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# Laramie Energy II, LLC

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OCT 14 2009

COGCC



ORIGINAL

## Application for Increased Well Density and Spacing

Section 3 T8S R96W

Docket #: 0910-SP-24

Cause: 139

**1. Land**

ORIGINAL

**2. Geology**

**3. Engineering**

**4. Resumes**

1

Verified Statement of Mark R. Petry

In support of the request for Director approval of the Verified Application of Laramie Energy II, LLC in Cause No. 139, Docket No. 0910-SP-24, pursuant to Rule 511.b, Mark R. Petry, Vice President of Business Development of Laramie Energy II, LLC, upon oath, deposes and states as follows:

- a. I am currently employed as the Vice President of Business Development of Laramie Energy II, LLC ("Laramie"). I have been and am presently responsible for and have knowledge of the land position related to the Application Lands.
- b. I have previously testified as an expert witness in petroleum land matters before the COGCC or before Hearing Officers of the COGCC. Included in Section No 4 of the Application is a copy of my resume. Attached are Exhibits L-1 through L-4, which were prepared by me or were under my direction and control. I have reviewed the exhibits, and to the best of my knowledge and belief, each of the exhibits is correct and accurate as of the date of this Verified Statement.
- c. Exhibit L-1 depicts the Application Lands in yellow and totaling approximately 40 acres. Also depicted are wells drilled, completed, and producing from the Mesaverde Group.
- d. Exhibit L-2 depicts the location of the Application Lands in the red circle and depicts a larger Piceance Basin view of lands approved for 10 acre well density, color coded by Applicant. This information was derived from the public records of the COGCC. I wish to point out that Exhibit L-2 depicts those lands approved for 10 acre well density as of May 8, 2008 and since that time additional lands have been approved for 10 acre well density.
- e. Exhibit L-3 depicts the Application Lands in yellow and depicts a larger Piceance Basin view of wells drilled, completed, and producing from the Mesaverde Group.
- f. Exhibit L-4 depicts the Application Lands with topography.
- g. I have not been advised of and am not aware of any protests to this Verified Application.
- h. The parties identified on Exhibit A to the Verified Application are the parties entitled to notice under the rules of the COGCC.

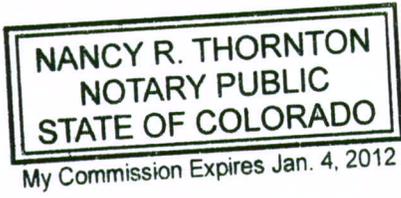
  
\_\_\_\_\_  
Mark R. Petry

STATE OF COLORADO     )  
  ) ss  
COUNTY OF DENVER     )

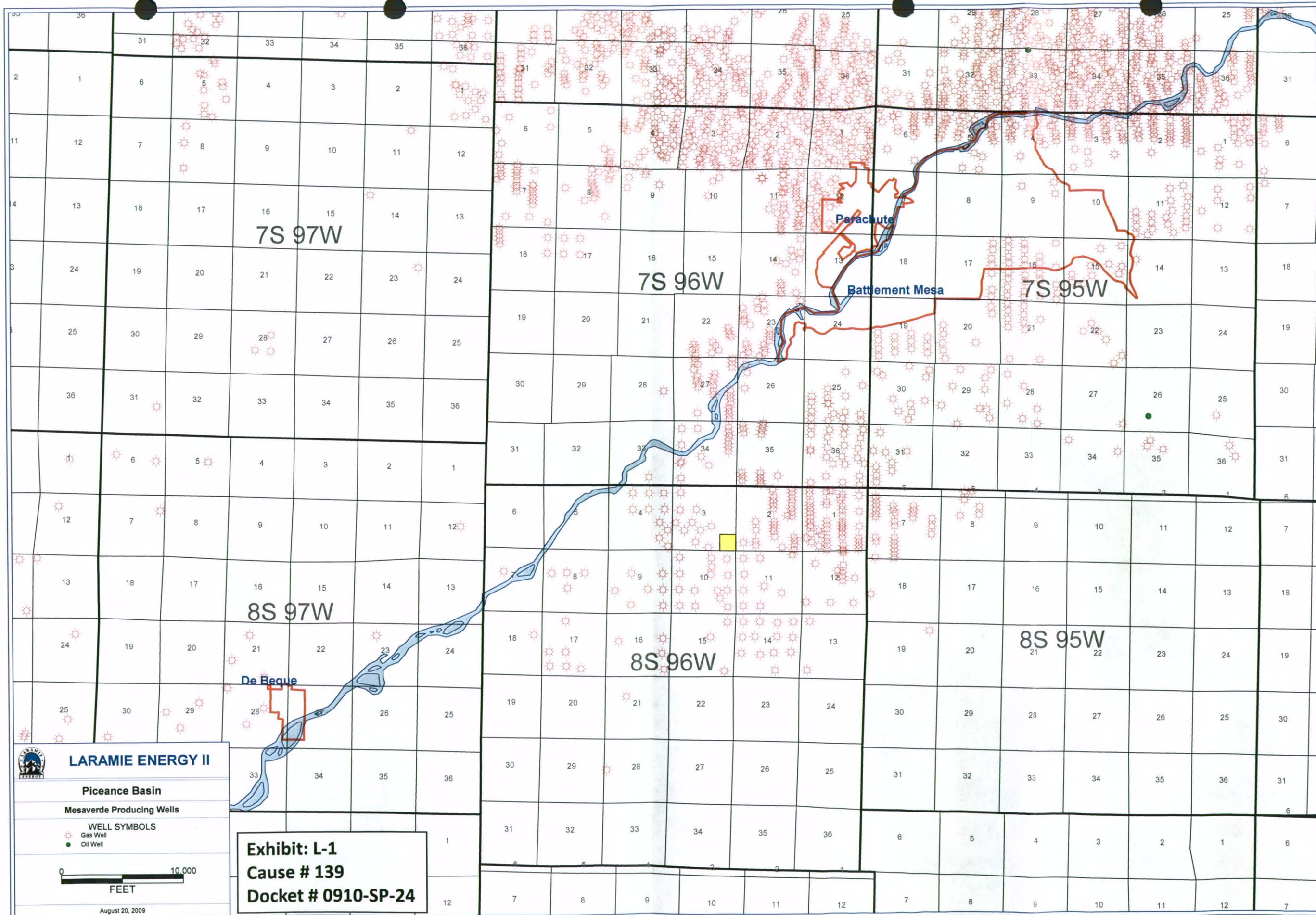
Subscribed to and sworn to before me this 7<sup>th</sup> day of October, 2009, by Mark R. Petry, Vice President of Business Development of Laramie Energy II, LLC.

My Commission expires: Jan 4, 2012

Nancy R. Thornton  
Notary Public



Address: 1512 Larimer St, Suite 1000  
Denver, CO 80202



**LARAMIE ENERGY II**

**Piceance Basin**

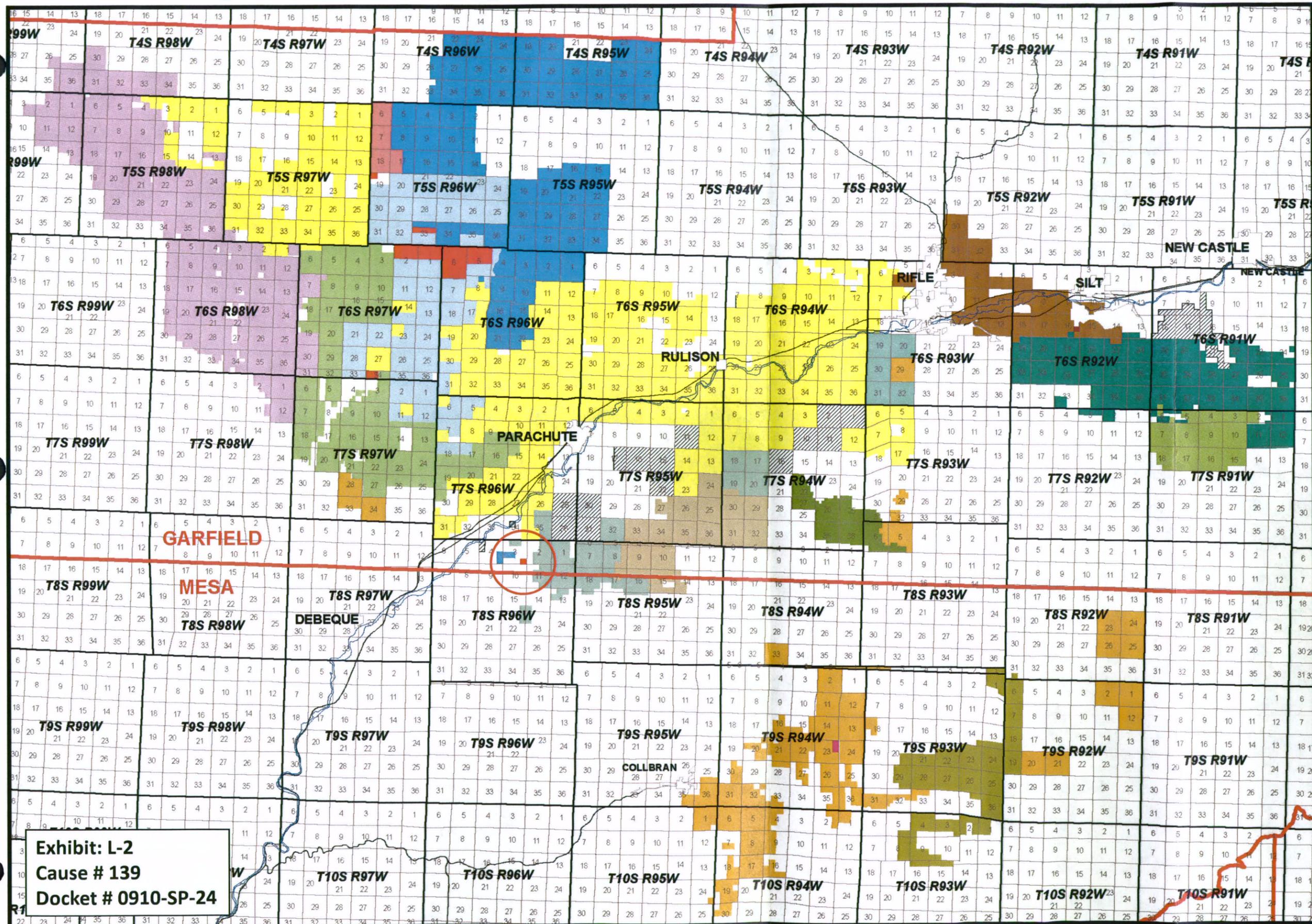
**Mesaverde Producing Wells**

**WELL SYMBOLS**  
 Gas Well  
 Oil Well



August 20, 2009

**Exhibit: L-1**  
**Cause # 139**  
**Docket # 0910-SP-24**

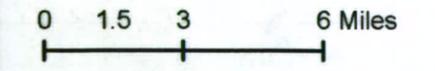


**DOWNHOLE 10-ACRE DENSITY LANDS (COLOR-CODED BY OPERATOR)**

- Antero
- Barrett
- Berry
- Black Diamond
- Chevron
- ConocoPhillips
- Delta
- Dolphin
- Encana
- Laramie
- Noble
- OXY
- PDC
- Petrogulf
- Plains
- Presco
- Whiting
- Williams
- Windsor

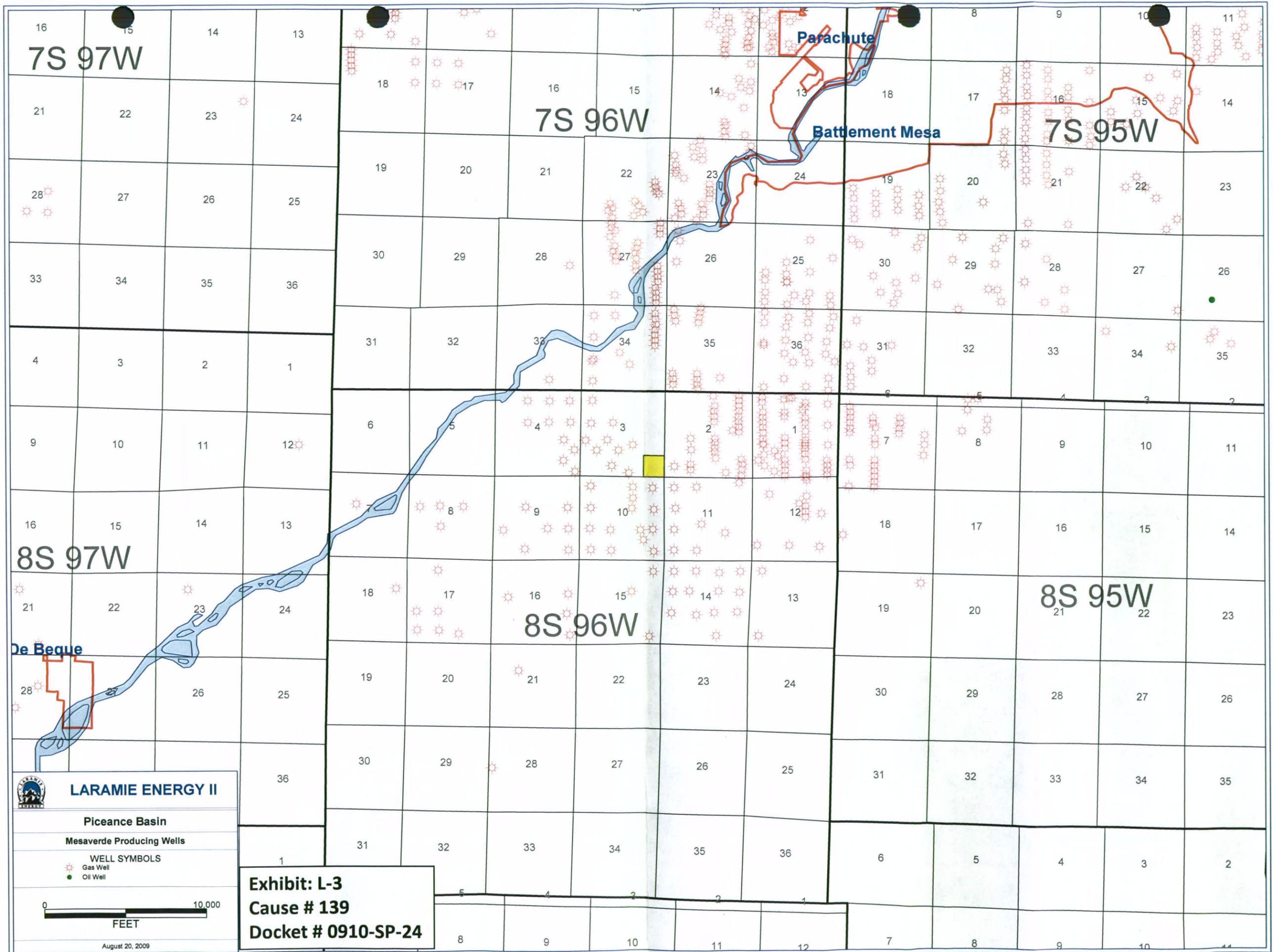
**DOWNHOLE 20-ACRE DENSITY LANDS**

*Note: Spaced lands are mapped to the nearest quarter quarter section or lot.*



**Exhibit: L-2**  
**Cause # 139**  
**Docket # 0910-SP-24**

**DOWNHOLE 10-ACRE DENSITY LANDS, GARFIELD & MESA COUNTIES, COLORADO AS OF MAY 8, 2008**



7S 97W

7S 96W

7S 95W

8S 97W

8S 96W

8S 95W

De Beque

Parachute

Battlement Mesa

**LARAMIE ENERGY II**

Piceance Basin  
Mesaverde Producing Wells

WELL SYMBOLS  
 ☆ Gas Well  
 ● Oil Well

0 10,000  
 FEET

August 20, 2009

**Exhibit: L-3**  
**Cause # 139**  
**Docket # 0910-SP-24**



**LARAMIE ENERGY II**

Piceance Basin

Topographic Map

Mesaverde Producing Wells

WELL SYMBOLS

Gas Well



August 20, 2009

**Exhibit: L-4**  
**Cause # 139**  
**Docket # 0910-SP-24**

2

Verified Statement of Mark G. King

In support of the request for Director approval of the Verified Application of Laramie Energy II, LLC in Cause No. 139, Docket 0910-SP-24, pursuant to Rule 511.b, Mark G. King, Senior Geologist of Laramie Energy II, LLC, upon oath, deposes and states as follows:

- a. I am currently employed as a Senior Geologist for Laramie Energy II, LLC. I have knowledge of the geologic characteristics of the Mesaverde Group underlying the Application Lands.
- b. I previously have testified as an expert witness in petroleum geology before Hearing Officers of the COGCC. My resume is included in section 4 of the application. I have reviewed the attached Exhibits G-1 through G-7 and to the best of my knowledge and belief; each of those exhibits is correct and accurate as of the date of this Verified Statement.
- c. Exhibit G-1 is a map showing the location of the application leasehold. The location of the Type log and cross-section A-A' (Exhibits G-2 and G-6) are also shown on this map.
- d. Exhibit G-2 is a type log for the Williams Fork and Iles Formations. The well in Exhibit G-2 is located in Section 34, Township 7S and Range 96W. The well name is the Laramie Energy LLC Reppo A10-34D. This well is located in Exhibit G-1. The type log contains 4 tracks. Track 1 contains a gamma ray curve colored so that sand shows up as yellow, shale gray and coal black. Track 2 is the depth track. Track 3 contains a deep resistivity curve. Track 4 contains the density and neutron curves. The red shading identifies log cross-over indicating the presence of gas. The Mesaverde Group is Upper Cretaceous in age and consists of the Iles Formation, which contains marine and non-marine deposits and the Williams Fork Formation, which consists of non-marine deposits. The Williams Fork Formation extends from the top of the Rollins SS to the top of the Mesaverde Group. The Williams Fork Formation comprises sandstones, shales and coals deposited in a coastal-plain setting. The lower 380 feet of the Williams Fork Formation in the type log is a coal bearing member commonly known as the Cameo. The sandstones within the Williams Fork Formation were primarily deposited as point bars on meandering rivers. The productive sandstones throughout the Williams Fork Formation are laterally discontinuous, naturally fractured, contain microdarcy permeability and average 6% - 10% porosity.
- e. Exhibit G-3 is a summary of the identified sand types found during an outcrop study of the Williams Fork Formation in Coal Canyon. Five sand body types were identified and sand body statistics compiled. Note that only the Compound Sinuous sand type has a mean sand width larger than the distance between wells drilled on 10 acre density (660 ft). The Simple Sinuous and Compound Sinuous sands are the most common sand types found in the outcrop study. Both sand types contain lateral accretion surfaces which act as internal baffles and barriers to flow.

- f. Exhibit G-4 contains two photographs of the Williams Fork outcrop in Coal Canyon. The upper and lower photographs are identical and are separated by the red line. The upper photograph has a schematic overlay on it highlighting the presence of multiple discrete sand bodies in the Williams Fork Formation. Four hypothetical wells drawn 660 ft apart (10 acre density) are also shown. This exhibit illustrates that wells drilled on 10 acre density will encounter different sands or different compartments within the same sand body.
- g. Exhibit G-5 is a sketch of a portion of the Williams Fork outcrop on the west side of Rifle Gap, on the eastern margin of the Piceance Basin. The diagram shows two sands in the same stratigraphic horizon with two hypothetical 10-acre wells, spaced 660 ft apart. This exhibit illustrates that the sand body widths in the outcrop are smaller than the distance between the hypothetical 10 acre density wells (660 ft).
- h. Exhibit G-6 is stratigraphic cross-section A-A'. This cross-section was constructed to illustrate the discontinuous nature of the Williams Fork sands in nearby closely spaced wells. Cross-section A-A' is located approximately 1 mile north of the application lands. The wells are 279 ft to 358 ft apart (10 acre density). The log contains a single track containing the gamma ray curve colored so that the sand shows up as yellow, shale gray and coal black. The marker labeled TOP is Top of Perforations. The colored panel between the logs is an attempt to correlate the sands and shales between the wells. Note the discontinuous nature of the sands. Note how the character of the sands that appear to correlate change between wells.
- i. Exhibit G-7 is a map showing the well penetrations near the application lands with the Corcoran penetrations highlighted by the blue circles. Note the number of Iles penetrations near the application lands. Note the red and green lines labeled Corcoran strandline and Cozzette strandline that pass diagonally across the map. This is the approximate location where the Corcoran and Cozzette Members of the Mesaverde Formation change from continental deposition (NW of the lines) to Marine deposition (SE of the lines). The lines were taken from a paper written by Brown, Smagala and Haefel (1986, AAPG Studies in Geology) titled "Southern Piceance Basin Model – Cozzette, Corcoran and Rollins Sandstones". Note that the application leasehold is located to the NW of the Corcoran strandline, indicating that the Corcoran was deposited in a continental setting. Refer to Cross Section A-A' (Exhibit G-2). The Rollins and Cozzette sands were deposited in a marine shoreface environment and correlate relatively well. The Corcoran, which is the primary Iles objective in the application lands, was deposited in a coastal-plain setting and consists of coal beds, shales and discontinuous sand bodies. The environment of deposition of the Corcoran in the application lands is thought to be identical to that of the Williams Fork Formation. Note the discontinuous nature of the Corcoran sands.
- j. Summary: The Williams Fork Formation and Corcoran sands of the Iles Formation are the primary targets for new wells drilled on the application lands. The geologic model of the Williams Fork Formation in the major producing regions of the Piceance Basin is well

understood. The model consists of log studies, completion and reservoir engineering studies and extensive representative outcrop data. Outcrop studies from both the western and eastern edges of the Piceance Basin illustrate that the Williams Fork Formation consists of sand bodies that are highly discontinuous in nature. Well logs confirm that the discontinuous sand model projects from the outcrop into the basin. The mean sand width identified from the outcrop study is 526 ft. Wells drilled on 10 acre density will statistically not encounter the same sand bodies. Exhibit 6 illustrated the discontinuous nature of the Williams Fork and Corcoran sands in nearby wells drilled on 10 acre density. The accepted geologic model predicts that the mean sand width found in outcrop and in drilled 10 acre density wells will also be present under the application lands.

Mark G. King  
Mark G. King

STATE OF COLORADO     )  
  ) ss  
COUNTY OF DENVER     )

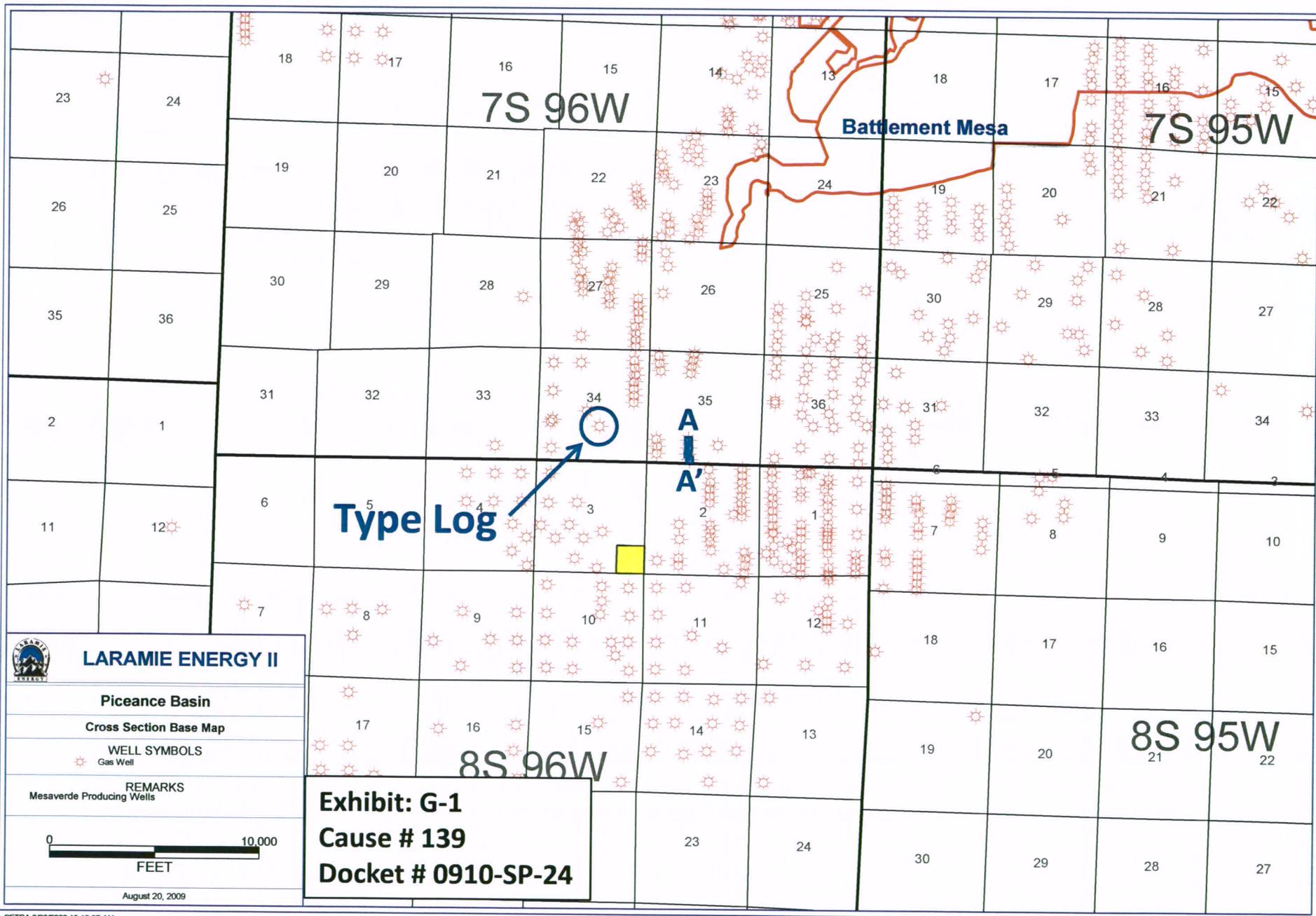
Subscribed to and sworn to before me this 5<sup>th</sup> day of October, 2009, by Mark G. King, Senior Geologist of Laramie Energy II, LLC.

My Commission Expires:

Nancy R. Thornton  
Notary Public

NANCY R. THORNTON  
NOTARY PUBLIC  
STATE OF COLORADO

My Commission Expires Jan. 4, 2012



**LARAMIE ENERGY II**

**Piceance Basin**

**Cross Section Base Map**

**WELL SYMBOLS**  
Gas Well

**REMARKS**  
Mesaverde Producing Wells

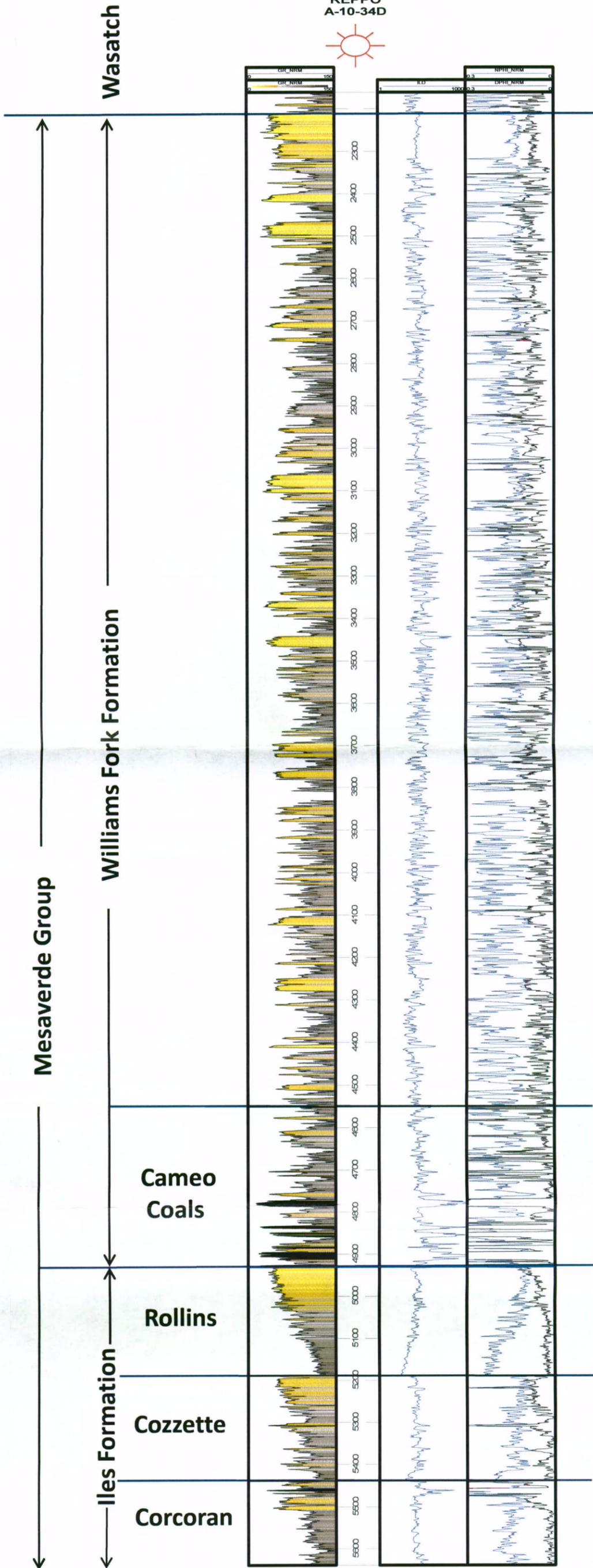


August 20, 2009

**Exhibit: G-1**  
**Cause # 139**  
**Docket # 0910-SP-24**

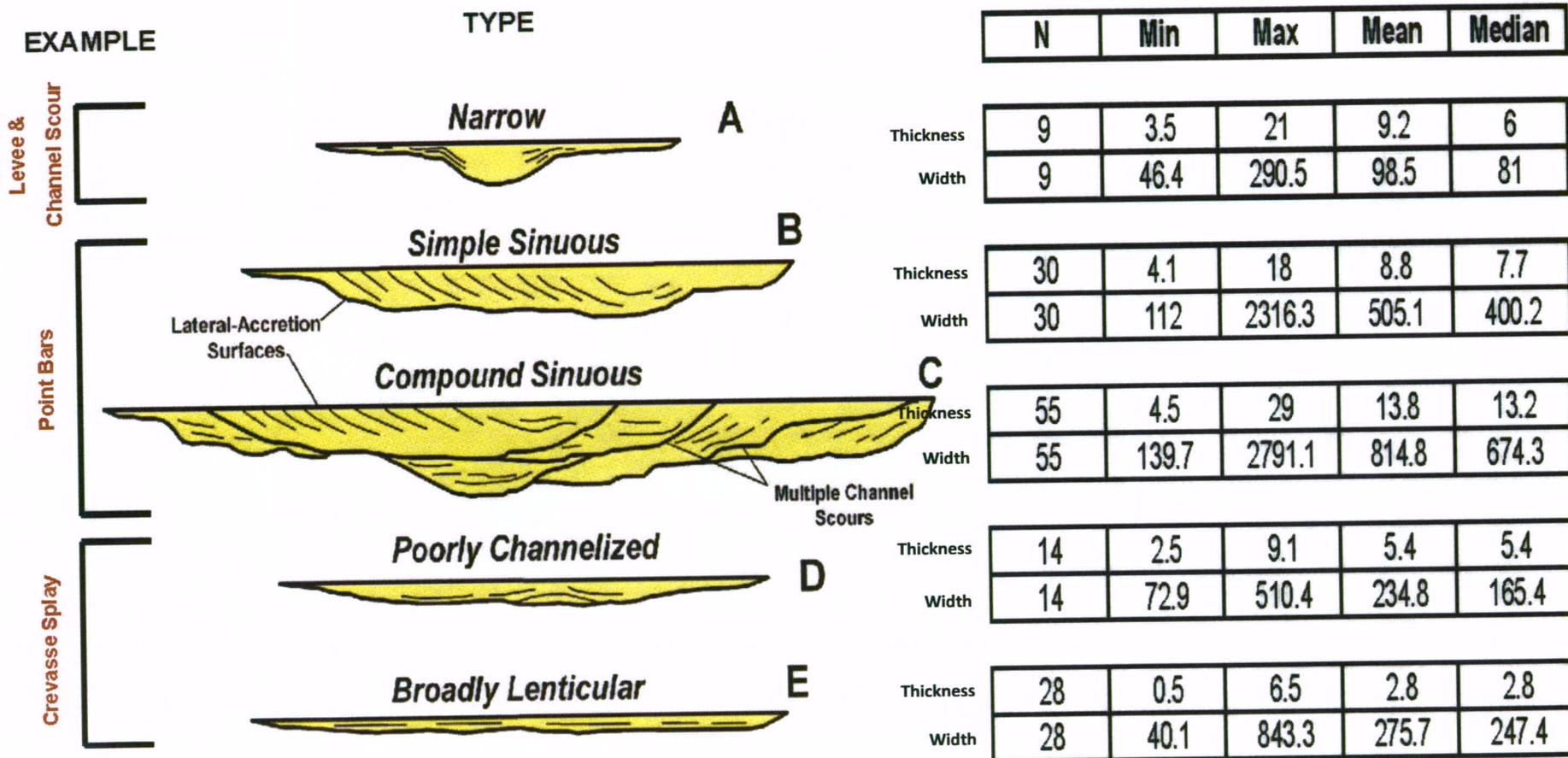
# Type Log

Twn-Rge-Sec : T7S R96W S34  
 LARAMIE ENERGY II  
 REPO  
 A-10-34D



# LOWER WILLIAMS FORK SAND BODY TYPES

## SAND BODY STATISTICS



### TOTAL POPULATION

Thickness (ft)	136	0.5	29	9.3	8
Apparent Width (ft)	136	40.1	2791.1	526	400.2

From Cole and Cumella (2005)

Exhibit: G-3

Cause # 139

Docket # 0910-SP-24

# WILLIAMS FORK IN COAL CANYON HIGHLIGHTING DISCRETE SAND BODIES

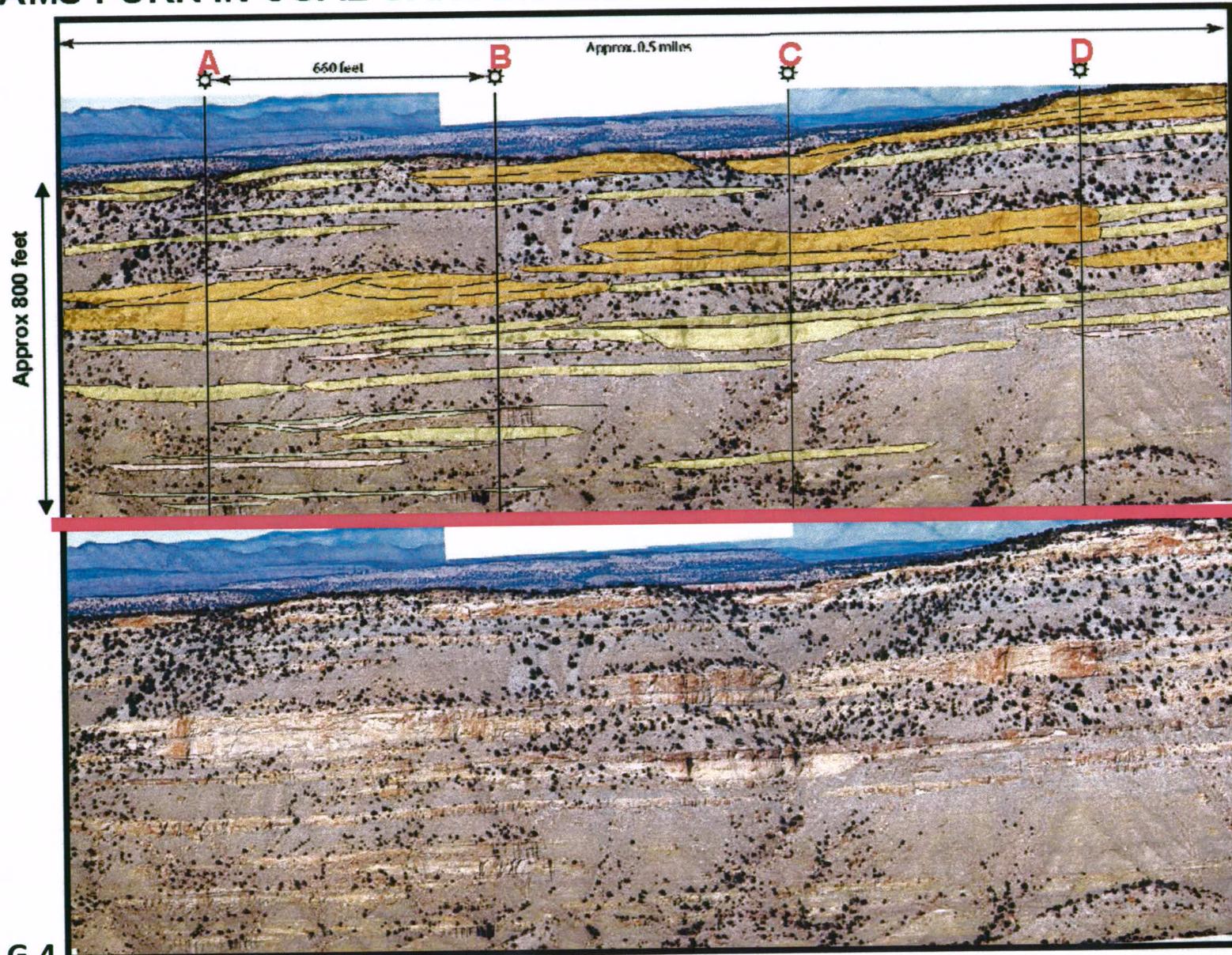


Exhibit: G-4  
Cause # 139  
Docket # 0910-SP-24

# Williams Fork Outcrop Diagram - Rifle Gap

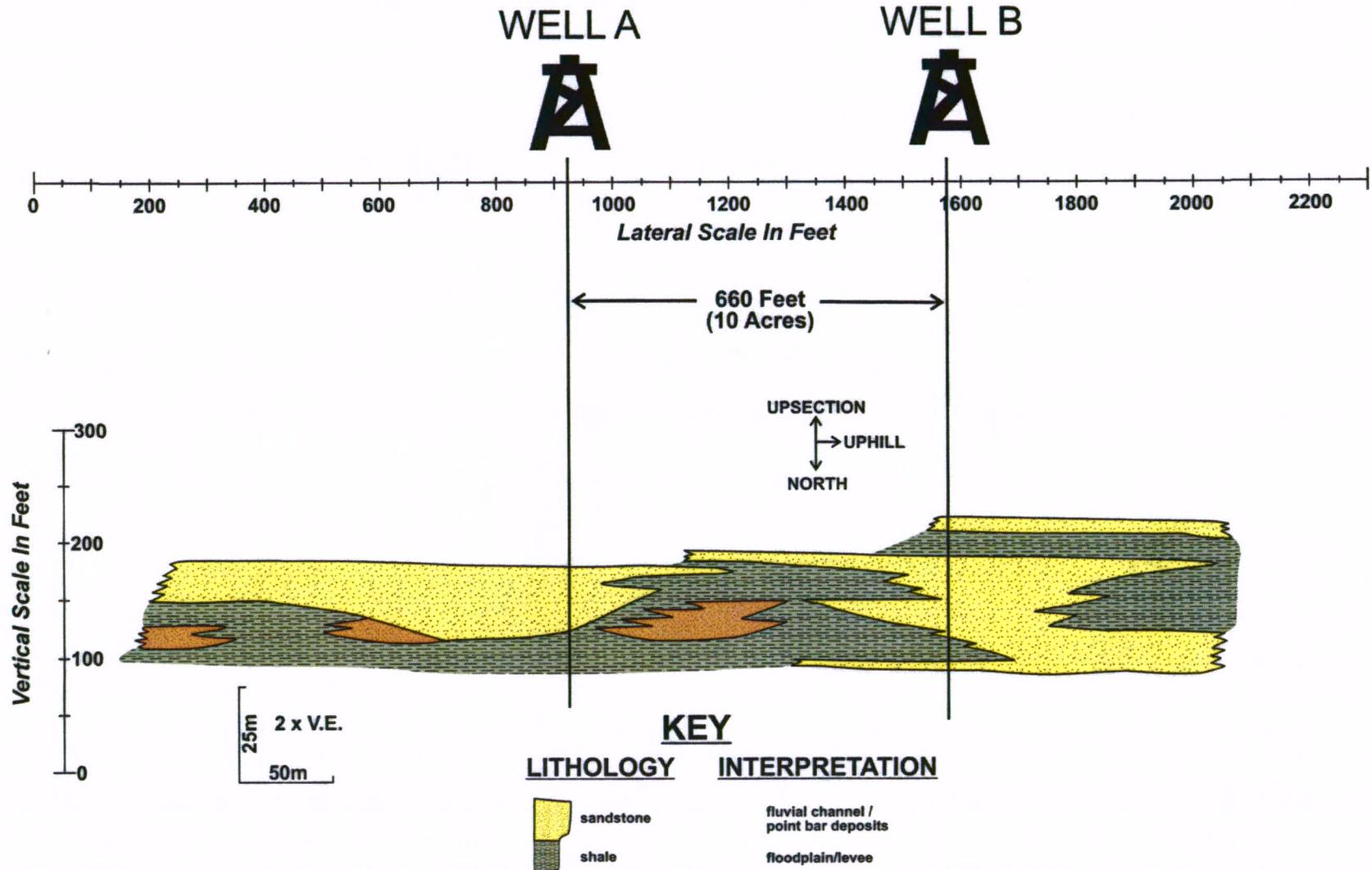


Exhibit: G-5  
Cause # 139  
Docket # 0910-SP-24

Outcrop of lens 8, west side of Rifle Gap, modified from Lorenz, 1982 (Pg. 28, Fig. 12).

A

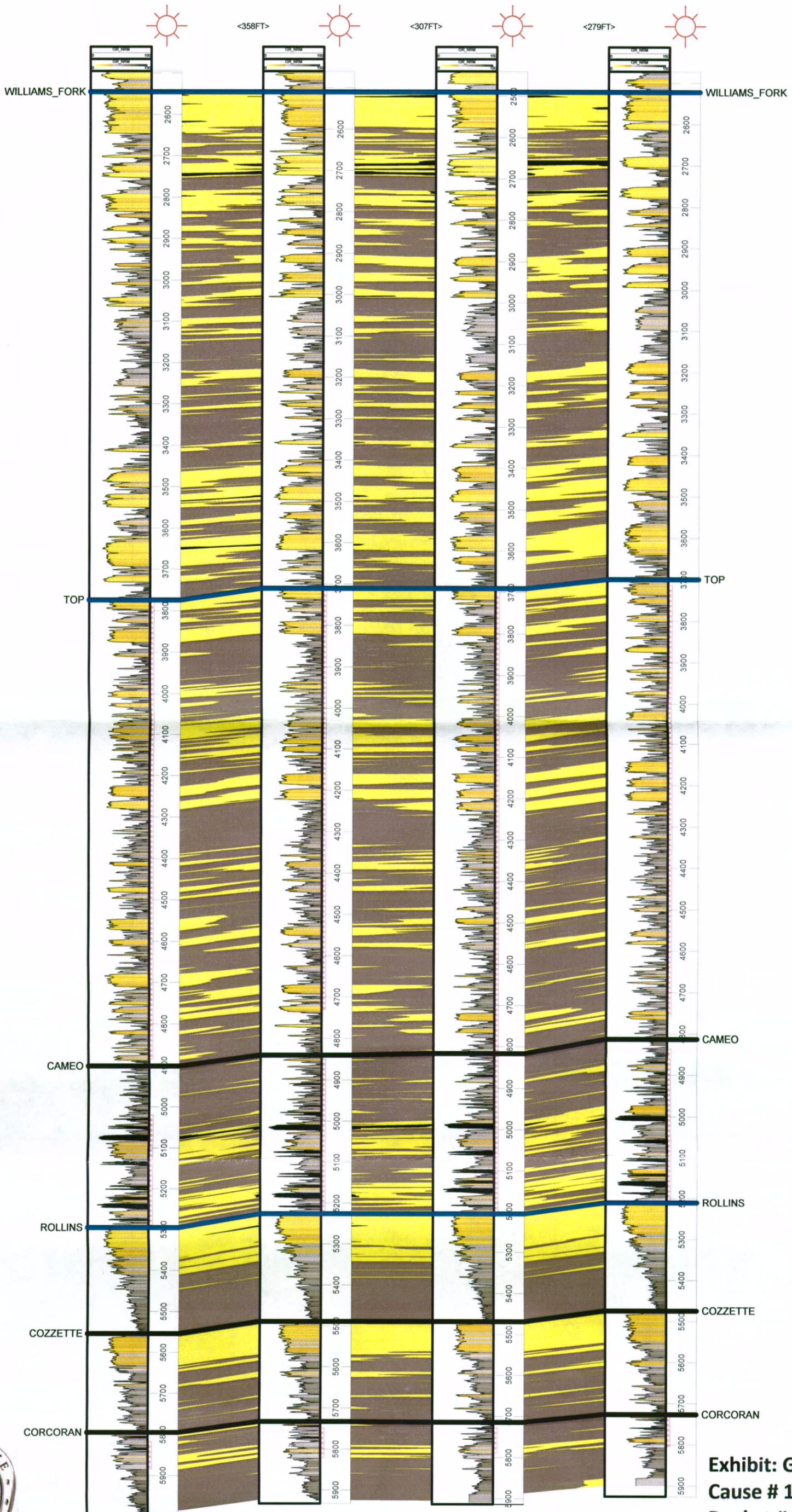
A'

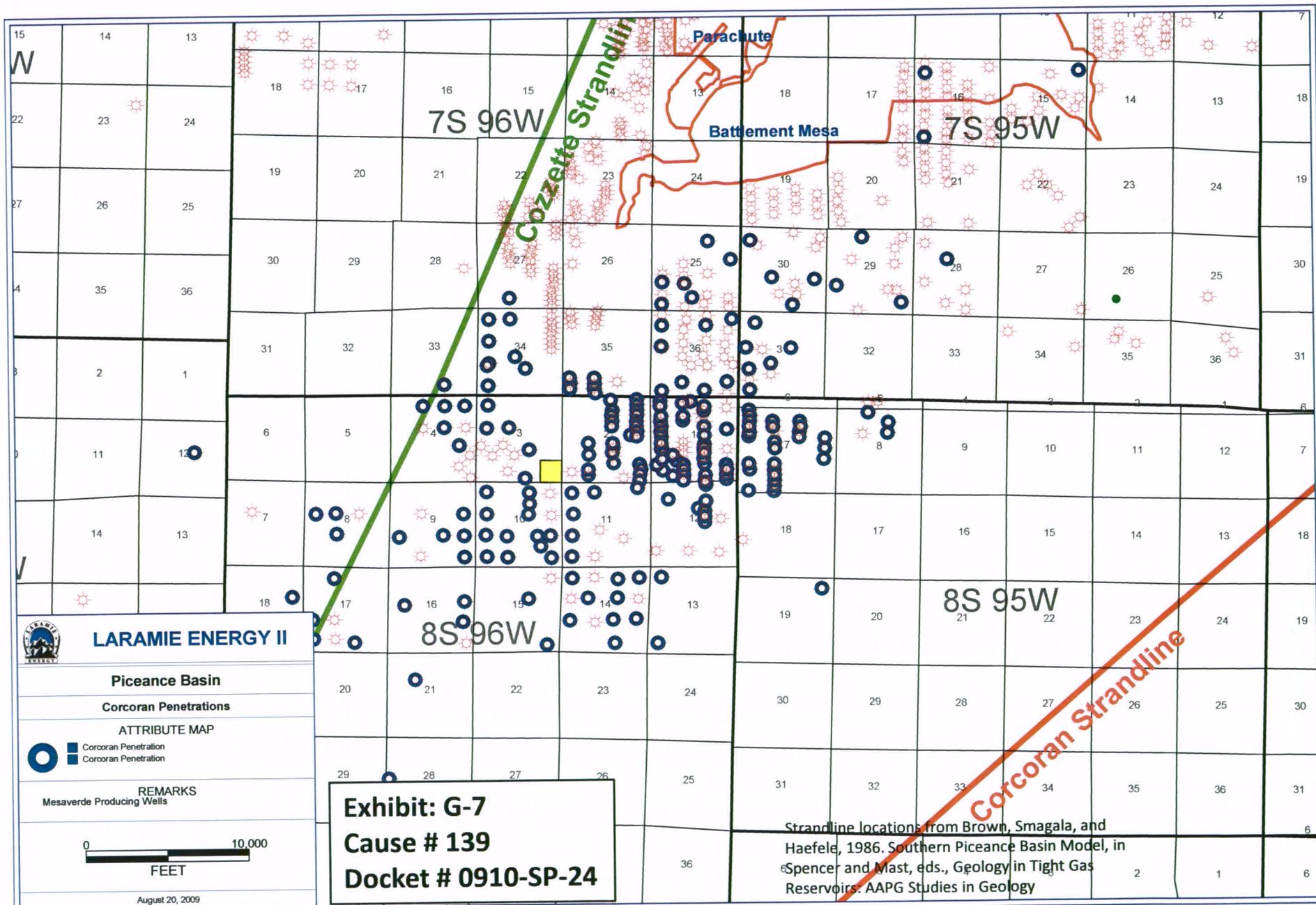
Twn-Rge-Sec : T7S R96W S35  
NOBLE ENERGY INC  
MCNEIL  
35-24A

Twn-Rge-Sec : T7S R96W S35  
NOBLE ENERGY INC  
RICHARDSON  
35-24B

Twn-Rge-Sec : T7S R96W S35  
NOBLE ENERGY INC  
RICHARDSON  
35-24C

Twn-Rge-Sec : T7S R96W S35  
NOBLE ENERGY INC  
RICHARDSON  
35-24D





3

Verified Statement of Robert G. Hea

In support of the request for Director approval of the Verified Application of Laramie Energy II, LLC in Cause No. 139, Docket No. 0910-SP-24, pursuant to Rule 511.b, Robert G. Hea, Vice President of Engineering & Operations of Laramie Energy II, LLC, upon oath, disposes and states as follows:

- a. I am currently employed as the Vice President of Engineering and Operations for Laramie Energy II, LLC. I have knowledge of the Reservoir Engineering characteristics of the Mesaverde Group underlying the Application Lands.
- b. I have previously testified as an expert witness regarding Engineering before Hearing Officers of the COGCC. My resume is included in Section 4 of the application. I prepared the attached Exhibits E-1 through E-11 and to the best of my knowledge and belief; each of those Exhibits are correct and accurate as of the date of this Verified Statement.
- c. Exhibit E-1 is a map showing the location of the application lands and the location of approved 10-acre density areas within the southern portion of the Piceance Basin. Note that, to the north in Section 3, Noble obtained 10-acre density in both the Williams Fork and Iles intervals in November 2007. From a Reservoir Engineering standpoint, there is nothing that differentiates the application lands from the Noble operated area already approved for 10-acre density.
- d. Exhibit E-2 is a map of the immediate area around the application lands with Williams Fork producing wells marked on the map with red symbols. The producing wells in Sections 33, 34, & 35 of T7S R96W, and Sections 2, 3, 4, 9, 10, & 11 of T8S R96W were used to generate the Type Curve (typical well) reserves and rate forecast that follow. Digital log data was available for five of the wells. These wells are noted on the map.
- e. Exhibit E-3 is the Type Curve for the completed Williams Fork wells in the Sections referenced above. The expected ultimate recovery (EUR) for the typical well in this area is 539 MMcf using the illustrated hyperbolic decline curve analysis.
- f. Exhibit E-4 is a summary of the log analyses performed on the five wells highlighted in Exhibit E-2. The average values for net pay, porosity, and water saturation as calculated for the Williams Fork interval are typical of Piceance Basin wells in this area.
- g. Exhibit E-5 is a Volumetric Analysis Summary for the Williams Fork interval only using the log analysis parameters summarized on Exhibit E-4 (net pay, porosity, and water saturation). The initial pressure was based on a 0.45 psi/ft pressure gradient to mid-perf. The Recovery Efficiency of 73% was taken from the results of the William's Production Company Rulison Pilot Study for 10-acre density drilling. With the EUR determined from the Type Curve analysis, one can solve for the Type Well drainage area. In this case the average well is draining 10.0 acres.

- h. Exhibit E-6 is an Economic Analysis summary of a typical Williams Fork well drilled and completed for \$1,200,000 that recovers 539 MMcf with an initial rate of 25,000 Mcf/month and selling natural gas and condensate at Nymex pricing of \$6.00/MMBtu & \$60/bbl with standard basis differentials. Such a typical well would yield greater than a 10% Rate of Return (a positive Net Present Value discounted at 10%) and is considered commercial.
- i. Exhibit E-7 is a map of the immediate area around the application lands with Iles (Cozette & Corcoran Sands) producing wells marked on the map with orange circles. The producing Iles wells in Sections 33, 34, & 35 of T7S R96W, and Sections 2, 3, 4, 9, 10, & 11 of T8S R96W were used to generate the Type Curve (typical well) reserves and rate forecast that follow. In most cases, the Iles completions were commingled with the Williams Fork interval. Digital log data was available for five of the wells. These wells are noted on Exhibit E-2.
- j. Exhibit E-8 is an Iles/Williams Fork Commingled Type Curve generated from producers in the Sections referenced above. The type curve match suggests a typical ultimate recovery of 690 MMcf per well for a commingled completion. Subtracting the Williams Fork Type Curve EUR of 539 MMcf leaves 151 MMcf that would be contributed by the Iles.
- k. Exhibit E-9 is a summary of the log analyses performed in the Iles interval for the five wells highlighted in Exhibit E-2. The values for net pay, porosity, and water saturation are typical of Piceance Basin Iles wells.
- l. Exhibit E-10 is a Volumetric Analysis Summary for the Iles interval only using the log analysis parameters summarized on Exhibit E-9 (net pay, porosity, and water saturation). The initial pressure was based on a 0.52 psi/ft gradient to mid-perf. The Recovery Efficiency of 73% corresponds to the results of the William's Production Company Rulison Pilot Study for 10-acre density drilling in the Williams Fork. This percentage was chosen because the rock properties appear to be similar between the Iles and the Williams Fork despite the difference in depositional environments. Additionally, a 73% Recovery Efficiency corresponds to a reservoir abandonment pressure of 850 psia or 0.15 psi/ft of depth which is considered reasonable. With the EUR determined from the difference in Type Curves, again one can solve for the Type Well drainage area. In this case the average Iles well is draining 13.0 acres.

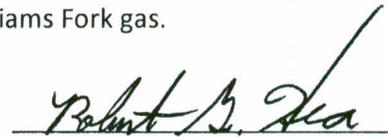
Also note that the higher Iles bottomhole pressure can aid in the unloading of water production from the uphole Williams Fork interval when commingled.

- m. Exhibit E-11 is an Economic Analysis comparison between drilling a "Grass Roots" Iles only well versus deepening a Williams Fork well to recover 151 MMcf. The cost to drill and complete an Iles only well is \$1,000,000. The incremental cost to deepen a Williams Fork well to the Iles is estimated at \$175,000. An Iles only completion should produce initially at 15,000 Mcf/month while adding an Iles completion to a Williams Fork well should increase the initial production by an incremental 5000 Mcf/month. At these costs, rates, and reserves, an Iles only well does not

meet the industry standard 10% rate of return. However, if drilled and completed in conjunction with the Williams Fork, the deepening does yield greater than a 10% rate of return.

n. Summary:

1. The application lands are in close proximity to acreage already approved for 10-acre density drilling to both the Williams Fork and Iles.
2. There are no known differences in the reservoirs between the application lands and the areas already approved for 10-acre density.
3. The nearby Williams Fork wells are draining, on average, approximately 10.0 acres per well. Drilling at 20-acre density would leave significant undrained areas behind and create waste.
4. 10-acre density Williams Fork wells that recover 539 MMcf (Type Curve EUR) are commercial.
5. Iles wells are draining, on average, approximately 13.0 acres. Drilling at 20-acre density would leave significant reserves behind and create waste.
6. "Grass Roots" Iles only wells that recover 151 MMcf are not commercial. The most efficient method to recover Iles reserves is through commingled development with the Williams Fork sands.
7. An added benefit of commingling Iles and Williams Fork production is that the deeper Iles intervals are slightly over-pressured. This additional pressure helps lift the associated water production from the Williams Fork up the wellbore to the surface which allows for maximum recovery of Williams Fork gas.



Robert G. Hea

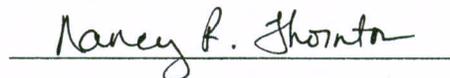
STATE OF COLORADO )

) ss

COUNTY OF DENVER )

Subscribed to and sworn to before me this 5th day of October, 2009, by Robert G. Hea, Vice President of Engineering and Operations for Laramie Energy II, LLC.

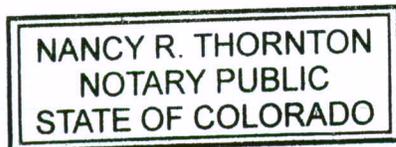
My Commission Expires: January 4, 2012



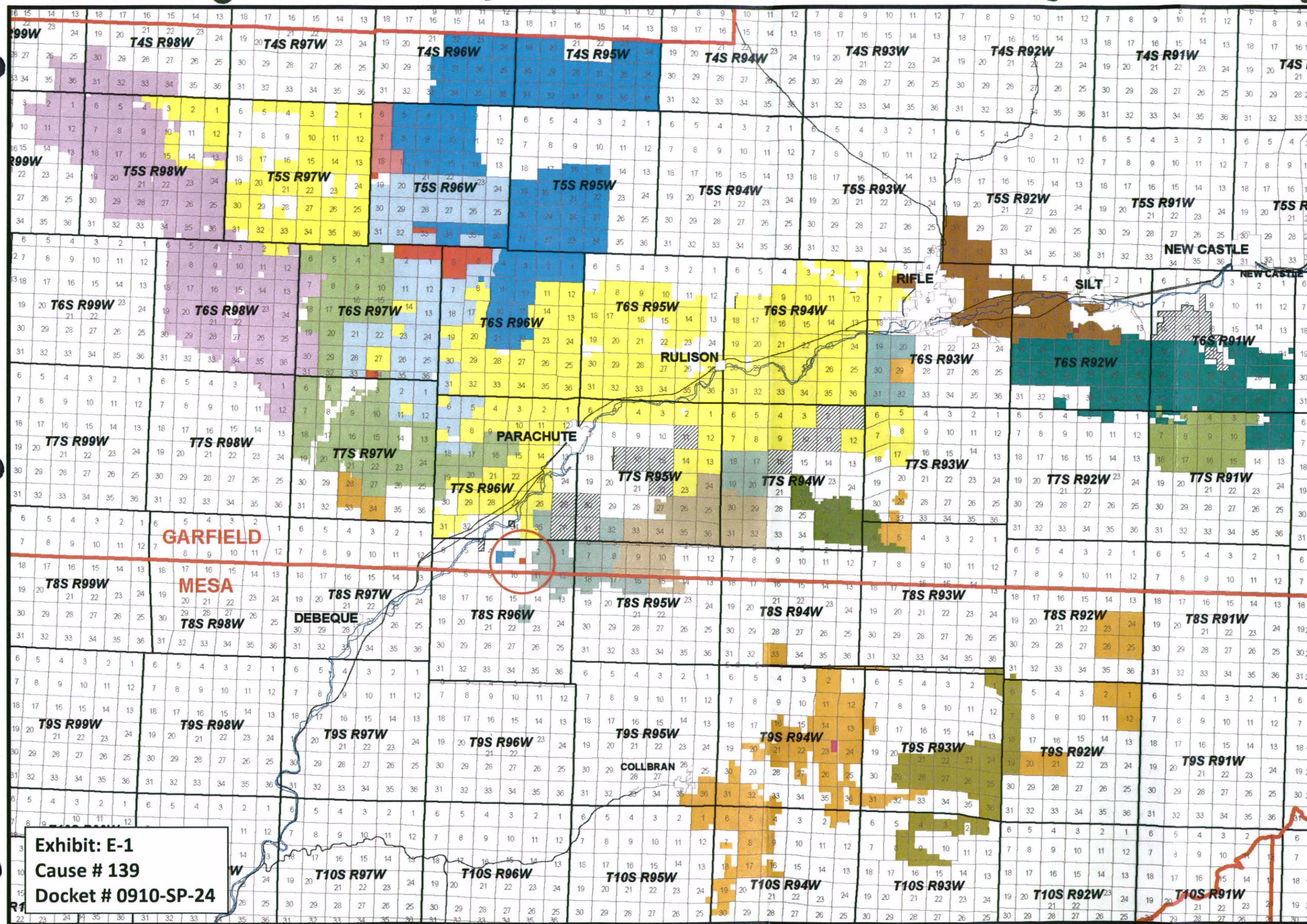
Notary Public

Address: 1512 Larimer St., Suite 1000

Denver, CO 80202



My Commission Expires Jan. 4, 2012

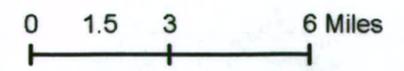


**DOWNHOLE 10-ACRE DENSITY LANDS  
(COLOR-CODED BY OPERATOR)**

- Antero
- Barrett
- Berry
- Black Diamond
- Chevron
- ConocoPhillips
- Delta
- Dolphin
- Encana
- Laramie
- Noble
- OXY
- PDC
- Petrogulf
- Plains
- Presco
- Whiting
- Williams
- Windsor

**DOWNHOLE 20-ACRE DENSITY LANDS**

*Note: Spaced lands are mapped to the nearest quarter quarter section or lot.*

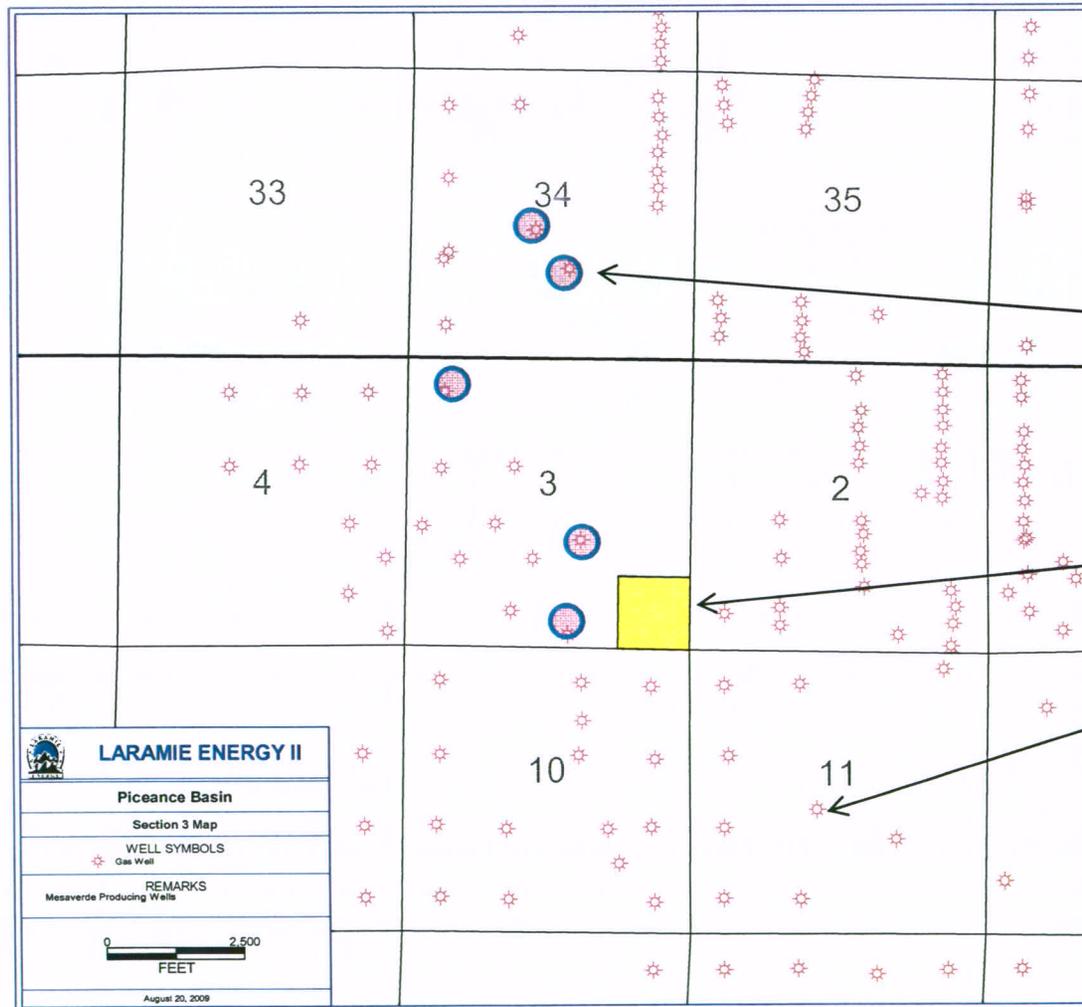


**Exhibit: E-1  
Cause # 139  
Docket # 0910-SP-24**

**DOWNHOLE 10-ACRE  
DENSITY LANDS, GARFIELD  
& MESA COUNTIES, COLORADO  
AS OF MAY 8, 2008**

# Offset William's Fork Producers To Application Lands

Section 3,  
Township 8 South,  
Range 96 West,  
Garfield County, CO



Wells with available digital Log data to the Iles. Used in Log Analyses for both Williams Fork and Iles intervals.

Application Lands

Wells with Williams Fork Completions

Exhibit: E-2  
Cause # 139  
Docket # 0910-SP-24

# William's Fork Type Curve (Typical Well) Wells Near Application Area

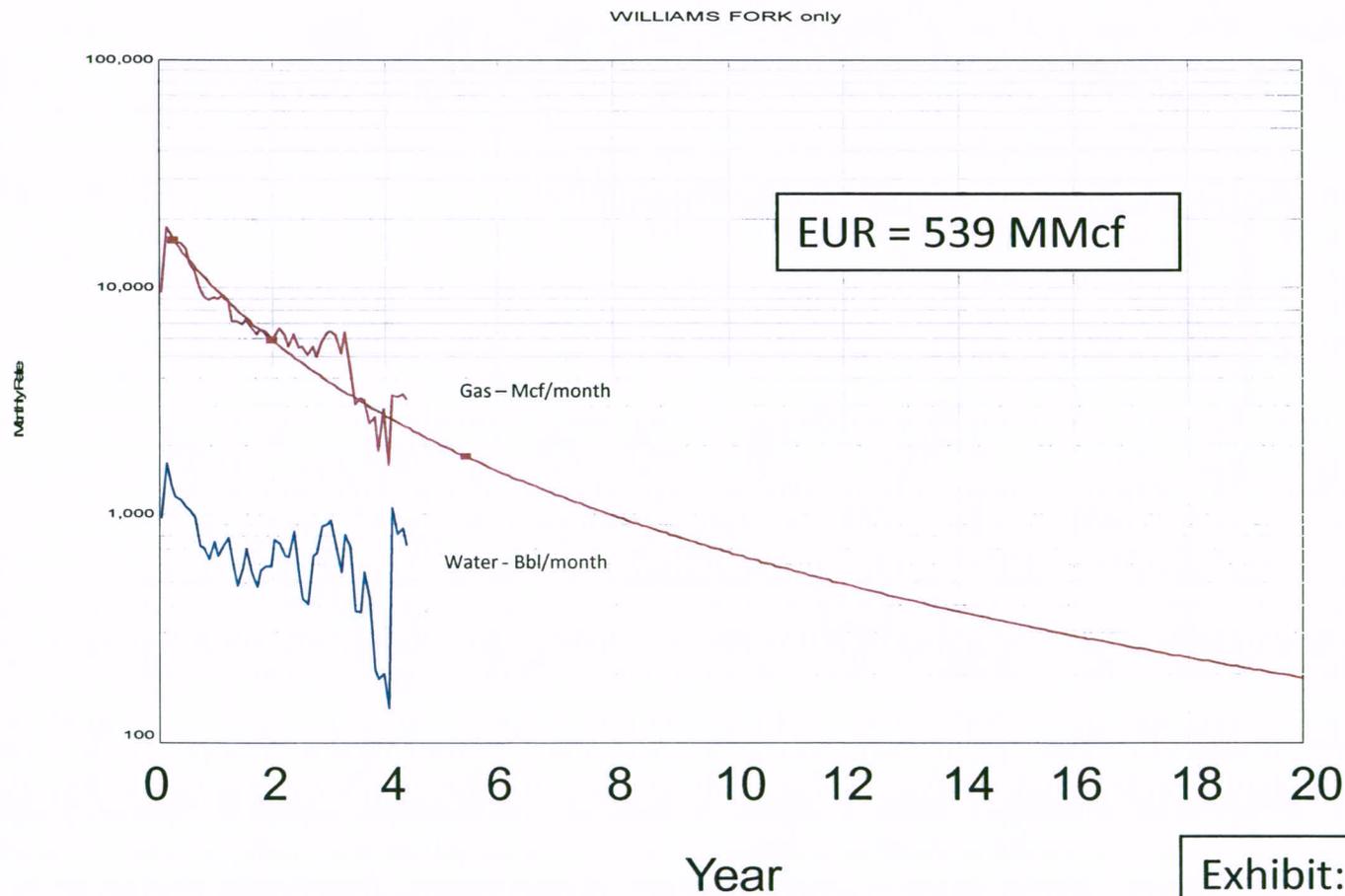


Exhibit: E-3  
Cause # 139  
Docket # 0910-SP-24

## William's Fork Log Analysis Wells Near Application Area

#	Well	Location	Net Pay (ft)	Porosity (%)	Water Saturation (%)
1	Reppo A-11-34B	34 T7S R96W	281	9.1	49.1
2	Reppo A-10-34D	34 T7S R96W	155	8.7	48.4
3	Colohan 3-4 OH4	3 T8S R96W	256	10.1	44.6
4	Lindauer 3-10 OO3	3 T8S R96W	251	8.6	51.8
5	Lindauer 3-15 (003)	3 T8S R96W	<u>222</u>	<u>8.3</u>	<u>50.6</u>
	Average		233	9.0	48.9

Exhibit: E-4  
 Cause # 139  
 Docket # 0910-SP-24

## William's Fork Volumetric Analysis Ties to Type Curve Reserves

		<u>Source</u>
• Input Parameter		
– Net Pay	233 ft	Log Analysis
– Porosity	9.0%	Log Analysis
– Water Saturation	48.9%	Log Analysis
– Initial Pressure	2200 psig	0.45 psi/ft Gradient
– Recovery Efficiency	73%	William's Rulison Pilot Study
– EUR	539 MMcf	Type Curve
• Solve for Drainage Area		
– Drainage Area	10.0 acres	Calculated

Exhibit: E-5  
Cause # 139  
Docket # 0910-SP-24

# William's Fork Drill Well

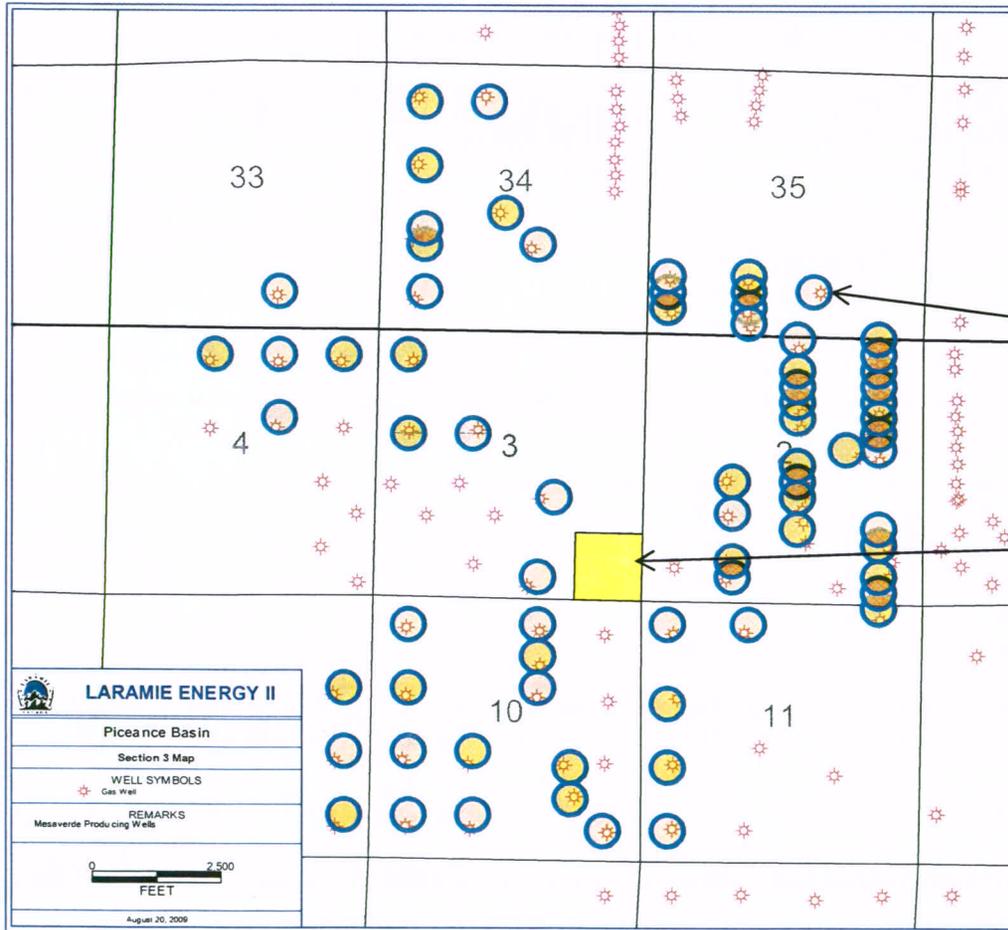
## Economics

Drilling Cost:	\$ 450,000
Completion Cost:	\$ 700,000
Facilities Cost:	<u>\$ 50,000</u>
Total Cost:	\$1,200,000

Reserves:	539 MMcf
Initial Rate:	25,000 Mcf/month
Initial Decline:	Hyperbolic
Terminal Decline:	6% Exponential
Well Life:	25 Years
Pricing:	\$6.00/MMBtu & \$60/bbl Flat Nymex
Basis Differential:	-\$1.00/MMBtu & -\$12.00/bbl
Rate of Return:	>10%

Exhibit: E-6 Cause # 139 Docket # 0910-SP-24
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# Offset Iles (Corcoran & Cozzette Sands) Producers To Application Lands



Section 3,  
Township 8 South,  
Range 96 West,  
Garfield County, CO

Wells with Iles (Corcoran  
and/or Cozzette) Completions

Application Lands

Exhibit: E-7  
Cause # 139  
Docket # 0910-SP-24

# Commingled Williams Fork & Isles Type Curve Wells Near Application Area

WILLIAMS FORK & ISLES Comming

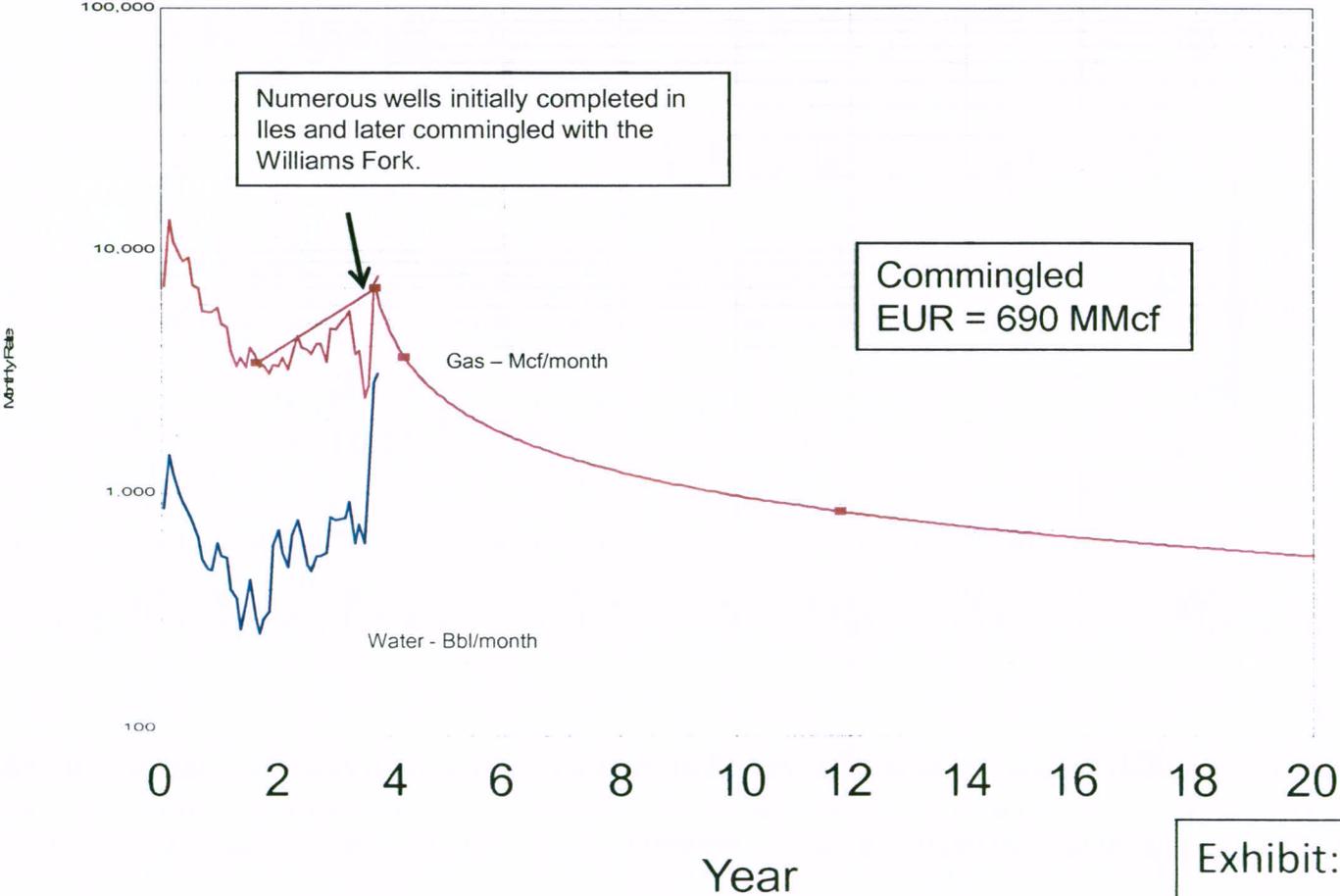


Exhibit: E-8  
Cause # 139  
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## Iles Log Analysis (Corcoran/Cozzette)

### Wells Near Application Area

#	Well	Location	Net Pay (ft)	Porosity (%)	Water Saturation (%)
1	Reppo A-11-34B	34 T7S R96W	12	13.8	34.4
2	Reppo A-10-34D	34 T7S R96W	12	12.5	36.0
3	Colohan 3-4 OH4	3 T8S R96W	48	11.3	40.2
4	Lindauer 3-10 OO3	3 T8S R96W	14	14.0	30.4
5	Lindauer 3-15 (003)	3 T8S R96W	<u>17</u>	<u>13.9</u>	<u>32.1</u>
	Average		21	13.1	34.6

Exhibit: E-9  
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## Iles Volumetric Analysis

### Ties to Type Curve Reserves

Input Parameter		Source
– Net Pay	21 ft	Log Analysis
– Porosity	13.1%	Log Analysis
– Water Saturation	34.6%	Log Analysis
– Initial Pressure	2850 psig	0.52 psi/ft Depth
– Recovery Efficiency	73%	Estimate from Williams Fork Type Curve
– EUR	151 MMcf	
• Solve for Drainage Area		
– Drainage Area	13.0 acres	Calculated

Exhibit: E-10  
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## Iles Deepening Economics

	<u>Grass Roots Iles Well</u>	<u>Deepening to Iles from W.F.</u>
Drilling Cost:	\$ 525,000	\$ 75,000
Completion Cost:	\$ 425,000	\$100,000
Facilities Cost:	<u>\$ 50,000</u>	<u>\$ 0</u>
Total Cost:	\$1,000,000	\$175,000
Reserves:	151 MMcf	151 MMcf
Initial Rate:	15,000 Mcf/month	5000 Mcf/month (Incremental to W.F.)
Pricing:	\$6.00/MMBtu & \$60/bbl Flat Nymex	
Basis Differential	-\$1.00/MMBtu & -\$12.00/bbl	
Rate of Return:	<10%	>10%

Exhibit: E-11  
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**MARK R. PETRY**

730 Garland Street  
Lakewood, Colorado 80215  
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**Education/Professional Certifications**

B.S Finance – University of Wyoming  
Certified Professional Landman

**Professional Experience**

**9/2007 to present**      **Vice President of Business Development/ Director of Business Development and Land Administration**  
**Laramie Energy II, LLC**

Responsibilities: New project identification, screening, and development; negotiating and managing due diligence of new acquisitions; negotiating and preparing exploration agreements, development agreements, and Joint Operating Agreements; directing land administration and lease acquisition/title curative staff; and establishing and fostering partner relationships.

**8/2006 to 9/2007**      **Director, Land**  
**Anadarko Petroleum Corp.**

Responsibilities: Directing the oil and gas land department responsible for the Rocky Mountain states with major emphasis on the exploitation of Powder River Basin coal bed methane, Wattenberg, and Natural Buttes fields and the development of over 8.1 million land grant acres in Colorado, Wyoming, and Utah; directing upper level projects, including the development of business strategies, drafting, negotiating and executing land related contracts and managing the transition and assimilation of the of three companies' land staffs, systems, and processes; providing guidance to four land managers on both technical, contractual, and personnel issues; leading a staff of 50 employees; and establishing, measuring and attaining strategic and tactical goals.

- Successfully integrated the land departments of three different companies that were experiencing significant employee turnover while maintaining aggressive drill programs. The drill programs involved net capital of over \$1.2 billion/year and the spudding of more than three operated wells/day.

**4/2000 to 8/2006**      **Vice President/Director, Land**  
**Western Gas Resources, Inc.**

Responsibilities: Officer of the company and directing the land department responsible for all mineral, surface land, lease and contract administration, and geographic information systems for all the upstream and midstream business teams of a \$4 billion public company; with major emphasis on the exploitation of the largest acreage position in the Powder River Basin coal bed methane play and the negotiation of surface use agreements for one of the largest and most active midstream companies in the western United States; participating in, and/or directing upper level projects, including acquisition due diligence, development of business strategies, drafting and negotiating purchase and sale, joint

venture, operating, farmout, and exploration agreements; leading a staff of 5 managers and 50 employees; and establishing, measuring and attaining strategic and tactical goals.

- Negotiated joint development agreement and associated joint operating agreements covering over 1 MM net joint venture acres that led to more efficient development and settled lawsuits.
- Negotiated asset and equity type purchase and sale agreements on over \$350MM of oil and gas assets.
- Directed a project to co-develop a land administration and associated GIS software system with a software company in which Western recovered its development and conversion costs of over \$1MM through increased efficiencies, lower staffing needs, and royalties on the sale of the software to other parties.
- Negotiated a 1031 like kind exchange of an expiring acreage position that would have been written off at a value of \$1MM for an acreage position with 40BCF or more of gas reserves.

**5/1998 to 4/2000      Business Development Manager  
Western Gas Resources, Inc.**

Responsibilities: Managing a staff with responsibility for the business development of midstream natural gas gathering, treating, and processing assets; directing the negotiation of gas gathering, gas treating, percent of proceeds and keep whole processing arrangements; personally responsible for establishing data rooms and the negotiation of larger joint venture and purchase and sale agreements involving upstream and midstream oil and gas assets; establishing and improving client relationships; participating in the establishment of goals and objectives; and reviewing and approving all contract economics.

- Negotiated purchase and sale agreements on over \$400MM of upstream and midstream assets.
- Secured major acreage and gas throughput dedications to justify the construction of a 100 MMCFD treating facility in East Texas.

**5/1994 to 5/1998      Business Development Representative  
Western Gas Resources, Inc.**

Responsibilities: Seeking new business opportunities to gather, process, or treat natural gas: negotiating related contracts; preparing economics and justification support for all proposed contracts; establishing and improving client relationships; and meeting company goals and objectives.

- Secured agreements that increased the throughput of a processing plant from 40MMCFD to 160MMCFD in six months.

**2/1991 to 5/1994      Operational Accounting Manager  
Western Gas Resources, Inc.**

Responsibilities: Managing a staff responsible for the accounting of gas and liquid sales, and processing, gathering and treating fees; providing guidance and technical expertise related to residue marketing

activity (revenue allocations, nominations, and imbalances); acting as liaison with operations, business development, gas marketing, information systems, contract administration, financial accounting, and legal departments; and directing severance tax compliance.

- Directed the due diligence and transition of a \$150MM gathering and processing asset acquisition.

**12/1988 to 2/1991      Revenue Disbursements and Severance Tax Supervisor  
Ladd Petroleum Corporation**

Responsibilities: Supervising and training a staff of revenue disbursement and production tax accountants; developing, testing, and implementing on-line revenue disbursement and tax calculation systems, responding to royalty and severance tax audits; and coordinating the maintenance of division order payment decks.

- Successfully negotiated a \$250K severance tax refund after reviewing gas purchase agreements that provided for tax reimbursement in the gas net back price.

**5/1983 to 12/1988      Oil and Gas Lease and Contract Supervisor  
Ladd Petroleum Corporation**

Responsibilities: Supervising staff in lease and contract administration, managing lease acquisition conversions into land information system; ensuring lease and contract compliance; acting as liaison with land, accounting, tax and information systems departments; designing and implementing management system enhancements and programmatic conversions of lease and contract data.

**12/1981 to 5/1983      Land Consultant  
Snyder Oil Company  
Presidio Oil Company  
Cockrell Oil Company  
Nugget Oil Company**

**Education/Professional Certifications:**

- University of Wyoming      Bachelor of Science with Honor in Finance
- Certified Professional Landman

**Professional Memberships:**

- AAPL      American Association of Professional Landmen
- DAPL      Denver Association of Professional Landmen
- WAPL      Wyoming Association of Professional Landmen

## Mark G. King

2662 S. Iris St.  
Lakewood, Colorado 80227

Phone: (720) 962-9163  
E-mail: markking55@hotmail.com

### SUMMARY OF QUALIFICATIONS

A seasoned geologist with a proven track record. Extensive experience in domestic and international development and exploration geology. Rocky Mountain tight-gas sand experience. Skilled in leading and participating on multi-national, multi-disciplined asset teams. Proficient in a variety of PC and Unix based geologic software (Petra, Geographix, Z-Map plus, CPS3, Boresight, Geolog, Power Tools, Finder, Power Log). Strong background in field operations. Excellent communication skills. Experienced in intense drilling campaign management and in asset sale and purchase evaluations.

### PROFESSIONAL EXPERIENCE

Laramie Energy II, Denver, Colorado 2007 – Present  
**Sr. Geologist**  
Responsible for the development and exploitation of Rulison Field in the Piceance Basin

Williams E&P, Denver, Colorado 2005 - 2007  
**Sr. Staff Geoscientist**  
Responsible for the development and exploitation of Trail Ridge Field in the Piceance Basin.

- Drilled and evaluated 45 delineation and development wells through 2007
- Spearheaded the successful effort to gain 10 acre density in Trail Ridge Field, adding approx 2000 locations to the drilling portfolio
- Implemented pad drilling techniques leading to increased efficiencies and reduced surface disturbances
- Intimately involved in all drilling, completion and facilities activities

Medicine Bow Energy, Denver, Colorado 2004 – 2005  
**Sr. Geologist**  
Responsible for the development and exploitation of producing properties in the San Juan and Powder River Basins.

#### **San Juan Basin**

- Completed geologic evaluations to optimize acquisition, exploitation and development opportunities.
- Identified 653 development locations and added 75 BCFE in reserves.
- Provided reservoir characterization and pool evaluations to minimize drilling risk.
- Generated basin wide geologic and production maps of all producing horizons in the San Juan Basin.

#### **Powder River Basin**

- Kaye Field geologist involved with the integration of geologic and engineering data to optimize the ongoing water flood.
- Operations Geologist for the horizontal drilling campaign in the West House Creek area. Utilized geo-steering techniques to accurately place the boreholes within the target zone.

ChevronTexaco, Sumatra, Indonesia

1998 – 2003

**Sr. Development Geologist**

Responsible for mapping, designing and implementing steamflood projects in Duri Field.

- Lead Geologist on multi-national/multi-disciplined development team that designed and implemented 3 major steamflood projects. Results: addition of 837MM barrels of reserves. Each project has capital expenditures of \$200+ MM and well counts of 600+ per project.
- Selected by management to trouble shoot the geology of a failing \$182 MM development project. This resulted in fault remediation through pattern re-alignment.
- Mentored national geologists and engineers and liaised with Indonesian government officials.
- Consultant for all geologic projects in Duri Field.
- Spearheaded field-wide hydrogeology, wastewater disposal and slurry fracture injection projects.
- Geologic gatekeeper of all OOIP and reserve estimates of Duri Field (OOIP 5.6 BBO).

Saudi Arabian Texaco, Kuwait

1994 – 1998

**Sr. Development/Operations Geologist**

Responsible for the development and exploitation of multiple reservoirs in Wafra Field.

- Team Leader and Lead Geologist of asset management team that designed, implemented and completed a successful 50 well (\$62 MM / 64 MMBO) infill drilling project.
- Lead Geologist on a development team that designed, drilled and completed a 13 well pilot project resulting in an incremental 16,000 BOPD at a cost of \$15 MM and a reserve addition of 19 MMBO. This reservoir was in "harvest mode" prior to being correctly mapped & revitalized.
- Lead Geologist on a reservoir pressure maintenance project, implementing the first water flood in the Partitioned Neutral Zone. This \$118 MM project involved drilling 41 vertical and horizontal injector and producing wells.
- Designed logging and coring programs.
- Selected perforation intervals and made completion design recommendations.
- Developed bidding processes and awarded service contracts for outsourced geologic work.
- Supervised wireline logging, coring and mudlogging activities.
- Completed reservoir characterization studies, sequence stratigraphy projects, petrophysics, detailed reservoir mapping and cross sections for major producing intervals in Wafra field using geologic computer software.

Texaco Inc., Denver, Colorado

1993 – 1994

**Development Geologist**

Responsible for development and exploitation of producing properties in San Juan and Paradox Basins.

- Generated 220 new San Juan Basin development locations through computerized mapping.
- Drilled 5 successful development wells and 1 rank exploration well.
- Constructed detailed reservoir maps and cross sections and completed formation evaluation/wireline log analysis of all pay zones.
- Selected perforation intervals and made recommendations regarding completion practices.

Texaco Middle East/Far East, Denver, Colorado

1991 – 1993

**Exploration Geologist.**

Responsible for the completion of regional and field wide geologic studies in Thailand and Malaysia.

- Analyzed and made recommendations of new venture opportunities in NW Thailand.
- Performed geologic evaluations and made recommendations on acquiring producing properties in the Pattani, Suphan Buri and Kampaeng Saen Basins.
- Compiled and analyzed field statistics and completed a cumulative probability study of field size distribution of the existing fields in Thailand.
- Mapped regional trends and prototype fields.
- Developed the bidding process and awarded service contracts for outsourced geologic work.
- Liased with Thai and Malaysian government officials.

Texaco USA, Denver, Colorado

1981 -1991

**Exploration Geologist.**

Responsible for the generation of exploration prospects and plays throughout the Rockies.

- Mapped clastic and carbonate sequences of all geologic ages and depositional environments within the Greater Green River, Paradox, Eagle, Uinta, and Piceance Basins.
- Drilled 5 rank exploration wells.
- Completed regional structural, stratigraphic and facies maps.
- Designed testing, logging and coring programs.
- Completed 2D seismic interpretations.
- Supervised geologic wellsite operations.
- Completed lease portfolio analysis and recommendations.

Texaco USA, Midland, Texas

1979 - 1981

**Petroleum Geologist.**

Responsible for generating exploration prospects in the northern Delaware Basin.

- Mapped and cross-sectioned the Pennsylvanian Atoka Carbonate Bank in the Delaware Basin.
- Generated numerous locations and drilled 2 exploration wells.

**EDUCATION**

**B.A., Geoscience, Jersey City State College, Jersey City, New Jersey**

**M.S., Geology, University of Toledo, Toledo, Ohio**

**Robert G. Hea**  
61 Glenmoor Drive  
Cherry Hills Village, CO 80113  
Office: (303) 339-4925

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## **SUMMARY**

Twenty-seven years of Exploration & Production experience including twenty-four years of Facility, Production, and Reservoir Engineering in addition to three years of Business Analysis in a Financial Planning & Controls capacity. Currently the Vice President of Engineering and Operations for Laramie Energy II, LLC.

## **PROFESSIONAL EXPERIENCE**

### **Laramie Energy II, LLC.**

**9/07 - Present**

#### Vice President of Engineering & Operations

Denver, CO

Responsible for all Reservoir, Production, and Facility Engineering functions within the Company and supervision of Production Operations.

### **Laramie Energy, LLC.**

**5/05 – 8/07**

#### Senior Operations/Reservoir Engineer

Denver, CO

Build and maintain Company Reserves database, evaluate reservoir performance to optimize drilling locations and completion practices. Evaluate third party exploration and acquisition opportunities. Assist with Facility Engineering projects as needed (pipeline, compression, and processing plant projects).

### **Forest Oil Corp.**

**1/97– 4/05**

#### Gulf Coast Region Reservoir Engineering Manager (4/03 – 4/05)

Denver, CO

Working Manager supervising five Offshore and four Onshore Reservoir Engineers plus Technicians responsible for all Reservoir Engineering functions of the Gulf Coast Business Unit. Responsibilities include technical review of all drilling, recompletion, and workover proposals, acquisition evaluations, and reservoir studies along with coordination of quarterly reserve report updates, annual insurance underwriting, FAS 143 estimations, annual budget generation, and special projects. Charged with managing a \$250MM capital budget.

#### Offshore Engineering/Asset Manager (11/97 – 3/03)

Denver, CO

Supervised and coordinated Reservoir Engineering, Production Engineering, and Production Operations departments. Coordinated Business Unit activities to meet Production, F&D Cost, and Lifting Cost goals. Served as final technical reviewer of all capital and expense projects, both Exploration and Development, prior to VP approvals. Assisted with Bank and Analyst presentations and prepared press releases as needed. Offshore Business Unit was merged with the Onshore Business Unit in April 2004 and became the Gulf Coast Region.

#### Sr. Reservoir Engineer – Offshore (1/97 – 10/97)

Denver, CO

Working level Reservoir Engineer assigned numerous Offshore Fields and charged with monetizing reserves. Active in Lease Sale and Acquisitions analyses.

### **Vastar Resources, Inc.**

**7/93 – 1/97**

#### Senior Operations/Analytical Engineer - Offshore (12/95 – 1/97)

Houston, TX

Reservoir Engineer and Exploitation Team Leader for multiple Vastar operated GOM fields. Performed reservoir studies and recommended Exploration and Development projects to monetize reserves. Co-authored SPE Paper on various Horizontal Drilling Technologies for shallow offshore gas reservoirs.

#### Exploration and Offshore Business Analyst – FP&C Department (7/93 – 11/95)

Houston, TX

Tracked financial performance of Vastar's \$300MM/yr Exploration and Development program. Provided management updates concerning capital and expense spending, reserve additions, drilling statistics, overall program performance and recommended changes to meet program goals. Served as liaison with tax department, Investor Relations, and Public Relations departments regarding external reporting. Coordinated annual E&P budget. Project coordinator for annual Company reserve audit. Assisted in preparation of Vastar's S-1 Registration Statement used in IPO effort. Primary Exploration and Production liaison with Coopers and Lybrand during audits of financial statements (S-1, S-3, 10Q, 10K).

**ARCO Oil & Gas Co.**

**1/82 – 6/93**

Reservoir Engineer – Offshore Joint Interest Business Unit (1/90 – 6/93)

Houston, TX

Performed economic and technical evaluations of capital projects for non-operated Offshore Joint Interest Fields.

Operations/Analytical Engineer - Onshore Business Unit (4/85 – 1/90)

Houston, TX

Responsible for performance and profitability of onshore ARCO operated South Texas oil and gas fields including implementing development drilling programs, workovers, and stimulation programs, and coordinating state and federal regulatory filings for producing oil and natural gas wells. Served as District Hydraulic Fracturing Coordinator responsible for review of all well stimulations in South Texas. Served as NGPA Section 107 Tight Gas Tax Credit Coordinator that resulted in receiving over \$5,000,000 in annual tax credits.

Production Engineer (1/84 – 3/85)

Corpus Christi, TX

Designed workovers and recompletions of onshore South Texas producing gas wells. Sized and installed compressor stations, gas dehydration systems, and amine sweetening systems meeting gas pipeline specifications.

Facilities Engineer (1/82 – 12/83)

Houston, TX

Engineer responsible for the design, bidding, and on-site construction supervision of South Texas onshore natural gas separation, compression, sweetening, and metering facilities and flowlines.

**EDUCATIONAL BACKGROUND & TRAINING**

University of Missouri at Rolla - BSME (1981)

Member - Society of Petroleum Engineers

Toastmasters International (CTM)