

UNITED STATES **OCD-ARTESIA**
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No 1004-0137
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 page 2.

1. Type of Well ☐ Oil Well ☒ Gas Well ☐ Other		5. Lease Serial No NMNM100342
2. Name of Operator COG Operating LLC		6. If Indian, Allottee, or Tribe Name
3a. Address 2208 W. Main Street Artesia, NM 88210	3b. Phone No. (include area code) 575-748-6940	7. If Unit or CA Agreement Name and/or No.
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) 660' FNL & 710' FWL, Unit D (NWNW) Sec12-T19S-R31E 660' FSL & 660' FWL, Unit M (SWSW) Sec12-T19S-R31E		8. Well Name and No Poptart 12 Federal #4H
Lat. Long.		9. API Well No 30-015-39712
		10. Field and Pool, or Exploratory Area Wildcat; Wolfcamp
		11. County or Parish, State Eddy County NM

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

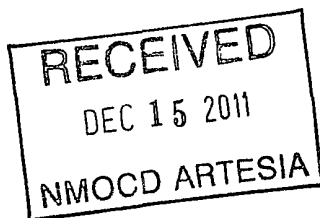
TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/ Resume)	☐ Water Shut-off
☐ Subsequent Report	☐ Altering Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug back	☐ 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 recomple horizontally, give subsurface locations and measured and true vertical depths or pertinent markers and sands. Attach the Bond under which the work will be performed or provide the Bond No. on file with the 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 recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notice 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 Operating LLC respectfully requests approval for the following changes to the original approved APD.

Directional Plan. (See Attached)

Casing Program. (See Attached)



Accepted for RECORD
NMOCD

TS
12/16/2011

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

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

Name (Printed/ Typed)

Mayte Reyes

Title, Regulatory Analyst

Signature.

Date 12/5/11

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by.

Title:

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.

Date:

APPROVED

DEC 12 2011

TS/ Chris Walls

BUREAU OF LAND MANAGEMENT
CARLOS 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 any Department of Agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

Poptart 12 Federal #4H Sundry

COG respectfully request the following changes:

Intermediate casing section:

Drill 12-1/4" hole to 2700'

Run 9-5/8" 36# J-55 BTC csg to 2700'

Cmt to surface in 1 stg with:

Lead: 550 sx Class C + 4% Gel + 2% CaCl₂ @ 13.5 ppg/1.75 yield

Tail: 250 sx Class C + 2% CaCl₂ @ 14.8/1.35 yield

Will NU on 9-5/8" csg with approved 5M system.

2nd Intermediate casing section:

Drill 8-3/4" pilot hole to 11,150'

Run logs and plug back from 11,150' to 10,000' with: 450 sx Class H cmt @ 17.2ppg / 0.98 yield

See updated directional plan

Kick off and build curve to approx 10,800' MD

Run 7" 29# P-110 LTC csg to approx 10,800' MD

Cmt to surface in 1 stg with:

Lead: 1000 sx 35:65:6 H + Salt + Gilsonite + CF + CFR-3 @ 12.7 ppg/1.89 yield

Tail: 300 sx Class H @ 15.6 ppg / 1.19 yield

Minimum tie back 2500' (designed to circ to sfc)

Will NU on 7" csg with approved 5M system.

4-1/2" Liner (lateral) section:

Drill 6-1/8" lateral hole to 14,414' MD (10,650' TVD) to approved BHL

Run 4-1/2" 11.6# P-110 LTC csg to TD

Hang liner (TOL @ 10,100') and cmt with:

Lead: 150 sx 50:50:2 H + Salt + GasStop + CFR-3 @ 14.4/1.25 yield

Tail: 200 sx 50:50:2 H + Salt + GasStop + Super CBL + CFR-3 @ 14.4/1.25 yield

TOC @ TOL. Will also run liner top packer.

Proposed Mud System:

Depth	Type System	Mud Weight	Viscosity (sec)	Waterloss (cc)
0' – 825'	Fresh Water	8.4	29	N.C.
825' – 2700'	Brine	10	29	N.C.
2700 – 11,150' (PH)	Brine	9.4 – 10.6	30	N.C.
2700' – 10,800' (7" section)	Brine	9.4 – 10.6	30	N.C.
10,800' – 14,414' (Lateral)	WBM	10.0 – 13.6	36-42	15-20



COG Operating LLC

Eddy County(NAD83)

Poptart "12" Federal

#4H

OH

Plan: Plan #2

Pathfinder X & Y Report

30 November, 2011

PATHFINDER®
A Schlumberger Company



Pathfinder
Pathfinder X & Y Report

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Company: COG Operating LLC
Project: Eddy County(NAD83)
Site: Poptart "12" Federal
Well: #4H
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference: Well #4H
TVD Reference: KB = 17 @ 3630 9usft (Original Well Elev)
MD Reference: KB = 17 @ 3630.9usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000 1 Single User Db

Project Eddy County(NAD83)

Map System: US State Plane 1983
Geo Datum: North American Datum 1983
Map Zone: New Mexico Eastern Zone

System Datum: Mean Sea Level

Site Poptart "12" Federal

Site Position:	Northing:	611,657.420 usft	Latitude:	32° 40' 49.717 N	
From: Map	Easting:	696,507.170 usft	Longitude:	103° 49' 44.433 W	
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.27 °

Well #4H

Well Position	+N/-S	0.0 usft	Northing:	611,657.420 usft	Latitude:	32° 40' 49.717 N
	+E/-W	0.0 usft	Easting:	696,507.170 usft	Longitude:	103° 49' 44.433 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,613.9 usft	

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	10/6/2011	7.69	60.58	48,868

Design Plan #2

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	181.00

Survey Tool Program Date 11/30/2011

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	14,413.8	Plan #2 (OH)	MWD	MWD - Standard



Pathfinder
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Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
0 0	0 00	0 00	0 0	-3,630.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
100 0	0 00	0 00	100.0	-3,530.9	0 0	0 0	0.0	0 00	611,657.42	696,507.17
200 0	0.00	0.00	200 0	-3,430.9	0.0	0 0	0 0	0.00	611,657.42	696,507.17
300 0	0 00	0 00	300 0	-3,330.9	0 0	0 0	0.0	0 00	611,657.42	696,507.17
400 0	0 00	0 00	400.0	-3,230.9	0 0	0 0	0.0	0.00	611,657.42	696,507.17
500.0	0 00	0.00	500 0	-3,130.9	0.0	0 0	0 0	0.00	611,657.42	696,507.17
600 0	0.00	0.00	600.0	-3,030.9	0 0	0 0	0 0	0 00	611,657.42	696,507.17
700.0	0.00	0 00	700 0	-2,930.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
800 0	0.00	0 00	800 0	-2,830.9	0.0	0 0	0 0	0 00	611,657.42	696,507.17
900 0	0 00	0 00	900 0	-2,730.9	0 0	0.0	0 0	0 00	611,657.42	696,507.17
1,000.0	0.00	0.00	1,000.0	-2,630.9	0 0	0 0	0.0	0.00	611,657.42	696,507.17
1,100.0	0 00	0 00	1,100.0	-2,530.9	0 0	0 0	0 0	0 00	611,657.42	696,507.17
1,200.0	0 00	0 00	1,200.0	-2,430.9	0.0	0.0	0 0	0.00	611,657.42	696,507.17
1,300 0	0.00	0.00	1,300 0	-2,330.9	0 0	0 0	0 0	0 00	611,657.42	696,507.17
1,400 0	0.00	0.00	1,400 0	-2,230.9	0 0	0 0	0 0	0 00	611,657.42	696,507.17
1,500 0	0 00	0 00	1,500.0	-2,130.9	0.0	0 0	0 0	0 00	611,657.42	696,507.17
1,600.0	0.00	0 00	1,600.0	-2,030.9	0 0	0 0	0 0	0 00	611,657.42	696,507.17
1,700 0	0.00	0.00	1,700 0	-1,930.9	0 0	0 0	0 0	0 00	611,657.42	696,507.17
1,800.0	0 00	0 00	1,800 0	-1,830.9	0.0	0.0	0 0	0.00	611,657.42	696,507.17
1,900 0	0 00	0.00	1,900.0	-1,730.9	0.0	0.0	0 0	0 00	611,657.42	696,507.17
2,000 0	0 00	0 00	2,000 0	-1,630.9	0 0	0 0	0.0	0 00	611,657.42	696,507.17
2,100.0	0 00	0 00	2,100.0	-1,530.9	0.0	0.0	0.0	0 00	611,657.42	696,507.17
2,200.0	0.00	0.00	2,200.0	-1,430.9	0 0	0 0	0.0	0 00	611,657.42	696,507.17
2,300 0	0.00	0 00	2,300 0	-1,330.9	0 0	0 0	0 0	0.00	611,657.42	696,507.17
2,400 0	0.00	0 00	2,400.0	-1,230.9	0 0	0 0	0.0	0.00	611,657.42	696,507.17
2,500 0	0.00	0.00	2,500.0	-1,130.9	0 0	0.0	0 0	0 00	611,657.42	696,507.17
2,600.0	0.00	0 00	2,600 0	-1,030.9	0 0	0 0	0 0	0 00	611,657.42	696,507.17



Pathfinder
Pathfinder X & Y Report



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Database: EDM 5000.1 Single User Db

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2,700.0	0.00	0.00	2,700.0	-930.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
2,800.0	0.00	0.00	2,800.0	-830.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
2,900.0	0.00	0.00	2,900.0	-730.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,000.0	0.00	0.00	3,000.0	-630.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,100.0	0.00	0.00	3,100.0	-530.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,200.0	0.00	0.00	3,200.0	-430.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,300.0	0.00	0.00	3,300.0	-330.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,400.0	0.00	0.00	3,400.0	-230.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,500.0	0.00	0.00	3,500.0	-130.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,600.0	0.00	0.00	3,600.0	-30.9	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,700.0	0.00	0.00	3,700.0	69.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,800.0	0.00	0.00	3,800.0	169.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
3,900.0	0.00	0.00	3,900.0	269.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,000.0	0.00	0.00	4,000.0	369.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,100.0	0.00	0.00	4,100.0	469.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,200.0	0.00	0.00	4,200.0	569.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,300.0	0.00	0.00	4,300.0	669.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,400.0	0.00	0.00	4,400.0	769.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,500.0	0.00	0.00	4,500.0	869.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,600.0	0.00	0.00	4,600.0	969.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,700.0	0.00	0.00	4,700.0	1,069.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,800.0	0.00	0.00	4,800.0	1,169.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
4,900.0	0.00	0.00	4,900.0	1,269.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,000.0	0.00	0.00	5,000.0	1,369.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,100.0	0.00	0.00	5,100.0	1,469.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,200.0	0.00	0.00	5,200.0	1,569.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,300.0	0.00	0.00	5,300.0	1,669.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17



Pathfinder
Pathfinder X & Y Report



Company: COG Operating LLC
Project: Eddy County(NAD83)
Site: Poptart "12" Federal
Well: #4H
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well #4H
KB = 17 @ 3630.9usft (Original Well Elev)
KB = 17 @ 3630.9usft (Original Well Elev)
Grd
Minimum Curvature
EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
5,400.0	0.00	0.00	5,400.0	1,769.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,500.0	0.00	0.00	5,500.0	1,869.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,600.0	0.00	0.00	5,600.0	1,969.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,700.0	0.00	0.00	5,700.0	2,069.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,800.0	0.00	0.00	5,800.0	2,169.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
5,900.0	0.00	0.00	5,900.0	2,269.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,000.0	0.00	0.00	6,000.0	2,369.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,100.0	0.00	0.00	6,100.0	2,469.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,200.0	0.00	0.00	6,200.0	2,569.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,300.0	0.00	0.00	6,300.0	2,669.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,400.0	0.00	0.00	6,400.0	2,769.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,500.0	0.00	0.00	6,500.0	2,869.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,600.0	0.00	0.00	6,600.0	2,969.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,700.0	0.00	0.00	6,700.0	3,069.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,800.0	0.00	0.00	6,800.0	3,169.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
6,900.0	0.00	0.00	6,900.0	3,269.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,000.0	0.00	0.00	7,000.0	3,369.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,100.0	0.00	0.00	7,100.0	3,469.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,200.0	0.00	0.00	7,200.0	3,569.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,300.0	0.00	0.00	7,300.0	3,669.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,400.0	0.00	0.00	7,400.0	3,769.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,500.0	0.00	0.00	7,500.0	3,869.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,600.0	0.00	0.00	7,600.0	3,969.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,700.0	0.00	0.00	7,700.0	4,069.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,800.0	0.00	0.00	7,800.0	4,169.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
7,900.0	0.00	0.00	7,900.0	4,269.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,000.0	0.00	0.00	8,000.0	4,369.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17



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8,100.0	0.00	0.00	8,100.0	4,469.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,200.0	0.00	0.00	8,200.0	4,569.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,300.0	0.00	0.00	8,300.0	4,669.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,400.0	0.00	0.00	8,400.0	4,769.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,500.0	0.00	0.00	8,500.0	4,869.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,600.0	0.00	0.00	8,600.0	4,969.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,700.0	0.00	0.00	8,700.0	5,069.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,800.0	0.00	0.00	8,800.0	5,169.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
8,900.0	0.00	0.00	8,900.0	5,269.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,000.0	0.00	0.00	9,000.0	5,369.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,100.0	0.00	0.00	9,100.0	5,469.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,200.0	0.00	0.00	9,200.0	5,569.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,300.0	0.00	0.00	9,300.0	5,669.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,400.0	0.00	0.00	9,400.0	5,769.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,500.0	0.00	0.00	9,500.0	5,869.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,600.0	0.00	0.00	9,600.0	5,969.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,700.0	0.00	0.00	9,700.0	6,069.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,800.0	0.00	0.00	9,800.0	6,169.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
9,900.0	0.00	0.00	9,900.0	6,269.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
10,000.0	0.00	0.00	10,000.0	6,369.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
10,100.0	0.00	0.00	10,100.0	6,469.1	0.0	0.0	0.0	0.00	611,657.42	696,507.17
10,172.5	0.00	0.00	10,172.5	6,541.6	0.0	0.0	0.0	0.00	611,657.42	696,507.17
10,175.0	0.30	181.00	10,175.0	6,544.1	0.0	0.0	0.0	12.00	611,657.41	696,507.17
10,200.0	3.30	181.00	10,200.0	6,569.1	-0.8	0.0	0.8	12.00	611,656.63	696,507.16
10,225.0	6.30	181.00	10,224.9	6,594.0	-2.9	-0.1	2.9	12.00	611,654.54	696,507.12
10,250.0	9.30	181.00	10,249.7	6,618.8	-6.3	-0.1	6.3	12.00	611,651.15	696,507.06
10,275.0	12.30	181.00	10,274.2	6,643.3	-11.0	-0.2	11.0	12.00	611,646.46	696,506.98



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company: COG Operating LLC
Project: Eddy County(NAD83)
Site: Poptart "12" Federal
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Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference: Well #4H
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000 1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
10,300.0	15 30	181 00	10,298.5	6,667.6	-16 9	-0 3	16 9	12.00	611,640.50	696,506 88
10,325.0	18.30	181 00	10,322.4	6,691 5	-24 1	-0.4	24 1	12 00	611,633 28	696,506 75
10,350.0	21 30	181 00	10,345.9	6,715.0	-32.6	-0.6	32 6	12.00	611,624 81	696,506 60
10,375.0	24 30	181 00	10,369.0	6,738 1	-42 3	-0 7	42 3	12.00	611,615 12	696,506.43
10,400.0	27 30	181 00	10,391 5	6,760.6	-53 2	-0 9	53 2	12.00	611,604 25	696,506 24
10,425.0	30.30	181.00	10,413.4	6,782 5	-65.2	-1 1	65.2	12.00	611,592.21	696,506.03
10,450.0	33.30	181 00	10,434.6	6,803.7	-78.4	-1 4	78.4	12.00	611,579 04	696,505.81
10,475.0	36.30	181.00	10,455.2	6,824 3	-92 6	-1 6	92 7	12 00	611,564 77	696,505 56
10,500.0	39 30	181.00	10,474.9	6,844 0	-108.0	-1.9	108.0	12.00	611,549.45	696,505 29
10,525.0	42.30	181 00	10,493.8	6,862 9	-124.3	-2.2	124.3	12.00	611,533 12	696,505 01
10,550.0	45.30	181 00	10,511.9	6,881.0	-141 6	-2.5	141.6	12.00	611,515 82	696,504 70
10,575.0	48 30	181 00	10,529 0	6,898 1	-159 8	-2.8	159 8	12.00	611,497 60	696,504 39
10,600.0	51.30	181 00	10,545.1	6,914 2	-178 9	-3.1	178 9	12.00	611,478.51	696,504 06
10,625.0	54 30	181 00	10,560.2	6,929 3	-198 8	-3 5	198 8	12 00	611,458 61	696,503 71
10,650.0	57 30	181 00	10,574.3	6,943 4	-219 5	-3 8	219 5	12 00	611,437 93	696,503 35
10,675 0	60 30	181 00	10,587 2	6,956 3	-240 9	-4 2	240 9	12.00	611,416.56	696,502.98
10,700.0	63 30	181 00	10,599.1	6,968 2	-262.9	-4.6	262 9	12 00	611,394 53	696,502.59
10,725.0	66 30	181 00	10,609 7	6,978.8	-285.5	-5 0	285 5	12.00	611,371.91	696,502 20
10,750 0	69 30	181 00	10,619 1	6,988 2	-308 6	-5 4	308 7	12.00	611,348 77	696,501.80
10,775.0	72 30	181 00	10,627.4	6,996.5	-332 2	-5 8	332 3	12.00	611,325 17	696,501 39
10,800.0	75 30	181 00	10,634 3	7,003 4	-356 3	-6 2	356 3	12 00	611,301 17	696,500 97
10,825.0	78.30	181.00	10,640 0	7,009 1	-380 6	-6 6	380.6	12.00	611,276.84	696,500 54
10,850.0	81 30	181 00	10,644 5	7,013.6	-405 2	-7.1	405.2	12.00	611,252 24	696,500.12
10,875 0	84 30	181 00	10,647.6	7,016 7	-430.0	-7 5	430 0	12 00	611,227 44	696,499 68
10,900.0	87.30	181.00	10,649.4	7,018 5	-454.9	-7 9	455 0	12.00	611,202 52	696,499.25
10,922 5	90 00	181 00	10,650.0	7,019 1	-477 4	-8 3	477 5	12.00	611,180 03	696,498 86
11,000 0	90 00	181 00	10,650 0	7,019 1	-554 9	-9 7	555.0	0 00	611,102 54	696,497.51



Pathfinder
Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company: COG Operating LLC
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Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
11,100.0	90.00	181.00	10,650.0	7,019.1	-654.9	-11.4	655.0	0.00	611,002.55	696,495.77
11,200.0	90.00	181.00	10,650.0	7,019.1	-754.9	-13.1	755.0	0.00	610,902.57	696,494.03
11,300.0	90.00	181.00	10,650.0	7,019.1	-854.8	-14.9	855.0	0.00	610,802.58	696,492.29
11,400.0	90.00	181.00	10,650.0	7,019.1	-954.8	-16.6	955.0	0.00	610,702.60	696,490.55
11,500.0	90.00	181.00	10,650.0	7,019.1	-1,054.8	-18.4	1,055.0	0.00	610,602.62	696,488.80
11,600.0	90.00	181.00	10,650.0	7,019.1	-1,154.8	-20.1	1,155.0	0.00	610,502.63	696,487.06
11,700.0	90.00	181.00	10,650.0	7,019.1	-1,254.8	-21.8	1,255.0	0.00	610,402.65	696,485.32
11,800.0	90.00	181.00	10,650.0	7,019.1	-1,354.8	-23.6	1,355.0	0.00	610,302.66	696,483.58
11,900.0	90.00	181.00	10,650.0	7,019.1	-1,454.7	-25.3	1,455.0	0.00	610,202.68	696,481.84
12,000.0	90.00	181.00	10,650.0	7,019.1	-1,554.7	-27.1	1,555.0	0.00	610,102.69	696,480.10
12,100.0	90.00	181.00	10,650.0	7,019.1	-1,654.7	-28.8	1,655.0	0.00	610,002.71	696,478.36
12,200.0	90.00	181.00	10,650.0	7,019.1	-1,754.7	-30.6	1,755.0	0.00	609,902.72	696,476.62
12,300.0	90.00	181.00	10,650.0	7,019.1	-1,854.7	-32.3	1,855.0	0.00	609,802.74	696,474.88
12,400.0	90.00	181.00	10,650.0	7,019.1	-1,954.7	-34.0	1,955.0	0.00	609,702.75	696,473.14
12,500.0	90.00	181.00	10,650.0	7,019.1	-2,054.7	-35.8	2,055.0	0.00	609,602.77	696,471.40
12,600.0	90.00	181.00	10,650.0	7,019.1	-2,154.6	-37.5	2,155.0	0.00	609,502.78	696,469.66
12,700.0	90.00	181.00	10,650.0	7,019.1	-2,254.6	-39.3	2,255.0	0.00	609,402.80	696,467.91
12,800.0	90.00	181.00	10,650.0	7,019.1	-2,354.6	-41.0	2,355.0	0.00	609,302.81	696,466.17
12,900.0	90.00	181.00	10,650.0	7,019.1	-2,454.6	-42.7	2,455.0	0.00	609,202.83	696,464.43
13,000.0	90.00	181.00	10,650.0	7,019.1	-2,554.6	-44.5	2,555.0	0.00	609,102.84	696,462.69
13,100.0	90.00	181.00	10,650.0	7,019.1	-2,654.6	-46.2	2,655.0	0.00	609,002.86	696,460.95
13,200.0	90.00	181.00	10,650.0	7,019.1	-2,754.5	-48.0	2,755.0	0.00	608,902.87	696,459.21
13,300.0	90.00	181.00	10,650.0	7,019.1	-2,854.5	-49.7	2,855.0	0.00	608,802.89	696,457.47
13,400.0	90.00	181.00	10,650.0	7,019.1	-2,954.5	-51.4	2,955.0	0.00	608,702.90	696,455.73
13,500.0	90.00	181.00	10,650.0	7,019.1	-3,054.5	-53.2	3,055.0	0.00	608,602.92	696,453.99
13,600.0	90.00	181.00	10,650.0	7,019.1	-3,154.5	-54.9	3,155.0	0.00	608,502.93	696,452.25
13,700.0	90.00	181.00	10,650.0	7,019.1	-3,254.5	-56.7	3,255.0	0.00	608,402.95	696,450.51



Pathfinder
Pathfinder X & Y Report



Company: COG Operating LLC
Project: Eddy County(NAD83)
Site: Poptart "12" Federal
Well: #4H
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference: Well #4H
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MD Reference: KB = 17 @ 3630.9usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000 1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
13,800.0	90.00	181.00	10,650.0	7,019.1	-3,354.5	-58.4	3,355.0	0.00	608,302.96	696,448.77
13,900.0	90.00	181.00	10,650.0	7,019.1	-3,454.4	-60.1	3,455.0	0.00	608,202.98	696,447.02
14,000.0	90.00	181.00	10,650.0	7,019.1	-3,554.4	-61.9	3,555.0	0.00	608,102.99	696,445.28
14,100.0	90.00	181.00	10,650.0	7,019.1	-3,654.4	-63.6	3,655.0	0.00	608,003.01	696,443.54
14,200.0	90.00	181.00	10,650.0	7,019.1	-3,754.4	-65.4	3,755.0	0.00	607,903.02	696,441.80
14,300.0	90.00	181.00	10,650.0	7,019.1	-3,854.4	-67.1	3,855.0	0.00	607,803.04	696,440.06
14,400.0	90.00	181.00	10,650.0	7,019.1	-3,954.4	-68.8	3,955.0	0.00	607,703.05	696,438.32
14,413.8	90.00	181.00	10,650.0	7,019.1	-3,968.2	-69.1	3,968.8	0.00	607,689.23	696,438.08

Checked By: _____ Approved By: _____ Date: _____



Project: Eddy County(NAD83)
Site: Poptart "12" Federa
Well: #4H
Wellbore: OH
Plan: Plan #2 (#4H/OH)



Azimuths to Grid North
True North: -0.27°
Magnetic North: 7.42°

Magnetic Field
Strength: 48867.7nT
Dip Angle: 60.58°
Date: 10/6/2011
Model: IGRF200510

PATHFINDER

A Schlumberger Company

PROJECT DETAILS, Eddy County(NAD83)
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level
Local North: Grid

WELL DETAILS, #4H

Ground Elevation: 3613.9
RKB Elevation KB = 17 @ 3630.9usft (Original Well Elev)
Rig Name: Original Well Elev

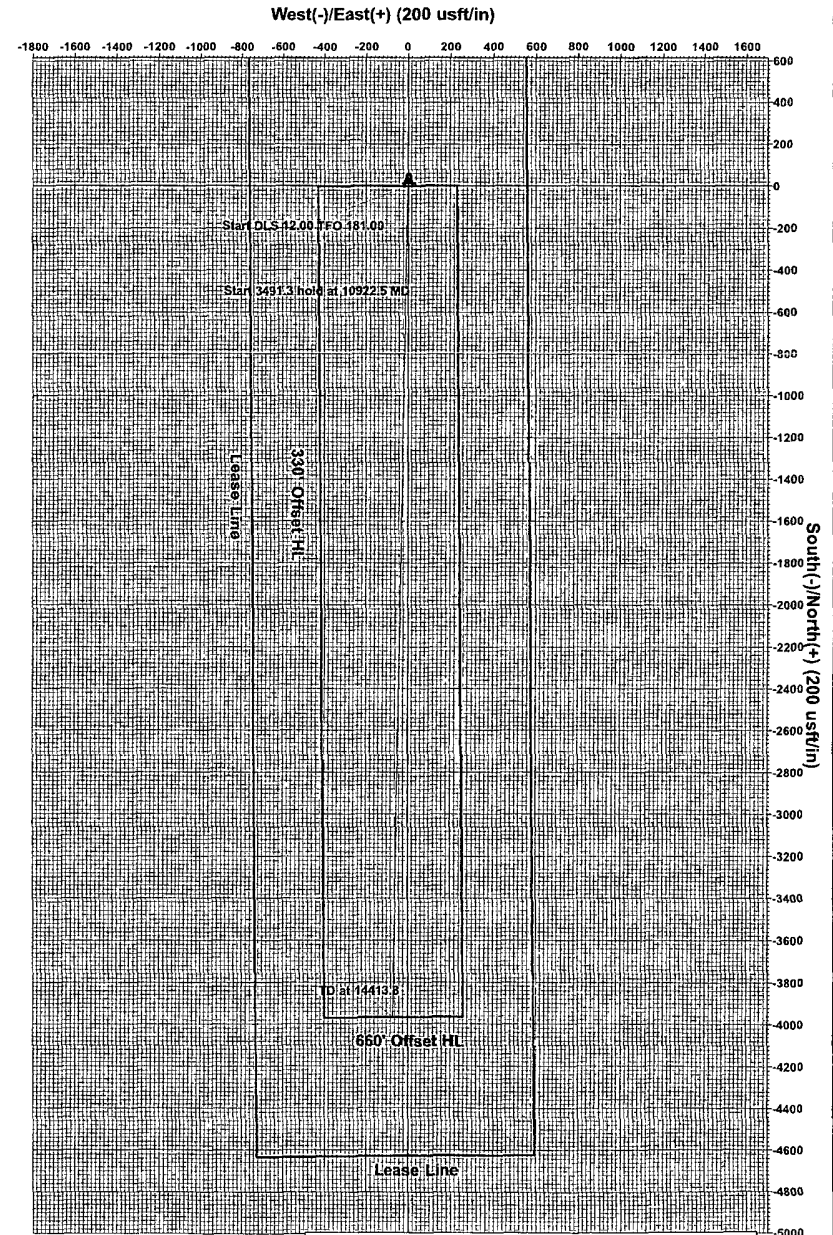
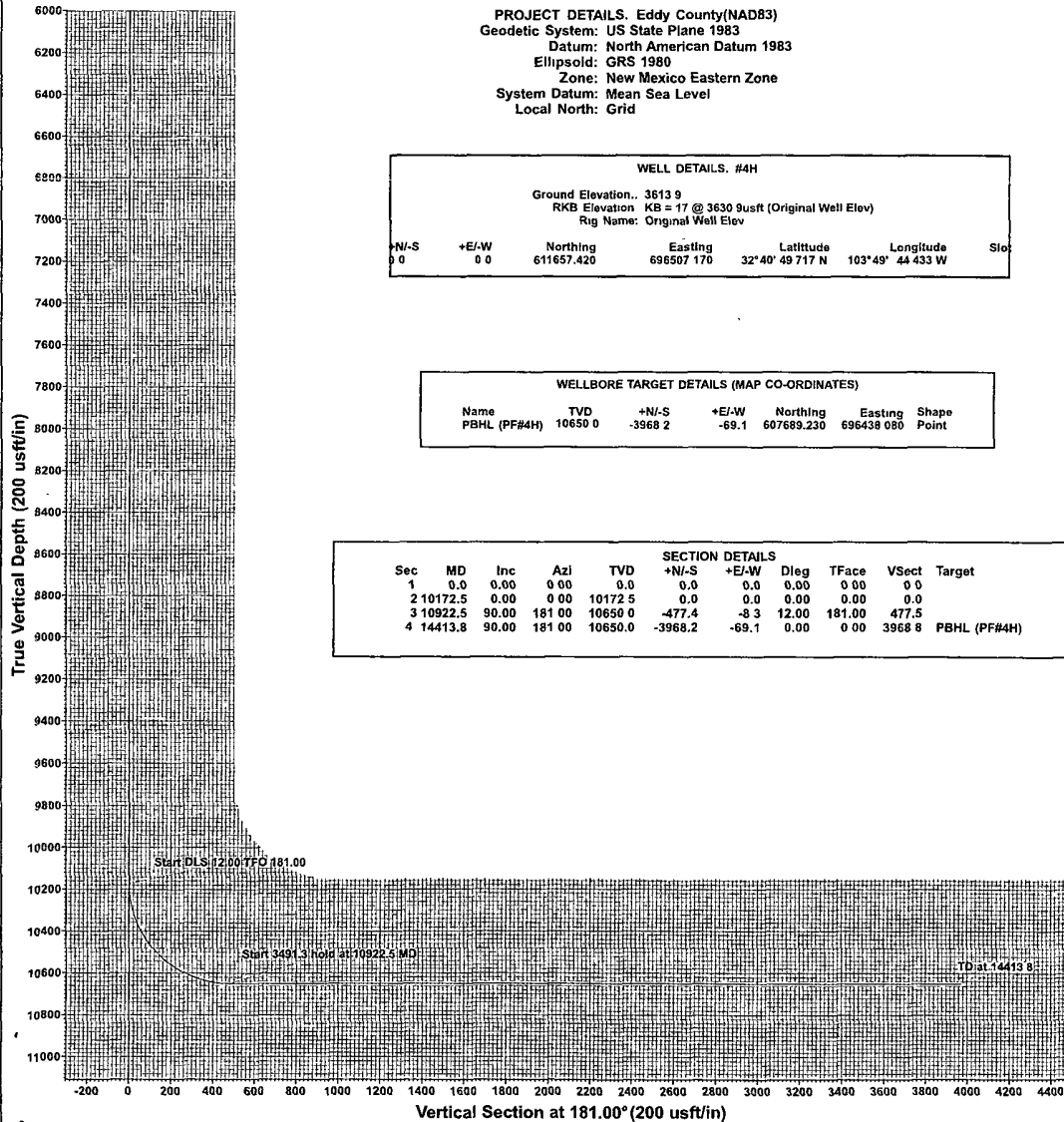
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slope
0.0	0.0	611657.420	696507.170	32°40' 49.717 N	103°49' 44.433 W	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
PBHL (PF#4H)	10650.0	-3968.2	-69.1	607689.230	696438.080	Point

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VFace	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	10172.5	0.00	0.00	10172.5	0.0	0.0	0.00	0.00	0.0	
3	10922.5	90.00	181.00	10650.0	-477.4	-8.3	12.00	181.00	477.5	
4	14413.8	90.00	181.00	10650.0	-3968.2	-69.1	0.00	0.00	3968.8	PBHL (PF#4H)



Plan Plan #2 (#4H/OH)
Created By Sam Bittle Date 16 03, November 30 2011

Checked _____ Date _____

COG Geophysical LLC
Pathfinder
Original Well Elev
Plan #2

CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating LLC
LEASE NO.:	NM-100342
WELL NAME & NO.:	Poptart 12 Federal #4H
SURFACE HOLE FOOTAGE:	0660' FNL & 0760' FWL
BOTTOM HOLE FOOTAGE:	0660' FSL & 0660' FWL
LOCATION:	Section 12, T. 19 S., R. 31 E., NMPM
COUNTY:	Eddy County, New Mexico

I. DRILLING

A. CASING

Changes to the approved APD casing and cement program require submitting a sundry and receiving approval prior to work. Failure to obtain approval prior to work will result in an Incident of Non-Compliance being issued.

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 Artesia Group and the Capitan Reef.

Possible water flows in the Artesia and Salado Groups.

High pressure formations may be encountered.

1. The 13-3/8 inch surface casing shall be set at approximately 825 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - 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.
3. The minimum required fill of cement behind the **7** inch production casing is:
- ☒ Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification.

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

The pilot hole plugging procedure is approved as written.

4. The minimum required fill of cement behind the **4 1/2** inch production liner is:
- ☒ Cement to top of liner. Operator shall provide method of verification.
Additional cement may be required – excess calculates to 7%.
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.

CRW 121211