log for the Codell Formation. The Codell is overlain by the Ft. Hayes member of the Niobrara Formation and underlain by the Carlile Shale.

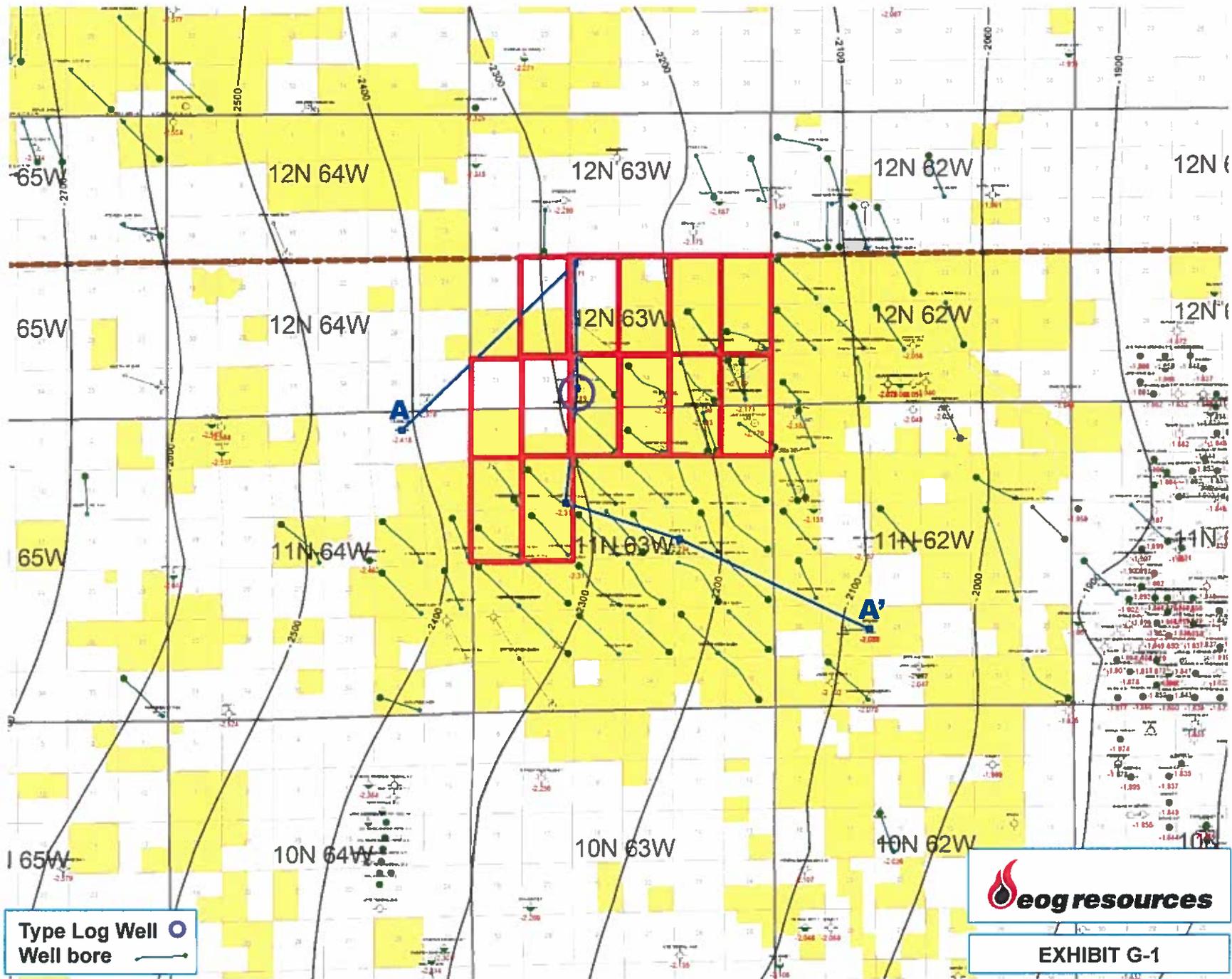
***IV. Exhibit G-4 (Cross Section A-A')***

Exhibit G-4 is a stratigraphic cross section constructed through nearby wells showing the mapped interval of the Codell Formation. This exhibit shows that the Codell Formation exists under the proposed spacing area. The location of cross section A-A' is shown on Exhibit G-1 & G-2.

My conclusion is that the Codell Formation exists under all of the Application lands.

The matters described herein were all conducted under my direction and control. To the best of my knowledge and belief, all of the matters set forth herein, my testimony and in the exhibits are true, correct and accurate.

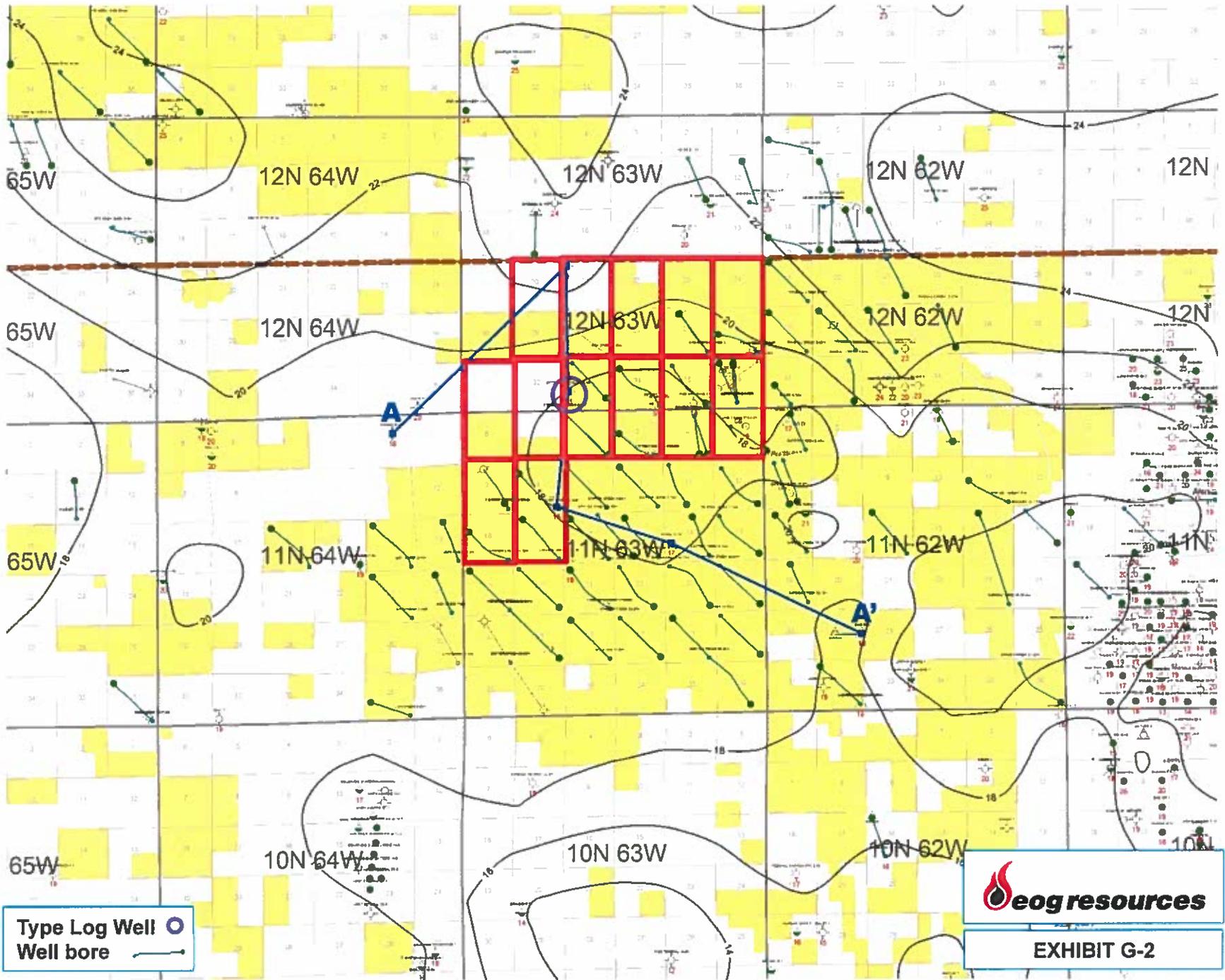




Type Log Well ○  
Well bore —●



EXHIBIT G-1



Type Log Well ○  
Well bore —



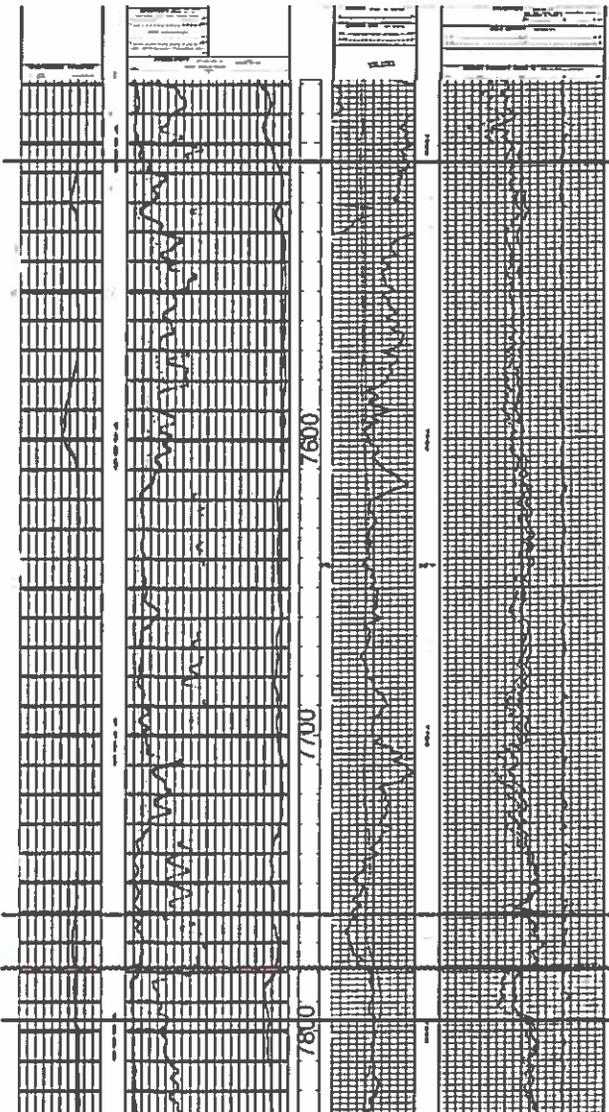
EXHIBIT G-2

DHSO  
TRANS-TEXAS ENERGY  
UPRR-PETERS RANCH 1-33  
T12N R63W S33  
C NW SW  
5,490  
05123103950000  
9/20/1981

UPPER CRETACEOUS

NIOBRARA

SMOKY HILL CHALK



Pierre Sh.

Niobrara.

Ft. Hayes L. S.

Codell

Carlile Sh.

# CODELL TYPE LOG



EXHIBIT G-3

  
 DRY  
 DAVIS OIL CO  
 KIESSELBACH  
 T11N R64W S2  
 C 5W NE  
 5,456  
 05123105600000  
 3/20/1982

<25,015FT>

  
 DRY  
 TRANS-TEXAS ENERGY  
 UPRR-AVERS 1-21  
 T12N R63W S21  
 C NW NW  
 5,505  
 05123103580000  
 11/6/1981

<12,893FT>

  
 DHSO  
 TRANS-TEXAS ENERGY  
 UPRR-PETERS RANCH 1-33  
 T12N R63W S33  
 C NW SW  
 5,490  
 05123103950000  
 9/20/1981

<12,016FT>

  
 DRY  
 COLE JACK A  
 COX 6-18  
 T11N R63W S8  
 E2 SE SE  
 5,310  
 05123132320000  
 3/13/1985

<12,508FT>

  
 DRY  
 TRUE OIL LLC  
 AYARS 13-14  
 T11N R63W S14  
 S2 NW SW  
 5,236  
 05123130760000  
 7/3/1988

<22,013FT>

  
 SRV  
 CONQUEST OIL CO  
 SWD C8A  
 T11N R62W S29  
 NE SE  
 5,198  
 05123328580000  
 4/30/2011

**A**



**A'**

Niobrara  
  
 Fort Hayes  
  
 Codell  
 Carlile



EXHIBIT G-4