# BEFORE THE OIL CONSERVATION DIVISION EXAMINER HEARING MARCH 7, 2019

# **CASE No. 20271**

HARRIER WELLS (W/2) (101H, 102H, 103H, 201H, 202H, 301H, 302H, 303H, 304H, 305H)

# LEA COUNTY, NEW MEXICO



# STATE OF NEW MEXICO DEPARTMENT OF ENERGY, MINERALS AND NATURAL RESOURCES OIL CONSERVATION DIVISION

APPLICATION OF COG OPERATING LLC FOR COMPULSORY POOLING, LEA COUNTY, NEW MEXICO.

**CASE NO. 20271** 

# AFFIDAVIT OF MATTHEW SOLOMON

Matthew Solomon, of lawful age and being first duly sworn, declares as follows:

- 1. My name is Matthew Solomon. I work for COG Operating LLC ("COG") as a Landman.
- 2. I have previously testified before the New Mexico Oil Conservation Division as an expert witness in petroleum land matters. My credentials as a petroleum landman have been accepted by the Division and made a matter of record.
- 3. I am familiar with the applications filed by COG in these matters and familiar with the status of the lands in the subject areas.
- 4. None of the parties proposed to be pooled in these cases has indicated opposition, therefore I do not expect any opposition at the hearing.
- 5. COG seeks an order pooling all uncommitted interests in the Bone Spring formation underlying a 640-acre horizontal spacing unit comprised of the W/2 of Section 35, Township 25 South, Range 32 East and the W/2 of Section 2, Township 26 South, Range 32 East Lea County. This horizontal spacing until will be dedicated to the following ten proposed initial wells:
  - The Harrier Federal Com #101H well to be drilled from a surface hole location in SE/4 SW/4 (Unit N) of Section 2 to a bottom hole location in the NE/4 NW/4 (Unit C) of Section 35.

1

- The Harrier Federal Com #102H well to be drilled from a surface hole location in SW/4 SW/4 (Unit M) of Section 2 to a bottom hole location in the NW/4 NW/4 (Unit D) of Section 35.
- The Harrier Federal Com #103H well to be drilled from a surface hole location in NW/4 NW/4 (Unit D) of Section 35 to a bottom hole location in the SW/4 SW/4 (Unit M) of Section 2.
- The Harrier Federal Com #201H well to be drilled from a surface hole location in SE/4 SW/4 (Unit N) of Section 2 to a bottom hole location in the NW/4 NW/4 (Unit D) of Section 35.
- The Harrier Federal Com #202H well to be drilled from a surface hole location in NW/4 NW/4 (Unit D) of Section 35 to a bottom hole location in the SW/4 SW/4 (Unit M) of Section 2.
- The Harrier Federal Com #301H well to be drilled from a surface hole location in SE/4 SW/4 (Unit N) of Section 2 to a bottom hole location in the NE/4 NW/4 (Unit C) of Section 35.
- The Harrier Federal Com #302H well to be drilled from a surface hole location in SE/4 SW/4 (Unit N) of Section 2 to a bottom hole location in the NE/4 NW/4 (Unit C) of Section 35.
- The Harrier Federal Com #303H well to be drilled from a surface hole location in SE/4 SW/4 (Unit N) of Section 2 to a bottom hole location in the NE/4 NW/4 (Unit C) of Section 35.
- The Harrier Federal Com #304H well to be drilled from a surface hole location in SW/4 SW/4 (Unit M) of Section 2 to a bottom hole location in the NW/4 NW/4 (Unit D) of Section 35.
- The Harrier Federal Com #305H well to be drilled from a surface hole location in SW/4 SW/4 (Unit M) of Section 2 to a bottom hole location in the NW/4 NW/4 (Unit D) of Section 35.
- 6. The completed intervals for the proposed Harrier Federal Com #101H, 201H and 303H wells will each be within 330 feet of the quarter-quarter line separating the W/2 W/2 and the E/2 W/2 of Sections 35 and 2 to allow inclusion of this acreage as proximity tracts into a standard 640-acre horizontal well spacing unit.
- 7. The completed interval for the Harrier Federal Com #102H, 301H, 302H, 304H and 305H wells will remain within the standard setback as required by the statewide

rules for oil wells. The completed intervals for the Harrier Federal Com #103H and 202H Wells will be closer to the outer boundary of the spacing unit that rules allow and, therefore, will be at unorthodox locations. COG has separately filed for and obtained orders approving non-standard well locations for these wells.

- 8. **COG Exhibit No. 1A** contains draft Form C-102s for the proposed wells.
- 9. **COG Exhibit No. 1B** identifies the tracts of land comprising the proposed spacing and proration unit in this case. This exhibit also identifies the interest ownership by tract and ultimately by spacing unit. COG is seeking to pool the interests identified under each Pooling Notification List in the exhibit. COG is seeking to pool working interest owners and two overriding royalty interest owners.
- 10. All interest owners that COG seeks to pool are locatable. COG has conducted a diligent search of all public records in Lea County, including phone directories and computer databases.
- 11. COG Exhibit No. 1C contains a sample of the well proposal letter along with an AFE provided to the working interest owners COG is seeking to pool. In addition to this letter, COG has made a diligent effort to reach agreement with the parties it is seeking to pool.
- 12. The costs reflected in the AFE are consistent with what other operators have incurred for drilling similar horizontal wells in the area in each of these formations.
- 13. In my opinion, COG has made good faith efforts to reach agreement with the parties it is seeking to pool. If COG reaches an agreement with any of the proposed pool parties before the Division enters an order, I will let the Division know that COG is no longer seeking to pool those parties.

- 14. No ownership depth severances exist within these proposed spacing and proration units, and there are no unleased mineral interests in the subject acreage.
- 15. COG has estimated the overhead and administrative costs for drilling and producing the proposed wells at \$7,000 per month while drilling and \$700 per month while producing. These costs are consistent with what other operators are charging in this area for similar wells.
- 16. I provided the law firm of Holland & Hart LLP a list of names and addresses for the owners that COG seeks to pool and instructed that they be notified of this hearing.
- 17. COG Exhibit Nos. 1A through 1C were either prepared by me or compiled under my direction and supervision.

FURTHER AFFIANT SAYETH NOT.

Matthew Solomon

STATE OF TEXAS )
COUNTY OF Midland
SUBSCRIBED and SWORN to before me thisleth_ day of March 2019 by
Matthew Solomon.
Melissa L Dimit Notary Public, State of Texas Notary ID 12542763-4 My Commission Exp. 09-09-2021
My Commission Expires:
9/9/2021

1625 N. FRENCH DR., HOBES, NM 86240 Phone: (575) 393-6161 Fax: (575) 393-0720

State of New Mexico Energy, Minerals & Natural Resources Department DIVISION OIL CONSERVATION

DISTRICT II 811 S. FIRST ST., ARTESIA, NM 88210 Phone: (575) 748-1283 Fax: (575) 748-9720

1220 SOUTH ST. FRANCIS DR.

Form C-102 Revised August 1, 2011 Submit one copy to appropriate District Office

DISTRICT III 1000 RIO BRAZOS RD., AZTEC, NM 87410 Phone: (505) 334-6178 Fax: (505) 334-6170 DISTRICT IV 1220 S. ST. FRANCIS DR., SANTA FE, NM 67505 Phone: (505) 476-3460 Fax: (505) 476-3462 Santa Fe, New Mexico 87505

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT Pool Name API Number Pool Code

Well Number Property Name Property Code HARRIER FEDERAL COM 101H OGRID No. Operator Name Elevation 3246.1' COG OPERATING, LLC

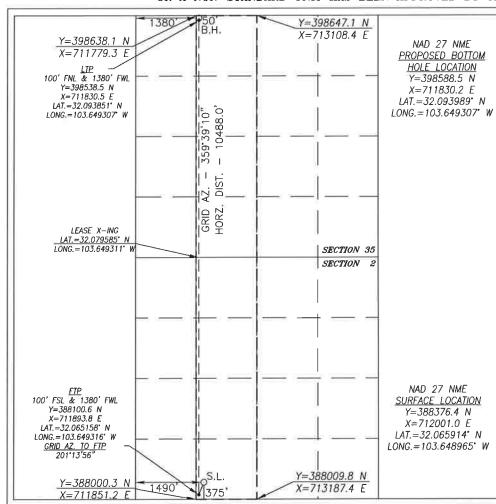
### Surface Location

UL or lo	t No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N		2	26-S	32-E		375	SOUTH	1490	WEST	LEA

#### Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
С	35	25-S	32-E		50	NORTH	1380	WEST	LEA
Dedicated Acres	Joint of	r Infill Co	nsolidation	Code Or	der No.		11		11

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



#### OPERATOR CERTIFICATION

I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

## BEFORE THE OIL CONSERVATION DIVISION

Santa Fe, New Mexico

Exhibit No. 1A

Submitted by: COG OPERATING LLC

Hearing Date: March 7, 2019 Case Nos. 20271

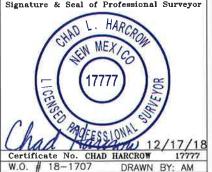
#### SURVEYOR CERTIFICATION

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

DECEMBER 12, 2018

Date of Survey

Signature & Seal of Professional Surveyor



DISTRICT I
1025 N. FRENCH DR., HOBBS, NM 88240
Phone: (676) 993-0161 Fax: (676) 993-0720

DISTRICT II
0155 N. FRENCH DR., HOBBS, NM 88240
Phone: (676) 993-0161 Fax: (676) 993-0120

OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR. State of New Mexico

1220 SOUTH ST. FRANCIS DR. Santa Fe, New Mexico 87505

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DISTRICT IV 1220 S. ST. FRANCIS DR., SANTA FE, NM 87505 Phone: (505) 476-3460 Fax: (505) 476-3462

□ AMENDED REPORT

: (805) 470-3400 Fax: (805) 470-3402	WELL LOCATION AND	ACREAGE DEDICATION	PLAT
API Number	Pool Code		Pool Name
Property Code	Prop	erty Name	Well Number
	HARRIER	FEDERAL COM	102H
OGRID No.		ator Name	Elevation
	COG OPE	RATING, LLC	3247.3'

#### Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	2	26-S	32-E		330	SOUTH	750	WEST	LEA

### Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	35	25-S	32-E		640	NORTH	690	WEST	LEA
Dedicated Acres	Joint o	r Infill Co	nsolidation (	Code Ord	ler No.				

<u>Y=398629.2 N</u> X=710450.2 E	Y=398638.1 N X=711779.3 E			OPERATOR CERTIFICATION  I hereby certify that the information
	359:38'48" - 10298.3' - 0.00		NAD 27 NME PROPOSED LTP & BOTTOM HOLE LOCATION Y=398393.8 N X=711140.4 E	herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.
	AZ. – DIST. –	l ř	LAT.=32.093466* N LONG.=103.651538* W	Signature Date
LEASE X-ING	GRID HORZ.			Printed Name
LAT = 32,079585' N LONG.=103.651541' W				E-mail Address
L0140105.057547 W		anamon os		SURVEYOR CERTIFICATION
		SECTION 35 SECTION 2		I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.
				DECEMBER 12, 2018
	h <del>+</del>			Date of Survey
	l r l			Signature & Seal of Professional Surveyor
FIP			NAD 27 NME	CHAO L. HARCROM
100' FSL & 690' FWL Y=388095.7 N X=711203.8 E LAT.=32.065157' N LONG.=103.651543' W			SURFACE LOCATION Y=388326.2 N X=711261.5 E LAT.=32.065789' N	17777 ) S S S S S S S S S S S S S S S S S
GRID AZ, TO FTP 194°02'03"			LONG.=103.651353* W	Chad Harris 12/17/18
<u>Y=387990.8 N</u> X=710514.9 E	Y=388000.3 N X=711851.2 E			Certificate No. CHAD HARCROW 17777   W.O. # 18-1703   DRAWN BY: AM

State of New Mexico DISTRICT I
1025 N. FRENCH DR., HOBBS, NM 88240
Phone: (676) 393-6161 Fax: (676) 393-0720

State of New Mexico

& Natural Resources Department DIVISION OIL CONSERVATION

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DISTRICT IV 1220 S. ST. FRANCIS DR., SANTA FE, NM 87505 Phone: (506) 476-3460 Fax: (505) 476-3462 WELL LOCATION AND ACREAGE DEDICATION PLAT Pool Name API Number Pool Code Well Number Property Name Property Code HARRIER FEDERAL COM 103H OGRID No. Operator Name Elevation COG OPERATING, LLC 3369.5'

#### Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	35	25-S	32-E		435	NORTH	232	WEST	LEA

#### Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
М	2	26-S	32-E		50	SOUTH	10	WEST	LEA
Dedicated Acre	Joint of	r Infill	Consolidation	Code Or	der No.	191	111		

Y=398629.2 N X=710450.2 E 100' FNL & 10' FWL Y=398529.2 N X=710460.3 E LAT.=32.093850' N LONG.=103.653731' W GRID AZ. TO FIP 326'12'53"	Y=398638.1 N X=711779.3 E	NAD 27 NME <u>SURFACE LOCATION</u> Y=398195.6 N X=710683.5 E LAT.=32.092929° N	OPERATOR CERTIFICATION  I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.
GRID AZ 179'38'59  GRID AZ 179'38'59	SECTION 35	LONG.=103.653018' W	Signature Date  Printed Name  E-mail Address  SURVEYOR CERTIFICATION  I hereby certify that the well location shown on this plat was plotted from field
		NAD 27 NME <u>PROPOSED BOTTOM</u> HOLE LOCATION	notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.  DECEMBER 12, 2018  Date of Survey  Signature & Seal of Professional Surveyor
100' FSL & 10' FWL Y=388090.9 N X=710524.1 E LAT.=32.065155' N LONG.=103.653738' W	Y=388000.3 N	Y=388040.9 N X=710524.4 E LAT.=32.065018 N LONG.=103.653738 W	(17777) 86 (17777) 86
<u>Y=387990.8 N</u> X=710514.9 E 10 B.H.	X=7 1851.2 E		Certificate No. CHAD HARCROW 17777 W.O. # 18-1700 DRAWN BY: AM

DISTRICT I 1625 N. FRENCH DR., HOBBS, NM 66240 Phone: (576) 393-6161 Fax: (576) 393-0720

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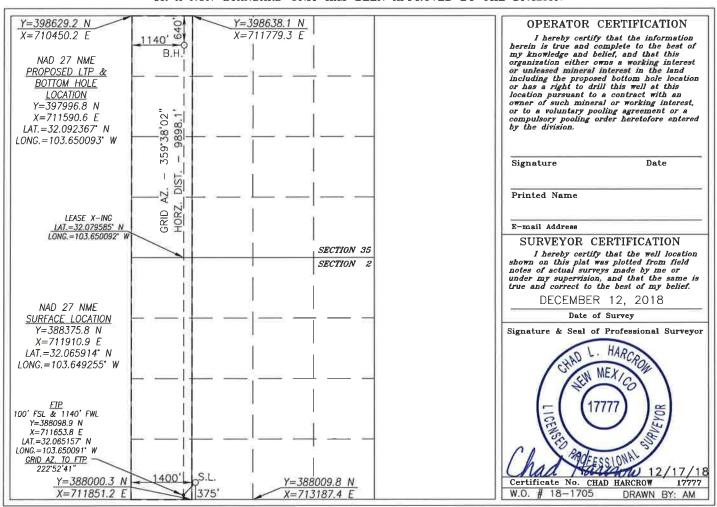
Revised August 1, 2011

Form C-102

DISTRICT IV 1220 S. ST. FRANCIS DR., SANTA FE, NM 87505 Phone: (505) 478-3480 Fax: (505) 478-3462

☐ AMENDED REPORT

nonc. (bob) 110 di			WELL LO	CATION	AND ACREA	GE DEDICATI	ON PLAT		
API	Number			Pool Code			Pool Name		
Property (	Code	<u> </u>			Property Nan			Well Num	
				HAR	RIER FEDEF	CAL COM		201	iΗ
OGRID N	).				Operator Nam			Elevatio	n
				COC	G OPERATIN	G, LLC		3249	∂.3°
					Surface Loc	ation			
UL or lot No.	Section	Township	Township Range Lot Idn Feet from the North/South line Feet from the						County
N	2	26-S	32-E		375	SOUTH	1400	WEST	LEA
			Bottom	Hole Loc	ation If Diffe	rent From Sur	face		
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	35	25-S	32-E		640	NORTH	1140	WEST	LEA
Dedicated Acres	Joint o	r Infill Co	nsolidation (	ode Or	der No.				-



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#### WELL LOCATION AND ACREAGE DEDICATION PLAT API Number Pool Code Pool Name Property Code Property Name Well Number HARRIER FEDERAL COM 202H OGRID No. Operator Name Elevation COG OPERATING, LLC 3369.5

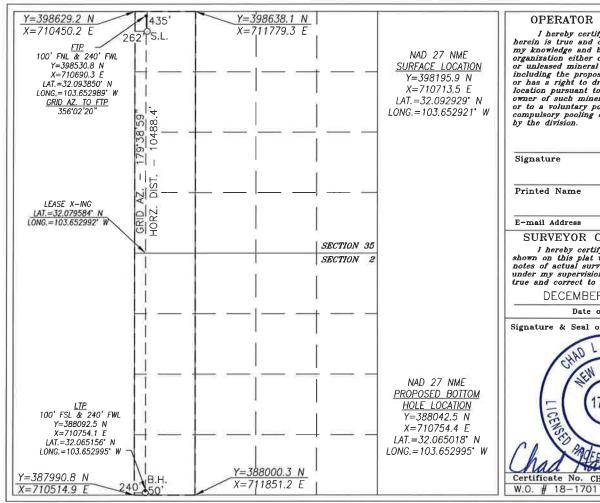
#### Surface Location

ſ	UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
	D	35	25-S	32-E		435	NORTH	262	WEST	LEA

#### Bottom Hole Location If Different From Surface

	UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
	М	2	26-S	32-E		50	SOUTH	240	WEST	LEA
Dedicated Acres   Joint or Infill		r Infill Con	nsolidation (	Code Or	der No.			111		

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



### OPERATOR CERTIFICATION

I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Date Printed Name

### SURVEYOR CERTIFICATION

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

**DECEMBER 12, 2018** 

Date of Survey

Signature & Seal of Professional Surveyor



DRAWN BY: AM

DISTRICT I

State of New Mexico 1825 N. FRENCH DR., HOBBS, NM 88240 Energy, Minerals & Natural Resources Department OIL CONSERVATION DIVISION

DISTRICT II 811 S. FIRST ST., ARTESIA, NM 88210 Phone: (575) 748-1283 Fax: (575) 748-8720

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DISTRICT IV 1220 S. ST. FRANCIS DR., SANTA FE, NM 67605 Phone: (505) 476-3460 Fax: (505) 476-3462

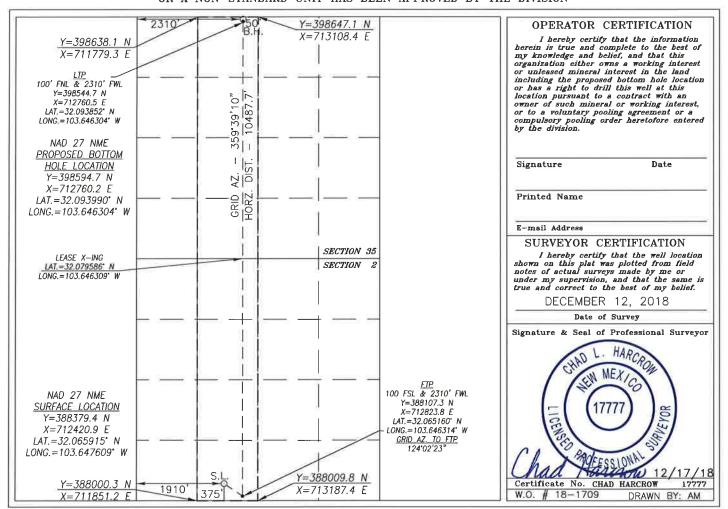
WELL LOCATION AND ACREAGE DEDICATION PLAT API Number Pool Code Pool Name Property Name Well Number Property Code HARRIER FEDERAL COM 301H Operator Name OGRID No. Elevation COG OPERATING, LLC 3252.6

#### Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	2	26-S	32-E		375	SOUTH	1910	WEST	LEA

#### Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
С	35	25-S	32-E		50	NORTH	2310	WEST	LEA
Dedicated Acres   Joint or Infill   Consolidation Code		Code Ore	der No.	h	11		lıı ————		



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State of New Mexico

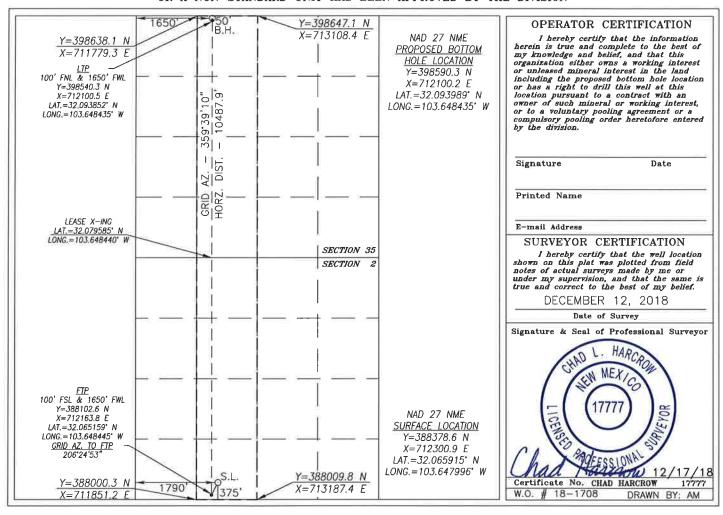
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□ AMENDED REPORT

			WELL LO	CATION	AND ACREA	GE DEDICATI	ON PLAT			
API	Number		1	Pool Code			Pool Name			
Property (	Code				Property Nan	1e		Well Num	iber	
				HAR	RIER FEDEF	RAL COM		302	2H	
OGRID No	).				Operator Nan	1e		Elevatio	n	
				COG OPERATING, LLC						
	Surface Location									
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County	
N	2	26-S	32-E		375	SOUTH	1790	WEST	LEA	
			Bottom	Hole Loc	ation If Diffe	erent From Sur	face			
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County	
С	C 35 25-S				50	NORTH	1650	WEST	LEA	
Dedicated Acres	Joint o	r Infill Co	nsolidation (	Code Ord	ler No.		·	14		



State of New Mexico DISTRICT I

1625 N. FRENCH DR., HOBBS, NM 68240
Phone: (575) 383-6161 Fax: (676) 393-0720

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1220 SOUTH ST. FRANCIS DR. Santa Fe, New Mexico 87505

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□ AMENDED REPORT

WELL LOCATION	AND	ACREAGE	DEDICATION	PLAT	
Pool Code				Pool Name	

API Number	Pool C	Code	Pool Name	
Property Code	I	Property Name HARRIER FEDERAL	COM	Well Number 303H
OGRID No.		COG OPERATING,	LLC	Elevation 3246.8'

#### Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	2	26-S	32-E		375	SOUTH	1460	WEST	LEA

### Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
С	35	25-S	32-E		50	NORTH	1360	WEST	LEA
Dedicated Acre	s Joint o	r Infill Co	nsolidation	Code Or	der No.		•	•	

Y=398638.1 N X=711779.3 E LIP 100' FNL & 1360' FWL Y=398538.3 N X=711810.5 E LAT.=32.093851' N LONG.=103.649371' W	359:39'10" 10488.0' 10488.0'	Y=398647.1 N X=713108.4 E	NAD 27 NME PROPOSED BOTTOM HOLE LOCATION Y=398588.3 N X=711810.2 E LAT.=32.093989* N LONG.=103.649371* W	OPERATOR CERTIFICATION  I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.
	GRID AZ. — HORZ. DIST.			Signature Date Printed Name
LEASE X-ING LAT.=32,079585' N LONG.=103.649376' W		SECTION 35   SECTION 2		E-mail Address  SURVEYOR CERTIFICATION  I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.
		_   -		DECEMBER 12, 2018  Date of Survey  Signature & Seal of Professional Surveyor
100' FSL & 1360' FWL Y=388100.5 N X=711873.8 E LAT.=32.065158' N LONG.=103.649381' W GRID AZ. TO FTP 199'24'00"			NAD 27 NME <u>SURFACE LOCATION</u> Y=388376.2 N X=711970.9 E LAT.=32.065914* N LONG.=103.649062* W	TOTAL MEXICO STATE OF THE PROPERTY OF THE PROP
Y=388000.3 N X=711851.2 E	S.L. 1460 375	Y=388009.8 N X=713187.4 E		Certificate No. CHAD HARCROW 17777 W.O. # 18-1706 DRAWN BY: AM

DISTRICT I 1625 N. FRENCH DR., HOBBS, NM 86240 Phone: (575) 393-6161 Fex: (576) 393-0720 DISTRICT II 611 S. FIRST ST., ARTESIA, NM 88210 Phone: (575) 748-9720

State of New Mexico Energy, Minerals & Natural Resources Department DIVISION

OIL CONSERVATION 1220 SOUTH ST. FRANCIS DR.

DISTRICT III 1000 RIO BRAZOS RD., AZTEC, NM 87410 Phone: (505) 334-8178 Fax: (505) 334-8170

Santa Fe, New Mexico 87505

Form C-102 Revised August 1, 2011 Submit one copy to appropriate District Office

**WEST** 

□ AMENDED REPORT

LEA

DISTRICT IV 1220 S. ST. FRANCIS DR., SANTA FE, NM 87605 Phone: (505) 476-3460 Fax: (505) 476-3462

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26-S

32 - E

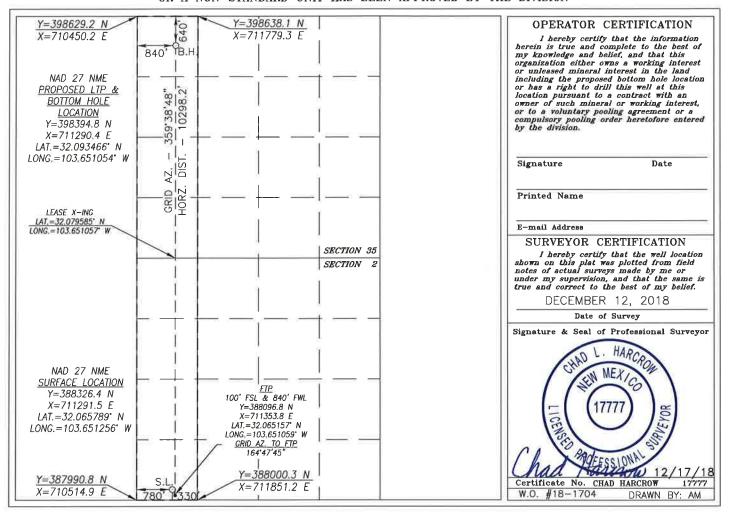
	()		WELL L	OCATION	AND	ACREAG	E DEDICATION	N PLAT		
API 1	API Number			Pool Code Pool Name						
Property C	ode			Well Number						
			HARRIER FEDERAL COM							4H
OGRID No	OGRID No.			Elevation 3247.1						
					Surfa	ce Locati	on			
UL or lot No.	L or lot No.   Section   Township			Lot Idn	Feet fr	om the N	orth/South line	Feet from the	East/West line	County

# 330 Bottom Hole Location If Different From Surface

SOUTH

780

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	35	25-S	32-E		640	NORTH	840	WEST	LEA
Dedicated Acres	Joint o	r Infill Con	nsolidation (	ode Or	der No.				



DISTRICT I

State of New Mexico 1625 N. FRENCH DR., HOBBS, NM 88240 Energy, Minerals & Natural Resources Department Phone: (676) 393-6161 Fax: (676) 393-6720 DIVISION OIL CONSERVATION

WELL LOCATION AND ACDEACE DEDICATION DIAT

DISTRICT II 811 S. FIRST ST., ARTESIA, NM 88210 Phone: (575) 748-1283 Fax: (575) 748-0720

DISTRICT III 1000 RIO BRAZOS RD., AZTEC, NM 87410 Phone: (505) 334-6178 Fax: (505) 334-6170

1220 SOUTH ST. FRANCIS DR. Santa Fe, New Mexico 87505

Form C-102 Revised August 1, 2011 Submit one copy to appropriate District Office

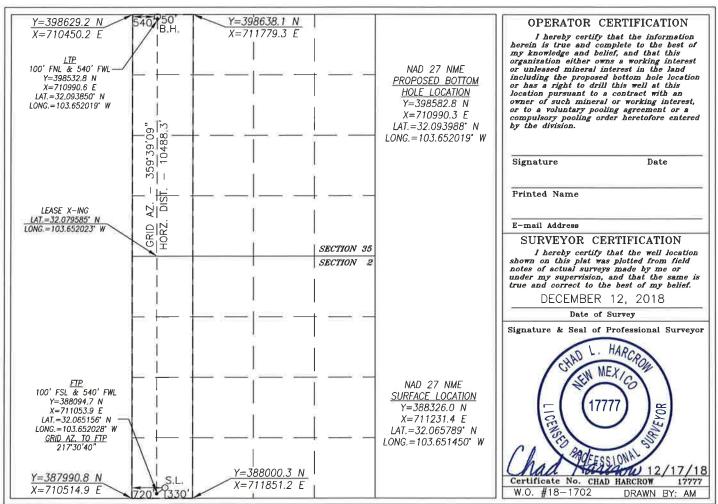
☐ AMENDED REPORT

DISTRICT IV 1220 S. ST. FRANCIS DR., SANTA FE, NM 87505 Phone: (505) 476-3460 Fax: (505) 476-3462

API	Number			Pool Code	AIND	TOTULIA	GE DEDICATION	Pool Name		
Property	Code			HAR	Well Number 305H					
OGRID N	0.		Operator Name COG OPERATING, LLC						Elevation 3247.6'	
			-		Surfac	e Loca	tion			
UL or lot No. Section Township Range Lot Idn Feet from the North/South line Feet from the										County
М	2	26-S	32-E 330 SOUTH 720					WEST	LEA	
			TD 11	77 1 7	4.1 7.4	c D:cc.	manut Emanu Casa	<b>C</b>		

# Bottom Hole Location If Different From Surface

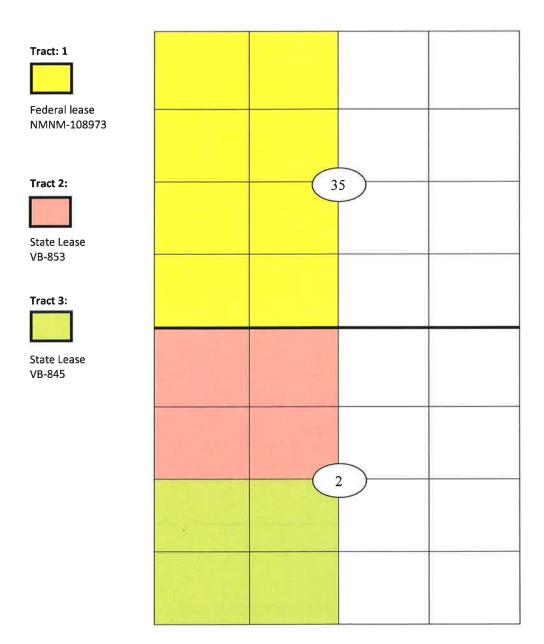
UL or lot No	Sect	tion	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	3	35	25-S	32-E		50	NORTH	540	WEST	LÉA
Dedicated Ac	res Jo	oint or	Infill	Consolidation	Code Or	der No.	<del>1</del>		······································	
							_			



## Case No. 20271

# Harrier Federal Com 101H, 102H, 103H, 201H, 202H, 301H, 302H, 303H, 304H, 305H

W2 of Section 35, T25S-R32E, NMPM & W2 of Section 2, T26S-R32E, NMPM, Lea County, New Mexico



Santa Fe, New Mexico
Exhibit No. 1B
Submitted by: COG OPERATING LLC
Hearing Date: March 7, 2019

Case Nos. 20271

# **Unit Working Interest**

Total	100.000000%
Sharbro Energy LLC	1.947390%
OXY Y-1	12.982600%
COG Operating LLC	85.070010%

# Tract 1 – W2 of Section 35

COG Operating LLC 100.000000%

# Tract 2 -NW4 of Section 2

Total	100.000000%
Sharbro Energy LLC	3.894780%
OXY Y-1	27.263460%
COG Operating LLC	68.841760%

## Tract 3 –SW4 of Section 2

Total	100.000000%
Sharbro Energy LLC	3.894780%
OXY Y-1	27.263460%
COG Operating LLC	68.841760%

# **Pooling Notification List**

## Working Interest Owners

Sharbro Energy, LLC/Sharbro Holdings, LLC P.O. Box 840 Artesia, NM 88211

OXY USA Inc. 5 Greenway Plaza, Suite 110 Houston, TX 77046

### Overriding Royalty Owners

Crownrock Minerals LP P. O. Box 51933 Midland, TX 79710

Cornerstone Family Trust John Kyle Thoma, Trustee P. O. Box 558 Peyton, CO 80831-0558



December 13, 2018

Via Certified Mail: 91 7199 9991 7039 1751 7271

OXY Y-1 Company P. O. Box 27570 Houston, TX 77227

Re: Harrier Federal Com Wells

Sec 35: W2 - T25S-R32E Sec 2: W2 - T26S-R32E Lea County, New Mexico

Dear Sir/Madam:

COG Operating LLC ("COG"), as Operator, hereby proposes to drill the following wells located in the W2 of Section 35, 25S-36E and W2 of Section 2, 26S-32E, Lea County, New Mexico:

The Harrier Federal Com #101H well has a surface hole location of 375' FSL and 1400' FWL of Section 2, 26S-32E, and a bottom hole location of 50' FNL and 1380' FWL of Section 35, 25S-32E, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 9,200' and a MD of approximately 19,500' to test the Bone Spring formation ("Operation"). The total cost of the Operation is estimated to be \$11,094,330, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

The Harrier Federal Com #102H well has a surface hole location of 375' FSL and 750' FWL of Section 2, 26S-32E, and a bottom hole location of 640' FNL and 690' FWL of Section 35, 25S-32E, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 9,200' and a MD of approximately 19,500' to test the Bone Spring formation ("Operation"). The total cost of the Operation is estimated to be \$11,074,330, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

The Harrier Federal Com #103H well has a surface hole location of 435' FNL and 232' FEL of Section 35, 25S-32E, and a bottom hole location of 50' FSL and 10' FWL of Section 2, 26S-32E, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 9,200' and a MD of approximately 19,500' to test the Bone Spring formation ("Operation"). The total cost of the Operation is estimated to be \$11,094,330, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

The Harrier Federal Com #201H well has a surface hole location of 375' FSL and 1400' FWL of Section 2, 26S-32E, and a bottom hole location of 640' FNL and 1140' FWL of Section 35, 25S-32E, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 9,400' and a MD of approximately 19,600' to test the Bone Spring formation ("Operation"). The total cost of the Operation is estimated to be \$11,094,330, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

The Harrier Federal Com #202H well has a surface hole location of 435' FNL and 262' FWL of Section 35, 25S-32E, and a bottom hole location of 50' FSL and 240' FWL of Section 2, 26S-32E, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 9,400' and a MD of approximately 19,600' to test the Bone Spring formation ("Operation"). The total cost of the Operation is estimated to be \$11,074,330, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

The Harrier Federal Com #301H well has a surface hole location of 375' FSL and 1910' FWL of Section 2, 26S-32E, and a bottom hole location of 50' FNL and 2310' FWL of Section 35, 25S-32E, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 9,800' and a MD of approximately 20,000' to test the Bone Spring formation ("Operation"). The total cost of the Operation is estimated to be \$11,194,130, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

The Harrier Federal Com #302H well has a surface hole location of 375' FSL and 1790' FWL of Section 2, 26S-32E, and a bottom hole location of 50' FNL and 1650' FWL of Section 35, 25S-32E, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 9,600' and a MD of approximately 19,500' to test the Bone Spring formation ("Operation"). The total cost of the Operation is estimated to be \$11,174,130, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

The Harrier Federal Com #303H well has a surface hole location of 375' FSL and 1460' FWL of Section 2, 26S-32E, and a bottom hole location of 50' FNL and 1360' FWL of Section 35, 25S-32E, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 9,800' and a MD of approximately 20,000' to test the Bone Spring formation ("Operation"). The total cost of the Operation is estimated to be \$11,194,130, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

The Harrier Federal Com #304H well has a surface hole location of 375' FSL and 780' FWL of Section 2, 26S-32E, and a bottom hole location of 640' FNL and 840' FWL of Section 35, 25S-32E, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 9,600' and a MD of approximately 20,000' to test the Bone Spring formation ("Operation"). The total cost of the Operation is estimated to be \$11,174,130, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

The Harrier Federal Com #305H well has a surface hole location of 375' FSL and 690' FWL of Section 2, 26S-32E, and a bottom hole location of 50' FNL and 540' FWL of Section 35, 25S-32E, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 9,800' and a MD of approximately 20,000' to test the Bone Spring formation ("Operation"). The total cost of the Operation is estimated to be \$11,174,130, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

COG is proposing to drill these wells under the terms of the modified 1989 AAPL form of Operating Agreement which is enclosed for your review and approval. The Operating Agreement covers Sec 35: W2 - T25S-R32E and Sec 2: W2 - T26S-R32E. It has the following general provisions:

- 100/300 Non-Consenting Penalty
- \$7,000/\$700 Drilling and Producing Rate
- COG Operating LLC named as Operator

Please indicate your participation elections in the spaces provided below, sign and return this letter, along with a signed copy of the enclosed AFEs and a copy of your geologic well requirements. A self-addressed, postage paid envelope is enclosed for your convenience. If you do not wish to participate, COG proposes to acquire your interest via term assignment. It has the following general provisions:

- 3 year primary term
- Delivering a 75% NRI, proportionately reduced
- \$5,000 per net acre bonus consideration

The Term Assignment offer terminates February 1, 2019 and is subject to the approval of COG's management and verification of title. If an agreement cannot be reached within 30 days of the date of this letter, COG will apply to the New Mexico Oil Conservation Division for compulsory pooling of your interest into a spacing unit for the proposed well if uncommitted at such time.

If you have any questions, please do not hesitate to contact the undersigned at (432) 685-4352 or msolomon@concho.com.

Respectfully,

Matt Solomon Staff Landman

I/We hereby elect to participate in the Harrier Federal Com #101H
I/We hereby elect <u>not</u> to participate in the Harrier Federal Com #101H
I/We hereby elect to participate in the Harrier Federal Com #102H
I/We hereby elect <u>not</u> to participate in the Harrier Federal Com #102H
I/We hereby elect to participate in the Harrier Federal Com #103H
I/We hereby elect <u>not</u> to participate in the Harrier Federal Com #103H
I/We hereby elect to participate in the Harrier Federal Com #201H
I/We hereby elect <u>not</u> to participate in the Harrier Federal Com #201H
I/We hereby elect to participate in the Harrier Federal Com #202H
l/We hereby elect <u>not</u> to participate in the <b>Harrier Federal Com #202H</b>
I/We hereby elect to participate in the <b>Harrier Federal Com #301H</b>
I/We hereby elect <u>not</u> to participate in the <b>Harrier Federal Com #301H</b>
L/Wa haveles elect to portion to in the Haurian Federal Com #202H
I/We hereby elect to participate in the Harrier Federal Com #302HI/We hereby elect <u>not</u> to participate in the Harrier Federal Com #302H
I/We hereby elect to participate in the Harrier Federal Com #303H
I/We hereby elect not to participate in the Harrier Federal Com #303H

	I/We hereby elect to participate in the Harrier Federal Com #304H
	I/We hereby elect <u>not</u> to participate in the Harrier Federal Com #304H
	I/We hereby elect to participate in the Harrier Federal Com #305H
	I/We hereby elect <u>not</u> to participate in the Harrier Federal Com #305H
Company:	
By:	
Name:	
Title:	<del></del> ;
Date: _	

WELL NAME:	HARRIER FED COM #101H	PROSPECT NAME:	LEA 2632 (717019)	
SHL:	Sec 2: 375 FSL & 1490 FWL	STATE & COUNTY:	New Mexico, Lea	
BHL:	Sec 35: 50 FNL & 1380 FWL	OBJECTIVE:	DRILL AND COMPLETE	
FORMATION:	Upper Avalon Shale	DEPTH:	19,500	
LEGAL:	Sec 2: 26S-32E	TVD:	9,200	

### 1960	NTANGIBLE COSTS ette/Curative/Permit
Transcription	surance
## STATEMENT CONTROLLED STATEMENT OF THE PROPERTY OF THE PROPE	amages/Right of Way
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Working LLC    Date Prepared   12/4/18	TOTAL TANGIBLES
Date Prepared 12/4/18  COG Operating LLC  Service:  By:  CB-RL-IM-SM  This AFE is only an estimate. By signing you agree to pay your share	TOTAL WELL COSTS
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Date Prepaired 12/4/18  COG Operating LLC  Se Working Interest By CB-RL-JM-SM  This AFE is only an estimate. By signing you agree to pay your share	
COG Operating LLC  By: CB-Rt_JM-SM  This AFE is only an estimate. By signing you agree to pay your share	G Operating LLC
COG Operating LLC  By: CB-Rt_JM-SM  This AFE is only an estimate. By signing you agree to pay your share	
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This AFE is only an estimate. By signing you agree to pay your share	nted Name:
of the actual costs incurred.	inted Name: de:

WELL NAME:	HARRIER FED COM #102H	PROSPECT NAME:	LEA 2632 (717019)	
SHL	Sec 2: 375 FSL & 750 FWL	STATE & COUNTY:	New Mexico, Lea	
BHL:	Sec 35: 640 FNL & 690 FWL	OBJECTIVE:	DRILL AND COMPLETE	
FORMATION:	Upper Avalon Shale	DEPTH:	19,500	
LEGAL:	Sec 2: 26S-32E	TVD:	9,200	

NTANGIBLE COSTS dla/Curalive/Parmit	201	Drig - Rig Release(D) 20,000		Completion(C)		Tank Bitty Constrctn(TB)		Pmpg Equipment(PEQ)	<u>TOT/</u>
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ontract Labor  simpling Supervision	225	6,500 37,800	325 326	40,000 15,000	356	100,000	374 375	6,500	15:
ontract Supervision	226	96,000	327	182,000	358		376	5,000	28
esting Casing/Tubing	228	30,000	328	5,000	-00		377	5,000	3
ud Legging Unit	229	30,000	329		3			7 - 1 - 1 - X	3
oging	230	0			)		378		
erforating/Wireline Services	231	4,000	331	538,000	i		379		54:
smulation/Treating	ý á		332	12,000			380		1:
ompletion Unit			333	90,000			381	8,800	9
wabbing Unit			334				382		
entats-Surface	235	125,000	335	466,000	359		383	7,000	59
entals-Subsurface	236	110,000	336	80,000			384		190
ucking/ForkistVRig Mobilization	237	200,000	337	40,000	360		385	3.000	243
eiding Services ater Disposal	238 239	3,000	338 339	5,000	361 362	135,000	386 387	500,000	69
lug to Abandon	240	0	340	60,000	302	133,000	307	500,000	
iismic Analysis	241	0	341		- 1				
scelaneous	242	0	342		- 3		389		
oritingency	243	45,000	343	250,000	363		590		29
osed Loop & Environmental	244	220,000	344	5,000	364		388		22
yed Diesel	245		345	484,000					
all Tubing			346						
owback Crews & Equip			347	48,000					4
fset Directional/Frac TOTAL INTANGIBLES	248	2 500 200	348	6,198,000		976 000	391	0	0.54
TOTAL INTANGIBLES		2,508,300		6,198,000		275,000		530,300	9,51
ANGIBLE COSTS									
orface Casing	401	48,000							4
ermediate Casing	402	174,000			- 1			-	17
oduction Casing/Liner	403	337,000							33
bing	- 8		504	52,030			530	5,000	. 5
elihead Equipment	405	60,000	505	18,700			531	3,000	6
mping Unit	1						506	96,000	9
me Mover	- 1						507	0	
ds			. 1				508	45,000	4
imps-Sub Surface (BH)			509			40.000	532	5,000	
nks	-				510	40,000			4
wlines uter Treater/Separator					511	150,000			10
ctrical System					513	100,000	533	15,000	11
ckers/Anchors/Hangers	414		514	65,000	0.0	100,000	534	2,000	B
uplings/Fittings/Valves	415		- 19	55,500	515	95,000		2,000	9
hydration					517				
ection Plant/CO2 Equipment	- 1				518				
mps-Surface					521	10,000			1
Irumenlation/SCADA/POC	- 1				522		529	7,000	
cellaneous	419		519		523		535	3,000	
ntingency	420		520		524		536		_
ters/LACT					525	30,000			3
res/Combustors/Emission					526	16,000			1
s Lift/Compression		040.000	527	11,000	516	75,000	528	404.000	4.60
TOTAL TANGIBLES TOTAL WELL COSTS	19	619,000 3,127,300		146,730 6,345,000	- 1	616,000 891,000		181,000 711,300	1,56
TOTAL WELL COSTS	- 1	3,127,300		0,040,000		000,168		/11,300	11,0/
% of Total Well Cost G Operating LLC		28%		57%		8%		6%	
		Date Prepared		12/4/18					
		COG Operating LLC							
approve:% Working Interest	4	Ву		CB-RL-JM-SM			_		
mpany.									
2									
nled Name:				By signing you agree to pay					

WELL NAME:	HARRIER FED COM #103H	PROSPECT NAME:	Bulldog 2532 (717114)	
SHL:	Sec 35: 435 FNL & 232 FWL	STATE & COUNTY:	New Mexico, Lea	
BHL	Sec 2: 50 FSL & 10 FWL	OBJECTIVE:	DRILL AND COMPLETE	
ORMATION:	Upper Avalon Shale	DEPTH:	19,500	
EGAL:	Sec 35: 25S-32E	TVD:	9,200	

201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216	20,000 2,500 2,000 7,000 135,000 0 600,000 205,000	302 303 305 306 307 308 309	10,000 15,000	351 352 353	40,000	366		20,0 2,5 20,0 7,0 185,0 22,6
204 205 206 207 208 209 210 211 212 213 214 215 216	7.000 135.000 7.500 0 0 600.000 205,000	305 306 307 308	15,000	352	40,000	366		7,0 185,0
205 206 207 208 209 210 211 212 213 214 215 216	135,000 7,500 0 0 0 600,000 205,000	306 307 308	15,000		40,000	366		185,0
206 207 208 209 210 211 212 213 214 215 216	7,500 0 0 600,000 205,000	306 307 308	15,000	353	40,000	366		
207 208 209 210 211 212 213 214 215 216	0 0 600,000 205,000	307 308						
208 209 210 211 212 213 214 215 216	0 600,000 205,000	308	4 449 000					22,0
209 210 211 212 213 214 215 216	600,000 205,000	308	4.440.000					
211 212 213 214 215 216	205,000	308	4 449 000					600,0
211 212 213 214 215 216	114,000	308	4 440 000					205_0
212 213 214 215 216		308						1,418,0
212 213 214 215 216			513,000					513.0
212 213 214 215 216			404,000					404,0
212 213 214 215 216		310	399,000					399,0
213 214 215 216	00.000	311	68,000	354		367		182,0
214 215 216	60,000	312	1,019,000			368		1,079,0
215 216	92,000	313	12,000			369		104,0
216	70,000	314	20,000			370		90,0
	0	315						-
	0							05.4
217	25,500							25,8
218	35,000							35,0
219	130,000					371		130,0
220	32.500					911		32,5
221	32,500 39,000							39,0
1.4		323				372		30,0
				355				6,0
			40.000		100.000		6,500	153,
		326	15,000	357	100,000	375	0,000	52,
227	96,000	327	182,000	358		376	5,000	283,
228	30,000	328	5,000			377		35,
229	30,000	329						30,
230	0					378		/
231	4,000	331	538,000			379		542,0
		332	12,000			380		12,0
		333	90,000			381	8,800	98,1
		334				382		
235	125,000	335	466,000	359		383	7,000	598,0
236	110,000	336	80,000			384		190,
237	200,000	337	40,000	360		385	3,000	243,
238	3,000	338	5,000	361		386		8,
239	0		60,000	362	135,000	387	500,000	695,
								700
								295
	220,000			364		388		225,
245			484,000					-
			48,000					48,
248			40,000			391	20,000	20,
2.10	2 508 300		6.198.000		275.000			9,531,
401	48.000							48,
	174,000							174
	337,000							337
		504	52,030			530	5,000	57,
405	60,000	505	18,700			531	3,000	81,
) [						506	96,000	96,
						507	0	
						508	45,000	45,
		509				532	5,000	5,
				510	40,000			40,
				511	100,000			100,
				512				150
				513	100,000			115,
414		514	65,000	n		534	2,000	67,
415					95,000			95,
0 3					10.000			10,
					10,000	500	7 000	
440		E40						7,
							3,000	- 3,
420		320			30,000	000		30,
0 3								16,
		527	11 000			52R		86,
Ų - B	619,000	041					181 000	1,562,
1							731,300	11,094,
0	5,12.1,000		0,0 10,500		,			
	28%		57%		8%		7%	
0. 3	Date Prepared:	_	12/4/18					
	COG Operating LLC							
3	Ву		CB-RL-JM-SM					
8								
	223 224 227 228 229 230 231 235 236 237 244 242 244 245 245 248 401 402 403 405 414 415 419 420	223	223	223	223	223	223	223

WELL NAME:	HARRIER FED COM #201H	PROSPECT NAME:	LEA 2632 (717019)	
SHL	Sec 2: 375 FSL & 1400 FWL	STATE & COUNTY:	New Mexico, Lea	
BHL:	Sec 35: 640 FNL & 1140 FWL	OBJECTIVE:	DRILL AND COMPLETE	
FORMATION:	Middle Avalon Shale	DEPTH:	19,600	
LEGAL:	Sec 2: 26S-32E	TVD:	9,400	

NTANGIBLE COSTS [Ide/Curative/Permit	201	Drig - Rig Release(D) 20,000		Completion(C)		Tank Bitty Constrctn(TB)		Pmpg Equipment(PEQ)	TOTA 20
nsurance	202	2,500	302						2
Damages/Right of Way	203	20,000	303		351				20
survey/Stake Location	204	7,000	305	10,000	352 353	40,000	366		185
ocation/Pite/Road Expense Onling / Completion Overhead	205 206	135,000	306	15,000	353	40,000	300		22
Furnkey Contract	207	7,500	300	15,000					
ootage Contract	208	0							
Daywork Contract	209	600,000							600
Directional Drilling Services	210	205,000							205
rac Equipment	2 1		307	1,418,000					1,418
rac Chemicals			308	513,000					513
rac Proppant			309	404,000					404
rac Proppart Transportation			310	399,000					399
uel & Power	211	114,000	311	68,000	354		367		182
Valer	212	60,000	312	1,019,000			368		1,079
lits	213	92,000	313	12,000			369		104
flud & Chemicals	214	70,000	314	20,000			370		90
Orill Stern Test	215	0	315						
oring & Analysis	216	D							
ement Surface	217	25,500							25
ement Intermediate	218	35,000							35.
ement 2nd Intermediate/Production	219	130,000							130
Cernent Squeeze & Other (Kickoff Plug)	220	0					371		
loat Equipment & Centralizers	221	32,500							32
asing Crews & Equipment	222	39,000							39
ishing Tools & Service	223	. 0	323				372		
eologic/Engineering	224	6,000	324		355		373		6
ontract Labor	225	6,500	325	40,000	356	100,000	374	6,500	153
ornpany Supervision	226	37,800	326	15,000	357		375		52
ontract Supervision	227	96,000	327	182,000	358		376	5,000	283
esting Casing/Tubing	228	30,000	328	5,000			377		35
lud Logging Unit	229	30,000	329				970		30
ogging	230	4,000	994	538,000			378		p. 100
orfurating/Wreline Services	231	4,000	331				379 380		542 12
broulationTreating			332	12,000				8,800	
ampletion Unit			333	90,000			381	8,800	98
wabbing Unit	225	125 000	335	466.000	359		383	7,000	598
entals-Surface	235	125,000	336	466,000 80,000	229		384	7,000	190
entals-Subsurface rucking/Forkint/Rig Mebilization	237	200.000	337	40,000	360		385	3,000	243
	238	3,000	338	5,000	361		386	5,000	8
Velding Services	239	0,000	339	60,000	362	135,000	387	500,000	695
lug to Atlandon	240	0	340	00,000	JUE	000,000	507	300,000	- 000
eismic Analysis	241	0	341						
liscellaneous	242	0	342				389		
ordingency	243	45,000	343	250,000	363		390		295
losed Loop & Environmental	244	220,000	344	5,000	364		388		225
yed Diesel	245		345	484,000					
oil Tübing			346						
lowback Crews & Equip			347	48,000					48
Offset Directional/Frac	248		348				391	20,000	20
TOTAL INTANGIBLES		2,508,300		6,198,000		275,000		550,300	9,531
ANGIBLE COSTS									
urface Casing	401	48,000							48
termediate Casing	402	174,000							174
roduction Casing/Liner	403	337,000	3						337
abing			504	52,030			530	5,000	57
ellhead Equipment	405	60,000	505	18,700			531	3,000	81
umping Unit								96,000	96
							506		
ime Mover							507	0	
ime Mover			500				507 508	45,000	
rime Mover ods umps-Sub Surface (BH)			509		E10	40.000	507		45
irine Mover ods umps-Sub Surface (BH) unks			509		510	40,000	507 508	45,000	
ime Mover ods umps-Sub Surface (BH) inks owlines			509		511	100,000	507 508	45,000	40 100
ima Mover  dds  mgps-Sub Surface (BH)  nks  volvines  ater Treater/Separator			509		511 512	100,000 150,000	507 508 532	45,000 5,000	40 100 150
ina Mover de mps-Sub Surface (BH) nks witines aber Treater/Separator cctrical System	414			85,000	511	100,000 150,000	507 508 532 533	45,000 5,000	100 150 111
ine Mover de mps-Sub Surface (BH) nks wkines ater Treater/Separator ckers/Anchors/Hangers	414 415		509	65,000	511 512 513	100,000 150,000 100,000	507 508 532	45,000 5,000	100 150 111 6
ime Mover  vide  migs-Sub Surface (BH)  nks  vollines  auter Treater/Separator  actificial System  ckers/Anchors/Hangers  oppings/Fatings/Valves	414 415			65,000	511 512 513 515	100,000 150,000	507 508 532 533	45,000 5,000	100 150 111 6
ime Mover de mps-Sub Surface (BH) nks wkines subter Treater/Separator schrical System ckers/Anchbur/tangers subglage/Fitings/Valves thydration				65,000	511 512 513 515 517	100,000 150,000 100,000	507 508 532 533	45,000 5,000	100 150 111 6
ime Mover  de d				65,000	511 512 513 515 517 518	100,000 150,000 100,000 95,000	507 508 532 533	45,000 5,000	40 10X 15X 11S 61
ime Mover  Ads  Imps-Sub Surface (BH)  Inks  Advines  Sater Treater/Separator  schrical System  Cears/Anchors/Hangers  oppings/Fatings/Valves  thydration  scton Plant/CO2 Equipment  Imps-Surface				65,000	511 512 513 515 517 518 521	100,000 150,000 100,000	507 508 532 533 534	45,000 5,000 15,000 2,000	44 100 150 111 60 90
ine Mover de mgs-Sub Surface (BH) nks whines ater Treater/Separator ectional System ckers/Anchors/Hangers uppings/Fetings/Valves hydration ection Plant/COZ Equipment impo-Surface incumentation/SCADA/POC				65,000	511 512 513 515 517 518	100,000 150,000 100,000 95,000	507 508 532 533	45,000 5,000 15,000 2,000 7,000	44 100 150 111 6: 90
ine Mover de d	415		514	65,000	511 512 513 515 517 518 521 522	100,000 150,000 100,000 95,000	507 508 532 533 534	45,000 5,000 15,000 2,000	44 100 150 111 6: 90
ime Mover  vide  mps-Sub Surface (BH)  nks  volvines  auter Treater/Separator  actinical System  cettinical System  surface  sur	415		514	65,000	511 512 513 515 517 518 521 522 523	100,000 150,000 100,000 95,000	507 508 532 533 534 529 535	45,000 5,000 15,000 2,000 7,000	100 150 111 6
ine Mover des imps-Sub Surface (BH) inks withins siter Treater/Separator cetrical System cetri	415		514	65,000	511 512 513 515 517 518 521 522 523 524 525	100,000 150,000 100,000 95,000 10,000	507 508 532 533 534 529 535	45,000 5,000 15,000 2,000 7,000	40 100 155 111: 6 9:
ine Mover de de mbp-Sub Surface (BH) mks withines after Treater/Separator cetrical System cupings/Fitings/Valves hydration ceton Plant/UOZ Equipment mps-Surface furumentation/SCADA/POC scellaneous nitingency trest/LACT trest/Combusiors/Emission	415		514	65,000	511 512 513 515 517 518 521 522 523 524	100,000 150,000 100,000 95,000	507 508 532 533 534 529 535	45,000 5,000 15,000 2,000 7,000	44 100 156 111 61 99
ine Mover de de mbp-Sub Surface (BH) mks withines after Treater/Separator cetrical System cupings/Fitings/Valves hydration ceton Plant/UOZ Equipment mps-Surface furumentation/SCADA/POC scellaneous nitingency trest/LACT trest/Combusiors/Emission	415	819,000	514 519 520		511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000	507 508 532 533 534 529 536 536	45,000 5,000 15,000 2,000 7,000	444 1000 158 1158 66 98 111 113 38 311
ine Mover de de mps-Sub Surface (BH) nks nvinnes atter Treater/Separator schricial System chicial System chicia	415	619,000 3,127,300	514 519 520	11,000	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000	507 508 532 533 534 529 536 536	45,000 5,000 15,000 2,000 7,000 3,000	44 100 155 111: 6 9: 11: 3.3 11: 8.6
ine Mover dds mps-Sub Surface (BH) nks withins siter Treater/Separator cetrical System cetrica	415	3,127,300	514 519 520	11,000 146,730 6,345,000	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000 891,000	507 508 532 533 534 529 536 536	45,000 5,000 15,000 2,000 7,000 3,000 181,000 731,300	44 100 158 111 66 99 111 33 34 11 88
ine Mover dds mps-Sub Surface (BH) mks withines after Treater/Separator cetrical System cetric	415		514 519 520	11.000 146,730	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000	507 508 532 533 534 529 536 536	45,000 5,000 15,000 2,000 7,000 3,000	44 100 155 111: 6 9: 11: 3.3 11: 8.6
ine Mover dds mps-Sub Surface (BH) mks withines after Treater/Separator cetrical System cetric	415	3,127,300	514 519 520	11,000 146,730 6,345,000	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000 891,000	507 508 532 533 534 529 536 536	45,000 5,000 15,000 2,000 7,000 3,000 181,000 731,300	44 100 155 111: 6 9: 11: 3.3 11: 8.6
ime Mover dds mines-Sub Surface (BH) mines-Sub Surface (BH) mike solvines sater Treater/Separator cetrical System cetrical Sys	415	3,127,300 28% Date Prepared:	514 519 520	11,000 146,730 6,345,000 57%	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000 891,000	507 508 532 533 534 529 536 536	45,000 5,000 15,000 2,000 7,000 3,000 181,000 731,300	44 100 155 111: 6 9: 11: 3.3 11: 8.6
ime Mover  de	415	3,127,300 28% Elate Prepared: COG Operating LLC	514 519 520	11,000 146,730 6,345,000 57%	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000 891,000	507 508 532 533 534 529 536 536	45,000 5,000 15,000 2,000 7,000 3,000 181,000 731,300	44 100 155 111: 6 9: 11: 3.3 11: 8.6
ime Mover dots  imps-Sub Surface (BH) inks  withines inter Treater/Separator cetrical System c	415	3,127,300 28% Date Prepared:	514 519 520	11,000 146,730 6,345,000 57%	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000 891,000	507 508 532 533 534 529 536 536	45,000 5,000 15,000 2,000 7,000 3,000 181,000 731,300	95 440 100 156 111 66 95
ine Mover de d	415	3,127,300 28% Elate Prepared: COG Operating LLC	514 519 520	11,000 146,730 6,345,000 57%	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000 891,000	507 508 532 533 534 529 536 536	45,000 5,000 15,000 2,000 7,000 3,000 181,000 731,300	44 100 155 111: 6 9: 11: 3.3 11: 8.6
me Mover dis mps-Sub Surface (BH) nks wikines ater Treater/Separator cetrical System cetrical Company cetrical System cetrical Company cetr	415	3,127,300 28% Elate Prepared: COG Operating LLC	514 519 520	11,000 146,730 6,345,000 57%	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000 891,000	507 508 532 533 534 529 536 536	45,000 5,000 15,000 2,000 7,000 3,000 181,000 731,300	4 10 10 15 11 11 6 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
me Mover do s mps-Sub Surface (BH) nks wikinss atter Treater/Separator ctrical System ctrical System continue System de service States dirumentation/SCADA/POC continue States dirumentation/SCADA/POC continue System	415	3,127,300 28%  Cate Prepared: COG Operating LLC By:	514 519 520 527	11,000 146,730 6,345,000 57%	511 512 513 515 517 518 521 522 523 524 525 526 516	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000 891,000	507 508 532 533 534 529 535 536	45,000 5,000 15,000 2,000 7,000 3,000 181,000 731,300	4 100 155 111 6 9 1 1

WELL NAME:	HARRIER FED COM #202H	PROSPECT NAME:	Bulldog 2532 (717114)	
SHL:	Sec 35: 435 FNL & 262 FWL	STATE & COUNTY:	New Mexico, Lea	
BHL:	Sec 2: 50 FSL & 240 FWL	OBJECTIVE	DRILL AND COMPLETE	
FORMATION:	Middle Avalon Shale	DEPTH:	19,600	
LEGAL:	Sec 35: 25S-32E	TVD:	9,400	

NTANGIBLE COSTS itle/Curative/Permit	201	Orig - Rig Release(D) 20,000		Completion(C)		Tank Btty Constrctn(TB)		Pmpg Equipment(PEQ)	<u>TOT</u>
ISUTANCE	202	2,500	302						
lamages/Right of Way	203	20,000	303		351				
urvey/Stake Location	204	7,000			352				
ocation/Pits/Road Expense	205	135,000	305	10,000	353	40,000	366		1
isling / Completion Overhead	206	7,500	306	15,000					
urnkey Contract	207	0	i ii						
ootage Contract	208	600,000	1 1		- 3				6
rectional Drilling Services	210	205,000			- 8			$\overline{}$	2
	210	203,000	307	1,418,000	- 3				1,4
ac Chemicals	1 1		308	513,000	- 1				5
ac Proppant	8 2		309	404,000	- 3				4
ac Proppant Transportation	8 8		310	399,000					3
el & Power	211	114,000	311	68,000	354		367		1
aler	212	60,000	312	1,019,000	334		368		
au	213	92,000	313	12,000			369		1,0
d & Chemicals	214	70,000	314	20,000			370		
Il Stem Test	215	70,000	315	20,000			3/0		
ring & Analysis	216	0	010		-				-
	217	25,500			1				-
ment Intermediate	218	35,000			-				
		130,000							1
ment 2nd Intermediate/Production	219				-		371		
ment Squeeze & Other (Kickoff Plug)	220	32,500					3/1		
at Equipment & Centralizers	221								
sing Crews & Equipment	222	39,000	323		- 3		372		
hing Tools & Service		6,000	323						
ologic/Engineering	224	6,000		40.000	356	400.000	373	6,500	
ntract Labor	225	6,500	325 326	40,000	356	100,000	374 375	0,000	1
mpany Supervision	226	37,800		15,000				5,000	
ntract Supervision	227	96,000	327	182,000	358		376	5,000	2
ting Casing/Tubing	228	30,000	328	5,000			377		
d Logging Unit	229	30,000	329		- 4		075		
ging	230	0					378		
forating/Wireline Services	231	4,000	331	538,000			379		- 5
mulation/Treating	1 3		332	12,000	-		380		
mpletion Unit			333	90,000			381	8,800	
abbing Unit			334				382		
ntals-Surface	235		335	466,000	359		383	7,000	5
ntals-Subsurface	236	110,000	336	80,000	- 3		384		1
cking/Forklift/Rig Mobilization	237	200,000	337	40,000	360		385	3,000	2
Iding Services	238	3,000	338	5,000	361		386		
ter Disposal	239		339	60,000	362	135,000	387	500,000	6
g to Atlandon	240	0	340						
smic Analysis	241	0	341						
cellaneous	242	0	342		- 3		389		
ntirgency	243	45,000	343	250,000	363		390		2
ued Loop & Environmental	244	220,000	344	5,000	364		388		2
ed Diesel	245		345	484,000					
of Tubing			346						
owback Crews & Equip			347	48,000					
fset Directional/Frac	248		348				391		
TOTAL INTANGIBLES	9	2,508,300		6,198,000	3	275,000		530,300	9,5
NGIBLE COSTS									
face Casing	401	48,000							
ermedate Casing	402	174,000			]				1
duction Casing/Liner	403	337,000							3
ing	- 8		504	52,030	- 1		530	5,000	
Bhead Equipment	405		505	40.700			531	0.000	
		60,000	. 505	18,700	Ì		231	3,000	
nping Unit		60,000	505	18,700			506	96,000	
		60,000	5005	18,700					
ne Mover		60,000	505	16,700			506	96,000	
ne Mover Is	3	60,000	509	18,700			506 507	96,000	
ne Mover is nps-Sub Surface (BH)	100	60,000		18,700	510	40,000	506 507 508	96,000 0 45,000	
ne Mover Ja pops-Sub Surface (BH) iks		60,000		18,700	510 511	40,000	506 507 508	96,000 0 45,000	
ne Mover Is pps-Sub Surface (BH) ks	1 2 2 2 2	60,000		16,700	510 511 512		506 507 508	96,000 0 45,000	
ne Mover is nps-Sub Surface (BH) ks vines tor Treuber/Separator	THE 8 20 9 30	60,000		15,700	511	100,000 150,000	506 507 508	96,000 0 45,000	1
no Mover 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	414	60,000		65,000	511 512	100,000 150,000	506 507 508 532	96,000 0 45,000 5,000	
no Mover s s spe-Sub Surface (BH) ks vines ter Treinter/Separator thrical System kars/Anchors/Hangers	414 415	60,000	509		511 512	100,000 150,000 100,000	506 507 508 532	96,000 0 45,000 5,000	
ne Mover 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6		80,000	509		511 512 513	100,000 150,000	506 507 508 532	96,000 0 45,000 5,000	
ne Mover  fo  ppgs-Sub Surface (BH)  ks  where  threat Feather/Sejarator  threat System  kers/Anchora/Hangers  appliqual/Hitings/Valves  yydraton		80,000	509		511 512 513 515	100,000 150,000 100,000	506 507 508 532	96,000 0 45,000 5,000	
ne Mover  s   spe-Sub Surface (BH)  ks  wires  ster Treater/Separator  throat System  kser/Anchon/Hangers  ppings/Fittings/Valves  tydration  ton PlantCO2 Equipment		80,000	509		511 512 513 515 517 518	100,000 150,000 100,000 95,000	506 507 508 532	96,000 0 45,000 5,000	1 1 1
ne Mover Is		80,000	509		511 512 513 515 517 518 521	100,000 150,000 100,000	506 507 508 532	96,000 0 45,000 5,000	
ne Mover s s pps-Sub Surface (BH) ks viries ter Treiter/Separator drical System kers/Anchors/Hangers plangs/Fittings/Valves ydraton toton PlanHCO2 Equipment apps-Surface pps-Surface pps-Surface pps-Surface pumentation/SCADA/POC			509		511 512 513 515 517 518 521 522	100,000 150,000 100,000 95,000	506 507 508 532 533 534	96,000 0 45,000 5,000 15,000 2,000	
ne Mover  is  inpe-Sub Surface (BH)  ics  vi reas  ter Treater/Separator  trical System  kars/Anchors/Hangers  splings/Fittings/Valves  ydration  cton Plant/COZ Equipment  sps-Surface  rumentation/SCADA/POC  cellaneous	415		509		511 512 513 515 517 518 521 522 523	100,000 150,000 100,000 95,000	506 507 508 532 533 534 529 535	96,000 0 45,000 5,000	1 1 1
ne Mover  Is  pps-Sub Surface (BH)  iks  wines  ter Treuter/Separator  thrical System  kers/Anchora/Hangers  pptgaff fittings/valves  yydraton  ction Plant/COZ Equipment  ttps-Surface  rumentalion/SCADA/POC  cellaneous	415		509 514 519		511 512 513 515 517 518 521 522 523 524	100,000 150,000 100,000 95,000	506 507 508 532 533 534	96,000 0 45,000 5,000 15,000 2,000	
ne Mover is in the second of t	415		509 514 519		511 512 513 515 517 518 521 522 523 524 525	100,000 150,000 100,000 95,000 10,000	506 507 508 532 533 534 529 535	96,000 0 45,000 5,000 15,000 2,000	
ne Mover is in the second of t	415		514 519 520	65,000	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000	506 507 508 532 533 534 529 535 536	96,000 0 45,000 5,000 15,000 2,000	
te Mover s s s s s s s s s s s s s s s s s s s	415		509 514 519	65,000	511 512 513 515 517 518 521 522 523 524 525	100,000 150,000 100,000 95,000 10,000 30,000 19,000 75,000	506 507 508 532 533 534 529 535	96,000 0 45,000 5,000 15,000 2,000 7,000 3,000	
ne Mover is in the second of t	415	619,000	514 519 520	65,000 11,000 146,730	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000	506 507 508 532 533 534 529 535 536	96,000 0 45,000 5,000 15,000 2,000 7,000 3,000	1,6
ne Mover  s   s   s   s   s   s   s   s   s   s	415	619,000 3,127,300	514 519 520	11,000 146,730 6,345,000	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000 891,000	506 507 508 532 533 534 529 535 536	96,000 0 45,000 5,000 15,000 2,000 7,000 3,000 181,000 711,300	1,5
ne Mover  is  pps-Sub Surface (BR)  ks  oriens  ter Treuter/Separator  thrical System  Asers/Anchors/Hangers  spings/Fittings/Valves  spingsnoy  ters/LACT  tes/Confbustors/Emission  suff/Confbustors/Emission  suff/Confbustors/Emission  TOTAL TANGBLES  TOTAL WELL COSTS	415	619,000	514 519 520	65,000 11,000 146,730	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000	506 507 508 532 533 534 529 535 536	96,000 0 45,000 5,000 15,000 2,000 7,000 3,000	1,5
me Mover  Is  mps-Sub Surface (BH)  kis  witnes  ater Treuter/Separator  Etrical System  SacerAn-chorul/sargers  upings/Fittings/Valves  upings/Fittin	419 420	619,000 3,127,300	514 519 520	11,000 146,730 6,345,000	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000 891,000	506 507 508 532 533 534 529 535 536	96,000 0 45,000 5,000 15,000 2,000 7,000 3,000 181,000 711,300	1,5
me Mover did did did did did did did did did di	419 420	619,000 3,127,300 28%	514 519 520	11,000 146,730 6,345,000	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000 891,000	506 507 508 532 533 534 529 535 536	96,000 0 45,000 5,000 15,000 2,000 7,000 3,000 181,000 711,300	1,5
Million Committee Co.	419 420	619,000 3,127,300 28%	514 519 520	11,000 146,730 6,345,000	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000 891,000	506 507 508 532 533 534 529 535 536	96,000 0 45,000 5,000 15,000 2,000 7,000 3,000 181,000 711,300	1,5
ne Mover dis  mps-Sub Surface (BH) like  wires  ster Treater/Separator  throat System  kers/Anchora/Hangers  patings/Titings/Valves  tydration  ton Plant/COZ Equipment  tips-Surface  rumentation/SCADA/POC  cellaneous  bingency  rers/LACT  es/Combustors/Emission  s_tiff/Compression  TOTAL TANGIBLES  TOTAL WELL COSTS  14. of Total Well Cost  approve:	419 420	619,000 3,127,300 28% Date Prepared:	514 519 520	11,000 146,730 6,345,000 57%	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000 891,000	506 507 508 532 533 534 529 535 536	96,000 0 45,000 5,000 15,000 2,000 7,000 3,000 181,000 711,300	1,5
ne Mover dis s spe-Sub Surface (BH) iks wines liter Treater/Separator thrical System teer Treater/Separator thrical System teer Treater/Separator thrical System teer Treater/Separator thrical System teer Treater/Separator treater/Separator teer/Separator teer/Separator teer/Separator trementation/SCADA/POC cellaneous titingency teer/LACT es/Combustors/Emission toTAL TANGIBLES TOTAL WELL COSTS  ## of Total Well Cost approve:	419 420	619,000 3,127,300 28% Date Prepared:	514 519 520	11,000 146,730 6,345,000 57%	511 512 513 515 517 518 521 522 523 524 525 526	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 616,000 891,000	506 507 508 532 533 534 529 535 536	96,000 0 45,000 5,000 15,000 2,000 7,000 3,000 181,000 711,300	1,5
ne Mover  is  inpa-Sub Surface (BH)  iks  wines   iter Treater/Separator  throat System  kens/Anchoral/Fangers  gengel/Fittings/Valves  yoyration  ction Plant/CO2 Equipment  pps-Surface  rumentation/SCADA/POC  cellaneous  tingency  ord/LACT  es/Combustors/Emission  Litt/Compression  TOTAL TANGIBLES  TOTAL WELL COSTS  16 of Total Well Cost  approve:  % Working Interest	419 420	619,000 3,127,300 28% Date Prepared: COG Operating LLC By:	519 520 527	11,000 146,730 6,345,000 57%	511 512 513 515 517 518 521 522 523 524 525 526 516	100,000 150,000 100,000 95,000 10,000 30,000 16,000 75,000 691,000 891,000	506 507 508 532 533 534 529 535 536	96,000 0 45,000 5,000 15,000 2,000 7,000 3,000 181,000 711,300	1,5

WELL NAME:	HARRIER FED COM #301H	PROSPECT NAME:	Lea 2632 (717019)	
SHL	Sec 2: 375 FSL & 1910 FWL	STATE & COUNTY:	New Mexico, Lea	
BHL:	Sec 35: 50 FNL & 2310 FWL	OBJECTIVE:	DRILL AND COMPLETE	
FORMATION:	Lower Avalon Shale	DEPTH:	20,000	
LEGAL:	Sec 2: 26S-32E	TVD:	9,800	

INTANGIBLE COSTS Tille/Curative/Permit	204	Drig - Rig Release(D)		Completion(C)		Tank Btty Constrctn(TB)		Pmpg Equipment(PEQ)	TOTAL
Interce Insurance	201	20,000	302						20,
Damages/Right of Way	203	20,000	303		351				20,
Survey/Stake Location	204	7,000		V-52-1	352				7,0
ocalion/Pits/Road Expense	205	135,000		10,000	353	40,000	366		185,0
Riving / Completion Overhead	206	7,500	306	15,000					22,5
ornkey Contract	207 208	0							-
laywork Contract	209	648.000							648,0
Prectional Drilling Services	210	224,000							224,0
rac Equipment			307	1,418,000					1,418,
rac Chemicals			308	513,000					513,
rac Proppant	1		309	404,000					404
rac Proppent Transportation		100.000	310	399,000					399,
uel & Power	211 212	125,000	311	1,019,000	354		367 368		1,079,
its	213	92,000	313	12,000		$\leftarrow$	369		104,
lud & Chemicals	214	70,000	314	20,000			370		90,
rill Stem Test	215	0	315						
oring & Analysis	216	0		24 1 1 2 4					
ement Surface	217	25,500							25,
ement Intermediate	218	35,000							35,
ement 2nd Intermediate/Production	219	130,000							130,
ement Squeeze & Other (Kickoff Plug)	220 221	32 500					371		
oat Equipment & Centralizers asing Crews & Equipment	221	32,500							32,
shing Tools & Service	223	39,000	323				372		39,
eologic/Engineering	224	7,200	324		355		373		7,
ontract Labor	225	6,500	325	40,000	356	100,000	374	6,500	153,
ompany Supervision	226	41,400	326	15,000	357		375		56,
ontract Supervision	227	104,000	327	182,000	358		376	5,000	291,
esting Casing/Tubing	228	30,000	328	5,000			377		35,
lud Logging Unit	229	30,000	329				0==	2	30,
erforating/Wireline Services	230	4,000	331	538,000			378 379		542,
bmulation/Treating	231	4,000	332	12,000			380		12,
ompletion Unit	i i		333	90,000		=	381	8,800	98,
wabbing Unit	1		334				382	0,000	
entals-Surfece	235	125,000	335	466,000	359		383	7,000	598,
entals-Subsurface	236	110,000	336	80,000			384		190,
ucking/Forklift/Rig Mobilization	237	200,000	337	40,000	360		385	3,000	243,
felding Services	238	3,000	338	5,000	361		386		θ,
ater Disposal	239	D	339	60,000	362	135,000	387	500,000	695,
og to Ahandon eismic Analysis	240	0	340						
scellaneous	242	0	342				389		3
ontingency	243	47,000	343	250,000	363		390		297,0
losed Loop & Environmental	244	220,000	344	5,000	364		388		225,0
yed Diesel	245		345	484,000					
oil Tubing			346						
lowback Crews & Equip			347	48,000					48,0
ffeet Directional/Frac TOTAL INTANGIBLES	248	2,601,100	348	6,198,000		275,000	391	20,000	9,624,4
ANGIBLE COSTS	-	2,001,100		0,130,000		213,000		550,500	9,024,2
urface Caning	401	48,000							48,0
termediate Casing	402	174,000							174,
oduction Casing/Liner	403	344,000							344,0
tring	- 8		504	52,030			530	5,000	57,
elihead Equipment	405	60,000	505	18,700			531	3,000	81,
imping Unit							506	96,000	96,
ime Mover	1						507	D	
ods umps-Sub Surface (BH)	-		500				508	45,000	45,
imps-sub surface (6H)	-		509		510	40,000	532	5,000	5,
owines	-				511	100,000		5	100,
aler Treater/Separator	*		ij		512	150,000			150,
ectrical System	3				513		533	15,000	115,
ickers/Anchors/Hangers	414		514	65,000			534	2,000	67,
uplings/Fittings/Valves	415				515	95,000			95,
hydration	1				517				
ection Plant/CO2 Equipment	-		Ĥ		518				
mps-Surface	- 4		į į		521	10,000	ECO	7.00	10,
strumentation/SCADA/POC scellaneous	419		519		522 523		529 535	7,000 3,000	7,
sonianeous	420		520		523		536	3,000	3,0
sters/LACT	-				525	30,000			30,
ares/Combustors/Emission	- 3				526	16,000			16,
s Lift/Compression	1		527	11,000	516	75,000	528		86,
TOTAL TANGIBLES		626,000		146,730		616,000		181,000	1,569,
TOTAL WELL COSTS		3,227,100	-	6,345,000		891,000		731,300	11,194,
% of Total Well Cost OG Operating LLC		29%		57%		8%		7%	
	1	Date Prepared:		12/4/18					
		COG Operating LLC							
# #pprove									
% Working Interest	4	Ву		CB-RL-JM-SM			_	ē	
Office All Control of the Control of									
empany.									
nted Name									
e to:				y signing you agree to pay	your:	share			
		of the actual costs incurre							

of the actual costs incurred.

WELL NAME:	HARRIER FED COM #302H	PROSPECT NAME:	Lea 2632 (717019)	
SHL:	Sec 2: 375 FSL & 1790 FWL	STATE & COUNTY:	New Mexico, Lea	
BHL:	Sec 35: 50 FNL & 1650 FWL	OBJECTIVE	DRILL AND COMPLETE	
FORMATION:	Lower Avalon Shale	DEPTH:	19,500	
LEGAL:	Sec 2: 26S-32E	TVD:	9,600	

INTANGIBLE COSTS Title/Curative/Permil	201	Drlg - Rig Release(D) 20,000		Completion(C)		Tank Btty Constrctn(TB)		Pmpg Equipment(PEQ)	<u>TOT/</u>
Insurance	202	2,500	302		S				
Damages/Right of Way	203	20,000	303		351			1-1	2
Survey/Stake Location	204	7,000			352				
ocation/Pits/Road Expense	205	135,000	305	10,000	353	40,000	366		18
Onling / Completion Overhead	206	7,500	306	15,000					2
urnkey Contract	207	0							
cotage Contract	208	0							_
Nywork Contract	209	648,000							64
Pirectional Drilling Services	210	224,000		and the same of th					22
rac Equipment			307	1;418,000					1,41
rac Chemicals			308	513,000					51
ruc Proppant			309	404,000					40
rac Proppant Transportation			310	399,000					39
uel & Power	211	125,000	311	68,000	354		367		19
Jater	212	60,000	312	1,019,000			368		1,07
ts.	213	92,000	313	12,000			369		10
ud & Chemicals	214	70,000	314	20,000			370		
ill Stem Test	215	0	315						_
oring & Analysis	216	0							
ement Surface	217	25,500							2
trant Intermediale	218	35,000							3
ement 2nd Intermediate/Production	219	130,000							13
ement Squeeze & Other (Kickoff Plug)	220	0					371		
eat Equipment & Centralizers	221	32,500							3
ising Crews & Equipment	222	39,000	أحوا						3
shing Tools & Service	223	0	323				372		¥
sologic/Engineering	224	7,200	324		355		373		-
ontract Labor	225	6,500	325	40,000	356	100,000	374	6,500	15
ompany Supervision	226	41,400	326	15,000	357		375		5
ontract Supervision	227	104,000	327	182,000	358		376	5,000	29
sting Casing/Tubing	228	30,000	328	5,000			377		3
ud Logging Unit	229	30,000	329						3
oging	230	0					378		
erforating/Wireline Services	231	4,000	331	538,000			379		54
mulation/Treating			332	12,000			380		1
impletion Unit			333	90,000			381	8,800	9
vatibing Unit			334				382		
ntals-Surface	235	125,000	335	466,000	359		383	7,000	59
mtuls-Subsurface	236	110,000	336	80,000			384		19
cking/Farkift/Rig Mobilization	237	200,000	337	40,000	360		385	3,000	24
ilding Services	238	3,000	338	5,000	361		386		
ater Disposal	239		339	60,000	362	135,000	387	500,000	69
ig to Abandon	240	. 0	340						
ismic Analysis	241	0	341						
scellaneous	242	0	342				389		
ntingency	243	47,000	343	250,000	363		390		29
osed Loop & Environmental	244	220,000	344	5,000	364		388		22
ed Diesel	245		345	484,000					
it Tubing			346						
owback Crews & Equip			347	48,000					4
fset Directional/Frac	248		348				391		
TOTAL INTANGIBLES		2,601,100		6,198,000		275,000		530,300	9,60
NICIPI E COSTS									
ANGIBLE COSTS rface Casing	401	48,000							46
minediale Casing	402	174,000							17-
oduction Casing/Liner	403	344,000							34
ping			504	52,030			530	5,000	5
Nhed Equipment	405	60,000	505	18,700			531	3,000	B
mping Unit	1	55,550		10,100			506	96,000	91
me Mover							507	90,000	
ds.							508	45,000	4
mps-Sub Surface (BH)	-		509				532	5,000	4
nks			- 20		510	40,000	SUL	0,000	40
wlines					511	100,000			100
ater Treater/Separator					512	150,000			150
ctrical System					513	100,000	533	15,000	115
ckers/Anchors/Hangers	414		514	65,000	010	100,000	534	2,000	
uplings/Fittings/Valves	415		514	05,000	515	95,000	UJ4	2,000	9
hydration	110				517	90,000			9:
ection Plant/CO2 Equipment	- 3				518				
mps-Surface						10,000			-
					521	10,000	FOC	7.000	:
Irumentation/SCADA/POC	410		540		522		529	7,000	
	419		519		523		535	3,000	
ntingency	420		520		524	+	536		
lers/LACT					525	30,000			31
es/Combustors/Emission					526	16,000	1		10
s Lift/Compression	- 1	****	527		516	75,000	528		BI
TOTAL TANGIBLES		626,000		146,730		616,000		181,000	1,56
TOTAL WELL COSTS	- 6	3,227,100		6,345,000		891,000		711,300	11,17
% of Total Well Cost G Operating LLC		29%		57%		8%		6%	
	10	Date Prepared		12/4/18					
*	-								
approve:		COG Operating LLC							
% Working Interest	-	By:		CB-RL-JM-SM					
npany									
ed Name:									
BO Halling.		This AFE is only an estima	ate, E	By signing you agree to pay	your	share			

This AFE is only an estimate. By signing you agree to pay your share of the actual costs incurred

WELL NAME:	HARRIER FED COM #303H	PROSPECT NAME:	Lea 2632 (717019)	
SHL:	Sec 2: 375 FSL & 1460 FWL	STATE & COUNTY:	New Mexico, Lea	
BHL:	Sec 35: 50 FNL & 1360 FWL	OBJECTIVE	DRILL AND COMPLETE	
FORMATION:	Lower Avalon Shale	DEPTH:	20,000	
LEGAL:	Sec 2: 26S-32E	TVD:	9,800	

INTANGIBLE COSTS Title/Curative/Permil	201	Drig - Rig Release(D) 20,000		Completion(C)		Tank Btty Constrctn(TB)		Pmpg Equipment(PEQ)	TOTAL 20,000
Insurance	202	2,500	302		-				2,500
Damages/Right of Way	203	20,000	303		351				20,000
Survey/Stake Location Location/Pits/Read Expense	204	7,000	305	10,000	352 353	40,000	366		7,000
Oriting / Completion Overhead	206	7,500	306		353	40,000	366		185,000 22,500
Turnkey Contract	207	7,500	. 300	15,000					22,500
Footage Contract	208	- 0							0
Daywork Contract	209	648,000						_ 00	648,000
Directional Drilling Services	210	224,000	9	9					224,000
Frac Equipment			307	1,418,000					1,418,000
Frac Chemicals			308	513,000					513,000
Frac Proppant			309	404,000					404,000
Frac Proppant Transportation			310	399,000					399,000
Fuel & Power	211	125,000	311	68,000	354		367		193,000
Water	212	60,000	312	1,019,000			368		1,079,000
Bits	213	92,000	313	12,000			369		104,000
Mud & Chemicals  Drill Stern Test	214	70,000	314	20,000			370		90,000
Coring & Analysis	215 216	0	315						0
Cernent Surface	217	25,500							25,500
Cement Intermediate	218	35,000							35,000
Cement 2nd Intermediate/Production	219	130,000							130,000
Cernent Squeeze & Other (Kickoff Plug)	220	0					371		130,000
Float Equipment & Centralizers	221	32,500							32,500
Casing Crews & Equipment	222	39,000							39,000
Fishing Tools & Service	223	0	323				372		0
Geologic/Engineering	224	7,200	324		355		373		7,200
Contract Labor	225	6,500	325	40,000	356	100,000	374	6,500	153,000
Company Supervision	226	41,400	326	15,000	357		375		56,400
Contract Supervision	227	104,000	327	182,000	358		376	5,000	291,000
Testing Casing/Tubing	228	30,000	328	5,000			377		35,000
Mud Logging Unit	229	30,000	329				070		30,000
Logging  Partnering Wyoline Services	230	4,000	331	538,000			378 379		542,000
PerforatingWireline Services Stimulation/Treating	231	4,000	332				380		
Completion Unit		1	333	12,000 90,000			381	8,800	98,800
Swatbing Unit			334	50,000			382	0,000	000,000
Rentals-Surface	235	125,000	335	466,000	359		383	7,000	598,000
Rentals-Subsurface	236	110,000	336	80,000	000		384	7,000	190,000
Trucking/ForkStVRig Mobilization	237	200,000	337	40,000	360		385	3,000	243,000
Weiding Services	238	3,000	338	5,000	361		386		8,000
Water Disposal	239		339	60,000	362	135,000	387	500,000	695,000
Plug te Abandon	240	0	340						0
Seismic Analysis	241	0	341						0
Miscelaneous	242	0	342				389		0
Contingency	243	47,000	343	250,000	363		390		297,000
Closed Loop & Environmental	244	220,000	344	5,000	364		388		225,000
Dyed Diesel	245		345	484,000					
Coil Tubing			346						0
Flowback Crews & Equip	248		347 348	48,000			391	00.000	48,000
Offset Directional/Frac TOTAL INTANGIBLES	240	2,601,100	340	6,198,000		275,000	331	20,000 550,300	9,624,400
TANGIBLE COSTS									
Surface Casing	401	48,000							48,000
Intermediate Casing	402	174,000							174,000
Production Casing/Liner	403	344,000							344,000
Tubing			504	52,030			530	5,000	57,030
Welthead Equipment	405	60,000	505	18,700			531	3,000	81,700
Pumping Unit							506	96,000	96,000
Prime Mover							507		0
Rods							508	45,000	45,000
Pumps-Sub Surface (8H)			509		610	40.000	532	5,000	5,000
Tanks Flowlines			1		510	40,000			40,000
Heater Treater/Separator			9		511	150,000			150,000
Electrical System			1		513	100,000	533	15,000	115,000
Packers/Anchors/Hangers	414		514	65,000	519	100,000	534	2,000	67,000
Couplings/Fittings/Valves	415			-00,000	515	95,000		2,000	95,000
Dehydration					517	55,500			95,000
Injection Plant/CO2 Equipment					518				0
Pumps-Surface			1		521	10,000			10,000
Instrumentation/SCADA/POC					522		529	7,000	7,000
Miscellaneous	419		519		523		535	3,000	3,000
Centingency	420		520		524		536		0
Meters/LACT					525	30,000			30,000
Flares/Combustors/Emission			1		526	16,000			16,000
Gas Lift/Compression			527	11,000	516	75,000	528		86,000
TOTAL TANGIBLES		626,000	3 7	146,730	- 51	616,000		181,000	1,569,730
TOTAL WELL COSTS  % of Total Well Cost COG Operating LLC		3,227,100	3 3	6,345,000		891,000 8%		731,300	11,194,130
· · · · · · · · · · · · · · · · · · ·		Date Prepared		12/4/18					
		COG Operating LLC							
We approve:% Working Interest		ву.		CB-RL-JM-SM			_	e	
Company: By:									
Printed Name:									
r to recent resulting.									
Title		This AFE is only an estim	ate P	A glaulud Aon suree to par					

This AFE is only an estimate By signing you agree to pay your share of the actual costs incurred.

WELL NAME:	HARRIER FED COM #304H	PROSPECT NAME:	Lea 2632 (717019)	
SHL:	Sec 2: 375 FSL & 780 FWL	STATE & COUNTY:	New Mexico, Lea	
BHL:	Sec 35: 640 FNL & 840 FWL	OBJECTIVE:	DRILL AND COMPLETE	
FORMATION:	Lower Avalon Shale	DEPTH:	20,000	
LEGAL:	Sec 2: 26S-32E	TVD:	9,600	

itle/Curative/Permit		20,000							20
surance	201	2,500	302						- 2
amages/Right of Way	203	20,000	303		351				20
urvey/Stake Location	204	7,000			352				
ocation/Pits/Road Expense	205	135,000	305	10,000	353	40,000	366		185
rilling / Completion Overhead	206	7,500	306	15,000					22
urnkey Contract	207	0							
sotage Centract	208	0							-
aywork Contract	209	648,000							64
rectional Drilling Services	210	224,000							22
ac Equipment			307	1,418,000					1,41
rac Chemicals			308	513,000					51
ac Proppart			309	404,000	- 9				40
ac Proppant Transportation	e s	405.000	310	399,000					39
ual & Power	211	125,000	311	68,000	354		367		19
ater	212	60,000	312	1,019,000			368		1,07
s ud & Chemicals	213 214	92,000	313	12,000	-		369 370		10
rill Stem Test	215	70,000	315	20,000			3/0		9
	216	0	313						-
oning & Analysis ement Surface	217	25,500			-				-
	218	35,000			- 3				2.
ement Intermediate									33
ement 2nd Intermediate/Production ement Squeece & Other (Kickoff Flug)	219	130,000			-		371		13
oat Equipment & Centralizers	220	32,500			9		3/1		-
	221	32,500							32
asing Crews & Equipment shing Tools & Service	223	39,000	323		1		372		38
eologic/Engineering	223	7,200	323		355				
eotogic/iting/neering ontract Labor	224	6,500	324	40,000	356	100,000	373 374	6,500	153
ontract Labor ompany Supervision	226	41,400	326	15,000	357	100,000	375	Uuc,a	153
ontract Supervision	226	104,000	327	182,000	357		376	5,000	291
nuting Casing/Tubing	228	30,000	328	5,000	000		377	3,000	35
ud Logging Unit	229	30,000	329	0,000			3//		30
oging one	230	30,000	JEJ				378		- 30
erforating/Wireline Services	231	4,000	331	538,000	- 1		379		542
imulation/Treating	2	4,000	332	12,000	- 1		380		12
ompletion Unit			333	90,000	1		381	8,800	96
watting Unit			334		- 1		382	0,000	
entals-Surface	235	125,000	335	466,000	359		383	7,000	596
entals-Subsurface	236	110,000	336	80,000			384		190
ucking/Forkift/Rig Mobilization	237	200,000	337	40,000	360		385	3,000	243
felding Services	238	3,000	338	5,000	361		386		- 8
ater Disposal	239	0	339	60,000	362	135,000	387	500,000	695
ug to Abandon	240	0	340		- 1				
nismic Analysis	241	0	341		- 3				
scriareous	242	0	342		- 3		389		
shtingenicy	243	47,000	343	250,000	363		390		297
osed Loop & Environmental	244	220,000	344	5,000	364		388		225
red Diesel	245		345	484,000	- 8				
oit Tubing			346						
owback Crews & Equip			347	48,000	- 1				48
fset Directional/Frac	248		348				391		/
TOTAL INTANGIBLES	-	2,601,100	- 33	6,198,000	-	275,000		530,300	9,604
ANGIBLE COSTS									
urface Casing	401	48,000							48
ermediale Casing	402	174.000			- 1				174
oduction Casing/Liner	403	344,000	1		- 1				344
bing			504	52,030	- 3		530	5,000	57
ellhead Equipment	405	60,000	505	18,700	1		531	3,000	81
imping Unit		,-50			1		506	96,000	96
ime Mover	- 5		- 1		- 5		507	0	
ds					1		508	45,000	45
Imps-Sub Surface (BH)			509		. 1		532	5,000	5
nks					510	40,000	1		40
owlines					511	100,000			100
ater Treater/Separator	1				512	150,000			150
octrical System	4				513		533	15,000	115
ckers/Anchors/Hangers	414		514	65,000	1		534	2,000	67
uplings/Fittings/Valves	415				515	95,000		-,,	95
hydration	- 1				517				
ection Plant/CO2 Equipment					518				
mps-Surface					521	10,000			10
strumentation/SCADA/POC					522	,	529	7,000	7
scellaneous	419		519		523		535	3,000	3
ntingency	420		520		524		536		
sters/LACT	1		1		525	30,000			30
res/Combustors/Emission	- 1				526	16,000			16
s Lift/Compression	J		527	11,000	516		528		- 86
TOTAL TANGIBLES		626,000		146,730	-	616,000		181,000	1,569
TOTAL WELL COSTS		3,227,100	8	6,345,000	- 1	000,168		711,300	11,174
% of Total Well Cost		29%		57%		8%		6%	
	1	Date Prepared:		12/4/18					
	(	COG Operating LLC							
e approve  Working Interest		By:		CB-RL-JM-SM					
mpany									

This AFE is only an estimate. By signing you agree to pay your share of the actual costs incurred.

WELL NAME:	HARRIER FED COM #305H	PROSPECT NAME:	Lea 2632 (717019)	
SHL	Sec 2: 375 FSL & 690 FWL	STATE & COUNTY:	New Mexico, Lea	
BHL:	Sec 35: 50 FNL & 540 FWL	OBJECTIVE:	DRILL AND COMPLETE	
FORMATION:	Lower Avalon Shale	DEPTH:	20,000	
LEGAL:	Sec 2: 26S-32E	TVD:	9,800	

INTANGIBLE COSTS Title/Curative/Permit	201	Prig - Rig Release(D) 20,000		Completion(C)		Tank Btty Constrctn(TB)		Pmpg Equipment(PEQ)	TOT
neurance	202	2,500	302						-
arnages/Right of Way	203	20,000	303		351				
urvey/Stake Location	204	7,000	100		352				
ocation/Pits/Road Expense	205	135,000	305	10,000	353	40,000	366		18
riling / Completion Overhead	206	7,500	306	15,000					1
urnkey Contract	207	0							
ootage Contract	208	0							
haywork Contract	209	648,000	8						- 64
Prectional Onling Services	210	224,000	65						2
rac Equipment			307	1,418,000					1,4
rac Chemicals		The same of the sa	308	513,000					5
rac Proppant			309	404,000					40
rac Proppant Transportation			310	399,000					39
uel & Power	211	125,000	311	68,000	354		367		15
Vator	212	60,000	312	1,019,000			368		1,0
ds	213	92,000	313	12,000			369		10
lud & Chemicals	214	70,000	314	20,000			370		
rill Stem Test	215	. 0	315						
oring & Analysis	216								
ement Surface	217	25,500							2
ement Intermediate	218	35,000	S.						3
ement 2nd Intermediate/Production	219	130,000							13
ement Squeeze & Other (Kickoff Plug)	220	0					371		
oat Equipment & Centralizers	221	32,500							3
asing Crews & Equipment	222	39,000					07-		3
shing Tools & Service	223	7,000	323		055		372		3
eologic/Engineering	224	7,200	324		355		373		
ontract Labor	225	6,500	325	40,000	356	100,000	374	6,500	15
ompany Supervision	226	41,400	326	15,000	357		375		
ontract Supervision	227	104,000	327	182,000	358		376	5,000	29
esting Casing/Tubing	228	30,000	328	5,000			377		
fud Logging Unit	229	30,000	329						3
ogging	230	0					378		
erforating/Wireline Services	231	4,000	331	538,000			379		54
timulation/Treating			332	12,000			360		1
ompletion Unit			333	90,000			381	8,800	9
wabbing Unit			334		- 3		382		
entals Surface	235	125,000	335	466,000	359		383	7,000	. 59
entals-Subsurface	236	110,000	336	80,000			384		19
rucking/Forkirt/Rig Mobilization	237	200,000	337	40,000	360		385	3,000	24
lelding Senices	238	3,000	338	5,000	361		386		
later Disposal	239	0	339	60,000	362	135,000	387	500,000	69
ug to Abandon	240	0	340						
eismic Analysis	241	0	341		. 3				-
iscellaneous	242	0	342				389		_
onlingency	243	47,000	343	250,000	363		390		29
losed Loop & Environmental	244	220,000	344	5,000	364		388		22
yed Diesel	245		345	484,000					_
oil Tubing			346		- 9				
towback Crews & Equip	0.10		347	48,000			-241		4
Offset Directional/Frac	248		348				391		_
TOTAL INTANGIBLES		2,601,100		6,198,000		275,000		530,300	9,60
ANCIBLE COSTS									
ANGIBLE COSTS		40.000							
urface Casing	401	48,000							4
fermediate Casing	402	174,000			1				17
roduction Casing/Liner	403	344,000							34
ubing			504	52,030			530	5,000	5
/ellhead Equipment	405	60,000	505	18,700	- 3		531	3,000	8
umping Unit							506	96,000	9
ime Mover							507	0	-
ods.			-				508	45,000	4
umps-Sub Surface (BH)			509		_ 2		532	5,000	
anks					510	40,000		-	4
owlines					511	100,000			10
eater Treater/Separator					512	150,000			15
ectrical System					513	100,000	533	15,000	11
	414		514	65,000			534	2,000	6
ackers/Anchors/Hangers					515	95,000			9
ackers/Anchors/Hungers ouplings/Fittings/Valves	415								
ackers/Anchors/Hangers puplings/Fittings/Valves	415				517				_
ackers/Anchors/Hangers  uppings/Fittings/Valves ehyt/dation jection Plant/CO2 Equipritent	415				518				1
sckers/Anchors/Hangers uppings/Fittings/Valves shydration species Plant/CO2 Equipment umps-Surface	415				518 521	10,000			
acker JAnchorsh Tangers  puplingsi Fittings/Valves  https://delines.com/ pection Plant/CO2 Equipment  amps-Surface.  strumentalion/SCADA/POC					518 521 522	10,000	529	7,000	
uplings/fittings/Valves hydration ection Plant/CO2 Equipment engs-Systace strumentation/SCADA/POC scellaneous	419		519		518 521 522 523	10,000	535	7,000	
uplings/fittings/valves thydration ection Plant/CO2 Equipritient entps Surface trumentation/SCADA/POC scettareous undergrees			519 520		518 521 522 523 524				
ickers/Anchors/Hangers uppings/Fittings/Valves hydration ection Plant/Co2 Equipment imps-Surface intrimentation/SCADA/POC socializations	419				518 521 522 523 524 525	30,000	535		3
ckers/Anchors/Hangers upings/Fitings/Valves hybration ection Plant/Co2 Equiphtent imps-Surface trumentation/SCADA/POC scellarleous indiagency hors/LACT	419		520		518 521 522 523 524		535		
ckers/Anchors/tangers  uplings/Fittings/Valves  hydration  ection Plant/COZ Equipritent  maps-Surface  trumentation/SCADA/POC  collaneous  ntragency  stars/LACT  res/Combustors/Emission  s Lift/Compression	419			11,000	518 521 522 523 524 525	30,000 16,000 75,000	535	3,000	3 1 8
ckers/Anchors/Hangers uplings/Fittings/Valves hybration schon-Pland/Co2 EquipHent mays-Surface trumontation/SCADA/POC scellaneous notespency hers/LACT res/Combustors/Emission s Lift/Compression TOTAL TANGIBLES	419	626,000	520	11,000 148,730	518 521 522 523 524 525 526	30,000 16,000 75,000 616,000	535 536	3,000	3 1 8 1,56
ckers/Anchors/tangers  uplings/Fittings/Valves  hydration  ection Plant/COZ Equipritent  maps-Surface  trumentation/SCADA/POC  collaneous  ntragency  stars/LACT  res/Combustors/Emission  s Lift/Compression	419		520	11,000	518 521 522 523 524 525 526	30,000 16,000 75,000	535 536	3,000	3 1 8 1,56
ckers/Anchors/Itangers  uplings/Fittings/Valves  hybration  schon Pland/Co2 Equiprisent  mps-Surface.  trumontation/SCADA/POC  scellarieous  ningency  ters/LACT  resr/Combustors/Emission  s Lift/Compression  TOTAL TANGIBLES  TOTAL WELL COSTS	419	626,000 3,227,100	520	11,000 146,730 6,345,000	518 521 522 523 524 525 526	30,000 16,000 75,000 616,000 891,000	535 536	3,000 181,000 711,300	3 1 8 1,56
ckers/Anchors/Hangers upings/Fitings/Valves hybration section Plant/CO2 EquipHent mps-Surface trumentation/SCADA/POC scellarieous infingency terrefu/ACT res/Combustors/Emission s Lift/Compression TOTAL TANGBLES TOTAL WELL COSTS	419	626,000	520	11,000 148,730	518 521 522 523 524 525 526	30,000 16,000 75,000 616,000	535 536	3,000	3 1 8 1,56
ckers/Anchors/Hangers upings/Fitings/Valves hybration section Plant/CO2 EquipHent mps-Surface trumentation/SCADA/POC scellarieous infingency terrefu/ACT res/Combustors/Emission s Lift/Compression TOTAL TANGBLES TOTAL WELL COSTS	419	626,000 3,227,100	520	11,000 146,730 6,345,000	518 521 522 523 524 525 526	30,000 16,000 75,000 616,000 891,000	535 536	3,000 181,000 711,300	3 1 8 1,56
uplings/Fittings/Valves hybration ection Plant/CO2 Equipritient mps-Surface turnmentsion/SCADA/POC scellarieous infragency testers/LACT ves/Combustors/Emission sc.Lift/Compression TOTAL TANGIBLES TOTAL WELL COSTS	419	626,000 3,227,100 28%	520	11,000 146,730 6,345,000	518 521 522 523 524 525 526	30,000 16,000 75,000 616,000 891,000	535 536	3,000 181,000 711,300	3 1 8 1,56
ckers/Anchors/Hangers upings/Fitings/Valves hybration ection Plant/CO2 Equiphtent mps-Surface trumentation/SCADA/POC scellarieous ntingency testers/LACT res/Combustors/Emission s Litt/Compression TOTAL TANGIBLES TOTAL WELL COSTS	419	626,000 3,227,100	520	11,000 146,730 6,345,000	518 521 522 523 524 525 526	30,000 16,000 75,000 616,000 891,000	535 536	3,000 181,000 711,300	3 1 8 1,56
acker JAnchorsh Tangers  pupingsi/Fittings/Valves  thyfartion  parts- Surface  strumentation/SCADA/POC  socifiaheous  softeneous  softeneo	419	626,000 3,227,100 28%	520	11,000 146,730 6,345,000	518 521 522 523 524 525 526	30,000 16,000 75,000 616,000 891,000	535 536	3,000 181,000 711,300	3 1 8 1,56
sckers/Anchors/Hangers upplings/Fittings/Valves hybridation section Plant/CO2 Equipritient surps-Surface strumentation/SCADA/POC socializations schingency stets/LACT ares/Combustors/Emission ss.Lit/Compression TOTAL TANGIBLES TOTAL WELL COSTS	419	626,000 3,227,100 29% Date Prepared	520	11,000 146,730 6,345,000	518 521 522 523 524 525 526	30,000 16,000 75,000 616,000 891,000	535 536	3,000 181,000 711,300	3 1 8 1,56
subchers/Anchors/Hangers pupilings/Fittings/Valves hip/gration section Plant/COZ Equipment amps-Surface strumentation/SCADA/POC sectionPlant/COZ foreigners hitchingency hitchingency hitchingency hitchingency structure/Emission so Lift/Compression TOTAL TANGIBLES TOTAL WELL COSTS % of Total Well Cost	419	626,000 3,227,100 29% Date Prepared	520	11,000 146,730 6,345,000	518 521 522 523 524 525 526	30,000 16,000 75,000 616,000 891,000	535 536	3,000 181,000 711,300	3 1 8 1,56
ckers/Anchors/Itangers uplings/Filtings/Valves hybrids/on ection Plant/CoZ EquipHent mps-Surface Itrumontation/ISCADA/POC scellaneous integency hers/LACT res/Combustors/Emission s Lift/Compression TOTAL TANGIBLES TOTAL WELL COSTS  % of Total Well Cost of Operating LLC	419	626,000 3,227,100 28% Date Prepared.	520	11,000 146,730 6,345,000 57%	518 521 522 523 524 525 526	30,000 16,000 75,000 616,000 891,000	535 536	3,000 181,000 711,300	3 1 8 1,56
ckers/Anchors/Hangers upings/Fitings/Valves hybridation action Plant/Co2 Equiphtent imps-Surface trumentation/ScADA/POC acetal-bours indispency hters/LACT res/Combustors/Emission is Lift/Compression TOTAL TANGIBLES TOTAL WELL COSTS % of Total Well Cost 98 pproviders % Working Interest	419	626,000 3,227,100 28% Date Prepared.	520	11,000 146,730 6,345,000 57%	518 521 522 523 524 525 526	30,000 16,000 75,000 616,000 891,000	535 536	3,000 181,000 711,300	3
ckers/Anchors/Itangers  uplings/Fittings/Valves  hybration  ection Plant/CoZ Equipment  meps Surface  trumontation/SCADA/POC  scellar-leous  ningancy  tetrs/LACT  res/Combustors/Emission  st/f/Compression  TOTAL TANGIBLES  TOTAL WELL COSTS  % of Total Well Cost  plaprove:  % Working Interest:	419	626,000 3,227,100 28% Date Prepared.	520	11,000 146,730 6,345,000 57%	518 521 522 523 524 525 526	30,000 16,000 75,000 616,000 891,000	535 536	3,000 181,000 711,300	3 1 8 1,56
ckers/Achors/Hangers upilings/Fithings/Valves hybrids/fion rection Plant/CO2 EquipHent mps-Surface trumentation/SCADA/POC cichlaneous notegency tere/LACT res/Combustors/Emission s Lift/Compression TOTAL TANGIBLES TOTAL WELL COSTS % of Total Well Cost sproves % Working Interest mpany:	419	626,000 3,227,100 28% Date Prepared.	520	11,000 146,730 6,345,000 57%	518 521 522 523 524 525 526	30,000 16,000 75,000 616,000 891,000	535 536	3,000 181,000 711,300	3 1 8 1,56

# STATE OF NEW MEXICO DEPARTMENT OF ENERGY, MINERALS AND NATURAL RESOURCES OIL CONSERVATION DIVISION

APPLICATION OF COG OPERATING LLC FOR COMPULSORY POOLING, LEA COUNTY, NEW MEXICO.

**CASE NO. 20271** 

# AFFIDAVIT OF JOHN BERTALOTT

John Bertalott, of lawful age and being first duly sworn, declares as follows:

- 1. My name is John Bertalott. I work for COG Operating LLC ("COG") as a geologist.
- 2. I have previously testified before the New Mexico Oil Conservation Division as an expert witness in petroleum geology. My credentials as a petroleum geology have been accepted by the Division and made a matter of record.
- 3. I am familiar with the applications filed by COG in these cases and I have conducted a geologic study of the targeted Avalon shale within the Bone Spring formation underlying the subject acreage.
- 4. COG is targeting Avalon shale within the Bone Spring formation with its proposed Harrier Federal Com #101H, #102H, #103H, #201H, #202H, #301H, #302H, #303H, #304H, and #305H Wells.
- 5. COG Exhibit No. 2A is a subsea structure map that I prepared on the top of the Avalon shale that is representative of the targeted intervals within the Bone Spring formation.

  The proposed wells are depicted by a green dashed line. Existing producing wells in the Avalon shale are represented by solid green lines. The structure map shows that the formation is

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BEFORE THE OIL CONSERVATION DIVISION
Santa Fe, New Mexico
Exhibit No. 2

gently dipping to the southeast in this area. I do not observe any faulting, pinchouts, or other geologic impediments to developing the targeted Avalon shale with a horizontal well in this area.

- 6. COG Exhibit No. 2B overlays a cross-section line in red consisting of three wells penetrating the Bone Spring formation that I used to construct a stratigraphic cross-section from A to A'. I consider these wells to be representative of the geology in the area.
- 7. COG Exhibit No. 2C is a cross section using the representative wells depicted on Exhibit 2B. Each well in the cross-section contains gamma ray, resistivity, and porosity logs. The proposed target intervals in the Avalon shale are labeled and depicted with set of green brackets on the left-hand side of the exhibit. The cross-section demonstrates that the targeted intervals extend across the proposed spacing and proration unit in all cases.
- 8. In my opinion the stand-up orientation of the proposed wells is the preferred orientation for horizontal well development in this area and is appropriate to efficiently and effectively develop the subject acreage.
- 9. Based on my geologic study, the Bone Spring formation underlying the subject area, including the targeted Avalon shale, is suitable for development by horizontal wells and the acreage comprising the proposed spacing and proration units will contribute more-or-less equally to the production from the wellbores.
- 10. In my opinion, the granting of COG's application will be in the best interest of conservation, the prevention of waste, and protection of correlative rights.

FURTHER AFFIANT SAYETH NOT.

John Berlalott

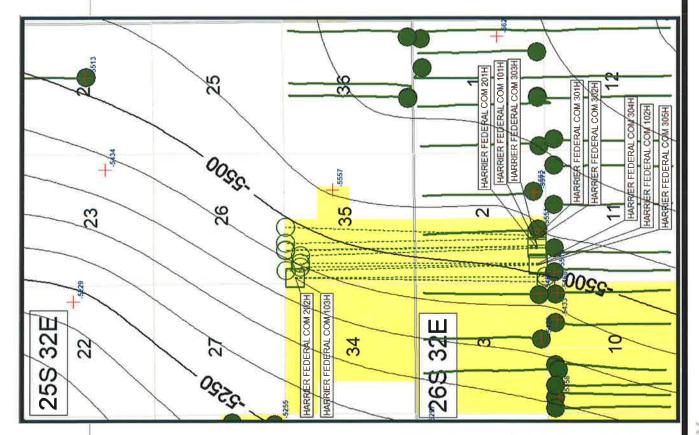
county of Midland

SUBSCRIBED and SWORN to before me this 6th day of March 2019 by John Bertalott.



OTARY PUBLIC

My Commission Expires:



BEFORE THE OIL CONSERVATION DIVISION

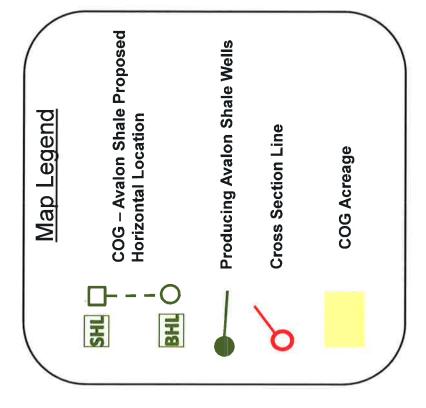
Santa Fe, New Mexico

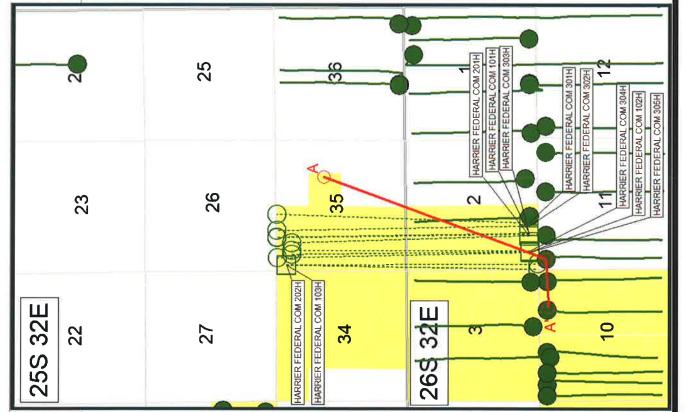
Exhibit No. 2A

Submitted by: COG OPERATING LLC

Hearing Date: March 7, 2019 Case Nos. 20271







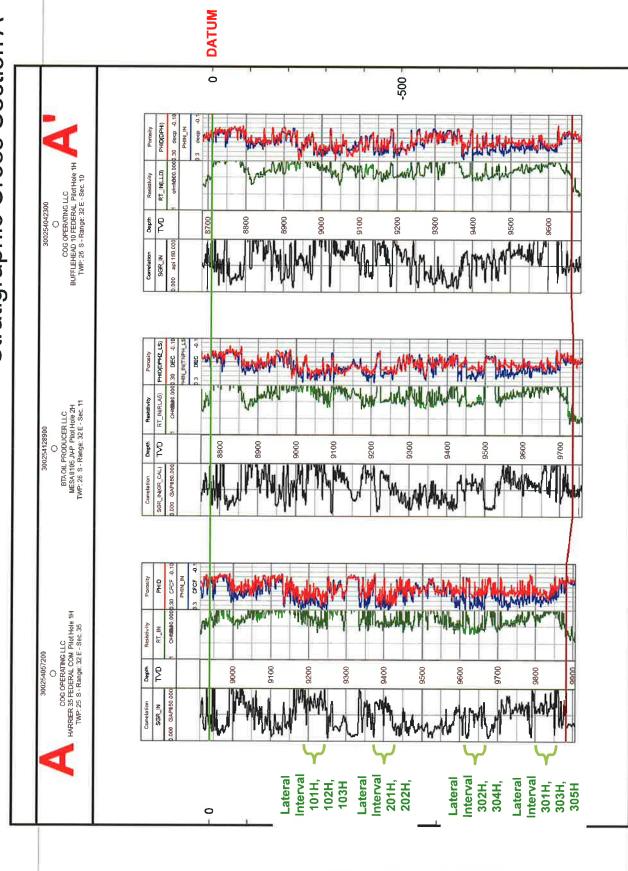
### **BEFORE THE OIL CONSERVATION DIVISION**

Santa Fe, New Mexico **Exhibit No. 2B** 

Submitted by: COG OPERATING LLC

Hearing Date: March 7, 2019 Case Nos. 20271





# BEFORE THE OIL CONSERVATION DIVISION

Santa Fe, New Mexico
Exhibit No. 2C
Submitted by: COG OPERATING LLC
Hearing Date: March 7, 2019

earing Date: March 7, 2019 Case Nos. 20271

# STATE OF NEW MEXICO DEPARTMENT OF ENERGY, MINERALS AND NATURAL RESOURCES OIL CONSERVATION DIVISION

APPLICATION OF COG OPERATING, LLC FOR COMPULSORY POOLING, LEA COUNTY, NEW MEXICO.

**CASE NO. 20271** 

# **AFFIDAVIT**

STATE OF NEW MEXICO ) ss.
COUNTY OF SANTA FE )

Adam G. Rankin, attorney for **COG Operating LLC** the Applicant herein, being first duly sworn, upon oath, states that the above-referenced Applications have been provided under the notice letters and proof of receipts attached hereto.

Adam G. Rankin

SUBSCRIBED AND SWORN to before me this 6th day of March 2019 by Adam G. Rankin.

OFFICIAL SEAL

CLARINDA L. WETZSTEON NOTARY PUBLIC

STATE-OF NEW MEXICO

My Commission Expires:

BEFORE THE OIL CONSERVATION DIVISION

Santa Fe, New Mexico
Exhibit No. 3

Submitted by: COG OPERATING LLC
Hearing Date: March 7, 2019

Case Nos. 20271



Michael H. Feldewert
Recognized Specialist in the
Area of Natural Resources —
Oil and Gas Law — New Mexico Board
of Legal Specification
mfeldewert@hollandhart.com

February 15, 2019

# VIA CERTIFIED MAIL CERTIFIED RECEIPT REQUESTED

TO: ALL INTEREST OWNERS SUBJECT TO POOLING PROCEEDINGS

Re: Application of COG Operating LLC for compulsory pooling, Lea County,

New Mexico.

Harrier Federal Com #101H-103H, #201H-202H and #301H-305H Wells

### Ladies & Gentlemen:

This letter is to advise you that COG Operating Inc. has filed the enclosed application with the New Mexico Oil Conservation Division. A hearing has been requested before a Division Examiner on March 7, 2019, and the status of the hearing can be monitored through the Division's website at <a href="http://www.emnrd.state.nm.us/ocd/">http://www.emnrd.state.nm.us/ocd/</a>. Division hearings will commence at 8:15 a.m. in Porter Hall at the Oil Conservation Division's Santa Fe Offices located at 1220 South Saint Francis Drive, Santa Fe, New Mexico 87505. You are not required to attend this hearing, but as an owner of an interest that may be affected by this application, you may appear and present testimony. Failure to appear at that time and become a party of record will preclude you from challenging the matter at a later date.

Parties appearing in cases are required by Division Rule 19.15.4.13.B to file a Pre-hearing Statement four business days in advance of a scheduled hearing. This statement must be filed at the Division's Santa Fe office at the above specified address and should include: the names of the parties and their attorneys; a concise statement of the case; the names of all witnesses the party will call to testify at the hearing; the approximate time the party will need to present its case; and identification of any procedural matters that are to be resolved prior to the hearing.

If you have any questions about this matter, please contact Matt Solomon at (432) 685-4352 or MSolomon@concho.com.

Sincerely,

Michael H. Feldewert

ATTORNEY FOR COG OPERATING LLC



# **Shipment Confirmation Acceptance Notice**

Note to Mailer: The labels and volume associated to this form online, must match the labeled packages being presented to the USPS® employee with this form.

COG - Harrier Wells CM# 51500.0010 Notice List 20190307 Docket Shipment Date: 02/11/2019 Shipped From:

Name: HOLLAND & HART LLP Address: 110 N GUADALUPE ST # 1

City: SANTA FE

State: NM ZIP+4® 87501

Type of Mail	Volume
Priority Mail Express®*	
Priority Mail®	0
First-Class Package Service®	
Returns	
International*	
Other	3
Total	3

<sup>\*</sup>Start time for products with service guarantees will begin when mail arrives at the local Post Office™ and items receive individual processing and acceptance scans.

### B. USPS Action

Note to RSS Clerk:

- Home screen > Mailing/Shipping > More
   Select Shipment Confirm
   Scan or enter the barcode/label number from PS Form 5630
- Confirm the volume count message by selecting Yes or No
   Select Pay and End Visit to complete transaction

USPS EMPLOYEE: Please scan upon pickup or receipt of mail. Leave form with customer or in customer's mail receptacle.

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