OCD Artesia

Form 3160-3
(March 2012)

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
SL:NM-007754 BL:NM-007752

6. If Indian, Allotee or Tribe Name
N/A

1a. Type of work: ☑ DRILL ☐ REENTER

7. If Unit or CA Agreement, Name and No.
N/A

1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☑ Single Zone ☐ Multiple Zone

8. Lease Name and Well No. 31#203
Churchmouse 1 Federal Com #17H

2. Name of Operator COG Operating LLC

9. API Well No.
30-015- 43662

3a. Address One Concho Center, 600 W. Illinois Ave
Midland, TX 79701

3b. Phone No. *(include area code)*
432-685-4384

10. Field and Pool, or Exploratory
Empire; Glorieta-Yeso, East 96610

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface SHL: 990' FSL & 150' FEL, Unit P
At proposed prod. zone BHL: 989' FSL & 330' FWL, Unit M

11. Sec., T. R. M. or Blk. and Survey or Area
Sec 1 T17S R29E

14. Distance in miles and direction from nearest town or post office*
2 miles from Loco Hills, NM

12. County or Parish
EDDY

13. State
NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drlg. unit line, if any)
150'

16. No. of acres in lease
SHL: 40 BHL: 1154.53

17. Spacing Unit dedicated to this well
160

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.
141.1'

19. Proposed Depth
TVD: 4376' MD: 9023'
EOC: 4451' TVD

20. BLM/BIA Bond No. on file
NMB000740; NMB000215

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3680' GL

22. Approximate date work will start*
12/30/2015

23. Estimated duration
15 Days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification
6. Such other site specific information and/or plans as may be required by the BLM.

25. Signature
Name *(Printed/Typed)* Kelly J. Holly
Date 06/05/2015

Title
Permitting Tech

Approved by *(Signature)* /s/George MacDonell
Name *(Printed/Typed)*
Date FEB 26 2016

Title FIELD MANAGER
Office BLM-CARLSBAD FIELD OFFICE

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

APPROVAL FOR TWO YEARS

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

*(Instructions on page 2)

APPROVAL SUBJECT TO GENERAL REQUIREMENTS AND SPECIAL STIPULATIONS ATTACHED

NM OIL CONSERVATION
ARTESIA DISTRICT
MAR 08 2016
RECEIVED

SEE ATTACHED FOR CONDITIONS OF APPROVAL
JRD 3/9/16

Roswell Controlled Water Basin

Witness Surface & Intermediate Casing

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-015- 43662	96610	Empire; Glorieta-Yeso East

[4] Property Code	[5] Property Name	[6] Well Number
314203	CHURCHMOUSE 1 FEDERAL COM	17H

[7] OGRID No.	[8] Operator Name	[9] Elevation
229137	COG OPERATING, LLC	3680'

[10] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	1	17-S	29-E		990	SOUTH	150	EAST	EDDY

[11] 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
M	1	17-S	29-E		989	SOUTH	330	WEST	EDDY

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
160			

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.

[16]

4 — 39.97 AC. | 3 — 40.00 AC. | 2 — 39.99 AC. | 1 — 39.99 AC.

CORNER DATA
NAD 27 – NM EAST

A: BRASS CAP "1914"
N 675322.5 – E 591200.5

B: BRASS CAP "1914"
N 677961.6 – E 591198.9

C: BRASS CAP "1914"
N 677951.9 – E 596474.4

D: BRASS CAP "1914"
N 675324.2 – E 596474.6

E: BRASS CAP "1914"
N 675326.5 – E 593844.9

F: CALCULATED POINT
N 677961.7 – E 593840.4

G: CALCULATED POINT
N 676642.0 – E 591199.7

H: CALCULATED POINT
N 676642.5 – E 593842.7

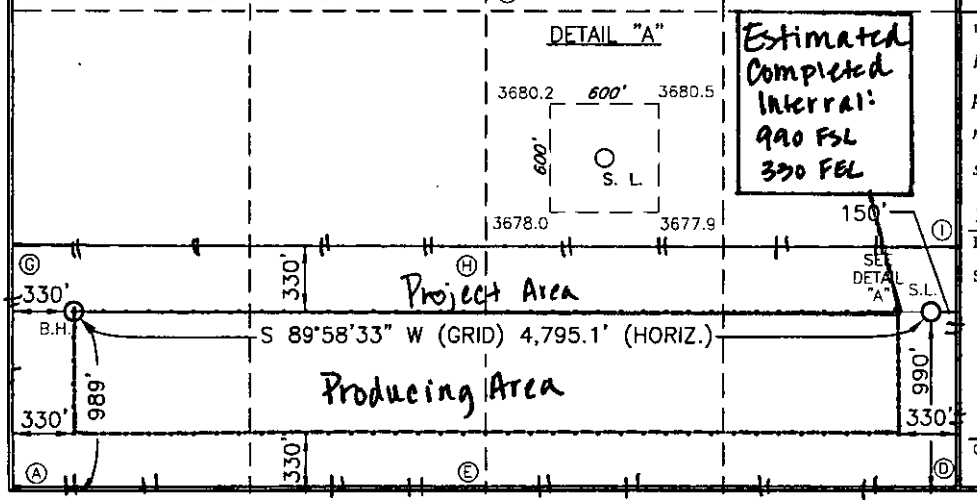
I: CALCULATED POINT
N 676643.0 – E 596474.5

GEODETIC DATA
NAD 27 – NM EAST

SURFACE LOCATION
N 676314.1
E 596324.6

LAT: 32.85888° N
LONG: 104.01965° W

BOTTOM HOLE LOCATION
N 676312.1
E 591529.9



[17] OPERATOR CERTIFICATION

I hereby certify that the information contained 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 a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature — Date: 3-3-15

Kelly J. Holly
Printed Name

kholly@concho.com
E-mail Address

[18] 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.

12/6/12
Date of Survey

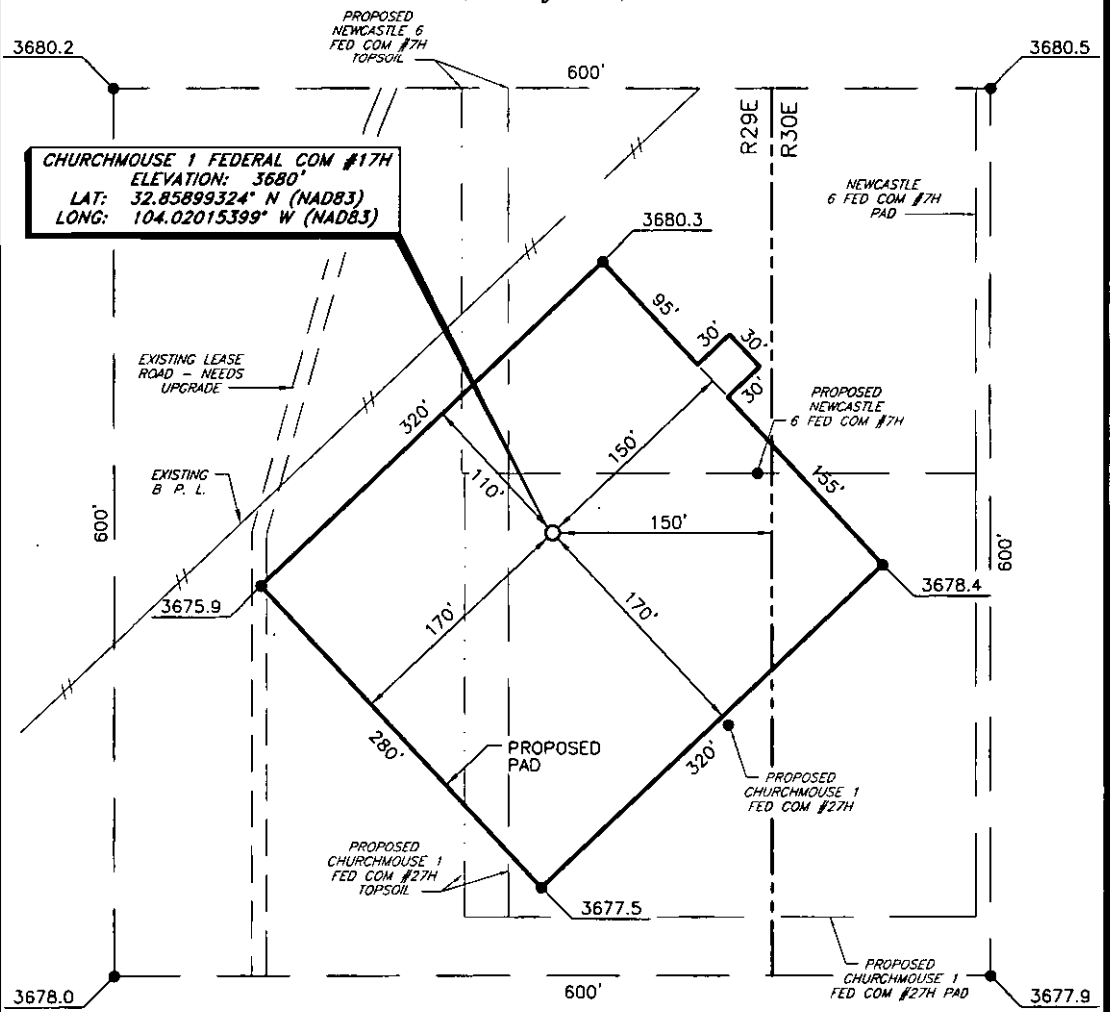
Signature and Seal of Professional Surveyor:

ROBERT M. HOWETT
NEW MEXICO
19680
PROFESSIONAL SURVEYOR

19680
Certificate Number

Revised: 5/2/13

COG OPERATING, LLC
Churchmouse 1 Federal Com #17H
(990' FSL & 150' FEL)
Section 1, T-17-S, R-29-E,
N. M. P. M., Eddy Co., New Mexico



DIRECTIONS TO LOCATION

From the intersection of CR-215 (Kewanee) and CR-257 (Mallet Road);
Go East on CR-257 approx. 1.0 mile;
Turn right on an existing lease road;
Go South on lease road approx. 0.7 mile;
Turn right; Go West approx. 400 feet;
Turn Left; Go South approx. 0.1 mile;
Location is approx. 200' East of the lease road.

THIS IS NOT A BOUNDARY SURVEY. APPARENT PROPERTY CORNERS AND PROPERTY LINES ARE SHOWN FOR INFORMATION ONLY. BOUNDARY DATA IS SHOWN FROM A PREVIOUS SURVEY REFERENCED HEREON.

I, R. M. Howett, a N. M. Professional Surveyor, hereby certify that I prepared this unclassified survey of a well location from an actual survey made on the ground under my direct supervision, said survey and plot meet the Min. Stds. for Surveying in the State of N. M. and are true and correct to the best of my knowledge and belief.

Robert M. Howett
Robert M. Howett NM PS 19680

ROBERT M. HOWETT NEW MEXICO 19680 PROFESSIONAL SURVEYOR 1/13/16

SCALE: 1" = 100'
0 50 100
BEARINGS ARE NAD 83 - NM EAST DISTANCES ARE GROUND.

NO.	REVISION	DATE
1	Well Name	5/2/13

JOB NO.: LS120012
DWG. NO.: 120012PAD

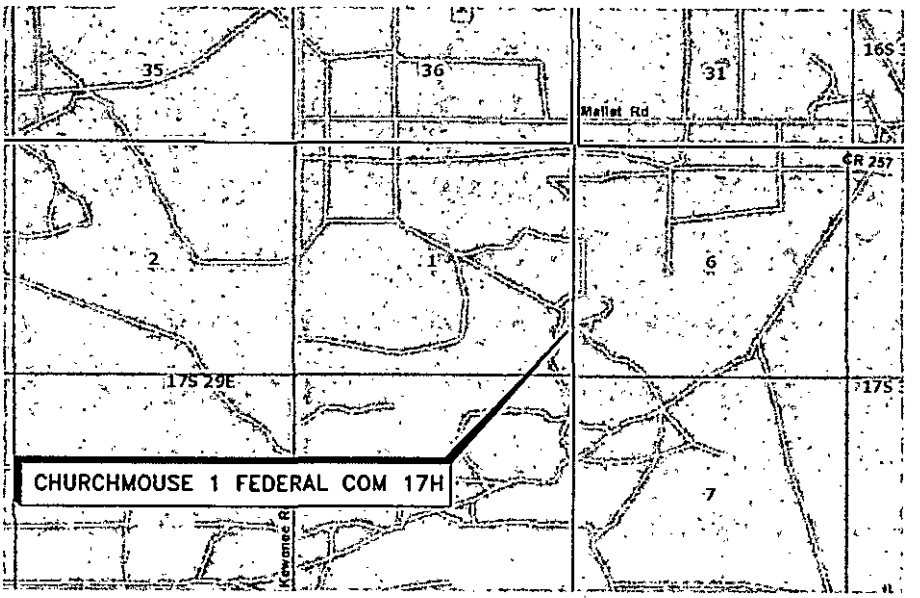
PROSPERITY CONSULTANTS, LLC

2251 Double Creek Drive, Suite 602, Round Rock, Texas 78664 o (512) 992-2087 f (512) 251-2518

SCALE: 1" = 100'
DATE: 12/6/12
SURVEYED BY: RH/GB
DRAWN BY: LWB
APPROVED BY: LWB
SHEET : 1 OF 1

VICINITY MAP

NOT TO SCALE



SECTION 1, TWP. 17 SOUTH, RGE. 29 EAST,
N. M. P. M., EDDY COUNTY, NEW MEXICO

OPERATOR: COG Operating, LLC
LEASE: Churchmouse 1 Federal Com
WELL NO.: 17H
ELEVATION: 3680'
LOCATION: 990' FSL & 150' FEL

DIRECTIONS TO LOCATION

From the intersection of County Road No. 215 (Kewanee) and County Road No. 257 (Mallet Road);

Go East on County Road No. 257 approx. 1.0 mile;

Turn right on an existing lease road;

Go South on lease road approx. 0.7 mile;

Turn right; Go West approx. 400 feet;

Turn Left; Go South approx. 0.1 mile;

Location is approx. 200' East of the lease road.

NO.	REVISION	DATE
1	Well Name	5/2/13

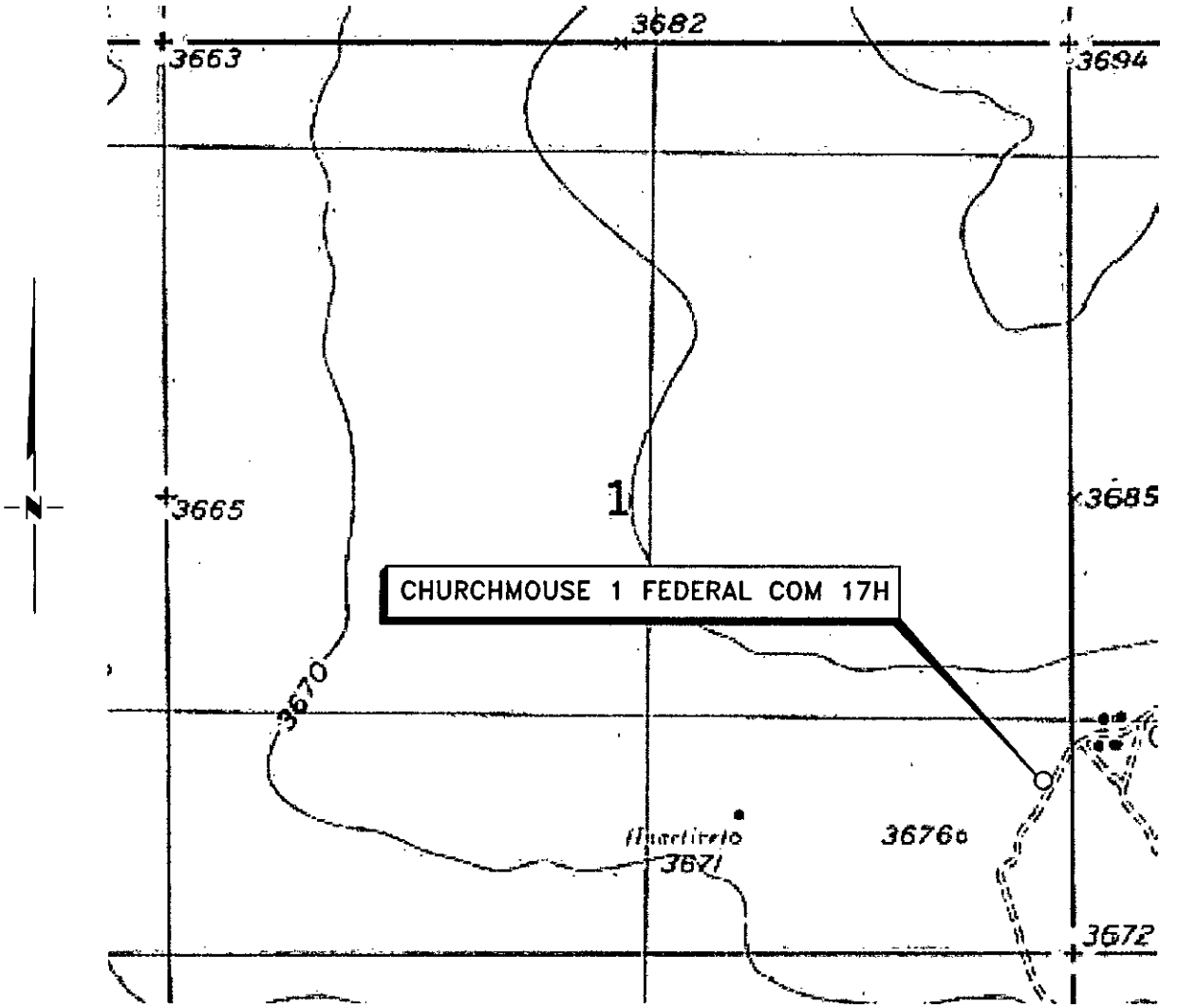
JOB NO.: LS120012
DWG. NO.: 120012VM

PROSPERITY CONSULTANTS, LLC

2251 Double Creek Drive, Suite 602, Round Rock, Texas 78664 o (512) 992-2087 f (512) 251-2518

SCALE: 1" = 1000'
DATE: 12/6/2012
SURVEYED BY: RH/GB
DRAWN BY: LWB
APPROVED BY: LWB
SHEET : 1 OF 1

LOCATION VERIFICATION MAP



SECTION 1, TWP. 17 SOUTH, RGE. 29 EAST,
N. M. P. M., EDDY COUNTY, NEW MEXICO

OPERATOR: COG Operating, LLC
LEASE: Churchmouse 1 Federal Com
WELL NO.: 17H
ELEVATION: 3680'

LOCATION: 990' FSL & 150' FEL
CONTOUR INTERVAL: 10'
USGS TOPO. SOURCE MAP:
Red Lake SE, NM (1955)

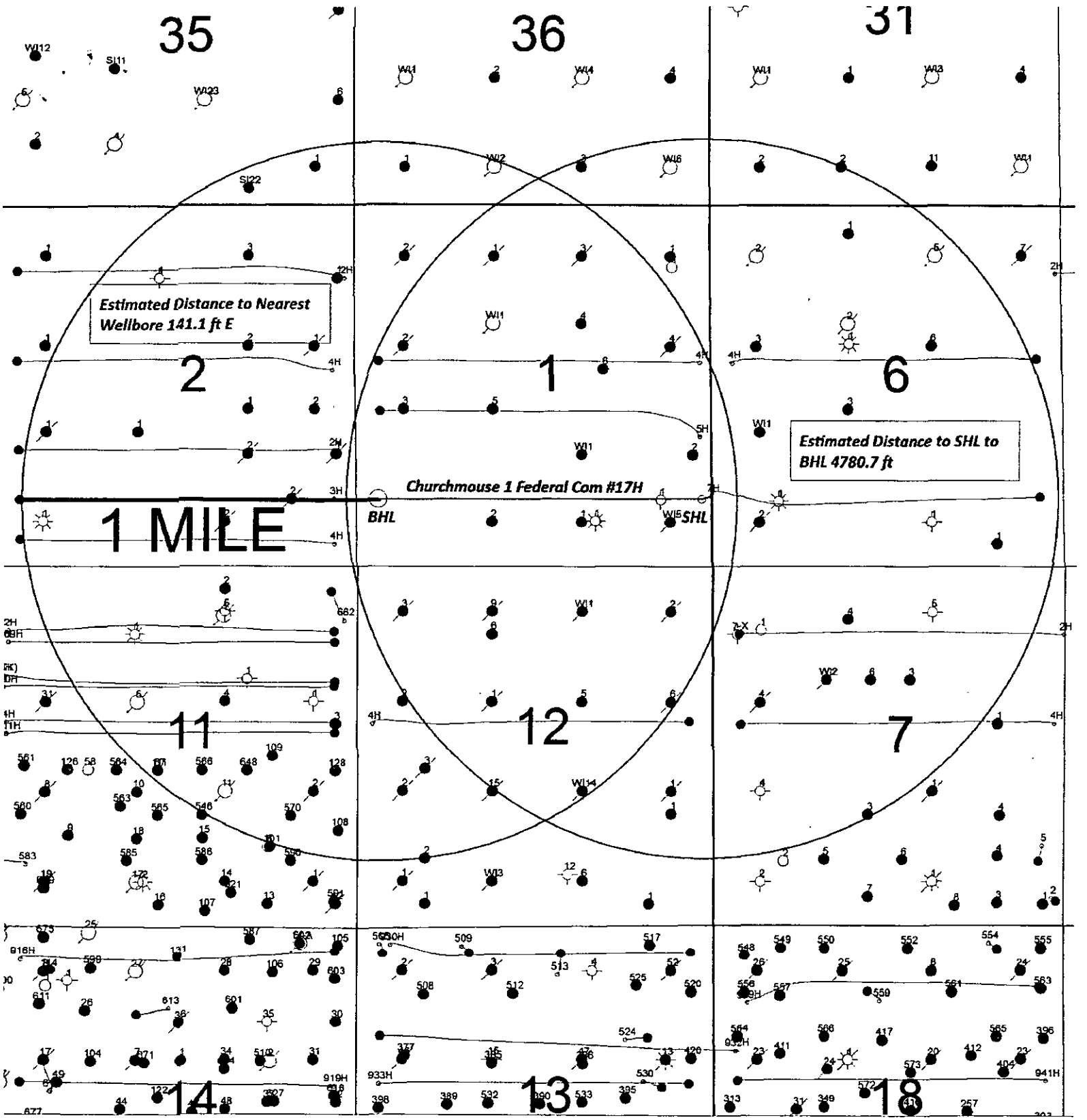
NO.	REVISION	DATE
1	Well Name	5/2/13

JOB NO.: LS120012
DWG. NO.: 120012LVM

PROSPERITY CONSULTANTS, LLC

2251 Double Creek Drive, Suite 602, Round Rock, Texas 78664 o (512) 992-2087 f (512) 251-2518

SCALE: 1" = 1000'
DATE: 12/6/12
SURVEYED BY: RH/GB
DRAWN BY: LWB
APPROVED BY: LWB
SHEET : 1 OF 1



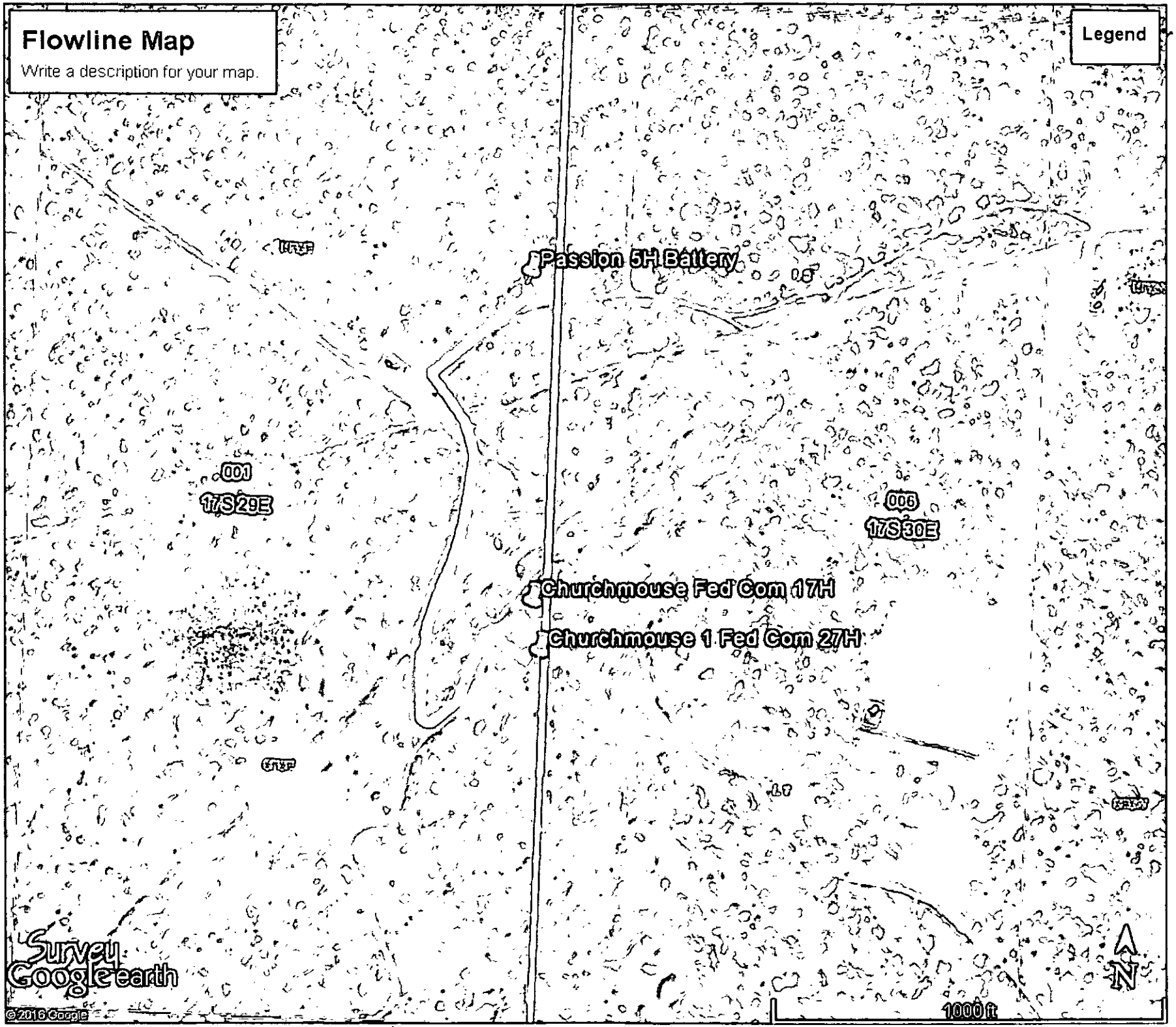
CONCHO

SENM Shelf Area

Churchmouse 1 Federal Com #17H

SEC. 1, T17S – R29E SHL 990 FSL 150 FEL, UNIT P
SEC. 1, T17S – R29E SHL 989 FSL 330 FWL, UNIT M

Author:		Date:
ldm		3 February, 2015


Flowline Map
Write a description for your map.
Legend
Passion 5H Battery
001
17S29E
006
17S30E
Churchmouse Fed Com 17H
Churchmouse 1 Fed Com 27H
Survey Google earth
© 2016 Google
1000 ft
N

COG Operating LLC
Churchmouse 1 Federal Com #17H

1. Geologic Formations

TVD of target	4450'	Pilot hole depth	NA
MD at TD:	8924'	Deepest expected fresh water:	110'

Back Reef

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Fresh Water	
Rustler	238'	Brackish Water	
Top of Salt	520'	Salt	
Tansill	1032'	Barren	
Yates	1139'	Oil/Gas	
Seven Rivers	1423'	Oil/Gas	
Queen	2025'	Oil/Gas	
Grayburg	2402'	Oil/Gas	
San Andres	2723'	Oil/Gas	
Glorieta	4159'	Oil/Gas	
Paddock	4223'	Target	
Blinebry	4609'	Will not penetrate	

*H2S, water flows, loss of circulation, abnormal pressures, etc.

2. Casing Program

Hole Size	Casing Interval From	Casing Interval To	Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17.5"	0	~~263'~~ 350'	13.375"	48	H40/J55	STC	11.49	3.79	31.20
12.25"	0	~~1052'~~ 1160'	9.625"	40	J55	LTC	4.43	1.55	18.03
8.75"	0	3929'	5.5"	17	L80	LTC	3.07	1.33	2.48
8.75"	3929'	4757'	5.5"	17	L80	LTC	2.77	1.33	5.32
7.875"	4757'	8924'	5.5"	17	L80	LTC	2.77	1.33	6.84
				BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

Sec COA

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h
BLM standard formulas where used on all SF calculations
Assumed 9.2 ppg MW equivalent pore pressure from 9 5/8" shoe to Deepest TVD in wellbore.

COG Operating LLC
Churchmouse 1 Federal Com #17H

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Is casing API approved? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	N
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

3. Cementing Program

Casing	# Sks	Wt. lb/gal	Yld ft3/sk	H_20 gal/sk	500 psi Comp. Strength (hours)	Slurry Description
Surf.	250	14.8	1.32	6.3	6	Tail: Class C + 2% Cacl2 +0.25 pps Celloflake
Inter. Single stage	125	11.8	2.45	14.4	72	Lead: 50:50:10 C: Poz:Gel w/ 5% Salt + 5 pps LCM + 0.25 pps Cello flake
	175	14.8	1.32	6.3	6	Tail: Class C w/ 2% Cacl2
	IF DV Tool +/- 3135'					
Inter. Multi-Stage	75	11.8	2.45	14.4	72	1st stage Lead: 50:50:10 C: Poz:Gel w/ 5% Salt + 5 pps LCM + 0.25 pps Cello flake
	150	14.8	1.32	6.3	6	1st stage Tail: Class C w/ 2% Cacl2
	100	11.8	2.45	14.4	72	2nd stage Lead: 50:50:10 C: Poz:Gel w/ 5% Salt + 5 pps LCM + 0.25 pps Cello flake

See COA

Prod. Single Stage	450	12.5	2.01	11.4	22	Lead: 35:65:6 C:Poz Gel w/5% salt + 5 pps LCM + 0.2% SMS + 1% FL-25 + 1% Ba-58+0.3% FL-52A + 0.125 pps CF
	900	14	1.37	6.4	10	Tail: 50:50:2 C:Pox Gel w/5% salt+3 pps LCM + 0.6% SMS + 1% FL-25 +1% BA-58+ 0.125 pps CF
	IF DV/ECP Tool +/- 2823'					
Prod Multi-Stage	300	12.5	2.01	11.4	22	2nd Stage Lead: 35:65;6 C:Poz Gel w/5% salt+5 pps LCM+0.2% SMS + 1% FL-25+1% BA-58+0.3% FL-52A+ 0.125 pps CF
	150	16.8	.99	4.8	6	2nd Stage Tail: Class"C" w/0.3% R-3 + 1.5% CD-32
	200	12.5	2.01	11.4	22	1st stage Lead: 35:65:6 C: PozGel w/5% salt + 5 pp LCM + 0.2% SMS + 1% FL-25+ 1% BA-58 + 0.3% FL-52A + 0.125 pps CF
	900	14	1.37	6.4	10	1st stage Tail: 50:50:2 C: PozGel w/5% salt + 3 pps LCM + 0.6% SMS + 1% FL-25 + 1% BA-58 + 0.125 pps CF

Casing String	TOC	% Excess
Surface	0'	50%
Intermediate	0'	50%
Production	0'	35%

4. Pressure Control Equipment * See attachment for further details*****

No	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.

BOP installed and tested before drilling which hole?	Size?	Min Required WP	Type	✓	Tested to:
12-1/4"	13-5/8"	2M	Annular	X	2000 psi
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other*		
8-3/4" & 7 7/8"	13-5/8"	2M	Annular	X	2000 psi
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other*		

*Specify if additional ram is utilized.

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

NA	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
NA	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
	NA — Are anchors required by manufacturer?
NA	A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. • Provide description here See attached schematic.

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	Surf. shoe	FW Gel	8.6-8.8	28-34	N/C
Surf shoe	Int shoe	Saturated Brine	10.0-10.2	28-34	N/C
Int shoe	TD	FW-Cut Brine	8.5-9.2	28-34	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring

6. Logging and Testing Procedures

Logging, Coring and Testing.	
X	Will run Cased hole GR/CNL from KOP to surface. Stated logs run will be in the Completion Report and submitted to the BLM.
No	Open hole logs are planned from KOP to Intermediate casing shoe.
No	Drill stem test? If yes, explain
No	Coring? If yes, explain

Additional logs planned		Interval
	Resistivity	Int. shoe to KOP
	Density	Int. shoe to KOP
	CBL	Production casing
X	Mud log	Intermediate shoe to TD
	PEX/HRLA/HNGS	Intermediate shoe to KOP

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	1960 psi
Abnormal Temperature	No

Mitigation measure for abnormal conditions.

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
NO	H2S is present
Yes	H2S Plan attached

8. Other facets of operation

Is this a walking operation? No.
Will be pre-setting casing? No

Attachments:
Directional Plan
Multi-stage Cement details
BOP description

Multi-stage Cement details:

Discussion of DV Tool cement options:

9 5/8" DV tool cement option is proposed for approval. This may become necessary if lost circulation occurs while drilling the 12 ¼" intermediate hole. DV tool depth will be based on hole conditions. Cement volumes will be adjusted proportionally. DV Tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe.

7" DV tool cement option is proposed for approval. This may become necessary if water flows in the San Andres are encountered. These water flows normally occur in areas where produced water disposal is happening. This dense cement is used to combat water flows. This cement recipe also has a right angle set time and is mixed a little under saturated so the water flow will be absorbed by cement. DV tool depth will be based on hole conditions. Cement volumes will be adjusted proportionally. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe.

Discussion of Pressure Control Equipment:

A 13 5/8" 3000 psi Double ram BOP or 13 5/8" 3000 psi Hydril type annular preventor will be used depending on the rig selected.

The majority of the rigs currently in use by COG have 13 5/8" 3000 psi BOPs (double ram or hydril type) but due to the vagaries of rig scheduling one of the few rigs with 11" BOPs might be used if the intermediate hole size is 11"; therefore, COG Operating LLC requests variance to the requirement of 13 5/8" BOPS on 13 3/8" casing. When the circumstance occurs that a 11" BOP is used on 13 3/8" casing a special flange will be utilized to allow testing the entire BOP with a test plug, without subjecting the casing to test pressure. The special flange also allows return to full-open capability if desired.

In every case COG Operating LLC will use BOP equipment which will meet or exceed well control requirements of Onshore Oil and Gas Order No. 2.

GEG 5/21/15

CONCHO

COG Operating LLC

Eddy County, New Mexico
Churchmouse 1 Federal Com
Churchmouse 1 Federal Com Well No. 17H
Original Hole

SHL: 990 FSL 150 FEL Sect 1-T17S-R29E Unit P
POE: 990 FSL 330 FEL Sect 1-T17S-R29E Unit P
BHL: 989 FSL 330 FWL Sect 1-T17S-R29E Unit M

Plan: rev0

Standard_report

14 February, 2015

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Well:	Churchmouse 1 Federal Com Well No. 17H	**North Reference:**	Grid
Wellbore:	Original Hole	**Survey Calculation Method:**	Minimum Curvature
Design:	rev0	**Database:**	Dbase Nov0914

Project Eddy County, New Mexico

Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site Churchmouse 1 Federal Com

Site Position:		**Northing:**	675,674.30 usft	**Latitude:**	32.85711944
From:	Map	**Easting:**	596,294.60 usft	**Longitude:**	-104.01974887
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.17 °

Well Churchmouse 1 Federal Com Well No. 17H, Surf Loc: 990 FSL 150 FEL Sect 1-T17S-R29E Unit P

Well Position	**+N/-S**	0.00 usft	**Northing:**	676,314.10 usft	**Latitude:**	32.85887779
	+E/-W	0.00 usft	**Easting:**	596,324.60 usft	**Longitude:**	-104.01964499
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,680.00 usft

Wellbore Original Hole

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/14/2015	7.39	60.60	48,580

Design rev0

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	269.98

Survey Tool Program Date 2/14/2015

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	9,022.31	rev0 (Original Hole)	MWD	MWD - Standard

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Well:	Churchmouse 1 Federal Com Well No. 17H	**North Reference:**	Grid
Wellbore:	Original Hole	**Survey Calculation Method:**	Minimum Curvature
Design:	rev0	**Database:**	Dbase Nov0914

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Well:	Churchmouse 1 Federal Com Well No. 17H	**North Reference:**	Grid
Wellbore:	Original Hole	**Survey Calculation Method:**	Minimum Curvature
Design:	rev0	**Database:**	Dbase Nov0914

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
3,930.00	0.00	0.00	3,930.00	0.00	0.00	0.00	0.00	676,314.10	596,324.60
KOP Begin 11°/100' build									
4,000.00	7.70	269.98	3,999.79	0.00	-4.70	11.00	4.70	676,314.10	596,319.90
4,100.00	18.70	269.98	4,097.00	-0.01	-27.50	11.00	27.50	676,314.09	596,297.10
4,200.00	29.70	269.98	4,188.07	-0.03	-68.43	11.00	68.43	676,314.07	596,256.17
4,300.00	40.70	269.98	4,269.66	-0.05	-125.98	11.00	125.98	676,314.05	596,198.62
4,377.00	49.17	269.98	4,324.12	-0.08	-180.32	11.00	180.32	676,314.02	596,144.28
330 Hard line intercept @ 4377 MD									
4,400.00	51.70	269.98	4,338.77	-0.08	-198.05	11.00	198.05	676,314.02	596,126.55
4,500.00	62.70	269.98	4,392.85	-0.12	-281.97	11.00	281.97	676,313.98	596,042.63
4,600.00	73.70	269.98	4,429.93	-0.16	-374.68	11.00	374.68	676,313.94	595,949.92
4,700.00	84.70	269.98	4,448.64	-0.20	-472.76	11.00	472.76	676,313.90	595,851.84
4,757.32	91.00	269.98	4,450.79	-0.22	-530.00	11.00	530.00	676,313.88	595,794.60
Begin 91.00 lateral section									

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Unitér #43)
Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Unitér #43)
Well:	Churchmouse 1 Federal Com Well No. 17H	**North Reference:**	Grid
Wellbore:	Original Hole	**Survey Calculation Method:**	Minimum Curvature
Design:	rev0	**Database:**	Dbase Nov0914

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
4,800.00	91.00	269.98	4,450.04	-0.24	-572.68	0.00	572.68	676,313.86	595,751.92
4,900.00	91.00	269.98	4,448.29	-0.28	-672.67	0.00	672.67	676,313.82	595,651.93
5,000.00	91.00	269.98	4,446.54	-0.32	-772.65	0.00	772.65	676,313.78	595,551.95
5,100.00	91.00	269.98	4,444.78	-0.36	-872.64	0.00	872.64	676,313.74	595,451.96
5,200.00	91.00	269.98	4,443.03	-0.41	-972.62	0.00	972.62	676,313.69	595,351.98
5,300.00	91.00	269.98	4,441.27	-0.45	-1,072.60	0.00	1,072.61	676,313.65	595,252.00
5,400.00	91.00	269.98	4,439.52	-0.49	-1,172.59	0.00	1,172.59	676,313.61	595,152.01
5,500.00	91.00	269.98	4,437.77	-0.53	-1,272.57	0.00	1,272.57	676,313.57	595,052.03
5,600.00	91.00	269.98	4,436.01	-0.57	-1,372.56	0.00	1,372.56	676,313.53	594,952.04
5,700.00	91.00	269.98	4,434.26	-0.61	-1,472.54	0.00	1,472.54	676,313.49	594,852.06
5,800.00	91.00	269.98	4,432.51	-0.66	-1,572.53	0.00	1,572.53	676,313.44	594,752.07
5,900.00	91.00	269.98	4,430.75	-0.70	-1,672.51	0.00	1,672.51	676,313.40	594,652.09
6,000.00	91.00	269.98	4,429.00	-0.74	-1,772.50	0.00	1,772.50	676,313.36	594,552.10
6,100.00	91.00	269.98	4,427.25	-0.78	-1,872.48	0.00	1,872.48	676,313.32	594,452.12
6,200.00	91.00	269.98	4,425.49	-0.82	-1,972.47	0.00	1,972.47	676,313.28	594,352.13
6,300.00	91.00	269.98	4,423.74	-0.86	-2,072.45	0.00	2,072.45	676,313.24	594,252.15
6,400.00	91.00	269.98	4,421.99	-0.91	-2,172.44	0.00	2,172.44	676,313.19	594,152.16
6,500.00	91.00	269.98	4,420.23	-0.95	-2,272.42	0.00	2,272.42	676,313.15	594,052.18
6,600.00	91.00	269.98	4,418.48	-0.99	-2,372.40	0.00	2,372.41	676,313.11	593,952.20
6,700.00	91.00	269.98	4,416.73	-1.03	-2,472.39	0.00	2,472.39	676,313.07	593,852.21
6,800.00	91.00	269.98	4,414.97	-1.07	-2,572.37	0.00	2,572.37	676,313.03	593,752.23
6,900.00	91.00	269.98	4,413.22	-1.11	-2,672.36	0.00	2,672.36	676,312.99	593,652.24
7,000.00	91.00	269.98	4,411.47	-1.16	-2,772.34	0.00	2,772.34	676,312.94	593,552.26
7,100.00	91.00	269.98	4,409.71	-1.20	-2,872.33	0.00	2,872.33	676,312.90	593,452.27
7,200.00	91.00	269.98	4,407.96	-1.24	-2,972.31	0.00	2,972.31	676,312.86	593,352.29
7,300.00	91.00	269.98	4,406.21	-1.28	-3,072.30	0.00	3,072.30	676,312.82	593,252.30
7,400.00	91.00	269.98	4,404.45	-1.32	-3,172.28	0.00	3,172.28	676,312.78	593,152.32

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Well:	Churchmouse 1 Federal Com Well No. 17H	**North Reference:**	Grid
Wellbore:	Original Hole	**Survey Calculation Method:**	Minimum Curvature
Design:	rev0	**Database:**	Dbase Nov0914

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	V. Sec (usft)	Northing (usft)	Easting (usft)
7,500.00	91.00	269.98	4,402.70	-1.36	-3,272.27	0.00	3,272.27	676,312.74	593,052.33
7,600.00	91.00	269.98	4,400.95	-1.41	-3,372.25	0.00	3,372.25	676,312.69	592,952.35
7,700.00	91.00	269.98	4,399.19	-1.45	-3,472.24	0.00	3,472.24	676,312.65	592,852.36
7,800.00	91.00	269.98	4,397.44	-1.49	-3,572.22	0.00	3,572.22	676,312.61	592,752.38
7,900.00	91.00	269.98	4,395.69	-1.53	-3,672.20	0.00	3,672.21	676,312.57	592,652.40
8,000.00	91.00	269.98	4,393.93	-1.57	-3,772.19	0.00	3,772.19	676,312.53	592,552.41
8,100.00	91.00	269.98	4,392.18	-1.62	-3,872.17	0.00	3,872.17	676,312.48	592,452.43
8,200.00	91.00	269.98	4,390.43	-1.66	-3,972.16	0.00	3,972.16	676,312.44	592,352.44
8,300.00	91.00	269.98	4,388.67	-1.70	-4,072.14	0.00	4,072.14	676,312.40	592,252.46
8,400.00	91.00	269.98	4,386.92	-1.74	-4,172.13	0.00	4,172.13	676,312.36	592,152.47
8,500.00	91.00	269.98	4,385.16	-1.78	-4,272.11	0.00	4,272.11	676,312.32	592,052.49
8,600.00	91.00	269.98	4,383.41	-1.82	-4,372.10	0.00	4,372.10	676,312.28	591,952.50
8,700.00	91.00	269.98	4,381.66	-1.87	-4,472.08	0.00	4,472.08	676,312.23	591,852.52
8,800.00	91.00	269.98	4,379.90	-1.91	-4,572.07	0.00	4,572.07	676,312.19	591,752.53
8,900.00	91.00	269.98	4,378.15	-1.95	-4,672.05	0.00	4,672.05	676,312.15	591,652.55
9,000.00	91.00	269.98	4,376.40	-1.99	-4,772.04	0.00	4,772.04	676,312.11	591,552.56
9,022.67	91.00	269.98	4,376.00	-2.00	-4,794.70	0.00	4,794.70	676,312.10	591,529.90
PBHL/TD									

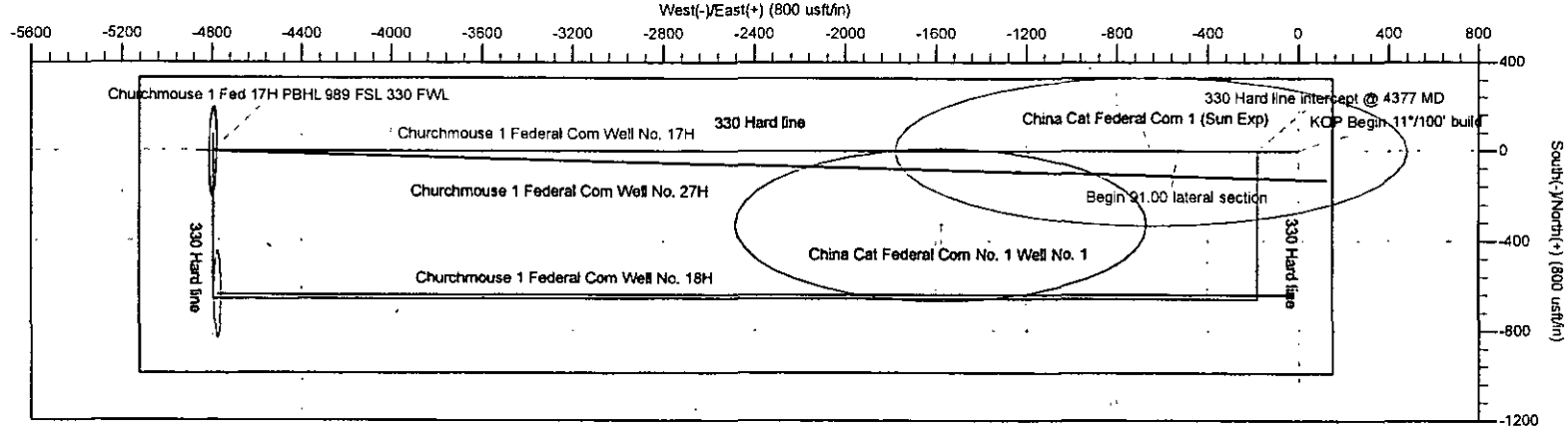
Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
3,930.00	3,930.00	0.00	0.00	KOP Begin 11°/100' build
4,377.00	4,324.12	-0.08	-180.32	330 Hard line intercept @ 4377 MD
4,757.32	4,450.79	-0.22	-530.00	Begin 91.00 lateral section
9,022.67	4,376.00	-2.00	-4,794.70	PBHL/TD

COG Operating LLC

CONCHO

Well:	**Churchmouse 1 Federal Com Well No. 17H**
Site:	**Churchmouse 1 Federal Com**
Project:	**Eddy County, New Mexico**
Design:	**rev0**
Rig:	**Uniter #43**



Azimuths to Grid North
True North: -0.17°
Magnetic North: 7.22°

Magnetic Field
Strength: 48579.7snT
Dip Angle: 60.60°
Date: 2/14/2015
Model IGRF2010

PRODIRECTIONAL

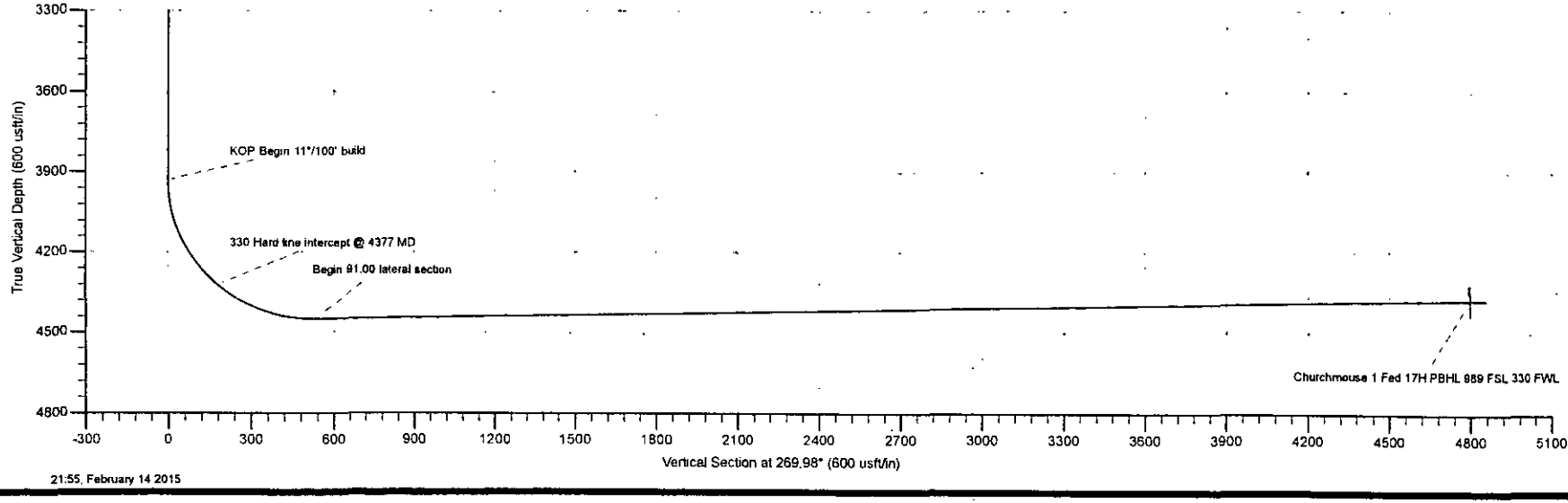
Surface Location: RKB=3680+12 @ 3692.00usft (Uniter #43)
US State Plane 1927 (Exact solution)
New Mexico East 3001

Northing	Easting	Latitude	Longitude
676314.10	596324.60	32.85887779	-104.01964499

Total Correction (M => G) To convert a Magnetic Direction to a Grid Direction, Add 7.22°

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3930.00	0.00	0.00	3930.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 11°/100' build
3	4757.32	91.00	269.98	4450.79	-0.22	-530.00	11.00	269.98	530.00	Begin 91.00 lateral section
4	9022.67	91.00	269.98	4376.00	-2.00	-4794.70	0.00	0.00	4794.70	PBHL/TD



21:55, February 14 2015

CONCHO

Anticollision Report

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Reference Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Churchmouse 1 Federal Com Well No. 17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Reference rev0

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 11,000.00 usft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	3.00 Sigma	**Casing Method:**	Not applied

Survey Tool Program **Date** 2/14/2015

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	9,022.31	rev0 (Original Hole)	MWD	MWD - Standard

Summary

Site Name / Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Churchmouse 1 Federal Com						
China Cat Federal Com 1 (Sun Exp) - Original hole - Sur	4,050.00	4,034.84	636.32	-56.25	0.919	Level 1<=1.00, ES
China Cat Federal Com 1 (Sun Exp) - Original hole - Sur	4,876.55	4,434.61	0.86	-22.33	0.037	Level 1<=1.00, CC, SF
China Cat Federal Com No. 1 Well No. 1 - Original Hole	5,803.40	4,405.35	327.91	129.48	1.653	Level 3<=2.00, CC, ES, SF
Churchmouse 1 Federal Com Well No. 18H - Original Ho	9,002.93	8,946.57	639.30	250.21	1.643	Level 3<=2.00, CC
Churchmouse 1 Federal Com Well No. 18H - Original Ho	9,022.67	8,946.57	639.61	249.70	1.640	Level 3<=2.00, ES, SF
Churchmouse 1 Federal Com Well No. 27H - Original Ho	3,930.00	3,934.00	176.92	150.78	6.769	CC, ES
Churchmouse 1 Federal Com Well No. 27H - Original Ho	9,022.67	9,694.53	543.49	438.57	5.180	SF

Offset Design Churchmouse 1 Federal Com - China Cat Federal Com 1 (Sun Exp) - Original hole - Surveys Original ho

Offset Site Error: 0.00 usft

Survey Program: 402-INC

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	17.10	0.00	0.00	-90.02	-0.27	-650.08	650.30				
100.00	100.00	82.92	100.02	0.15	6.19	-90.11	-1.27	-650.08	650.08	648.28	1.80	360.302	
105.38	105.38	88.31	105.40	0.17	6.59	-90.12	-1.32	-650.08	650.08	648.15	1.93	336.836	
200.00	200.00	182.93	200.02	0.49	13.66	-90.16	-1.79	-650.08	650.08	645.94	4.14	157.091	
247.29	247.29	230.21	247.31	0.64	17.19	-90.16	-1.77	-650.08	650.08	644.84	5.24	124.022	
300.00	300.00	282.91	300.00	0.82	21.13	-90.14	-1.55	-650.08	650.08	643.61	6.47	100.454	
374.07	374.07	356.93	374.02	1.07	26.65	-90.08	-0.88	-650.08	650.08	641.88	8.20	79.289	
400.00	400.00	382.83	399.93	1.16	28.59	-90.05	-0.55	-650.08	650.08	641.28	8.80	73.844	
500.00	500.00	483.00	500.02	1.50	43.63	-90.05	-0.56	-650.08	650.08	637.75	12.33	52.729	
511.22	511.22	494.22	511.24	1.53	45.51	-90.05	-0.60	-650.08	650.08	637.32	12.76	50.965	
600.00	600.00	583.02	600.02	1.83	60.43	-90.07	-0.76	-650.08	650.08	633.95	16.13	40.301	
626.01	626.01	609.03	626.03	1.92	64.80	-90.07	-0.79	-650.08	650.08	632.96	17.12	37.974	
700.00	700.00	683.02	700.01	2.17	77.23	-90.07	-0.78	-650.08	650.08	630.15	19.93	32.616	
760.92	760.92	743.93	760.91	2.38	87.46	-90.06	-0.70	-650.08	650.08	627.83	22.25	29.221	
800.00	800.00	783.01	799.98	2.51	94.02	-90.05	-0.62	-650.08	650.08	626.35	23.73	27.393	
872.02	872.02	855.00	871.97	2.75	106.12	-90.03	-0.39	-650.08	650.08	623.61	26.47	24.561	
900.00	900.00	882.97	899.93	2.85	110.81	-90.02	-0.28	-650.08	650.08	622.55	27.53	23.613	
1,000.00	1,000.00	983.33	1,000.04	3.18	132.58	-90.07	-0.78	-650.08	650.08	619.09	30.99	20.977	
1,013.24	1,013.24	996.57	1,013.28	3.23	135.44	-90.07	-0.82	-650.08	650.08	618.64	31.45	20.673	
1,100.00	1,100.00	1,083.36	1,100.04	3.52	154.33	-90.09	-1.01	-650.08	650.08	615.65	34.43	18.881	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Reference Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Churchmouse 1 Federal Com Well No. 17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Churchmouse 1 Federal Com - China Cat Federal Com 1 (Sun Exp) - Original hole - Surveys Original ho — Offset Site Error: 0.00 usft

Survey Program: 402-INC — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
1,130.79	1,130.79	1,114.16	1,130.83	3.62	161.03	-90.09	-1.03	-650.08	650.08	614.59	35.49	18.317	
1,200.00	1,200.00	1,183.35	1,200.01	3.86	176.09	-90.09	-0.97	-650.08	650.08	612.21	37.87	17.166	
1,267.16	1,267.16	1,250.48	1,267.12	4.08	190.70	-90.07	-0.78	-650.08	650.08	609.90	40.18	16.179	
1,300.00	1,300.00	1,283.30	1,299.93	4.19	197.85	-90.06	-0.64	-650.08	650.08	608.77	41.31	15.737	
1,400.00	1,400.00	1,383.76	1,400.00	4.53	220.38	-90.02	-0.22	-650.08	650.08	605.46	44.62	14.569	
1,402.92	1,402.92	1,386.68	1,402.92	4.54	221.07	-90.02	-0.22	-650.08	650.08	605.37	44.71	14.540	
1,500.00	1,500.00	1,483.88	1,500.00	4.87	243.70	-90.02	-0.27	-650.08	650.08	602.42	47.66	13.639	
1,600.00	1,600.00	1,584.00	1,600.01	5.21	266.98	-90.03	-0.34	-650.08	650.08	599.28	50.80	12.796	
1,660.90	1,660.90	1,644.92	1,660.90	5.41	281.46	-90.03	-0.34	-650.08	650.08	597.32	52.76	12.321	
1,700.00	1,700.00	1,684.02	1,699.99	5.54	290.76	-90.02	-0.26	-650.08	650.08	596.06	54.02	12.035	
1,787.51	1,787.51	1,771.71	1,787.50	5.84	311.61	-90.02	-0.18	-650.08	650.08	593.31	56.77	11.451	
1,800.00	1,800.00	1,784.21	1,800.00	5.88	314.58	-90.02	-0.19	-650.08	650.08	592.92	57.16	11.372	
1,875.04	1,875.04	1,859.41	1,875.04	6.13	332.28	-90.02	-0.25	-650.08	650.08	590.55	59.53	10.920	
1,900.00	1,900.00	1,884.38	1,900.00	6.22	337.71	-90.02	-0.22	-650.08	650.08	589.74	60.34	10.773	
2,000.00	2,000.00	1,984.50	2,000.00	6.55	359.36	-90.02	-0.27	-650.08	650.08	586.50	63.58	10.225	
2,100.00	2,100.00	2,084.53	2,100.00	6.89	380.11	-90.02	-0.27	-650.08	650.08	583.31	66.77	9.735	
2,200.00	2,200.00	2,184.56	2,200.00	7.23	400.87	-90.02	-0.27	-650.08	650.08	580.11	69.97	9.291	
2,300.00	2,300.00	2,284.74	2,300.00	7.57	421.69	-90.02	-0.27	-650.08	650.08	576.72	73.36	8.862	
2,400.00	2,400.00	2,384.77	2,400.00	7.90	442.48	-90.02	-0.27	-650.08	650.08	573.31	76.77	8.468	
2,500.00	2,500.00	2,484.80	2,500.00	8.24	463.27	-90.02	-0.27	-650.08	650.08	569.89	80.19	8.107	
2,600.00	2,600.00	2,584.84	2,600.00	8.58	484.06	-90.02	-0.27	-650.08	650.08	566.47	83.61	7.775	
2,700.00	2,700.00	2,685.15	2,700.02	8.91	507.49	-90.05	-0.59	-650.08	650.08	563.13	86.95	7.477	
2,760.07	2,760.07	2,745.21	2,760.06	9.12	521.79	-90.05	-0.54	-650.08	650.08	561.14	88.94	7.309	
2,800.00	2,800.00	2,785.11	2,799.96	9.25	531.29	-90.03	-0.38	-650.08	650.08	559.81	90.27	7.202	
2,876.94	2,876.94	2,862.29	2,876.91	9.51	549.07	-89.99	0.10	-650.08	650.08	557.30	92.78	7.007	
2,900.00	2,900.00	2,885.36	2,899.97	9.59	554.33	-89.99	0.17	-650.08	650.08	556.55	93.53	6.950	
3,000.00	3,000.00	2,985.49	3,000.04	9.93	577.15	-90.00	-0.05	-650.08	650.08	553.30	96.78	6.717	
3,049.99	3,049.99	3,035.58	3,049.98	10.09	588.90	-90.01	-0.10	-650.08	650.08	551.64	98.44	6.604	
3,100.00	3,100.00	3,085.58	3,099.97	10.26	594.24	-89.98	0.25	-650.08	650.08	549.93	100.15	6.491	
3,169.17	3,169.17	3,154.76	3,169.13	10.50	604.41	-89.95	0.57	-650.08	650.08	547.56	102.52	6.341	
3,200.00	3,200.00	3,185.59	3,199.96	10.60	608.94	-89.94	0.66	-650.08	650.08	546.51	103.57	6.277	
3,288.07	3,288.07	3,273.70	3,288.05	10.90	621.88	-89.94	0.70	-650.08	650.08	543.50	106.58	6.099	
3,300.00	3,300.00	3,285.64	3,299.99	10.94	623.64	-89.94	0.68	-650.08	650.08	543.09	106.99	6.076	
3,400.00	3,400.00	3,385.73	3,400.05	11.27	638.34	-89.97	0.32	-650.08	650.08	539.67	110.41	5.888	
3,439.42	3,439.42	3,425.20	3,439.50	11.41	644.14	-89.99	0.07	-650.08	650.08	538.32	111.76	5.817	
3,500.00	3,500.00	3,485.82	3,500.00	11.61	652.03	-90.02	-0.20	-650.08	650.08	536.25	113.83	5.711	
3,563.96	3,563.96	3,549.77	3,563.95	11.83	657.54	-90.00	0.02	-650.08	650.08	534.06	116.02	5.603	
3,600.00	3,600.00	3,585.81	3,599.99	11.95	660.64	-89.99	0.12	-650.08	650.08	532.83	117.25	5.545	
3,672.84	3,672.84	3,658.66	3,672.83	12.19	668.92	-89.98	0.24	-650.08	650.08	530.34	119.74	5.429	
3,700.00	3,700.00	3,685.82	3,699.99	12.29	669.26	-89.98	0.26	-650.08	650.08	529.42	120.66	5.388	
3,794.06	3,794.06	3,779.89	3,794.06	12.60	677.36	-89.98	0.23	-650.08	650.08	526.20	123.88	5.248	
3,800.00	3,800.00	3,785.84	3,800.00	12.62	677.88	-89.98	0.23	-650.08	650.08	526.00	124.08	5.239	
3,900.00	3,900.00	3,885.86	3,900.02	12.96	686.49	-90.00	0.02	-650.08	650.08	522.59	127.49	5.099	
3,905.14	3,905.14	3,891.00	3,905.15	12.98	686.94	-90.00	0.00	-650.08	650.08	522.41	127.67	5.092	
3,930.00	3,930.00	3,915.87	3,930.02	13.06	689.08	-90.01	-0.08	-650.08	650.08	521.56	128.52	5.058	
3,950.00	3,950.00	3,935.88	3,950.02	13.12	690.80	-90.01	-0.15	-650.08	649.70	-53.71	703.41	0.924 Level 1<=1.00	
4,000.00	3,999.79	3,985.68	3,999.79	13.28	694.65	-90.02	-0.27	-650.08	645.38	-56.17	701.56	0.920 Level 1<=1.00	
4,050.00	4,048.94	4,034.84	4,048.94	13.43	697.89	-90.02	-0.27	-650.08	638.32	-56.25	692.57	0.919 Level 1<=1.00, ES	
4,100.00	4,097.00	4,082.89	4,097.00	13.60	701.06	-90.02	-0.27	-650.08	622.58	-54.42	677.00	0.920 Level 1<=1.00	
4,150.00	4,143.52	4,129.41	4,143.52	13.79	704.12	-90.02	-0.27	-650.08	604.31	-50.83	654.93	0.923 Level 1<=1.00	
4,200.00	4,188.07	4,173.97	4,188.07	14.02	707.06	-90.02	-0.27	-650.08	581.65	-44.84	626.50	0.928 Level 1<=1.00	

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Reference Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Churchmouse 1 Federal Com Well No. 17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Churchmouse 1 Federal Com - China Cat Federal Com 1 (Sun Exp) - Original hole - Surveys Original ho

Offset Site Error: 0.00 usft

Survey Program: 402-INC

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,250.00	4,230.25	4,216.15	4,230.25	14.31	709.83	-90.02	-0.27	-650.08	554.84	-37.08	591.91	0.937	Level 1<=1.00
4,300.00	4,269.66	4,255.56	4,269.66	14.68	712.43	-90.02	-0.27	-650.08	524.10	-27.37	551.47	0.950	Level 1<=1.00
4,350.00	4,305.94	4,291.85	4,305.94	15.16	714.82	-90.02	-0.27	-650.08	489.73	-15.79	505.52	0.969	Level 1<=1.00
4,400.00	4,338.77	4,324.67	4,338.77	15.77	716.98	-90.02	-0.27	-650.08	452.03	-2.46	454.49	0.995	Level 1<=1.00
4,450.00	4,367.83	4,353.73	4,367.83	16.53	718.90	-90.02	-0.27	-650.08	411.37	12.47	398.90	1.031	Level 2<=1.50
4,500.00	4,392.85	4,378.76	4,392.85	17.45	720.55	-90.02	-0.27	-650.08	368.11	28.82	339.29	1.085	Level 2<=1.50
4,550.00	4,413.62	4,399.53	4,413.62	18.54	721.91	-90.02	-0.27	-650.08	322.64	46.34	276.30	1.168	Level 2<=1.50
4,600.00	4,429.93	4,415.84	4,429.93	19.78	722.99	-90.02	-0.27	-650.08	275.40	64.78	210.62	1.308	Level 2<=1.50
4,650.00	4,441.64	4,427.55	4,441.64	21.16	723.76	-90.02	-0.27	-650.08	226.81	83.83	142.98	1.586	Level 3<=2.00
4,700.00	4,448.64	4,434.55	4,448.64	22.64	724.22	-90.02	-0.27	-650.08	177.32	103.07	74.25	2.388	
4,750.00	4,450.87	4,436.77	4,450.87	24.21	724.37	-90.02	-0.27	-650.08	127.39	112.57	14.82	8.596	
4,757.32	4,450.79	4,436.70	4,450.79	24.45	724.36	-90.02	-0.27	-650.08	120.08	98.33	21.74	5.522	
4,800.00	4,450.04	4,435.95	4,450.04	25.85	724.31	-90.02	-0.27	-650.08	77.40	55.35	22.05	3.510	
4,875.55	4,448.70	4,434.61	4,448.70	28.48	724.23	-89.95	-0.27	-650.08	0.86	-22.33	23.19	0.037	Level 1<=1.00, CC, SF
4,900.00	4,448.29	4,434.20	4,448.29	29.28	724.20	89.97	-0.27	-650.08	22.59	-0.42	23.01	0.982	Level 1<=1.00
5,000.00	4,446.54	4,432.44	4,446.54	32.88	724.08	89.98	-0.27	-650.08	122.57	98.80	23.77	5.156	
5,100.00	4,444.78	4,430.69	4,444.78	36.59	723.97	89.98	-0.27	-650.08	222.56	197.88	24.67	9.021	
5,200.00	4,443.03	4,428.93	4,443.03	40.38	723.85	89.98	-0.27	-650.08	322.54	296.93	25.61	12.592	
5,300.00	4,441.28	4,427.18	4,441.28	44.23	723.74	89.98	-0.27	-650.08	422.52	395.94	26.58	15.894	
5,400.00	4,439.52	4,425.43	4,439.52	48.14	723.62	89.98	-0.27	-650.08	522.51	494.93	27.58	18.948	
5,500.00	4,437.77	4,423.67	4,437.77	52.07	723.51	89.98	-0.27	-650.08	622.49	593.91	28.58	21.778	
5,600.00	4,436.01	4,421.92	4,436.01	56.04	723.39	89.98	-0.27	-650.08	722.48	692.87	29.60	24.404	
5,700.00	4,434.26	4,420.17	4,434.26	60.03	723.27	89.98	-0.27	-650.08	822.46	791.83	30.64	26.847	
5,800.00	4,432.51	4,418.41	4,432.51	64.04	723.16	89.98	-0.27	-650.08	922.45	890.77	31.68	29.122	
5,900.00	4,430.75	4,416.66	4,430.75	68.06	723.04	89.98	-0.27	-650.08	1,022.43	989.71	32.72	31.246	
6,000.00	4,429.00	4,414.91	4,429.00	72.10	722.93	89.98	-0.27	-650.08	1,122.42	1,088.64	33.77	33.233	
6,100.00	4,427.25	4,413.15	4,427.25	76.14	722.81	89.98	-0.27	-650.08	1,222.40	1,187.57	34.83	35.095	
6,200.00	4,425.49	4,411.40	4,425.49	80.20	722.70	89.98	-0.27	-650.08	1,322.39	1,286.49	35.89	36.844	
6,300.00	4,423.74	4,409.65	4,423.74	84.26	722.58	89.98	-0.27	-650.08	1,422.37	1,385.41	36.96	38.488	
6,400.00	4,421.99	4,407.89	4,421.99	88.33	722.47	89.98	-0.27	-650.08	1,522.36	1,484.33	38.02	40.036	
6,500.00	4,420.23	4,406.14	4,420.23	92.41	722.35	89.98	-0.27	-650.08	1,622.34	1,583.25	39.09	41.498	
6,600.00	4,418.48	4,404.39	4,418.48	96.49	722.23	89.98	-0.27	-650.08	1,722.33	1,682.16	40.17	42.879	
6,700.00	4,416.73	4,402.63	4,416.73	100.57	722.12	89.98	-0.27	-650.08	1,822.31	1,781.07	41.24	44.186	
6,800.00	4,414.97	4,400.88	4,414.97	104.66	722.00	89.98	-0.27	-650.08	1,922.29	1,879.98	42.32	45.425	
6,900.00	4,413.22	4,399.13	4,413.22	108.76	721.89	89.98	-0.27	-650.08	2,022.28	1,978.88	43.40	46.600	
7,000.00	4,411.47	4,397.37	4,411.47	112.85	721.77	89.98	-0.27	-650.08	2,122.26	2,077.79	44.48	47.718	
7,100.00	4,409.71	4,395.62	4,409.71	116.95	721.66	89.98	-0.27	-650.08	2,222.25	2,176.69	45.56	48.780	
7,200.00	4,407.96	4,393.86	4,407.96	121.05	721.54	89.98	-0.27	-650.08	2,322.23	2,275.60	46.64	49.793	
7,300.00	4,406.21	4,392.11	4,406.21	125.16	721.43	89.98	-0.27	-650.08	2,422.22	2,374.50	47.72	50.758	
7,400.00	4,404.45	4,390.36	4,404.45	129.26	721.31	89.98	-0.27	-650.08	2,522.20	2,473.40	48.80	51.680	
7,500.00	4,402.70	4,388.60	4,402.70	133.37	721.19	89.98	-0.27	-650.08	2,622.19	2,572.30	49.89	52.561	
7,600.00	4,400.95	4,386.85	4,400.95	137.48	721.08	89.98	-0.27	-650.08	2,722.17	2,671.20	50.97	53.403	
7,700.00	4,399.19	4,385.10	4,399.19	141.59	720.96	89.98	-0.27	-650.08	2,822.16	2,770.10	52.06	54.210	
7,800.00	4,397.44	4,383.34	4,397.44	145.71	720.85	89.98	-0.27	-650.08	2,922.14	2,868.99	53.15	54.983	
7,900.00	4,395.69	4,381.59	4,395.69	149.82	720.73	89.98	-0.27	-650.08	3,022.13	2,967.89	54.23	55.724	
8,000.00	4,393.93	4,379.84	4,393.93	153.93	720.62	89.98	-0.27	-650.08	3,122.11	3,066.79	55.32	56.435	
8,100.00	4,392.18	4,378.08	4,392.18	158.05	720.50	89.98	-0.27	-650.08	3,222.09	3,165.68	56.41	57.120	
8,200.00	4,390.43	4,376.33	4,390.43	162.17	720.39	89.98	-0.27	-650.08	3,322.08	3,264.58	57.50	57.777	
8,300.00	4,388.67	4,374.58	4,388.67	166.29	720.27	89.98	-0.27	-650.08	3,422.06	3,363.48	58.59	58.410	
8,400.00	4,386.92	4,372.82	4,386.92	170.40	720.16	89.98	-0.27	-650.08	3,522.05	3,462.37	59.68	59.019	
8,500.00	4,385.16	4,371.07	4,385.16	174.52	720.04	89.98	-0.27	-650.08	3,622.03	3,561.27	60.77	59.606	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Reference Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Churchmouse 1 Federal Com Well No. 17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Churchmouse 1 Federal Com - China Cat Federal Com 1 (Sun Exp) - Original hole - Surveys Original ho

Offset Site Error: 0.00 usft

Survey Program: 402-INC

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,600.00	4,383.41	4,369.32	4,383.41	178.64	719.92	89.98	-0.27	-650.08	3,722.02	3,660.16	61.86	60.171	
8,700.00	4,381.66	4,367.56	4,381.66	182.77	719.81	89.98	-0.27	-650.08	3,822.00	3,759.06	62.95	60.717	
8,800.00	4,379.90	4,365.81	4,379.90	186.89	719.69	89.98	-0.27	-650.08	3,921.99	3,857.95	64.04	61.245	
8,900.00	4,378.15	4,364.06	4,378.15	191.01	719.58	89.98	-0.27	-650.08	4,021.97	3,956.84	65.13	61.754	
9,000.00	4,376.40	4,362.30	4,376.40	195.13	719.46	89.98	-0.27	-650.08	4,121.96	4,055.74	66.22	62.246	
9,022.67	4,376.00	4,361.90	4,376.00	196.07	719.44	89.98	-0.27	-650.08	4,144.62	4,078.15	66.47	62.355	

CONCHO

Anticollision Report

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Reference Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Churchmouse 1 Federal Com Well No. 17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Churchmouse 1 Federal Com - China Cat Federal Com No. 1 Well No. 1 - Original Hole - Surveys Origi — **Offset Site Error:** 0.00 usft

Survey Program: 210-INC — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	28.00	0.00	0.00	-101.79	-328.80	-1,575.80	1,609.98				
100.00	100.00	70.36	98.36	0.15	5.25	-101.81	-329.51	-1,575.80	1,609.88	1,607.99	1.89	850.411	
200.00	200.00	175.35	203.35	0.49	13.09	-101.80	-329.24	-1,575.80	1,609.83	1,605.00	4.83	333.162	
300.00	300.00	272.04	300.00	0.82	24.85	-101.79	-328.80	-1,575.80	1,609.74	1,600.94	8.80	182.884	
400.00	400.00	372.06	400.00	1.16	39.64	-101.79	-328.80	-1,575.80	1,609.74	1,596.12	13.62	118.193	
500.00	500.00	473.05	500.91	1.50	53.43	-101.78	-328.81	-1,575.80	1,609.70	1,591.63	18.07	89.074	
596.31	596.31	568.45	596.30	1.82	65.48	-101.77	-328.48	-1,575.80	1,609.67	1,587.74	21.94	73.381	
600.00	600.00	572.11	599.96	1.83	65.94	-101.77	-328.48	-1,575.80	1,609.67	1,587.59	22.08	72.888	
700.00	700.00	671.19	699.02	2.17	78.46	-101.78	-328.63	-1,575.80	1,609.70	1,583.60	26.11	61.660	
800.00	800.00	774.76	802.52	2.51	88.27	-101.77	-328.33	-1,575.80	1,609.64	1,579.43	30.21	53.280	
900.00	900.00	874.17	901.92	2.85	95.21	-101.75	-327.65	-1,575.80	1,609.50	1,575.37	34.14	47.148	
1,000.00	1,000.00	973.59	1,001.34	3.18	102.14	-101.73	-327.14	-1,575.80	1,609.40	1,571.30	38.11	42.236	
1,100.00	1,100.00	1,073.02	1,100.76	3.52	109.08	-101.72	-326.81	-1,575.80	1,609.33	1,567.23	42.10	38.222	
1,200.00	1,200.00	1,172.45	1,200.19	3.86	116.02	-101.71	-326.66	-1,575.80	1,609.30	1,563.17	46.13	34.886	
1,239.19	1,239.19	1,211.43	1,239.16	3.99	118.74	-101.71	-326.64	-1,575.80	1,609.30	1,561.58	47.71	33.728	
1,300.00	1,300.00	1,271.90	1,299.63	4.19	122.95	-101.71	-326.67	-1,575.80	1,609.30	1,559.13	50.18	32.073	
1,400.00	1,400.00	1,371.35	1,399.08	4.53	129.89	-101.72	-326.87	-1,575.80	1,609.34	1,555.10	54.24	29.671	
1,500.00	1,500.00	1,470.81	1,498.53	4.87	136.83	-101.73	-327.24	-1,575.80	1,609.42	1,551.10	58.32	27.596	
1,600.00	1,600.00	1,570.28	1,597.98	5.21	143.77	-101.75	-327.78	-1,575.80	1,609.53	1,547.11	62.42	25.787	
1,700.00	1,700.00	1,669.75	1,697.44	5.54	150.71	-101.78	-328.50	-1,575.80	1,609.68	1,543.15	66.52	24.197	
1,800.00	1,800.00	1,770.77	1,798.44	5.88	156.98	-101.80	-329.17	-1,575.80	1,609.81	1,539.69	70.13	22.955	
1,900.00	1,900.00	1,871.69	1,899.35	6.22	162.81	-101.81	-329.51	-1,575.80	1,609.88	1,536.48	73.40	21.933	
2,000.00	2,000.00	1,972.59	2,000.26	6.55	168.64	-101.81	-329.57	-1,575.80	1,609.90	1,533.23	76.66	21.000	
2,100.00	2,100.00	2,073.49	2,101.16	6.89	174.47	-101.81	-329.35	-1,575.80	1,609.85	1,529.94	79.91	20.146	
2,200.00	2,200.00	2,174.38	2,202.04	7.23	180.30	-101.79	-328.86	-1,575.80	1,609.75	1,526.60	83.15	19.360	
2,300.00	2,300.00	2,273.44	2,301.08	7.57	186.07	-101.77	-328.35	-1,575.80	1,609.65	1,523.24	86.41	18.628	
2,393.11	2,393.11	2,365.48	2,393.11	7.88	191.43	-101.77	-328.20	-1,575.80	1,609.62	1,520.16	89.46	17.993	
2,400.00	2,400.00	2,372.28	2,399.91	7.90	191.83	-101.77	-328.20	-1,575.80	1,609.62	1,519.93	89.69	17.947	
2,500.00	2,500.00	2,471.14	2,498.76	8.24	197.58	-101.77	-328.40	-1,575.80	1,609.66	1,516.68	92.98	17.312	
2,600.00	2,600.00	2,571.81	2,599.42	8.58	203.00	-101.79	-328.85	-1,575.80	1,609.75	1,513.44	96.31	16.714	
2,700.00	2,700.00	2,672.38	2,699.99	8.91	206.99	-101.79	-328.94	-1,575.80	1,609.77	1,510.25	99.51	16.177	
2,800.00	2,800.00	2,772.95	2,800.56	9.25	210.97	-101.79	-328.85	-1,575.80	1,609.75	1,507.04	102.71	15.673	
2,828.05	2,828.05	2,800.00	2,827.61	9.35	212.04	-101.79	-328.80	-1,575.80	1,609.74	1,506.18	103.57	15.542	
2,900.00	2,900.00	2,871.88	2,899.49	9.59	216.31	-101.79	-328.93	-1,575.80	1,609.77	1,503.63	106.14	15.167	
3,000.00	3,000.00	2,972.17	2,999.77	9.93	222.28	-101.79	-329.05	-1,575.80	1,609.79	1,500.08	109.71	14.673	
3,100.00	3,100.00	3,072.45	3,100.05	10.26	228.24	-101.80	-329.08	-1,575.80	1,609.79	1,496.51	113.28	14.210	
3,200.00	3,200.00	3,172.73	3,200.33	10.60	234.20	-101.79	-329.02	-1,575.80	1,609.78	1,492.93	116.85	13.777	
3,300.00	3,300.00	3,273.00	3,300.60	10.94	240.16	-101.79	-328.88	-1,575.80	1,609.75	1,489.34	120.41	13.369	
3,338.68	3,338.68	3,311.00	3,338.58	11.07	242.42	-101.79	-328.80	-1,575.80	1,609.74	1,487.98	121.76	13.220	
3,400.00	3,400.00	3,371.90	3,399.47	11.27	247.17	-101.79	-328.92	-1,575.80	1,609.76	1,485.73	124.03	12.979	
3,500.00	3,500.00	3,472.20	3,499.77	11.61	255.01	-101.79	-329.03	-1,575.80	1,609.79	1,482.03	127.76	12.600	
3,600.00	3,600.00	3,572.51	3,600.08	11.95	262.84	-101.79	-329.06	-1,575.80	1,609.79	1,478.31	131.48	12.244	
3,700.00	3,700.00	3,672.81	3,700.37	12.29	270.67	-101.79	-328.99	-1,575.80	1,609.78	1,474.58	135.20	11.907	
3,800.00	3,800.00	3,773.10	3,800.66	12.62	278.50	-101.79	-328.83	-1,575.80	1,609.74	1,470.83	138.91	11.588	
3,846.09	3,846.09	3,818.57	3,846.09	12.78	282.36	-101.79	-328.80	-1,575.80	1,609.74	1,469.11	140.62	11.447	
3,900.00	3,900.00	3,872.48	3,900.00	12.96	287.08	-101.79	-328.80	-1,575.80	1,609.74	1,467.07	142.67	11.283	
3,930.00	3,930.00	3,902.48	3,930.00	13.06	289.70	-101.79	-328.80	-1,575.80	1,609.74	1,465.93	143.81	11.194	
3,950.00	3,950.00	3,922.48	3,950.00	13.12	291.45	-101.79	-328.80	-1,575.80	1,609.36	1,310.12	299.24	5.378	
4,000.00	3,999.79	3,972.28	3,999.79	13.28	295.80	-101.82	-328.80	-1,575.80	1,605.14	1,304.08	301.06	5.332	
4,050.00	4,048.94	4,021.43	4,048.94	13.43	300.10	-101.89	-328.80	-1,575.80	1,596.27	1,296.42	299.84	5.324	
4,100.00	4,097.00	4,069.49	4,097.00	13.60	304.31	-101.99	-328.80	-1,575.80	1,582.83	1,287.33	295.50	5.356	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Reference Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Churchmouse 1 Federal Com Well No. 17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Churchmouse 1 Federal Com - China Cat Federal Com No. 1 Well No. 1 - Original Hole - Surveys Origi — Offset Site Error: 0.00 usft

Survey Program: 210-INC — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,150.00	4,143.52	4,116.01	4,143.52	13.79	308.38	-102.13	-328.80	-1,575.80	1,564.95	1,276.99	287.96	5.435	
4,200.00	4,188.07	4,160.57	4,188.07	14.02	312.27	-102.30	-328.80	-1,575.80	1,542.81	1,265.59	277.22	5.565	
4,250.00	4,230.25	4,202.75	4,230.25	14.31	315.96	-102.52	-328.80	-1,575.80	1,516.62	1,253.29	263.33	5.759	
4,300.00	4,269.66	4,242.16	4,269.66	14.68	319.41	-102.78	-328.80	-1,575.80	1,486.62	1,240.21	246.41	6.033	
4,350.00	4,305.94	4,278.17	4,306.62	15.16	322.50	-103.07	-328.77	-1,575.80	1,453.11	1,226.44	226.67	6.411	
4,400.00	4,338.77	4,311.91	4,339.36	15.77	325.04	-103.42	-328.70	-1,575.80	1,416.40	1,211.91	204.49	6.926	
4,450.00	4,367.83	4,340.90	4,368.34	16.53	327.29	-103.81	-328.66	-1,575.80	1,376.86	1,195.92	180.94	7.609	
4,500.00	4,392.85	4,365.86	4,393.31	17.45	329.23	-104.25	-328.62	-1,575.80	1,334.88	1,177.17	157.71	8.464	
4,550.00	4,413.62	4,386.58	4,414.02	18.54	330.83	-104.74	-328.59	-1,575.80	1,290.85	1,152.61	138.24	9.338	
4,600.00	4,429.93	4,402.85	4,430.29	19.78	332.10	-105.29	-328.57	-1,575.80	1,245.21	1,116.55	128.66	9.678	
4,650.00	4,441.64	4,414.53	4,441.97	21.16	333.00	-105.90	-328.56	-1,575.80	1,198.40	1,063.88	134.54	8.907	
4,700.00	4,448.64	4,421.51	4,448.95	22.64	333.55	-106.58	-328.55	-1,575.80	1,150.88	1,000.75	150.12	7.666	
4,750.00	4,450.87	4,423.73	4,451.17	24.21	333.72	-107.32	-328.55	-1,575.80	1,103.11	944.09	159.02	6.937	
4,757.32	4,450.79	4,423.65	4,451.09	24.45	333.71	-107.43	-328.55	-1,575.80	1,096.13	937.02	159.10	6.889	
4,800.00	4,450.04	4,422.90	4,450.35	25.85	333.65	-108.12	-328.55	-1,575.80	1,055.48	894.99	160.49	6.578	
4,900.00	4,448.29	4,421.16	4,448.60	29.28	333.52	-109.98	-328.55	-1,575.80	960.94	797.04	163.90	5.863	
5,000.00	4,446.54	4,419.41	4,446.85	32.88	333.38	-112.23	-328.56	-1,575.80	867.63	700.16	167.47	5.181	
5,100.00	4,444.78	4,417.66	4,445.10	36.59	333.25	-115.02	-328.56	-1,575.80	775.98	604.83	171.15	4.534	
5,200.00	4,443.03	4,415.91	4,443.35	40.38	333.11	-118.55	-328.56	-1,575.80	686.67	511.75	174.92	3.926	
5,300.00	4,441.28	4,414.16	4,441.60	44.23	332.98	-123.11	-328.56	-1,575.80	600.72	421.98	178.73	3.361	
5,400.00	4,439.52	4,412.41	4,439.85	48.14	332.84	-129.13	-328.56	-1,575.80	519.82	337.22	182.60	2.847	
5,500.00	4,437.77	4,410.66	4,438.10	52.07	332.70	-137.25	-328.56	-1,575.80	446.71	260.22	186.49	2.395	
5,600.00	4,436.01	4,408.91	4,436.35	56.04	332.57	-148.22	-328.57	-1,575.80	385.86	195.45	190.41	2.026	
5,700.00	4,434.26	4,407.16	4,434.60	60.03	332.43	-162.52	-328.57	-1,575.80	343.82	149.48	194.34	1.769	Level 3<=2.00
5,800.00	4,432.51	4,405.41	4,432.86	64.04	332.30	-179.43	-328.57	-1,575.80	327.93	129.64	198.29	1.654	Level 3<=2.00
5,803.40	4,432.45	4,405.35	4,432.80	64.17	332.29	179.98	-328.57	-1,575.80	327.91	129.48	198.43	1.653	Level 3<=2.00, CC, ES, SF
5,900.00	4,430.75	4,403.66	4,431.11	68.06	332.16	163.57	-328.57	-1,575.80	341.84	139.59	202.25	1.690	Level 3<=2.00
6,000.00	4,429.00	4,401.92	4,429.36	72.10	332.03	149.04	-328.57	-1,575.80	382.32	176.10	206.22	1.854	Level 3<=2.00
6,100.00	4,427.25	4,400.17	4,427.61	76.14	331.89	137.85	-328.58	-1,575.80	442.12	231.93	210.19	2.103	
6,200.00	4,425.49	4,398.42	4,425.86	80.20	331.75	129.57	-328.58	-1,575.80	514.56	300.39	214.16	2.403	
6,300.00	4,423.74	4,396.67	4,424.11	84.26	331.62	123.42	-328.58	-1,575.80	595.03	376.89	218.14	2.728	
6,400.00	4,421.99	4,394.92	4,422.36	88.33	331.48	118.78	-328.58	-1,575.80	680.69	458.58	222.11	3.065	
6,500.00	4,420.23	4,393.17	4,420.61	92.41	331.35	115.19	-328.58	-1,575.80	769.82	543.74	226.08	3.405	
6,600.00	4,418.48	4,391.42	4,418.86	96.49	331.21	112.35	-328.59	-1,575.80	861.34	631.28	230.05	3.744	
6,700.00	4,416.73	4,389.67	4,417.12	100.57	331.08	110.07	-328.59	-1,575.80	954.55	720.53	234.02	4.079	
6,800.00	4,414.97	4,387.92	4,415.37	104.66	330.94	108.19	-328.59	-1,575.80	1,049.01	811.03	237.98	4.408	
6,900.00	4,413.22	4,386.17	4,413.62	108.76	330.80	106.63	-328.59	-1,575.80	1,144.41	902.47	241.94	4.730	
7,000.00	4,411.47	4,384.42	4,411.87	112.85	330.67	105.30	-328.59	-1,575.80	1,240.54	994.64	245.89	5.045	
7,100.00	4,409.71	4,382.66	4,410.12	116.95	330.53	104.17	-328.60	-1,575.80	1,337.23	1,087.39	249.84	5.352	
7,200.00	4,407.96	4,380.91	4,408.37	121.05	330.40	103.19	-328.60	-1,575.80	1,434.37	1,180.59	253.77	5.652	
7,300.00	4,406.21	4,379.16	4,406.62	125.16	330.26	102.34	-328.60	-1,575.80	1,531.88	1,274.17	257.71	5.944	
7,400.00	4,404.45	4,377.43	4,404.87	129.26	330.12	101.59	-328.60	-1,575.80	1,629.68	1,368.05	261.63	6.229	
7,500.00	4,402.70	4,375.68	4,403.12	133.37	329.99	100.92	-328.60	-1,575.80	1,727.74	1,462.20	265.54	6.508	
7,600.00	4,400.95	4,373.93	4,401.37	137.48	329.85	100.32	-328.61	-1,575.80	1,826.01	1,556.56	269.45	6.777	
7,700.00	4,399.19	4,372.18	4,399.63	141.59	329.72	99.78	-328.61	-1,575.80	1,924.45	1,651.11	273.34	7.040	
7,800.00	4,397.44	4,370.43	4,397.88	145.71	329.58	99.31	-328.61	-1,575.80	2,023.04	1,745.81	277.23	7.297	
7,900.00	4,395.69	4,368.68	4,396.13	149.82	329.45	98.87	-328.61	-1,575.80	2,121.77	1,840.66	281.10	7.548	
8,000.00	4,393.93	4,366.93	4,394.38	153.93	329.31	98.47	-328.62	-1,575.80	2,220.60	1,935.63	284.97	7.792	
8,100.00	4,392.18	4,365.19	4,392.63	158.05	329.17	98.10	-328.62	-1,575.80	2,319.54	2,030.72	288.82	8.031	
8,200.00	4,390.43	4,363.44	4,390.88	162.17	329.04	97.77	-328.62	-1,575.80	2,418.56	2,125.89	292.67	8.264	
8,300.00	4,388.67	4,361.69	4,389.13	166.29	328.90	97.46	-328.62	-1,575.80	2,517.66	2,221.18	296.50	8.491	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Reference Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Churchmouse 1 Federal Com Well No. 17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Churchmouse 1 Federal Com - China Cat Federal Com No. 1 Well No. 1 - Original Hole - Surveys Origi — Offset Site Error: 0.00 usft

Survey Program: 210-INC — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,400.00	4,386.92	4,359.94	4,387.38	170.40	328.77	97.18	-328.63	-1,575.80	2,616.83	2,316.51	300.32	8.714	
8,500.00	4,385.16	4,358.19	4,385.63	174.52	328.63	96.91	-328.63	-1,575.80	2,716.05	2,411.92	304.13	8.931	
8,600.00	4,383.41	4,356.44	4,383.88	178.64	328.50	96.67	-328.63	-1,575.80	2,815.33	2,507.41	307.92	9.143	
8,700.00	4,381.66	4,354.69	4,382.14	182.77	328.36	96.44	-328.63	-1,575.80	2,914.66	2,602.95	311.70	9.351	
8,800.00	4,379.90	4,352.94	4,380.39	186.89	328.22	96.22	-328.64	-1,575.80	3,014.03	2,698.56	315.47	9.554	
8,900.00	4,378.15	4,351.19	4,378.64	191.01	328.09	96.02	-328.64	-1,575.80	3,113.44	2,794.21	319.23	9.753	
9,000.00	4,376.40	4,349.44	4,376.89	195.13	327.95	95.84	-328.64	-1,575.80	3,212.88	2,889.91	322.97	9.948	
9,022.67	4,376.00	4,349.05	4,376.49	196.07	327.92	95.79	-328.64	-1,575.80	3,235.43	2,911.61	323.82	9.992	

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Reference Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Churchmouse 1 Federal Com Well No. 17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Churchmouse 1 Federal Com - Churchmouse 1 Federal Com Well No. 18H - Original Hole - rev1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	8.00	0.00	0.00	-177.32	-639.80	-30.00	640.55				
100.00	100.00	92.00	100.00	0.15	0.14	-177.32	-639.80	-30.00	640.50	640.22	0.28	2,248.769	
200.00	200.00	192.00	200.00	0.49	0.46	-177.32	-639.80	-30.00	640.50	639.56	0.94	678.486	
300.00	300.00	292.00	300.00	0.82	0.80	-177.32	-639.80	-30.00	640.50	638.88	1.62	395.784	
400.00	400.00	392.00	400.00	1.16	1.13	-177.32	-639.80	-30.00	640.50	638.21	2.29	279.377	
500.00	500.00	492.00	500.00	1.50	1.47	-177.32	-639.80	-30.00	640.50	637.54	2.97	215.882	
600.00	600.00	592.00	600.00	1.83	1.81	-177.32	-639.80	-30.00	640.50	636.86	3.64	175.904	
700.00	700.00	692.00	700.00	2.17	2.14	-177.32	-639.80	-30.00	640.50	636.19	4.32	148.419	
800.00	800.00	792.00	800.00	2.51	2.48	-177.32	-639.80	-30.00	640.50	635.51	4.99	128.362	
900.00	900.00	892.00	900.00	2.85	2.82	-177.32	-639.80	-30.00	640.50	634.84	5.66	113.081	
1,000.00	1,000.00	992.00	1,000.00	3.18	3.16	-177.32	-639.80	-30.00	640.50	634.16	6.34	101.051	
1,100.00	1,100.00	1,092.00	1,100.00	3.52	3.49	-177.32	-639.80	-30.00	640.50	633.49	7.01	91.335	
1,200.00	1,200.00	1,192.00	1,200.00	3.86	3.83	-177.32	-639.80	-30.00	640.50	632.82	7.69	83.323	
1,300.00	1,300.00	1,292.00	1,300.00	4.19	4.17	-177.32	-639.80	-30.00	640.50	632.14	8.36	76.603	
1,400.00	1,400.00	1,392.00	1,400.00	4.53	4.50	-177.32	-639.80	-30.00	640.50	631.47	9.04	70.887	
1,500.00	1,500.00	1,492.00	1,500.00	4.87	4.84	-177.32	-639.80	-30.00	640.50	630.79	9.71	65.964	
1,600.00	1,600.00	1,592.00	1,600.00	5.21	5.18	-177.32	-639.80	-30.00	640.50	630.12	10.38	61.681	
1,700.00	1,700.00	1,692.00	1,700.00	5.54	5.52	-177.32	-639.80	-30.00	640.50	629.44	11.06	57.920	
1,800.00	1,800.00	1,792.00	1,800.00	5.88	5.85	-177.32	-639.80	-30.00	640.50	628.77	11.73	54.591	
1,900.00	1,900.00	1,892.00	1,900.00	6.22	6.19	-177.32	-639.80	-30.00	640.50	628.10	12.41	51.624	
2,000.00	2,000.00	1,992.00	2,000.00	6.55	6.53	-177.32	-639.80	-30.00	640.50	627.42	13.08	48.963	
2,100.00	2,100.00	2,092.00	2,100.00	6.89	6.86	-177.32	-639.80	-30.00	640.50	626.75	13.76	46.563	
2,200.00	2,200.00	2,192.00	2,200.00	7.23	7.20	-177.32	-639.80	-30.00	640.50	626.07	14.43	44.387	
2,300.00	2,300.00	2,292.00	2,300.00	7.57	7.54	-177.32	-639.80	-30.00	640.50	625.40	15.10	42.405	
2,400.00	2,400.00	2,392.00	2,400.00	7.90	7.88	-177.32	-639.80	-30.00	640.50	624.72	15.78	40.593	
2,500.00	2,500.00	2,492.00	2,500.00	8.24	8.21	-177.32	-639.80	-30.00	640.50	624.05	16.45	38.930	
2,600.00	2,600.00	2,592.00	2,600.00	8.58	8.55	-177.32	-639.80	-30.00	640.50	623.38	17.13	37.397	
2,700.00	2,700.00	2,692.00	2,700.00	8.91	8.89	-177.32	-639.80	-30.00	640.50	622.70	17.80	35.980	
2,800.00	2,800.00	2,792.00	2,800.00	9.25	9.22	-177.32	-639.80	-30.00	640.50	622.03	18.48	34.667	
2,900.00	2,900.00	2,892.00	2,900.00	9.59	9.56	-177.32	-639.80	-30.00	640.50	621.35	19.15	33.447	
3,000.00	3,000.00	2,992.00	3,000.00	9.93	9.90	-177.32	-639.80	-30.00	640.50	620.68	19.82	32.309	
3,100.00	3,100.00	3,092.00	3,100.00	10.26	10.24	-177.32	-639.80	-30.00	640.50	620.00	20.50	31.246	
3,200.00	3,200.00	3,192.00	3,200.00	10.60	10.57	-177.32	-639.80	-30.00	640.50	619.33	21.17	30.251	
3,300.00	3,300.00	3,292.00	3,300.00	10.94	10.91	-177.32	-639.80	-30.00	640.50	618.66	21.85	29.317	
3,400.00	3,400.00	3,392.00	3,400.00	11.27	11.25	-177.32	-639.80	-30.00	640.50	617.98	22.52	28.440	
3,500.00	3,500.00	3,492.00	3,500.00	11.61	11.58	-177.32	-639.80	-30.00	640.50	617.31	23.20	27.613	
3,600.00	3,600.00	3,592.00	3,600.00	11.95	11.92	-177.32	-639.80	-30.00	640.50	616.63	23.87	26.833	
3,700.00	3,700.00	3,692.00	3,700.00	12.29	12.26	-177.32	-639.80	-30.00	640.50	615.96	24.54	26.096	
3,800.00	3,800.00	3,792.00	3,800.00	12.62	12.60	-177.32	-639.80	-30.00	640.50	615.28	25.22	25.398	
3,900.00	3,900.00	3,892.00	3,900.00	12.96	12.93	-177.32	-639.80	-30.00	640.50	614.61	25.89	24.736	
3,905.59	3,905.59	3,897.59	3,905.59	12.98	12.95	-177.32	-639.80	-30.00	640.50	614.57	25.93	24.701	
3,930.00	3,930.00	3,921.02	3,929.02	13.06	13.03	-177.29	-639.80	-30.27	640.52	614.43	26.09	24.551	
3,950.00	3,950.00	3,939.90	3,947.87	13.12	13.09	-177.24	-639.80	-31.22	640.55	614.33	26.21	24.437	
4,000.00	3,999.79	3,987.00	3,994.65	13.28	13.23	-177.15	-639.80	-36.57	640.61	614.11	26.51	24.168	
4,050.00	4,048.94	4,034.01	4,040.67	13.43	13.38	-177.11	-639.80	-46.09	640.67	613.86	26.81	23.896	
4,100.00	4,097.00	4,080.94	4,085.57	13.60	13.54	-177.12	-639.81	-59.70	640.71	613.57	27.14	23.608	
4,150.00	4,143.52	4,127.83	4,129.02	13.79	13.73	-177.18	-639.81	-77.27	640.73	613.22	27.51	23.289	
4,200.00	4,188.07	4,174.88	4,170.69	14.02	13.95	-177.29	-639.82	-98.66	640.74	612.78	27.96	22.918	
4,250.00	4,230.25	4,221.53	4,210.27	14.31	14.22	-177.45	-639.83	-123.71	640.73	612.22	28.51	22.471	
4,300.00	4,269.66	4,268.41	4,247.45	14.68	14.56	-177.65	-639.83	-152.22	640.70	611.48	29.22	21.925	
4,350.00	4,305.94	4,315.32	4,281.95	15.16	15.00	-177.88	-639.84	-183.99	640.66	610.53	30.13	21.262	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Reference Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Churchmouse 1 Federal Com Well No. 17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Churchmouse 1 Federal Com - Churchmouse 1 Federal Com Well No. 18H - Original Hole - rev1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,400.00	4 338.77	4,362.31	4,313.49	15.77	15.55	-178.14	-639.85	-218.79	640.60	609.32	31.29	20.475	
4,450.00	4,387.83	4,409.38	4,341.83	16.53	16.23	-178.42	-639.86	-256.36	640.53	607.81	32.72	19.574	
4,500.00	4,392.85	4,456.57	4,366.71	17.45	17.05	-178.70	-639.87	-296.44	640.45	605.98	34.47	18.581	
4,550.00	4,413.62	4,503.90	4,387.92	18.54	18.02	-178.99	-639.88	-338.73	640.36	603.84	36.52	17.533	
4,600.00	4 429.93	4,551.38	4,405.26	19.78	19.14	-179.28	-639.89	-382.91	640.27	601.38	38.88	16.467	
4,650.00	4 441.64	4,600.00	4,418.77	21.16	20.42	-179.43	-639.91	-429.60	640.17	598.63	41.54	15.410	
4,700.00	4,448.64	4,646.91	4,427.62	22.64	21.77	-179.74	-639.92	-475.85	640.07	595.59	44.38	14.421	
4,750.00	4,450.87	4,695.00	4,432.36	24.21	23.24	-179.93	-639.93	-523.49	639.98	592.55	47.43	13.493	
4,757.32	4,450.79	4,702.06	4,432.68	24.45	23.48	-179.95	-639.93	-530.54	639.97	592.08	47.89	13.364	
4,800.00	4,450.04	4,743.73	4,432.79	25.85	24.81	179.96	-639.95	-572.21	639.94	589.31	50 63	12.639	
4,900.00	4,449.29	4,843.73	4 431.04	29.28	28.20	179.96	-639.97	-672.19	639.92	582.47	57.45	11.138	
5,000.00	4,446.54	4,943.73	4 429.29	32.88	31.75	179.96	-640.00	-772.18	639.91	575.31	64.60	9.906	
5,100.00	4,444.78	5,043.73	4 427.55	36.59	35.42	179.96	-640.03	-872.16	639.89	567.91	71.98	8.890	
5,200.00	4,443.03	5,143.73	4 425.80	40.38	39.20	179.96	-640.05	-972.15	639.88	560.33	79.54	8.044	
5,300.00	4,441.28	5,243.73	4 424.05	44.23	43.03	179.96	-640.08	-1,072.13	639.86	552.63	87.23	7.335	
5,400.00	4,439.52	5,343.73	4,422.30	48.14	46.92	179.96	-640.11	-1,172.12	639.85	544.83	95.02	6.734	
5,500.00	4,437.77	5,443.73	4,420.56	52.07	50.85	179.96	-640.13	-1,272.10	639.83	536.95	102.88	6.219	
5,600.00	4,436.01	5,543.73	4,418.81	56.04	54.81	179.96	-640.16	-1,372.09	639.82	529.01	110.81	5.774	
5,700.00	4,434.26	5,643.73	4,417.06	60 03	58.79	179.96	-640.19	-1,472.07	639.80	521.03	118.78	5.387	
5,800.00	4,432.51	5,743.73	4,415.31	64.04	62.80	179.96	-640.21	-1,572.06	639.79	513.00	126.78	5.046	
5,900.00	4,430.75	5,843.73	4,413.57	68.06	66.82	179.96	-640.24	-1,572.04	639.77	504.95	134.82	4.745	
6,000.00	4,429.00	5,943.73	4,411.82	72.10	70.85	179.96	-640.27	-1,772.03	639.76	496.87	142.89	4.477	
6,100.00	4,427.25	6,043.73	4,410.07	76.14	74.89	179.96	-640.29	-1,872.01	639.74	488.78	150.98	4 237	
6 200.00	4,425.49	6,143.73	4,408.32	80.20	78.95	179.96	-640.32	-1,972.00	639.73	480.64	159.09	4.021	
6,300.00	4,423.74	6,243.73	4,406.58	84.26	83.01	179.96	-640.35	-2,071.98	639.71	472.50	167.21	3.826	
6,400.00	4,421.99	6,343.73	4,404.83	88.33	87.08	179.96	-640.37	-2,171.96	639.70	464.35	175.34	3.648	
6,500.00	4,420.23	6,443.73	4,403.08	92.41	91.15	179.96	-640.40	-2,271.95	639.68	456.19	183.49	3.486	
6,600.00	4,418.48	6,543.73	4,401.34	96.49	95.23	179.96	-640.43	-2,371.93	639.67	448.02	191.65	3.338	
6,700.00	4,416.73	6,643.73	4,399.59	100.57	99.32	179.96	-640.45	-2,471.92	639.65	439.83	199.82	3.201	
6,800.00	4,414.97	6,743.73	4,397.84	104.66	103.41	179.96	-640.48	-2,571.90	639.64	431.64	207.99	3.075	
6,900.00	4,413.22	6,843.73	4,396.09	108.76	107.50	179.96	-640.51	-2,671.89	639.62	423.45	216.18	2.959	
7,000.00	4,411.47	6,943.73	4,394.35	112.85	111.60	179.96	-640.53	-2,771.87	639.61	415.24	224.37	2.851	
7,100.00	4,409.71	7,043.73	4,392.60	116.95	115.69	179.96	-640.56	-2,871.86	639.59	407.03	232.56	2.750	
7,200.00	4,407.96	7,143.73	4,390.85	121.05	119.80	179.96	-640.59	-2,971.84	639.58	398.82	240.76	2.656	
7,300.00	4,406.21	7,243.73	4,389.10	125.16	123.90	179.96	-640.61	-3,071.83	639.56	390.60	248.97	2.569	
7,400.00	4 404.45	7,343.73	4,387.36	129.26	128.01	179.96	-640.64	-3,171.81	639.55	382.37	257.17	2.487	
7,500.00	4,402.70	7,443.73	4,385.61	133.37	132.11	179.96	-640.67	-3,271.80	639.53	374.15	265.39	2.410	
7,600.00	4,400.95	7,543.73	4,383.86	137.48	136.22	179.96	-640.69	-3,371.78	639.52	365.91	273.60	2.337	
7,700.00	4,399.19	7,643.73	4,382.11	141.59	140.33	179.96	-640.72	-3,471.77	639.50	357.68	281.82	2.269	
7,800.00	4,397.44	7,743.73	4,380.37	145.71	144.45	179.96	-640.75	-3,571.75	639.49	349.44	290.04	2.205	
7,900.00	4,395.69	7,843.73	4,378.62	149.82	148.56	179.96	-640.77	-3,671.74	639.47	341.20	298.27	2.144	
8,000.00	4,393.93	7,943.73	4,376.87	153.93	152.67	179.96	-640.80	-3,771.72	639.46	332.96	306.49	2.086	
8,100.00	4,392.18	8,043.73	4,375.13	158.05	156.79	179.96	-640.83	-3,871.71	639.44	324.72	314.72	2.032	
8,200.00	4,390.43	8,143.73	4,373.38	162.17	160.91	179.96	-640.86	-3,971.69	639.43	316.47	322.95	1.980	Level 3<=2.00
8,300.00	4,388.67	8,243.73	4,371.63	166.29	165.02	179.96	-640.88	-4,071.67	639.41	308 22	331.19	1.931	Level 3<=2.00
8,400.00	4,386.92	8,343.73	4,369.88	170.40	169.14	179.96	-640.91	-4,171.66	639.40	299.97	339.42	1.884	Level 3<=2.00
8,500.00	4,385.16	8,443.73	4,368.14	174.52	173.26	179.96	-640.94	-4,271.64	639.38	291.72	347.66	1.839	Level 3<=2.00
8,600.00	4,383.41	8,543.73	4,366.39	178.64	177.38	179.96	-640.96	-4,371.63	639.37	283.47	355.90	1.796	Level 3<=2.00
8,700.00	4,381.66	8,643.73	4,364.64	182.77	181.51	179.96	-640.99	-4,471.61	639.35	275.21	364.14	1.756	Level 3<=2.00
8,800.00	4,379.90	8,743.73	4,362.89	186.89	185.63	179.96	-641.02	-4,571.60	639.34	266.96	372.38	1.717	Level 3<=2.00
8,900.00	4,378.15	8,843.73	4,361.15	191.01	189.75	179.96	-641.04	-4,671.58	639.32	258.70	380.62	1.680	Level 3<=2.00

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Reference Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Churchmouse 1 Federal Com Well No. 17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Churchmouse 1 Federal Com - Churchmouse 1 Federal Com Well No. 18H - Original Hole - rev1 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,000.00	4,376.40	8,943.73	4,359.40	195.13	193.67	179.96	-641.07	-4,771.57	639.30	250.44	388.86	1.644	Level 3<=2.00
9,002.93	4,376.35	8,946.57	4,359.35	195.25	193.99	179.95	-641.07	-4,774.40	639.30	250.21	389.10	1.643	Level 3<=2.00, CC
9,022.67	4,376.00	8,946.57	4,359.35	196.07	193.99	178.18	-641.07	-4,774.40	639.61	249.70	389.91	1.640	Level 3<=2.00, ES, SF

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Reference Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Churchmouse 1 Federal Com Well No. 17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Churchmouse 1 Federal Com - Churchmouse 1 Federal Com Well No. 27H - Original Hole - rev0 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	4.00	0.00	0.00	0.01	137.29	-130.00	120.00	176.92				
100.00	100.00	104.00	100.00	0.15	0.16	137.29	-130.00	120.00	176.92	176.61	0.31	570.377	
200.00	200.00	204.00	200.00	0.49	0.50	137.29	-130.00	120.00	176.92	175.93	0.98	179.708	
300.00	300.00	304.00	300.00	0.82	0.84	137.29	-130.00	120.00	176.92	175.26	1.66	106.656	
400.00	400.00	404.00	400.00	1.16	1.17	137.29	-130.00	120.00	176.92	174.58	2.33	75.831	
500.00	500.00	504.00	500.00	1.50	1.51	137.29	-130.00	120.00	176.92	173.91	3.01	58.828	
600.00	600.00	604.00	600.00	1.83	1.85	137.29	-130.00	120.00	176.92	173.24	3.68	48.054	
700.00	700.00	704.00	700.00	2.17	2.18	137.29	-130.00	120.00	176.92	172.56	4.36	40.615	
800.00	800.00	804.00	800.00	2.51	2.52	137.29	-130.00	120.00	176.92	171.89	5.03	35.171	
900.00	900.00	904.00	900.00	2.85	2.86	137.29	-130.00	120.00	176.92	171.21	5.70	31.013	
1,000.00	1,000.00	1,004.00	1,000.00	3.18	3.20	137.29	-130.00	120.00	176.92	170.54	6.38	27.735	
1,100.00	1,100.00	1,104.00	1,100.00	3.52	3.53	137.29	-130.00	120.00	176.92	169.86	7.05	25.084	
1,200.00	1,200.00	1,204.00	1,200.00	3.86	3.87	137.29	-130.00	120.00	176.92	169.19	7.73	22.895	
1,300.00	1,300.00	1,304.00	1,300.00	4.19	4.21	137.29	-130.00	120.00	176.92	168.52	8.40	21.057	
1,400.00	1,400.00	1,404.00	1,400.00	4.53	4.54	137.29	-130.00	120.00	176.92	167.84	9.08	19.493	
1,500.00	1,500.00	1,504.00	1,500.00	4.87	4.88	137.29	-130.00	120.00	176.92	167.17	9.75	18.145	
1,600.00	1,600.00	1,604.00	1,600.00	5.21	5.22	137.29	-130.00	120.00	176.92	166.49	10.42	16.971	
1,700.00	1,700.00	1,704.00	1,700.00	5.54	5.56	137.29	-130.00	120.00	176.92	165.82	11.10	15.940	
1,800.00	1,800.00	1,804.00	1,800.00	5.88	5.89	137.29	-130.00	120.00	176.92	165.14	11.77	15.027	
1,900.00	1,900.00	1,904.00	1,900.00	6.22	6.23	137.29	-130.00	120.00	176.92	164.47	12.45	14.213	
2,000.00	2,000.00	2,004.00	2,000.00	6.55	6.57	137.29	-130.00	120.00	176.92	163.80	13.12	13.483	
2,100.00	2,100.00	2,104.00	2,100.00	6.89	6.90	137.29	-130.00	120.00	176.92	163.12	13.80	12.824	
2,200.00	2,200.00	2,204.00	2,200.00	7.23	7.24	137.29	-130.00	120.00	176.92	162.45	14.47	12.226	
2,300.00	2,300.00	2,304.00	2,300.00	7.57	7.58	137.29	-130.00	120.00	176.92	161.77	15.14	11.682	
2,400.00	2,400.00	2,404.00	2,400.00	7.90	7.92	137.29	-130.00	120.00	176.92	161.10	15.82	11.184	
2,500.00	2,500.00	2,504.00	2,500.00	8.24	8.25	137.29	-130.00	120.00	176.92	160.42	16.49	10.727	
2,600.00	2,600.00	2,604.00	2,600.00	8.58	8.59	137.29	-130.00	120.00	176.92	159.75	17.17	10.305	
2,700.00	2,700.00	2,704.00	2,700.00	8.91	8.93	137.29	-130.00	120.00	176.92	159.08	17.84	9.916	
2,800.00	2,800.00	2,804.00	2,800.00	9.25	9.26	137.29	-130.00	120.00	176.92	158.40	18.52	9.555	
2,900.00	2,900.00	2,904.00	2,900.00	9.59	9.60	137.29	-130.00	120.00	176.92	157.73	19.19	9.219	
3,000.00	3,000.00	3,004.00	3,000.00	9.93	9.94	137.29	-130.00	120.00	176.92	157.05	19.86	8.906	
3,100.00	3,100.00	3,104.00	3,100.00	10.26	10.28	137.29	-130.00	120.00	176.92	156.38	20.54	8.614	
3,200.00	3,200.00	3,204.00	3,200.00	10.60	10.61	137.29	-130.00	120.00	176.92	155.70	21.21	8.340	
3,300.00	3,300.00	3,304.00	3,300.00	10.94	10.95	137.29	-130.00	120.00	176.92	155.03	21.89	8.083	
3,400.00	3,400.00	3,404.00	3,400.00	11.27	11.29	137.29	-130.00	120.00	176.92	154.36	22.56	7.841	
3,500.00	3,500.00	3,504.00	3,500.00	11.61	11.62	137.29	-130.00	120.00	176.92	153.68	23.24	7.614	
3,600.00	3,600.00	3,604.00	3,600.00	11.95	11.96	137.29	-130.00	120.00	176.92	153.01	23.91	7.399	
3,700.00	3,700.00	3,704.00	3,700.00	12.29	12.30	137.29	-130.00	120.00	176.92	152.33	24.58	7.196	
3,800.00	3,800.00	3,804.00	3,800.00	12.62	12.64	137.29	-130.00	120.00	176.92	151.66	25.26	7.004	
3,900.00	3,900.00	3,904.00	3,900.00	12.96	12.97	137.29	-130.00	120.00	176.92	150.98	25.93	6.822	
3,930.00	3,930.00	3,934.00	3,930.00	13.06	13.07	137.29	-130.00	120.00	176.92	150.78	26.14	6.769 CC, ES	
3,950.00	3,950.00	3,954.00	3,950.00	13.12	13.14	137.20	-130.00	120.00	177.18	150.92	26.26	6.747	
4,000.00	3,999.79	4,003.79	3,999.79	13.28	13.31	136.19	-130.00	120.00	180.14	153.65	26.49	6.801	
4,050.00	4,048.94	4,052.94	4,048.94	13.43	13.48	134.18	-130.00	120.00	186.52	159.92	26.60	7.012	
4,100.00	4,097.00	4,101.00	4,097.00	13.60	13.64	131.39	-130.00	120.00	196.60	170.02	26.58	7.397	
4,150.00	4,143.52	4,147.52	4,143.52	13.79	13.79	128.10	-130.00	120.00	210.66	184.26	26.40	7.980	
4,200.00	4,188.07	4,192.07	4,188.07	14.02	13.94	124.60	-130.00	120.00	228.90	202.85	26.05	8.786	
4,250.00	4,230.25	4,234.25	4,230.25	14.31	14.09	121.12	-130.00	120.00	251.44	225.87	25.56	9.837	
4,300.00	4,269.66	4,273.56	4,269.66	14.68	14.22	117.85	-130.00	120.00	278.20	253.24	24.96	11.147	
4,350.00	4,305.94	4,309.94	4,305.94	15.16	14.34	114.87	-130.00	120.00	309.00	284.69	24.31	12.739	
4,400.00	4,338.77	4,342.77	4,338.77	15.77	14.45	112.22	-130.00	120.00	343.56	319.83	23.73	14.480	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Reference Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Churchmouse 1 Federal Com Well No. 17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Churchmouse 1 Federal Com - Churchmouse 1 Federal Com Well No. 27H - Original Hole - rev0 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,450.00	4,367.83	4,371.83	4,367.83	16.53	14.55	109.91	-130.00	120.00	381.51	358.16	23.34	16.344	
4,500.00	4,392.85	4,396.85	4,392.85	17.45	14.64	107.91	-130.00	120.00	422.44	399.06	23.37	18.072	
4,550.00	4,413.62	4,417.62	4,413.62	18.54	14.71	106.18	-130.00	120.00	465.90	441.77	24.13	19.308	
4,600.00	4,429.93	4,433.93	4,429.93	19.78	14.76	104.71	-130.00	120.00	511.44	485.39	26.05	19.637	
4,650.00	4,441.64	4,445.64	4,441.64	21.16	14.80	103.44	-130.00	120.00	558.57	528.92	29.64	18.842	
4,700.00	4,448.64	5,382.01	4,994.69	22.64	28.08	-173.74	-114.20	-485.26	557.98	539.42	18.54	30.091	
4,750.00	4,450.87	5,431.88	4,993.82	24.21	29.72	-173.71	-112.90	-535.10	554.67	535.80	18.87	29.399	
4,757.32	4,450.79	5,439.19	4,993.70	24.45	29.97	-173.70	-112.71	-542.41	554.58	535.63	18.95	29.271	
4,800.00	4,450.04	5,481.86	4,992.95	25.85	31.43	-173.66	-111.59	-585.06	554.35	534.61	19.74	28.085	
4,900.00	4,448.29	5,581.83	4,991.21	29.28	34.97	-173.54	-108.99	-684.98	553.83	532.15	21.69	25.536	
5,000.00	4,446.54	5,681.79	4,989.47	32.88	38.63	-173.42	-106.38	-784.89	553.33	529.60	23.73	23.321	
5,100.00	4,444.78	5,781.75	4,987.72	36.59	42.38	-173.29	-103.77	-884.81	552.83	527.01	25.82	21.411	
5,200.00	4,443.03	5,881.72	4,985.98	40.38	46.20	-173.15	-101.16	-984.72	552.35	524.41	27.95	19.765	
5,300.00	4,441.28	5,981.68	4,984.24	44.23	50.07	-173.01	-98.55	-1,084.64	551.88	521.80	30.09	18.342	
5,400.00	4,439.52	6,081.65	4,982.49	48.14	53.98	-172.85	-95.94	-1,184.56	551.43	519.19	32.24	17.106	
5,500.00	4,437.77	6,181.61	4,980.75	52.07	57.92	-172.70	-93.34	-1,284.47	550.98	516.60	34.38	16.025	
5,600.00	4,436.01	6,281.58	4,979.01	56.04	61.89	-172.53	-90.73	-1,384.39	550.55	514.03	36.52	15.075	
5,700.00	4,434.26	6,381.54	4,977.26	60.03	65.88	-172.35	-88.12	-1,484.30	550.13	511.48	38.65	14.234	
5,800.00	4,432.51	6,481.51	4,975.52	64.04	69.89	-172.16	-85.51	-1,584.22	549.73	508.96	40.76	13.486	
5,900.00	4,430.75	6,581.47	4,973.78	68.06	73.91	-171.95	-82.90	-1,684.13	549.33	506.47	42.86	12.817	
6,000.00	4,429.00	6,681.44	4,972.03	72.10	77.94	-171.74	-80.30	-1,784.05	548.95	504.01	44.94	12.215	
6,100.00	4,427.25	6,781.40	4,970.29	76.14	81.99	-171.51	-77.69	-1,883.96	548.58	501.58	47.00	11.671	
6,200.00	4,425.49	6,881.37	4,968.55	80.20	86.04	-171.26	-75.08	-1,983.88	548.22	499.17	49.05	11.177	
6,300.00	4,423.74	6,981.33	4,966.80	84.26	90.11	-171.00	-72.47	-2,083.80	547.88	496.80	51.08	10.726	
6,400.00	4,421.99	7,081.30	4,965.06	88.33	94.17	-170.71	-69.86	-2,183.71	547.55	494.46	53.09	10.313	
6,500.00	4,420.23	7,181.26	4,963.32	92.41	98.25	-170.41	-67.25	-2,283.63	547.23	492.14	55.09	9.934	
6,600.00	4,418.48	7,281.23	4,961.57	96.49	102.33	-170.08	-64.65	-2,383.54	546.92	489.85	57.07	9.583	
6,700.00	4,416.73	7,381.19	4,959.83	100.57	106.42	-169.72	-62.04	-2,483.46	546.63	487.59	59.04	9.259	
6,800.00	4,414.97	7,481.16	4,958.09	104.66	110.50	-169.33	-59.43	-2,583.37	546.35	485.36	60.99	8.958	
6,900.00	4,413.22	7,581.12	4,956.34	108.76	114.60	-168.90	-56.82	-2,683.29	546.08	483.14	62.94	8.677	
7,000.00	4,411.47	7,681.09	4,954.60	112.85	118.69	-168.43	-54.21	-2,783.21	545.83	480.95	64.87	8.414	
7,100.00	4,409.71	7,781.05	4,952.86	116.95	122.79	-167.91	-51.60	-2,883.12	545.58	478.78	66.80	8.167	
7,200.00	4,407.96	7,881.02	4,951.11	121.05	126.90	-167.34	-49.00	-2,983.04	545.35	476.63	68.72	7.936	
7,300.00	4,406.21	7,980.98	4,949.37	125.16	131.00	-166.71	-46.39	-3,082.95	545.14	474.50	70.64	7.717	
7,400.00	4,404.45	8,080.95	4,947.63	129.26	135.11	-166.00	-43.78	-3,182.87	544.93	472.38	72.55	7.511	
7,500.00	4,402.70	8,180.91	4,945.88	133.37	139.22	-165.20	-41.17	-3,282.78	544.74	470.28	74.47	7.315	
7,600.00	4,400.95	8,280.88	4,944.14	137.48	143.33	-164.29	-38.56	-3,382.70	544.56	468.18	76.38	7.130	
7,700.00	4,399.19	8,380.84	4,942.40	141.59	147.44	-163.26	-35.95	-3,482.61	544.40	466.10	78.30	6.953	
7,800.00	4,397.44	8,480.81	4,940.65	145.71	151.55	-162.07	-33.35	-3,582.53	544.24	464.02	80.22	6.784	
7,900.00	4,395.69	8,580.77	4,938.91	149.82	155.67	-160.68	-30.74	-3,682.45	544.10	461.95	82.15	6.623	
8,000.00	4,393.93	8,680.74	4,937.17	153.93	159.79	-159.04	-28.13	-3,782.36	543.98	459.88	84.10	6.469	
8,100.00	4,392.18	8,780.70	4,935.42	158.05	163.90	-157.09	-25.52	-3,882.28	543.86	457.81	86.05	6.320	
8,200.00	4,390.43	8,880.67	4,933.68	162.17	168.02	-154.73	-22.91	-3,982.19	543.76	455.75	88.02	6.178	
8,300.00	4,388.67	8,980.63	4,931.94	166.29	172.14	-151.83	-20.30	-4,082.11	543.67	453.68	90.00	6.041	
8,400.00	4,386.92	9,080.60	4,930.19	170.40	176.27	-148.19	-17.70	-4,182.02	543.60	451.60	92.00	5.909	
8,500.00	4,385.16	9,180.56	4,928.45	174.52	180.39	-143.55	-15.09	-4,281.94	543.54	449.51	94.02	5.781	
8,600.00	4,383.41	9,280.52	4,926.71	178.64	184.51	-137.52	-12.48	-4,381.86	543.49	447.42	96.07	5.657	
8,700.00	4,381.66	9,380.49	4,924.96	182.77	188.63	-129.57	-9.87	-4,481.77	543.45	445.31	98.13	5.538	
8,800.00	4,379.90	9,480.45	4,923.22	186.89	192.76	-119.11	-7.26	-4,581.69	543.43	443.20	100.23	5.422	
8,900.00	4,378.15	9,580.42	4,921.48	191.01	196.88	-105.82	-4.66	-4,681.60	543.41	441.06	102.36	5.309	
8,933.47	4,377.56	9,613.88	4,920.89	192.39	198.27	-100.81	-3.78	-4,715.05	543.41	440.34	103.07	5.272	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Reference Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Churchmouse 1 Federal Com Well No. 17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Offset Design Churchmouse 1 Federal Com - Churchmouse 1 Federal Com Well No. 27H - Original Hole - rev0 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD — **Offset Well Error:** 0.00 usft

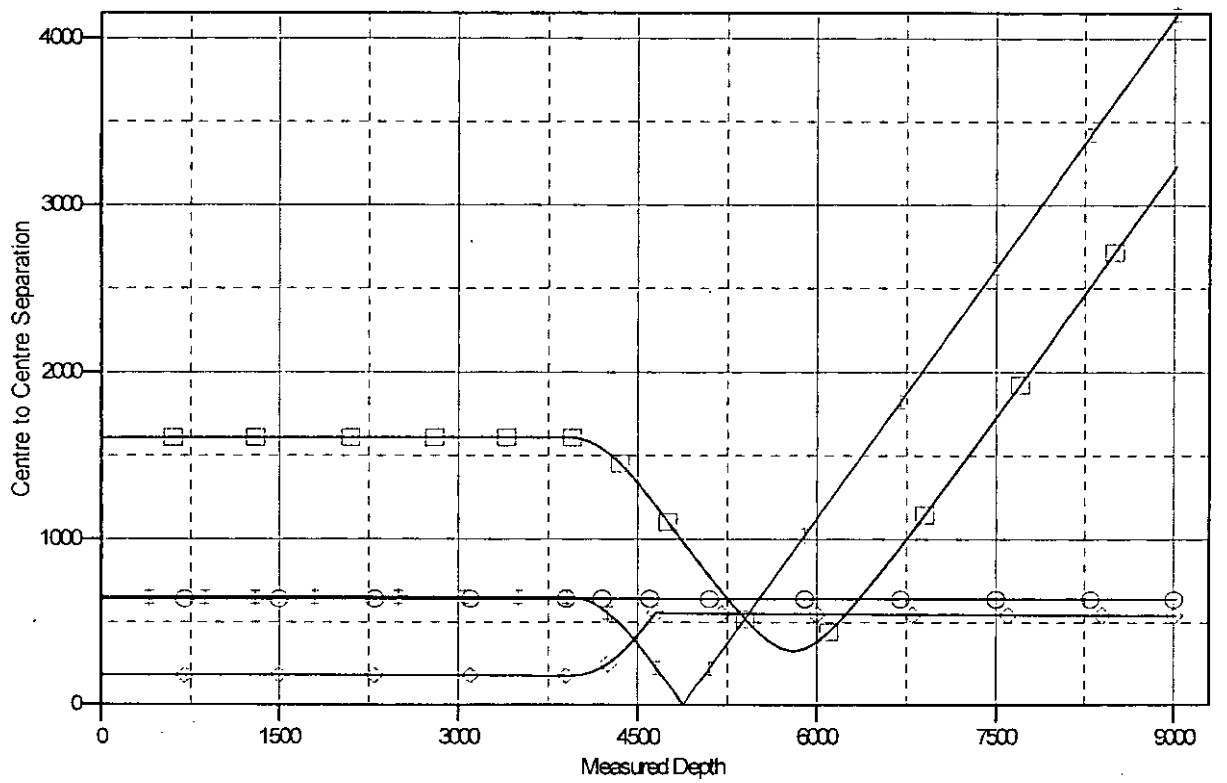
Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,000.00	4,376.40	9,680.38	4,919.73	195.13	201.01	-90.34	-2.05	-4,781.52	543.42	438.90	104.51	5.200	
9,004.85	4,376.31	9,685.23	4,919.65	195.33	201.21	-89.56	-1.92	-4,786.36	543.42	438.80	104.62	5.194	
9,022.67	4,376.00	9,694.53	4,919.49	196.07	201.59	-71.37	-1.68	-4,795.66	543.49	438.57	104.91	5.180	SF

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Reference Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Churchmouse 1 Federal Com Well No. 17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Reference Depths are relative to RKB=3680+12 @ 3692.00usft (Uniter
Offset Depths are relative to Offset Datum
Central Meridian is -104.33333334

Coordinates are relative to: Churchmouse 1 Federal Com Well No. 17H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.17°

Ladder Plot



LEGEND

al hole, Surveys Original hole V0
-1, Original Hole, rev0 V0
China Cat Federal Com No. 1 Well No. 1, Original Hole, Surveys Original Hole V0
Churchmouse 1 Federal Com Well No. 18H, Original Hole, rev1 V0

Company:	COG Operating LLC	**Local Co-ordinate Reference:**	Well Churchmouse 1 Federal Com Well No. 17H
Project:	Eddy County, New Mexico	**TVD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Reference Site:	Churchmouse 1 Federal Com	**MD Reference:**	RKB=3680+12 @ 3692.00usft (Uniter #43)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	Churchmouse 1 Federal Com Well No. 17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	3.00 sigma
Reference Wellbore	Original Hole	**Database:**	Dbase Nov0914
Reference Design:	rev0	**Offset TVD Reference:**	Reference Datum

Reference Depths are relative to RKB=3680+12 @ 3692.00usft (Uniter
Offset Depths are relative to Offset Datum
Central Meridian is -104.33333334

Coordinates are relative to: Churchmouse 1 Federal Com Well No. 17H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.17°

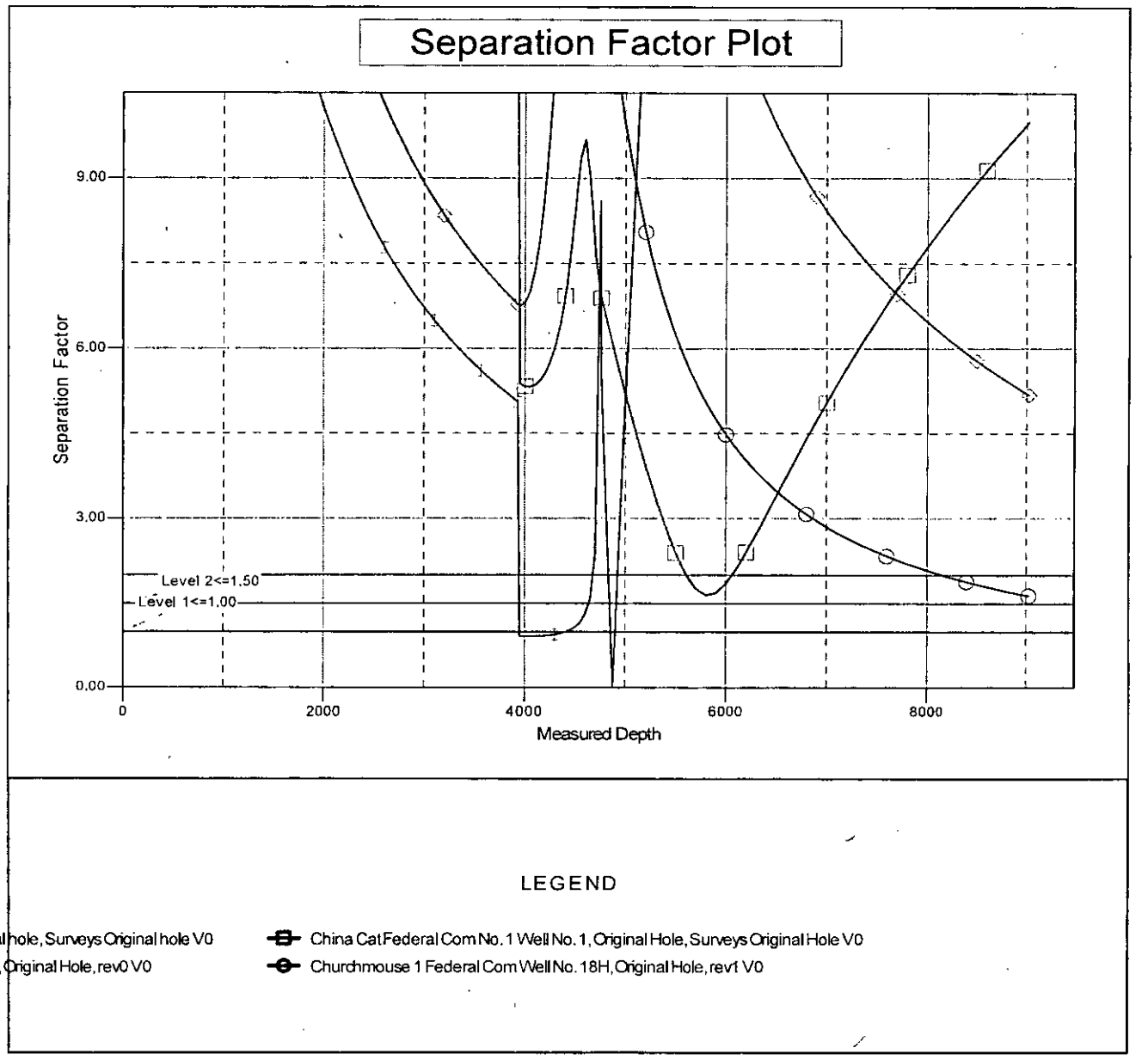
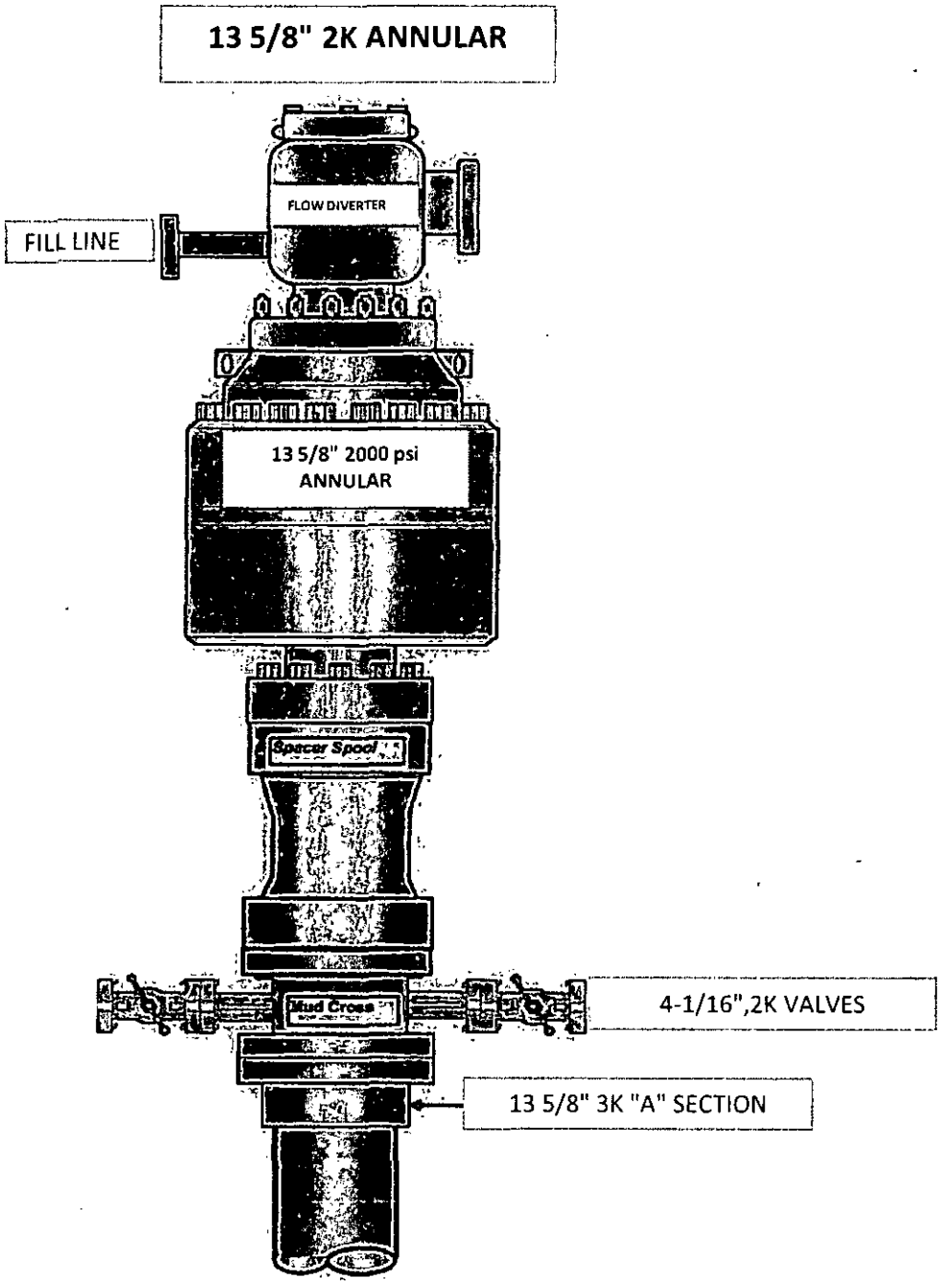


Exhibit #10

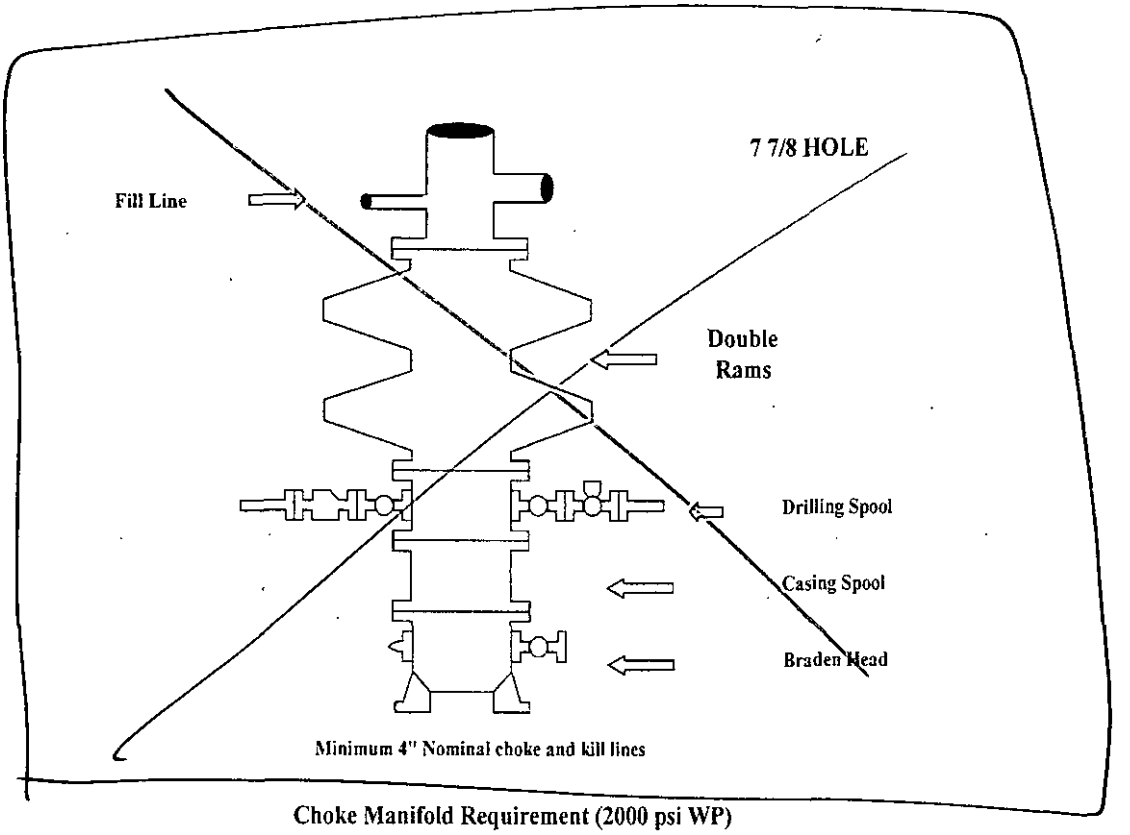
(Choke Manifold Schematic same as Exhibit #9)



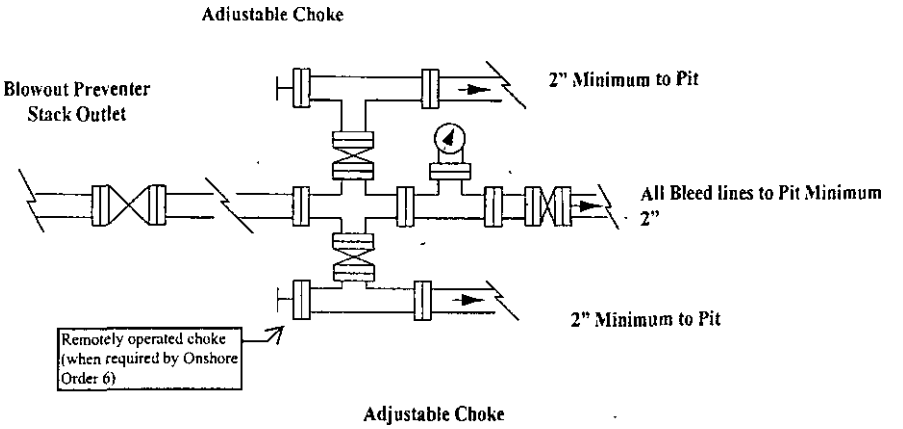
COG Operating LLC

Exhibit #9

BOPE and Choke Schematic



Choke Manifold Requirement (2000 psi WP)
No Annular Required



Adjustable Choke

NOTES REGARDING THE BLOWOUT PREVENTERS
Master Drilling Plan
Eddy County, New Mexico

1. Drilling nipple to be so constructed that it can be removed without use of a welder through rotary table opening, with minimum I.D. equal to preventer bore.
2. Wear ring to be properly installed in head.
3. Blow out preventer and all fittings must be in good condition, 2000 psi WP minimum.
4. All fittings to be flanged.
5. Safety valve must be available on rig floor at all times with proper connections, valve to be full 2000 psi WP minimum.
6. All choke and fill lines to be securely anchored especially ends of choke lines.
7. Equipment through which bit must pass shall be at least as large as the diameter of the casing being drilled through.
8. Kelly cock on Kelly.
9. Extension wrenches and hands wheels to be properly installed.
10. Blow out preventer control to be located as close to driller's position as feasible.
11. Blow out preventer closing equipment to include minimum 40-gallon accumulator, two independent sources of pump power on each closing unit installation all API specifications.

Closed Loop Operation & Maintenance Procedure

All drilling fluid circulated over shaker(s) with cuttings discharged into roll off container.

Fluid and fines below shaker(s) are circulated with transfer pump through centrifuge(s) or solids separator with cuttings and fines discharged into roll off container.

Fluid is continuously re-circulated through equipment with polymer added to aid separation of cutting fines.

Roll off containers are lined and de-watered with fluids re-circulated into system.

Additional tank is used to capture unused drilling fluid or cement returns from casing jobs.

This equipment will be maintained 24 hrs./day by solids control personnel and or rig crews that stay on location.

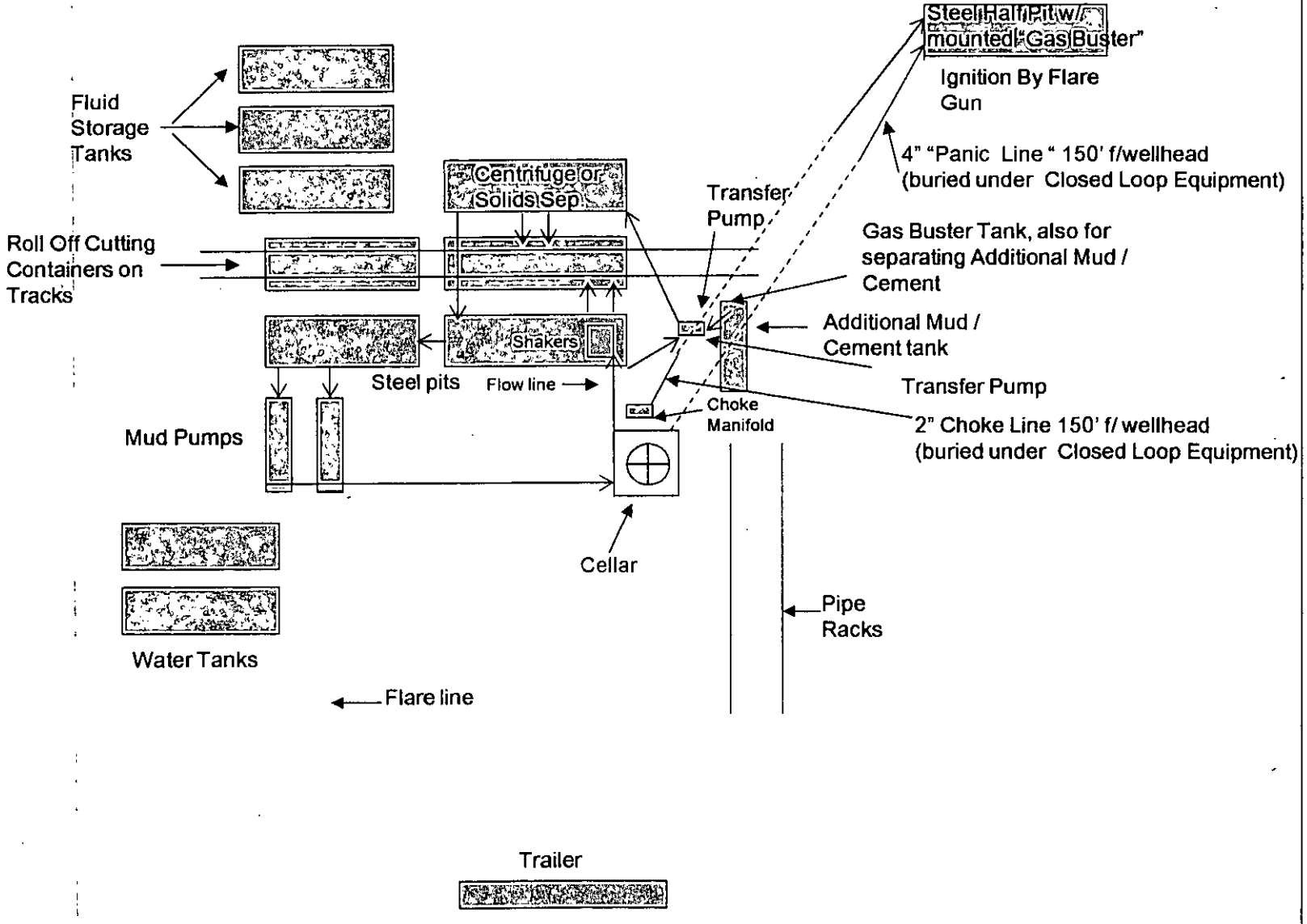
Cuttings will be hauled to either:

CRI (permit number R9166)
or
GMI (permit number 711-019-001)

dependent upon which rig is available to drill this well.

COG Operating LLC

Closed Loop Equipment Diagram



COG Operating LLC

Hydrogen Sulfide Drilling Operation Plan

I. HYDROGEN SULFIDE TRAINING

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

1. The hazards an characteristics of hydrogen sulfide (H2S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H2S detectors alarms warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H2S on metal components. If high tensile tubular are to be used, personnel well be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
3. The contents and requirements of the H2S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H2S zone (within 3 days or 500 feet) and weekly H2S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H2S Drilling Operations Plan and the Public Protection Plan. **The concentrations of H2S of wells in this area from surface to TD are low enough that a contingency plan is not required.**

II. H2S SAFETY EQUIPMENT AND SYSTEMS

Note: All H2S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonable expected to contain H2S.

1. **Well Control Equipment:**

   A. Flare line.

   B. Choke manifold with minimum of one remotely operated choke.

   C. Closed Loop Blow Down Tank

   D. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.

   E. Auxiliary equipment may include if applicable: mud-gas separator, annular preventer & rotating head.

2. **Protective equipment for essential personnel:**

   A. SCBA (Self contained breathing apparatus) 30-minute units located in the doghouse and at briefing areas, as indicated on well site diagram.

3. **H2S detection and monitoring equipment:**

   A. Portable H2S monitors positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 PPM are reached.

4. **Visual warning systems:**

   A. Wind direction indicators as shown on well site diagram.

   B. Caution/Danger signs (Exhibit #7) shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate. See example attached.

5. **Mud program:**

   A. The mud program has been designed to minimize the volume of H2S circulated to surface. Proper mud weight, safe drilling practices, and the use of H2S scavengers will minimize hazards when penetrating H2S bearing zones.

6. **Metallurgy:**

   A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H2S service.

   B. All elastomers used for packing and seals shall be H2S trim.

7. **Communication:**

   A. Radio communications in company vehicles including cellular telephone and 2-way radio.

   B. Land line (telephone) communication at Office.

8. **Well testing:**

   A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safely and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H2S environment will use the closed chamber method of testing.

   B. There will be no drill stem testing.

EXHIBIT #7

WARNING

YOU ARE ENTERING AN H2S

AUTHORIZED PERSONNEL ONLY

1. BEARDS OR CONTACT LENSES NOT ALLOWED
2. HARD HATS REQUIRED
3. SMOKING IN DESIGNATED AREAS ONLY
4. BE WIND CONSCIOUS AT ALL TIMES
5. CHECK WITH COG OPERATING FOREMAN AT

COG OPERATING LLC
1-432-683-7443
1-575-746-2010

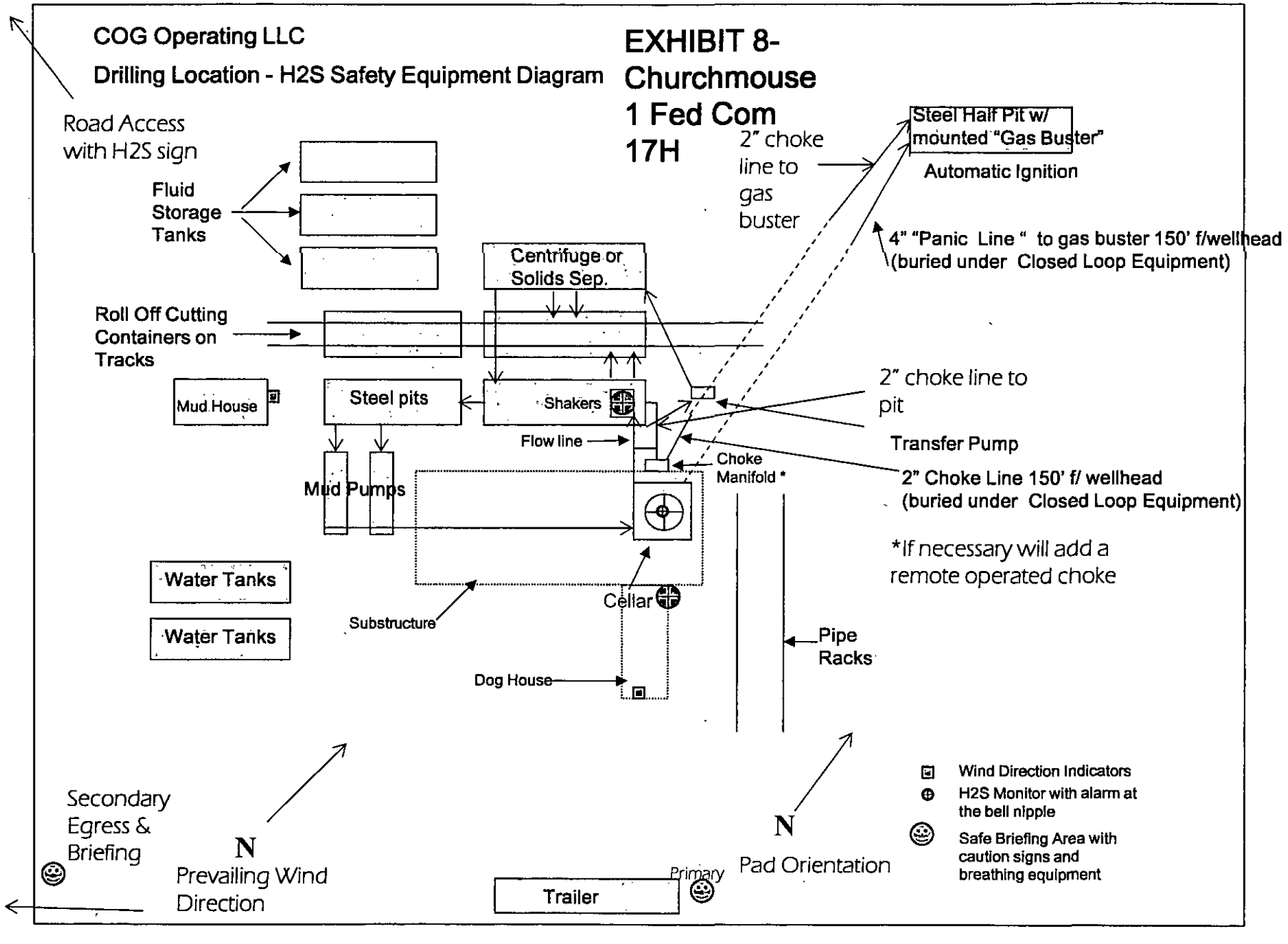
EDDY COUNTY EMERGENCY NUMBERS
ARTESIA FIRE DEPT. 575-746-5050
ARTESIA POLICE DEPT. 575-746-5000
EDDY CO. SHERIFF DEPT. 575-746-9888

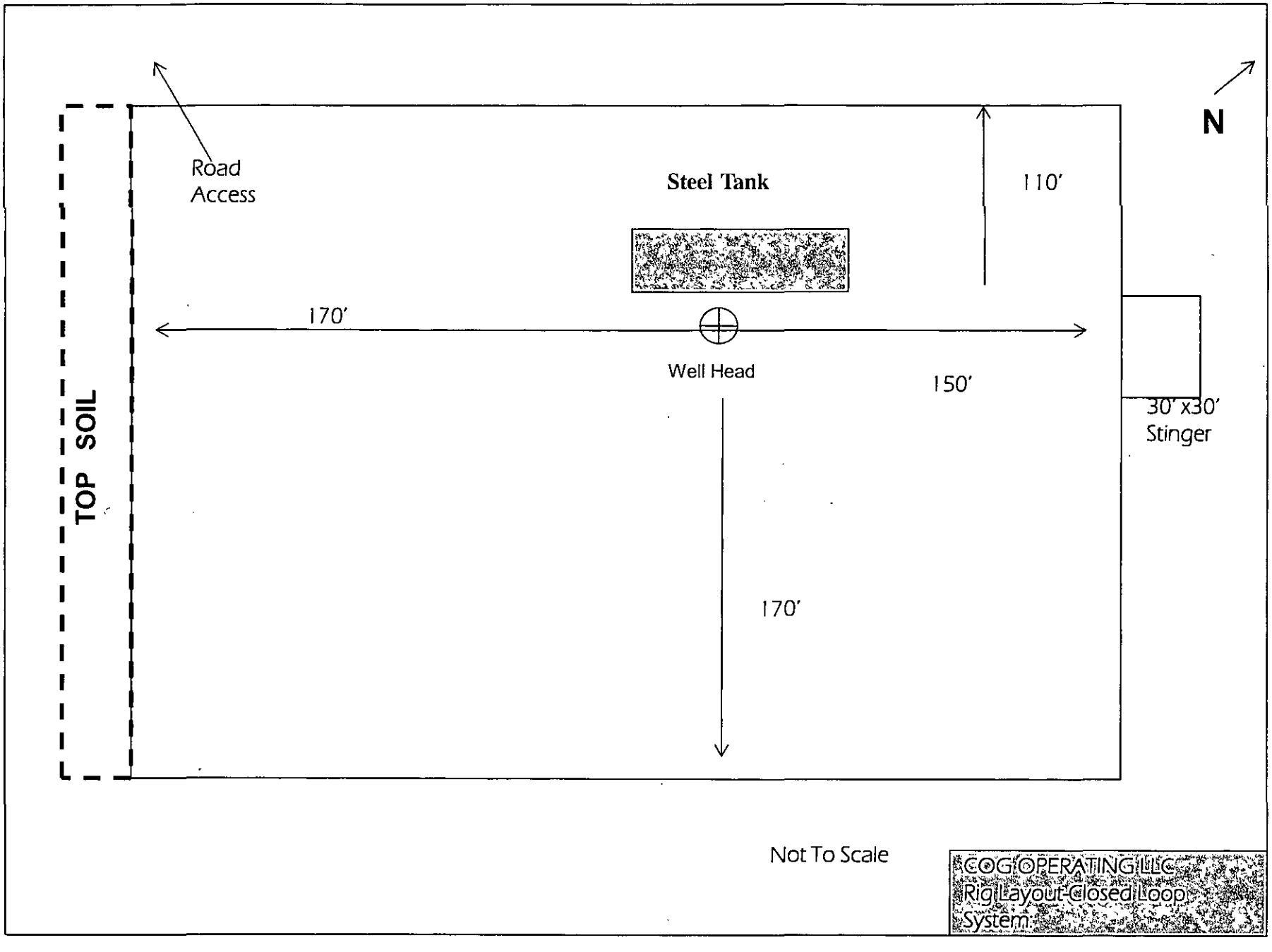
LEA COUNTY EMERGENCY NUMBERS
HOBBS FIRE DEPT. 575-397-9308
HOBBS POLICE DEPT. 575-397-9285
LEA CO. SHERIFF DEPT. 575-396-1196

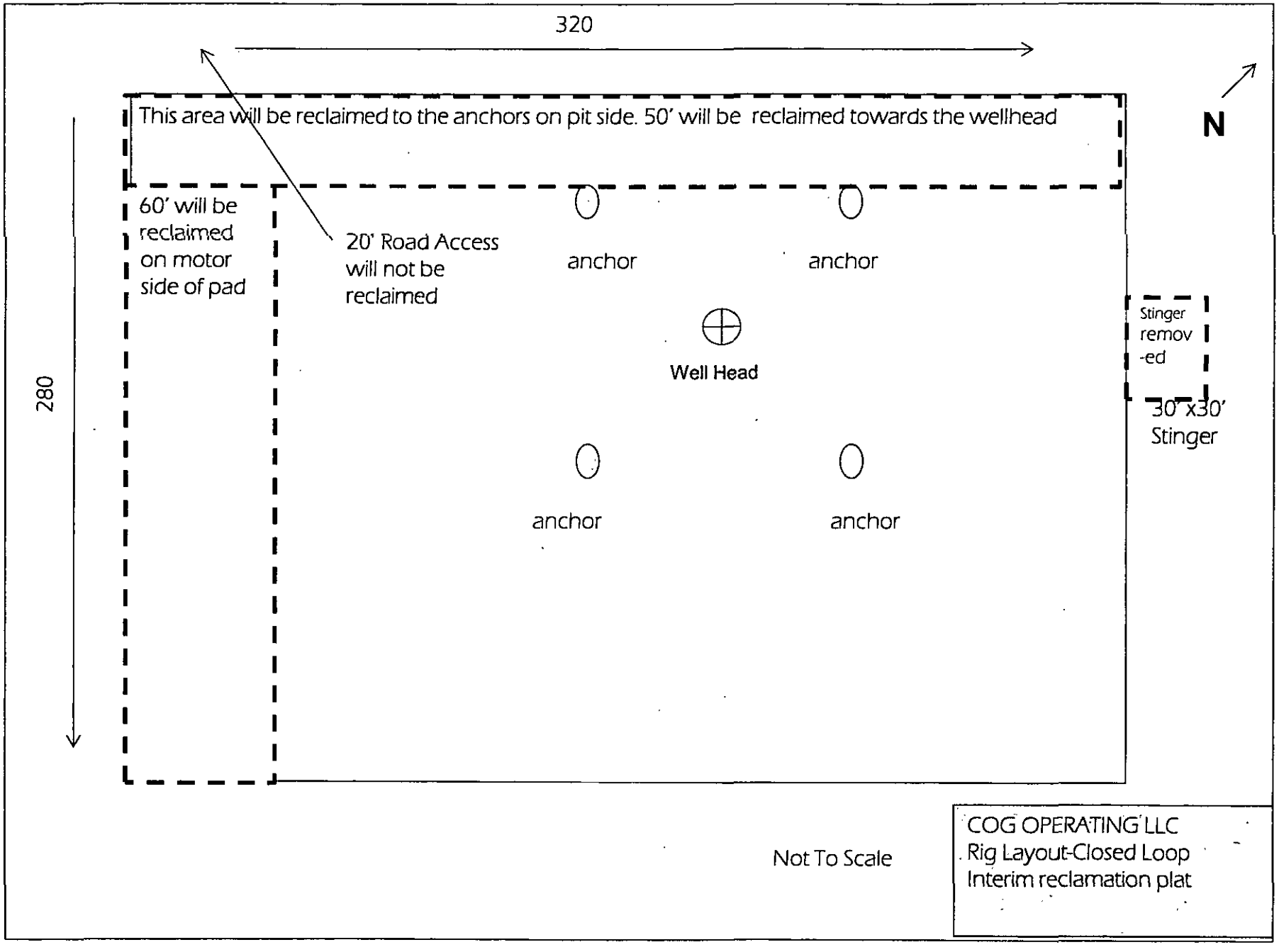
COG Operating LLC

Drilling Location - H2S Safety Equipment Diagram

EXHIBIT 8-
Churchmouse
1 Fed Com
17H




N
Road Access
Steel Tank
110'
170'
Well Head
150'
30' x30' Stinger
TOP SOIL
170'
Not To Scale
COG OPERATING LLC
Rig Layout-Closed Loop System


320
N
This area will be reclaimed to the anchors on pit side. 50' will be reclaimed towards the wellhead
60' will be reclaimed on motor side of pad
20' Road Access will not be reclaimed
anchor
anchor
Well Head
Stinger remov -ed
30' x30' Stinger
280
anchor
anchor
Not To Scale
COG OPERATING LLC
Rig Layout-Closed Loop
Interim reclamation plat

Surface Use & Operating Plan

Churchmouse 1 Federal Com 17H

- Surface Tenant: Bogle Farms, Lewis Derrick, P O Box 441, Artesia, NM 88211.
- New Road: approx. 0'
- Flow Line: approx. 1,610'
- Facilities: Passion 1 Fed Com 5H Federal Com Tank Battery

Well Site Information

V Door: Northeast

Topsoil: Southwest

Interim Reclamation: Northwest/Southwest

Notes

-shares pad with the Newcastle 6 Fed Com 7H, previously call Churchmouse 7H

-0.659 acres of new disturbance

Onsite: 11/19/2012

Tanner Nygren(BLM), Caden Jameson (COG), Gary Box (P.C.)

SURFACE USE AND OPERATING PLAN

1. Existing & Proposed Access Roads

A. The well site survey and elevation plat for the proposed well is attached with this application. It was staked by Renewable Resource Consultants, LLC, Midland, TX.

B. All roads to the location are shown in the Vicinity Map. The existing lease roads are illustrated and are adequate for travel during drilling and production operations. Upgrading existing roads prior to drilling the well will be done where necessary. The road route to the well site is depicted (red) in Vicinity Map. The road highlighted in the Vicinity Map will be used to access the well.

C. Directions to location: See Vicinity Map.

D. Routine grading and maintenance of existing roads will be conducted as necessary to maintain their condition as long as any operations continue on this lease. Roads will be maintained according to specifications in section 2A of this Surface Use and Operating Plan. For all caliche roads indicated in RED on the Vicinity Map roads will be maintained a minimum of 2 times per year in dry conditions and 3 times per year in wet conditions.

2. Proposed Access Road:

The Elevation Plat shows that 0' of new access road will be required for this location. If any road is required it will be constructed as follows:

A. The maximum width of the running surface will be 20'. The road will be crowned, ditched and constructed of 6" rolled and compacted caliche. Ditches will be at 3:1 slope and 4 feet wide. Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns.

B. The average grade will be less than 1%.

C. No turnouts are planned.

D. No culverts, cattleguard, gates, low water crossings or fence cuts are necessary.

E. Surfacing material will consist of native caliche. Caliche will be obtained from the actual well site if available. Secondary candidate source will be caliche pit from NMSLO owned located in SWSW of Section 32 Township 16 South Rang 30 East.

3. Location of Existing Well:

The 1-mile Map shows all existing wells within a one-mile radius of this well.

As shown on this plat there are numerous wells producing from the San Andres and Yeso formations.

4. Location of Existing and/or Proposed Facilities:

A. COG Operating LLC does operate a production facility on this lease indicated below in B. (1). With the exception of a wellhead and pumping unit there are no current plans for facilities, flares, tanks, vessels, and/or associated production equipment to be left on the well site after drilling and completions have finished.

B. If the well is productive, contemplated facilities will be as follows:

1) Production will be sent Passion 1 Fed Com 5H Federal Tank Battery located in Section 1 at approx. 1910' FSL & 100' FEL in T17S R29E. The facility location is shown in Flowline plat.

2) The tank battery and facilities including all flow lines and piping will be installed according to API specifications.

3) Any additional caliche will be obtained from the actual well site. If caliche does not exist or is not plentiful from the well site the caliche will be hauled from secondary private source owned by NMSLO Caliche Pit located in S2 SW4 of Section 32 Township 16 South Range 30 East.

4) Proposed flow lines, will follow an archaeologically approved route to the Passion 1 Fed Com 5H Federal Tank Battery located in Section 1 at approx. 1910' FSL & 100' FEL in T17S R29E. The flowline will be SDR 7 3" poly line laid on the surface and will be approximately 1,610 feet in length. Normal working pressure of the flowline will be below 70 psi. See Exhibit 1.

5) It will be necessary to run electric power if this well is productive. Power will be provided by CVE. There will be no necessary electric line construction for this well. CVE operates an existing primary line parallel to the well pad, therefor no poles will be set off the well pad disturbance.

6) If the well is productive, rehabilitation plans will include the following:

- The original topsoil from the well site will be returned to the location, and the site will be re-contoured as close as possible to the original site.

5. Location and Type of Water Supply:

The well will be drilled with combination brine and fresh water mud system as outlined in the drilling program. Water will be obtained from commercial water stations in the area and hauled to location by transport truck over the existing and proposed access roads shown in Vicinity Map. A fresh water source is nearby in Section 17 17S-R30E and fast line may be laid along existing road ROW's and fresh water pumped to the well. All water will originate from private wells location depicted on the "Water Well Map" attached to this APD (Loco Hills Water Disposal Co. No water well will be drilled on the location.

6. Source of Construction Materials and Location "Turn-Over" Procedure:

Obtaining caliche: The primary way of obtaining caliche to build locations and roads will be by "turning over" the location. This means, caliche will be obtained from the actual well sight. A caliche permit will be obtained from BLM prior to pushing up any caliche. 2400 cu. Yards is max amount of caliche needed for pad and roads. Amount will vary for each pad. The procedure below has been approved by BLM personnel:

A. The top 6 inches of topsoil is pushed off and stockpiled along the side of the location.

B. An approximate 120' X 120' area is used within the proposed well site to remove caliche.

C. Subsoil is removed and piled alongside the 120' by 120' area within the pad site.

D. When caliche is found, material will be stock piled within the pad site to build the location and road.

E. Then subsoil is pushed back in the hole and caliche is spread accordingly across entire location and road.

F. Once well is drilled, the stock piled top soil will be used for interim reclamation and spread along areas where caliche is picked up and the location size is reduced. Neither caliche nor subsoil will be stock piled outside of the well pad. Topsoil will be stockpiled along the edge of the pad as depicted in attached plat.

- In the event that no caliche is found onsite, caliche will be hauled in from a BLM approved caliche pit or other established mineral pit. Candidate source will be caliche from NMSLO Caliche Pit located in S2 SW4 of Section 32 Township 16 South Range 30 East.

7. Methods of Handling W1-7ater Disposal:

A. The well will be drilled utilizing a closed loop mud system. Drill cuttings will be held in roll-off style mud box commerciales and taken to R360's disposal site located at 4507 West Carlsbad Highway, Hobbs, NM 88240.

B. Drilling fluids will be contained in steel mud pits and taken to R360's disposal site located at 4507 West Carlsbad Highway, Hobbs, NM 88240.

C. Water produced from the well during completion will be held temporarily in steel tanks and then taken to an NMOCD approved commercial disposal facility. R360's disposal site located at 4507 West Carlsbad Highway, Hobbs, NM 88240.

D. Garbage and trash produced during drilling or completion operations will be collected in a trash bin and hauled to an approved landfill-Lea Landfill LLC. Located at Mile Marker 64, Highway 62-180 East, P O Box 3247, Carlsbad, NM 88221. No toxic waste or hazardous chemicals will be produced by this operation.

E. Human waste and grey water will need to be properly contained and disposed of. Proper disposal and elimination of waste and grey water may include but are not limited to portable septic systems and/or portable waste gathering systems (i.e. portable toilets).

F. After the rig is moved out and the well is either completed or abandoned, all waste materials will be cleaned up within 30 days. In the event of a dry hole only a dry hole marker will remain.

G. Produced water from the well will be disposed of into COG Operating LLC's salt water disposal well system. Wells and respective locations are identified on the "SWD Well EXBT".

8. Ancillary Facilities:

No airstrip, campsite or other facilities will be built as a result of the operation on this well.

9. Well Site Layout:

A. The drill pad layout, with elevations staked by Renewable Resource Consultants, LLC, is shown in the Well Pad Layout plat. Dimensions of the pad and pits are also shown in Well Pad Layout plat. V door direction is Northeast. Topsoil, if available, will be stockpiled per BLM specifications. Because the pad is almost level no major cuts will be required.

B. The Rig Layout Closed-Loop exhibit shows the proposed orientation of closed loop system and access road. No permanent living facilities are planned, but a temporary foreman/toolpusher's trailer will be on location during the drilling operations.

10. Plans for Restoration of the Surface:

A. Interim Reclamation will take place after the well has been completed. The pad will be downsized by reclaiming the areas not needed for production operations. The portions of the pad that are not needed for production operations will be re-contoured to its original state as much as possible. The caliche that is removed will be reused to either build another pad site or for road repairs within the lease. The stockpiled topsoil will then be spread out reclaimed area and reseeded with a BLM approved seed mixture. In the event that the well must be worked over or maintained, it may be necessary to drive, park, and/or operate machinery on reclaimed land. This area will be repaired or reclaimed after work is complete.

B. Final Reclamation: Upon plugging and abandoning the well all caliche for well pad and lease road will be removed and surface will be recountoured to reflect its surroundings as much as possible. Caliche will be recycled for road repair or reused for another well pad within the lease. If any topsoil remains, it will be spread out and the area will be re-seeded with a BLM approved mixture and re-vegetated as per BLM orders. When required by BLM, the well pad site will be restored to match pre-construction grades.

11. (Sedimentation and Erosion Control)

- No Sedimentation or Erosion Control will be necessary on this location as it is generally flat without little to no slope or cut and fill.

12. Surface Ownership:

A. The surface is owned by the U.S. Government and is administered by the Bureau of Land Management. The surface is multiple uses with the primary uses of the region for grazing of livestock and the production of oil and gas.

B. The surface tenant is Key Livestock, LLC 1012 E 2nd, Roswell, NM 88201.

C. The proposed road routes and surface location will be restored as directed by the BLM

13.Other Information:

A. The area around the well site is grassland and the topsoil is sandy. The vegetation is moderately sparse with native prairie grasses, some mesquite and shinnery oak. No wildlife was observed but it is likely that mule deer, rabbits, coyotes and rodents traverse the area.

B. There is no permanent or live water in the immediate area.

C. There are no dwellings within 2 miles of this location.

D. If needed, a Cultural Resources Examination is being prepared by Boone Arch Services of New Mexico, LLC. Carlsbad, NM, 88220. 506 E Chapman Rd. , phone # 575.887.7667 and the results will be forwarded to your office in the near future. Otherwise, **COG will be participating in the Permian Basin MOA Program.**

14. Bond Coverage:

Bond Coverage is Nationwide Bond # 000215

15. Lessee's and Operator's Representative:

The COG Operating LLC representative responsible for assuring compliance with the surface use plan is as follows:

Brad English	Ray Peterson
Drilling Superintendent	Drilling Manager
COG Operating LLC	COG Operating LLC
One Concho Center	One Concho Center
600 W. Illinois	600 W. Illinois
Midland, TX 79701	Midland, TX 79701
Phone (432) 818-2320 (office)	Phone (432) 685-4304 (office)
(432) 260-7995 (business)	(432) 818-2254 (business)

I hereby certify that I, or persons under my direct supervision, have inspected the drill site and access road proposed herein; that I am familiar with the conditions that presently exist; that I have full knowledge of State and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or COG Operating, LLC, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements. Executed this 25th day of January, 2016.

Signed: Carl Bird

Printed Name: Carl Bird

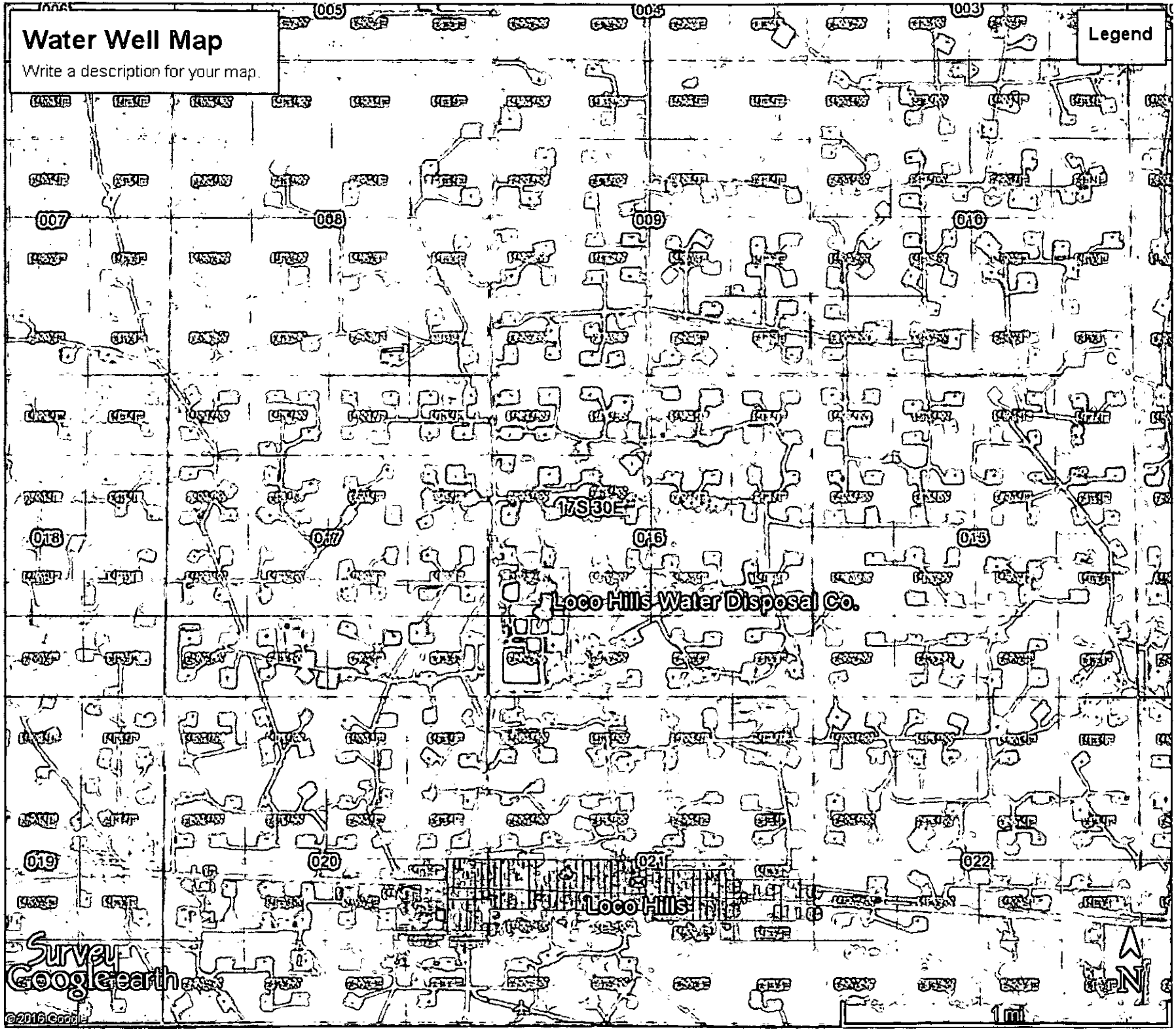
Position: Drilling Engineer

Address: One Concho Center, 600 W. Illinois, Midland, Texas 79701

Telephone: (432) 683-7443

Field Representative (if not above signatory): Same

E-mail: cbird@concho.com


Water Well Map
Write a description for your map.
Legend
005
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Loco Hills Water Disposal Co.
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020
021
022
Loco Hills
Survey
Google earth
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SWD Well Exhibit

Well Name	API Number	Section	Twn (S)	Rng (E)	County
Aid State 14 #1 SWD	30-015-29569	14	17	28	Eddy
Bate Federal #3 SWD	30-025-22597	35	19	33	Lea
Big George #3 SWD	30-015-28759	12	17	28	Eddy
Biscuit Hills #1 SWD	30-015-28142	29	17	31	Eddy
Burch Keely Unit #113 SWD	30-015-03068	24	17	29	Eddy
Chase 21 State Com #1 SWD	30-015-30874	21	17	29	Eddy
Curly Fed #2 SWD	30-025-38442	34	17	32	Lea
Delta Wing Fed #1 SWD	30-015-26309	15	17	29	Eddy
Durango 15 State Com #1 SWD	30-015-31557	15	17	29	Eddy
Empire Federal #3 SWD	30-015-37831	10	17	29	Eddy
Empire Fed 10 #5 SWD	30-015-39446	10	17	29	Eddy
Empire State 2 SWD	30-015-37787	9	17	29	Eddy
Empire State 9 #4 SWD	30-015-38972	9	17	29	Eddy
Empire State SWD 15 #1	30-015-39771	15	17	29	Eddy
Empire State SWD 8 #1	30-015-38973	8	17	29	Eddy
Federal 18-4 SWD	30-025-01671	18	19	33	Lea
Federal BI #1 SWD	30-025-27068	28	17	32	Lea
Loco Hills 33 #4 SWD	30-015-37269	33	17	30	Eddy
Loco Hills 33 #6 SWD	30-015-39478	33	17	30	Eddy
Loco Hills 34 #3 SWD	30-015-37270	34	17	30	Eddy
Loco Hills 34 #5 SWD	30-015-39477	34	17	30	Eddy
Loco Hills 35 #1 SWD	30-015-31635	36	17	30	Eddy
Loco Hills 35 #2 SWD	30-015-37268	35	17	30	Eddy
Maljamar 29 #1 SWD	30-025-39519	29	17	32	Lea
Maljamar SWD 30 #2	30-025-40310	30	17	32	Lea
Mary Dodd A #47 SWD	30-015-20408	22	17	29	Eddy
Mary Dodd B Deep Fed #2 SWD	30-015-31041	14	17	29	Eddy
Muskegon 16 State Com #1	30-015-27108	16	17	29	Eddy
Oxy Spumoni St #1 SWD	30-015-33089	16	17	31	Eddy
Pronghorn SWD #1	30-025-32735	24	19	32	Lea
Saber Fed #1SWD	30-015-27882	11	17	29	Eddy

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating
LEASE NO.:	NM7752
WELL NAME & NO.:	17H-Churchmouse 1 Federal Com
SURFACE HOLE FOOTAGE:	990'/S & 150'/E
BOTTOM HOLE FOOTAGE	989'/S & 330'/W
LOCATION:	Section 1, T. 17 S., R. 29 E., NMPM
COUNTY:	Eddy County, New Mexico

TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken: Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

Communitization Agreement

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

Cave and Karst Conditions of Approval

** Depending on location, additional Drilling, Casing, and Cementing procedures may be required by engineering to protect critical karst groundwater recharge areas.

Cave/Karst Surface Mitigation

The following stipulations will be applied to minimize impacts during construction, drilling and production.

Construction:
In the advent that any underground voids are opened up during construction activities, construction activities will be halted and the BLM will be notified immediately.

No Blasting:
No blasting will be utilized for pad construction. The pad will be constructed and leveled by adding the necessary fill and caliche.

Pad Berming:
The entire perimeter of the well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad.

- The compacted berm shall be constructed at a minimum of 12 inches high with impermeable mineral material (e.g. caliche).
- No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad.
- The topsoil stockpile shall be located outside the bermed well pad.
- Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm.
- No storm drains, tubing or openings shall be placed in the berm.
- If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.
- The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed.
- Any access road entering the well pad shall be constructed so that the integrity of the berm height surrounding the well pad is not compromised. (Any access road crossing the berm cannot be lower than the berm height.)

Tank Battery Liners and Berms:
Tank battery locations and all facilities will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.

Leak Detection System:
A method of detecting leaks is required. The method could incorporate gauges to measure loss, situating values and lines so they can be visually inspected, or installing

electronic sensors to alarm when a leak is present. Leak detection plan will be submitted to BLM for approval.

Automatic Shut-off Systems:
Automatic shut off, check values, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

Cave/Karst Subsurface Mitigation

The following stipulations will be applied to protect cave/karst and ground water concerns:

Rotary Drilling with Fresh Water:
Fresh water will be used as a circulating medium in zones where caves or karst features are expected. SEE ALSO: Drilling COAs for this well.

Directional Drilling:
Kick off for directional drilling will occur at least 100 feet below the bottom of the cave occurrence zone. SEE ALSO: Drilling COAs for this well.

Lost Circulation:
ALL lost circulation zones from the surface to the base of the cave occurrence zone will be logged and reported in the drilling report.

Regardless of the type of drilling machinery used, if a void of four feet or more and circulation losses greater than 70 percent occur simultaneously while drilling in any cave-bearing zone, the BLM will be notified immediately by the operator. The BLM will assess the situation and work with the operator on corrective actions to resolve the problem.

Abandonment Cementing:
Upon well abandonment in high cave karst areas additional plugging conditions of approval may be required. The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

Pressure Testing:
Annual pressure monitoring will be performed by the operator on all casing annuli and reported in a sundry notice. If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Temporary storage of topsoil. Piled topsoil height must not exceed three feet in order to maintain the viability of topsoil biota crucial for rapid establishment of seeding at interim and final reclamation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation.The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing
The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

G. ON LEASE ACCESS ROADS

Road Width
The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

Surfacing
Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

Crowning
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

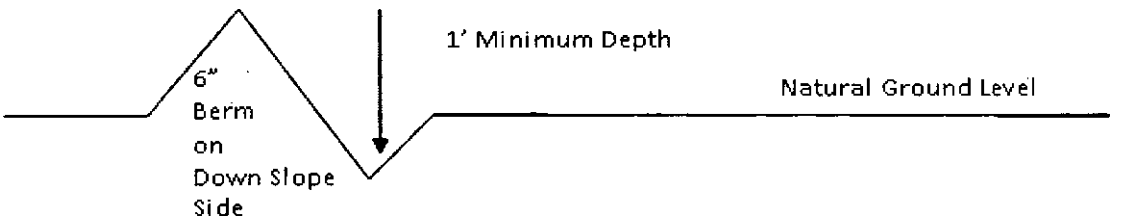
Ditching
Ditching shall be required on both sides of the road.

Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage
Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

400 foot road with 4% road slope: $\frac{400'}{4\%} + 100' = 200'$ lead-off ditch interval

Cattleguards
An appropriately sized cattleguard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattleguards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguards that are in place and are utilized during lease operations.

Fence Requirement
Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Public Access
Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Construction Steps

1. Salvage topsoil
2. Construct road
3. Redistribute topsoil
4. Revegetate slopes

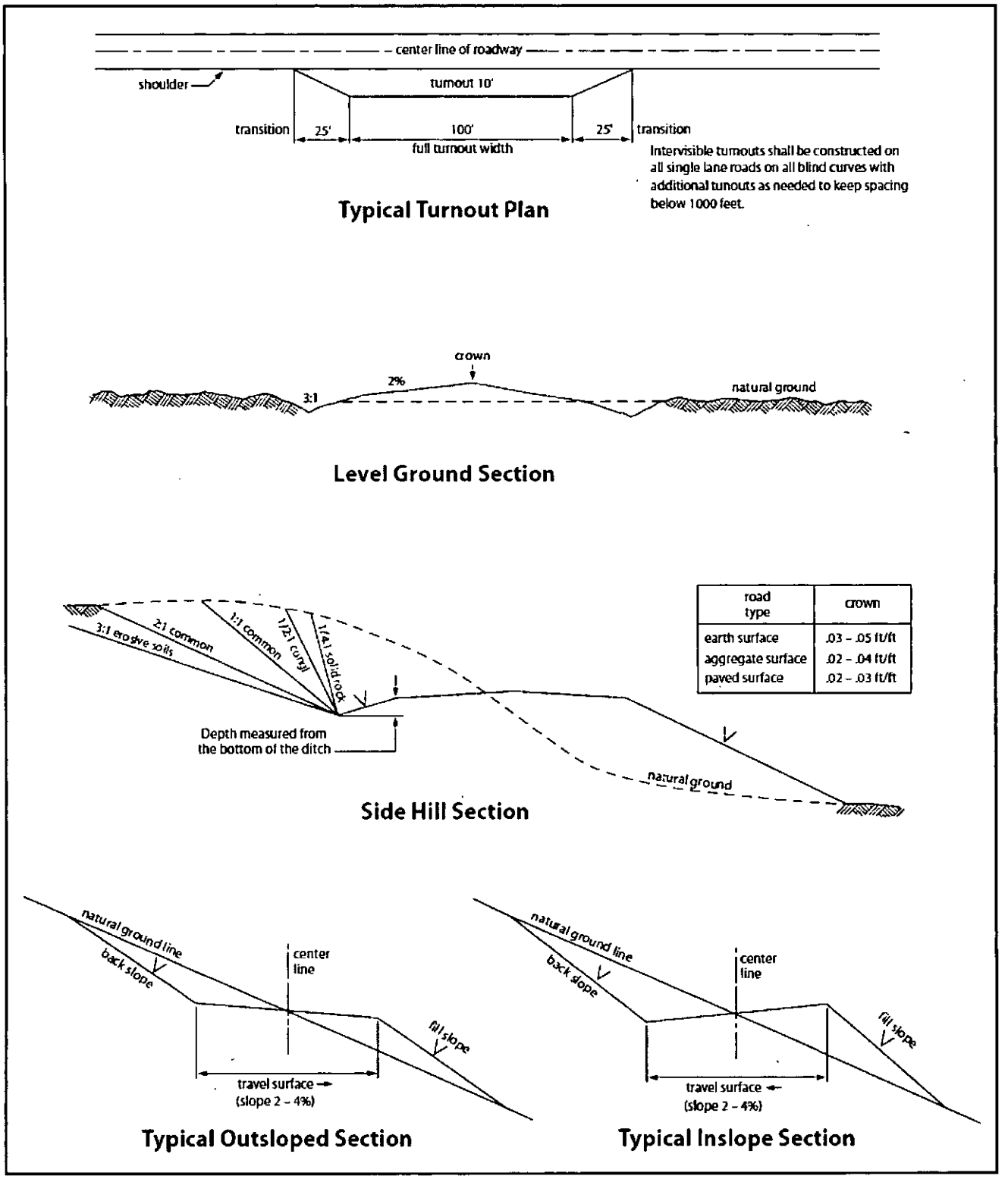


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

I. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

a. Spudding well (minimum of 24 hours)
b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
c. BOPE tests (minimum of 4 hours)

☒ **Eddy County**
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

1. A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **Grayburg** formation. **As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.**

2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a "Major" violation.**

3. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

B. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

Wait on cement (WOC) for Water Basin:
After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE.

Provide compressive strengths including hours to reach required 500 pounds *compressive strength prior to cementing each casing string. Have well specific* cement details onsite prior to pumping the cement for each casing string.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Medium Cave/Karst
Possibility of water flows in the Salado, Artesia group, and Queen.
Possibility of lost circulation in the Red Beds, Artesia Group, Rustler, San Andres, and Grayburg.

1. The **13-3/8** inch surface casing shall be set at approximately **350** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt. Additional cement shall be required—excess calculates 11%.**

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

    b. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.

    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

    d. If cement falls back, remedial cementing will be done prior to drilling out that string.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing, which shall be set at base of the **Tansill** at approximately **1160** feet, is:

Option #1:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.**

Option #2:

DV tool shall be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe. Operator shall submit sundry if DV tool depth cannot be set in this range. If an ECP is used, it is to be set a minimum of 50' below the shoe to provide cement across the shoe. If it cannot be set below the shoe, a CBL shall be run to verify cement coverage.

a. First stage to DV tool:

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage.

b. Second stage above DV tool:

☒ Cement to surface. Operator shall provide method of verification. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.**

Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every other joint.

3. The minimum required fill of cement behind the **7 X 5-1/2** inch production casing is:

Option #1:

☒ Cement to surface. If cement does not circulate, contact the appropriate BLM office.

Option #2:

Operator has proposed DV tool at depth of 2823', but will adjust cement proportionately if moved. DV tool shall be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe. Operator shall submit sundry if DV tool depth cannot be set in this range. If an ECP is used, it is to be set a minimum of 50' below the shoe to provide cement across the shoe. If it cannot be set below the shoe, a CBL shall be run to verify cement coverage.

a. First stage to DV tool:

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation on the next stage.

b. Second stage above DV tool:

☒ Cement to surface. If cement does not circulate, contact the appropriate BLM office.

4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. **In the case where the only BOP installed is an annular preventer, it shall be tested to a minimum of 2000 psi (which may require upgrading to 3M or 5M annular).**

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.

4. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

   a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

   b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**.

c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock.

d. The results of the test shall be reported to the appropriate BLM office.

e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**

f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

E. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

TMAK 012016

II. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities
Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Exclosure Netting (Open-top Tanks)
Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

Chemical and Fuel Secondary Containment and Exclosure Screening
The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

Open-Vent Exhaust Stack Exclosures
The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

Containment Structures
Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

Painting Requirement
All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

B. PIPELINES
STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES

A copy of the Grant and attachments, including stipulations, survey plat(s) and/or map(s), shall be on location during construction. BLM personnel may request to review a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, Holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC § 2601 *et seq.* (1982) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant (*see* 40 CFR, Part 702-799 and in particular, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193). Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the Authorized Officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. Holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. § 9601, *et seq.* or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, *et seq.*) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way Holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way Holder on the Right-of-Way. This provision applies without regard to whether a release is caused by Holder, its agent, or unrelated third parties.

4. Holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. Holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

a. Activities of Holder including, but not limited to: construction, operation, maintenance, and termination of the facility;

b. Activities of other parties including, but not limited to:
   (1) Land clearing
   (2) Earth-disturbing and earth-moving work
   (3) Blasting
   (4) Vandalism and sabotage;

c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars ($1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil, salt water, or other pollutant, wherever found, shall be the responsibility of Holder, regardless of fault. Upon failure of Holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he/she deems necessary to control and clean up the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of Holder. Such action by the Authorized Officer shall not relieve Holder of any responsibility as provided herein.

6. All construction and maintenance activity shall be confined to the authorized right-of-way width of **20** feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline shall be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline shall be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity shall be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation shall be allowed unless approved in writing by the Authorized Officer.

8. Holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky of duney areas, the pipeline shall be "snaked" around hummocks and dunes rather than suspended across these features.

9. The pipeline shall be buried with a minimum of __**24**_____ inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

10. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

13. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. Signs will be maintained in a legible condition for the life of the pipeline.

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

16. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, powerline corridor, and adjacent land

affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

17. Surface pipelines shall be less than or equal to 4 inches and a working pressure below 125 psi.

18. Special Stipulations:

a. **Lesser Prairie-Chicken:** Oil and gas activities will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Normal vehicle use on existing roads will not be restricted.

b. This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

c. **Dunes Sagebrush Lizard Trench Stipulation**
   1. Pre-construction contact with a BLM wildlife biologist is required before any ground disturbing activities associated with the project occurs.
   2. Successful completion of the BLM Trench Stipulation Workshop is required for a non-agency person to be approved as a monitor.
   3. Any trench left open for (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, an agency approved monitor shall walk the entire length of the open trench and remove all trapped vertebrates. The bottom surface of the trench will be disturbed a minimum of 2 inches in order to arouse any buried vertebrates. All vertebrates will be released a minimum of 100 yards from the trench.
   4. For trenches left open for eight (8) hours or more the following requirements apply:

      i. Earthen escape ramps and/or structures (built at no more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the trench. Metal structures will not be authorized.

Options will be discussed in detail at the required Trench Stipulation Workshop.

ii. One approved monitor shall be required to survey up to three miles of trench between the hours of 11 AM-2 PM. A daily report (consolidate if there is more than one monitor) on the vertebrates found and removed from the trench shall be provided to the BLM (email/fax is acceptable) the following morning.

iii. Prior to backfilling of the trench all structures used as escape ramps will be removed and the bottom surface of the trench will be disturbed a minimum of 2 inches in order to arouse any buried vertebrates. All vertebrates will be released a minimum of 100 yards from the trench.

5. This stipulation shall apply to the entire length of the project in the DSL habitat polygon regardless of land ownership or CCA/CCAA enrollment status.
6. A project closeout will be required within three business days of the completion of the project.

III. INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

X. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well.

Candidate Conservation Agreement

The proponent of the proposed action is a Participating Cooperator in the Candidate Conservation Agreement (CCA) for the lesser prairie-chicken (*Tympanuchus pallidicinctus*) and dunes sagebrush lizard (*Sceloporus arenicolus*).

The goal of the Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (USFWS), Center of Excellence for Hazardous Materials Management (CEHMM) and the Participating Cooperator is to reduce and/or eliminate threats to the LPC and/ or SDL. By agreeing to conduct the conservation measures described by the CCA, the Participating Cooperator contributes funding or provides in-kind services for conservation.

The Certificate of Participation (CP) associate with the CCA is voluntary between CEHMM, BLM, USFWS and the Participating Cooperator. Through the CP, the Participating Cooperator voluntarily commits to implement or fund specific conservation actions that will reduce and/or eliminate threats to the SDL and /or the LPC. Funds contributed as part of the CP will be used to implement conservation measures and associated activities. The funds will be directed to the highest priority projects to restore or reclaim habitat at the sole discretion of BLM and USFWS.

The following Conservation Measures are to be accomplished in addition to those described in the CCA and Pecos District Special Status Species Resource Management Plan Amendment (RMPA):

1. To the extent determined by the BLM representative at the Plan of Development stage, all infrastructures supporting the development of a well (including roads, power lines, and pipelines) will be constructed within the same corridor.

2. On enrolled parcels that contain inactive wells, roads and/or facilities that are not reclaimed to current standards, the Participating Cooperator shall remediate and reclaim their facilities within three years of executing this CP, unless the Cooperator can demonstrate they will put the facilities back to beneficial use for the enrolled parcel(s). If an extension is requested by the Cooperator, they shall submit a detailed plan (including dates) and receive BLM approval prior to the three year deadline. All remediation and reclamation shall be performed in accordance with BLM requirements and be approved in advance by the Authorized Officer.

3. Utilize alternative techniques to minimize new surface disturbance when required and as determined by the BLM representative at the Plan of Development stage.

4. Install fence markings along fences owned, controlled, or constructed by the Participating Cooperator that cross through occupied habitat within two miles of an active LPC lek.

5. Bury new powerlines that are within two (2) miles of LPC lek sites active at least once within the past five years (measured from the lek). The avoidance distance is subject to change based on new information received from peer reviewed science.

6. Bury new powerlines that are within one (1) mile of historic LPC lek sites where at least one LPC has been observed within the past three years (measured from the historic lek). The avoidance distance is subject to change based on new information received from peer reviewed science.

7. Management recommendations may be developed based on new information received from peer reviewed science to mitigate impacts from H2S and/or the accumulation of sulfates in the soil related to production of gas containing H2S on the LPC. Such management recommendations will be applied by the Participating Cooperator as Conservation Measures under this CI/CP in suitable and occupied SDL/LPC habitat where peer-reviewed science has shown that H2S levels threaten the LPC.

Seed Mixture for LPC Sand/Shinnery Sites

Holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed shall be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed shall be either certified or registered seed. The seed container shall be tagged in accordance with State law(s) and available for inspection by the Authorized Officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). Holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. Seeding shall be repeated until a satisfactory stand is established as determined by the Authorized Officer. Evaluation of growth may not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

Species	lb/acre
Plains Bristlegrass	5lbs/A
Sand Bluestem	5lbs/A
Little Bluestem	3lbs/A
Big Bluestem	6lbs/A
Plains Coreopsis	2lbs/A
Sand Dropseed	1lbs/A

*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed