

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

NM OIL CONSERVATION

ARTESIA DISTRICT  
OCD Artesia  
JUN 15 2015

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.*

RECEIVED

**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		8. Well Name and No. PATRON 23 FEDERAL 4H
2. Name of Operator COG PRODUCTION LLC Contact: MAYTE X REYES E-Mail: mreyes1@concho.com		9. API Well No. 30-015-42451-00-X1
3a. Address 2208 W MAIN STREET ARTESIA, NM 88210	3b. Phone No. (include area code) Ph: 575.748.6945	10. Field and Pool, or Exploratory CORRAL DRAW
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 23 T25S R29E NENE 190FNL 660FEL 32.122101 N Lat, 103.948205 W Lon		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 APD
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

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 recomplate 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 recomplate 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.)

COG Production LLC, respectfully requests approval for the following changes to the original approved APD.

BHL:  
From BHL: 330? FSL & 660? FEL  
To BHL: 660? FSL & 660? FEL  
C102 attached.

**SEE ATTACHED FOR  
CONDITIONS OF APPROVAL**

Drilling Changes:  
Drilling program, directional plan, BOP and choke schematics attached.

Accepted for record  
NMOCD  
6/17/15

14. I hereby certify that the foregoing is true and correct.  
Electronic Submission #304048 verified by the BLM Well Information System  
For COG PRODUCTION LLC, sent to the Carlsbad  
Committed to AFMSS for processing by JENNIFER SANCHEZ on 06/05/2015 (15JAS0369SE)

Name (Printed/Typed) MAYTE X REYES	Title REGULATORY ANALYST
Signature (Electronic Submission)	Date 06/04/2015

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

Approved By _____	Title _____	Date JUN 8 2015
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 BUREAU OF LAND MANAGEMENT CARLSBAD FIELD 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.

**Additional data for EC transaction #304048 that would not fit on the form**

**32. Additional remarks, continued**

Formation:

From: WILLOW LAKE;BONE SPRING, SOUTHEAST [96217]

To: WC-015 G-07 S252923A;UPR WOLFCAMP [98138]

Flex Hose Variance attached.

**NM OIL CONSERVATION**

ARTESIA DISTRICT

JUN 15 2015

State of New Mexico  
Energy, Minerals & Natural Resources Department

Form C-102

**OIL CONSERVATION DIVISION**

Revised August 1, 2011

11885 SOUTH ST. FRANCIS DR.  
Santa Fe, New Mexico 87505

RECEIVED

Submit one copy to appropriate

**DISTRICT I**  
1823 N. FRENCH DR., HOBBES, NM 88240  
Phone: (505) 393-9101 Fax: (505) 393-9720

**DISTRICT II**  
1301 W. GRAND AVENUE, ARTESIA, NM 88210  
Phone: (505) 748-1283 Fax: (505) 748-9720

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

**DISTRICT IV**  
11885 S. ST. FRANCIS DR., SANTA FE, NM 87505  
Phone: (505) 476-3400 Fax: (505) 476-3482

AMENDED REPORT

**WELL LOCATION AND ACREAGE DEDICATION PLAT**

API Number 30-015-42451	Pool Code 98138	Pool Name WC-015 G-07 S252923A; Wolfcamp
Property Code 37491	Property Name PATRON 23 FEDERAL	Well Number 4H
OGRID No. 217955	Operator Name COG PRODUCTION, LLC	Elevation 3141.0

**Surface Location**

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	23	25-S	29-E		190	NORTH	660	EAST	EDDY

**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	County
P	23	25-S	29-E		660	SOUTH	660	EAST	EDDY

Dedicated Acres 320	Joint or Infill	Consolidation Code	Order No.
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**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**

<p>NAD 27 <u>SURFACE LOCATION</u> Y=408355.9 N X=619229.7 E LAT.=32.122101' N LONG.=103.948205' W</p> <p>NAD 27 <u>PROPOSED BOTTOM HOLE LOCATION</u> Y=403898.0 N X=619241.2 E LAT.=32.109846' N LONG.=103.948219' W</p>	<p>190' S.L.</p> <p>660'</p> <p>GRID AZ. = 179°51'10" HORZ. DIST. = 4458.0</p> <p>PRODUCING AREA PROTECT AREA</p> <p>B.H. 660'</p> <p>660'</p>	<p><b>OPERATOR CERTIFICATION</b></p> <p>I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p><i>Mayte Reyes</i> 6-4-15. Signature Date Mayte Reyes Printed Name mreyes1@concho.com E-mail Address</p>
		<p><b>SURVEYOR CERTIFICATION</b></p> <p>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.</p> <p>APRIL 24, 2013 Date of Survey</p> <p>Signature &amp; Seal of Professional Surveyor</p> <p><i>Chad L. Harcrow</i> 5/18/15 Certificate No. CHAD HARCROW 17777 W.O. # 15-635 DRAWN BY: AM</p>

## COG Operating LLC, Patron 23 Federal 4H

### 1. Geologic Formations

TVD of target	10,711'	Pilot hole depth	12,200'
MD at TD:	14,959'	Deepest expected fresh water:	60'

#### Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	718	Water	
Top of Salt	1222	Salt	
Lamar	3291		
Delaware Group	3310	Oil/Gas	
Bone Spring	7116	Oil/Gas	
Wolfcamp	10,306	Oil/Gas	
Penn Shale	12,046		
Strawn	12,786	Will Not Penetrate	
Middle Wolfcamp	10,711	Target Zone	
Pilot Hole TD	12,200		

\*H<sub>2</sub>S, water flows, loss of circulation, abnormal pressures, etc.

### 2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0	750	13.375"	54.5	J55	STC	3.184	1.748	16.856
12.25"	0	3300	9.625"	36	J55	LTC	1.294	0.719	3.813
8.75"	0	10,350	7"	29	HCP110	LTC	1.878	1.940	3.095
6.125"	9850	14,959	4.5"	13.5	HCP110	BTC	2.105	2.448	2.918
BLM Minimum Safety Factor							1.125	1.0	1.6 Dry 1.8 Wet

- 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.
- Explanation for SF's below BLM's minimum standards:
  - 9-5/8" Burst SF @ 0.719 – used BLM's frac gradient scenario to qualify.  
3520 psi/3300' = 1.06 > 0.7

**COG Operating LLC, Patron 23 Federal 4H**

	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. See assumptions above table.	N
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.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3 <sup>rd</sup> 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 2 <sup>nd</sup> 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**

Csg	#sx	Density ppg	Yield ft <sup>3</sup> /sx	H <sub>2</sub> O gal/sx	500# Comp Strength (hours)	Slurry Description
Sfc	350	13.5	1.75	9.2	13	Lead: Class C + 4% Gel + 2% CaCl <sub>2</sub>
	250	14.8	1.34	6.4	6	Tail: Class C + 2% CaCl <sub>2</sub>
Intrmd 1	950	13.5	1.75	9.2	15	Lead: Class C + 4% Gel
	250	14.8	1.34	6.4	6	Tail: Class C + 2% CaCl <sub>2</sub>
Intrmd 2	500	10.2	3.50	22.0	72	Lead: Tuned Light H Blend (FR, Retarder, FL adds as needed)
	200	16.4	1.10	4.3	12	Tail: Class H (FR, Retarder, FL adds as needed)
Prod	300	14.4	1.25	5.7	17	Lead: 50:50:2 H Blend (FR, Retarder, FL adds as needed)
	300	14.4	1.25	5.7	17	Tail: 50:50:2 H Blend (FR, FL adds as needed)

Casing String	TOC	% Excess
Surface	0'	50% on OH volumes
Intermediate 1	0'	35% on OH volumes
Intermediate 2	0'	35% on OH volumes
Production	9850' (@ Top of Liner)	35% on OH volumes

COG Operating LLC, Patron 23 Federal 4H

PHTD = 12,200'

KOP = 10,350'

*will need more cement. This is not adequate*

Plug top	Plug Bottom	% Excess	No. Sacks	Wt. lb/gal	Yld. ft <sup>3</sup> /sack	Water gal/sk	Slurry Description and Cement Type
10,350	11,300	10	225	17.2	0.99	5	Class H
11,300	12,200	10	225	17.2	0.99	.5	Class H

4. Pressure Control Equipment

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.
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BOP installed and tested before drilling which hole?	Size?	System Rated WP	Type	✓	Tested to:
12-1/4"	13-5/8"	2M	Annular	X	50% of working pressure  WP
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other*		
8-3/4"	11"	5M	Annular	X	50% testing pressure  WP
			Blind Ram	X	
			Pipe Ram	X	
			Double Ram		
			Other*		
6-1/8"	11"	5M	Annular	X	50% testing pressure  WP
			Blind Ram	X	
			Pipe Ram	X	
			Double Ram		
			Other*		

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.

**COG Operating LLC, Patron 23 Federal 4H**

Y	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.
Y	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.
	Are anchors required by manufacturer?
N	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. See attached schematic & Description.

**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 csg	Int 1 shoe	Saturated Brine	10.0-10.2	28-34	N/C
Int 1 shoe	Int 2 shoe	Cut Brine	8.7-9.3	28-34	N/C
Int 2 shoe	PHTD	Cut Brine	8.7-9.3	28-34	N/C
Int 2 shoe/KOP	TMD	OBM	11.0 – 14.0	40-60	10-50

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

Weighted OBM system will be used in the curve and lateral for shale stability, not for formation over pressure.

What will be used to monitor the loss or gain of fluid?	Pason PVT
---	-----------

**6. Logging and Testing Procedures**

Logging, Coring and Testing	
X	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No Logs are planned based on well control or offset log information.
	Drill stem test? If yes, explain
	Coring? If yes, explain

Additional logs planned	Interval
Resistivity	
Density	
CBL	
Mud log	
PEX	

COG Operating LLC, Patron 23 Federal 4H

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	5773 psi
Abnormal Temperature	No

Mitigation measure for abnormal conditions. Describe:  
No abnormal drilling conditions are expected to occur.

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.	
	H2S is present
X	H2S Contingency Plan Attached

8. Other Facets of Operation

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

Attachments:

- BOP & Choke Schematics
- Flex hose spec sheet & test chart
- Directional Plan



COG Production LLC  
 Project: Eddy County, NM  
 Site: Patron 23 Federal  
 Well: #4H  
 Wellbore: OH  
 Plan: Plan #1 (#4H/OH)

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	10228.5	0.00	0.00	10228.5	0.0	0.0	0.00	0.00	0.0	
3	10977.9	89.93	179.85	10706.0	-476.9	1.2	12.00	179.85	476.9	
4	14959.0	89.93	179.85	10711.0	-4457.9	11.5	0.00	0.00	4457.9	PBHL (P23F #4H/OH)

WELL DETAILS: #4H

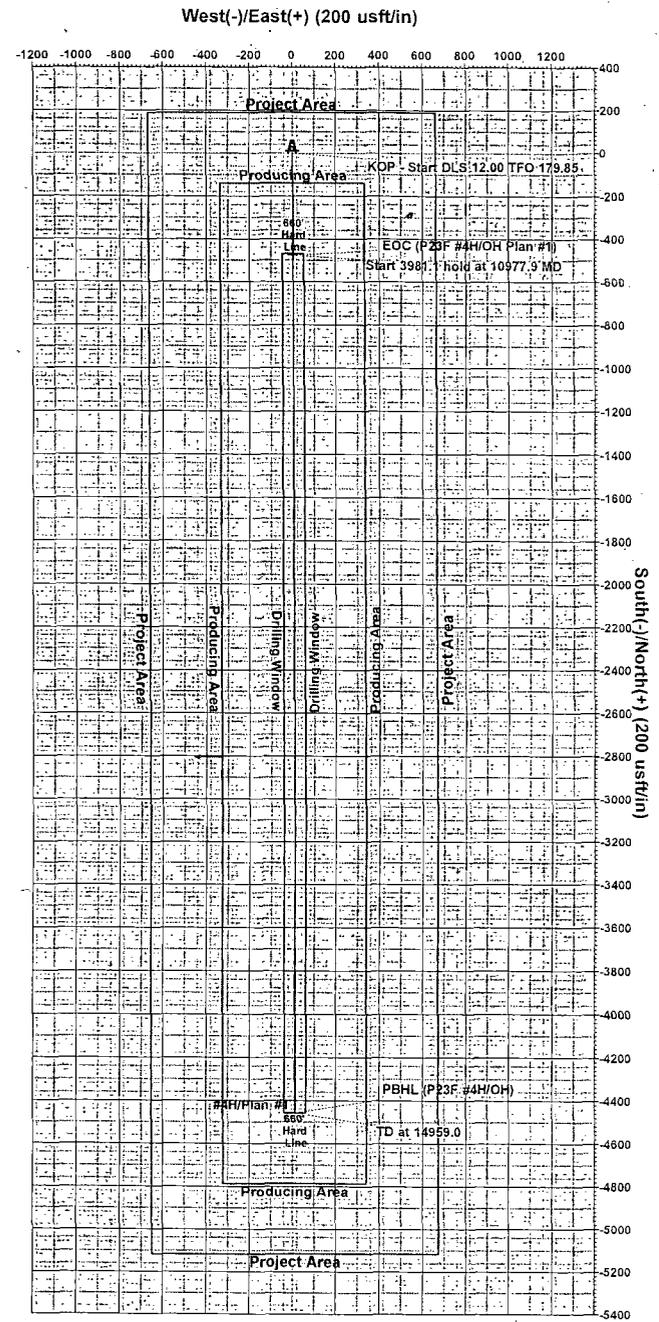
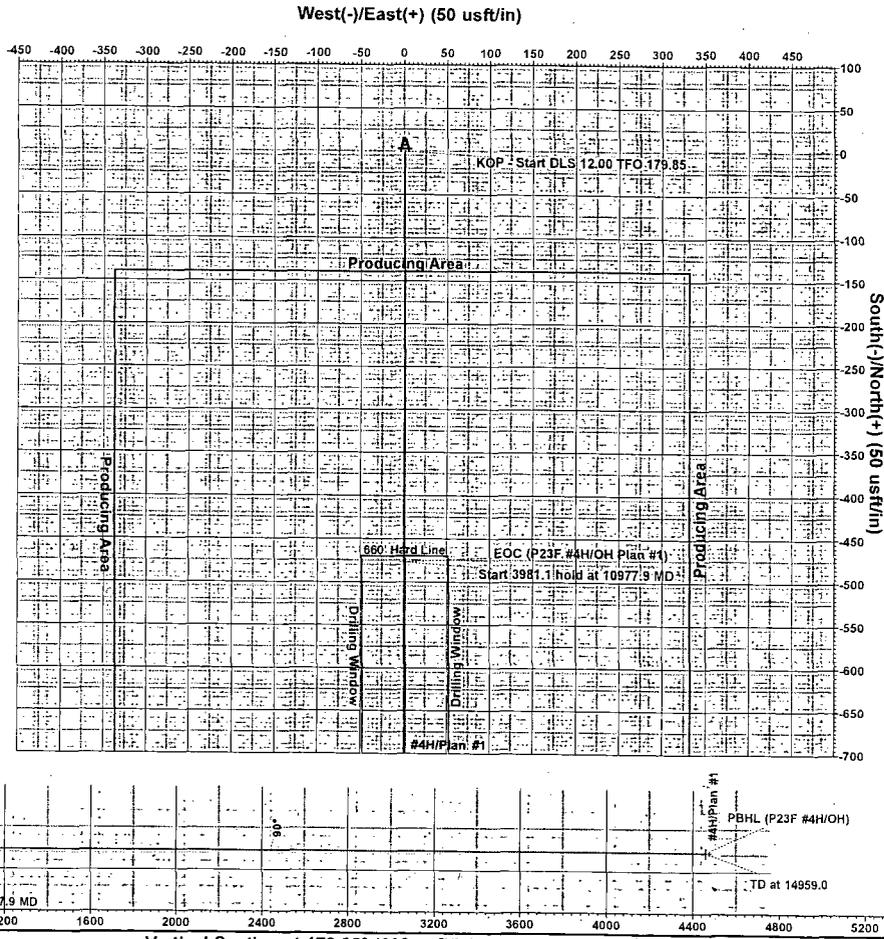
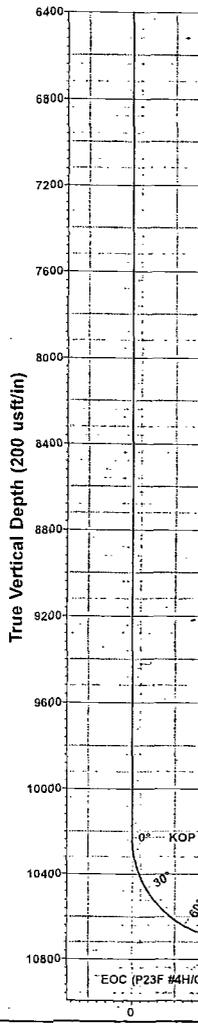
Ground Elevation:: 3141.0  
 RKB Elevation: KB @ 3166.0usft (Latshaw 44)  
 Rig Name: Latshaw 44

Northing 408355.90      Easting 619229.70      Latitude 32° 7' 19.564 N      Longitude 103° 56' 53.537 W



Azimuths to Grid North  
 True North: -0.20°  
 Magnetic North: 7.06°

Magnetic Field  
 Strength: 48121.5snT  
 Dip Angle: 59.93°  
 Date: 5/29/2015  
 Model: IGRF2010



Plan: Plan #1 (#4H/OH)  
 Created By: Well Planner Date: 13:38, May 29 2015

Terra Directional Services  
 322 Spring Hill Drive, Suite A100, Spring, Texas 77386  
 432.425.7532

PROJECT DETAILS: Eddy County, NM  
 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  
 Local North: Grid



## **COG Production LLC**

**Eddy County, NM**

**Patron 23 Federal**

**#4H**

**OH**

**Plan: Plan #1**

## **Standard Planning Report**

**29 May, 2015**





TDS  
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Patron 23 Federal
Company:	COG Production LLC	TVD Reference:	KB @ 3166.0usft (Latshaw 44)
Project:	Eddy County, NM	MD Reference:	KB @ 3166.0usft (Latshaw 44)
Site:	Patron 23 Federal	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Project:	Eddy County, NM		
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:	Patron 23 Federal				
Site Position:	From: Map	Northing:	408,355.90 usft	Latitude:	32° 7' 19.564 N
		Easting:	619,229.70 usft	Longitude:	103° 56' 53.537 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.20 °

Well:	#4H					
Well Position	+N/-S	0.0 usft	Northing:	408,355.90 usft	Latitude:	32° 7' 19.564 N
	+E/-W	0.0 usft	Easting:	619,229.70 usft	Longitude:	103° 56' 53.537 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,141.0 usft	

Wellbore:	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/29/2015	7.27	59.93	48,122

Design:	Plan #1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.0	
Vertical Section	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	179.85	

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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
10,228.5	0.00	0.00	10,228.5	0.0	0.0	0.00	0.00	0.00	0.00	
10,977.9	89.93	179.85	10,706.0	-476.9	1.2	12.00	12.00	24.00	179.85	
14,959.0	89.93	179.85	10,711.0	-4,457.9	11.5	0.00	0.00	0.00	0.00	PBHL (P23F #4H/OH)



TDS  
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Patron 23 Federal
Company:	COG Production LLC	TVD Reference:	KB @ 3166.0usft (Latshaw 44)
Project:	Eddy County, NM	MD Reference:	KB @ 3166.0usft (Latshaw 44)
Site:	Patron 23 Federal	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00	



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Patron 23 Federal
Company:	COG Production LLC	TVD Reference:	KB @ 3166.0usft (Latshaw 44)
Project:	Eddy County, NM	MD Reference:	KB @ 3166.0usft (Latshaw 44)
Site:	Patron 23 Federal	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #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)	
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,600.0	0.00	0.00	6,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,800.0	0.00	0.00	6,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,700.0	0.00	0.00	7,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,800.0	0.00	0.00	7,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
7,900.0	0.00	0.00	7,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,000.0	0.00	0.00	8,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,100.0	0.00	0.00	8,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,200.0	0.00	0.00	8,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,300.0	0.00	0.00	8,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,400.0	0.00	0.00	8,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,600.0	0.00	0.00	8,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,700.0	0.00	0.00	8,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,800.0	0.00	0.00	8,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
8,900.0	0.00	0.00	8,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,000.0	0.00	0.00	9,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,100.0	0.00	0.00	9,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,200.0	0.00	0.00	9,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,300.0	0.00	0.00	9,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,400.0	0.00	0.00	9,400.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,500.0	0.00	0.00	9,500.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,600.0	0.00	0.00	9,600.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,700.0	0.00	0.00	9,700.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,800.0	0.00	0.00	9,800.0	0.0	0.0	0.0	0.00	0.00	0.00	
9,900.0	0.00	0.00	9,900.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,000.0	0.00	0.00	10,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,100.0	0.00	0.00	10,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,200.0	0.00	0.00	10,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
10,228.5	0.00	0.00	10,228.5	0.0	0.0	0.0	0.00	0.00	0.00	
<b>KOP - Start DLS 12.00 TFO 179.85</b>										
10,250.0	2.58	179.85	10,250.0	-0.5	0.0	0.5	12.00	12.00	0.00	
10,275.0	5.58	179.85	10,274.9	-2.3	0.0	2.3	12.00	12.00	0.00	



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Patron 23 Federal
Company:	COG Production LLC	TVD Reference:	KB @ 3166.0usft (Latshaw 44)
Project:	Eddy County, NM	MD Reference:	KB @ 3166.0usft (Latshaw 44)
Site:	Patron 23 Federal	North Reference:	Grid
Well:	#4H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #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)
10,300.0	8.58	179.85	10,299.7	-5.3	0.0	5.3	12.00	12.00	0.00
10,325.0	11.58	179.85	10,324.3	-9.7	0.0	9.7	12.00	12.00	0.00
10,350.0	14.58	179.85	10,348.7	-15.4	0.0	15.4	12.00	12.00	0.00
10,375.0	17.58	179.85	10,372.7	-22.3	0.1	22.3	12.00	12.00	0.00
10,400.0	20.58	179.85	10,396.3	-30.5	0.1	30.5	12.00	12.00	0.00
10,425.0	23.58	179.85	10,419.5	-39.9	0.1	39.9	12.00	12.00	0.00
10,450.0	26.58	179.85	10,442.1	-50.5	0.1	50.5	12.00	12.00	0.00
10,475.0	29.58	179.85	10,464.2	-62.2	0.2	62.2	12.00	12.00	0.00
10,500.0	32.58	179.85	10,485.6	-75.1	0.2	75.1	12.00	12.00	0.00
10,525.0	35.58	179.85	10,506.3	-89.1	0.2	89.1	12.00	12.00	0.00
10,550.0	38.58	179.85	10,526.3	-104.2	0.3	104.2	12.00	12.00	0.00
10,575.0	41.58	179.85	10,545.4	-120.3	0.3	120.3	12.00	12.00	0.00
10,600.0	44.58	179.85	10,563.6	-137.4	0.4	137.4	12.00	12.00	0.00
10,625.0	47.58	179.85	10,581.0	-155.4	0.4	155.4	12.00	12.00	0.00
10,650.0	50.58	179.85	10,597.3	-174.3	0.4	174.3	12.00	12.00	0.00
10,675.0	53.58	179.85	10,612.7	-194.0	0.5	194.0	12.00	12.00	0.00
10,700.0	56.58	179.85	10,627.0	-214.5	0.6	214.5	12.00	12.00	0.00
10,725.0	59.58	179.85	10,640.2	-235.7	0.6	235.7	12.00	12.00	0.00
10,750.0	62.58	179.85	10,652.3	-257.6	0.7	257.6	12.00	12.00	0.00
10,775.0	65.58	179.85	10,663.3	-280.1	0.7	280.1	12.00	12.00	0.00
10,800.0	68.58	179.85	10,673.0	-303.1	0.8	303.1	12.00	12.00	0.00
10,825.0	71.58	179.85	10,681.5	-326.6	0.8	326.6	12.00	12.00	0.00
10,850.0	74.58	179.85	10,688.8	-350.5	0.9	350.5	12.00	12.00	0.00
10,875.0	77.58	179.85	10,694.8	-374.8	1.0	374.8	12.00	12.00	0.00
10,900.0	80.58	179.85	10,699.5	-399.3	1.0	399.3	12.00	12.00	0.00
10,925.0	83.58	179.85	10,703.0	-424.1	1.1	424.1	12.00	12.00	0.00
10,950.0	86.58	179.85	10,705.1	-449.0	1.2	449.0	12.00	12.00	0.00
10,975.0	89.58	179.85	10,706.0	-474.0	1.2	474.0	12.00	12.00	0.00
10,977.9	89.93	179.85	10,706.0	-476.9	1.2	476.9	12.00	12.00	0.00
<b>EOC - Start 3981.1 hold at 10977.9 MD</b>									
11,000.0	89.93	179.85	10,706.0	-499.0	1.3	499.0	0.00	0.00	0.00
11,100.0	89.93	179.85	10,706.1	-599.0	1.5	599.0	0.00	0.00	0.00
11,200.0	89.93	179.85	10,706.2	-699.0	1.8	699.0	0.00	0.00	0.00
11,300.0	89.93	179.85	10,706.4	-799.0	2.1	799.0	0.00	0.00	0.00
11,400.0	89.93	179.85	10,706.5	-899.0	2.3	899.0	0.00	0.00	0.00
11,500.0	89.93	179.85	10,706.6	-999.0	2.6	999.0	0.00	0.00	0.00
11,600.0	89.93	179.85	10,706.8	-1,099.0	2.8	1,099.0	0.00	0.00	0.00
11,700.0	89.93	179.85	10,706.9	-1,199.0	3.1	1,199.0	0.00	0.00	0.00
11,800.0	89.93	179.85	10,707.0	-1,299.0	3.4	1,299.0	0.00	0.00	0.00
11,900.0	89.93	179.85	10,707.1	-1,399.0	3.6	1,399.0	0.00	0.00	0.00
12,000.0	89.93	179.85	10,707.3	-1,499.0	3.9	1,499.0	0.00	0.00	0.00
12,100.0	89.93	179.85	10,707.4	-1,599.0	4.1	1,599.0	0.00	0.00	0.00
12,200.0	89.93	179.85	10,707.5	-1,699.0	4.4	1,699.0	0.00	0.00	0.00
12,300.0	89.93	179.85	10,707.6	-1,799.0	4.6	1,799.0	0.00	0.00	0.00
12,400.0	89.93	179.85	10,707.8	-1,899.0	4.9	1,899.0	0.00	0.00	0.00
12,500.0	89.93	179.85	10,707.9	-1,999.0	5.2	1,999.0	0.00	0.00	0.00
12,600.0	89.93	179.85	10,708.0	-2,099.0	5.4	2,099.0	0.00	0.00	0.00
12,700.0	89.93	179.85	10,708.1	-2,199.0	5.7	2,199.0	0.00	0.00	0.00
12,800.0	89.93	179.85	10,708.3	-2,299.0	5.9	2,299.0	0.00	0.00	0.00
12,900.0	89.93	179.85	10,708.4	-2,399.0	6.2	2,399.0	0.00	0.00	0.00
13,000.0	89.93	179.85	10,708.5	-2,499.0	6.4	2,499.0	0.00	0.00	0.00
13,100.0	89.93	179.85	10,708.6	-2,599.0	6.7	2,599.0	0.00	0.00	0.00
13,200.0	89.93	179.85	10,708.8	-2,699.0	7.0	2,699.0	0.00	0.00	0.00
13,300.0	89.93	179.85	10,708.9	-2,799.0	7.2	2,799.0	0.00	0.00	0.00



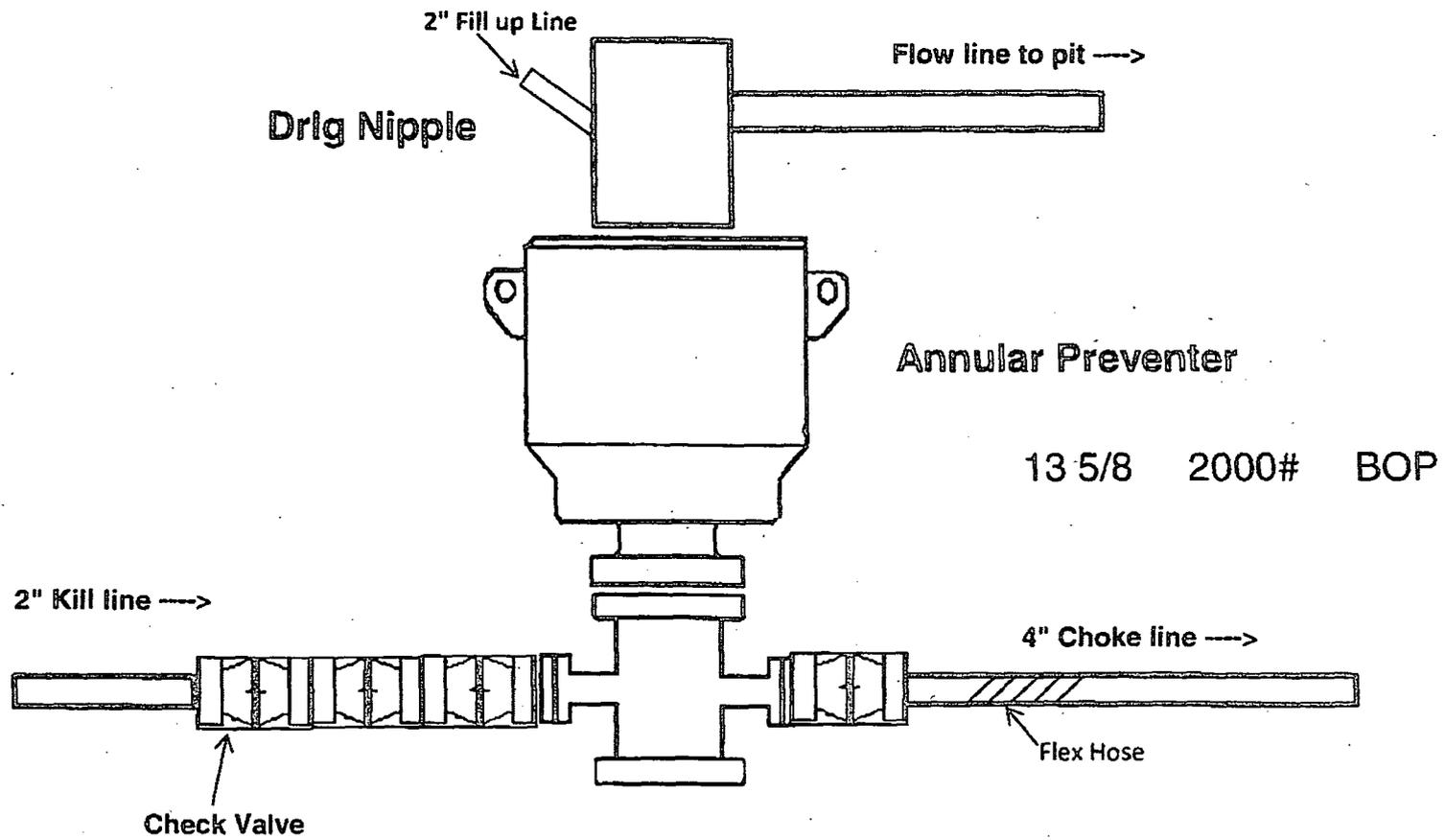
Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Site Patron 23 Federal
Company:	COG Production LLC	TVD Reference:	KB @ 3166.0usft (Latshaw 44)
Project:	Eddy County, NM	MD Reference:	KB @ 3166.0usft (Latshaw 44)
Site:	Patron 23 Federal	North Reference:	Grid
Well:	#4H.	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #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)	
13,400.0	89.93	179.85	10,709.0	-2,899.0	7.5	2,899.0	0.00	0.00	0.00	
13,500.0	89.93	179.85	10,709.2	-2,999.0	7.7	2,999.0	0.00	0.00	0.00	
13,600.0	89.93	179.85	10,709.3	-3,099.0	8.0	3,099.0	0.00	0.00	0.00	
13,700.0	89.93	179.85	10,709.4	-3,199.0	8.3	3,199.0	0.00	0.00	0.00	
13,800.0	89.93	179.85	10,709.5	-3,299.0	8.5	3,299.0	0.00	0.00	0.00	
13,900.0	89.93	179.85	10,709.7	-3,399.0	8.8	3,399.0	0.00	0.00	0.00	
14,000.0	89.93	179.85	10,709.8	-3,499.0	9.0	3,499.0	0.00	0.00	0.00	
14,100.0	89.93	179.85	10,709.9	-3,599.0	9.3	3,599.0	0.00	0.00	0.00	
14,200.0	89.93	179.85	10,710.0	-3,698.9	9.5	3,699.0	0.00	0.00	0.00	
14,300.0	89.93	179.85	10,710.2	-3,798.9	9.8	3,799.0	0.00	0.00	0.00	
14,400.0	89.93	179.85	10,710.3	-3,898.9	10.1	3,899.0	0.00	0.00	0.00	
14,500.0	89.93	179.85	10,710.4	-3,998.9	10.3	3,999.0	0.00	0.00	0.00	
14,600.0	89.93	179.85	10,710.5	-4,098.9	10.6	4,099.0	0.00	0.00	0.00	
14,700.0	89.93	179.85	10,710.7	-4,198.9	10.8	4,199.0	0.00	0.00	0.00	
14,800.0	89.93	179.85	10,710.8	-4,298.9	11.1	4,299.0	0.00	0.00	0.00	
14,900.0	89.93	179.85	10,710.9	-4,398.9	11.3	4,399.0	0.00	0.00	0.00	
14,959.0	89.93	179.85	10,711.0	-4,457.9	11.5	4,457.9	0.00	0.00	0.00	
TD at 14959.0										

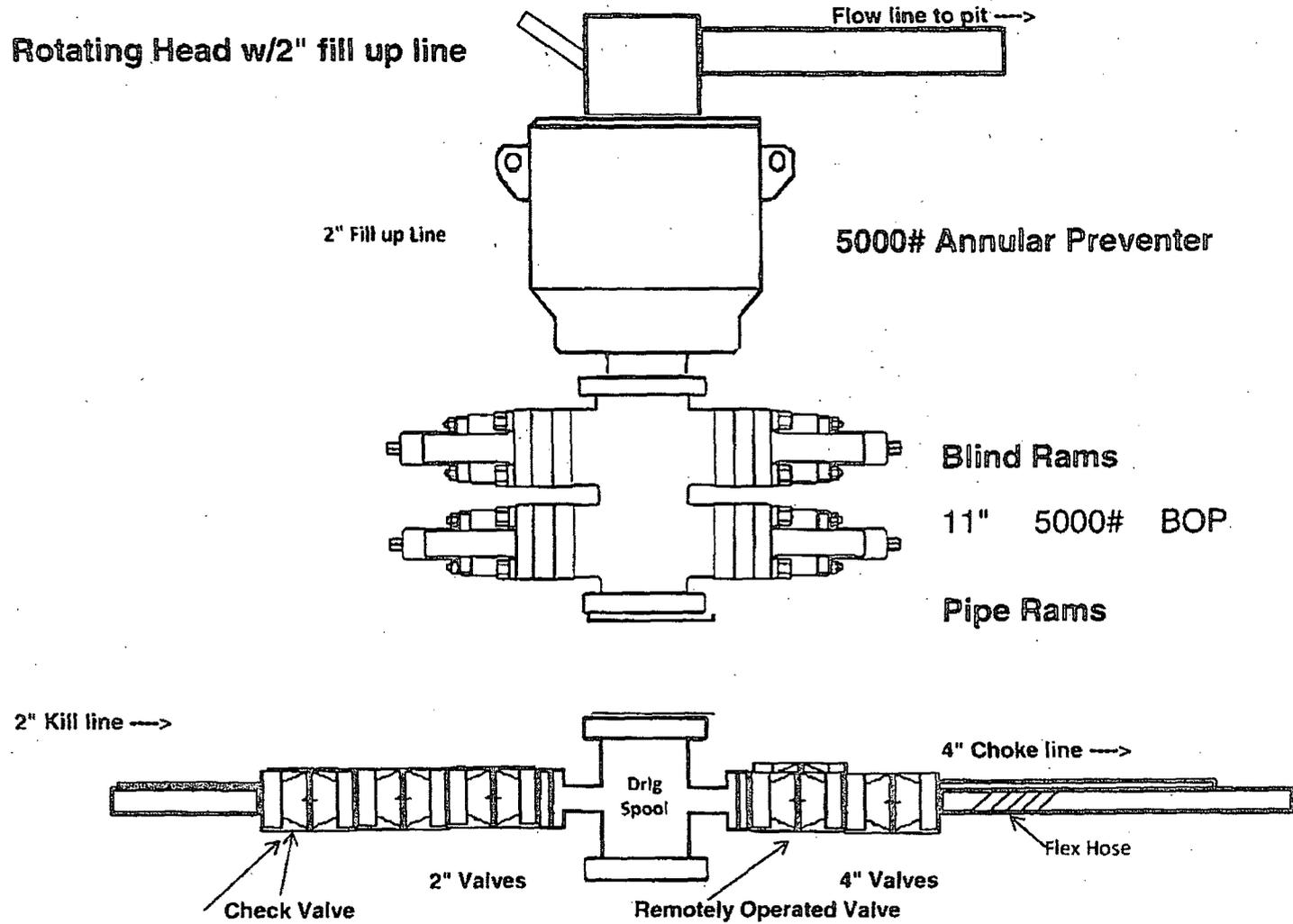
Design Targets										
Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/S (usft)	+E/W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Drilling Window/Hard Lir		0.00	179.86	0.0	-470.0	1.2	407,885.90	619,230.90	32° 7' 14.912 N	103° 56' 53.543 W
- plan misses target center by 470.0usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E)										
- Rectangle (sides W100.0 H3,987.9 D0.0)										
EOC (P23F #4H/OH Pla		0.00	0.00	10,706.0	-476.9	1.2	407,879.04	619,230.93	32° 7' 14.845 N	103° 56' 53.543 W
- plan hits target center										
- Point										
PBHL (P23F #4H/OH)		0.00	0.00	10,711.0	-4,457.9	11.5	403,898.00	619,241.20	32° 6' 35.447 N	103° 56' 53.589 W
- plan hits target center										
- Point										

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/S (usft)	+E/W (usft)		
10,228.5	10,228.5	0.0	0.0	KOP - Start DLS 12.00 TFO 179.85	
10,977.9	10,706.0	-476.9	1.2	EOC - Start 3981.1 hold at 10977.9 MD	
14,959.0	10,711.0	-4,457.9	11.5	TD at 14959.0	

# 2,000 psi BOP Schematic



# 5,000 psi BOP Schematic







Midwest Hose  
& Specialty, Inc.

### Certificate of Conformity

Customer: **LATSHAW DRILLING**

Customer P.O.# **RIG#44**

Sales Order # **242739**

Date Assembled: **2/9/2015**

### Specifications

Hose Assembly Type: **Choke & Kill**

Assembly Serial # **292614-1**

Hose Lot # and Date Code **10900-08/13**

Hose Working Pressure (psi) **10000**

Test Pressure (psi) **15000**

We hereby certify that the above material supplied for the referenced purchase order to be true according to the requirements of the purchase order and current industry standards.

Supplier:  
Midwest Hose & Specialty, Inc.  
3312 S I-35 Service Rd  
Oklahoma City, OK 73129

Comments:

Approved By

Date

2/10/2015



Midwest Hose  
& Specialty, Inc.

### Certificate of Conformity

Customer: **LATSHAW DRILLING**

Customer P.O.# **RIG#44**

Sales Order # **242739**

Date Assembled: **2/9/2015**

### Specifications

Hose Assembly Type: **Choke & Kill**

Assembly Serial # **292614-2**

Hose Lot # and Date Code **11794-10/14**

Hose Working Pressure (psi) **10000**

Test Pressure (psi) **15000**

We hereby certify that the above material supplied for the referenced purchase order to be true according to the requirements of the purchase order and current industry standards.

Supplier:

Midwest Hose & Specialty, Inc.

3312 S I-35 Service Rd

Oklahoma City, OK 73129

Comments:

Approved By

Date

2/10/2015

JUN 15 2015

PECOS DISTRICT  
CONDITIONS OF APPROVAL

RECEIVED

OPERATOR'S NAME:	COG Production LLC
LEASE NO.:	NMNM-120895
WELL NAME & NO.:	Patron 23 Federal 4H
SURFACE HOLE FOOTAGE:	0190' FNL & 0660' FEL
BOTTOM HOLE FOOTAGE:	0660' FSL & 0660' FEL
LOCATION:	Section 23, T. 25 S., R 29 E., NMPM
COUNTY:	Eddy County, New Mexico

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. Operator has stated that Hydrogen Sulfide (H<sub>2</sub>S) monitors will be installed prior to drilling out the surface shoe. Operator has also stated that if H<sub>2</sub>S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area will meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, 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. 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 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.

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

Possibility of water flows in the Canyon, Ellenburger, and Precambrian.  
Possibility of lost circulation in the Ellenburger.

1. The 13-3/8 inch surface casing shall be set at approximately **750** 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.**
  - 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 is:

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

**Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.**

**Centralizers required through the curve and a minimum of one every other joint.**

**Pilot hole is required to have a plug at the bottom of the hole. If two plugs are set, the BLM is to be contacted (575-361-2822) prior to tag of bottom plug, which must be a minimum of 200' in length. Operator can set one plug from bottom of pilot hole to kick-off point and save the WOC time for tagging the first plug. Additional cement will be required as plug 1 excess calculates to NEGATIVE 41% and plug 2 excess calculates to NEGATIVE 33%.**

3. The minimum required fill of cement behind the 7 inch production casing is:

- Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Excess calculates to 22% - Additional cement may be required.**

**Formation below the 7" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe and the mud weight for the bottom of the hole. Report results to BLM office.**

4. The minimum required fill of cement behind the 4-1/2 inch production Liner is:

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

5. 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. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).
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.
  - 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.
4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** intermediate casing shoe shall be **5000 (5M)** psi. **5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.**

5. 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 (8 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 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. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two 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.
  - g. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the **Wolfcamp** formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

**D. DRILLING MUD**

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the **Wolfcamp** formation, and shall be used until production casing is run and cemented.

**E. DRILL STEM TEST**

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

**F. 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.

**JAM 060815**