



October 18, 2018

EOG Resources Inc.  
5509 Champions Drive  
Midland, TX 79706  
Attention: Land Department

U.S. CERTIFIED MAIL – 91 7199 9991 7038 7703 4825

**RECEIVED**

OCT 22 2018

**EOG RESOURCES, INC**  
**MIDLAND DIVISION**

**Re: Well Proposal – Mastiff Federal Com #701H**  
Sec 4: Lot 1, SE/4NE/4, and E/2 SE/4 - T24S-R32E  
Sec 9: E/2 E/2 - T24S-R32E  
Approximate First Take Point: 100' FNL / 330' FEL, Sec.4-T24S-R32E  
Approximate Last Take Point: 100' FSL / 330' FEL, Sec.9-T24S-R32E  
Lea County, New Mexico

Dear Sir/Madam:

COG Operating LLC (COG), as Operator, hereby proposes the drilling and completion of the Mastiff Federal Com #701H well as a horizontal well at the above-captioned location, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 12,300' and a MD of approximately 22,860' to test the Wolfcamp Formation ("Operation"). Surface Hole Location and Bottom Hole Location to be determined in accordance with COG's operating plans and surface restrictions on the property. The total cost of the Operation is estimated to be \$13,904,855.00, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

COG is proposing to drill this well under the terms of the modified 1989 AAPL form of Operating Agreement which is enclosed for your review and approval. The Operating Agreement's contract lands will cover the Lots 1, 2, S2NE and SE/4 of Sec. 4-T24S-R32E and the E/2 of Sec. 9-T24S-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 election in the space provided below, sign and return this letter, along with a signed copy of the enclosed AFE 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 would like to term assign your leasehold under the following general terms:

- Reservation unto Assignor of the positive difference, if any, between existing burdens and 20%
- 3 Year Primary Term
- \$3,000/ Net Acre Bonus Consideration

The term assignment offer 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) 685-2515.

Respectfully,

A handwritten signature in blue ink, appearing to read "A. Reker".

Adam C. Reker  
Landman

\_\_\_\_\_ I/We hereby elect to participate in the Mastiff Federal Com #701H.

\_\_\_\_\_ I/We hereby elect **not** to participate in the Mastiff Federal Com #701H.

Company: **EOG Resources Inc.**

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

Name: \_\_\_\_\_

Title: \_\_\_\_\_

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



**EOG Resources Inc.**

5509 Champions Drive

Midland, TX 79706

Attention: Land Department

**RECEIVED**

OCT 22 2018

**EOG RESOURCES, INC  
MIDLAND DIVISION**

**Re: Well Proposal – Mastiff Federal Com #702H**

Sec 4: Lot 1, SE/4NE/4, and E/2 SE/4 - T24S-R32E

Sec 9: E/2 E/2 - T24S-R32E

Approximate First Take Point: 100' FNL / 843' FEL, Sec.4-T24S-R32E

Approximate Last Take Point: 100' FSL / 843' FEL, Sec.9-T24S-R32E

Lea County, New Mexico

Dear Sir/Madam:

COG Operating LLC (COG), as Operator, hereby proposes the drilling and completion of the Mastiff Federal Com #702H well as a horizontal well at the above-captioned location, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 12,400' and a MD of approximately 22,960' to test the Wolfcamp Formation ("Operation"). Surface Hole Location and Bottom Hole Location to be determined in accordance with COG's operating plans and surface restrictions on the property. The total cost of the Operation is estimated to be \$13,904,855.00, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

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Adam C. Reker  
Landman

\_\_\_\_\_ I/We hereby elect to participate in the Mastiff Federal Com #702H.

\_\_\_\_\_ I/We hereby elect not to participate in the Mastiff Federal Com #702H.

Company: EOG Resources Inc.

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

Name: \_\_\_\_\_

Title: \_\_\_\_\_

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





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**MIDLAND DIVISION**

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Sec 4: Lot 2, SW/4NE/4, W/2SE/4 - T24S-R32E  
Sec 9: W/2 E/2 - T24S-R32E  
Approximate First Take Point: 100' FNL / 1356' FEL, Sec.4-T24S-R32E  
Approximate Last Take Point: 100' FSL / 1356' FEL, Sec.9-T24S-R32E  
Lea County, New Mexico

Dear Sir/Madam:

COG Operating LLC (COG), as Operator, hereby proposes the drilling and completion of the Mastiff Federal Com #703H well as a horizontal well at the above-captioned location, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 12,300' and a MD of approximately 22,860' to test the Wolfcamp Formation ("Operation"). Surface Hole Location and Bottom Hole Location to be determined in accordance with COG's operating plans and surface restrictions on the property. The total cost of the Operation is estimated to be \$13,904,855.00, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

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Sec 4: Lot 2, SW/4NE/4, W/2SE/4 - T24S-R32E

Sec 9: W/2 E/2 - T24S-R32E

Approximate First Take Point: 100' FNL / 1869' FEL, Sec.4-T24S-R32E

Approximate Last Take Point: 100' FSL / 1869' FEL, Sec.9-T24S-R32E

Lea County, New Mexico

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COG Operating LLC (COG), as Operator, hereby proposes the drilling and completion of the Mastiff Federal Com #704H well as a horizontal well at the above-captioned location, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 12,400' and a MD of approximately 22,960' to test the Wolfcamp Formation ("Operation"). Surface Hole Location and Bottom Hole Location to be determined in accordance with COG's operating plans and surface restrictions on the property. The total cost of the Operation is estimated to be \$13,904,855.00, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

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**MIDLAND DIVISION**

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Sec 4: Lot 2, SW/4NE/4, W/2SE/4 - T24S-R32E  
Sec 9: W/2 E/2 - T24S-R32E  
Approximate First Take Point: 100' FNL / 2382' FEL, Sec.4-T24S-R32E  
Approximate Last Take Point: 100' FSL / 2382' FEL, Sec.9-T24S-R32E  
Lea County, New Mexico

Dear Sir/Madam:

COG Operating LLC (COG), as Operator, hereby proposes the drilling and completion of the Mastiff Federal Com #705H well as a horizontal well at the above-captioned location, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 12,300' and a MD of approximately 22,860' to test the Wolfcamp Formation ("Operation"). Surface Hole Location and Bottom Hole Location to be determined in accordance with COG's operating plans and surface restrictions on the property. The total cost of the Operation is estimated to be \$13,904,855.00, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

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



October 18, 2018

U.S. CERTIFIED MAIL – 91 7199 9991 7038 7703 4795

**EOG Resources Inc.**

5509 Champions Drive

Midland, TX 79706

Attention: Land Department

**Re: Well Proposal – Mastiff Federal Com #706H**

Sec 4: Lot 3, SE/4NW/4, E/2SW/4 - T24S-R32E

Sec 33: E/2 W/2 - T23S-R32E

Approximate First Take Point: 100' FSL / 2385' FWL, Sec.4-T24S-R32E

Approximate Last Take Point: 100' FSL / 2385' FWL, Sec.33-T23S-R32E

Lea County, New Mexico

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Company: EOG Resources Inc.

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

Name: \_\_\_\_\_

Title: \_\_\_\_\_

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





**EOG Resources Inc.**

5509 Champions Drive

Midland, TX 79706

Attention: Land Department

**Re: Well Proposal – Mastiff Federal Com #707H**

Sec 4: Lot 3, SE/4NW/4, E/2SW/4 - T24S-R32E

Sec 33: E/2 W/2 - T23S-R32E

Approximate First Take Point: 100' FSL / 1872' FWL, Sec.4-T24S-R32E

Approximate Last Take Point: 100' FSL / 1872' FWL, Sec.33-T23S-R32E

Lea County, New Mexico

Dear Sir/Madam:

COG Operating LLC (COG), as Operator, hereby proposes the drilling and completion of the Mastiff Federal Com #707H well as a horizontal well at the above-captioned location, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 12,300' and a MD of approximately 22,860' to test the Wolfcamp Formation ("Operation"). Surface Hole Location and Bottom Hole Location to be determined in accordance with COG's operating plans and surface restrictions on the property. The total cost of the Operation is estimated to be \$13,904,855.00, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

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Company: EOG Resources Inc.

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

Name: \_\_\_\_\_

Title: \_\_\_\_\_

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



**EOG Resources Inc.**

5509 Champions Drive

Midland, TX 79706

Attention: Land Department

**Re: Well Proposal – Mastiff Federal Com #708H**

Sec 4: Lot 3, SE/4NW/4, E/2SW/4 - T24S-R32E

Sec 33: E/2 W/2 - T23S-R32E

Approximate First Take Point: 100' FSL / 1359' FWL, Sec.4-T24S-R32E

Approximate Last Take Point: 100' FSL / 1359' FWL, Sec.33-T23S-R32E

Lea County, New Mexico

Dear Sir/Madam:

COG Operating LLC (COG), as Operator, hereby proposes the drilling and completion of the Mastiff Federal Com #708H well as a horizontal well at the above-captioned location, or at a legal location as approved by the governing regulatory agency, to a TVD of approximately 12,400' and a MD of approximately 22,960' to test the Wolfcamp Formation ("Operation"). Surface Hole Location and Bottom Hole Location to be determined in accordance with COG's operating plans and surface restrictions on the property. The total cost of the Operation is estimated to be \$13,904,855.00, and a detailed description of the cost is set out in the enclosed Authority for Expenditure ("AFE").

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Approximate First Take Point: 100' FSL / 846' FWL, Sec.4-T24S-R32E

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Lea County, New Mexico

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- 3 Year Primary Term
- \$3,000/ Net Acre Bonus Consideration

The term assignment offer 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) 685-2515.

Respectfully,

A handwritten signature in blue ink, appearing to read "Adam C. Reker".

Adam C. Reker  
Landman

\_\_\_\_\_ I/We hereby elect to participate in the Mastiff Federal Com #710H.

\_\_\_\_\_ I/We hereby elect not to participate in the Mastiff Federal Com #710H.

Company: EOG Resources Inc.

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

Name: \_\_\_\_\_

Title: \_\_\_\_\_

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



COG OPERATING LLC  
AUTHORITY FOR EXPENDITURE  
DRILLING

WELL NAME:	MASTIFF FED COM #701H	PROSPECT NAME:	Bulldog 2432 (717113)
FTP:	Sec 4: 100 FNL & 330 FEL	STATE & COUNTY:	New Mexico, Lea
LTP:	Sec 9: 100 FSL & 330 FEL	OBJECTIVE:	Drill and Complete
FORMATION:	Wolfcamp	DEPTH:	22,860
LEGAL:	Sec 4-24S-32E	TVD:	12,300

		Drig - Rig			Tank Btty		Pmpq	
INTANGIBLE COSTS		Release(D)	Completion(C)		Constrctn(TB)		Equipment(PEQ)	TOTAL
Title/Curative/Permit	201	20,000						20,000
Insurance	202	2,500	302					2,500
Damages/Right of Way	203	20,000	303	351				20,000
Survey/Stake Location	204	7,000		352				7,000
Location/Pits/Road Expense	205	135,000	305	10,000	353	45,000	366	190,000
Drilling / Completion Overhead	206	11,100	306	15,000				26,100
Turnkey Contract	207	0						0
Footage Contract	208	0						0
Daywork Contract	209	923,000						923,000
Directional Drilling Services	210	442,000						442,000
Frac Equipment			307	1,418,000				1,418,000
Frac Chemicals			308	473,000				473,000
Frac Proppant			309	814,000				814,000
Frac Proppant Transportation			310	399,000				399,000
Fuel & Power	211	211,000	311	68,000	354		367	279,000
Water	212	60,000	312	966,000			368	1,026,000
Bits	213	111,000	313	4,500			369	115,500
Mud & Chemicals	214	275,000	314	25,000			370	300,000
Drill Stem Test	215	0	315					0
Coring & Analysis	216	0						0
Cement Surface	217	28,000						28,000
Cement Intermediate	218	75,000						75,000
Cement 2nd Intermediate/Production	219	115,000						115,000
Cement Squeeze & Other (Kickoff Plug)	220	0					371	0
Float Equipment & Centralizers	221	65,000						65,000
Casing Crews & Equipment	222	70,000						70,000
Fishing Tools & Service	223	0	323				372	0
Geologic/Engineering	224	11,400	324		355		373	11,400
Contract Labor	225	6,500	325	20,000	356	122,935	374	6,500
Company Supervision	226	66,600	326	15,000	357		375	81,600
Contract Supervision	227	157,000	327	255,000	358		376	5,000
Testing Casing/Tubing	228	30,000	328	5,000			377	35,000
Mud Logging Unit	229	52,000	329					52,000
Logging	230	0					378	0
Perforating/Wireline Services	231	4,000	331	538,000			379	542,000
Stimulation/Treating			332	397,000			380	397,000
Completion Unit			333	138,000			381	8,800
Swabbing Unit			334				382	0
Rentals-Surface	235	190,000	335	403,000	359		383	7,000
Rentals-Subsurface	236	150,000	336	30,000			384	180,000
Trucking/Forklift/Rig Mobilization	237	200,000	337	20,000	360		385	3,000
Welding Services	238	3,000	338	5,000	361		386	8,000
Water Disposal	239	0	339	60,000	362	135,000	387	195,000
Plug to Abandon	240	0	340					0
Seismic Analysis	241	0	341					0
Miscellaneous	242	0	342				389	0
Contingency	243	69,000	343	250,000	363		390	319,000
Closed Loop & Environmental	244	330,000	344	5,000	364		388	335,000
Dyed Diesel	245		345	484,000				
Coil Tubing			346	750,000				750,000
Flowback Crews & Equip			347	48,000				48,000
Offset Directional/Frac	248		348				391	0
TOTAL INTANGIBLES		3,840,100		7,615,500		302,935		30,300
11,788,835								
TANGIBLE COSTS								
Surface Casing	401	52,000						52,000
Intermediate Casing	402	555,000						555,000
Production Casing/Liner	403	516,000						516,000
Tubing			504	52,030			530	5,000
Wellhead Equipment	405	75,000	505	22,000			531	3,000
Pumping Unit				0			506	96,000
Prime Mover				0			507	0
Rods				0			508	35,000
Pumps-Sub Surface (BH)			509				532	5,000
Tanks					510	63,645.00		63,645
Flowlines					511	26,593.00		26,593
Heater Treater/Separator					512	140,007.00		140,007
Electrical System					513	130,000.00	533	15,000
Packers/Anchors/Hangers	414		514	66,000			534	2,000
Couplings/Fittings/Valves	415				515	102,282		102,282
Dehydration					517			0
Injection Plant/CO2 Equipment					518			0
Pumps-Surface					521	5,000		5,000
Instrumentation/SCADA/POC					522	10,482	529	7,000
Miscellaneous	419		519		523	5,241	535	3,000
Contingency	420		520		524		536	0
Meters/LACT					525	25,156		25,156
Flares/Combustors/Emission					526	23,584		23,584
Gas Lift/Compression			527	15,000	516	60,000	528	75,000
TOTAL TANGIBLES		1,198,000		155,030		591,990		171,000
TOTAL WELL COSTS		5,038,100		7,771,000		894,925		201,300
13,904,855								

COG Operating LLC

Date Prepared: 10/18/18

We approve:  
% Working Interest

COG Operating LLC

By: MB

Company:  
By:

Printed Name:  
Title:  
Date:

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



COG OPERATING LLC  
AUTHORITY FOR EXPENDITURE  
DRILLING

WELL NAME:	MASTIFF FED COM #702H	PROSPECT NAME:	Bulldog 2432 (717113)
FTP:	Sec 4: 100 FNL & 843 FEL	STATE & COUNTY:	New Mexico, Lea
LTP:	Sec 9: 100 FSL & 843 FEL	OBJECTIVE:	Drill and Complete
FORMATION:	Wolfcamp	DEPTH:	22,960
LEGAL:	Sec 4-24S-32E	TVD:	12,400

INTANGIBLE COSTS		Drig - Rig Release(D)		Completion(C)		Tank Btty Constrctn(TB)		Pmpq Equipment(PEQ)		TOTAL
Title/Curative/Permit	201	20,000								20,000
Insurance	202	2,500	302							2,500
Damages/Right of Way	203	20,000	303		351					20,000
Survey/Stake Location	204	7,000			352					7,000
Location/Pits/Road Expense	205	135,000	305	10,000	353	45,000	366			190,000
Drilling / Completion Overhead	206	11,100	306	15,000						26,100
Turnkey Contract	207	0								0
Footage Contract	208	0								0
Daywork Contract	209	923,000								923,000
Directional Drilling Services	210	442,000								442,000
Frac Equipment			307	1,418,000						1,418,000
Frac Chemicals			308	473,000						473,000
Frac Proppant			309	814,000						814,000
Frac Proppant Transportation			310	399,000						399,000
Fuel & Power	211	211,000	311	68,000	354		367			279,000
Water	212	60,000	312	966,000			368			1,026,000
Bits	213	111,000	313	4,500			369			115,500
Mud & Chemicals	214	275,000	314	25,000			370			300,000
Drill Stem Test	215	0	315							0
Coring & Analysis	216	0								0
Cement Surface	217	28,000								28,000
Cement Intermediate	218	75,000								75,000
Cement 2nd Intermediate/Production	219	115,000								115,000
Cement Squeeze & Other (Kickoff Plug)	220	0					371			0
Float Equipment & Centralizers	221	65,000								65,000
Casing Crews & Equipment	222	70,000								70,000
Fishing Tools & Service	223	0	323				372			0
Geologic/Engineering	224	11,400	324		355		373			11,400
Contract Labor	225	6,500	325	20,000	356	122,935	374	6,500		155,935
Company Supervision	226	66,600	326	15,000	357		375			81,600
Contract Supervision	227	157,000	327	255,000	358		376	5,000		417,000
Testing Casing/Tubing	228	30,000	328	5,000			377			35,000
Mud Logging Unit	229	52,000	329							52,000
Logging	230	0					378			0
Perforating/Wireline Services	231	4,000	331	538,000			379			542,000
Stimulation/Treating			332	397,000			380			397,000
Completion Unit			333	138,000			381	8,800		146,800
Swabbing Unit			334				382			0
Rentals-Surface	235	190,000	335	403,000	359		383	7,000		600,000
Rentals-Subsurface	236	150,000	336	30,000			384			180,000
Trucking/Forklift/Rig Mobilization	237	200,000	337	20,000	360		385	3,000		223,000
Welding Services	238	3,000	338	5,000	361		386			8,000
Water Disposal	239	0	339	60,000	362	135,000	387			195,000
Plug to Abandon	240	0	340							0
Seismic Analysis	241	0	341							0
Miscellaneous	242	0	342				389			0
Contingency	243	69,000	343	250,000	363		390			319,000
Closed Loop & Environmental	244	330,000	344	5,000	364		388			335,000
Dyed Diesel	245		345	484,000						
Coil Tubing			346	750,000						750,000
Flowback Crews & Equip			347	48,000						48,000
Offset Directional/Frac	248		348				391			0
TOTAL INTANGIBLES		3,840,100		7,615,500		302,935		30,300		11,788,835

TANGIBLE COSTS										
Surface Casing	401	52,000								52,000
Intermediate Casing	402	555,000								555,000
Production Casing/Liner	403	516,000								516,000
Tubing			504	52,030			530	5,000		57,030
Wellhead Equipment	405	75,000	505	22,000			531	3,000		100,000
Pumping Unit				0			506	96,000		96,000
Prime Mover				0			507			0
Rods				0			508	35,000		35,000
Pumps-Sub Surface (BH)			509				532	5,000		5,000
Tanks					510	63,645.00				63,645
Flowlines					511	26,593.00				26,593
Heater Treater/Separator					512	140,007.00				140,007
Electrical System					513	130,000.00	533	15,000		145,000
Packers/Anchors/Hangers	414		514	66,000			534	2,000		68,000
Couplings/Fittings/Valves	415				515	102,282				102,282
Dehydration					517					0
Injection Plant/CO2 Equipment					518					0
Pumps-Surface					521	5,000				5,000
Instrumentation/SCADA/POC					522	10,482	529	7,000		17,482
Miscellaneous	419		519		523	5,241	535	3,000		8,241
Contingency	420		520		524		536			0
Meters/LACT					525	25,156				25,156
Flares/Combustors/Emission					526	23,584				23,584
Gas Lift/Compression			527	15,000	516	60,000	528			75,000
TOTAL TANGIBLES		1,198,000		155,030		591,990		171,000		2,116,020
TOTAL WELL COSTS		5,038,100		7,771,000		894,925		201,300		13,904,855

COG Operating LLC

% of Total Well Cost

36%

56%

6%

1%

Date Prepared:

10/18/18

COG Operating LLC

ACR

We approve:

% Working Interest

By:

MB

Company:

By:

Printed Name:

Title:

Date:

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



COG OPERATING LLC  
AUTHORITY FOR EXPENDITURE  
DRILLING


WELL NAME:	MASTIFF FED COM #703H	PROSPECT NAME:	Bulldog 2432 (717113)
FTP:	Sec 4: 100 FNL & 1356 FEL	STATE & COUNTY:	New Mexico, Lea
LTP:	Sec 9: 100 FSL & 1356 FEL	OBJECTIVE:	Drill and Complete
FORMATION:	Wolfcamp	DEPTH:	22,860
LEGAL:	Sec 4-24S-32E	TVD:	12,300

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Damages/Right of Way	203	20,000	303		351					20,000
Survey/Stake Location	204	7,000			352					7,000
Location/Pits/Road Expense	205	135,000	305	10,000	353	45,000	366			190,000
Drilling / Completion Overhead	206	11,100	306	15,000						26,100
Turnkey Contract	207	0								0
Footage Contract	208	0								0
Daywork Contract	209	923,000								923,000
Directional Drilling Services	210	442,000								442,000
Frac Equipment			307	1,418,000						1,418,000
Frac Chemicals			308	473,000						473,000
Frac Proppant			309	814,000						814,000
Frac Proppant Transportation			310	399,000						399,000
Fuel & Power	211	211,000	311	68,000	354		367			279,000
Water	212	60,000	312	966,000			368			1,026,000
Bits	213	111,000	313	4,500			369			115,500
Mud & Chemicals	214	275,000	314	25,000			370			300,000
Drill Stem Test	215	0	315							0
Coring & Analysis	216	0								0
Cement Surface	217	28,000								28,000
Cement Intermediate	218	75,000								75,000
Cement 2nd Intermediate/Production	219	115,000								115,000
Cement Squeeze & Other (Kickoff Plug)	220	0					371			0
Float Equipment & Centralizers	221	65,000								65,000
Casing Crews & Equipment	222	70,000								70,000
Fishing Tools & Service	223	0	323				372			0
Geologic/Engineering	224	11,400	324		355		373			11,400
Contract Labor	225	6,500	325	20,000	356	122,935	374	6,500		155,935
Company Supervision	226	66,600	326	15,000	357		375			81,600
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Testing Casing/Tubing	228	30,000	328	5,000			377			35,000
Mud Logging Unit	229	52,000	329							52,000
Logging	230	0					378			0
Perforating/Wireline Services	231	4,000	331	538,000			379			542,000
Stimulation/Treating			332	397,000			380			397,000
Completion Unit			333	138,000			381	8,800		146,800
Swabbing Unit			334				382			0
Rentals-Surface	235	190,000	335	403,000	359		383	7,000		600,000
Rentals-Subsurface	236	150,000	336	30,000			384			180,000
Trucking/Forklift/Rig Mobilization	237	200,000	337	20,000	360		385	3,000		223,000
Welding Services	238	3,000	338	5,000	361		386			8,000
Water Disposal	239	0	339	60,000	362	135,000	387			195,000
Plug to Abandon	240	0	340							0
Seismic Analysis	241	0	341							0
Miscellaneous	242	0	342				389			0
Contingency	243	69,000	343	250,000	363		390			319,000
Closed Loop & Environmental	244	330,000	344	5,000	364		388			335,000
Dyed Diesel	245		345	484,000						
Coil Tubing			346	750,000						750,000
Flowback Crews & Equip			347	48,000						48,000
Offset Directional/Frac	248		348				391			0
TOTAL INTANGIBLES		3,840,100		7,615,500		302,935		30,300		11,788,835

TANGIBLE COSTS										
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Tubing			504	52,030			530	5,000		57,030
Wellhead Equipment	405	75,000	505	22,000			531	3,000		100,000
Pumping Unit				0			506	96,000		96,000
Prime Mover				0			507			0
Rods				0			508	35,000		35,000
Pumps-Sub Surface (BH)			509				532	5,000		5,000
Tanks					510	63,645.00				63,645
Flowlines					511	26,593.00				26,593
Heater Treater/Separator					512	140,007.00				140,007
Electrical System					513	130,000.00	533	15,000		145,000
Packers/Anchors/Hangers	414		514	66,000			534	2,000		68,000
Couplings/Fittings/Valves	415				515	102,282				102,282
Dehydration					517					0
Injection Plant/CO2 Equipment					518					0
Pumps-Surface					521	5,000				5,000
Instrumentation/SCADA/POC					522	10,482	529	7,000		17,482
Miscellaneous	419		519		523	5,241	535	3,000		8,241
Contingency	420		520		524		536			0
Meters/LACT					525	25,156				25,156
Flares/Combustors/Emission					526	23,584				23,584
Gas Lift/Compression			527	15,000	516	60,000	528			75,000
TOTAL TANGIBLES		1,198,000		155,030		591,990		171,000		2,116,020
TOTAL WELL COSTS		5,038,100		7,771,000		894,925		201,300		13,904,855

COG Operating LLC	% of Total Well Cost	36%	56%	6%	1%
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We approve:



% Working Interest

Company:

By:

Printed Name:

Title:

Date:

Date Prepared:

10/18/18

COG Operating LLC



By:

MB

of the actual costs incurred.



COG OPERATING LLC  
AUTHORITY FOR EXPENDITURE  
DRILLING

WELL NAME:	MASTIFF FED COM #704H	PROSPECT NAME:	Bulldog 2432 (717113)
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Mud Logging Unit	229	52,000	329			52,000
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Completion Unit			333	138,000	381	8,800
Swabbing Unit			334		382	0
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Trucking/Forklift/Rig Mobilization	237	200,000	337	20,000	360	385
Welding Services	238	3,000	338	5,000	361	386
Water Disposal	239	0	339	60,000	362	135,000
Plug to Abandon	240	0	340		387	195,000
Seismic Analysis	241	0	341			0
Miscellaneous	242	0	342		389	0
Contingency	243	69,000	343	250,000	363	390
Closed Loop & Environmental	244	330,000	344	5,000	364	388
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Prime Mover				0	507	0
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Contingency	420		520		524	
Meters/LACT				525	25,156	25,156
Flares/Combustors/Emission				526	23,584	23,584
Gas Lift/Compression			527	15,000	516	60,000
TOTAL TANGIBLES		1,198,000	155,030	591,990	171,000	2,116,020
TOTAL WELL COSTS		5,038,100	7,771,000	894,925	201,300	13,904,855

% of Total Well Cost		36%	56%	6%	1%
COG Operating LLC					



COG OPERATING LLC  
AUTHORITY FOR EXPENDITURE  
DRILLING

WELL NAME:	MASTIFF FED COM #705H	PROSPECT NAME:	Bulldog 2432 (717113)
FTP:	Sec 4: 100 FNL & 2382 FEL	STATE & COUNTY:	New Mexico, Lea
LTP:	Sec 9: 100 FSL & 2382 FEL	OBJECTIVE:	Drill and Complete
FORMATION:	Wolfcamp	DEPTH:	22,860
LEGAL:	Sec 4-24S-32E	TVD:	12,300

INTANGIBLE COSTS		Drig - Rig Release(D)	Completion(C)	Tank Btty Constrctn(TB)	Pmpq Equipment(PEQ)	TOTAL
Title/Curative/Permit	201	20,000				20,000
Insurance	202	2,500	302			2,500
Damages/Right of Way	203	20,000	303	351		20,000
Survey/Stake Location	204	7,000		352		7,000
Location/Pits/Road Expense	205	135,000	305	10,000	45,000	190,000
Drilling / Completion Overhead	206	11,100	306	15,000		26,100
Turnkey Contract	207	0				0
Footage Contract	208	0				0
Daywork Contract	209	923,000				923,000
Directional Drilling Services	210	442,000				442,000
Frac Equipment			307	1,418,000		1,418,000
Frac Chemicals			308	473,000		473,000
Frac Proppant			309	814,000		814,000
Frac Proppant Transportation			310	399,000		399,000
Fuel & Power	211	211,000	311	68,000	354	279,000
Water	212	60,000	312	966,000	368	1,026,000
Bits	213	111,000	313	4,500	369	115,500
Mud & Chemicals	214	275,000	314	25,000	370	300,000
Drill Stem Test	215	0	315			0
Coring & Analysis	216	0				0
Cement Surface	217	28,000				28,000
Cement Intermediate	218	75,000				75,000
Cement 2nd Intermediate/Production	219	115,000				115,000
Cement Squeeze & Other (Kickoff Plug)	220	0			371	0
Float Equipment & Centralizers	221	65,000				65,000
Casing Crews & Equipment	222	70,000				70,000
Fishing Tools & Service	223	0	323		372	0
Geologic/Engineering	224	11,400	324	355	373	11,400
Contract Labor	225	6,500	325	20,000	356	155,935
Company Supervision	226	66,600	326	15,000	357	81,600
Contract Supervision	227	157,000	327	255,000	358	417,000
Testing Casing/Tubing	228	30,000	328	5,000	377	35,000
Mud Logging Unit	229	52,000	329			52,000
Logging	230	0			378	0
Perforating/Wireline Services	231	4,000	331	538,000	379	542,000
Stimulation/Treating			332	397,000	380	397,000
Completion Unit			333	138,000	381	146,800
Swabbing Unit			334		382	0
Rentals-Surface	235	190,000	335	403,000	359	600,000
Rentals-Subsurface	236	150,000	336	30,000	384	180,000
Trucking/Forklift/Rig Mobilization	237	200,000	337	20,000	360	223,000
Welding Services	238	3,000	338	5,000	361	8,000
Water Disposal	239	0	339	60,000	362	195,000
Plug to Abandon	240	0	340			0
Seismic Analysis	241	0	341			0
Miscellaneous	242	0	342		389	0
Contingency	243	69,000	343	250,000	363	319,000
Closed Loop & Environmental	244	330,000	344	5,000	364	335,000
Dyed Diesel	245		345	484,000		
Coil Tubing			346	750,000		750,000
Flowback Crews & Equip			347	48,000		48,000
Offset Directional/Frac	248		348		391	0
TOTAL INTANGIBLES		3,840,100	7,615,500	302,935	30,300	11,788,835

TANGIBLE COSTS						
Surface Casing	401	52,000				52,000
Intermediate Casing	402	555,000				555,000
Production Casing/Liner	403	516,000				516,000
Tubing			504	52,030	530	57,030
Wellhead Equipment	405	75,000	505	22,000	531	100,000
Pumping Unit				0	506	96,000
Prime Mover				0	507	0
Rods				0	508	35,000
Pumps-Sub Surface (BH)			509		532	5,000
Tanks				510	63,645.00	63,645
Flowlines				511	26,593.00	26,593
Heater Treater/Separator				512	140,007.00	140,007
Electrical System				513	130,000.00	145,000
Packers/Anchors/Hangers	414		514	66,000	534	68,000
Couplings/Fittings/Valves	415			515	102,282	102,282
Dehydration				517		0
Injection Plant/CO2 Equipment				518		0
Pumps-Surface				521	5,000	5,000
Instrumentation/SCADA/POC				522	10,482	17,482
Miscellaneous	419		519	523	5,241	8,241
Contingency	420		520	524		0
Meters/LACT				525	25,156	25,156
Flares/Combustors/Emission				526	23,584	23,584
Gas Lift/Compression			527	15,000	516	75,000
TOTAL TANGIBLES		1,198,000	155,030	591,990	171,000	2,116,020
TOTAL WELL COSTS		5,038,100	7,771,000	894,925	201,300	13,904,855

COG Operating LLC	% of Total Well Cost	36%	56%	6%	1%
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Date Prepared: 10/18/18

COG Operating LLC *ACR*

We approve:  
\_\_\_\_\_% Working Interest

By: MB

Company:  
By: \_\_\_\_\_

Printed Name:  
Title:  
Date: \_\_\_\_\_

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



COG OPERATING LLC  
AUTHORITY FOR EXPENDITURE  
DRILLING

WELL NAME:	MASTIFF FED COM #706H	PROSPECT NAME:	Bulldog 2432 (717113)
FTP:	Sec 4: 100 FSL & 2385 FWL	STATE & COUNTY:	New Mexico, Lea
LTP:	Sec 33: 100 FNL & 2385 FWL	OBJECTIVE:	Drill and Complete
FORMATION:	Wolfcamp	DEPTH:	22,960
LEGAL:	Sec 4-24S-32E	TVD:	12,400

INTANGIBLE COSTS		Drilq - Rig Release(D)	Completion(C)	Tank Btty Constrctn(TB)	Pmpq Equipment(PEQ)	TOTAL
Title/Curative/Permit	201	20,000				20,000
Insurance	202	2,500	302			2,500
Damages/Right of Way	203	20,000	303	351		20,000
Survey/Stake Location	204	7,000		352		7,000
Location/Pits/Road Expense	205	135,000	305	10,000	353	45,000
Drilling / Completion Overhead	206	11,100	306	15,000	366	
Turnkey Contract	207	0				0
Footage Contract	208	0				0
Daywork Contract	209	923,000				923,000
Directional Drilling Services	210	442,000				442,000
Frac Equipment			307	1,418,000		1,418,000
Frac Chemicals			308	473,000		473,000
Frac Proppant			309	814,000		814,000
Frac Proppant Transportation			310	399,000		399,000
Fuel & Power	211	211,000	311	68,000	354	
Water	212	60,000	312	966,000	367	
Bits	213	111,000	313	4,500	368	
Mud & Chemicals	214	275,000	314	25,000	369	
Drill Stem Test	215	0	315		370	
Coring & Analysis	216	0				0
Cement Surface	217	28,000				28,000
Cement Intermediate	218	75,000				75,000
Cement 2nd Intermediate/Production	219	115,000				115,000
Cement Squeeze & Other (Kickoff Plug)	220	0			371	0
Float Equipment & Centralizers	221	65,000				65,000
Casing Crews & Equipment	222	70,000				70,000
Fishing Tools & Service	223	0	323		372	0
Geologic/Engineering	224	11,400	324		373	11,400
Contract Labor	225	6,500	325	20,000	356	122,935
Company Supervision	226	66,600	326	15,000	357	
Contract Supervision	227	157,000	327	255,000	358	
Testing Casing/Tubing	228	30,000	328	5,000	376	5,000
Mud Logging Unit	229	52,000	329		377	
Logging	230	0				52,000
Perforating/Wireline Services	231	4,000	331	538,000	378	0
Stimulation/Treating			332	397,000	379	
Completion Unit			333	138,000	380	
Swabbing Unit			334		381	8,800
Rentals-Surface	235	190,000	335	403,000	382	0
Rentals-Subsurface	236	150,000	336	30,000	383	7,000
Trucking/Forklift/Rig Mobilization	237	200,000	337	20,000	384	
Welding Services	238	3,000	338	5,000	385	3,000
Water Disposal	239	0	339	60,000	386	
Plug to Abandon	240	0	340		387	135,000
Seismic Analysis	241	0	341			
Miscellaneous	242	0	342		389	
Contingency	243	69,000	343	250,000	390	
Closed Loop & Environmental	244	330,000	344	5,000	391	
Dyed Diesel	245		345	484,000	388	
Coil Tubing			346	750,000		
Flowback Crews & Equip			347	48,000		
Offset Directional/Frac	248		348		391	
TOTAL INTANGIBLES		3,840,100	7,615,500	302,935	30,300	11,788,835

TANGIBLE COSTS									
Surface Casing	401	52,000							52,000
Intermediate Casing	402	555,000							555,000
Production Casing/Liner	403	516,000							516,000
Tubing			504	52,030			530	5,000	57,030
Wellhead Equipment	405	75,000	505	22,000			531	3,000	100,000
Pumping Unit				0			506	96,000	96,000
Prime Mover				0			507		0
Rods				0			508	35,000	35,000
Pumps-Sub Surface (BH)			509				532	5,000	5,000
Tanks					510	63,645.00			63,645
Flowlines					511	26,593.00			26,593
Heater Treater/Separator					512	140,007.00			140,007
Electrical System					513	130,000.00	533	15,000	145,000
Packers/Anchors/Hangers	414		514	66,000			534	2,000	68,000
Couplings/Fittings/Valves	415				515	102,282			102,282
Dehydration					517				0
Injection Plant/CO2 Equipment					518				0
Pumps-Surface					521	5,000			5,000
Instrumentation/SCADA/POC					522	10,482	529	7,000	17,482
Miscellaneous	419		519		523	5,241	535	3,000	8,241
Contingency	420		520		524		536		0
Meters/LACT					525	25,156			25,156
Flares/Combustors/Emission					526	23,584			23,584
Gas Lift/Compression			527	15,000	516	60,000	528		75,000
TOTAL TANGIBLES		1,198,000		155,030		591,990		171,000	2,116,020
TOTAL WELL COSTS		5,038,100		7,771,000		894,925		201,300	13,904,855

COG Operating LLC	% of Total Well Cost	36%	56%	6%	1%
Date Prepared: 10/18/18					
COG Operating LLC <i>AM</i>					
We approve: _____					
By: _____ MB					
Company: _____					
By: _____					
Printed Name: _____					
Title: _____					
Date: _____					
This AFE is only an estimate. By signing you agree to pay your share of the actual costs incurred.					



COG OPERATING LLC  
AUTHORITY FOR EXPENDITURE  
DRILLING

WELL NAME:	MASTIFF FED COM #707H	PROSPECT NAME:	Bulldog 2432 (717113)
FTP:	Sec 4: 100 FSL & 1872 FWL	STATE & COUNTY:	New Mexico, Lea
LTP:	Sec 33: 100 FNL & 1872 FWL	OBJECTIVE:	Drill and Complete
FORMATION:	Wolfcamp	DEPTH:	22,860
LEGAL:	Sec 4-24S-32E	TVD:	12,300

INTANGIBLE COSTS		Drilg - Rig Release(D)	Completion(C)	Tank Btty Constrctn(TB)	Pmpq Equipment(PEQ)	TOTAL
Title/Curative/Permit	201	20,000				20,000
Insurance	202	2,500	302			2,500
Damages/Right of Way	203	20,000	303	351		20,000
Survey/Stake Location	204	7,000		352		7,000
Location/Pits/Road Expense	205	135,000	305	45,000	366	190,000
Drilling / Completion Overhead	206	11,100	306			26,100
Turnkey Contract	207	0				0
Footage Contract	208	0				0
Daywork Contract	209	923,000				923,000
Directional Drilling Services	210	442,000				442,000
Frac Equipment			307	1,418,000		1,418,000
Frac Chemicals			308	473,000		473,000
Frac Proppant			309	814,000		814,000
Frac Proppant Transportation			310	399,000		399,000
Fuel & Power	211	211,000	311	68,000	367	279,000
Water	212	60,000	312	966,000	368	1,026,000
Bits	213	111,000	313	4,500	369	115,500
Mud & Chemicals	214	275,000	314	25,000	370	300,000
Drill Stem Test	215	0	315			0
Coring & Analysis	216	0				0
Cement Surface	217	28,000				28,000
Cement Intermediate	218	75,000				75,000
Cement 2nd Intermediate/Production	219	115,000				115,000
Cement Squeeze & Other (Kickoff Plug)	220	0			371	0
Float Equipment & Centralizers	221	65,000				65,000
Casing Crews & Equipment	222	70,000				70,000
Fishing Tools & Service	223	0	323		372	0
Geologic/Engineering	224	11,400	324	355	373	11,400
Contract Labor	225	6,500	325	20,000	374	155,935
Company Supervision	226	66,600	326	15,000	375	81,600
Contract Supervision	227	157,000	327	255,000	376	417,000
Testing Casing/Tubing	228	30,000	328	5,000	377	35,000
Mud Logging Unit	229	52,000	329			52,000
Logging	230	0			378	0
Perforating/Wireline Services	231	4,000	331	538,000	379	542,000
Stimulation/Treating			332	397,000	380	397,000
Completion Unit			333	138,000	381	146,800
Swabbing Unit			334		382	0
Rentals-Surface	235	190,000	335	403,000	383	600,000
Rentals-Subsurface	236	150,000	336	30,000	384	180,000
Trucking/Forklift/Rig Mobilization	237	200,000	337	20,000	385	223,000
Welding Services	238	3,000	338	5,000	386	8,000
Water Disposal	239	0	339	60,000	387	195,000
Plug to Abandon	240	0	340			0
Seismic Analysis	241	0	341			0
Miscellaneous	242	0	342		389	0
Contingency	243	69,000	343	250,000	390	319,000
Closed Loop & Environmental	244	330,000	344	5,000	388	335,000
Dyed Diesel	245		345	484,000		
Coil Tubing			346	750,000		750,000
Flowback Crews & Equip			347	48,000		48,000
Offset Directional/Frac	248		348		391	0
TOTAL INTANGIBLES		3,840,100	7,615,500	302,935	30,300	11,788,835

TANGIBLE COSTS						
Surface Casing	401	52,000				52,000
Intermediate Casing	402	555,000				555,000
Production Casing/Liner	403	516,000				516,000
Tubing			504	52,030	530	57,030
Wellhead Equipment	405	75,000	505	22,000	531	100,000
Pumping Unit				0	506	96,000
Prime Mover				0	507	0
Rods				0	508	35,000
Pumps-Sub Surface (BH)			509		532	5,000
Tanks				510	63,645.00	63,645
Flowlines				511	26,593.00	26,593
Heater Treater/Separator				512	140,007.00	140,007
Electrical System				513	130,000.00	145,000
Packers/Anchors/Hangers	414		514	66,000	534	68,000
Couplings/Fittings/Valves	415			515	102,282	102,282
Dehydration				517		0
Injection Plant/CO2 Equipment				518		0
Pumps-Surface				521	5,000	5,000
Instrumentation/SCADA/POC				522	10,482	17,482
Miscellaneous	419		519	523	5,241	8,241
Contingency	420		520	524		0
Meters/LACT				525	25,156	25,156
Flares/Combustors/Emission				526	23,584	23,584
Gas Lift/Compression			527	15,000	516	75,000
TOTAL TANGIBLES		1,198,000	155,030	591,990	171,000	2,116,020
TOTAL WELL COSTS		5,038,100	7,771,000	894,925	201,300	13,904,855

COG Operating LLC	% of Total Well Cost	36%	56%	6%	1%
Date Prepared: 10/18/18					
COG Operating LLC <i>ALA</i>					
By: MB					
We approve: _____					
_____% Working Interest					
Company: _____					
By: _____					
Printed Name: _____					
Title: _____					
Date: _____					
This AFE is only an estimate. By signing you agree to pay your share of the actual costs incurred.					



COG OPERATING LLC  
AUTHORITY FOR EXPENDITURE  
DRILLING

WELL NAME:	MASTIFF FED COM #708H	PROSPECT NAME:	Bulldog 2432 (717113)
FTP:	Sec 4: 100 FSL & 1359 FWL	STATE & COUNTY:	New Mexico, Lea
LTP:	Sec 33: 100 FNL & 1359 FWL	OBJECTIVE:	Drill and Complete
FORMATION:	Wolfcamp	DEPTH:	22,960
LEGAL:	Sec 4-24S-32E	TVD:	12,400

INTANGIBLE COSTS		Drilg - Rig Release(D)	Completion(C)	Tank Btty Constrctn(TB)	Pmpq Equipment(PEQ)	TOTAL
Title/Curative/Permit	201	20,000				20,000
Insurance	202	2,500	302			2,500
Damages/Right of Way	203	20,000	303	351		20,000
Survey/Stake Location	204	7,000		352		7,000
Location/Pits/Road Expense	205	135,000	305	353	45,000	190,000
Drilling / Completion Overhead	206	11,100	306			26,100
Turnkey Contract	207	0				0
Footage Contract	208	0				0
Daywork Contract	209	923,000				923,000
Directional Drilling Services	210	442,000				442,000
Frac Equipment			307			1,418,000
Frac Chemicals			308			473,000
Frac Proppant			309			814,000
Frac Proppant Transportation			310			399,000
Fuel & Power	211	211,000	311	354	367	279,000
Water	212	60,000	312		368	1,026,000
Bits	213	111,000	313		369	115,500
Mud & Chemicals	214	275,000	314		370	300,000
Drill Stem Test	215	0	315			0
Coring & Analysis	216	0				0
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Mud Logging Unit	229	52,000	329			52,000
Logging	230	0			378	0
Perforating/Wireline Services	231	4,000	331		379	542,000
Stimulation/Treating			332		380	397,000
Completion Unit			333		381	146,800
Swabbing Unit			334		382	0
Rentals-Surface	235	190,000	335	359	383	600,000
Rentals-Subsurface	236	150,000	336		384	180,000
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Water Disposal	239	0	339	362	387	195,000
Plug to Abandon	240	0	340			0
Seismic Analysis	241	0	341			0
Miscellaneous	242	0	342		389	0
Contingency	243	69,000	343	363	390	319,000
Closed Loop & Environmental	244	330,000	344	364	388	335,000
Dyed Diesel	245		345			
Coil Tubing			346			750,000
Flowback Crews & Equip			347			48,000
Offset Directional/Frac	248		348		391	0
TOTAL INTANGIBLES		3,840,100	7,615,500	302,935	30,300	11,788,835

TANGIBLE COSTS						
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Intermediate Casing	402	555,000				555,000
Production Casing/Liner	403	516,000				516,000
Tubing			504	52,030	530	57,030
Wellhead Equipment	405	75,000	505	22,000	531	100,000
Pumping Unit				0	506	96,000
Prime Mover				0	507	0
Rods				0	508	35,000
Pumps-Sub Surface (BH)			509		532	5,000
Tanks				510	63,645.00	63,645
Flowlines				511	26,593.00	26,593
Heater Treater/Separator				512	140,007.00	140,007
Electrical System				513	130,000.00	145,000
Packers/Anchors/Hangers	414		514	66,000	534	68,000
Couplings/Fittings/Valves	415			515	102,282	102,282
Dehydration				517		0
Injection Plant/CO2 Equipment				518		0
Pumps-Surface				521	5,000	5,000
Instrumentation/SCADA/POC				522	10,482	17,482
Miscellaneous	419		519	5,241	535	8,241
Contingency	420		520		536	0
Meters/LACT				525	25,156	25,156
Flares/Combustors/Emission				526	23,584	23,584
Gas Lift/Compression			527	15,000	528	75,000
TOTAL TANGIBLES		1,198,000		155,030		2,116,020
TOTAL WELL COSTS		5,038,100		7,771,000		13,904,855

COG Operating LLC	% of Total Well Cost	36%	56%	6%	1%
Date Prepared: 10/18/18					
COG Operating LLC <i>ACR</i>					
We approve: _____					
_____% Working Interest					
By: _____					
Company: _____					
By: _____					
Printed Name: _____					
Title: _____					
Date: _____					
This AFE is only an estimate. By signing you agree to pay your share of the actual costs incurred.					



COG OPERATING LLC  
AUTHORITY FOR EXPENDITURE  
DRILLING

WELL NAME:	MASTIFF FED COM #709H	PROSPECT NAME:	Bulldog 2432 (717113)
FTP:	Sec 4: 100 FSL & 846 FWL	STATE & COUNTY:	New Mexico, Lea
LTP:	Sec 33: 100 FNL & 846 FWL	OBJECTIVE:	Drill and Complete
FORMATION:	Wolfcamp	DEPTH:	22,860
LEGAL:	Sec 4-24S-32E	TVD:	12,300

INTANGIBLE COSTS		Drilq - Rig		Tank Btty		Pmpg		TOTAL	
		Release(D)	Completion(C)	Constrctn(TB)		Equipment(PEQ)			
Title/Curative/Permit	201	20,000							20,000
Insurance	202	2,500	302						2,500
Damages/Right of Way	203	20,000	303	351					20,000
Survey/Stake Location	204	7,000		352					7,000
Location/Pits/Road Expense	205	135,000	305	10,000	45,000	366			190,000
Drilling / Completion Overhead	206	11,100	306	15,000					26,100
Turnkey Contract	207	0							0
Footage Contract	208	0							0
Daywork Contract	209	923,000							923,000
Directional Drilling Services	210	442,000							442,000
Frac Equipment			307	1,418,000					1,418,000
Frac Chemicals			308	473,000					473,000
Frac Proppant			309	814,000					814,000
Frac Proppant Transportation			310	399,000					399,000
Fuel & Power	211	211,000	311	68,000	354	367			279,000
Water	212	60,000	312	966,000		368			1,026,000
Bits	213	111,000	313	4,500		369			115,500
Mud & Chemicals	214	275,000	314	25,000		370			300,000
Drill Stem Test	215	0	315						0
Coring & Analysis	216	0							0
Cement Surface	217	28,000							28,000
Cement Intermediate	218	75,000							75,000
Cement 2nd Intermediate/Production	219	115,000							115,000
Cement Squeeze & Other (Kickoff Plug)	220	0				371			0
Float Equipment & Centralizers	221	65,000							65,000
Casing Crews & Equipment	222	70,000							70,000
Fishing Tools & Service	223	0	323			372			0
Geologic/Engineering	224	11,400	324	355		373			11,400
Contract Labor	225	6,500	325	20,000	356	122,935	374	6,500	155,935
Company Supervision	226	66,600	326	15,000	357		375		81,600
Contract Supervision	227	157,000	327	255,000	358		376	5,000	417,000
Testing Casing/Tubing	228	30,000	328	5,000			377		35,000
Mud Logging Unit	229	52,000	329						52,000
Logging	230	0					378		0
Perforating/Wireline Services	231	4,000	331	538,000			379		542,000
Stimulation/Treating			332	397,000			380		397,000
Completion Unit			333	138,000			381	8,800	146,800
Swabbing Unit			334				382		0
Rentals-Surface	235	190,000	335	403,000	359		383	7,000	600,000
Rentals-Subsurface	236	150,000	336	30,000			384		180,000
Trucking/Forklift/Rig Mobilization	237	200,000	337	20,000	360		385	3,000	223,000
Welding Services	238	3,000	338	5,000	361		386		8,000
Water Disposal	239	0	339	60,000	362	135,000	387		195,000
Plug to Abandon	240	0	340						0
Seismic Analysis	241	0	341						0
Miscellaneous	242	0	342				389		0
Contingency	243	69,000	343	250,000	363		390		319,000
Closed Loop & Environmental	244	330,000	344	5,000	364		388		335,000
Dyed Diesel	245		345	484,000					
Coil Tubing			346	750,000					750,000
Flowback Crews & Equip			347	48,000					48,000
Offset Directional/Frac	248		348				391		0
TOTAL INTANGIBLES		3,840,100		7,615,500		302,935		30,300	11,788,835

TANGIBLE COSTS									
Surface Casing	401	52,000							52,000
Intermediate Casing	402	555,000							555,000
Production Casing/Liner	403	516,000							516,000
Tubing			504	52,030			530	5,000	57,030
Wellhead Equipment	405	75,000	505	22,000			531	3,000	100,000
Pumping Unit				0			506	96,000	96,000
Prime Mover				0			507		0
Rods				0			508	35,000	35,000
Pumps-Sub Surface (BH)			509				532	5,000	5,000
Tanks					510	63,645.00			63,645
Flowlines					511	26,593.00			26,593
Heater Treater/Separator					512	140,007.00			140,007
Electrical System					513	130,000.00	533	15,000	145,000
Packers/Anchors/Hangers	414		514	66,000			534	2,000	68,000
Couplings/Fittings/Valves	415				515	102,282			102,282
Dehydration					517				0
Injection Plant/CO2 Equipment					518				0
Pumps-Surface					521	5,000			5,000
Instrumentation/SCADA/POC					522	10,482	529	7,000	17,482
Miscellaneous	419		519		523	5,241	535	3,000	8,241
Contingency	420		520		524		536		0
Meters/LACT					525	25,156			25,156
Flares/Combustors/Emission					526	23,584			23,584
Gas Lift/Compression			527	15,000	516	60,000	528		75,000
TOTAL TANGIBLES		1,198,000		155,030		591,990		171,000	2,116,020
TOTAL WELL COSTS		5,038,100		7,771,000		894,925		201,300	13,904,855

COG Operating LLC	% of Total Well Cost	36%	56%	6%	1%
Date Prepared: 10/18/18					
COG Operating LLC <i>ACB</i>					
We approve: _____					
By: _____ MB					
Company: _____					
By: _____					
Printed Name: _____					
Title: _____					
Date: _____					
This AFE is only an estimate. By signing you agree to pay your share of the actual costs incurred.					



COG OPERATING LLC  
AUTHORITY FOR EXPENDITURE  
DRILLING

WELL NAME:	MASTIFF FED COM #710H	PROSPECT NAME:	Bulldog 2432 (717113)
FTP:	Sec 4: 100 FSL & 330 FWL	STATE & COUNTY:	New Mexico, Lea
LTP:	Sec 33: 100 FNL & 330 FWL	OBJECTIVE:	Drill and Complete
FORMATION:	Wolfcamp	DEPTH:	22,960
LEGAL:	Sec 4-24S-32E	TVD:	12,400

INTANGIBLE COSTS		Drilg - Rig Release(D)	Completion(C)	Tank Btty Constrctn(TB)	Pmpq Equipment(PEQ)	TOTAL
Title/Curative/Permit	201	20,000				20,000
Insurance	202	2,500	302			2,500
Damages/Right of Way	203	20,000	303	351		20,000
Survey/Stake Location	204	7,000		352		7,000
Location/Pits/Road Expense	205	135,000	305	353	45,000	190,000
Drilling / Completion Overhead	206	11,100	306			26,100
Turnkey Contract	207	0				0
Footage Contract	208	0				0
Daywork Contract	209	923,000				923,000
Directional Drilling Services	210	442,000				442,000
Frac Equipment			307	1,418,000		1,418,000
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Frac Proppant			309	814,000		814,000
Frac Proppant Transportation			310	399,000		399,000
Fuel & Power	211	211,000	311	68,000	354	279,000
Water	212	60,000	312	966,000	367	1,026,000
Bits	213	111,000	313	4,500	368	115,500
Mud & Chemicals	214	275,000	314	25,000	369	300,000
Drill Stem Test	215	0	315		370	0
Coring & Analysis	216	0				0
Cement Surface	217	28,000				28,000
Cement Intermediate	218	75,000				75,000
Cement 2nd Intermediate/Production	219	115,000				115,000
Cement Squeeze & Other (Kickoff Plug)	220	0			371	0
Float Equipment & Centralizers	221	65,000				65,000
Casing Crews & Equipment	222	70,000				70,000
Fishing Tools & Service	223	0	323		372	0
Geologic/Engineering	224	11,400	324	355	373	11,400
Contract Labor	225	6,500	325	20,000	374	155,935
Company Supervision	226	66,600	326	15,000	375	81,600
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Testing Casing/Tubing	228	30,000	328	5,000	377	35,000
Mud Logging Unit	229	52,000	329			52,000
Logging	230	0			378	0
Perforating/Wireline Services	231	4,000	331	538,000	379	542,000
Stimulation/Treating			332	397,000	380	397,000
Completion Unit			333	138,000	381	146,800
Swabbing Unit			334		382	0
Rentals-Surface	235	190,000	335	403,000	383	600,000
Rentals-Subsurface	236	150,000	336	30,000	384	180,000
Trucking/Forklift/Rig Mobilization	237	200,000	337	20,000	385	223,000
Welding Services	238	3,000	338	5,000	386	8,000
Water Disposal	239	0	339	60,000	387	195,000
Plug to Abandon	240	0	340			0
Seismic Analysis	241	0	341			0
Miscellaneous	242	0	342		389	0
Contingency	243	69,000	343	250,000	390	319,000
Closed Loop & Environmental	244	330,000	344	5,000	388	335,000
Dyed Diesel	245		345	484,000		
Coil Tubing			346	750,000		750,000
Flowback Crews & Equip			347	48,000		48,000
Offset Directional/Frac	248		348		391	0
TOTAL INTANGIBLES		3,840,100	7,615,500	302,935	30,300	11,788,835

TANGIBLE COSTS						
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Intermediate Casing	402	555,000				555,000
Production Casing/Liner	403	516,000				516,000
Tubing			504	52,030	530	57,030
Wellhead Equipment	405	75,000	505	22,000	531	100,000
Pumping Unit				0	506	96,000
Prime Mover				0	507	0
Rods				0	508	35,000
Pumps-Sub Surface (BH)			509		532	5,000
Tanks				510	63,645.00	63,645
Flowlines				511	26,593.00	26,593
Heater Treater/Separator				512	140,007.00	140,007
Electrical System				513	130,000.00	145,000
Packers/Anchors/Hangers	414		514	66,000	533	15,000
Couplings/Fittings/Valves	415			515	102,282	68,000
Dehydration				517		102,282
Injection Plant/CO2 Equipment				518		0
Pumps-Surface				521	5,000	0
Instrumentation/SCADA/POC				522	10,482	5,000
Miscellaneous	419		519	5,241	529	7,000
Contingency	420		520		535	3,000
Meters/LACT				524		8,241
Flares/Combustors/Emission				525	25,156	0
Gas Lift/Compression				526	23,584	25,156
			527	15,000	516	23,584
				516	60,000	75,000
TOTAL TANGIBLES		1,198,000	155,030	591,990	171,000	2,116,020
TOTAL WELL COSTS		5,038,100	7,771,000	894,925	201,300	13,904,855

COG Operating LLC	% of Total Well Cost	36%	56%	6%	1%
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Date Prepared:	10/18/18
COG Operating LLC	ACB
We approve:	
% Working Interest	
By:	MB

Company:	
By:	
Printed Name:	
Title:	
Date:	

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