

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

OCD Artesia

FORM APPROVED  
OMB NO. 1004-0135  
Expires: July 31, 2010**SUNDRY NOTICES AND REPORTS ON WELLS**  
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.***SUBMIT IN TRIPLICATE - Other instructions on reverse side.**

1. Type of Well <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		5. Lease Serial No. NMNM7724
2. Name of Operator COG OPERATING LLC Contact: KELLY J HOLLY E-Mail: kholly@concho.com		6. If Indian, Allottee or Tribe Name
3a. Address ONE CONCHO CENTER 600 W ILLINOIS AVE MIDLAND, TX 79701	3b. Phone No. (include area code) Ph: 432-685-4384	7. If Unit or CA/Agreement, Name and/or No.
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 19 T16S R30E Mer NMP SWNW 1650FNL 330FWL		8. Well Name and No. SANTA ELENA 19 FEDERAL 1H
		9. API Well No. 30-015-40567
		10. Field and Pool, or Exploratory WILDCAT; ABO <i>97575</i> <i>PAVD MESA; ABO</i>
		11. County or Parish, and State EDDY COUNTY, NM

## 12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	Change to Original A
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	PD

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

Apache Corp and COG Operating LLC submitted a Change of Operator for this well to the OCD on 11/20/2012 and to the BLM on 11/21/2012.

COG Operating LLC respectfully requests permission to change the well to Horizontal and the location of this well to be:

SHL: 1650 FNL & 330 FWL  
BHL: 1651 FNL & 330 FEL

A revised C-102, directional plan and drilling plan is attached for your review.

Accepted for record  
NMOCD *tes*  
*12/3/2012*  
SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

RECEIVED

NOV 30 2012

NMOCD ARTESIA

APPROVED

NOV 29 2012

/s/ Chris Wallis

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #161196 verified by the BLM Well Information System  
For COG OPERATING LLC, sent to the Carlsbad  
Committed to AFMSS for processing by KURT SIMMONS on 11/28/2012 ()

Name (Printed/Typed) KELLY J HOLLY

Title PERMITTING TECH

Signature (Electronic Submission)

Date 11/27/2012

## THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By

Title

Date

Conditions of approval, if any, are attached. Approval of this notice 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.

Office

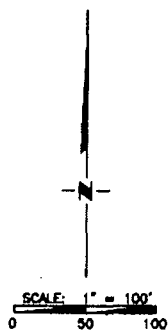
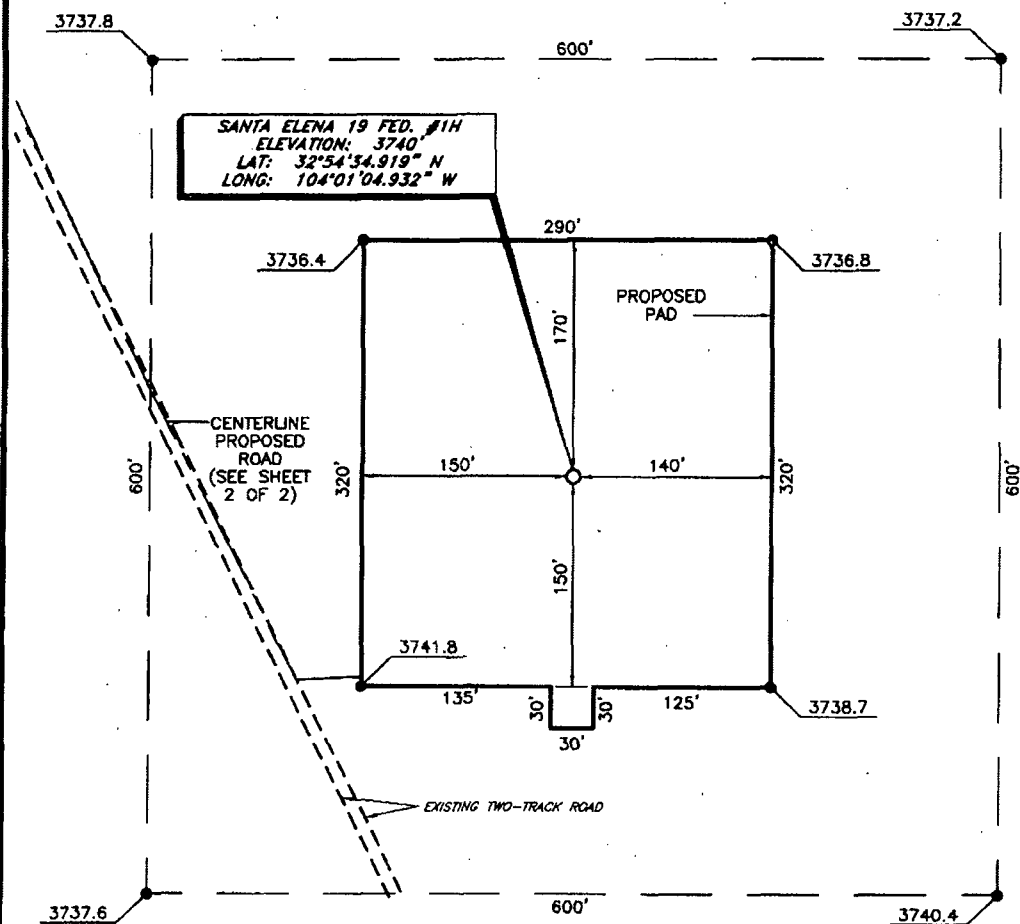
Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

**\*\* OPERATOR-SUBMITTED \*\* OPERATOR-SUBMITTED \*\* OPERATOR-SUBMITTED \*\***



# COG OPERATING, LLC

Santa Elena 19 Fed. #1H  
(1650' FNL & 330' FWL)  
Section 19, T-16-S, R-30-E,  
N. M. P. M., Eddy Co., New Mexico



## DIRECTIONS TO LOCATION

From the intersection of U. S. Hwy. No. 82 and County Road No. 215 (Keweenaw);

Go North on County Road No. 215 approx. 5.2 miles;

Turn right and go Northeasterly 0.15 mile to a cattleguard and the beginning of a proposed lease road;

Follow proposed road, staked on an existing two-track road to be upgraded, Northeasterly 1.2 miles;

Turn right and continue following the proposed road Southeasterly 0.2 mile.

Location stake is approximately 245' East of the road.

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NO.	REVISION	DATE
JOB NO.:	LS120018	
DWG. NO.:	120016PAD	

PROSPERITY CONSULTANTS, LLC

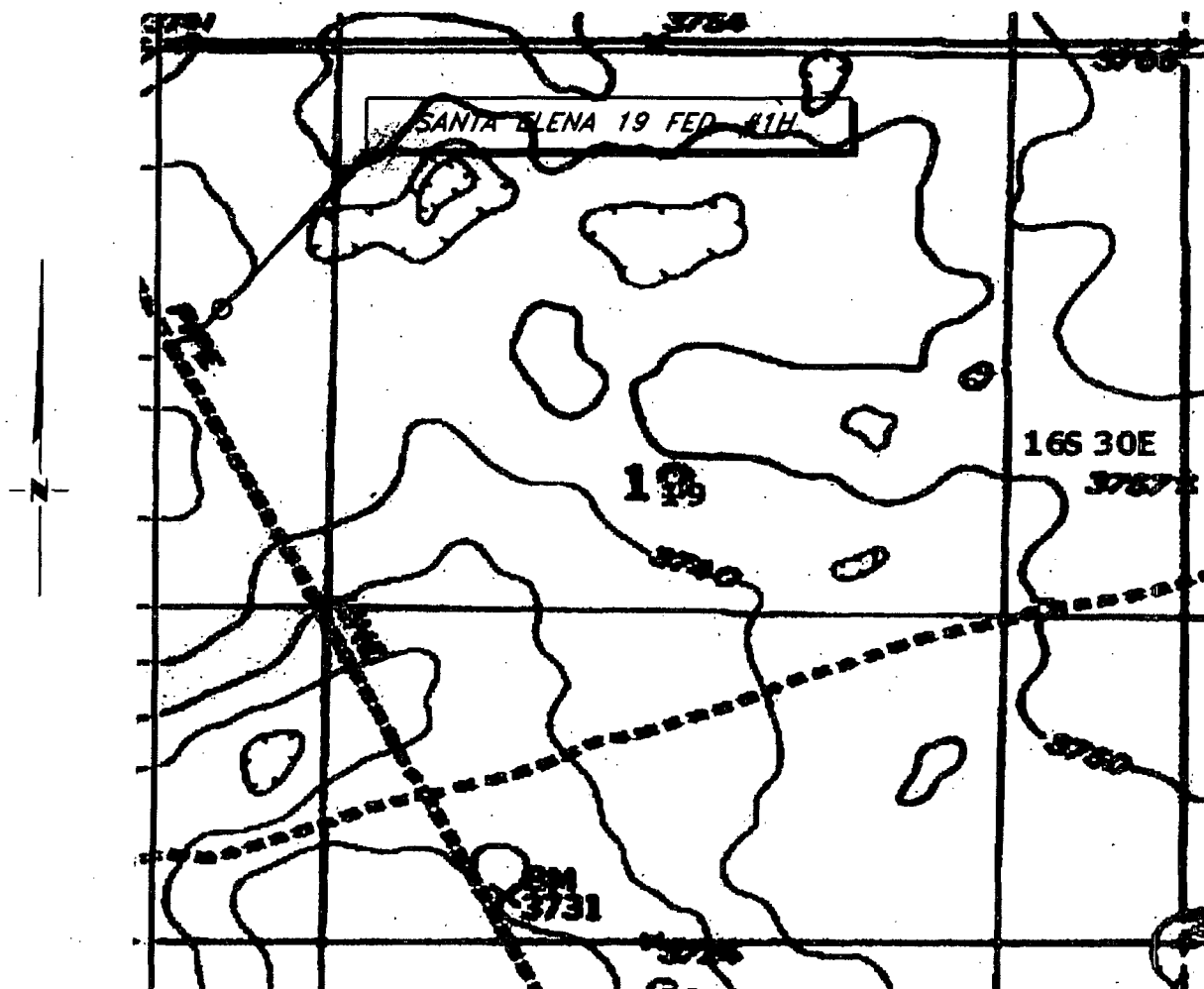


2251 Double Creek Drive, Suite 602, Round Rock, Texas 78664

o (512) 992-2087 f (512) 251-2518

SCALE: 1" = 100'
DATE: 11/21/12
SURVEYED BY: RH/GB
DRAWN BY: LWB
APPROVED BY: LWB
SHEET : 1 OF 2

# LOCATION VERIFICATION MAP



SECTION 19, TWP. 16 SOUTH, RGE. 30 EAST,  
N. M. P. M., EDDY COUNTY, NEW MEXICO

OPERATOR: COG Operating, LLC  
LEASE: Santa Elena 19 Fed.  
WELL NO.: 1H  
ELEVATION: 3740'

LOCATION: 1650' FNL & 330' FWL  
CONTOUR INTERVAL: 10'  
USGS TOPO. SOURCE MAP:  
Basin Well, NM (1953)

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NO.	REVISION	DATE
JOB NO.: LS120016		
DWG. NO.: 120016LVM		

PROSPERITY CONSULTANTS, LLC



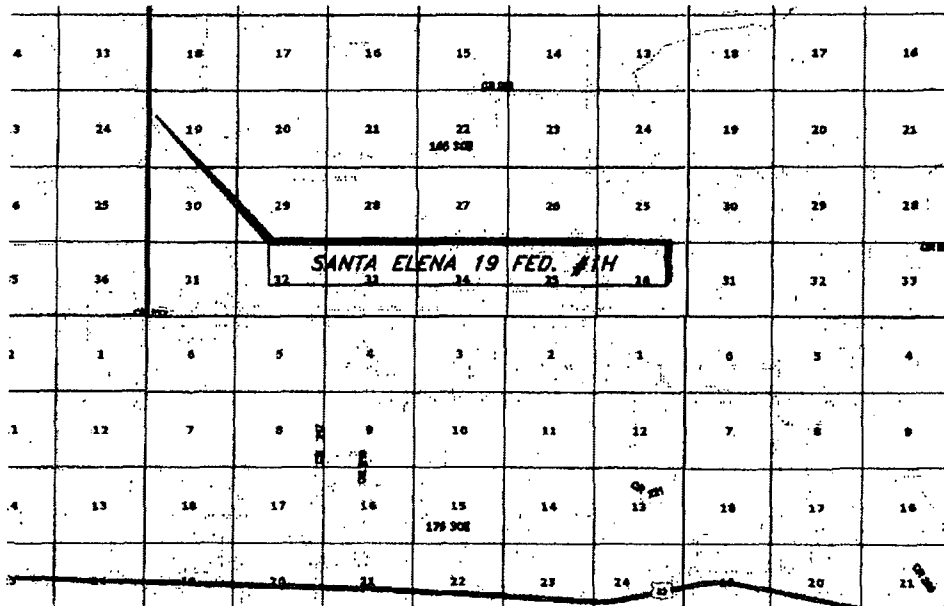
2251 Double Creek Drive, Suite 602, Round Rock, Texas 78664

o (512) 992-2087 f (512) 251-2518

SCALE: 1" = 1000'  
DATE: 11/21/12  
SURVEYED BY: RH/GB  
DRAWN BY: LWB  
APPROVED BY: LWB  
SHEET : 1 OF 1

# VICINITY MAP

NOT TO SCALE



SECTION 19, TWP. 16 SOUTH, RGE. 30 EAST,  
N. M. P. M., EDDY COUNTY, NEW MEXICO

OPERATOR: COG Operating, LLC  
LEASE: Santa Elena 19 Fed.  
WELL NO.: 1H  
ELEVATION: 3740'  
LOCATION: 1650' FNL & 330' FWL

## DIRECTIONS TO LOCATION

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lease road;

Follow proposed road, staked on an existing  
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1.2 miles;

Turn right and continue following the proposed  
road Southeasterly 0.2 mile.

Location stake is approximately 245' East of  
the road.

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NO.	REVISION	DATE
JOB NO.:	LS120016	
DWG. NO.:	120016VM	

PROSPERITY CONSULTANTS, LLC



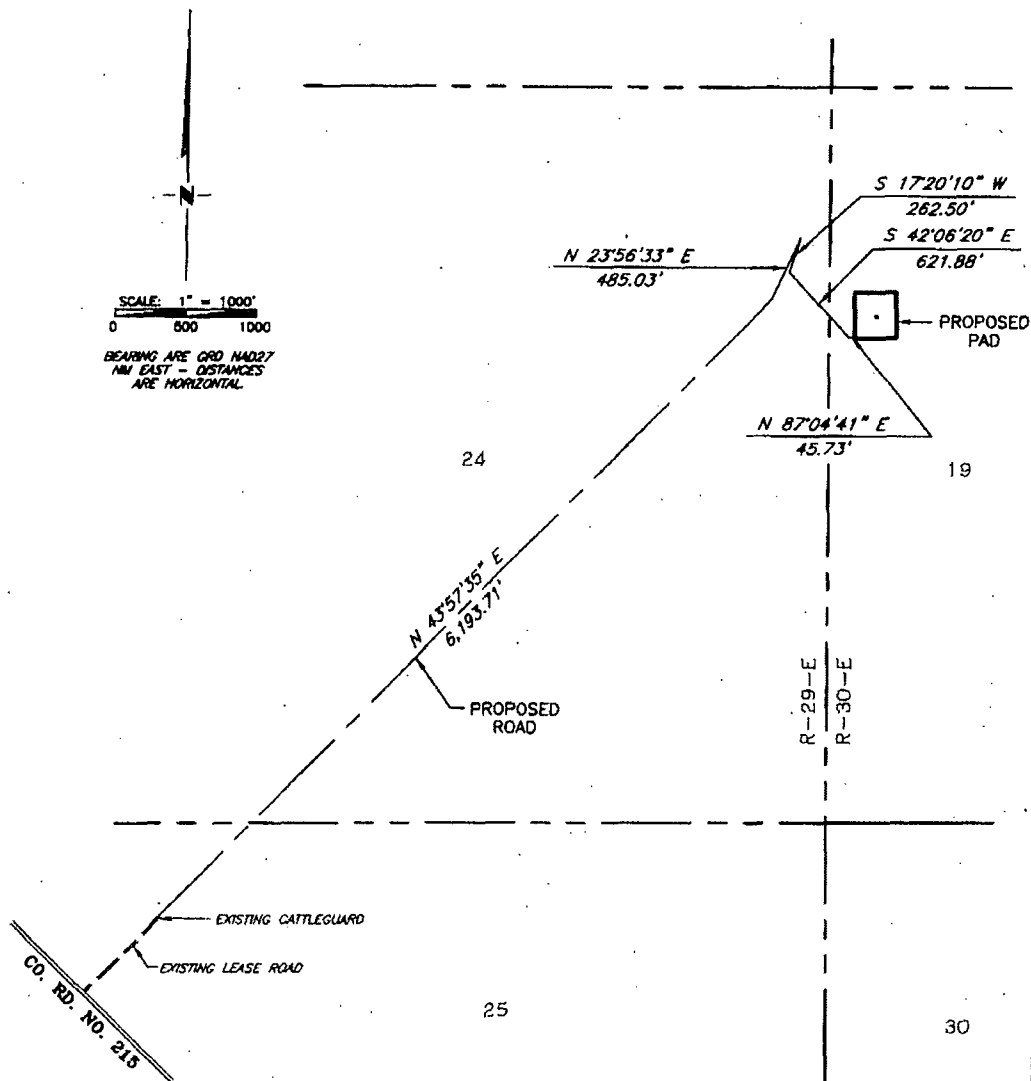
2251 Double Creek Drive, Suite 602, Round Rock, Texas 78664

o (512) 992-2087 f (512) 251-2518

SCALE: 1" = 1000'
DATE: 11/21/12
SURVEYED BY: RH/GB
DRAWN BY: LWB
APPROVED BY: LWB
SHEET : 1 OF 1

# COG OPERATING, LLC

Santa Elena 19 Fed. #1H  
(1650' FNL & 330' FWL)  
Section 19, T-16-S, R-30-E,  
N. M. P. M., Eddy Co., New Mexico



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NO.	REVISION	DATE
JOB NO.:	LS120016	
DWG. NO.:	120016PAD2	

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: 11/21/12
SURVEYED BY: RH/GB
DRAWN BY: LWB
APPROVED BY: LWB
SHEET : 2 OF 2

ATTACHMENT TO FORM 3160-3  
COG Operating, LLC  
SANTA ELENA 19 FEDERAL# 1H  
SHL: 1650' FNL & 330' FWL, LOT 2  
BHL: 1651' FNL & 330' FEL, Unit H  
Sec 19, T16S, R30E  
Eddy County, NM

1. Proration Unit Spacing: 160 Acres
2. Ground Elevation: 3740'
3. Proposed Depths: Pilot Hole TD: 5550' TVD/MD  
Horizontal: EOC (end of curve) TVD=4380' MD = 4650'  
Toe (end of lateral) TVD=4400' MD= 8679'
4. Estimated tops of geological markers:

Rustler	320'
Top of Salt	430'
Base of Salt	1060'
Yates	1175'
Seven Rivers	1415'
Queen	1980'
Grayburg	2395'
San Andres	2760'
Glorieta	4160'
Paddock	4210'
Blinbry	4450'
Tubb	5450'

5. Possible mineral bearing formations:

Water Sand	110'	Fresh Water
Grayburg	2395'	
San Andres	2760'	
Glorieta	4160'	
Paddock	4210'	
Blinbry	4450'	
Tubb	5450'	

No other formations are expected to give up oil, gas or fresh water in measurable quantities. Setting 13 3/8" casing to 345' (25' into Rustler) and circulating cement back to the surface will protect the surface fresh water sand. The Salt Section will be protected by setting 9 5/8" casing to 2700' and circulating cement back to surface in a single or multi-stage job and/or with an ECP. Any shallower zones above TD, which contain commercial quantities of oil and/or gas, will have cement circulated across them. This will be achieved by cementing 7" x 5 1/2" tapered production casing from the TD to surface in two stages with DV Tool and ECP set at KOP. At KOP the production casing string will crossover from 7" to 5 1/2". First stage will be from TD to KOP and second stage will be from KOP to surface. If wellbore conditions arise that require immediate action and/or a change to this program, COG Operating LLC personnel will always react to protect the wellbore and/or environment.

5 7/8" pilot hole will be drilled from 3750' (150' above KOP) to 5550'. After logging, the pilot hole will be plugged back to 3750' TVD (150' above KOP) using approx 800 sks Class "C" cement containing 0.3% R-3 & 1.5% CD-32. Yield 0.99 cu.ft./sk and wt 16.8 ppg. Plug back cement calculated using 25% excess.

**ATTACHMENT TO FORM 3160-3**  
**COG Operating, LLC**  
**Santa Elena 19 Federal #1H**  
**Page 2 of 6**

**6. Proposed Mud System**

The well will be drilled to TD with a combination of fresh water, brine, cut brine and polymer mud systems. The applicable depths and properties of these systems are as follows:

See COA

DEPTH (MD)	TYPE	WEIGHT	VISCOSITY	WATERLOSS
0-345' 400	Fresh Water	8.5	28	N.C.
345'-2700'	Brine	10	30	N.C.
2700'-3902'	Cut Brine	8.7-9.2	30	N.C.
3902'-4650'	Cut Brine/polymer mud	8.7-9.2	30	N.C.
4650'-8679'	Cut Brine/polymer mud	8.7-9.2	30	N.C.

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

**6. Proposed Casing Program**

See COA

Hole Size	Interval MD	OD Casing	Weight	Grade	Condition	Jt.	brst/clps/ten
17 1/2"	0-345' 400	13 3/8"	48#	H-40/J-55 Hybrid	New	ST&C	4.73/4.75/21.1
12 1/4"	345'-2700'	9 5/8"	40#	J/K-55	New	ST&C	1.95/1.83/4.81
8 3/4"	2700'-3902'	7"	26#	L-80	New	LT&C	1.45/2.90/5.86
8 3/4"	3902'-4650'	5 1/2"	17#	L-80	New	LT&C	1.55/2.99/5.26
7 7/8"	4650'-8679'	5 1/2"	17#	L-80	New	LT&C	1.55/2.99/5.26

Production string will be a tapered string with 7" 26# L-80 LTC run from surface to kick off point (3902') and then crossed over to 5 1/2" 17# L-80 LTC.



ATTACHMENT TO FORM 3160-3  
COG Operating, LLC  
Santa Elena 19 Federal #1H  
Page 3 of 6

## 7. Proposed Cement Program

### 13 3/8" SURFACE: (Circulate to Surface)

Lead: 0'-345'	425 sks	Class "C" w/2% CaCl <sub>2</sub> +	1.32 cf/sk	14.8 ppg
Excess 104%		0.25 pps CF		

### 9 5/8" INTERMEDIATE:

#### Option #1: Single Stage (Circulate to Surface)

Lead:	500 sks	50:50:10 C:Poz:Gel	2.45 cf/sk	11.8 ppg
0'-2000'		w/ 5% Salt+ 0.25% CF		
Excess 89%		+5 pps LCM		

Tail:	300 sks	Class C w/2% CaCl <sub>2</sub>	1.32 cf/sk	14.8 ppg
2000'-2700'				
Excess 68%				

450

#### Option #2: Multi-stage w/ DV Tool @ +/- 395' (DV Tool 50' below 13 3/8" csg. Shoe) (Circulate to Surface)

##### Stage #1:

Lead:				
395'-2000'	400 sks	50:50:10 C:Poz:Gel w/5%	2.45 cf/sk	11.8 ppg
Excess 95%		Salt +5 pps LCM +		
		0.25 pps CF		

Tail:				
2000'-2700'	300 sks	Class "C" w/2% CaCl <sub>2</sub>	1.32 cf/sk	14.8 ppg
Excess 68%				

##### Stage #2

0'-395'	200 sks	50:50:10 C:Poz:Gel w/5%	2.45 cf/sk	11.8 ppg
Excess 237%		salt+ 5 pps LCM +		
		0.25 pps CF		

Note: Multi-stage tool to be set depending on hole conditions at approximately 395' (50' below the surface casing shoe). Cement volumes will be adjusted proportionately for depth changes of multi-stage tool.

**ATTACHMENT TO FORM 3160-3**  
**COG Operating, LLC**  
**Santa Elena 19 Federal #1H**  
**Page 4 of 6**

**7" X 5 1/2" TAPERED PRODUCTION CASING:**

**Option #1: Single Stage (Cement cal to surface)**

1st Lead:	400 sks	35:65:6 C:Poz Gel w/5% salt+ 5 pps LCM+ 0.2 % SMS+ 0.3% FL-52A+ 0.125 pps CF	2.05 cf/sk	12.5 ppg
0'-2900'				
Excess 76%				
2 <sup>nd</sup> Lead:	400 sks	50:50:2 C:Poz Gel w/5% salt+ 3 pps LCM+ 0.6 % SMS+ 0.125 pps CF+1% FL-25+ 1% BA-58	1.37 cf/sk	14.0 ppg
2900'-3902'				
Excess 244%				
Tail:	550 sks	Class "H" SOLUCEM-H w/0.7% HR-601	2.62 cf/sk	15.0 ppg
3902'-8679'				
Excess 62%				

**Option #2: Multi-stage (2 Stages) w/DV Tool & ECP@ +/-3902'**  
**(Cement calculated to surface)**

**Stage #1:**

Tail:	550 sks	Class "H" SOLUCEM-H w/0.7% HR-601	2.62 cf/sk	15.0 ppg
3902'-8679'				
Excess 62%				

**Stage #2: 2<sup>nd</sup> DV Tool & ECP @ +/-3902'**

Lead:	400 sks	35:65:6 C:Poz Gel w/5% salt+ 5 pps LCM+ 0.2 % SMS+ 0.3% FL-52A+ 0.125 pps CF	2.05 cf/sk	12.5 ppg
0'-2900'				
Excess 248%				
Tail:	400 sks	50:50:2 C:Poz Gel w/5% salt+ 3 pps LCM+ 0.6 % SMS+ 0.125 pps CF+1% FL-25+ 1% BA-58	1.37 cf/sk	14.0 ppg
2900'-3902'				
Excess 33%				

**ATTACHMENT TO FORM 3160-3**  
**COG Operating, LLC**  
**Santa Elena 19 Federal #1H**  
**Page 5 of 6**

Note: 5 ½" casing will be run from KOP at 3902' thru curve and lateral to TD of 8679' MD. Productive intervals will be isolated by cement as described above..

Note: FL-52A is fluid loss additive, R-3 is retarder.

Note: Multi-stage tool & ECP to be set depending on hole conditions at approximately 3902'. Cement volumes will be adjusted proportionately for depth changes of multi-stage tool.

**8. Pressure Control Equipment:**

The blowout preventer equipment (BOP) shown in Exhibit #9 will consist of a double ram-type (2000 psi WP) preventer, and in some cases possibly a 2000 psi Hydril type annular preventer as provided for in Onshore Order #2. This unit will be hydraulically operated and the ram type preventer will be equipped with blind rams on top and 4 1/2" drill pipe rams on the bottom. A 13-5/8" BOP will be used during the drilling of the well. A 13 5/8" permanent casing head will be installed on the 13 3/8" casing. The BOP will be nipped up on the 13 5/8" permanent casing head and tested to 2000 psig. After setting 9-5/8", permanent "B section" well head will be installed and the BOP will then be nipped up on the permanent B . BOP and well head will be tested by a third party to 2000 psig and used continuously until total depth is reached. 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, choke lines and a choke manifold with a 2000 psi WP rating all of which will also be tested to working pressure by independent tester also.

**9. Production Hole Drilling Summary:**

**Drill 8¾" hole to 3902'. Kick off at +/- 3902', building curve at 12°/100' over +/- 758' to horizontal at 4650' MD/4380'TVD. Reduce hole size and drill 7 7/8" lateral section in a easterly direction for +/-4029' lateral to TD at +/-8679' MD, 4400' TVD. Run 7" x 5-1/2" production casing. 7" to be run from surface to kickoff point and then changed over to 5 ½". 5 ½" casing will be run from kickoff point to td and both strings will be isolated by either a single stage or multi-stage cement jobs Cement will be circulated to surface.**

**10. Auxiliary Well Control and Monitoring Equipment**

- A. Kelly cock will be kept in the drill string at all times.
- B. A full opening drill pipe-stabbing valve with proper drill pipe connections will be on the rig floor at all times.

**ATTACHMENT TO FORM 3160-3  
COG Operating, LLC  
Santa Elena 19 Federal #1H  
Page 6 of 6**

**11. Logging, Testing and Coring Program:**

- A. The following logs will be run in the vertical portion of the hole to KOP: SLB-PEX/HRLA,HNGS.
- B. The mud logging program will consist of lagged 10' samples from KOP to TD in Horizontal hole.
- C. Drill Stem test is not anticipated.
- D. No conventional coring is anticipated.
- E. Further testing procedures will be determined after the 7" x 5 1/2" production casing has been cemented at TD based on drill shows and log evaluation.

**12. Abnormal Conditions, Pressures, Temperatures and Potential Hazards:**

No abnormal pressures or temperatures are anticipated. The estimated bottom hole temperature is 93° Fahrenheit and estimated maximum bottom hole pressure is 2444 psi(pilot hole TD). Maximum BHP for lateral is 1936 psi. estimated BHT is 87° Fahrenheit . Wells in the High Lonesome area will penetrate formations that are known or could reasonably be expected to contain Hydrogen Sulfide. Measurable gas volumes or Hydrogen Sulfide levels have not been encountered during drilling operations in this area, However as per Onshore order No. 6 a H2S drilling operations plan is included with this APD. No major loss circulation zones have been reported in offsetting wells.

**13. Anticipated Starting Date**

Drilling operations will commence approximately on approximately December 7, 2012 with drilling and completion operations lasting approximately 90 days.

# Plan Proposal

FOR

**COG Operating, LLC  
Santa Elena 19 Federal #1H  
Eddy Co., NM**

Design #1

Presented By:

---

Aaron Boger  
Account Manager

---

Dusty Moyer  
Well Planner

**SHL  
1650' FNL & 330' FWL  
Penetration Point  
1651' FNL 2394' FWL  
PBHL  
1651' FNL & 330' FEL  
SEC.19-T16S-R30E**

# Attcher



Site: Sec. 19-T16S-R30E  
Well: Santa Elena 19 Federal #1H  
Wellbore: Wellbore #1  
Design: Design #1  
Lat: 32° 54' 34.919 N  
Long: 104° 1' 4.932 W  
GL: 3740.00  
KB: WELL @ 3757.00usft (Original Well Elev)

#### SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3902.15	0.00	0.00	3902.15	0.00	0.00	0.00	0.00	0.00	KOP 12°/100
4649.73	89.71	89.90	4379.61	0.85	475.05	12.00	89.90	475.05	EOC / Hold to TD
8678.94	89.71	89.90	4400.00	8.10	4504.20	0.00	0.00	4504.21	TD at 8678.94

#### WELL DETAILS: Santa Elena 19 Federal #1H

+N/-S	+E/-W	Northing	Ground Level:	3740.00	Longitude	Slot
0.00	0.00	694805.100	Easting	596763.200	32° 54' 34.919 N	104° 1' 4.932 W

#### PROJECT DETAILS: Eddy County(NM27E)

Geodetic System: US State Plane 1927 (Exact solution)  
Datum: NAD 1927 (NADCON CONUS)  
Ellipsoid: Clarke 1866  
Zone: New Mexico East 3001

System Datum: Mean Sea Level

#### SITE DETAILS: Sec.19-T16S-R30E

Site Centre Latitude: 32° 54' 34.919 N  
Longitude: 104° 1' 4.932 W

Positional Uncertainty: 0.00  
Convergence: 0.17  
Local North: Grid

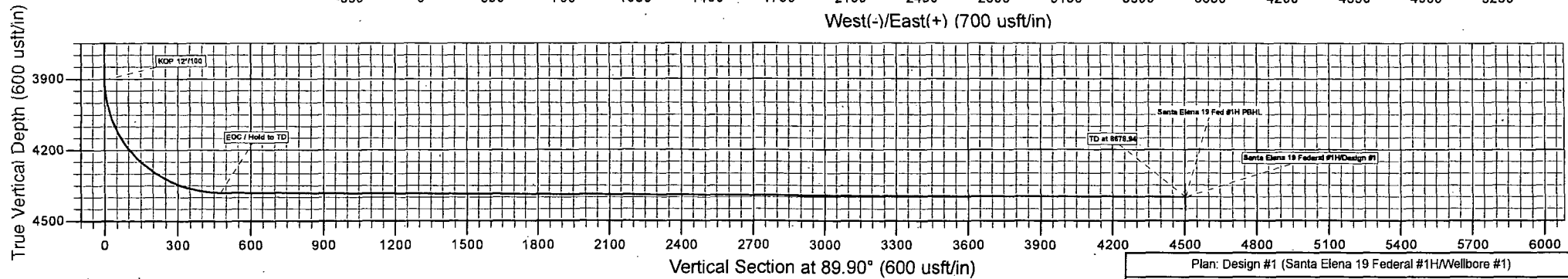
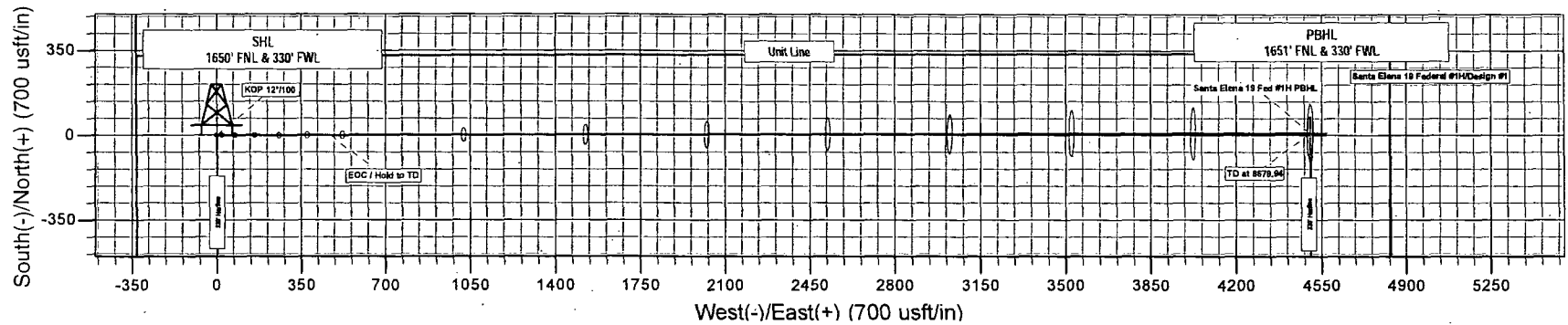
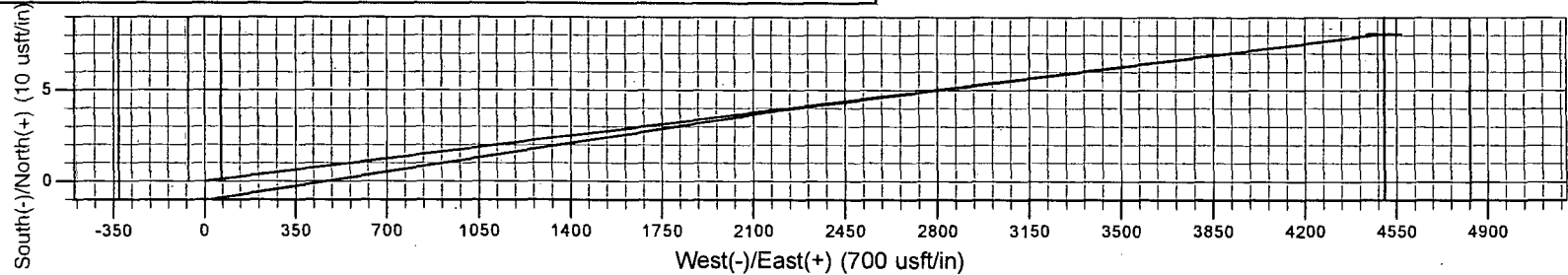
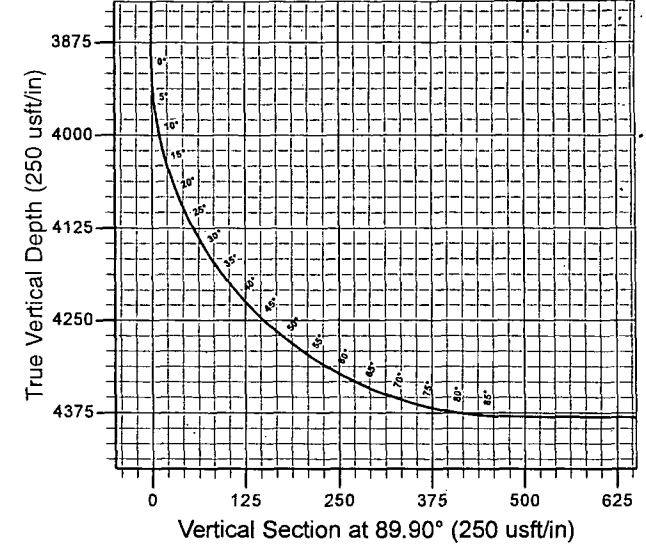
#### WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Santa Elena 19 Fed #1H PBHL4400.00	8.10	4504.20	32° 54' 34.863 N	104° 0' 12.097 W	Point	



Azimuths to Grid North  
True North: -0.17°  
Magnetic North: 7.50°

Magnetic Field  
Strength: 48831.9snT  
Dip Angle: 60.71°  
Date: 11/26/2012  
Model: IGRF2010



Plan: Design #1 (Santa Elena 19 Federal #1H/Wellbore #1)

Created By: Lando Hiler Date: 15:44, November 26 2012

# Archer

## **COG Operating, LLC**

**Eddy County(NM27E)**

**Sec.19-T16S-R30E**

**Santa Elena 19 Federal #1H**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**26 November, 2012**



Database:	EDMDBBW	Local Co-ordinate Reference:	Well Santa Elena 19 Federal #1H
Company:	COG Operating, LLC	TVD Reference:	WELL @ 3757.00usft (Original Well Elev)
Project:	Eddy County(NM27E)	MD Reference:	WELL @ 3757.00usft (Original Well Elev)
Site:	Sec.19-T16S-R30E	North Reference:	Grid
Well:	Santa Elena 19 Federal #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Eddy County(NM27E), Surface Location: 915'FSL & 400'FWL, Top of Paddock 4000'TVD		
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	Sec.19-T16S-R30E		
Site Position:		Northing:	694,805.100 usft
From:	Map	Easting:	596,763.200 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"
		Latitude:	32° 54' 34.919 N
		Longitude:	104° 1' 4.932 W
		Grid Convergence:	0.17 °

Well	Santa Elena 19 Federal #1H		
Well Position	+N/-S	0.00 usft	Northing: 694,805.100 usft
	+E/-W	0.00 usft	Easting: 596,763.200 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 54' 34.919 N
		Longitude:	104° 1' 4.932 W
		Ground Level:	3,740.00 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010	11/26/12	7.67
			Dip Angle
			60.71
			Field Strength
			48,832

Design	Design #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			89.90

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,902.15	0.00	0.00	3,902.15	0.00	0.00	0.00	0.00	0.00	0.00	
4,649.73	89.71	89.90	4,379.61	0.85	475.05	12.00	12.00	0.00	89.90	Santa Elena 19 Fed #
8,678.94	89.71	89.90	4,400.00	8.10	4,504.20	0.00	0.00	0.00	0.00	Santa Elena 19 Fed #



Database:	EDMDBBW	Local Co-ordinate Reference:	Well-Santa Elena 19 Federal #1H
Company:	COG Operating, LLC	TVD Reference:	WELL @ 3757.00usft (Original Well Elev)
Project:	Eddy County(NM27E)	MD Reference:	WELL @ 3757.00usft (Original Well Elev)
Site:	Sec.19-T16S-R30E	North Reference:	Grid
Well:	Santa Elena 19 Federal #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

## Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP-12°/100'									
3,902.15	0.00	0.00	3,902.15	0.00	0.00	0.00	0.00	0.00	0.00
3,925.00	2.74	89.90	3,924.99	0.00	0.55	0.55	12.00	12.00	0.00
3,950.00	5.74	89.90	3,949.92	0.00	2.40	2.40	12.00	12.00	0.00
3,975.00	8.74	89.90	3,974.72	0.01	5.55	5.55	12.00	12.00	0.00
4,000.00	11.74	89.90	3,999.32	0.02	9.99	9.99	12.00	12.00	0.00
4,025.00	14.74	89.90	4,023.65	0.03	15.72	15.72	12.00	12.00	0.00
4,050.00	17.74	89.90	4,047.65	0.04	22.71	22.71	12.00	12.00	0.00
4,075.00	20.74	89.90	4,071.25	0.06	30.95	30.95	12.00	12.00	0.00
4,100.00	23.74	89.90	4,094.39	0.07	40.41	40.41	12.00	12.00	0.00
4,125.00	26.74	89.90	4,117.00	0.09	51.07	51.07	12.00	12.00	0.00
4,150.00	29.74	89.90	4,139.02	0.11	62.90	62.90	12.00	12.00	0.00
4,175.00	32.74	89.90	4,160.39	0.14	75.86	75.86	12.00	12.00	0.00
4,200.00	35.74	89.90	4,181.05	0.16	89.93	89.93	12.00	12.00	0.00
4,225.00	38.74	89.90	4,200.95	0.19	105.06	105.06	12.00	12.00	0.00

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Santa Elena 19 Federal #1H
Company:	COG Operating, LLC	TVD Reference:	WELL @ 3757.00usft (Original Well Elev)
Project:	Eddy County(NM27E)	MD Reference:	WELL @ 3757.00usft (Original Well Elev)
Site:	Sec 19-T16S-R30E	North Reference:	Grid
Well:	Santa Elena 19 Federal #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

## Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,250.00	41.74	89.90	4,220.04	0.22	121.20	121.20	12.00	12.00	0.00
4,275.00	44.74	89.90	4,238.24	0.25	138.33	138.33	12.00	12.00	0.00
4,300.00	47.74	89.90	4,255.53	0.28	156.38	156.38	12.00	12.00	0.00
4,325.00	50.74	89.90	4,271.85	0.32	175.32	175.32	12.00	12.00	0.00
4,350.00	53.74	89.90	4,287.16	0.35	195.08	195.08	12.00	12.00	0.00
4,375.00	56.74	89.90	4,301.41	0.39	215.62	215.62	12.00	12.00	0.00
4,400.00	59.74	89.90	4,314.57	0.43	236.87	236.87	12.00	12.00	0.00
4,425.00	62.74	89.90	4,326.59	0.47	258.79	258.79	12.00	12.00	0.00
4,450.00	65.74	89.90	4,337.46	0.51	281.30	281.30	12.00	12.00	0.00
4,475.00	68.74	89.90	4,347.13	0.55	304.35	304.35	12.00	12.00	0.00
4,500.00	71.74	89.90	4,355.58	0.59	327.88	327.88	12.00	12.00	0.00
4,525.00	74.74	89.90	4,362.78	0.63	351.81	351.81	12.00	12.00	0.00
4,550.00	77.74	89.90	4,368.73	0.68	376.09	376.09	12.00	12.00	0.00
4,575.00	80.74	89.90	4,373.40	0.72	400.65	400.65	12.00	12.00	0.00
4,600.00	83.74	89.90	4,376.77	0.77	425.42	425.42	12.00	12.00	0.00
4,625.00	86.74	89.90	4,378.84	0.81	450.33	450.33	12.00	12.00	0.00
EOC / Hold to TD									
4,649.73	89.71	89.90	4,379.61	0.85	475.05	475.05	12.00	12.00	0.00
4,700.00	89.71	89.90	4,379.86	0.94	525.31	525.31	0.00	0.00	0.00
4,800.00	89.71	89.90	4,380.37	1.12	625.31	625.31	0.00	0.00	0.00
4,900.00	89.71	89.90	4,380.88	1.30	725.31	725.31	0.00	0.00	0.00
5,000.00	89.71	89.90	4,381.38	1.48	825.31	825.31	0.00	0.00	0.00
5,100.00	89.71	89.90	4,381.89	1.66	925.31	925.31	0.00	0.00	0.00
5,200.00	89.71	89.90	4,382.39	1.84	1,025.31	1,025.31	0.00	0.00	0.00
5,300.00	89.71	89.90	4,382.90	2.02	1,125.30	1,125.31	0.00	0.00	0.00
5,400.00	89.71	89.90	4,383.41	2.20	1,225.30	1,225.31	0.00	0.00	0.00
5,500.00	89.71	89.90	4,383.91	2.38	1,325.30	1,325.30	0.00	0.00	0.00
5,600.00	89.71	89.90	4,384.42	2.56	1,425.30	1,425.30	0.00	0.00	0.00
5,700.00	89.71	89.90	4,384.92	2.74	1,525.30	1,525.30	0.00	0.00	0.00
5,800.00	89.71	89.90	4,385.43	2.92	1,625.30	1,625.30	0.00	0.00	0.00
5,900.00	89.71	89.90	4,385.94	3.10	1,725.30	1,725.30	0.00	0.00	0.00
6,000.00	89.71	89.90	4,386.44	3.28	1,825.29	1,825.30	0.00	0.00	0.00
6,100.00	89.71	89.90	4,386.95	3.46	1,925.29	1,925.30	0.00	0.00	0.00
6,200.00	89.71	89.90	4,387.46	3.64	2,025.29	2,025.29	0.00	0.00	0.00
6,300.00	89.71	89.90	4,387.96	3.82	2,125.29	2,125.29	0.00	0.00	0.00
6,400.00	89.71	89.90	4,388.47	4.00	2,225.29	2,225.29	0.00	0.00	0.00
6,500.00	89.71	89.90	4,388.97	4.18	2,325.29	2,325.29	0.00	0.00	0.00
6,600.00	89.71	89.90	4,389.48	4.36	2,425.29	2,425.29	0.00	0.00	0.00
6,700.00	89.71	89.90	4,389.99	4.54	2,525.28	2,525.29	0.00	0.00	0.00
6,800.00	89.71	89.90	4,390.49	4.72	2,625.28	2,625.29	0.00	0.00	0.00
6,900.00	89.71	89.90	4,391.00	4.90	2,725.28	2,725.29	0.00	0.00	0.00
7,000.00	89.71	89.90	4,391.50	5.08	2,825.28	2,825.28	0.00	0.00	0.00
7,100.00	89.71	89.90	4,392.01	5.26	2,925.28	2,925.28	0.00	0.00	0.00
7,200.00	89.71	89.90	4,392.52	5.44	3,025.28	3,025.28	0.00	0.00	0.00
7,300.00	89.71	89.90	4,393.02	5.62	3,125.28	3,125.28	0.00	0.00	0.00
7,400.00	89.71	89.90	4,393.53	5.80	3,225.27	3,225.28	0.00	0.00	0.00
7,500.00	89.71	89.90	4,394.04	5.98	3,325.27	3,325.28	0.00	0.00	0.00
7,600.00	89.71	89.90	4,394.54	6.16	3,425.27	3,425.28	0.00	0.00	0.00
7,700.00	89.71	89.90	4,395.05	6.34	3,525.27	3,525.28	0.00	0.00	0.00
7,800.00	89.71	89.90	4,395.55	6.52	3,625.27	3,625.27	0.00	0.00	0.00
7,900.00	89.71	89.90	4,396.06	6.70	3,725.27	3,725.27	0.00	0.00	0.00
8,000.00	89.71	89.90	4,396.57	6.88	3,825.27	3,825.27	0.00	0.00	0.00
8,100.00	89.71	89.90	4,397.07	7.06	3,925.26	3,925.27	0.00	0.00	0.00

Database:	EDMDBBW	Local Co-ordinate Reference:	Well Santa Elena 19 Federal #1H
Company:	COG Operating, LLC	TVD Reference:	WELL @ 3757.00usft (Original Well Elev)
Project:	Eddy County(NM27E)	MD Reference:	WELL @ 3757.00usft (Original Well Elev)
Site:	Sec.19-T16S-R30E	North Reference:	Grid
Well:	Santa Elena 19 Federal #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,200.00	89.71	89.90	4,397.58	7.24	4,025.26	4,025.27	0.00	0.00	0.00
8,300.00	89.71	89.90	4,398.08	7.42	4,125.26	4,125.27	0.00	0.00	0.00
8,400.00	89.71	89.90	4,398.59	7.60	4,225.26	4,225.27	0.00	0.00	0.00
8,500.00	89.71	89.90	4,399.10	7.78	4,325.26	4,325.27	0.00	0.00	0.00
8,600.00	89.71	89.90	4,399.60	7.96	4,425.26	4,425.26	0.00	0.00	0.00
TD at 8678.94									
8,678.94	89.71	89.90	4,400.00	8.10	4,504.20	4,504.21	0.00	0.00	0.00

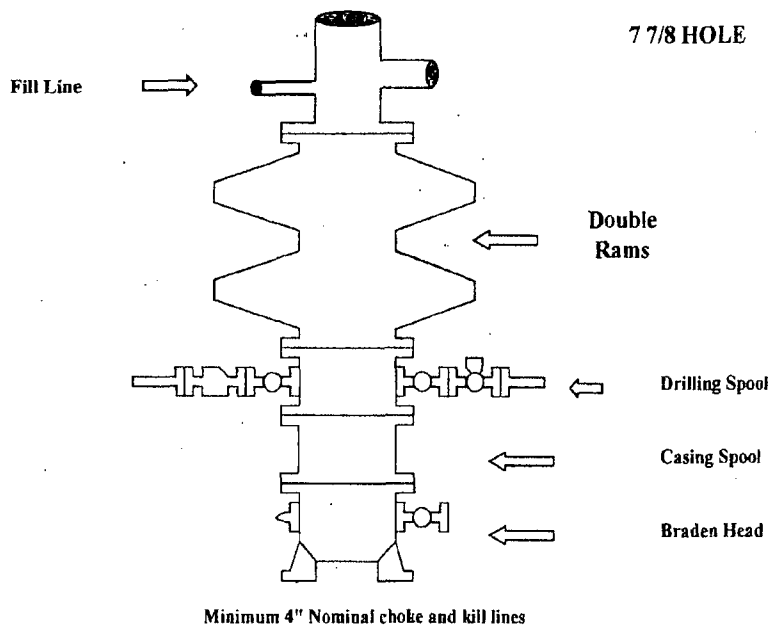
Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
hit/miss target									
Shape									
Santa Elena 19 Fed #1H	0.00	0.00	4,400.00	8.10	4,504.20	694,813.200	601,267.400	32° 54' 34.863 N	104° 0' 12.097 W
- plan hits target center									
- Point									

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,902.15	3,902.15	0.00	0.00	KOP 12°/100
4,649.73	4,379.61	0.85	475.05	EOC / Hold to TD
8,678.94	4,400.00	8.10	4,504.20	TD at 8678.94

# COG Operating LLC

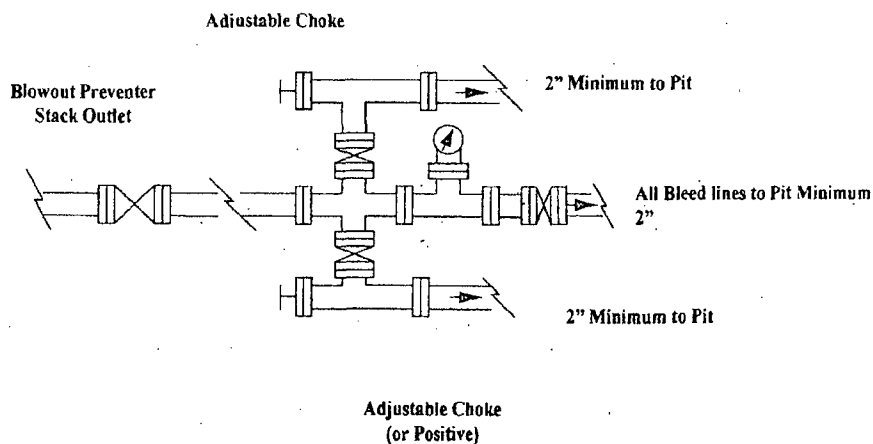
## Exhibit #9

### BOPE and Choke Schematic

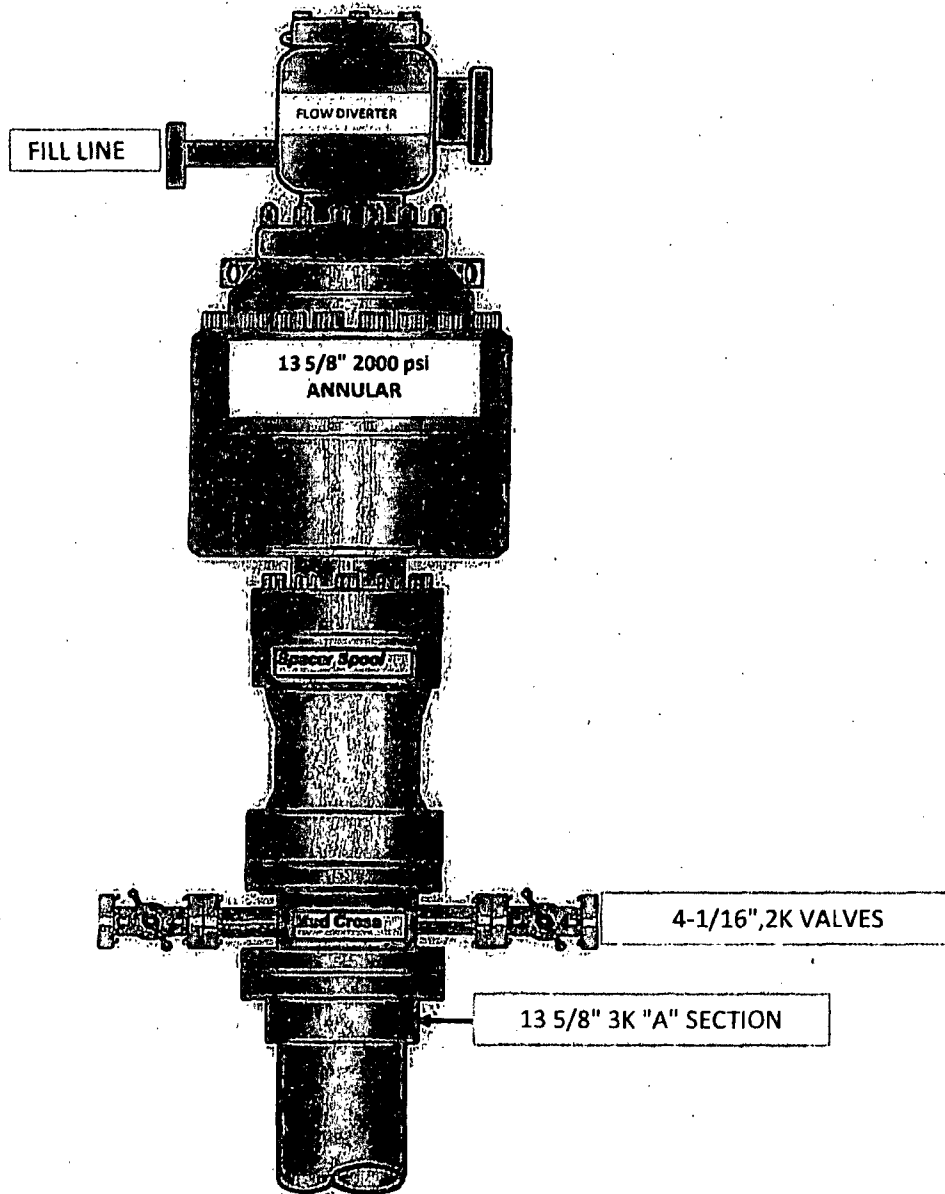


Minimum 4" Nominal choke and kill lines

Choke Manifold Requirement (2000 psi WP)  
No Annular Required



13 5/8" 2K ANNULAR

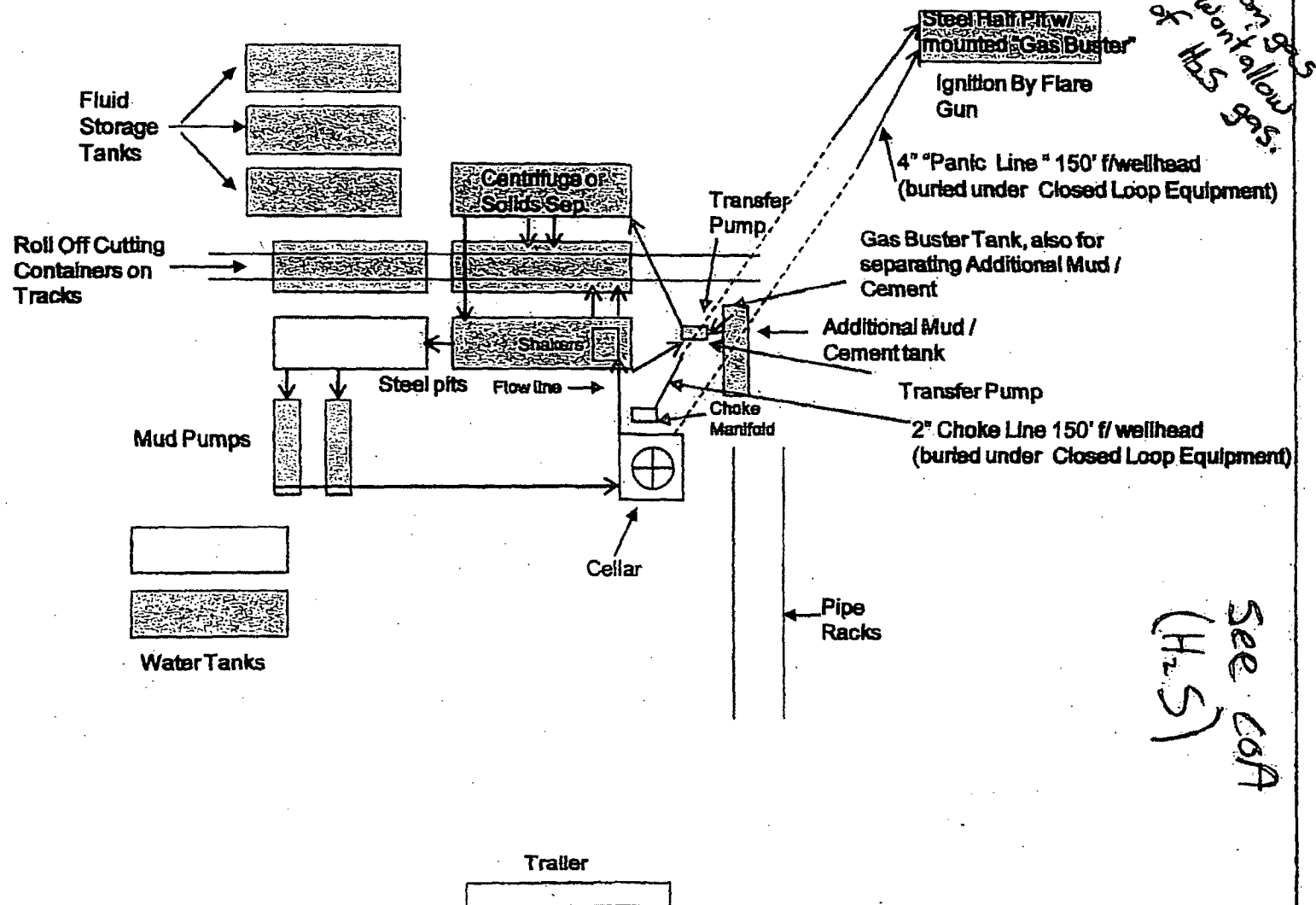


**NOTES REGARDING THE BLOWOUT PREVENTERS**

**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.

COG Operating LLC  
Closed Loop Equipment Diagram



## CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating LLC
LEASE NO.:	NM7724
WELL NAME & NO.:	1H Santa Elena 19 Federal
SURFACE HOLE FOOTAGE:	1650' FNL & 330' FWL
BOTTOM HOLE FOOTAGE:	1651' FNL & 330' FEL
LOCATION:	Section 19, T.16 S., R.30 E., NMPM
COUNTY:	Eddy County, New Mexico

### I. DRILLING

#### A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

- a. Spudding well
- b. Setting and/or Cementing of all casing strings
- c. BOPE tests

☒ **Eddy County**

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

1. **Although Hydrogen Sulfide has not been reported in the area, it is always a potential hazard. If Hydrogen Sulfide is encountered, please report measured amounts 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. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.
4. **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. 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.).

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

Wait on cement (WOC) time prior to drilling out for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. **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. See individual casing strings for details regarding lead cement slurry requirements.

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

**Possible lost circulation in the San Andres Formation.**

1. The 13-3/8 inch surface casing shall be set at **approximately 400 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt)** and cemented to the surface.
  - a. Effective June 6, 2012, the BLM will no longer approve a tag with 1" to determine cement top. 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
  - 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 is:

☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.

**Operator has proposed DV tool at depth of 450', 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.**

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 tie-back on the next stage.

b. Second stage above DV tool:

☒ Cement as proposed. Operator shall provide method of verification.

**The pilot hole plugging procedure is approved as written. Class H cement must be used.**

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

☒ Cement as proposed. Operator shall provide method of verification.

**Operator has proposed DV tool at depth of 3902', 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.**

c. 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 tie-back on the next stage.

d. Second stage above DV tool:

☒ Cement as proposed. Operator shall provide method of verification.

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. 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**.
  - a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.
3. 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**. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (18 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
  - c. The results of the test shall be reported to the appropriate BLM office.
  - d. 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.**
  - e. 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.

#### **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.

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