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LONGS PEAK RESOURCES, LLC

Docket No. 170700465

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

IN THE MATTER OF THE PROMULGATION)	CAUSE NO. 535
AND ESTABLISHMENT OF FIELD RULES)	
TO GOVERN OPERATIONS FOR THE)	DOCKET NO. 170700465
NIOBRARA, FORT HAYES, CODELL AND)	
CARLILE FORMATIONS, UNNAMED FIELD,)	TYPE: SPACING
WELD COUNTY, COLORADO)	

REQUEST FOR RECOMMENDATION OF
APPROVAL OF APPLICATION WITHOUT A HEARING

Longs Peak Resources, LLC, Operator No. 10611 ("LPR" or "Applicant"), by and through its undersigned attorneys, hereby requests pursuant to Rule 511.a. of the Rules and Regulations of the Colorado Oil and Gas Conservation Commission for the Director to recommend approval of its May 25, 2017 (amended July 12, 2017) verified application ("Application") and the supporting exhibits without a hearing.

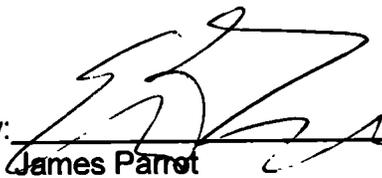
Applicant requests that the above-captioned matter be approved based upon: (i) the merits of the Application, and (ii) Applicant's sworn written testimony verifying sufficient facts along with exhibits that adequately support the relief requested in the Application. To Applicant's information and belief, 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 15 day of August, 2017.

Respectfully submitted,

LONGS PEAK RESOURCES, LLC

By:  _____

James Parnot
Jillian Fulcher
Evan Bekkedahl
Beatty & Wozniak, P.C.
Attorneys for Applicant
216 16th Street, Suite 1100
Denver, Colorado 80202
(303) 407-4499

Land Testimony – Kent Snider
Cause No. 535; Docket No. 170700465
Spacing and Density Application – Carlile, Fort Hayes, Niobrara and Codell Formations
Unnamed Field, Weld County, Colorado

September 2017 Colorado Oil and Gas Conservation Commission Hearing

My name is Kent Snider, and I am currently employed as the Vice President of Land for Vertex Energy Partners, LLC, as agent for Longs Peak Resources, LLC, Operator No. 10611 (“LPR” or “Applicant”). I have over 35 years of experience in oil and gas land work. I am familiar with the matters set forth in the May 25, 2017 (amended June 15, 2017, and again July 12, 2017), verified application (the “Application”) filed herein, and the lands subject to said application, consisting of Sections 4 and 9, Township 11 North, Range 66 West, 6th P.M. (“Application Lands”).

LPR filed the verified Application pursuant to §34-60-116, C.R.S., for an order establishing an approximate 1283-acre drilling and spacing unit for the Carlile and Fort Hayes Formations, authorizing a total of six (6) horizontal wells within the Application Lands for production from the Carlile, Fort Hayes, and Codell Formations, and establishing an approximate 1283-acre drilling and spacing unit for the Application Lands, and authorizing the drilling of up to seven (7) horizontal wells within the proposed unit, for the production of oil, gas and associated hydrocarbons from the Niobrara Formation.

In support of LPR’s Application and my sworn testimony herein, I am submitting four (4) exhibits, which provide the basis for approval of LPR’s request.

Exhibit L-1: Leasehold Ownership Map:

Exhibit L-1 is a map showing the location and leasehold ownership of the Application Lands, which consist of state and fee mineral interests. LPR owns a leasehold in the Application Lands.

Exhibit L-2: Topographic Map:

Exhibit L-2 is a topographical map of the Application Lands.

Exhibit L-3: Aerial Map:

Exhibit L-3 is an aerial map of the Application Lands.

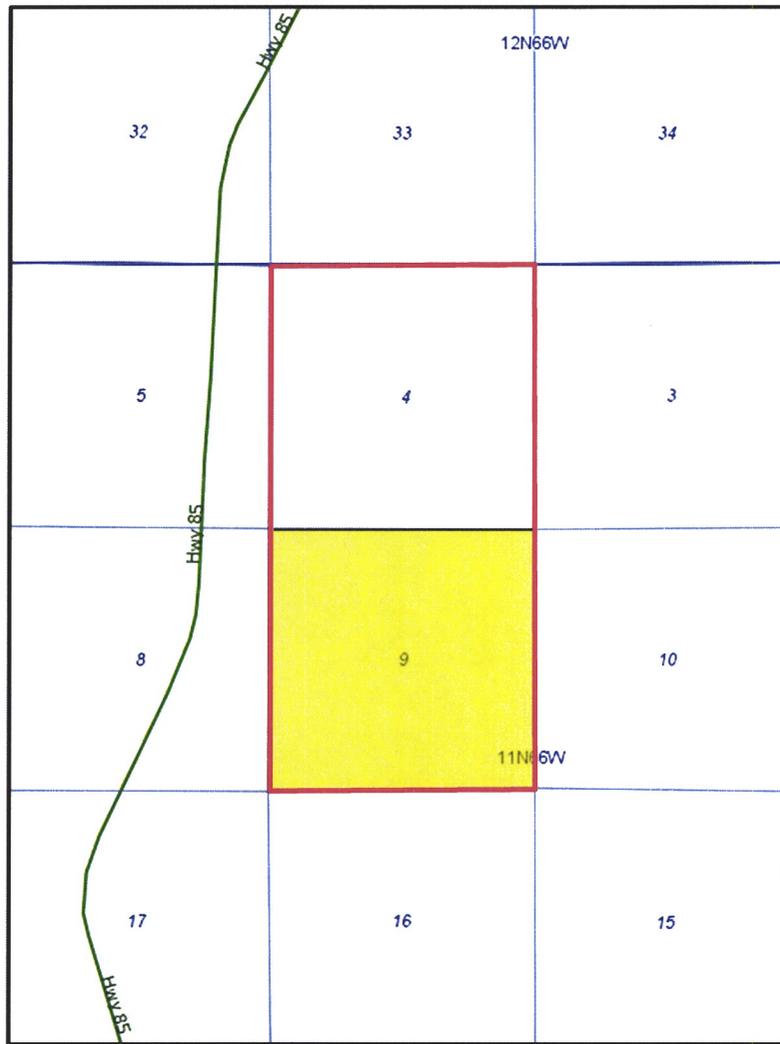
Exhibit L-4: Interested Parties:

Attached as Exhibit L-4 is a list of interested parties within the Application Lands.

The Application will not result in a requirement for consultation with the Colorado Department of Public Health and Environment or Colorado Parks and Wildlife pursuant to 306.c.(1)B. or 306.d.(1)B.

Based on the examination of relevant contracts and records, the interested parties (owners within the proposed drilling and spacing unit) have been duly served with the Application and associated Notice of Hearing. Further, as of the date of this testimony, Applicant has not received any notice of objection or protest to the Application.

Exhibit L-1
Leasehold Ownership Map



 = Application Lands

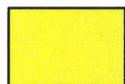
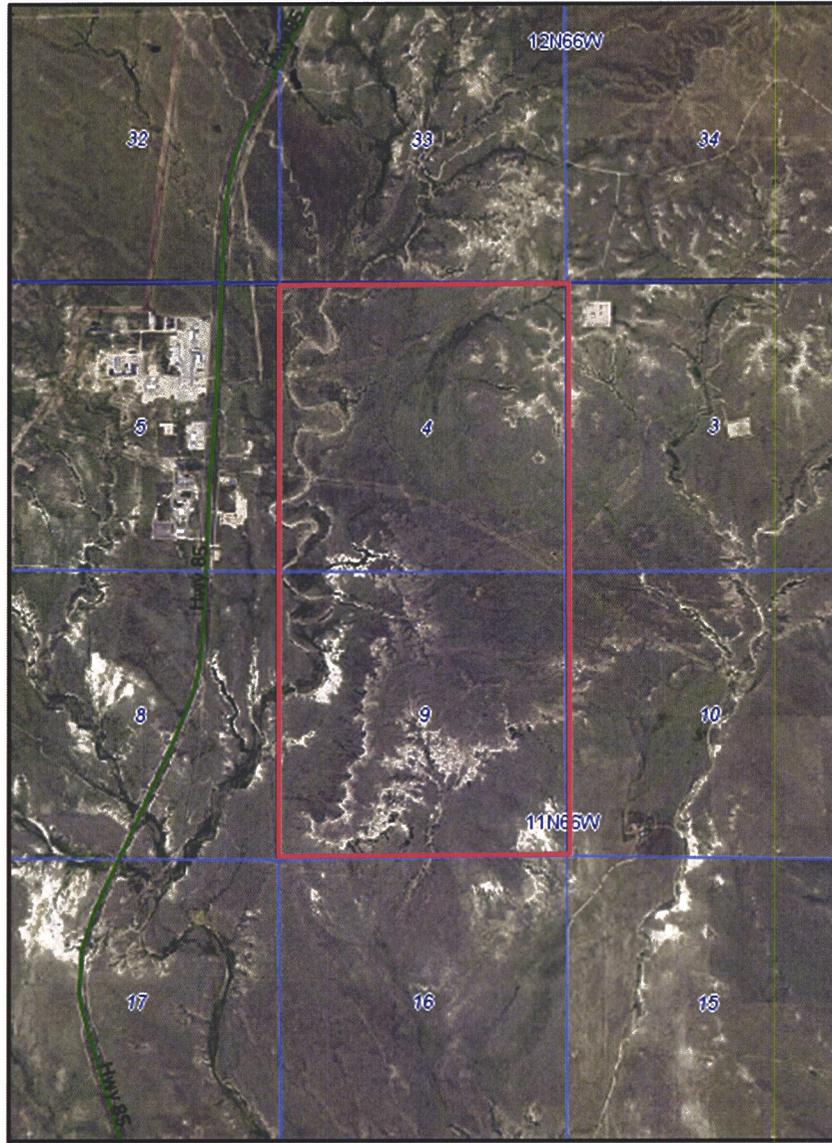
 = LPR leasehold

Exhibit L-3
Aerial Map



**Exhibit L-4
Interested Parties**

**Brandon Marette, Energy Liaison
Colorado Parks and Wildlife
Northeast Region Office
6060 Broadway
Denver, CO 80216**

**Troy Swain
Weld County
Department of Planning Services
1555 North 17th Avenue
Greeley, CO 80631**

**Etchepare, LLC
PO BOX 848
Cheyenne, WY 82003**

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

**State of Colorado
1127 Sherman Street
Suite 300
Denver, CO 80203**

**Longs Peak Resources, LLC
10701 Melody Dr., Suite 515
Northglenn, CO 80234**

Geology Testimony – Derek Sondergaard
Cause 535, Docket Nos. 170700464, 170700465, 170700466, 170700467
Spacing and Density; Carlile, Fort Hayes, Niobrara and Codell Formations
Unnamed Field, Weld County, Colorado

September 2017 Colorado Oil and Gas Conservation Commission Hearing

My name is Derek Sondergaard, and I am currently employed as a Geologist for Windmill Energy Services working for Longs Peak Resources, LLC (“Longs Peak”). I graduated from Central Michigan University with a Bachelor of Science degree in Geology in 1997 and a Master’s degree in Geological Engineering from Michigan Technological University in 2000. I have over 18 years of experience in the oil and gas industry. I am familiar with the lands subject to, and the matters set forth in the April 13, 2017 (amended June 15, 2017, and again July 12, 2017), verified application (the “Application”).

Request for Administrative Notice of Engineering Evidence

In support of its Verified Application, Longs Peak requests that the Commission take administrative notice (as provided for by Rule 519.c.(4)2) of Commission Order Nos. 535-706 and 535-669 and associated geologic evidence as support for drilling 13 horizontal wells for production from the Carlile, Fort Hayes, Niobrara and Codell Formations, and amending setbacks for horizontal wells in the Carlile, Fort Hayes, Niobrara and Codell Formations. I have personally reviewed the geology testimony and exhibits submitted in support of Order Nos. 535-706 and 535-669. From this review, I conclude that such testimony and evidence are applicable to, and provide persuasive precedent for, Applicant’s requests for relief as to the Carlile, Fort Hayes, Codell and Niobrara Formations. The Carlile and Fort Hayes Formations are addressed in the Application, and therefore this testimony, as wellbores my deviate from the Codell Formation into the Carlile and Fort Hayes Formations due to the thickness of the Codell Formation in this area. Any deviation of the Codell Formation wellbores into the Carlile and Fort Hayes Formations will not affect the economics of the Codell wells and ultimately the conclusions within this testimony.

Conclusions

Based on my review of the above-referenced Commission Orders together with my experience in the Carlile, Fort Hayes, Codell and Niobrara Formations in the DJ Basin, I believe that establishing the proposed well counts and setback will allow the most efficient and economic method to develop the resource potential for this formation. The approval of the Application will prevent waste, protect correlative rights, and assure the greatest ultimate recovery of oil, gas and associated hydrocarbons from the reservoirs.

Further, based on my examination of the geological testimony and exhibits submitted in support of the application in Order No. 535-669, the thickness of the Codell Formation in the Application Lands is set forth in the table below:

Docket No.	Lands	Codell Thickness
170700464	<u>Township 12 North, Range 66 West, 6th P.M.</u> Section 27: All Section 34: All	18-19ft

170700465	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 4: Lot 1 (80.78 acres), Lot 3 (40.95 acres), Lot 4 (41.33 acres), S $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$ [All] Section 9: All	18-19ft
170700466	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 3: Lot 1 (79.80 acres), Lot 2 (79.92 acres), S $\frac{1}{2}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ [All] Section 10: All	19-20ft
170700467	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 15: All Section 22: All	19-20ft

Also, based on my examination of the geological testimony and exhibits submitted in support of the application in Order No. 535-706, the thickness of the Niobrara Formation in the Application Lands is set forth in the table below:

Docket No.	Lands	Niobrara Thickness
170700464	<u>Township 12 North, Range 66 West, 6th P.M.</u> Section 27: All Section 34: All	145-146
170700465	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 4: Lot 1 (80.78 acres), Lot 3 (40.95 acres), Lot 4 (41.33 acres), S $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$ [All] Section 9: All	146-147
170700466	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 3: Lot 1 (79.80 acres), Lot 2 (79.92 acres), S $\frac{1}{2}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$, S $\frac{1}{2}$ [All] Section 10: All	145-146
170700467	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 15: All Section 22: All	146-147

To the best of my knowledge, all of the matters set forth herein, my testimony and the supporting exhibits are true, correct and accurate.

Engineering Testimony – Mark McNamee
Cause 535, Docket Nos. 170700464, 170700465, 170700466, 170700467
Spacing and Density, Carlile, Fort Hayes, Niobrara and Codell Formations
Unnamed Field, Weld County, Colorado

September 2017 Colorado Oil and Gas Conservation Commission Hearing

My name is Mark McNamee, and I am currently employed as a Petroleum Engineer for Windmill Energy Services working for Longs Peak Resources, LLC (“Longs Peak”). I graduated from the University of Wyoming in 1979 with a Bachelor of Science in Petroleum Engineering. I am a Registered Engineer in the State of Colorado and I have over 38 years of experience in the oil and gas industry. I am familiar with the lands subject to, and the matters set forth in the May 25, 2017, (amended June 15, 2017, and again July 12, 2017) verified application (the “Application”).

Request for Administrative Notice of Engineering Evidence

Niobrara Formation

Applicant is requesting to 1) authorize up to 7 horizontal Niobrara wells in the Application Lands, and 2) amend the setbacks for such horizontal Niobrara wells such that (a) any horizontal wells to be drilled under the Application for production from the Niobrara Formation will be drilled from the surface of the drilling unit, or on adjacent lands with consent of the landowner, from no more than 4 surface locations, unless an exception is granted by the Director, (b) the wellbores of any horizontal wells to be drilled under the Application may enter the Niobrara Formation anywhere within the unit, or on adjacent lands, without exception being granted by the Director, (c) for any permitted wells to be drilled under the Application for production from the Niobrara Formation, the treated intervals of the wells shall be not less than 150 feet from the treated interval of another well producing from the same formation, without exception being granted by the Director, and (d) for any permitted wells to be drilled under the Application for production from the Niobrara Formation, the productive interval of any permitted well shall be located no closer than 300 feet from the unit boundary.

In support of its Verified Application, Longs Peak requests that the Commission take administrative notice (as provided for by Rule 519.c.(4)2) of Commission Order No. 535-706 as to the relief requested for horizontal wells in the Niobrara Formation. I have personally reviewed the engineering testimony and exhibits submitted in support of Order No. 535-706. From this review, I conclude that such testimony and evidence are applicable to, and provide persuasive precedent for, Applicant’s requests for relief as to the Niobrara Formation.

The engineering testimony calculated the average drainage areas for wells drilled in the Niobrara Formation offsetting the Application Lands, with 8,500’ – 9,500’ laterals to be 115 acres. A total of 7 Niobrara wells will drain $7 \times 115 = 805$ acres, which is less than the size of the 1,280 acre DSU. Furthermore, with a calculated effective drainage radius of 256 feet, a treated interval setback of 300 feet from the boundaries of the drilling and spacing unit will prevent the drainage of reserves in adjacent lands and will allow the production of reserves that otherwise would not be recovered from the Niobrara, thus protecting correlative rights and preventing waste.

Codell Formation

Applicant is requesting to 1) establish a drilling and spacing unit for the Carlile and Codell Formations, 2) authorize up to 6 horizontal Carlile, Fort Hayes, and Codell wells in the Application Lands, and 3) establish the setbacks for such horizontal Carlile, Fort Hayes, and Codell wells such that (a) any horizontal wells to be drilled under the Application for production from the Carlile, Fort Hayes, and Codell Formations will be drilled from the surface of the drilling unit, or on adjacent lands with consent of the landowner, from no more than 4 surface locations, unless an exception is granted by the Director, (b) the wellbores of any horizontal wells to be drilled under the Application may enter the Carlile, Fort Hayes, and Codell Formations anywhere within the unit, or on adjacent lands, without exception being granted by the Director, (c) for any permitted wells to be drilled under the Application for production from the Carlile, Fort Hayes, and Codell Formations, the treated intervals of the wells shall be not less than 150 feet from the treated interval of another well producing from the same formation, without exception being granted by the Director, and (d) for any permitted wells to be drilled under the Application for production from the Carlile and Fort Hayes Formations, the productive interval of any permitted well shall be located no closer than 300 feet from the unit boundary, as currently established by prior Order for the Codell Formation.

In support of its Verified Application, Longs Peak requests that the Commission take administrative notice (as provided for by Rule 519.c.(4)2) of Commission Order No. 535-669 as to the relief requested for horizontal wells in the Carlile, Fort Hayes, and Codell Formations. I have personally reviewed the engineering testimony and exhibits submitted in support of Order No. 535-669. From this review, I conclude that such testimony and evidence are applicable to, and provide persuasive precedent for, Applicant's requests for relief as to the Carlile, Fort Hayes, and Codell Formations.

The engineering testimony calculated the average drainage areas for wells drilled in the Carlile, Fort Hayes, and Codell Formations offsetting the Application Lands, with 8,500' – 9,600' laterals to be 163 acres. A total of six (6) wells will drain $6 \times 163 = 978$ acres, which is less than the size of the smallest 1280 acre DSU. Applicant is not requesting to amend the setbacks for the Codell Formations so no additional drainage calculations for the Codell are necessary. Furthermore, no drainage calculations for the Carlile and Fort Hayes Formations are necessary, as these are not target formations, and are included in the Application, and therefore included in this portion of the testimony referring to the Codell Formation, only because wellbores may deviate from the Codell Formation into the Carlile and Fort Hayes Formations due to the thickness of the Codell Formation in this area. However, in any event, the wells targeting the Codell Formation will not drain an area larger than the proposed unit. Any deviation of the Codell Formation wellbores into the Carlile and Fort Hayes Formations will not affect the economics and drainage calculations contained herein for the Codell Formation wells.

Conclusions

Based on my review of the above-referenced Commission Orders together with my experience in the Carlile, Fort Hayes, Codell and Niobrara Formations in the DJ Basin, I believe that establishing the proposed well counts and setbacks will allow the most efficient and economic method to develop the resource potential for this formation. The approval of the Application will prevent waste, protect correlative rights, and assure the greatest ultimate recovery of oil, gas and associated hydrocarbons from the reservoirs.

To the best of my knowledge, all of the matters set forth herein, my testimony and the supporting exhibits are true, correct and accurate.

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Supplemental Geology Testimony – Derek Sondergaard
 Cause 535, Docket Nos. 170700464, 170700465, 170700466, 170700467
 Spacing and Density; Carlile, Fort Hayes, Niobrara and Codell Formations
 Unnamed Field, Weld County, Colorado

September 2017 Colorado Oil and Gas Conservation Commission Hearing

My name is Derek Sondergaard, and I am currently employed as a Geologist for Windmill Energy Services working for Longs Peak Resources, LLC (“Longs Peak”). I graduated from Central Michigan University with a Bachelor of Science degree in Geology in 1997 and a Master’s degree in Geological Engineering from Michigan Technological University in 2000. I have over 18 years of experience in the oil and gas industry. I am familiar with the lands subject to, and the matters set forth in the April 13, 2017 (amended June 15, 2017, and again July 12, 2017), verified application (the “Application”).

Request for Administrative Notice of Engineering Evidence

In support of its Verified Application, Longs Peak requests that the Commission take administrative notice (as provided for by Rule 519.c.(4)2) of Commission Order Nos. 535-706 and 535-669 and associated geologic evidence as support for drilling 13 horizontal wells for production from the Carlile, Fort Hayes, Niobrara and Codell Formations, and amending setbacks for horizontal wells in the Carlile, Fort Hayes, Niobrara and Codell Formations. I have personally reviewed the geology testimony and exhibits submitted in support of Order Nos. 535-706 and 535-669. From this review, I conclude that such testimony and evidence are applicable to, and provide persuasive precedent for, Applicant’s requests for relief as to the Carlile, Fort Hayes, Codell and Niobrara Formations. The Carlile and Fort Hayes Formations are addressed in the Application, and therefore this testimony, as wellbores my deviate from the Codell Formation into the Carlile and Fort Hayes Formations due to the thickness of the Codell Formation in this area. Any deviation of the Codell Formation wellbores into the Carlile and Fort Hayes Formations will not affect the economics of the Codell wells and ultimately the conclusions within this testimony.

Conclusions

Based on my review of the above-referenced Commission Orders together with my experience in the Carlile, Fort Hayes, Codell and Niobrara Formations in the DJ Basin, I believe that establishing the proposed well counts and setback will allow the most efficient and economic method to develop the resource potential for this formation. The approval of the Application will prevent waste, protect correlative rights, and assure the greatest ultimate recovery of oil, gas and associated hydrocarbons from the reservoirs.

Further, based on my examination of the geological testimony and exhibits submitted in support of the application in Order No. 535-669, the thickness of the Codell Formation in the Application Lands is set forth in the table below:

Docket No.	Lands	Codell Thickness
170700464	<u>Township 12 North, Range 66 West, 6th P.M.</u> Section 27: All Section 34: All	18-19ft

170700465	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 4: Lot 1 (80.78 acres), Lot 3 (40.95 acres), Lot 4 (41.33 acres), S½N½, S½ [All] Section 9: All	18-19ft
170700466	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 3: Lot 1 (79.80 acres), Lot 2 (79.92 acres), S½NE¼, S½NW¼, S½ [All] Section 10: All	19-20ft
170700467	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 15: All Section 22: All	19-20ft

Also, based on my examination of the geological testimony and exhibits submitted in support of the application in Order No. 535-706, the thickness of the Niobrara Formation in the Application Lands is set forth in the table below:

Docket No.	Lands	Niobrara Thickness
170700464	<u>Township 12 North, Range 66 West, 6th P.M.</u> Section 27: All Section 34: All	145-146
170700465	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 4: Lot 1 (80.78 acres), Lot 3 (40.95 acres), Lot 4 (41.33 acres), S½N½, S½ [All] Section 9: All	146-147
170700466	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 3: Lot 1 (79.80 acres), Lot 2 (79.92 acres), S½NE¼, S½NW¼, S½ [All] Section 10: All	145-146
170700467	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 15: All Section 22: All	146-147

Also, based on my examination of the Carlile Formation in this area, the thickness of the Carlile Formation in the Application Lands is set forth in the table below:

Docket No.	Lands	Carlile Thickness
170700464	<u>Township 12 North, Range 66 West, 6th P.M.</u> Section 27: All Section 34: All	37-39ft

170700465	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 4: Lot 1 (80.78 acres), Lot 3 (40.95 acres), Lot 4 (41.33 acres), S½N½, S½ [All] Section 9: All	38-39ft
170700466	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 3: Lot 1 (79.80 acres), Lot 2 (79.92 acres), S½NE¼, S½NW¼, S½ [All] Section 10: All	37-38ft
170700467	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 15: All Section 22: All	38-40ft

Also, based on my examination of the Fort Hayes Formation in this area, the thickness of the Fort Hayes Formation in the Application Lands is set forth in the table below:

Docket No.	Lands	Fort Hayes Thickness
170700464	<u>Township 12 North, Range 66 West, 6th P.M.</u> Section 27: All Section 34: All	16-17ft
170700465	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 4: Lot 1 (80.78 acres), Lot 3 (40.95 acres), Lot 4 (41.33 acres), S½N½, S½ [All] Section 9: All	16-18ft
170700466	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 3: Lot 1 (79.80 acres), Lot 2 (79.92 acres), S½NE¼, S½NW¼, S½ [All] Section 10: All	16-18ft
170700467	<u>Township 11 North, Range 66 West, 6th P.M.</u> Section 15: All Section 22: All	18-21ft

To the best of my knowledge, all of the matters set forth herein, my testimony and the supporting exhibits are true, correct and accurate.

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Order No. 535-669

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

IN THE MATTER OF THE PROMULGATION) CAUSE NO. 535
AND ESTABLISHMENT OF FIELD RULES TO)
GOVERN OPERATIONS FOR THE CODELL) DOCKET NO. 150500267
AND NIOBRARA FORMATIONS, UNNAMED)
FIELD, WELD COUNTY, COLORADO) TYPE: SPACING

REQUEST FOR RECOMMENDATION OF
APPROVAL OF APPLICATION WITHOUT A HEARING

ORIGINAL

Anadarko E&P Onshore LLC (Operator No. 2800) ("Applicant"), by and through its undersigned attorneys, hereby requests pursuant to Rule 511.a. of the Rules and Regulations of the Colorado Oil and Gas Conservation Commission for the Director to recommend approval of its March 10, 2015 verified application ("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 27 day of April, 2015.

Respectfully submitted,

ANADARKO E&P ONSHORE LLC

By: 
James P. Parrot
Jillian Fulcher
Beatty & Wozniak, P.C.
Attorneys for Applicant
216 16th Street, Suite 1100
Denver, Colorado 80202
(303) 407-4499

**ANADARKO
E&P
ONSHORE LLC**

Cause No. 535
Docket No. 150500267

Land Testimony – Jason Rayburn
Cause No. 535; Docket No. 150500267
Spacing and Density Application, Codell and Niobrara Formations
Unnamed Field, Weld County, Colorado

May 2015 Colorado Oil and Gas Conservation Commission Hearing

My name is Jason Rayburn, and I am currently employed as a Senior Landman for Anadarko E&P Onshore LLC ("Applicant"). I graduated from the University of Oklahoma in 2008 with a Bachelor of Science in Business Administration with an emphasis in Energy Management. I have over 8 years of experience in petroleum land management and administrative areas of the oil and gas business. I am familiar with the lands subject to, and the matters set forth in the March 10, 2015, verified application (the "Application") filed herein.

In support of Applicant's Application and my sworn testimony herein, I am submitting four (4) exhibits. This testimony and exhibits provide the supporting basis for approval of the Applicant's request for an order to: (1) vacate an approximate 732.00-acre drilling and spacing unit established by Order No. 535-5, but only as to Sections 15 and 22, Township 12 North, Range 65 West, 6th P.M.; (2) establish an approximate 1,372.00-acre drilling and spacing unit for the below-described lands, and authorize the drilling of up to seven (7) horizontal wells within the proposed unit, for the production of oil, gas and associated hydrocarbons from the Niobrara Formation; and (3) authorize an additional five (5) horizontal wells for a total of six (6) horizontal wells in an existing drilling and spacing unit established by Order No. 535-571 for production from the Codell Formation, for the below-described lands:

Township 12 North, Range 65 West, 6th P.M.

Section 15: Lots 1-4 (a/d/a All)

Section 22: All

Section 27: All

1,372 acres, more or less, Weld County, Colorado ("Application Lands")

Exhibit L-1: Leasehold Ownership Map:

Exhibit L-1 is a map showing the location of the Application Lands and the leasehold ownership. The Application Lands consist of fee and federal mineral interests. The following parties own leasehold or unleased mineral interests in the Application Lands:

<u>INTEREST OWNER(S)</u>	<u>UNIT WI¹</u>
Anadarko E&P Onshore LLC	53.0%
Other working interest owners	<u>47.0%</u>
TOTAL:	100.000000%

¹ Interests are approximate.

Exhibit L-2: Topographic Map:

Exhibit L-2 is a topographical map of the Application Lands.

Exhibit L-3: Aerial Map:

Exhibit L-3 is an aerial map of the Application Lands.

Exhibit L-4: Interested Parties:

Attached as Exhibit L-4 is a list of interested parties within the Application Lands.

The Application will not result in a requirement for consultation with the Colorado Department of Public Health and Environment or Colorado Parks and Wildlife pursuant to 306.c.(1)B. or 306.d.(1)B.

Based on the examination of relevant contracts and records, the interested parties (owners within the proposed drilling and spacing unit) have been duly served with the Application and associated Notice of Hearing. Further, as of the date of this testimony, Anadarko has not received any notice of objection or protest to the Application.

Exhibit L-1
Leasehold Ownership Map

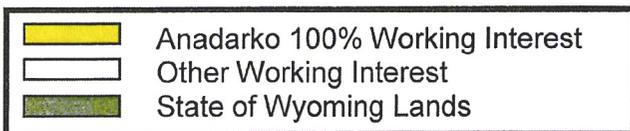
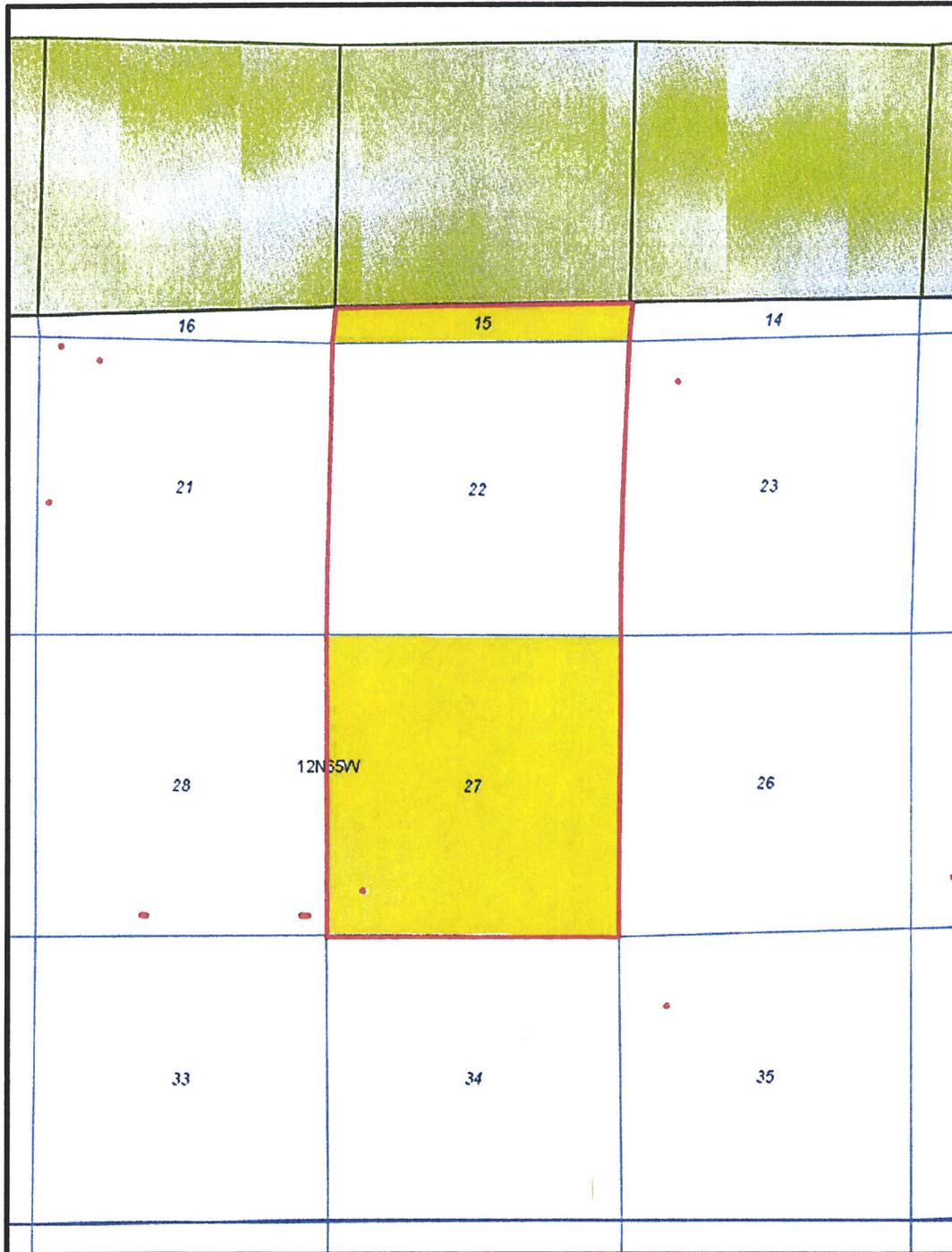
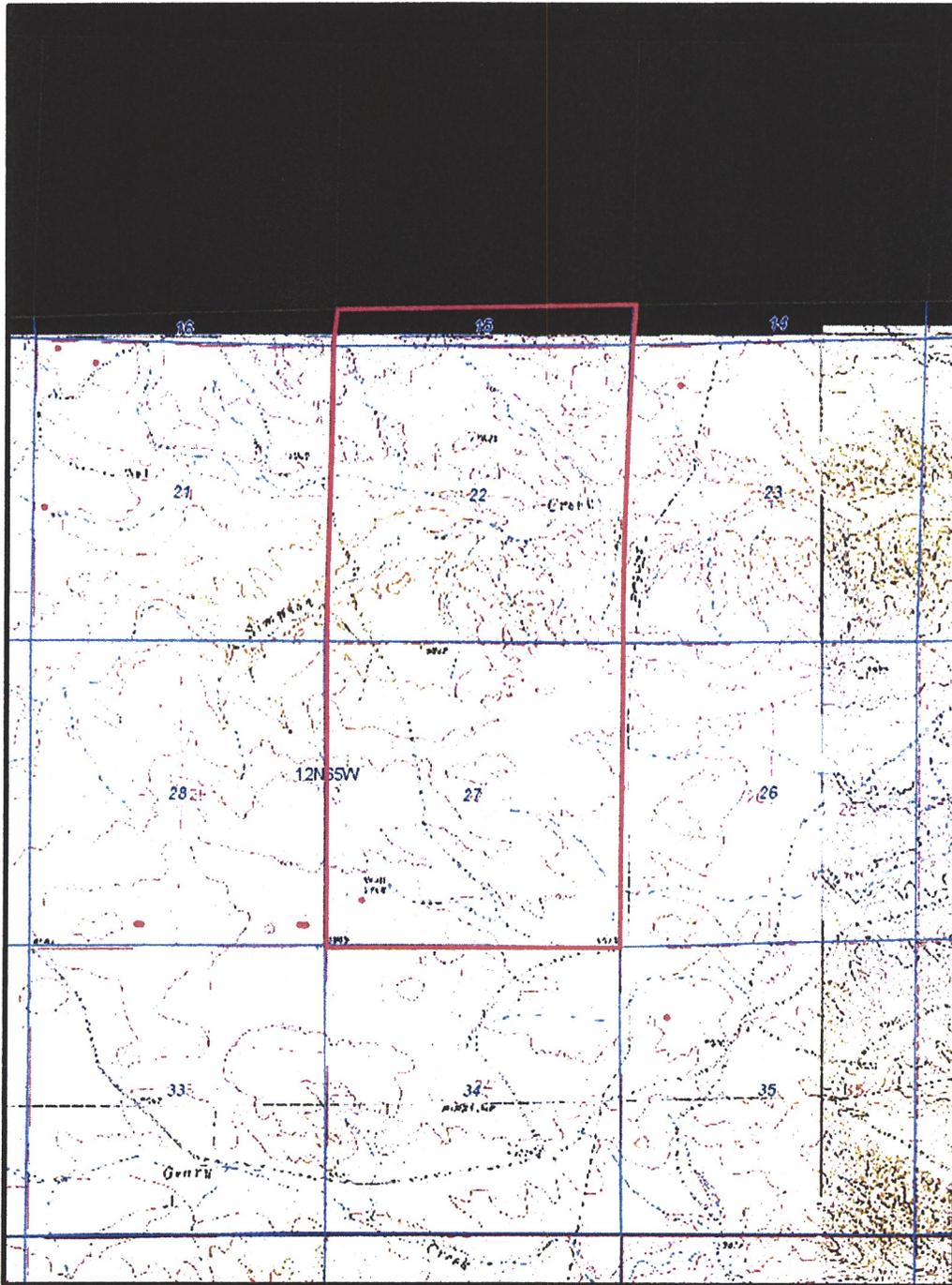
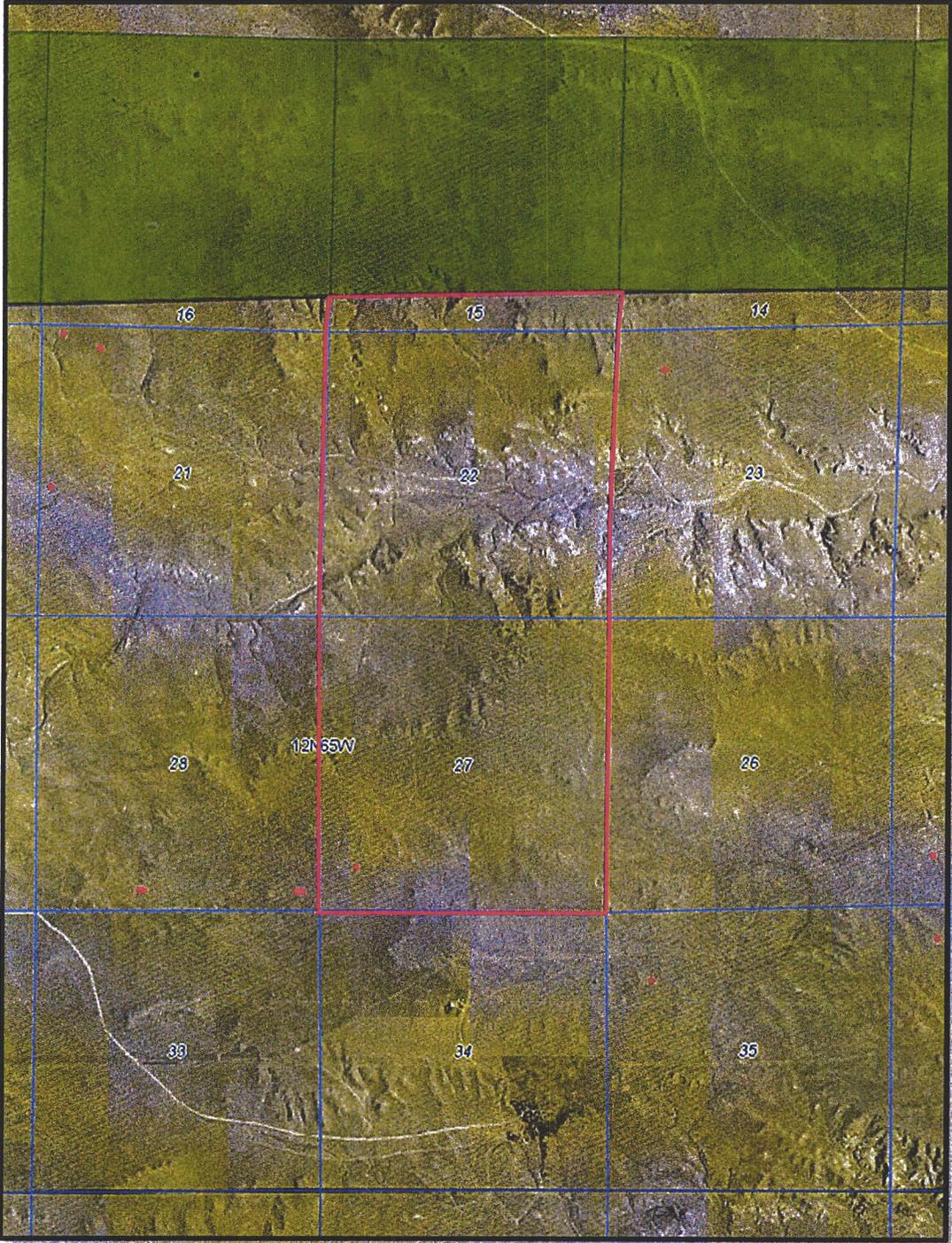


Exhibit L-2
Topographic Map²



² The dark green areas of the map cover lands within the State of Wyoming. The black areas of the map cover lands for which the Colorado Oil and Gas Conservation Commission's GIS website apparently does not have topographic data.

Exhibit L-3
Aerial Map³



³ The green shaded areas of the map cover lands within the State of Wyoming.



**Exhibit L-4
Interested Parties**

**Anadarko E&P Onshore LLC
1099 18th Street, Suite 1800
Denver, CO 80202**

**Gadeco, LLC
3600 S Yosemite St, Ste 900
Denver, CO 80237**

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

**Tom Parko
Weld County
1555 North 17th Street
Greeley, CO 80631**

**U.S. Department of Interior
Bureau of Land Management
2850 Youngfield Street
Lakewood, CO 80215**

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



Geologic Testimony – Thomas A. Berkman

Cause No. 535; Docket Nos. 150400192, 150500252, 150500255, 1050500267,
150500268, and 150500270

Spacing and Increased Density Applications
Codell and Niobrara Formations
Unnamed Field, Weld County, Colorado

May 18 & 19, 2015 Colorado Oil and Gas Conservation Commission Hearing

My name is Tom Berkman, and I am currently employed as a Senior Project Advisor for Anadarko E&P Onshore LLC ("Applicant"). I graduated from Colorado College in Colorado Springs with B.A. Degree in Geology, and from Oregon State University in Corvallis, OR with an M.S. in Geoscience. I have over 27 years of experience in the oil and gas industry. I am familiar with the lands subject to, and the matters set forth in the verified applications (the "Applications") described below and filed herein.

In support of Applicant's Applications and my sworn testimony herein, I am submitting five (5) exhibits. This testimony and exhibits provide the supporting basis for approval of the Applicant's request for orders to, among other things, (1) establish approximate 1280-acre drilling and spacing units¹ for the below-described lands, and authorize the drilling of up to seven (7) horizontal wells within the proposed units, for the production of oil, gas and associated hydrocarbons from the Niobrara Formation; and (2) authorize an additional five (5) horizontal wells for a total of six (6) horizontal wells in an existing drilling and spacing units established for production from the Codell Formation, for the below-described lands:

Township 11 North, Range 65 West, 6th P.M.
Section 2: Lots 1 and 2, S $\frac{1}{2}$ N $\frac{1}{2}$, S $\frac{1}{2}$ (a/d/a All)

Township 12 North, Range 65 West, 6th P.M.
Section 35: All

1,275.80 acres, more or less, Weld County, Colorado (Docket No. 150500270)

Township 12 North, Range 65 West, 6th P.M.
Section 14: Lots 1-4 (a/d/a All)
Section 23: All
Section 26: All

¹ The lands subject to each respective application vary in acreage depending on the presence of irregular lots.

1,360 acres, more or less, Weld County, Colorado (Docket No. 150500268)

Township 12 North, Range 65 West, 6th P.M.

Section 15: Lots 1-4 (a/d/a All)

Section 22: All

Section 27: All

1,372 acres, more or less, Weld County, Colorado (Docket No. 150500267)

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

Section 6: Lots 1-7, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ (a/d/a All)

Township 12 North, Range 63 West, 6th P.M.

Section 31: Lots 1-4, E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$ (a/d/a All)

1,285.19 acres, more or less, Weld County, Colorado (Docket No. 150500255)

Township 11 North, Range 64 West, 6th P.M.

Section 3: All

Township 12 North, Range 64 West, 6th P.M.

Section 34: All

1,271.88 acres, more or less, Weld County, Colorado (Docket No. 150500252)

Township 12 North, Range 65 West, 6th P.M.

Section 13: Lots 1 through 4 (a/d/a all that portion lying within Colorado)

Section 24: All

Section 25: All

1,349 acres, more or less, Weld County, Colorado (Docket No. 150400192)

Exhibit G-1

Exhibit G-1 is a Type Log of the Upper Cretaceous stratigraphy of the northern D-J Basin. The Niobrara Formation consists of 2 informal members, the Smokey Hill shale, and the Fort Hayes limestone, which directly overlies the Codell. The Pierre Shale overlies the Niobrara. The Carlisle shale is present below the Codell sandstone.

Exhibit G-2

Exhibit G-2 is a structure map on the top of the Codell/base Niobrara showing the proposed drilling and spacing units. The map shows the structure dipping gently to the west at approximately 50 ft / mile across the proposed units.

Exhibit G-3

Exhibit G-3 is a net pay isopach map of the Codell sandstone. Thickness of the Codell ranges from 16 ft in the south part of the map to approximately 20 ft along the Colorado – Wyoming border.

Exhibit G-4

Exhibit G-4 is a net pay isopach map of the Niobrara shale. Thickness of the Niobrara net pay ranges from less than 135 ft in the west to approximately 140 ft along the east portion of the map.

Exhibit G-5

Exhibit G-5 is a west to east stratigraphic cross-section across the proposed drilling and spacing units, hung on the top of the Codell sandstone. It is evident that the Codell sandstone and Niobrara shale exists under the Application Lands.

Conclusions

The Codell sandstone consists of a very fine-grained laminated sandstone, interbedded with bioturbated sands and silts which were deposited in a marine setting during the Cretaceous Western Interior Seaway. This tight sandstone has been producing oil and gas in the DJ Basin for dozens of years, and exists under all of the drilling and spacing units proposed in this Application.

The Niobrara consists of 2 informal members, the Smoky Hill shale member and the Fort Hayes limestone member, deposited during a major marine transgression in the Cretaceous Western Interior Seaway. The Niobrara is a self-sourced resource play that is present throughout much of the Rocky Mountain region.

To the best of my knowledge, all of the matters set forth herein, my testimony and the supporting exhibits are true, correct and accurate.

Dated 27 of April, 2015.

Thomas A. Berkman

Thomas A. Berkman
Sr. Project Geological Advisor
Anadarko Petroleum

VERIFICATION

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

The foregoing instrument was subscribed and sworn to before me this 27th of April, 2015,
by Thomas A. Berkman, Sr. Project Geological Advisor for Anadarko Petroleum

Witness my hand and official seal.

My commission expires: 9/21/2015



MY COMMISSION EXPIRES 9/21/2015

Notary Public Kathy Algiene

Upper Cretaceous Type Log
Northern DJ Basin

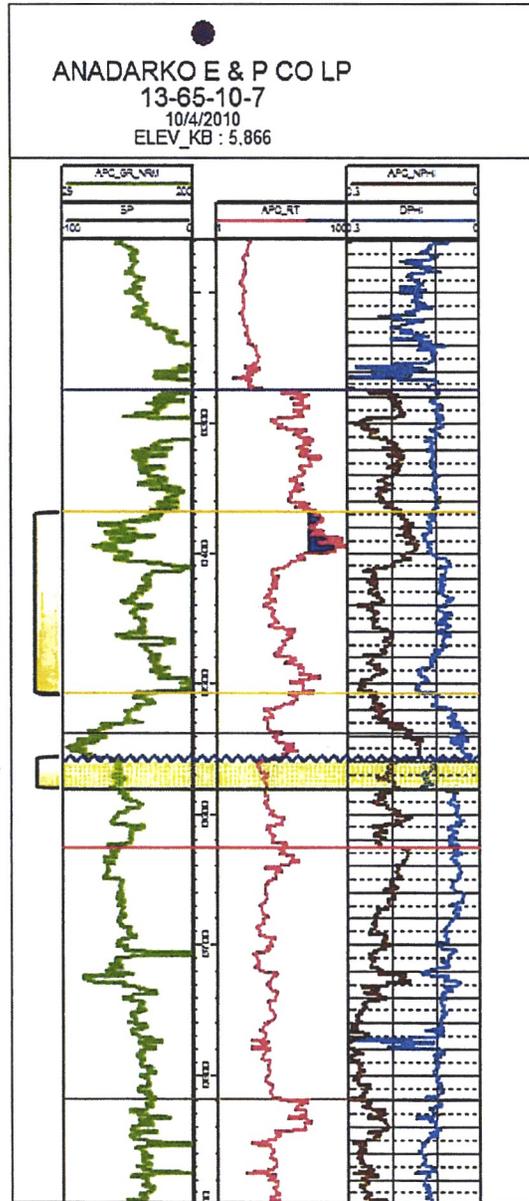
Exhibit G-1 Dockets:

- 150500270
- 150500288
- 150500267
- 150500255
- 150500252
- 150400192

Upper Cretaceous

Niobrara

Greenhorn



Pierre Shale

Smoky Hill Shale
Member

Ft Hayes Ls

Codell Ss

Carlise Sh

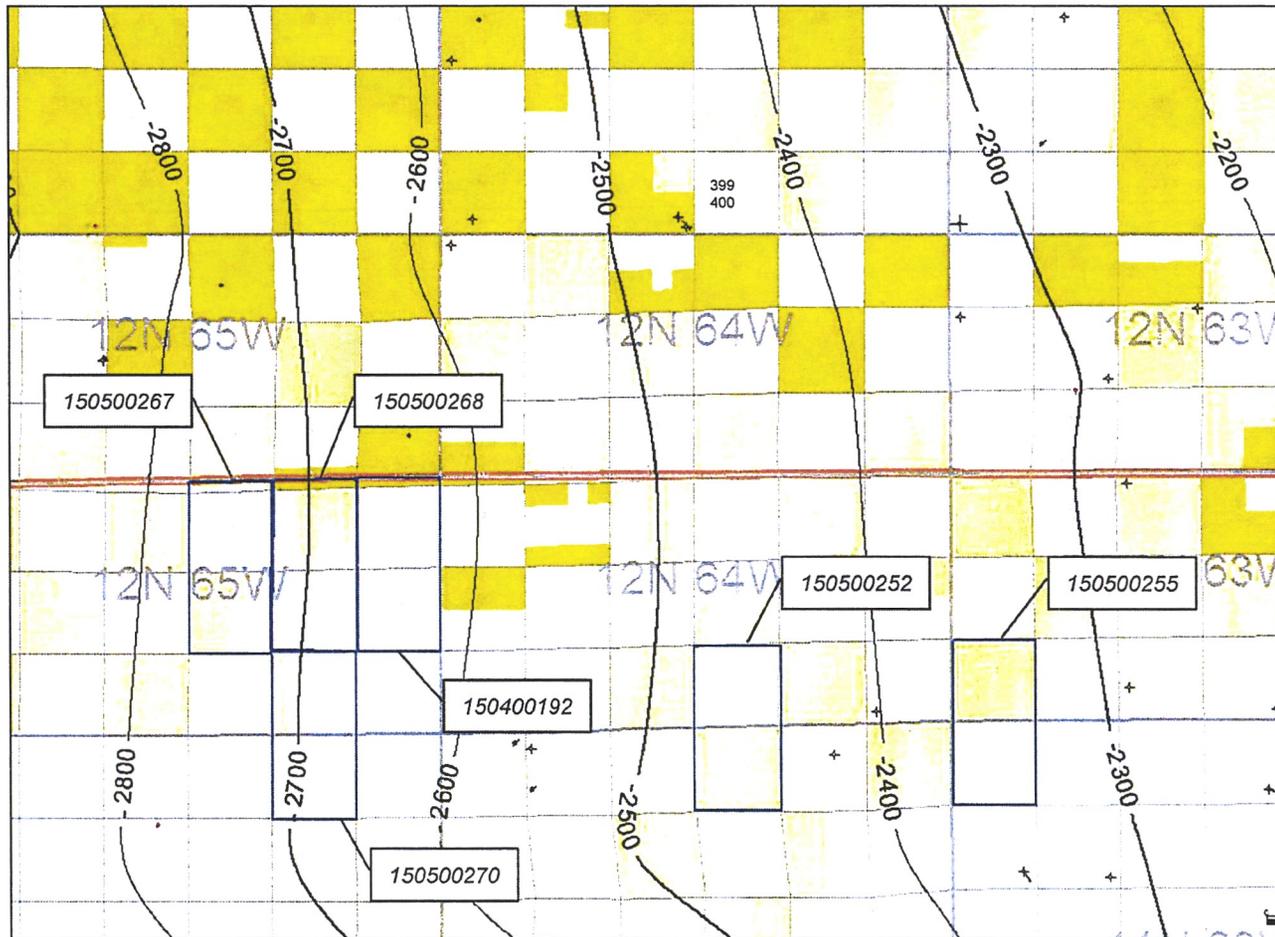
Limestone mbr



Top Codell (Base Niobrara) Structure Map (ss)

Exhibit G-2 Dockets:

- 150500270
- 150500268
- 150500267
- 150500255
- 150500252
- 150400192



 Proposed Spacing Units

Anadarko Petroleum

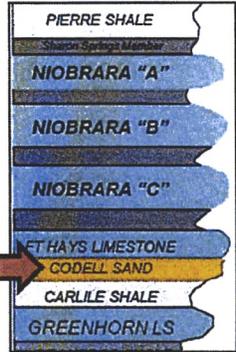
Northern DJ Basin
 Top Codell Structure Map
 Codell & Niobrara DSU Applications

0 25,000
 FEET

WELL SYMBOLS

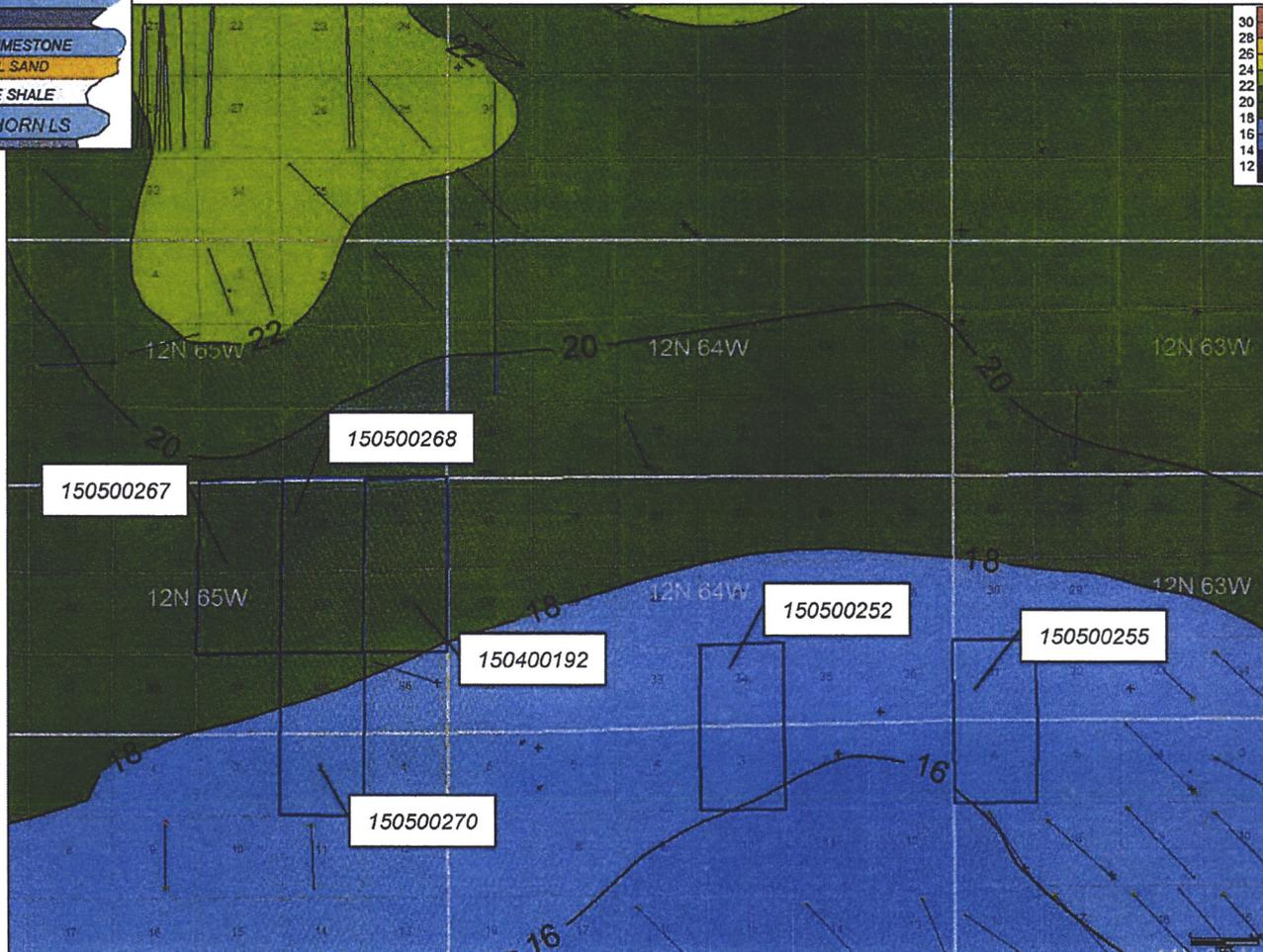
-  DRY & ABANDON GAS SHOWS
-  DRY & ABANDON WITH OIL SHOWS
-  DRY & ABANDONED-OIL SHOWS
-  DRY AND ABANDON
-  Dry Hole
-  WATER INJECTION WELL
-  Microseismic Monitor Well
-  OBSERVATION WELL
-  OIL WELL
-  PLUGGED AND ABANDON OIL WELL
-  PLUGGED & ABANDONED
-  PLUGGED OIL
-  PILOT HOLE





Codell Net Pay Isopach Map (ft)

Exhibit G-3 Dockets:



- 150500270
- 150500268
- 150500267
- 150500255
- 150500252
- 150400192

Proposed Spacing Units

Anadarko Petroleum

Laramie County

Codell Net Pay Isopach Map
Codell & Niobrara Spacing Applications

WELL SYMBOLS

- ▲ DRY & ABANDON GAS SHOWS
- ⊕ DRY & ABANDON WITH OIL SHOWS
- ⊖ DRY & ABANDONED-OIL SHOWS
- ⊙ DRY AND ABANDON
- Dry Hole
- ⊕ WATER INJECTION WELL
- ⊖ Junked and Abandoned
- ⊙ Microseismic Monitor Well
- ⊕ OIL & GAS
- ⊖ OIL & GAS
- ⊙ OBSERVATION WELL
- ⊕ OIL WELL
- ⊖ PLUGGED AND ABANDON OIL WELL
- ⊙ PLUGGED & ABANDONED
- ⊕ PLUGGED OIL
- ⊙ Walling on Permit
- ⊕ PILOT HOLE
- ⊖ SERVICE WELL
- ⊙ SERVICE WELL
- ⊕ New Symbol
- ⊖ TEMPORARILY ABANDON

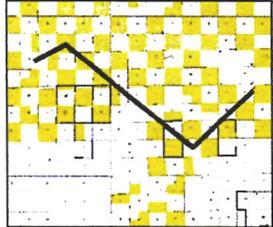
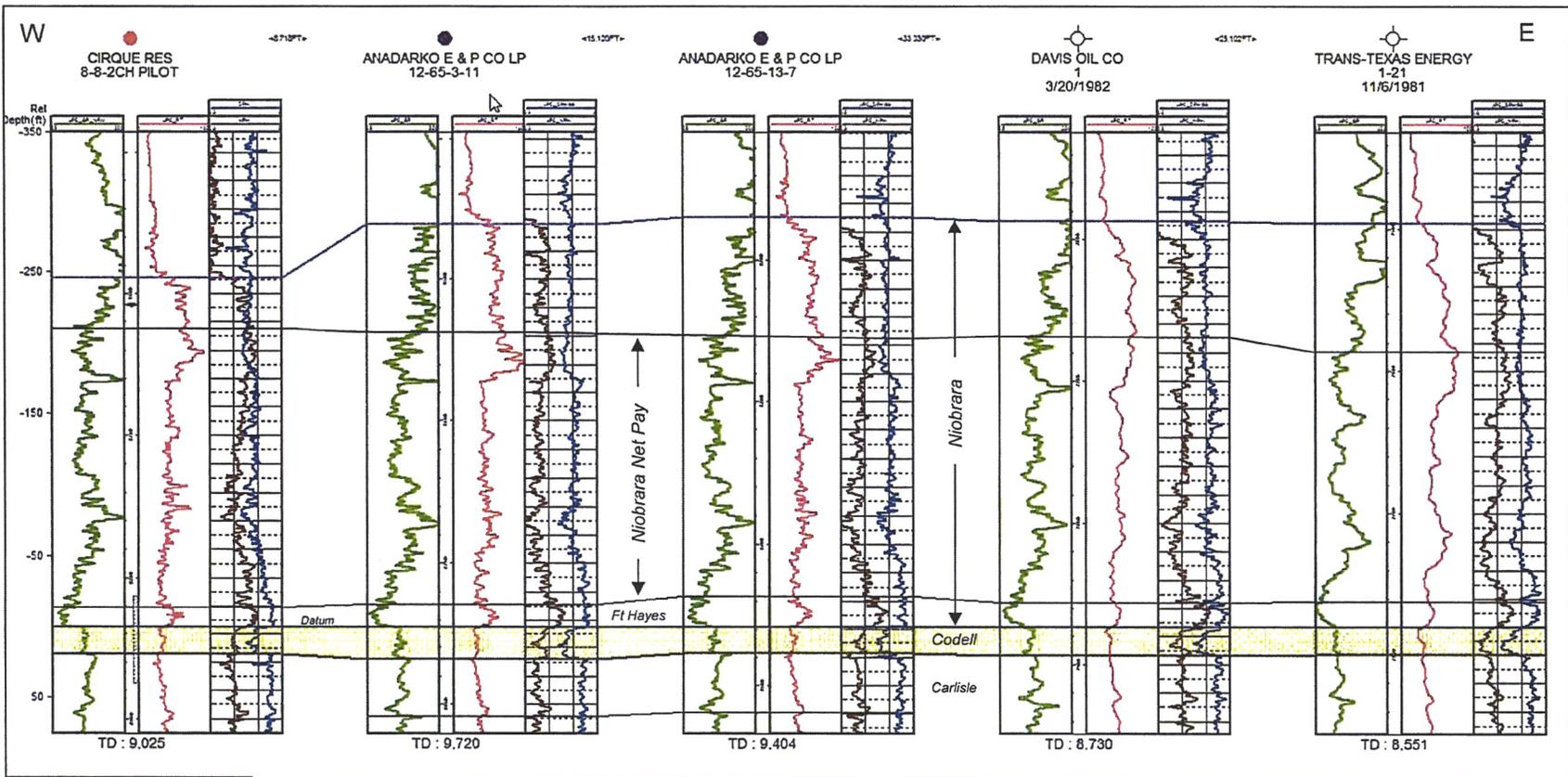
By T. Barkman

0 10,000 20,000
FEET



Exhibit G-5 Dockets: 150500270
 150500268
 150500267
 150500255
 150500252
 150400192

Codell - Niobrara Stratigraphic Cross Section



Location Map



Engineering Testimony – Emily Boecking
Cause No. 535; Docket Nos. 150400192, 150500252, 150500255, 1050500267,
150500268, and 150500270
Spacing and Increased Density Applications
Codell and Niobrara Formations
Unnamed Field, Weld County, Colorado

May 2015 Colorado Oil and Gas Conservation Commission Hearing

My name is Emily Boecking, and I am currently employed as a Reservoir Engineer for Anadarko E&P Onshore LLC ("Applicant"). I graduated from Duke University in 2007 with a Bachelor of Science in Mechanical Engineering. I have over 7 years of experience in the oil and gas industry of which 5 years have been spent as a reservoir engineer. I am familiar with the lands subject to, and the matters set forth in the verified applications (the "Applications") described below and filed herein.

In support of Applicant's Applications and my sworn testimony herein, I am submitting five (5) exhibits. This testimony and exhibits provide the supporting basis for approval of the Applicant's request for orders to, among other things, (1) establish approximate 1280-acre drilling and spacing units¹ for the below-described lands, and authorize the drilling of up to seven (7) horizontal wells within the proposed units, for the production of oil, gas and associated hydrocarbons from the Niobrara Formation; and (2) authorize an additional five (5) horizontal wells for a total of six (6) horizontal wells in an existing drilling and spacing units established for production from the Codell Formation, for the below-described lands:

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1,360 acres, more or less, Weld County, Colorado (Docket No. 150500268)

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¹ The lands subject to each respective application vary in acreage depending on the presence of irregular lots.

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Section 27: All

1,372 acres, more or less, Weld County, Colorado (Docket No. 150500267)

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Township 12 North, Range 63 West, 6th P.M.
Section 31: Lots 1-4, E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$ (a/d/a All)

1,285.19 acres, more or less, Weld County, Colorado (Docket No. 150500255)

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Section 3: All

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Section 34: All

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Section 13: Lots 1 through 4 (a/d/a all that portion lying within Colorado)
Section 24: All
Section 25: All

1,349 acres, more or less, Weld County, Colorado (Docket No. 150400192)

Exhibit E-1: Codell Drainage Area Calculation:

Exhibit No. E-1 is a table showing reservoir drainage area calculations for currently producing offsetting wells in the Northern DJ Basin closest to the proposed unit. Wells included in this table are producing from the Codell formation with production for 5 months or more and have horizontal completed lateral lengths ranging from 8,500'- 9,600'.

Exhibit E-2: Codell Decline Curve Analysis:

Exhibit No. E-2 shows the decline curves used to extrapolate estimated ultimate recovery for use in the drainage area calculations for the Codell.

Exhibit E-3: Niobrara Drainage Area and Joshi Effective Vertical Drainage Radii:

Exhibit No. E-3 is a table showing reservoir drainage area calculations and Joshi effective vertical drainage radii for currently producing offsetting wells in the Northern DJ Basin closest to the proposed unit. Wells included in this table are producing from the Niobrara formation with production for 12 months or more and have horizontal completed lateral lengths ranging from 3,400- 5,800.

Exhibit E-4: Estimated Drainage for Proposed 9,000' Niobrara Horizontal Well:

Exhibit No. E-4 shows the horizontal well drainage area calculation for a well with a 9,000' completed lateral length producing from the Niobrara using the Joshi method.

Exhibit E-5: Niobrara Decline Curve Analysis:

Exhibit No. E-5 shows the decline curves used to extrapolate estimated ultimate recovery for use in the drainage area and Joshi effective vertical drainage radii calculations for the Niobrara.

Testimony and Conclusions

Based on the preceding engineering analysis, the calculated drainage for wells listed on Exhibit E-1 ranges from 94 acres to 286 acres, with an average of 163 acres for the Codell Formation with 8,500'-9,600' laterals. Further, the calculated Joshi effective vertical drainage radii for wells listed on Exhibit E-3 ranges from 106 to 601 feet, with an average of 315 feet for the Niobrara Formation with 3,400'- 5,800' laterals. The estimated horizontal drainage area for a 9,000 lateral length well in the Niobrara Formation is calculated to be 137 acres.

Based on this analysis it is recommended that the Commission approve the above-referenced applications requesting approximate 1280-acre drilling and spacing units for the above-described lands for production of oil, gas and associated hydrocarbons from the Niobrara Formation, and authorize the drilling of up to seven (7) horizontal wells within the units. Further, it is my recommendation that the Commission authorize the drilling of five (5) additional horizontal wells, for a total of six (6) horizontal wells, for existing drilling and spacing units established for production of oil, gas and associated hydrocarbons from the Codell Formation for the above-described lands. In so doing, the development of the above-described lands will promote efficient drainage from the Niobrara and Codell Formations, protect correlative rights, and avoid waste of the resource.

Exhibit E-1: Codell Drainage Area Calculation

Codell Horizontal Well Drainage Area Calculation

API No	Lease	Well No	Reservoir	Operator	Section	Township	Range	Cumulative Oil (bbl)	EUR Oil (bbl)	Completed Interval	Average Porosity (phi, %)	Water Saturation (Sw, %)	Thickness (h, ft)	Drainage Area (acres)
49021210120000	JUBILEE	103-0433H	Codell	EOG Resources	4	13 N	65 W	170,560	307,075	9,313	12	50	24	220
49021210560000	JUBILEE	513-0820H	Codell	EOG Resources	8	13 N	65 W	115,259	216,748	9,401	12	51	22	170
49021210610000	JUBILEE	584-1705H	Codell	EOG Resources	17	13 N	65 W	70,868	163,223	9,400	12	51	23	122
49021210600000	JUBILEE	586-1705H	Codell	EOG Resources	17	13 N	65 W	63,850	125,086	9,086	12	51	23	94
49021210880000	JUBILEE	611-0706H	Codell	EOG Resources	7	13 N	65 W	63,840	206,659	8,511	12	51	22	162
49021209670000	REDSTONE	2-1-1CH	Codell	EOG Resources	2	13 N	65 W	79,064	228,755	9,467	12	50	24	163
49021210150000	WINDY POLE	504-1806H	Codell	EOG Resources	18	13 N	64 W	108,173	183,450	9,116	12	53	22	147
49021211280000	CREEK	525-2413H	Codell	EOG Resources	24	15 N	65 W	86,015	168,216	8,897	12	57	30	112
49021212270000	WINDY	509-1806H	Codell	EOG Resources	18	13 N	64 W	55,229	168,067	9,488	12	50	24	118
49021210270000	JUBILEE	531-2210H	Codell	EOG Resources	22	13 N	65 W	100,410	402,429	9,549	12	50	24	286
49021210260000	JUBILEE	529-2227H	Codell	EOG Resources	22	13 N	65 W	74,618	248,307	9,004	12	53	22	200
49021210830000	JUBILEE	553-1034H	Codell	EOG Resources	10	13 N	65 W	104,887	284,305	9,431	13	50	25	180
49021212260000	WINDY	502-1806H	Codell	EOG Resources	18	13 N	64 W	75,706	262,619	9,026	12	50	24	185
49021210840000	WINDY	554-1034H	Codell	EOG Resources	10	13 N	65 W	89,009	216,834	9,369	13	50	25	137
49021210850000	JUBILEE	565-1034H	Codell	EOG Resources	10	13 N	65 W	81,152	251,971	9,355	13	50	25	158

Average Drainage Area: 163 Acres

$$\text{Drainage area equation: } Area = \frac{EUR * B_D}{7758 * h * phi * (1 - S_w) * R_F}$$

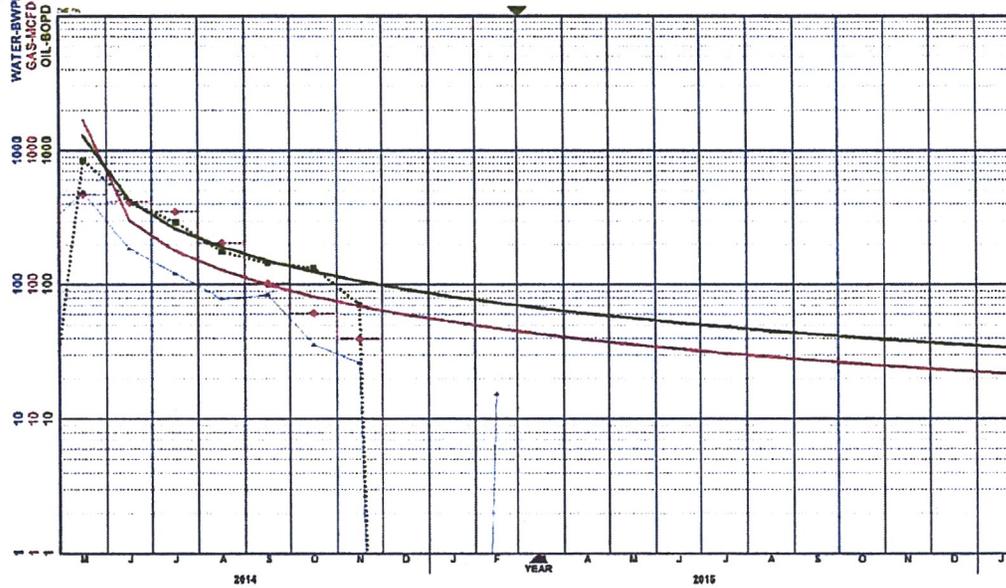
$$B_D = 1.4$$

$$R_F = 18\%$$

Exhibit E-2: Codell Decline Curve Analysis

Jubilee 586-1705H
4902121060000
Codell
EOG Resources
17 13N 65W
Cum Oil (BO)
EUR Oil (BO)

63,850
 125,086



Jubilee 584-1705H
49021210610000
Codell
EOG Resources
17 13N 65W
Cum Oil (BO)
EUR Oil (BO)

70,866
 163,223

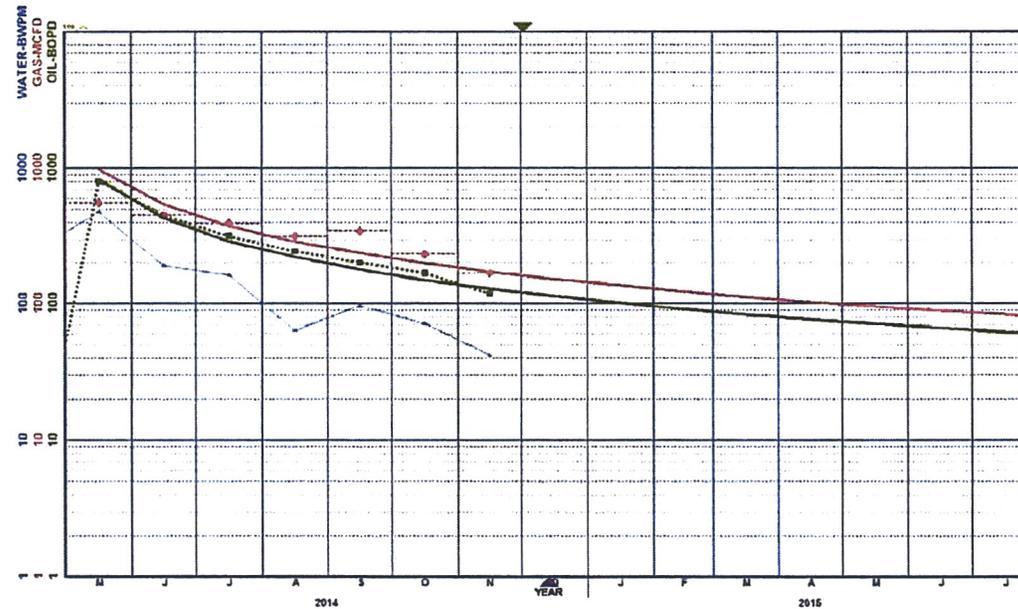
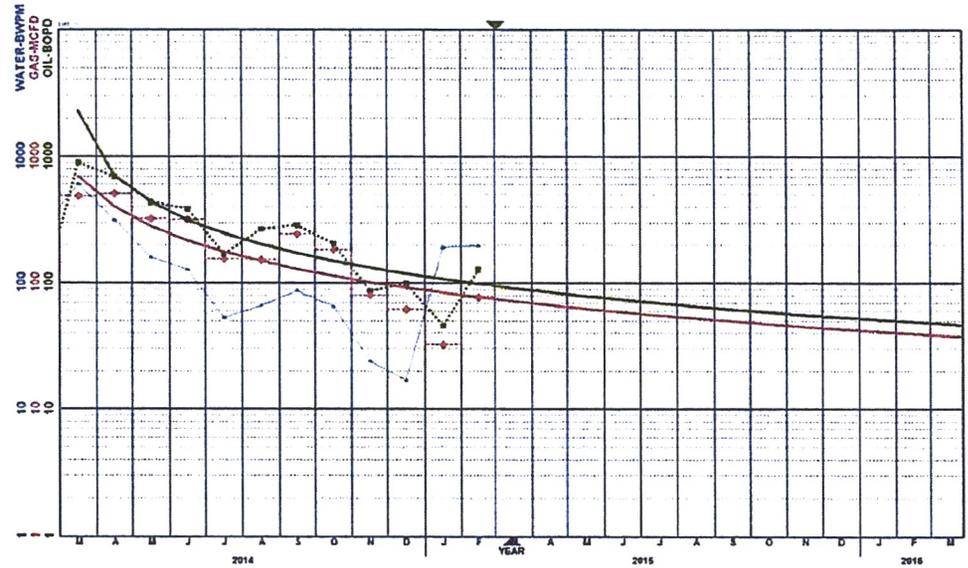


Exhibit E-2: Codell Decline Curve Analysis

Jubilee 513-0820H
49021210560000
Codell
EOG Resources
8 13N 65W
Cum Oil (BO) 115,259
EUR Oil (BO) 216,748



Jubilee 611-0706H
49021210880000
Codell
EOG Resources
7 13N 65W
Cum Oil (BO) 63,840
EUR Oil (BO) 206,659

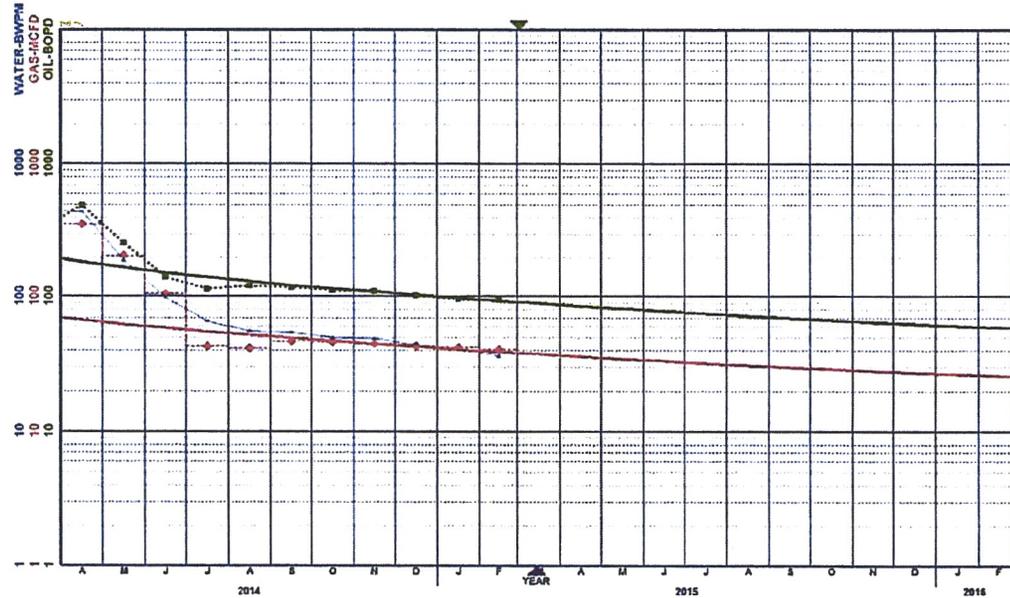
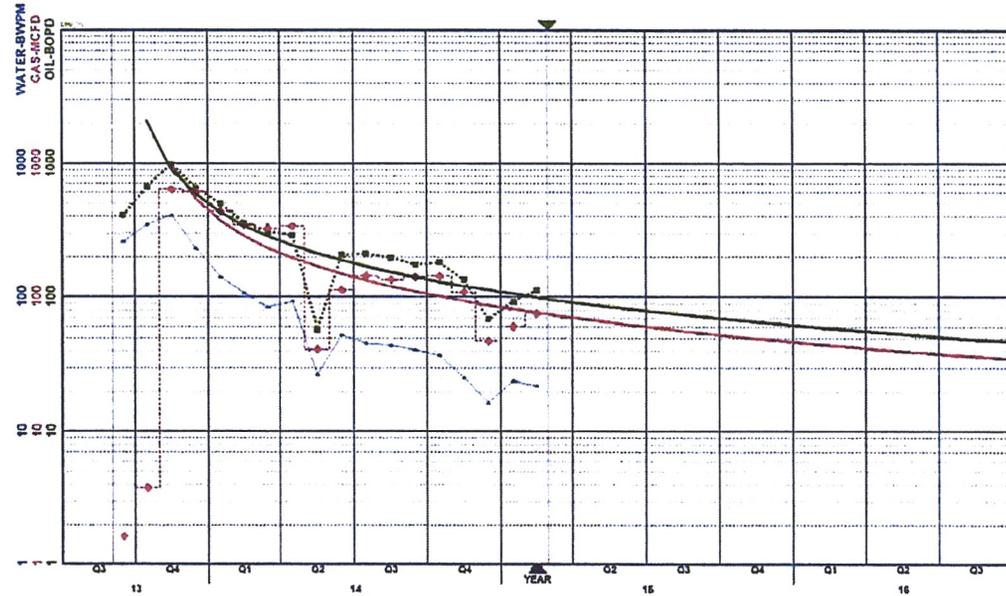


Exhibit E-2: Codell Decline Curve Analysis

Jubilee 103-0433H
49021210120000
Codell
EOG Resources
4 13N 65W
Cum Oil (BO) 170,560
EUR Oil (BO) 307,075



Windy 504-1806H
49021210150000
Codell
EOG Resources
18 13N 64W
Cum Oil (BO) 108,173
EUR Oil (BO) 183,450

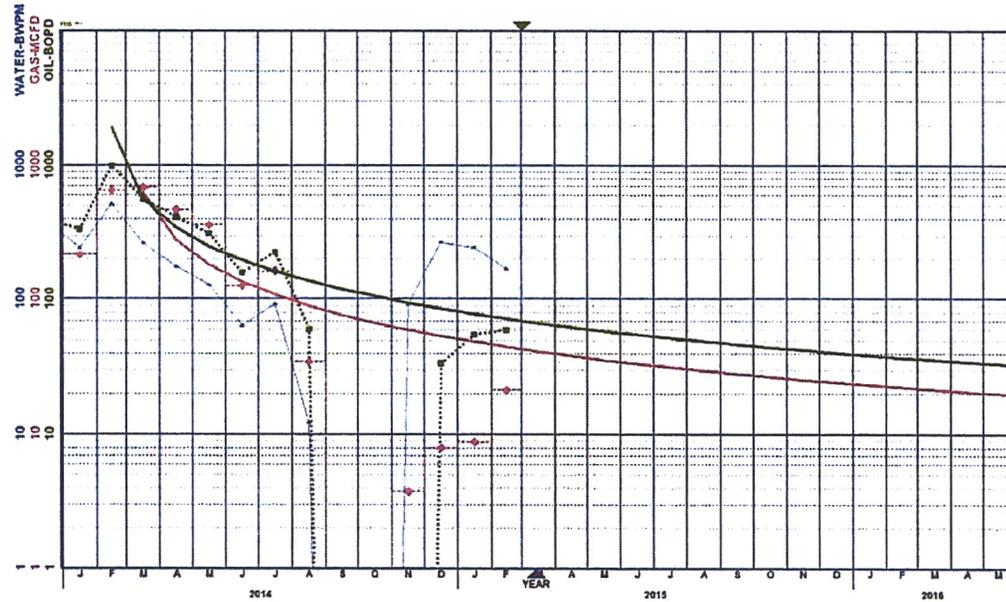
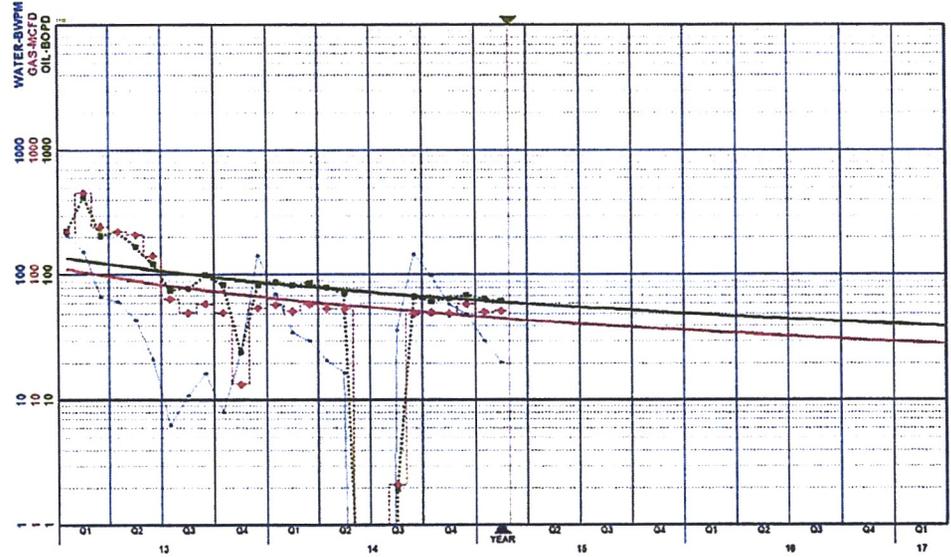


Exhibit E-2: Codell Decline Curve Analysis

Redstone 2-1-1 CH
49021209670000
Codell
EOG Resources
2 13N 65W
Cum Oil (BO) 79,064
EUR Oil (BO) 228,755



Pole Creek 525-2413H
49021211280000
Codell
EOG Resources
24 15N 65W
Cum Oil (BO) 86,015
EUR Oil (BO) 168,216

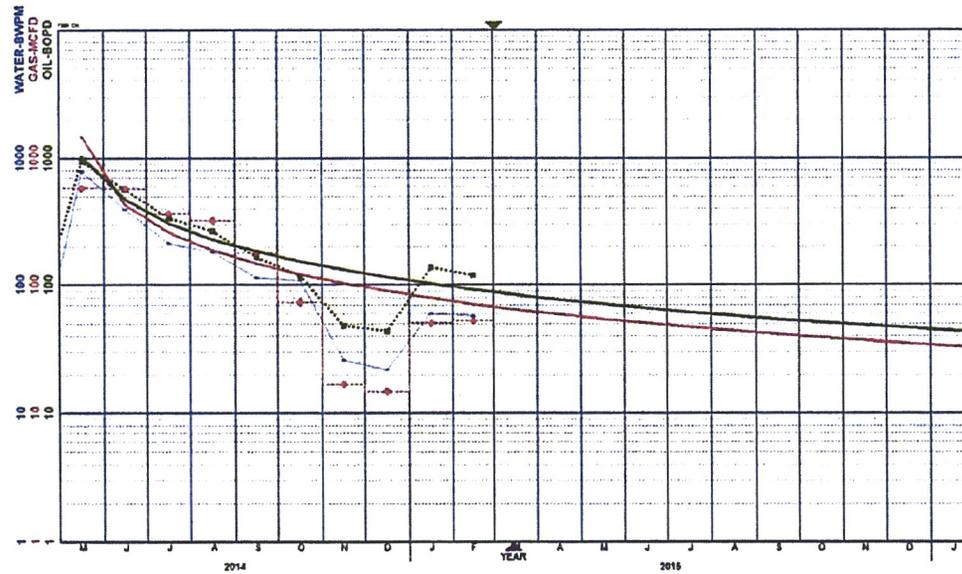
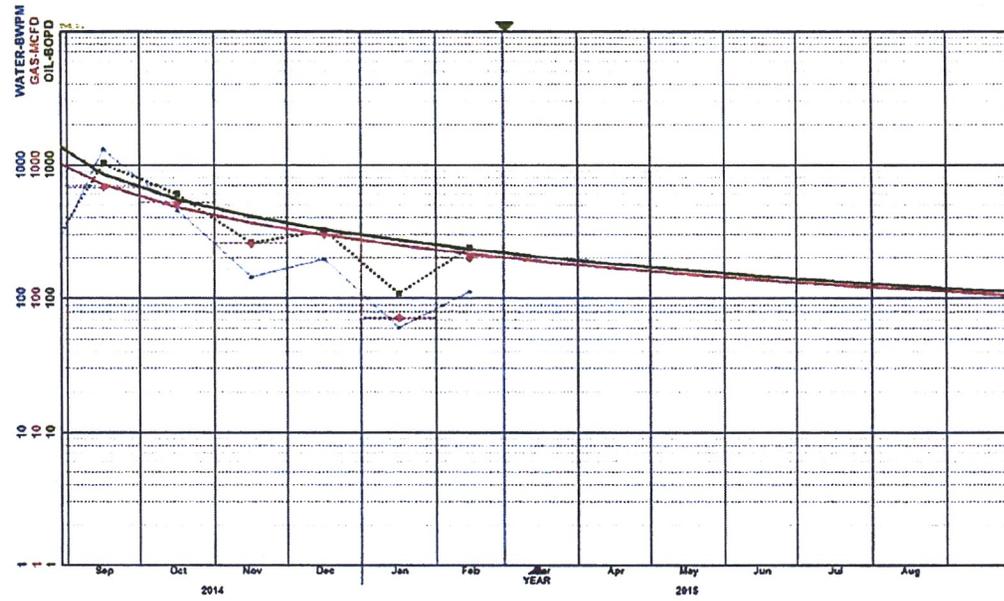


Exhibit E-2: Codell Decline Curve Analysis

Jubilee 555-1034H
49021210850000
Codell
EOG Resources
10 13N 65W
Cum Oil (BO) 81,152
EUR Oil (BO) 251,971



Jubilee 553-1034H
49021210830000
Codell
EOG Resources
10 13N 65W
Cum Oil (BO) 104,887
EUR Oil (BO) 284,305

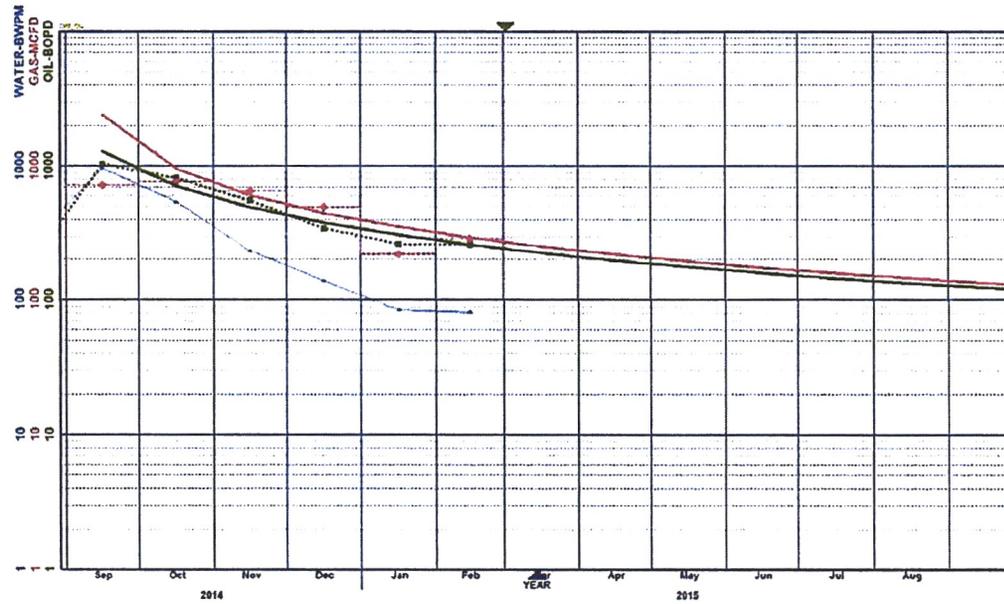


Exhibit E-2: Codell Decline Curve Analysis

Jubilee 554-1034H
49021210840000
Codell
EOG Resources
10 13N 65W
Cum Oil (BO) 89,009
EUR Oil (BO) 216,834

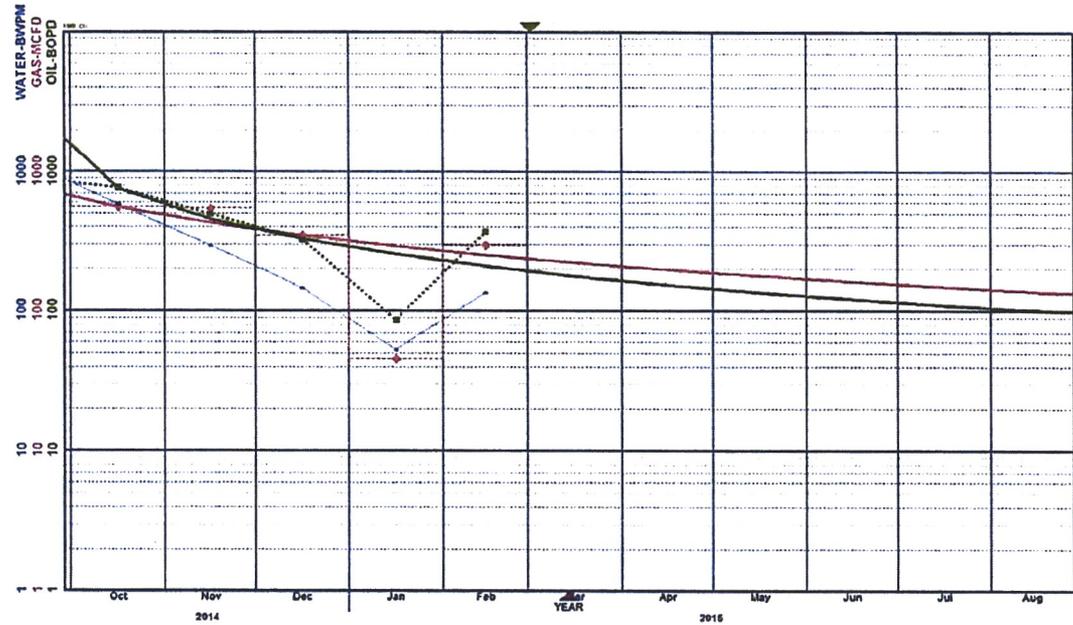
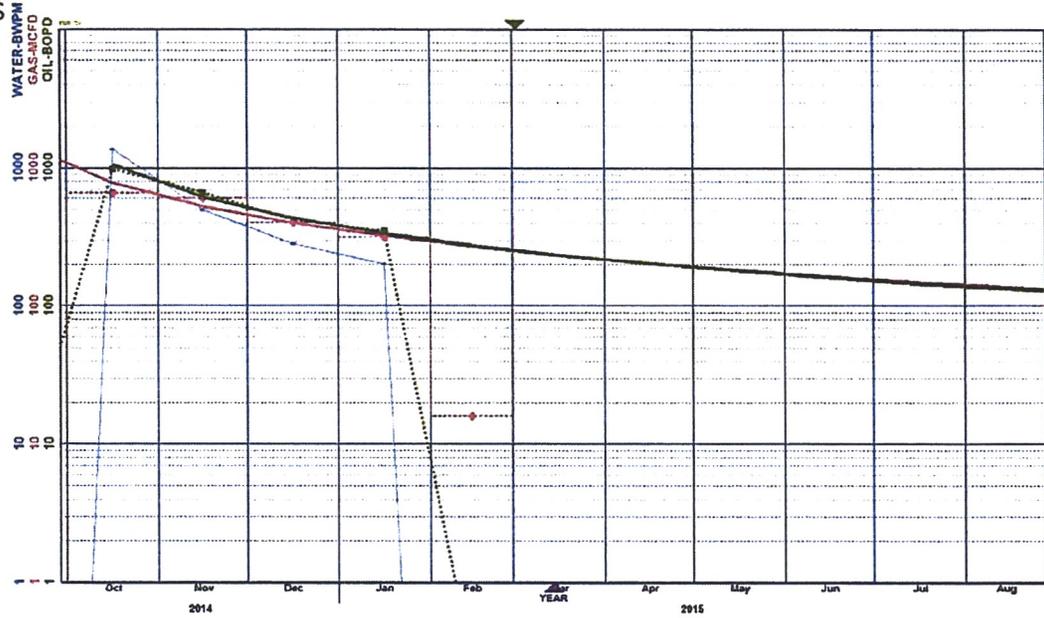


Exhibit E-2: Codell Decline Curve Analysis

Jubilee 529-2227H
 49021210260000
 Codell
 EOG Resources
 22 13N 65W
 Cum Oil (BO) 74,618
 EUR Oil (BO) 246,307



Jubilee 531-2210H
 49021210270000
 Codell
 EOG Resources
 22 13N 65W
 Cum Oil (BO) 100,410
 EUR Oil (BO) 402,429

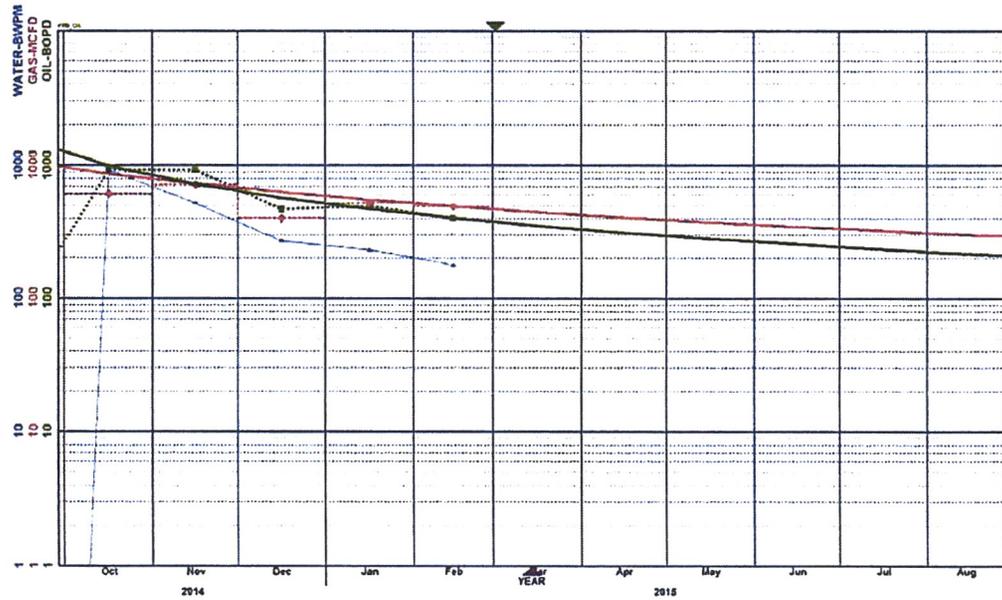
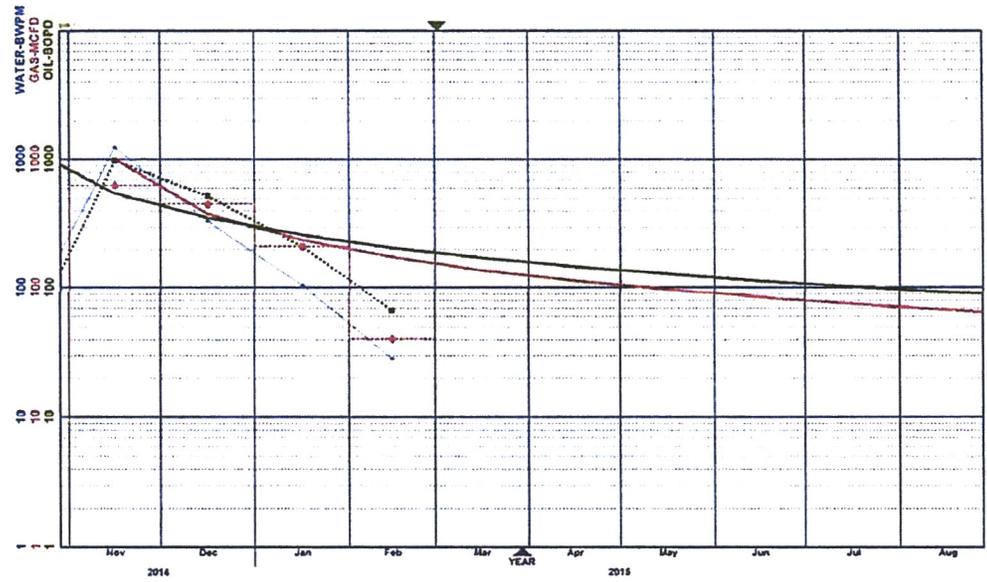


Exhibit E-2: Codell Decline Curve Analysis

Windy 509-1806H
49021212270000
Codell
EOG Resources
18 13N 64W
Cum Oil (BO) 55,229
EUR Oil (BO) 168,067



Windy 502-1806H
49021212260000
Codell
EOG Resources
18 13N 64W
Cum Oil (BO) 75,706
EUR Oil (BO) 262,619

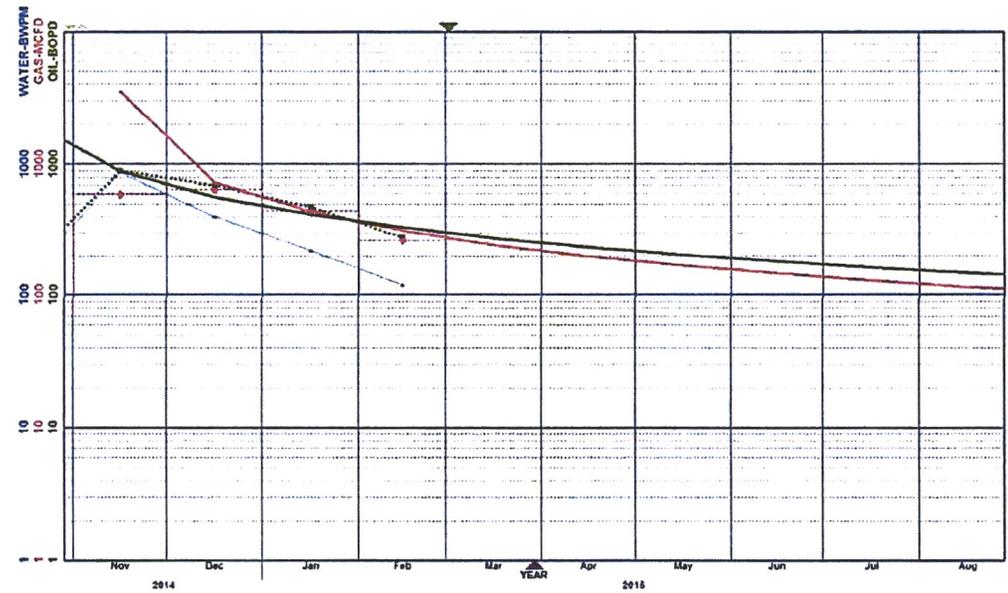


Exhibit E-3: Niobrara Drainage Area and Joshi Effective Vertical Drainage Radii

Niobrara Horizontal Well Drainage Area Calculation

API No	Lease	Well No	Reservoir	Operator	Section	Town ship	Range	Cumulative Oil (bbl)	EUR Oil (bbl)	Completed Interval	Average Porosity (phi, %)	Water Saturation (Sw, %)	Thickness (h, ft)	Drainage Area (acres)	Joshi Effective Vertical Drainage Radius (feet)
49021206490000	ATCHISON	13-65-35-4H	Niobrara	ANADARKO E & P COMPANY LIMITED PRTNR	35	13 N	65 W	25,264	33,450	5,713	10	45	133	29	106
49021206650000	ATCHISON	12-65-13-4H	Niobrara	ANADARKO E & P COMPANY LIMITED PRTNR	13	12 N	65 W	26,852	34,756	3,851	10	45	134	29	156
49021207500000	PATRIOT	1-19H	Niobrara	EOG RESOURCES INCORPORATED	19	14 N	64 W	24,314	34,345	4,216	9	45	146	28	137
49021206810000	ATCHISON	12-65-1-4H	Niobrara	ANADARKO E & P COMPANY LIMITED PRTNR	1	12 N	65 W	39,810	48,466	5,748	10	45	134	41	150
49021206630000	STATE	13-64-16-4H	Niobrara	ANADARKO E & P COMPANY LIMITED PRTNR	16	13 N	64 W	40,452	56,086	5,480	10	45	136	47	179
49021207610000	MARLIN	12-65-3-4H	Niobrara	ANADARKO E & P COMPANY LIMITED PRTNR	3	12 N	65 W	50,782	61,678	4,203	10	45	134	49	233
49021206520000	SHATTO	13-65-10-4H	Niobrara	ANADARKO E & P COMPANY LIMITED PRTNR	10	13 N	65 W	58,512	75,533	5,225	10	45	132	62	241
49021208720000	JUBILEE	69-04H	Niobrara	EOG RESOURCES INCORPORATED	4	13 N	65 W	74,716	96,003	3,540	10	45	136	77	401
49021209810000	BIG SANDY	7-33H	Niobrara	EOG RESOURCES INCORPORATED	33	14 N	65 W	51,968	129,285	3,541	10	45	136	104	522
49021207560000	MARLIN	12-65-3-2H	Niobrara	ANADARKO E & P COMPANY LIMITED PRTNR	3	12 N	65 W	91,596	133,860	4,407	10	45	134	109	461
49021209800000	JUBILEE	30-07H	Niobrara	EOG RESOURCES INCORPORATED	7	13 N	65 W	67,347	161,148	3,836	10	45	133	130	595
49021208750000	WINDY	01-18H	Niobrara	EOG RESOURCES INCORPORATED	18	13 N	64 W	76,552	135,612	3,401	9	45	132	120	601
AVERAGE									83,352	4,430	10	45	135	69	315

$$\text{Drainage area equation: } Area = \frac{EUR * B_o}{7758 * h * phi * (1 - S_w) * R_F}$$

$$B_o = 1.4$$

$$R_F = 3\%$$

Exhibit E-4: Estimated Drainage for Proposed 9000' Niobrara Horizontal Well

Horizontal Well Drainage Area
Joshi Method

r = effective drainage radius from vertical well, ft

L = lateral length, ft

A = drainage area for horizontal well

$$A = \frac{\pi r^2 + 2rL}{43560}$$

$$r = 315 \text{ ft}$$

$$L = 9,000 \text{ ft}$$

$$A = 137 \text{ acres}$$

Exhibit E-5: Niobrara Decline Curve Analysis

ATCHISON 13-65-35-4H
 49021206490000
 Niobrara
 ANADARKO E & P COMPANY LIMITED PRTR
 35 13 N 65 W
 Cum Oil (BO) 25,264
 EUR Oil (BO) 33,450

ATCHISON 12-65-13-4H
 49021206650000
 Niobrara
 ANADARKO E & P COMPANY LIMITED PRTR
 13 12 N 65 W
 Cum Oil (BO) 26,852
 EUR Oil (BO) 34,756

PATRIOT 1-19H
 49021207500000
 Niobrara
 EOG RESOURCES INCORPORATED
 19 14 N 64 W
 Cum Oil (BO) 24,314
 EUR Oil (BO) 34,345

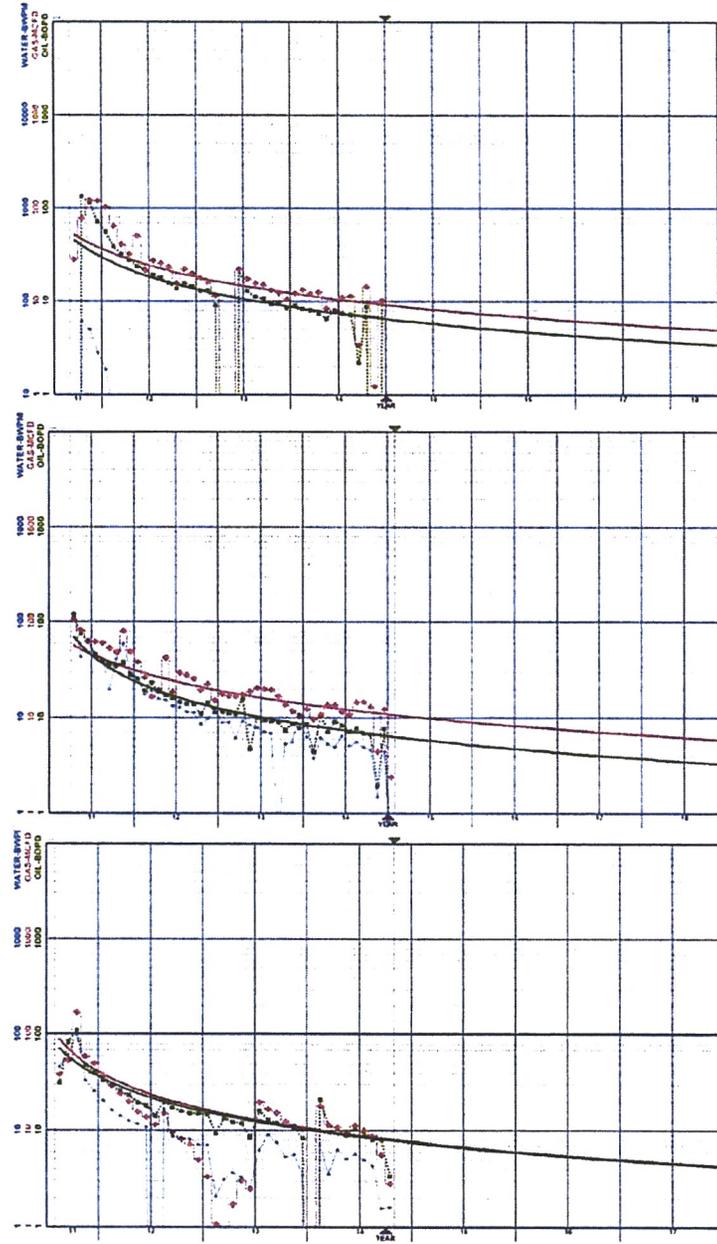


Exhibit E-5: Niobrara Decline Curve Analysis

ATCHISON 12-65-1-4H
 49021206810000
 Niobrara
 ANADARKO E & P COMPANY LIMITED PRTR
 1 12 N 65 W
 Cum Oil (BO) 39,810
 EUR Oil (BO) 48,466

STATE 13-64-16-4H
 49021206630000
 Niobrara
 ANADARKO E & P COMPANY LIMITED PRTR
 16 13 N 64 W
 Cum Oil (BO) 40,452
 EUR Oil (BO) 56,086

MARLIN 12-65-3-4H
 49021207610000
 Niobrara
 ANADARKO E & P COMPANY LIMITED PRTR
 3 12 N 65 W
 Cum Oil (BO) 50,782
 EUR Oil (BO) 61,678

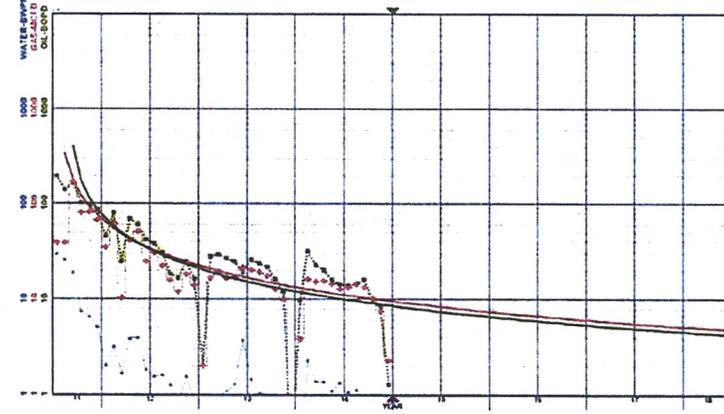
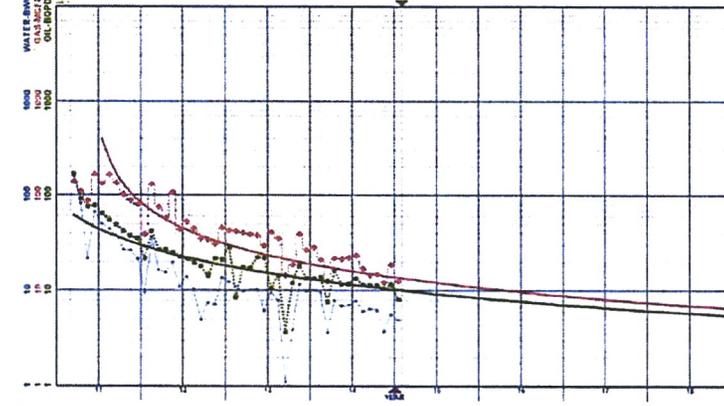
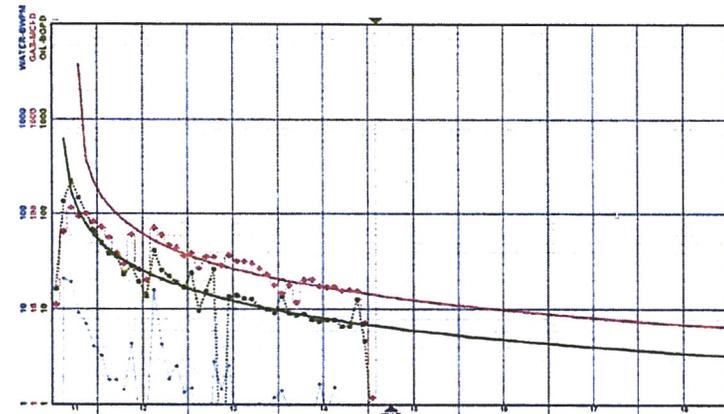


Exhibit E-5: Niobrara Decline Curve Analysis

SHATTO 13-65-10-4H
 49021206520000
 Niobrara
 ANADARKO E & P COMPANY LIMITED PRNTR
 10 13 N 65 W

Cum Oil (BO) 58,512
 EUR Oil (BO) 75,533

JUBILEE 69-04H
 49021208720000
 Niobrara
 EOG RESOURCES INCORPORATED
 4 13 N 65 W

Cum Oil (BO) 74,716
 EUR Oil (BO) 96,003

BIG SANDY 7-33H
 49021209810000
 Niobrara
 EOG RESOURCES INCORPORATED
 33 14 N 65 W

Cum Oil (BO) 51,968
 EUR Oil (BO) 129,285

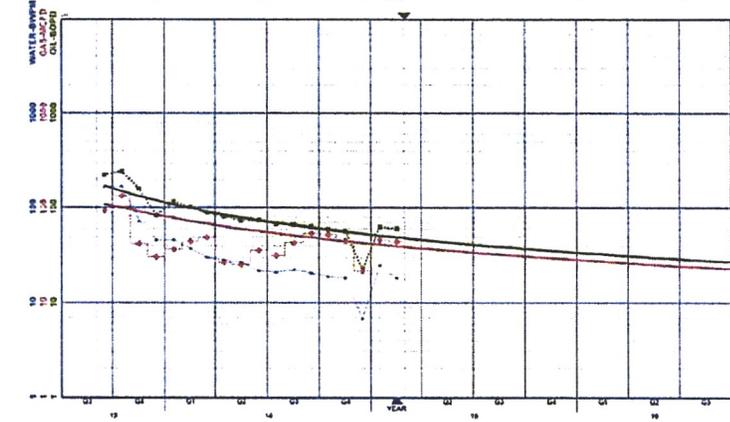
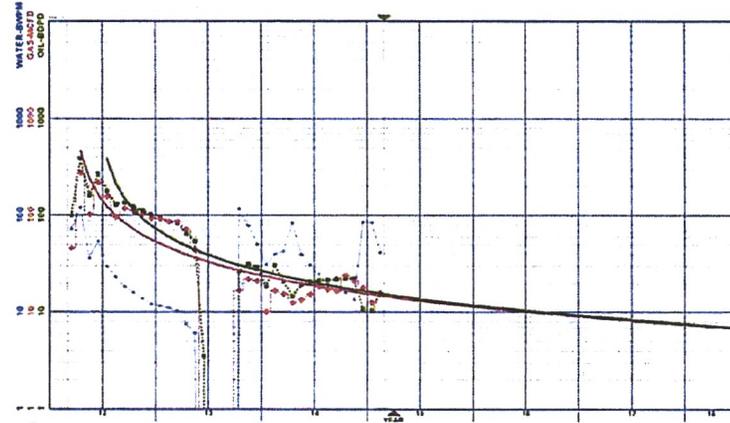
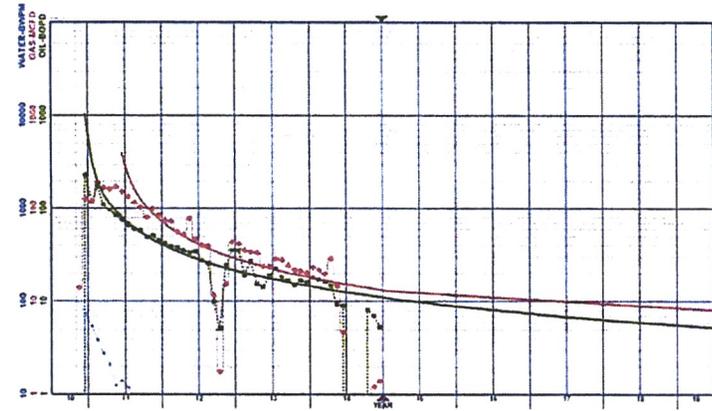
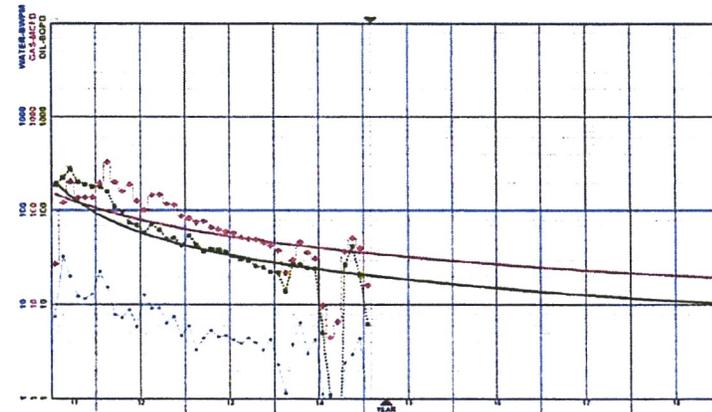
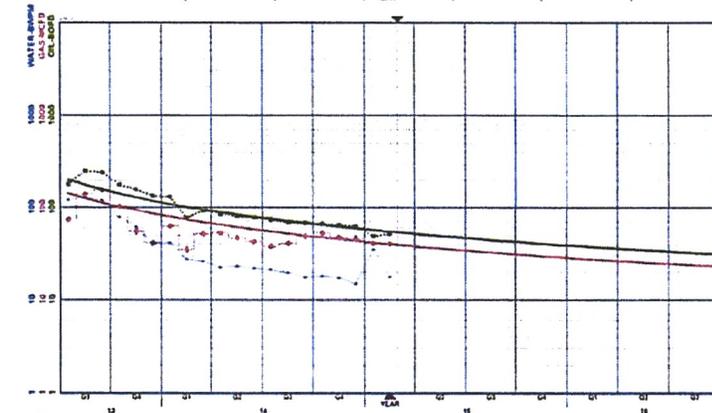


Exhibit E-5: Niobrara Decline Curve Analysis

MARLIN 12-65-3-2H
 49021207560000
 Niobrara
 ANADARKO E & P COMPANY LIMITED PRTRN
 3 12 N 65 W
 Cum Oil (BO) 91,596
 EUR Oil (BO) 133,860

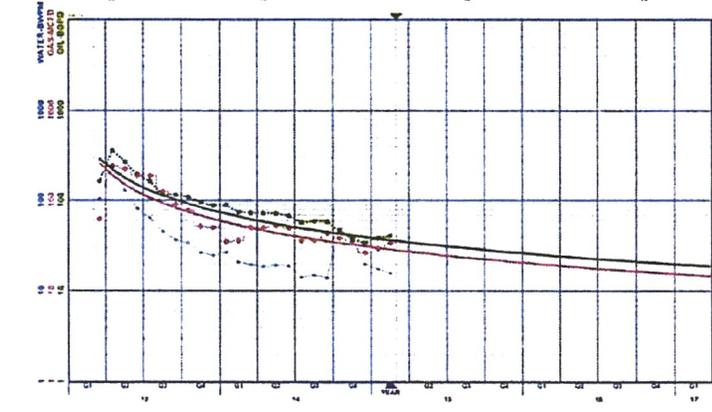


JUBILEE 30-07H
 49021209800000
 Niobrara
 EOG RESOURCES INCORPORATED
 7 13 N 65 W
 Cum Oil (BO) 67,347
 EUR Oil (BO) 161,148



Cum Oil (BO)
 EUR Oil (BO)

WINDY 01-18H
 49021208750000
 Niobrara
 EOG RESOURCES INCORPORATED
 18 13 N 64 W
 Cum Oil (BO) 67,347
 EUR Oil (BO) 76,552



Cum Oil (BO)
 EUR Oil (BO)



10.05.15

RECEIVED
AUG 22 2017
COGCC

511 DOCUMENTS

Order no. 535-706

RECEIVED
OCT 05 2015
COGCC

**BEFORE THE OIL & GAS CONSERVATION COMMISSION
OF THE STATE OF COLORADO**

IN THE MATTER OF THE PROMULGATION) CAUSE NO. 535
AND ESTABLISHMENT OF FIELD RULES TO)
GOVERN OPERATIONS FOR THE CODELL) DOCKET NO. 151000562
AND NIOBRARA FORMATIONS, UNNAMED)
FIELD, WELD COUNTY, COLORADO) TYPE: SPACING

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

Anadarko E&P Onshore LLC, Operator No. 2800 ("Applicant"), by and through its undersigned attorneys, hereby requests pursuant to Rule 511.a. of the Rules and Regulations of the Colorado Oil and Gas Conservation Commission for the Director to recommend approval of its August 27, 2015 verified application ("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 5 day of October, 2015.

Respectfully submitted,

ANADARKO E&P ONSHORE LLC

By: 

James P. Parrot
Jillian Fulcher
Beatty & Wozniak, P.C.
Attorneys for Applicant
216 16th Street, Suite 1100
Denver, Colorado 80202
(303) 407-4499

**ANADARKO
E&P ONSHORE
LLC**

Cause No. 535
Docket No. 151000562

Land Testimony – Jason Rayburn
Cause No. 535; Docket No. 151000562
Increased Density Application, Niobrara Formation
Hereford Field, Weld County, Colorado

October 2015 Colorado Oil and Gas Conservation Commission Hearing

My name is Jason Rayburn, and I am currently employed as a Senior Landman for Anadarko E&P Onshore LLC (“Applicant”). I graduated from the University of Oklahoma in 2008 with a Bachelor of Science in Business Administration with an emphasis in Energy Management. I have over 8 years of experience in petroleum land management and administrative areas of the oil and gas business. I am familiar with the lands subject to, and the matters set forth in the August 21, 2015, verified application (the “Application”) filed herein.

On August 21, 2015, Applicant filed the verified Application pursuant to §34-60-116, C.R.S., for an order to:

A. Establish an approximate 1,262.83-acre drilling and spacing unit for Section 31, Township 12 North, Range 65 West, 6th P.M. and Section 6, Township 11 North, Range 65 West, 6th P.M.

B. Authorize the drilling of up to seven (7) horizontal wells in the proposed drilling and spacing unit for production from the Niobrara Formation.

In support of Applicant’s Application and my sworn testimony herein, I am submitting four (4) exhibits. This testimony and exhibits provide the supporting basis for approval of the Applicant’s request for an order to: establish an approximate 1,262.83-acre drilling and spacing unit for Section 31, Township 12 North, Range 65 West, 6th P.M. and Section 6, Township 11 North, Range 65 West, 6th P.M., and authorize the drilling of up to seven (7) horizontal wells within the proposed unit, for the production of oil, gas and associated hydrocarbons from the Niobrara Formation, for the following described lands:

Township 12 North, Range 65 West, 6th P.M.
Section 31: All

Township 11 North, Range 65 West, 6th P.M.
Section 6: All

Approximately 1,262.83-acres, more or less, Weld County, CO
 (“Application Lands”).

Exhibit L-1: Leasehold Ownership Map:

Exhibit L-1 is a map showing the location of the Application Lands and the leasehold ownership. The Application Lands consist of fee mineral interest. The

following parties own leasehold or unleased mineral interests in the Application Lands:

<u>INTEREST OWNER(S)</u>	<u>UNIT WI¹</u>
Anadarko E&P Onshore LLC	50.30%
Other working interest owners	<u>49.70%</u>
TOTAL:	100.00%

Exhibit L-2: Topographic Map:

Exhibit L-2 is a topographical map of the Application Lands.

Exhibit L-3: Aerial Map:

Exhibit L-3 is an aerial map of the Application Lands.

Exhibit L-4: Interested Parties:

Attached as Exhibit L-4 is a list of interested parties within the Application Lands.

The Application will not result in a requirement for consultation with the Colorado Department of Public Health and Environment or Colorado Parks and Wildlife pursuant to 306.c.(1)B. or 306.d.(1)B.

As stated in the Application, some of the minerals underlying the proposed drilling and spacing unit are owned by the United States of America. As such, Applicant will seek a Communitization Agreement from the Bureau of Land Management upon approval of the proposed drilling and spacing unit.

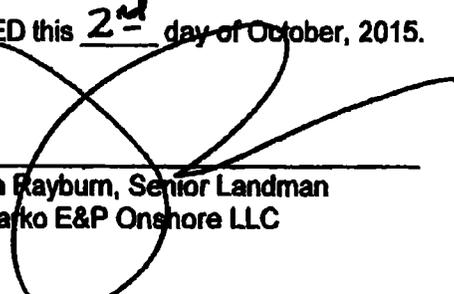
Based on the examination of relevant contracts and records, the interested parties (owners within the proposed drilling and spacing unit) have been duly served with the Application and associated Notice of Hearing. Further, as of the date of this testimony, Anadarko has not received any notice of objection or protest to the Application.

¹ Interests are approximate.

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.

DATED this 2nd day of October, 2015.



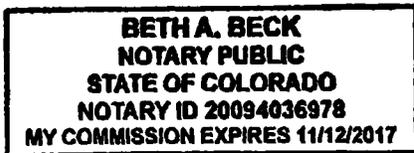
Jason Rayburn, Senior Landman
Anadarko E&P Onshore LLC

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

The foregoing instrument was subscribed and sworn to before me this 2nd day of October, 2015, by Jason Rayburn, Senior Landman for Anadarko E&P Onshore LLC.

Witness my hand and official seal.

My commission expires: 11/12/2017



Beth A. Beck

Notary Public

Exhibit L-1
Leasehold Ownership Map

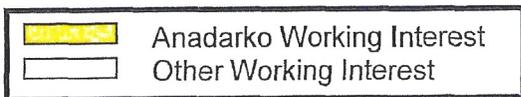
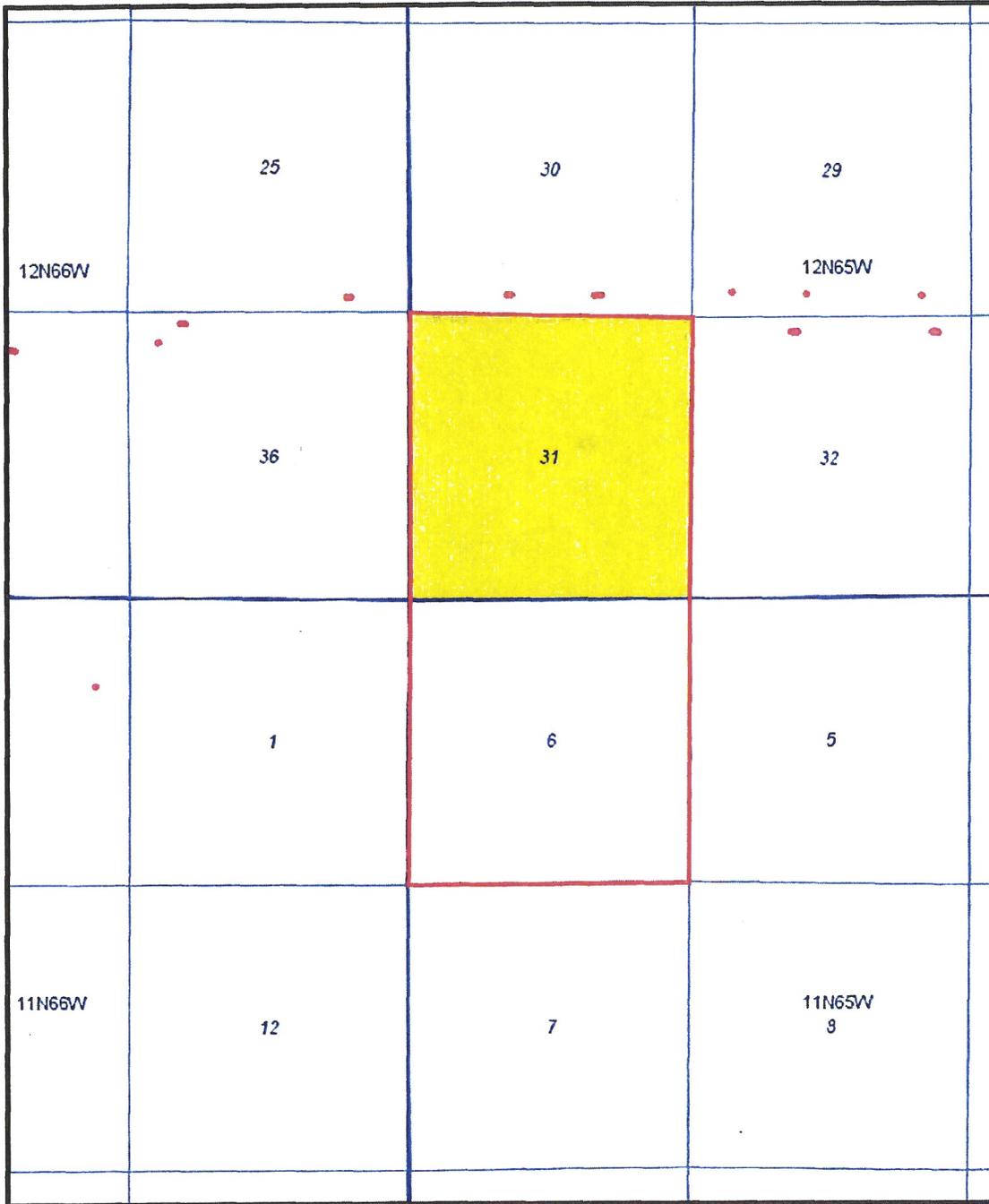


Exhibit L-2
Topographic Map

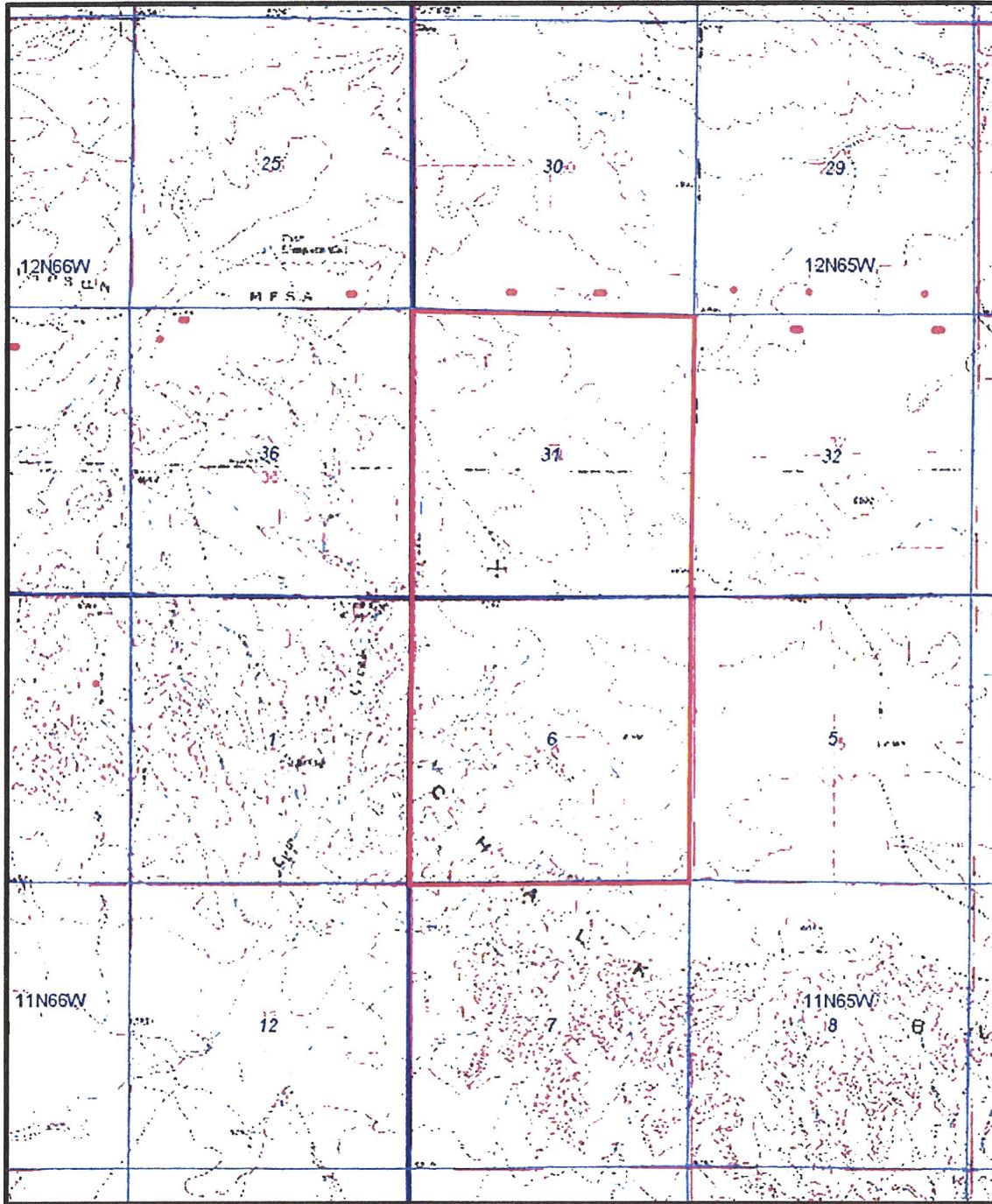


Exhibit L-3
Aerial Map

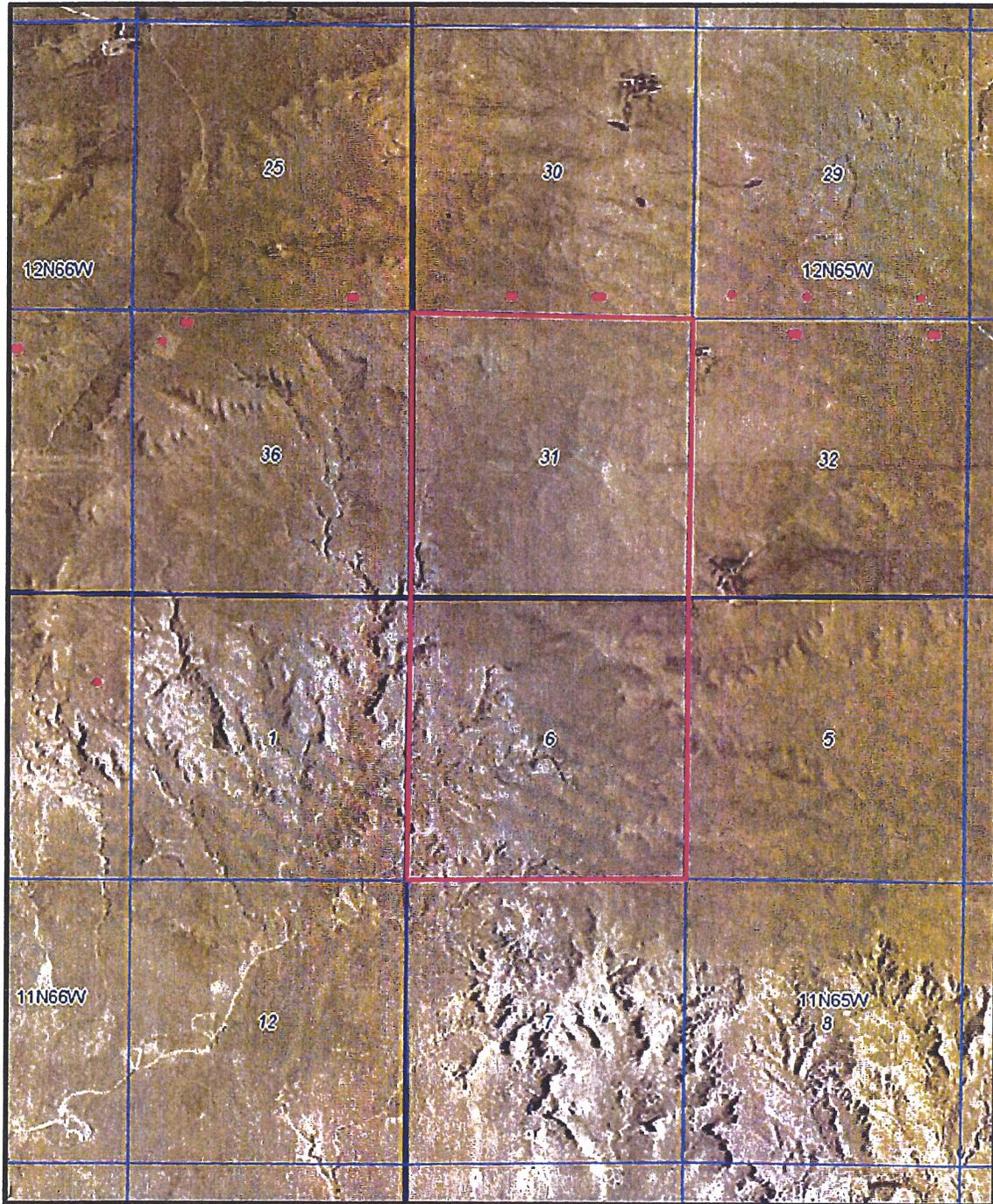




Exhibit L-4
Interested Parties

ABO Petroleum Corporation
105 S. 4th St.
Artesia, NM 88210-2177

Anadarko Oil & Gas, LLC
1099 18th Street, Suite 1800
Denver, CO 80202

Chesapeake Exploration, L.L.C.
6100 North Western
P.O. Box 18496
Oklahoma City, OK 73154-0496

Cirque Brennsee, LLC
475 Seventeenth Street, Suite 1600
Denver, CO 80202

Elizabeth J. Cox
P. O. Box 47
Cheyenne, WY 82003

Elizabeth J. Cox as Personal Representative of the Estate
of Mark T. Cox III
P. O. Box 47
Cheyenne, WY 82003

EOG Resources, Inc.
P.O. Box 4362
Houston, TX 77210-4362

Estate of Elizabeth S. Cashman, deceased
Unknown
Cheyenne, WY 82009

Futura, LLC
9302 S. 83rd Ct.
Hickory Hills, IL 60457

Hydrocarbon Minerals II, LLC
9302 S. 83rd Ct.
Hickory Hills, IL 60457

Mariemont Properties, Inc
3429 Southwestern Blvd.
Dallas, TX 75225

Midland Trust
P. O. Box 9257
Dallas, TX 75209

MYCO Industries, Inc.
105 S. 4th St.
Artesia, NM 88210-2177

Noble Energy, Inc.
Attn: COGCC Land Coordinator
1625 Broadway St., Suite 2200
Denver, CO 80202

OOGC America, Inc.
c/o CNOOC International Limited,
P.O. Box 4705, No. 25 Chaoyangmenbei Dajie
(Dongcheng District)
Beijing, P.R. China 100010

POCO Minerals, LLC
P. O. Box 601673
Dallas, TX 75360

Robert E. Wagner and Jan G. Wagner
5807 Laura Dawn Avenue
Cheyenne, WY 82009

Sabre Exploration, Inc.
P. O. Box 4848
Wichita Falls, TX 76308-0848

State of Colorado
1127 Sherman St.
Denver, CO 80203

Thomas Walker Cox
29007 Palmetto Drive
Big Pine Key, FL 33043

Yates Petroleum Corporation
105 S. 4th St.
Artesia, NM 88210-2177

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

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

Troy Swain
Weld County
Department of Planning Services
1555 North 17th Avenue
Greeley, CO 80631

Bureau of Land Management
2850 Youngfield Street
Lakewood, Colorado 80215-7093



**Exhibit L-4
Interested Parties**

**Albert Lloyd Cashman And Sharon D. Cashman
9728 Branding Iron Drive
Cheyenne, Wy 82009**

**Anadarko Land Corp.
1099 18th Street, Suite 1800
Denver, Co 80202**

**Carol Ann Strukel
17249 Sundance Dr.
College Station, Tx 77845**

**Etchpare, Llc
P.O. Box 848
Cheyenne, Wy 82003**

**Frank E Horton And Dorothy L. Horton, Husband
And Wife
18007 County Road 128
Nunn, Co 80648**

**Steven Layne Pursley
5146 N. Granite Reef Road
Scottsdale, Az 85250**

**Sylvia Childers And Buster Childers, Wife And
Husband
Campstool Rout, Box 64
Cheyenne, Wy 82007**

**Wadad Harlow Cashman
501 Los Angeles Dr.
El Paso, Tx 79902**

**Wadad Harlow Cashman
4305 Okeegge Dr.
El Paso, Tx 79902**

**Junior F. Stephan, And Loreen Stephan, Husband
And Wife
P.O. Box 692
Cheyenne, Wy 82003**



Geologic Testimony – Thomas A. Berkman

**Cause No. 535; Docket Nos. 151000628, 151000561, & 151000562
Spacing and Setback Applications
Niobrara Formations
Unnamed Field, Weld County, Colorado**

October 26th & 27th, 2015 Colorado Oil and Gas Conservation Commission Hearing

My name is Tom Berkman, and I am currently employed as a Senior Project Advisor for Anadarko E&P Onshore LLC ("Applicant"). I graduated from Colorado College in Colorado Springs with B.A. Degree in Geology, and from Oregon State University in Corvallis, OR with an M.S. in Geoscience. I have over 27 years of experience in the oil and gas industry. I am familiar with the lands subject to, and the matters set forth in the verified applications (the "Applications") described below and filed herein.

In support of Applicant's Applications and my sworn testimony herein, I am submitting four (4) exhibits. This testimony and exhibits provide the supporting basis for approval of the Applicant's request for orders to, among other things: (1) establish approximate 1280-acre drilling and spacing units¹ for the below-described lands²; (2) authorize the drilling of up to seven horizontal wells within the proposed units for the production of oil, gas and associated hydrocarbons from the Niobrara Formation; and (3) reduce well setbacks to 330' from the unit boundary.

Township 12 North, Range 65 West, 6th P.M.

Section 17: Lots 1-4
Section 20: All
Section 29: All

1,343 acres, more or less, Weld County, Colorado (Docket No. 151000628)

Township 12 North, Range 65 West, 6th P.M.

Section 18: Lots 1-4
Section 19: All
Section 30: All

1,299.82 acres, more or less, Weld County, Colorado (Docket No. 151000561)

¹ The lands subject to each respective application vary in acreage depending on the presence of irregular lots.

² Docket No. 151000628 is limited to a request for a reduction in setbacks.

Township 12 North, Range 65 West, 6th P.M.
Section 31: All

Township 11 North, Range 65 West, 6th P.M.
Section 6: All

1,262.83 acres, more or less, Weld County, Colorado (Docket No. 151000562)

Exhibit G-1

Exhibit G-1 is a Type Log of the Upper Cretaceous stratigraphy of the northern D-J Basin. The Niobrara Formation consists of 2 informal members, the Smokey Hill shale, and the Fort Hayes limestone, which directly overlies the Codell. The Pierre Shale overlies the Niobrara. The Carlisle shale is present below the Codell sandstone.

Exhibit G-2

Exhibit G-2 is a structure map on the top of the Codell / base Niobrara showing the proposed application lands. The map shows the structure dipping gently to the west at approximately 50 ft / mile across the proposed units. The synclinal basin axis is also shown inside the -3000 ss contour interval along the west side of the map.

Exhibit G-3

Exhibit G-3 is a net pay isopach map of the Niobrara shale. Thickness of the Niobrara net pay ranges from less than 130 ft in the northwest to approximately 140 ft along the east portion of the map. The net pay portion of the Niobrara is shown in the stratigraphic column in the upper left, and encompasses the productive "B" and "C" chalk benches of the Niobrara interval.

Exhibit G-4

Exhibit G-4 is a west to east stratigraphic cross-section across the proposed application lands, hung on the base of the Niobrara Formation. It is evident that the full Niobrara shale interval exists under the Application lands.

Conclusions

The Niobrara consists of 2 informal members, the Smoky Hill shale member and the Fort Hayes limestone member, deposited during a major marine transgression in the Cretaceous Western Interior Seaway.

The Niobrara is a self-sourced resource play that is present throughout much of the Rocky Mountain region. The Niobrara shale has been producing oil and gas in the DJ Basin for dozens of years, and exists under the entirety of the Application Lands.

To the best of my knowledge, all of the matters set forth herein, my testimony and the supporting exhibits are true, correct and accurate.

Dated this 22 day of September, 2015.

Thomas A. Berkman

Thomas A. Berkman
Sr. Project Geological Advisor
Anadarko Petroleum

VERIFICATION

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

The foregoing instrument was subscribed and sworn to before me this 22nd day of ~~September~~ 2015, by Thomas A. Berkman, Sr. Project Geological Advisor for Anadarko Petroleum

Witness my hand and official seal.

My commission expires: 10/17/2016

RACHEL MARIE CRUZ
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20124066688
MY COMMISSION EXPIRES 10/17/2016

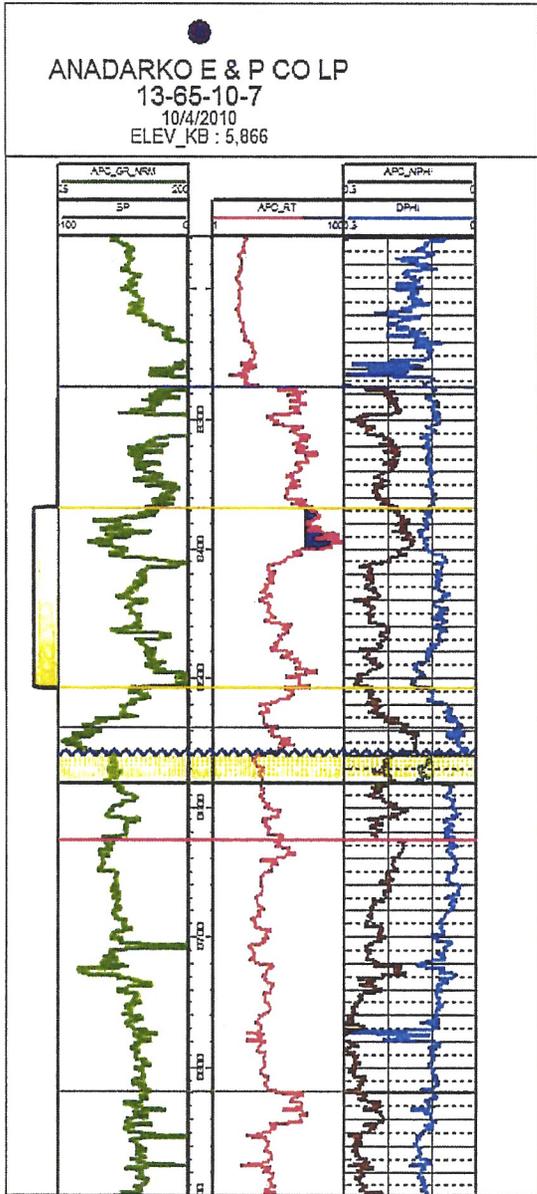
Notary Public *Rachel Marie Cruz*

Upper Cretaceous Type Log
Northern DJ Basin

Upper Cretaceous

Niobrara

Greenhorn



Pierre Shale

Smoky Hill Shale
Member

Ft Hayes Ls

Codell Ss

Carlise Sh

Limestone mbr

Exhibit G-1 Dockets:

151000628

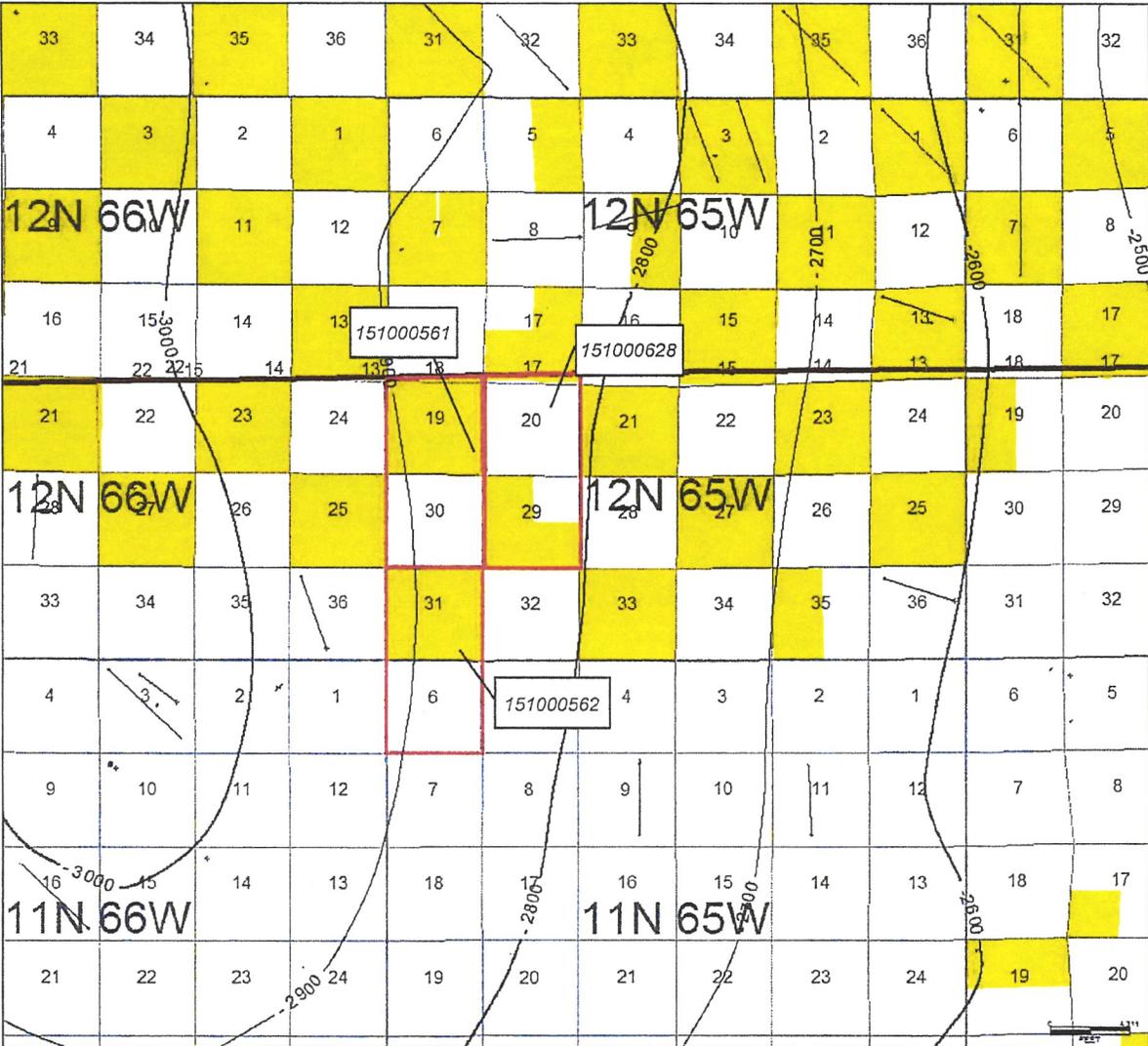
151000561

151000562



151000628
 151000561
 151000562

Top Codell (Base Niobrara) Structure Map (ss)



 Proposed Spacing Units



Anadarko Petroleum

Northern DJ Basin

Top Codell Structure Map

Codell & Niobrara DSU Applications



- WELL SYMBOLS
- ⊕ DRY & ABANDON GAS SHOWS
 - ⊕ DRY & ABANDON WITH OIL SHOWS
 - ⊕ DRY & ABANDONED-OIL SHOWS
 - ⊕ DRY AND ABANDON
 - ⊕ Dry Hole
 - ⊕ WATER INJECTION WELL
 - ⊕ Microseismic Monitor Well
 - ⊕ OBSERVATION WELL
 - ⊕ OIL WELL
 - ⊕ PLUGGED AND ABANDON OIL WELL
 - ⊕ PLUGGED & ABANDONED
 - ⊕ PLUGGED OIL
 - ⊕ PILOT HOLE

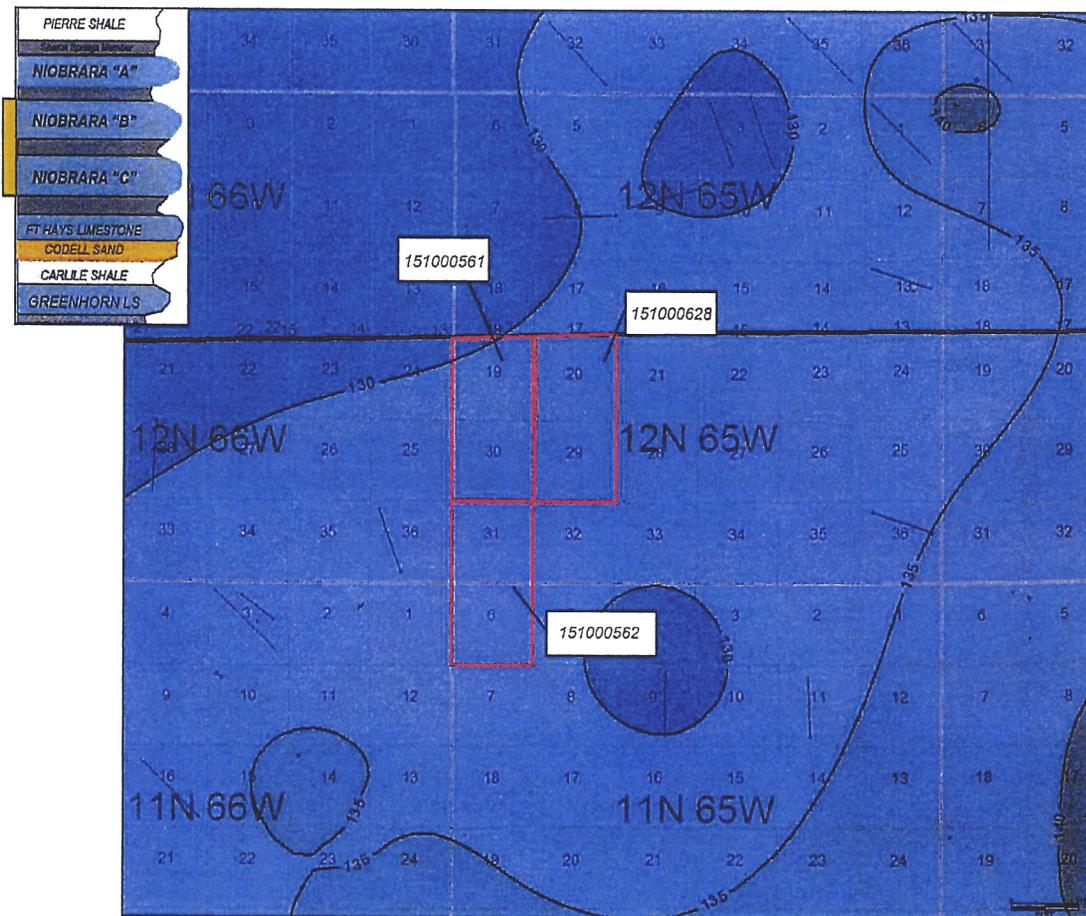
Niobrara Net Pay Isopach Map (ft)

Exhibit G-3 Dockets:

151000628

151000561

151000562

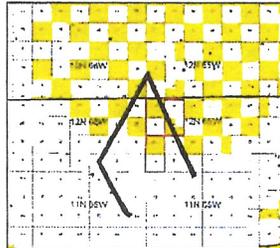
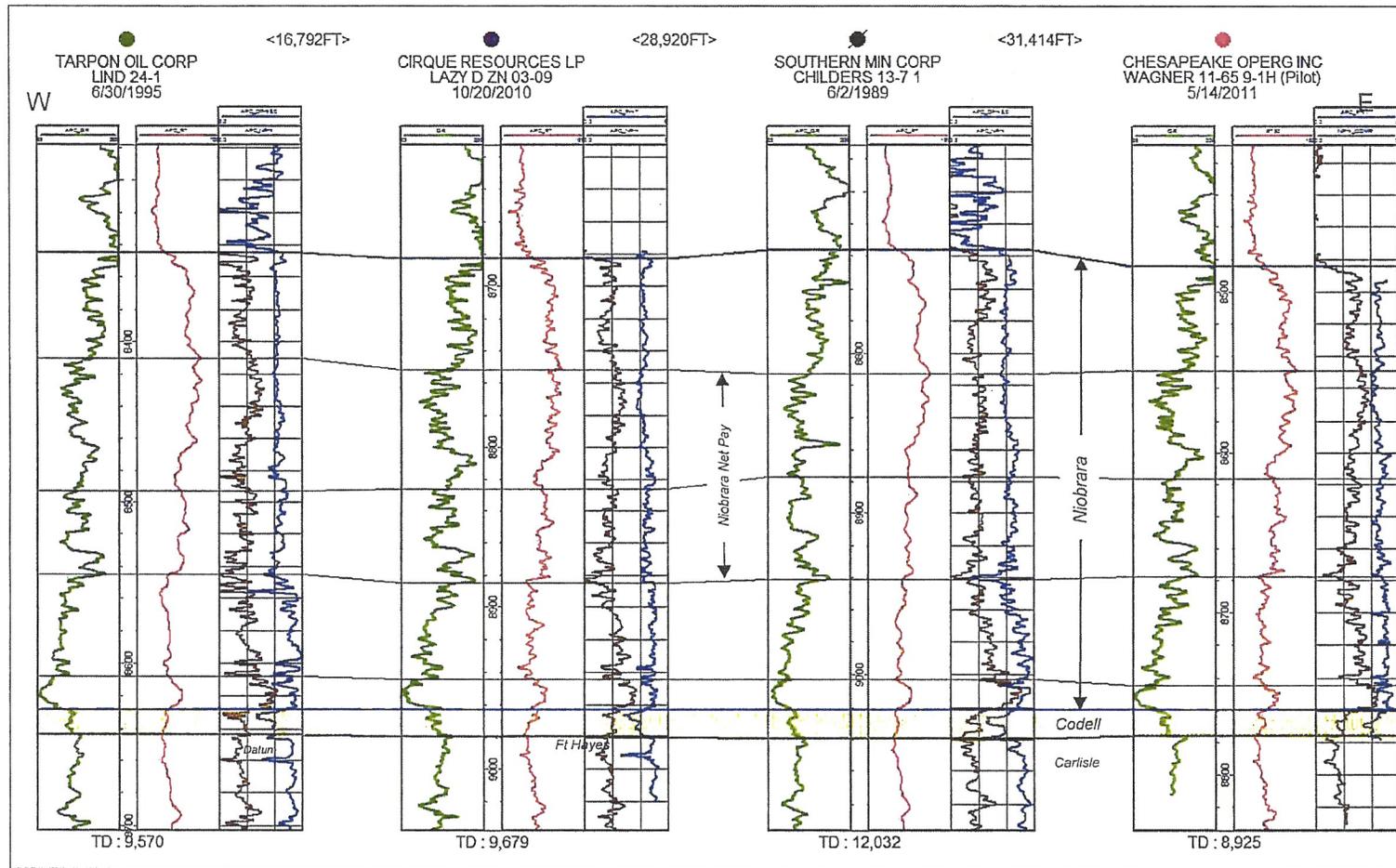


Proposed Spacing Units

Anadarko Petroleum
Laramie County
Niobrara Net Pay Isopach Map Codell & Niobrara Spacing Applications
WELL SYMBOLS
A DRY & ABANDON GAS SHOWS
⊥ DRY & ABANDON WITH OIL SHOWS
⊥ DRY W/O ABANDONED OIL SHOWS
⊥ DRY W/O ABANDON
⊥ Dry Hole
⊥ WATER INJECTION WELL
⊥ Junked and Abandoned
⊥ Microseismic Monitor Well
⊥ OIL & GAS
⊥ OIL & GAS
⊥ OBSERVATION WELL
⊥ OIL WELL
⊥ PLUGGED AND ABANDON OIL WELL
⊥ PLUGGED OIL
⊥ Working on Permit
⊥ FLOT HOLE
⊥ SERVICE WELL
⊥ SERVICE WELL
⊥ Temporarily Abandon
1" = 10,000'
0 10,000 20,000 FEET



Niobrara Stratigraphic Cross Section



Location Map

Exhibit G-4 Dockets: 151000628
151000561
151000562





Cause No. 421, Docket No. 1412-SP-2204



Cause No. 535
Docket No. 151000628, 151000561, & 151000562

Anadarko Petroleum Corporation

Emily Boecking – Engineering Testimony
Cause 535, Docket No. 151000628, 151000561, & 151000562
Spacing and Setback Applications
Niobrara Formations
Unnamed Field, Weld County, Colorado

My name is Emily Boecking, and I am currently employed as a Senior Reservoir Engineer for Anadarko Petroleum Corporation (“Anadarko”). I graduated from the Duke University in 2007 with a Bachelor of Science in Mechanical Engineering. I have over 7 years of experience in the oil and gas industry of which 5 years have spent as a reservoir engineer. I am familiar with the lands subject to, and the matters set forth in the October 16, 2014, verified application (the “Application”). My resume/CV is attached to this submission. See Appendix.

In support of the Application, I am submitting two exhibits. The exhibits are attached to my sworn testimony and form the basis for the Application requesting for orders to, among other things, (1) establish approximate 1280-acre drilling and spacing units¹ for the below-described lands; (2) authorize the drilling of up to seven horizontal wells within the proposed units for the production of oil, gas and associated hydrocarbons from the Niobrara Formation; and (3) reduce well setbacks to 330’ from 600’ from the unit boundary.

Township 12 North, Range 65 West, 6th P.M.

Section 17: Lots 1-4
Section 20: All
Section 29: All

1,275.80 acres, more or less, Weld County, Colorado (Docket No. 151000628)

Township 12 North, Range 65 West, 6th P.M.

Section 18: Lots 1-4
Section 19: All
Section 30: All

1,275.80 acres, more or less, Weld County, Colorado (Docket No. 151000561)

Township 12 North, Range 65 West, 6th P.M.

Section 31: All

Township 11 North, Range 65 West, 6th P.M.

Section 6: All

¹ The lands subject to each respective application vary in acreage depending on the presence of irregular lots.

1,360 acres, more or less, Weld County, Colorado (Docket No. 150500562)

1. Exhibit No. E-1

Exhibit No. E-1 is a table showing reservoir drainage area calculations for currently producing offsetting wells in the Northern DJ Basin closest to the proposed unit. Wells included in this table are producing from the Niobrara formation with production for 9 months or more and have horizontal completed lateral lengths ranging from 8,500'- 9,500'.

2. Exhibit No. E-2

Exhibit No. E-2 shows the decline curves used to extrapolate estimated ultimate recovery for use in the drainage area calculations for the Niobrara.

Testimony and Conclusions

Anadarko believes that drilling and completion of seven horizontal well in the Niobrara Formation underlying the Application Lands is the most efficient and economic method to develop the resource potential for this formation.

The average drainage areas for the wells drilling in the Niobrara Formation offsetting the Application Lands, with 8,500- 9,500' laterals, was calculated to be 115 acres. A total of 7 Niobrara wells will drain $7 \times 115 = 805$ acres, which is less than the size of the established 1,280 acre DSU. Furthermore, with a calculated effective drainage radius of 256 feet, a setback of 330 feet will allow the production of reserves that otherwise would not be recovered from the Niobrara, thus preventing waste.

It is acknowledged that while these methods of calculation are widely accepted in the industry as sound approximations for reservoir volume and dimensions, there are statistical outliers. Furthermore, factors such as heterogeneity of reservoir, effective propped hydraulic fracturing, and elapsed production at the time analysis is performed affect the input parameters for the volumetric calculations. Therefore, the average drainage area and average drainage radius of the well set is utilized as the basis of support for the analysis and recommendation provided within this testimony.

Based on my engineering analysis, it is my recommendation the Commission authorize the establishment of the 1,280 acre DSUs, the drilling of up to seven Niobrara wells within the established DSU, and the reduced setback to 330' from 600' from the unit boundary. By so doing the development of said Application Lands will promote efficient drainage, protect correlative rights, and avoid waste of the resource.

To the best of my knowledge, all of the matters set forth herein, my testimony and the supporting exhibits are true, correct and accurate.

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.

Emily Boecking

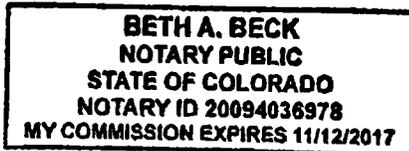
Emily Boecking
Senior Reservoir Engineer
Anadarko Petroleum Corporation

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

The foregoing instrument was subscribed and sworn to before me this 1st day of October, 2015, by Emily Boecking, Senior Reservoir Engineer for Anadarko Petroleum Corporation.

Witness my hand and official seal.

[SEAL]



My commission expires: 11/12/2017

Beth A. Beck

Notary Public



Colorado Oil and Gas Conservation Commission Hearings

Docket #'s

151000628
151000561
151000562

Engineering Exhibits

Emily Boecking
Sr Reservoir Engineer
Anadarko Petroleum
Denver, CO

Exhibit E-1: Niobrara Drainage Area Calculation

Niobrara Horizontal Well Drainage Area Calculation

API No	Lease	Well No	Reservoir	Operator	Section	Township	Range	Cumulative Oil (bbl)	EUR Oil (bbl) (1)	Completed Interval	Average Porosity (phi, %) (2)	Water Saturation (Sw, %) (2)	Thickness (h, ft) (2)	Drainage Area (A, acres) (3)	Joshi Effective Drainage Radius (r, ft) (4)
49021210820000	JUBILEE	153-1034H	NIOBRARA	EOG Resources	10	13N	65W	95,480	217,691	9,371	8	55	135	134	298
49021210860000	JUBILEE	154-1034H	NIOBRARA	EOG Resources	10	13N	65W	121,705	400,180	9,365	8	54	135	242	517
49021210870000	JUBILEE	151-1034H	NIOBRARA	EOG Resources	10	13N	65W	123,803	319,129	9,484	8	54	135	193	414
49021210890000	JUBILEE	152-1034H	NIOBRARA	EOG Resources	10	13N	65W	57,249	133,050	9,307	8	54	135	80	182
49021210910000	JUBILEE	193-2326H	NIOBRARA	EOG Resources	23	13N	65W	39,118	157,017	9,021	8	54	132	97	226
49021211080000	JUBILEE	156-2227H	NIOBRARA	EOG Resources	22	13N	65W	8,794	20,488	9,156	8	53	133	12	29
49021211100000	JUBILEE	155-2210H	NIOBRARA	EOG Resources	22	13N	65W	33,844	84,124	8,324	8	51	135	48	25
AVERAGE								68,570	190,240	9,147	8	54	134	115	256

(1) EUR projected using ARPS decline curve analysis

(2) Anadarko petrophysical analysis

(3) Drainage area equation:
$$A = \frac{EUR * B_O}{7758 * h * phi * (1 - S_w) * R_F}$$

(4) Joshi Method Effective Drainage Radius:
$$A = \frac{\pi r^2 + 2r * L}{43560}$$

Average Drainage Area: 115 Acres

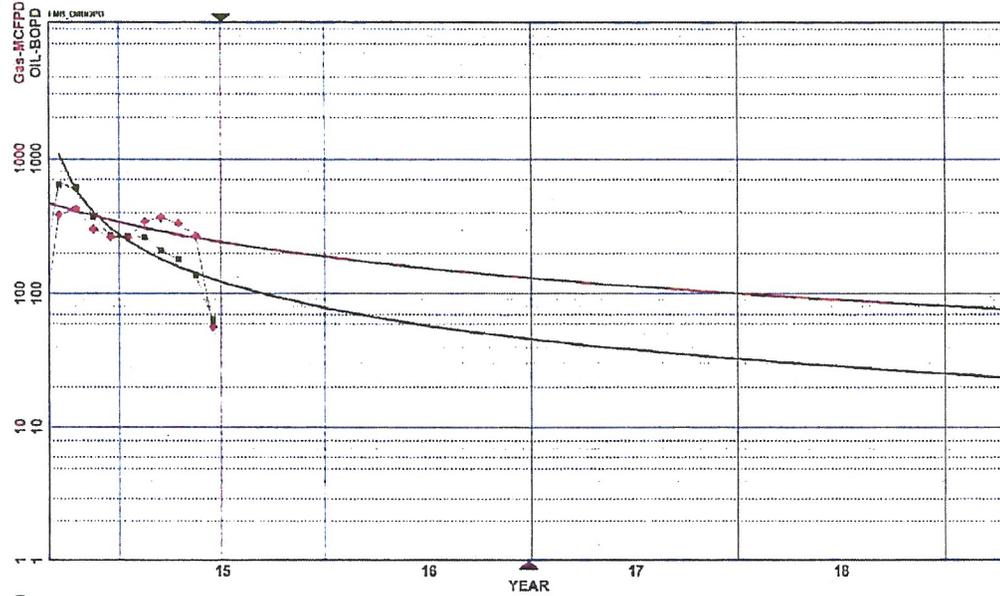
Average Effective Drainage Radius: 256 ft

$B_O = 1.4$

$R_F = 6\%$

Exhibit E-2: Niobrara Decline Curve Analysis

Jubilee 153-1034H
 49021210820000
 Niobrara
 EOG Resources
 10 13N 65W
 Cum Oil (BO) 77,388
 EUR Oil (BO) 240,095



Jubilee 154-1034H
 49021210860000
 Niobrara
 EOG Resources
 10 13N 65W
 Cum Oil (BO) 88,048
 EUR Oil (BO) 253,350

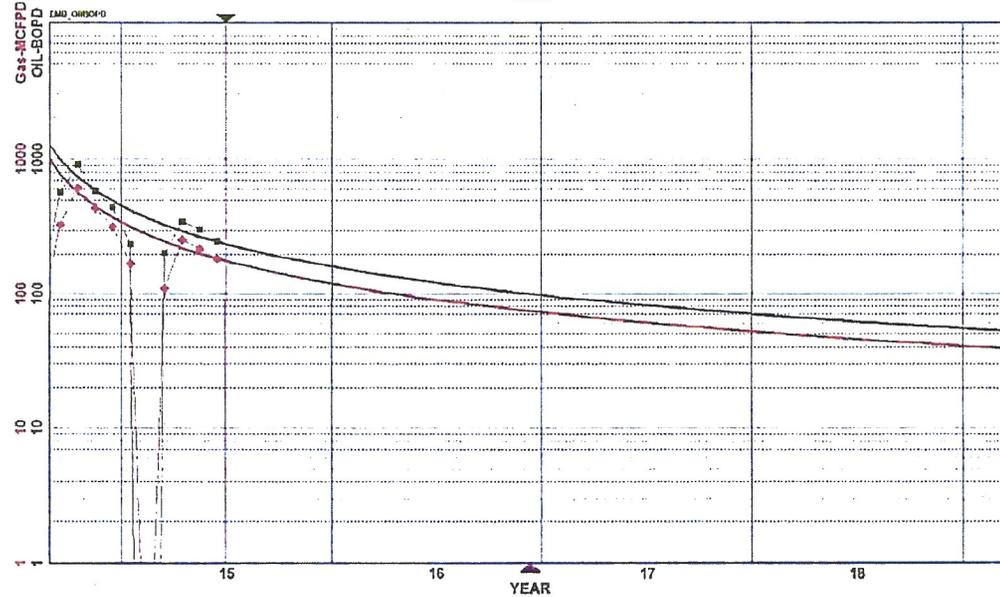
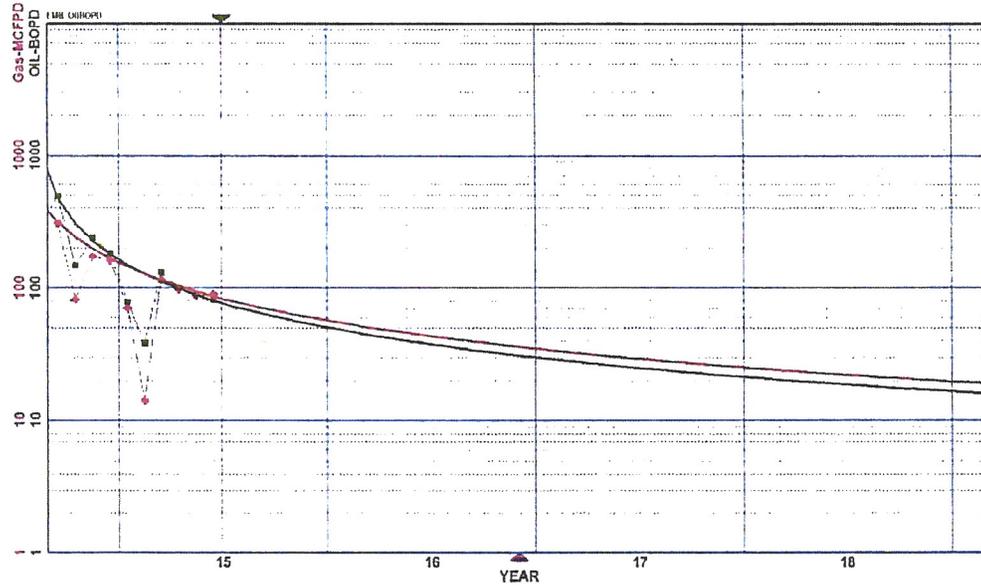


Exhibit E-2: Niobrara Decline Curve Analysis

Jubilee 152-1034H
49021210890000
Niobrara
EOG Resources
10 13N 65W
Cum Oil (BO) 44,947
EUR Oil (BO) 103,652



Jubilee 151-1034H
49021210870000
Niobrara
EOG Resources
10 13N 65W
Cum Oil (BO) 102,680
EUR Oil (BO) 331,226

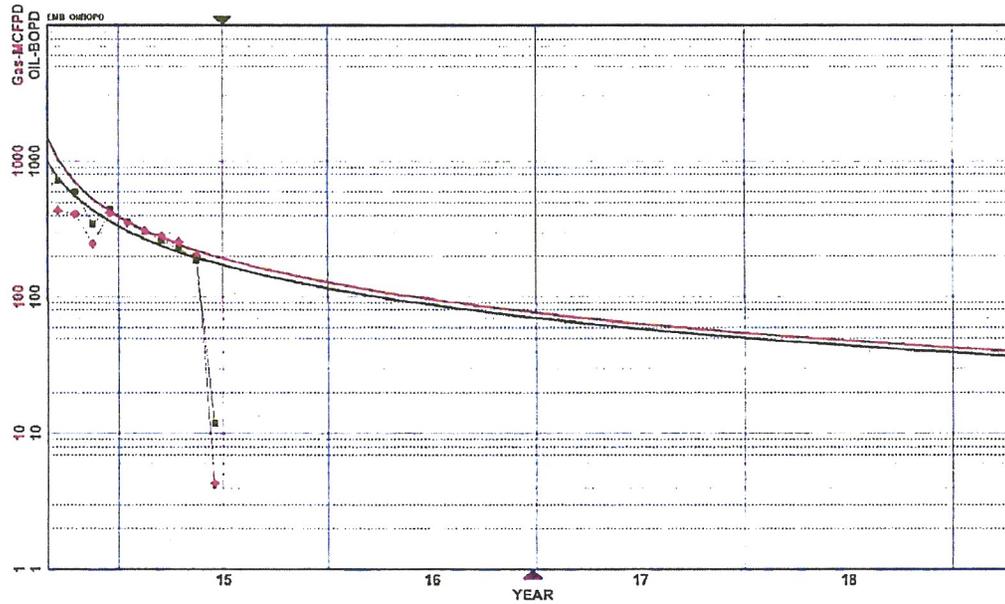
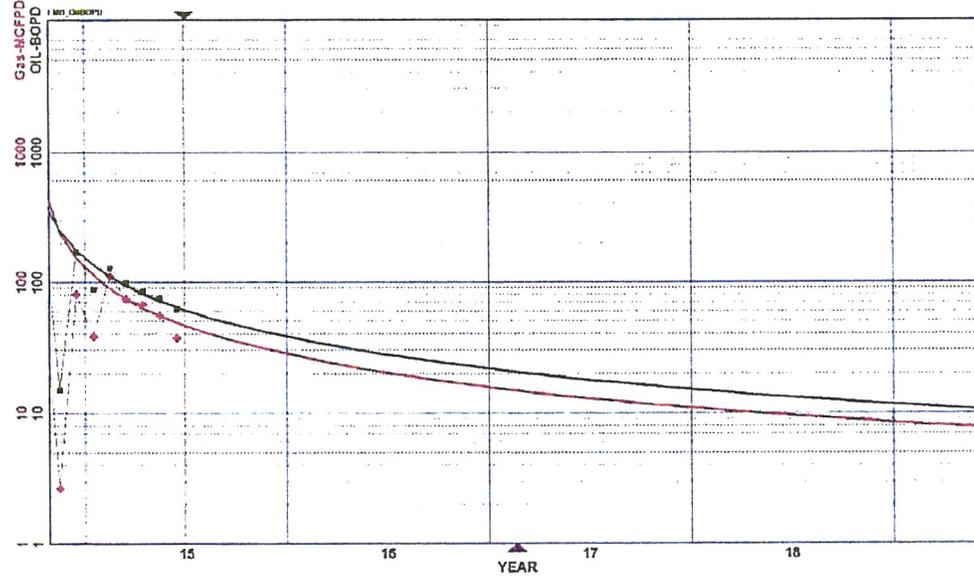


Exhibit E-2: Niobrara Decline Curve Analysis

Jubilee 155-2210H
49021211100000
Niobrara
EOG Resources
22 13N 65W
Cum Oil (BO) 24,086
EUR Oil (BO) 61,334



Jubilee 156-2227H
49021211080000
Niobrara
EOG Resources
22 13N 65W
Cum Oil (BO) 6,021
EUR Oil (BO) 36,345

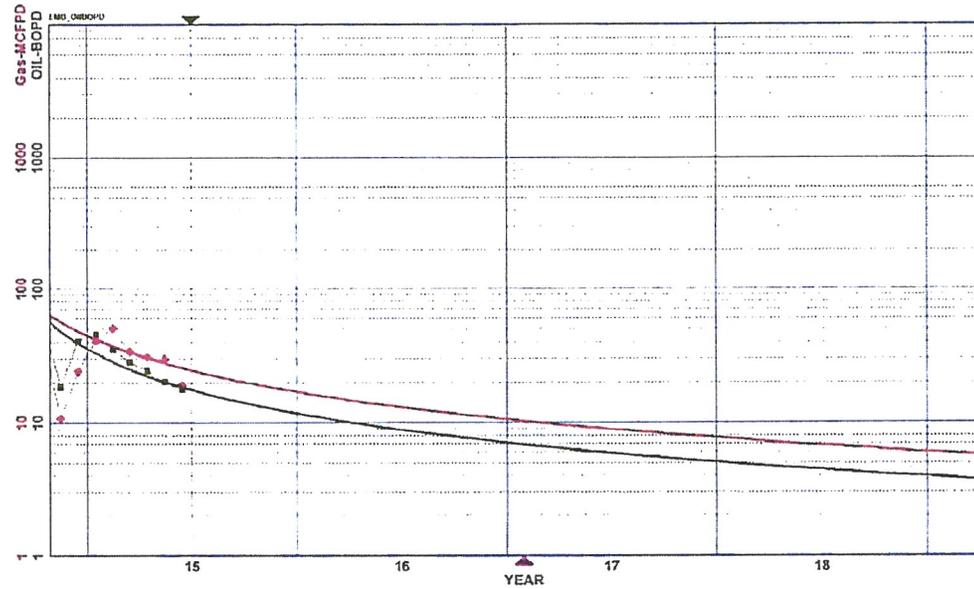


Exhibit E-2: Niobrara Decline Curve Analysis

Jubilee 193-2326H
49021210910000
Niobrara
EOG Resources
23 13N 65W
Cum Oil (BO) 24,086
EUR Oil (BO) 61,334

