

ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Engineering Bureau -
 1220 South St. Francis Drive, Santa Fe, NM 87505



ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Application Acronyms:

[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]
[DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
[PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
[WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
[SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
[EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

- [1] **TYPE OF APPLICATION** - Check Those Which Apply for [A]
 [A] Location - Spacing Unit - Simultaneous Dedication
☒ NSL ☐ NSP ☐ SD

Check One Only for [B] or [C]

- [B] Commingling - Storage - Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

- [C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
☐ WFX ☐ PMX ☐ SWD ☐ IPI ☐ EOR ☐ PPR

- [D] Other: Specify _____

- [2] **NOTIFICATION REQUIRED TO:** - Check Those Which Apply, or ☐ Does Not Apply
 [A] ☐ Working, Royalty or Overriding Royalty Interest Owners
 [B] ☐ Offset Operators, Leaseholders or Surface Owner
 [C] ☐ Application is One Which Requires Published Legal Notice
 [D] ☐ Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office
 [E] ☐ For all of the above, Proof of Notification or Publication is Attached, and/or,
 [F] ☐ Waivers are Attached

- [3] **SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.**

- [4] **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

PHYLLIS A. EDWARDS
 Print or Type Name

Signature

REGULATORY ANALYST
 Title

3-2-07
 Date

pedwards@conchoresources.com
 e-mail Address

**Reindeer Federal #1
Eddy County, NM
API #: 30-015 33746**

Drilled a West ½, 320 spacing Crows Flat; Morrow gas well
TD of 11,700 Date drilled: 2-28-05

Location:

660' FSL & 1680' FWL Sec 21, T16S, R28E, Unit N

<u>Perf</u>	<u># of Holes</u>	<u>Acidize</u>	<u>CIBP</u>
11,575' – 11,672'	70	2500 gals	11,472 w/ 35' cmt cap
11,351' – 11,409'	48	2000 gals	11,325 w/ 35' cmt cap
11,196' – 11,254'	78	1750 gals	11,100 w/ 35' cmt cap
10,414' – 10,461'	22	1500 gals	8,888 w/ 35' cmt cap
			7,100 w/ 35' cmt cap

Morrow uneconomical

Attachment 1

Plat & sundry dated 2-17-06 shows plan to directionally drill to produce a Crows Flat; Wolfcamp

Surface

660' FSL & 1680' FWL Sec 21, T16S, R28E, Unit N

Proposed BHL

660' FSL & 660' FEL Sec 21, T16S, R28E, Unit P

Attachment 2

Plat & sundries dated 10-10-06 & 2-21-07 show KO plug @ 6283'.
Drill horizontally to 9695' to produce Wolfcamp

Attachment 3

Directional survey shows that actual BHL is
663' FSL & 300' FEL Sec 21, T16S, R28E, Unit P

Directional survey shows that bottom perf of 9438' is
663' FSL & 528' FEL which is a legal location

Attachment 4

Map & legend of offset wells. The only Wolfcamp producer is COG's.

Attachment 5

Updated land plat showing that COG Operating LLC owns offset acreage.

COG Operating LLC respectfully requests permission to have this NSL approved.
Please advise COG what will be the allowable, since this is a 120 acre spacing.

State of New Mexico

Energy, Minerals and Natural Resources Department

DISTRICT I

1625 N. FRANKLIN DR., ROSA, NM 85240

DISTRICT II

1301 W. GRAND AVENUE, ARTESIA, NM 88210

DISTRICT III

1000 Rio Brazos Rd., Artesia, NM 87410

DISTRICT IV

1220 S. ST. FRANCIS DR., SANTA FE, NM 87505

OIL CONSERVATION DIVISION

1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

Form C-102
Revised JUNE 10, 2003
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number 30-015-33746	Pool Code 97102	Pool Name Crow Flats;Wolfcamp
Property Code 34451	Property Name REINDEER FEDERAL	Well Number 1
OGRID No. 013837	Operator Name MACK ENERGY CORPORATION	Elevation 3589'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	21	16-S	28-E		660	SOUTH	1680	WEST	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/West line	County
P	21	16S	28E		660	South	660	East	Eddy
Dedicated Acres 120	Joint or Infill	Consolidation Code	Order No.						

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

	RECEIVED FEB 27 2006 OCU-ARTESIA	OPERATOR CERTIFICATION I hereby certify the the information contained herein is true and complete to the best of my knowledge and belief. <i>Jerry W. Sherrell</i> Signature Jerry W. Sherrell Printed Name Production Clerk Title 2/17/2006 Date
	GEODETIC COORDINATES NAD 27 NME Y=691937.9 N X=545998.4 E LAT.=32°54'07.66" N LONG.=104°11'00.47" W	SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision and that the same is true and correct to the best of my belief. OCTOBER 1, 2004 Date Surveyed Signature of Surveyor Professional Surveyor NEW MEXICO 04.11.216 Certified No. GARY EDSON 12841
	3585.0' 3586.3' 3587.3' 3591.4' 1680' 600' 600' Producing Area Project Area BHL	

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD-ARTESIA

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals

SUBMIT IN TRIPLICATE

RECEIVED

FEB 27 2006

OCD-ARTESIA

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other

2. Name of Operator

Mack Energy Corporation

3. Address and Telephone No.

P.O. Box 960, Artesia, NM 88211-0960 (505)748-1288

4. Location of Well (Footage, Sec., T. R., M. or Survey Description)

Surface Location 660 FSL & 1680 FWL, Sec. 21-T16S-R28E, Unit N
BHL 660 FSL & 660 FEL, Sec. 21-T16S-R28E, Unit P

5. Lease Designation and Serial No.

NMNM-100844

6. If Indian, Allottee or Tribe Name

7. If Unit or CA, Agreement Designation

8. Well Name and No.

Reindeer Federal #1

9. API Well No.

30-015-33746 DIXI

10. Field and Pool, or Exploratory Area

Crow Flats Wolfcamp

11. County or Parish, State

Eddy, NM

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

TYPE OF SUBMISSION

- ☒ Notice of Intent
☐ Subsequent Report
☐ Final Abandonment Notice

TYPE OF ACTION

- ☐ Abandonment
☐ Recompletion
☐ Plugging Back
☐ Casing Repair
☐ Altering Casing
☒ Other Drill Horizontal
☐ Change of Plans
☐ New Construction
☐ Non-Routine Fracturing
☐ Water Shut-Off
☐ Conversion to Injection
☐ Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13 Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work)*

Reindeer Federal #1 Horizontal

Surface Location: 660 FSL & 1680 FWL BHL: 660 FSL & 660 FEL
Sec. 21-T16S-R28E

Drilling Procedure:

1. MIRU set cement plug at +/-6125'. RIH with Whipstock Assembly, run Gyro, orient direction to East.
2. RIH w/7 7/8" bit. RIH w/Scientific Drilling directional equipment, drill formation along designated path (See attached)
3. TD well, run 5 1/2" casing to surface and cement.

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

Signed Jerry W. Shenell
(This space for Federal or State office use)
(ORIG. SGD.) ALEXIS C. SWOBODA

Title Production Clerk

Date 2/17/2006

Approved by
Conditions of approval, if any:

Title PETROLEUM ENGINEER

Date FEB 24 2006

Title 18 U.S.C. Section 1001, makes 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.

*See Instruction on Reverse Side

State of New Mexico

Energy, Minerals and Natural Resources Department

Form C-102

Revised JUNE 10, 2003

Submit to Appropriate District Office

State Lease - 4 Copies

Fee Lease - 3 Copies

OIL CONSERVATION DIVISION

1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

DISTRICT II

1000 E. GRAND AVENUE, ALBUQUERQUE, NM 87210

DISTRICT III

1000 E. BRASOS RD., ALBUQUERQUE, NM 87410

DISTRICT IV

1220 S. ST. FRANCIS DR., SANTA FE, NM 87505

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number 30-015-33746	Pool Code 97102	Pool Name Crow Flats;Wolfcamp
Property Code 302554	Property Name REINDEER FEDERAL	Well Number 1
OGED No. 229137	Operator Name COG OPERATING LLC	Elevation 3589'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	21	16-S	28-E		660	SOUTH	1680	WEST	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/West line	County
P	21	16S	28E		663	SOUTH	300	FEL	Eddy

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
120			

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

	OPERATOR CERTIFICATION I hereby certify the information contained herein is true and complete to the best of my knowledge and belief. <i>Phyllis A. Edwards</i> Signature Phyllis A. Edwards Printed Name Regulatory Analyst Title 1-15-07 Date
	SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision and that the same is true and correct to the best of my belief. OCTOBER 1, 2004 Date Surveyed REV: 10/4/04 Signature of Surveyor Professional Surveyor <i>GARY E. JOHNSON</i> Signature NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR 04.11.1216 Certified No. GARY E. JOHNSON 12841
	GEODETIC COORDINATES NAD 27 NME Y=691937.9 N X=545998.4 E LAT.=32°54'07.66" N LONG.=104°11'00.47" W
	Producing Area Project Area

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires: March 31, 2007

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
☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator
COG Operating LLC

3a. Address
550 W. Texas Ave., Suite 1300 Midland, TX 79701

3b. Phone No. (include area code)
432-685-4340

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

**660' FSL & 1680' FWL
Unit N, Section 21, T16S, R32E Lea Co., NM**

5. Lease Serial No.

NMNM-100844

6. If Indian, Allottee or Tribe Name

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

8. Well Name and No.

Reindeer Federal #1

9. API Well No.

30-015-33746

10. Field and Pool, or Exploratory Area

Crows Flat, Wolfcamp

11. County or Parish, State

Eddy County, NM

12. CHECK APPROPRIATE BOX(ES) 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	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other Re-enter well, drill out plugs, sidetrack to TD. Run/cmt csg
	☐ 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 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.)

9-17-06 NU BOP & test to 2000# for 10 minutes - OK.

9-20-06 Drill out cmt plugs to 6065'. Set plug back @ @ 6283'. Set w/ 250 sx 1 + 1.25 + 2% salt. KO plug @ 6283'.

10-9-06 Time drilled (built curve) to 9695' TD.

10-10-06 Ran 233 jts 5-1/2" 17# L-80 csg and set @ 9695'. Cmt 1st stage w/ 200 sx C followed by 650 sx H. Cmt 2nd stage w/ 200 sx H followed by 1550 sx C. Circ 170 sx. Plug down @ 9:30 PM. WOC 12 hrs. Test csg to 600# for 20 min - OK.

14. I hereby certify that the foregoing is true and correct
Name (Printed/Typed)

Phyllis A. Edwards

Title **Regulatory Analyst**

Signature

Phyllis A. Edwards

Date

10/10/2006

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

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.

Title

Date

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.

(Instructions on page 2)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB No. 1004-0137
Expires: March 31, 2007

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
☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator COG Operating LLC

3a. Address
550 W. Texas Ave., Suite 1300 Midland, TX 797013b. Phone No. (include area code)
432-685-4340

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

SURFACE: 660' FSL & 1680' FWL
Unit N, Section 21, T16S, R28EBHL: 663' FSL & 300' FEL
Unit P, Section 21, T16S, R28E

5. Lease Serial No.

NMNM-100844

6. If Indian, Allottee or Tribe Name

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

8. Well Name and No.

Reindeer Federal #1

9. API Well No.

30-015-33746

10. Field and Pool, or Exploratory Area

Wildcat, Wolfcamp

11. County or Parish, State

Eddy County, NM

12. CHECK APPROPRIATE BOX(ES) 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	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other Completion
	☐ 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 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 recomple 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.)

10-20-06 Perf Wolfcamp w/ 4 SPF @ 8677' - 8680' (9 holes), 8869' - 8872' (11 holes), 9246-9250' (15 holes), 9433-9438' (17 holes). Total 52 holes. Acidize w/ 500 gals acid.

10-24-06 Frac 1st stg 8677-9438' w/3977 gals 15% HCL, 135,127 gal gel, 11,073# 100 mesh sand, 20,406# 14/30 LiteProp, 85,993# 16/30 sand. Set Comp BP @ 8515'.
Perf Wolfcamp w/ 4 SPF 8283'-8289' (23 holes), 8150'-8156' (21 holes), 7956'-7960' (15 holes). 59 total holes.
Frac 2nd stg w/5997 gals 15% HCL, 83,622 gals gel, 8025# 100 mesh sand, 78,557# 16/30 sand. Set flow thru plug @ 7850'.
Perf Wolfcamp w/ 4 SPF @ 7620'-7625' (17 holes), 7516'-7520' (16 holes), 7439'-7443' (14 holes), 7350'-7353' (12 holes). Total 59 holes.

10-25-06 Frac 3rd stg w/ 7938 gals 15% HCL, 121,632# gel, 11,049# 100 mesh sand, 5555# LiteProp, 69,452# 16/30 sand.

10-26-06 Flow test well.

11-2-06 SI. WOPL.

02-15-07 Turn to production.

14. I hereby certify that the foregoing is true and correct
Name (Printed/Typed)

Phyllis A. Edwards

Title Regulatory Analyst

Signature



Date

02/21/2007

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

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.

Title

Date

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.

(Instructions on page 2)

COG Operating LLC

Eddy County, NM (NAD 27 NME)

Reindeer Federal #1

Reindeer Federal #1

OH

Design: Actual

Standard Survey Report

09 October, 2006



Scientific Drilling

Scientific Drilling

Survey Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well Reindeer Federal #1
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	GL=3589, KB=3607 @ 3607.0ft (GL=3589, KB=3607)
Site:	Reindeer Federal #1	MD Reference:	GL=3589, KB=3607 @ 3607.0ft (GL=3589, KB=3607)
Well:	Reindeer Federal #1	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Actual	Database:	EDM 2003.14 Single User Db

Project:	Eddy County, NM (NAD 27 NME)		
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:	Reindeer Federal #1		
Site Position:		Northing:	691,937.85 ft
From:	Map	Easting:	545,998.40 ft
Position Uncertainty:	0.0 ft	Slot Radius:	0.00000 ft
		Latitude:	32° 54' 7.655 N
		Longitude:	104° 11' 0.467 W
		Grid Convergence:	0.08 °

Well:	Reindeer Federal #1, 660 FSL & 1680 FWL				
Well Position	+N-S	0.0 ft	Northing:	691,937.90 ft	
	+E-W	0.0 ft	Easting:	545,998.40 ft	
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft	Ground Level:	3,589.0 ft
				Latitude:	32° 54' 7.655 N
				Longitude:	104° 11' 0.467 W

Wellbore:	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF200510	2006-10-09	(°)	(°)	(nT)
			8.47	60.83	49,440

Design:	Actual				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	90.00	

Survey Program	Date	2006-10-09			
From	To	Survey (Wellbore)	Tool Name	Description	
(ft)	(ft)				
100.0	6,080.0	GYRO (OH)	Keeper	Keeper Standard Rate Gyro	
6,125.0	9,695.0	MWD (OH)	MWD	MWD - Standard ISCWSA	

Survey	Measured Depth	Inclination	Azimuth	Vertical Depth	+N-S	+E-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate
	(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(°/100ft)	(°/100ft)	(°/100ft)
	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
	100.0	0.82	152.92	100.0	-0.6	0.3	0.3	0.82	0.82	0.00
	200.0	1.35	208.21	200.0	-2.3	0.1	0.1	1.11	0.53	55.29
	300.0	2.07	225.87	299.9	-4.6	-1.8	-1.8	0.88	0.72	17.66
	400.0	2.39	231.60	399.9	-7.2	-4.7	-4.7	0.39	0.32	5.73
	500.0	2.31	233.19	499.8	-9.7	-7.9	-7.9	0.10	-0.08	1.59
	600.0	1.85	233.99	599.7	-11.8	-10.9	-10.9	0.46	-0.46	0.80
	700.0	1.71	240.33	699.7	-13.5	-13.5	-13.5	0.24	-0.14	6.34
	800.0	1.44	245.73	799.6	-14.8	-15.9	-15.9	0.31	-0.27	5.40
	900.0	1.24	247.70	899.6	-15.7	-18.0	-18.0	0.21	-0.20	1.97
	1,000.0	0.94	247.85	999.6	-16.4	-19.8	-19.8	0.30	-0.30	0.15
	1,100.0	0.74	246.71	1,099.6	-17.0	-21.2	-21.2	0.20	-0.20	0.86

Scientific Drilling

Survey Report



Company: COG Operating LLC
 Project: Eddy County, NM (NAD 27 NME)
 Site: Reindeer Federal #1
 Well: Reindeer Federal #1
 Wellbore: OH
 Design: Actual

Local Co-ordinate Reference: Well Reindeer Federal #1
 TVD Reference: GL=3589, KB=3607 @ 3607.0ft (GL=3589, KB=3607)
 MD Reference: GL=3589, KB=3607 @ 3607.0ft (GL=3589, KB=3607)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 2003.14 Single User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,200.0	0.59	263.99	1,199.6	-17.2	-22.3	-22.3	0.23	-0.15	15.28
1,300.0	0.48	266.45	1,299.6	-17.3	-23.2	-23.2	0.11	-0.11	2.46
1,400.0	0.35	272.74	1,399.6	-17.3	-23.9	-23.9	0.14	-0.13	6.29
1,500.0	0.35	265.23	1,499.6	-17.3	-24.5	-24.5	0.05	0.00	-7.51
1,600.0	0.40	268.57	1,599.6	-17.4	-25.2	-25.2	0.05	0.05	3.34
1,700.0	0.52	260.42	1,699.5	-17.5	-26.0	-26.0	0.14	0.12	-8.15
1,800.0	0.57	267.40	1,799.5	-17.6	-26.9	-26.9	0.08	0.05	6.98
1,900.0	0.61	263.26	1,899.5	-17.6	-28.0	-28.0	0.06	0.04	-4.14
2,000.0	0.60	262.51	1,999.5	-17.8	-29.0	-29.0	0.01	-0.01	-0.75
2,100.0	0.59	270.56	2,099.5	-17.8	-30.0	-30.0	0.08	-0.01	8.05
2,200.0	0.68	270.76	2,199.5	-17.8	-31.2	-31.2	0.09	0.09	0.20
2,300.0	0.55	278.47	2,299.5	-17.7	-32.2	-32.2	0.15	-0.13	7.71
2,400.0	0.72	274.01	2,399.5	-17.6	-33.3	-33.3	0.18	0.17	-4.46
2,500.0	0.61	278.07	2,499.5	-17.5	-34.5	-34.5	0.12	-0.11	4.06
2,600.0	0.65	271.63	2,599.5	-17.4	-35.6	-35.6	0.08	0.04	-6.44
2,700.0	0.64	274.07	2,699.5	-17.4	-36.7	-36.7	0.03	-0.01	2.44
2,800.0	0.60	279.72	2,799.5	-17.2	-37.8	-37.8	0.07	-0.04	5.65
2,900.0	0.68	277.08	2,899.5	-17.1	-38.9	-38.9	0.09	0.08	-2.64
3,000.0	0.75	275.91	2,999.5	-16.9	-40.1	-40.1	0.07	0.07	-1.17
3,100.0	0.67	279.12	3,099.5	-16.8	-41.3	-41.3	0.09	-0.08	3.21
3,200.0	0.72	284.78	3,199.5	-16.5	-42.5	-42.5	0.08	0.05	5.66
3,300.0	0.80	279.26	3,299.4	-16.3	-43.8	-43.8	0.11	0.08	-5.52
3,400.0	0.68	283.86	3,399.4	-16.0	-45.1	-45.1	0.13	-0.12	4.60
3,500.0	0.51	282.23	3,499.4	-15.8	-46.1	-46.1	0.17	-0.17	-1.63
3,600.0	0.56	281.33	3,599.4	-15.6	-47.0	-47.0	0.05	0.05	-0.90
3,700.0	0.70	273.03	3,699.4	-15.4	-48.1	-48.1	0.17	0.14	-8.30
3,800.0	0.52	279.39	3,799.4	-15.3	-49.2	-49.2	0.19	-0.18	6.36
3,900.0	0.74	268.36	3,899.4	-15.3	-50.3	-50.3	0.25	0.22	-11.03
4,000.0	0.78	263.83	3,999.4	-15.4	-51.6	-51.6	0.07	0.04	-4.53
4,100.0	0.78	262.40	4,099.4	-15.5	-52.9	-52.9	0.02	0.00	-1.43
4,200.0	0.91	266.64	4,199.4	-15.7	-54.4	-54.4	0.14	0.13	4.24
4,300.0	0.92	260.78	4,299.4	-15.8	-56.0	-56.0	0.09	0.01	-5.86
4,400.0	0.69	260.17	4,399.4	-16.1	-57.4	-57.4	0.23	-0.23	-0.61
4,500.0	0.63	265.76	4,499.4	-16.2	-58.5	-58.5	0.09	-0.06	5.59
4,600.0	0.56	256.07	4,599.3	-16.4	-59.5	-59.5	0.12	-0.07	-9.69
4,700.0	0.21	76.07	4,699.3	-16.5	-59.8	-59.8	0.77	-0.35	180.00
4,800.0	0.58	266.26	4,799.3	-16.4	-60.2	-60.2	0.79	0.37	-169.81
4,900.0	0.63	262.17	4,899.3	-16.6	-61.2	-61.2	0.07	0.05	-4.09
5,000.0	0.70	252.22	4,999.3	-16.8	-62.3	-62.3	0.13	0.07	-9.95
5,100.0	0.64	248.06	5,099.3	-17.2	-63.4	-63.4	0.08	-0.06	-4.16
5,200.0	0.67	253.45	5,199.3	-17.6	-64.5	-64.5	0.07	0.03	5.39
5,300.0	0.53	240.59	5,299.3	-18.0	-65.5	-65.5	0.19	-0.14	-12.86
5,400.0	0.46	220.92	5,399.3	-18.5	-66.1	-66.1	0.18	-0.07	-19.67
5,500.0	0.52	207.18	5,499.3	-19.2	-66.6	-66.6	0.13	0.06	-13.74
5,600.0	0.52	215.64	5,599.3	-20.0	-67.1	-67.1	0.08	0.00	8.46
5,700.0	0.55	221.60	5,699.3	-20.7	-67.7	-67.7	0.06	0.03	5.96
5,800.0	0.48	193.80	5,799.3	-21.5	-68.1	-68.1	0.26	-0.07	-27.80
5,900.0	0.46	173.15	5,899.3	-22.3	-68.1	-68.1	0.17	-0.02	-20.65
6,000.0	0.48	151.26	5,999.3	-23.1	-67.9	-67.9	0.18	0.02	-21.89
6,125.0	10.24	90.01	6,123.6	-23.5	-56.5	-56.5	8.01	7.81	-49.00
6,157.0	15.12	90.47	6,154.8	-23.5	-49.5	-49.5	15.25	15.25	1.44
6,188.0	19.65	90.20	6,184.4	-23.6	-40.2	-40.2	14.62	14.61	-0.87
6,219.0	24.16	91.64	6,213.1	-23.8	-28.7	-28.7	14.65	14.55	4.65
6,250.0	27.24	92.65	6,241.1	-24.3	-15.2	-15.2	10.04	9.94	3.26

Scientific Drilling

Survey Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD 27 NME)
Site: Reindeer Federal #1
Well: Reindeer Federal #1
Wellbore: OH
Design: Actual

Local Co-ordinate Reference: Well Reindeer Federal #1
TVD Reference: GL=3589, KB=3607 @ 3607.0ft (GL=3589, KB=3607)
MD Reference: GL=3589, KB=3607 @ 3607.0ft (GL=3589, KB=3607)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.14 Single User Db

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,281.0	30.95	92.38	6,268.2	-25.0	-0.2	-0.2	11.98	11.97	-0.87
6,312.0	34.49	92.02	6,294.2	-25.6	16.6	16.6	11.44	11.42	-1.16
6,344.0	37.60	91.37	6,320.1	-26.2	35.4	35.4	9.79	9.72	-2.03
6,375.0	40.31	91.03	6,344.2	-26.6	54.9	54.9	8.77	8.74	-1.10
6,406.0	43.46	91.03	6,367.3	-26.9	75.6	75.6	10.16	10.16	0.00
6,437.0	46.50	89.37	6,389.2	-27.0	97.5	97.5	10.51	9.81	-5.35
6,468.0	49.62	88.65	6,409.9	-26.6	120.5	120.5	10.21	10.06	-2.32
6,500.0	51.95	88.60	6,430.2	-26.0	145.3	145.3	7.28	7.28	-0.16
6,531.0	53.80	89.88	6,448.9	-25.7	170.0	170.0	6.82	5.97	4.13
6,562.0	56.70	89.17	6,466.5	-25.5	195.5	195.5	9.54	9.35	-2.29
6,593.0	60.43	89.32	6,482.7	-25.1	221.9	221.9	12.04	12.03	0.48
6,624.0	63.96	88.36	6,497.2	-24.6	249.4	249.4	11.71	11.39	-3.10
6,655.0	67.02	88.73	6,510.0	-23.9	277.5	277.5	9.93	9.87	1.19
6,686.0	70.08	88.84	6,521.4	-23.2	306.4	306.4	9.88	9.87	0.35
6,717.0	72.91	87.97	6,531.2	-22.4	335.8	335.8	9.51	9.13	-2.81
6,749.0	75.57	89.27	6,539.9	-21.7	366.6	366.6	9.19	8.31	4.06
6,780.0	78.17	89.80	6,546.9	-21.4	396.7	396.7	8.55	8.39	1.71
6,811.0	80.84	89.55	6,552.6	-21.3	427.2	427.2	8.65	8.61	-0.81
6,842.0	83.42	90.10	6,556.8	-21.2	457.9	457.9	8.51	8.32	1.77
6,873.0	85.18	90.21	6,559.9	-21.3	488.8	488.8	5.69	5.68	0.35
6,904.0	86.87	89.73	6,562.0	-21.2	519.7	519.7	5.67	5.45	-1.55
6,936.0	88.92	89.17	6,563.2	-20.9	551.7	551.7	6.64	6.41	-1.75
6,967.0	89.60	90.92	6,563.6	-21.0	582.7	582.7	6.06	2.19	5.65
6,998.0	89.97	91.36	6,563.7	-21.6	613.7	613.7	1.85	1.19	1.42
7,029.0	89.06	88.93	6,564.0	-21.6	644.7	644.7	8.37	-2.94	-7.84
7,060.0	88.96	88.44	6,564.5	-20.9	675.6	675.6	1.61	-0.32	-1.58
7,092.0	89.06	88.38	6,565.1	-20.0	707.6	707.6	0.36	0.31	-0.19
7,123.0	89.13	88.51	6,565.6	-19.2	738.6	738.6	0.48	0.23	0.42
7,154.0	89.29	88.62	6,566.0	-18.4	769.6	769.6	0.63	0.52	0.35
7,185.0	88.52	91.13	6,566.6	-18.4	800.6	800.6	8.47	-2.48	8.10
7,216.0	88.38	90.23	6,567.4	-18.7	831.6	831.6	2.94	-0.45	-2.90
7,247.0	88.45	90.94	6,568.3	-19.0	862.6	862.6	2.30	0.23	2.29
7,278.0	88.55	90.25	6,569.1	-19.4	893.5	893.5	2.25	0.32	-2.23
7,309.0	88.12	88.69	6,570.0	-19.1	924.5	924.5	5.22	-1.39	-5.03
7,340.0	87.98	88.27	6,571.1	-18.3	955.5	955.5	1.43	-0.45	-1.35
7,372.0	88.01	89.12	6,572.2	-17.5	987.5	987.5	2.66	0.09	2.66
7,403.0	89.02	89.60	6,573.0	-17.2	1,018.5	1,018.5	3.61	3.26	1.55
7,434.0	89.56	88.57	6,573.4	-16.7	1,049.5	1,049.5	3.75	1.74	-3.32
7,465.0	89.56	88.77	6,573.6	-16.0	1,080.4	1,080.4	0.65	0.00	0.65
7,496.0	89.70	88.94	6,573.8	-15.4	1,111.4	1,111.4	0.71	0.45	0.55
7,527.0	89.76	89.20	6,574.0	-14.9	1,142.4	1,142.4	0.86	0.19	0.84
7,556.0	89.73	89.10	6,574.1	-14.4	1,171.4	1,171.4	0.36	-0.10	-0.34
7,589.0	89.80	88.44	6,574.2	-13.7	1,204.4	1,204.4	2.01	0.21	-2.00
7,620.0	90.03	89.20	6,574.3	-13.1	1,235.4	1,235.4	2.56	0.74	2.45
7,652.0	90.13	88.59	6,574.2	-12.5	1,267.4	1,267.4	1.93	0.31	-1.91
7,683.0	89.63	88.59	6,574.3	-11.7	1,298.4	1,298.4	1.61	-1.61	0.00
7,714.0	89.76	88.54	6,574.4	-10.9	1,329.4	1,329.4	0.45	0.42	-0.16
7,745.0	89.70	89.24	6,574.6	-10.3	1,360.4	1,360.4	2.27	-0.19	2.26
7,776.0	89.73	89.37	6,574.7	-9.9	1,391.4	1,391.4	0.43	0.10	0.42
7,807.0	89.80	89.62	6,574.9	-9.7	1,422.4	1,422.4	0.84	0.23	0.81
7,838.0	89.90	89.75	6,575.0	-9.5	1,453.4	1,453.4	0.53	0.32	0.42
7,869.0	89.90	89.86	6,575.0	-9.4	1,484.4	1,484.4	0.35	0.00	0.35
7,901.0	90.07	89.84	6,575.0	-9.3	1,516.4	1,516.4	0.53	0.53	-0.06
7,932.0	89.80	90.06	6,575.1	-9.3	1,547.4	1,547.4	1.12	-0.87	0.71

Scientific Drilling

Survey Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD 27 NME)
Site: Reindeer Federal #1
Well: Reindeer Federal #1
Wellbore: OH
Design: Actual

Local Co-ordinate Reference: Well Reindeer Federal #1
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.14 Single User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,963.0	90.03	90.64	6,575.1	-9.5	1,578.4	1,578.4	2.01	0.74	1.87
7,994.0	88.96	90.38	6,575.4	-9.7	1,609.4	1,609.4	3.55	-3.45	-0.84
8,025.0	89.13	91.36	6,575.9	-10.2	1,640.4	1,640.4	3.21	0.55	3.16
8,056.0	89.36	90.49	6,576.3	-10.7	1,671.4	1,671.4	2.90	0.74	-2.81
8,087.0	89.63	90.10	6,576.6	-10.9	1,702.4	1,702.4	1.53	0.87	-1.26
8,118.0	89.26	91.36	6,576.9	-11.3	1,733.4	1,733.4	4.24	-1.19	4.06
8,149.0	89.36	91.51	6,577.2	-12.0	1,764.3	1,764.3	0.58	0.32	0.48
8,180.0	89.40	90.13	6,577.6	-12.5	1,795.3	1,795.3	4.45	0.13	-4.45
8,212.0	89.16	90.67	6,578.0	-12.7	1,827.3	1,827.3	1.85	-0.75	1.69
8,243.0	89.36	89.55	6,578.4	-12.8	1,858.3	1,858.3	3.67	0.65	-3.61
8,274.0	89.29	89.41	6,578.7	-12.5	1,889.3	1,889.3	0.50	-0.23	-0.45
8,305.0	89.70	90.11	6,579.0	-12.4	1,920.3	1,920.3	2.62	1.32	2.26
8,336.0	90.10	90.82	6,579.1	-12.6	1,951.3	1,951.3	2.63	1.29	2.29
8,367.0	90.34	90.93	6,579.0	-13.1	1,982.3	1,982.3	0.85	0.77	0.35
8,398.0	89.06	89.16	6,579.1	-13.1	2,013.3	2,013.3	7.05	-4.13	-5.71
8,430.0	88.79	90.23	6,579.7	-12.9	2,045.3	2,045.3	3.45	-0.84	3.34
8,461.0	88.89	90.21	6,580.3	-13.1	2,076.3	2,076.3	0.33	0.32	-0.06
8,492.0	88.12	89.32	6,581.2	-12.9	2,107.3	2,107.3	3.80	-2.48	-2.87
8,523.0	88.05	88.13	6,582.2	-12.2	2,138.3	2,138.3	3.84	-0.23	-3.84
8,554.0	88.18	89.09	6,583.2	-11.5	2,169.2	2,169.2	3.12	0.42	3.10
8,585.0	88.75	88.99	6,584.0	-11.0	2,200.2	2,200.2	1.87	1.84	-0.32
8,616.0	88.65	88.50	6,584.7	-10.3	2,231.2	2,231.2	1.61	-0.32	-1.58
8,648.0	88.69	88.72	6,585.5	-9.5	2,263.2	2,263.2	0.70	0.12	0.69
8,679.0	88.55	87.95	6,586.2	-8.6	2,294.2	2,294.2	2.52	-0.45	-2.48
8,710.0	88.65	88.24	6,587.0	-7.6	2,325.1	2,325.1	0.99	0.32	0.94
8,741.0	89.73	88.23	6,587.4	-6.6	2,356.1	2,356.1	3.48	3.48	-0.03
8,772.0	89.87	87.45	6,587.5	-5.5	2,387.1	2,387.1	2.56	0.45	-2.52
8,803.0	89.93	87.33	6,587.6	-4.1	2,418.1	2,418.1	0.43	0.19	-0.39
8,835.0	90.03	87.51	6,587.6	-2.6	2,450.0	2,450.0	0.64	0.31	0.56
8,866.0	90.40	87.73	6,587.5	-1.3	2,481.0	2,481.0	1.39	1.19	0.71
8,897.0	90.67	86.35	6,587.2	0.3	2,512.0	2,512.0	4.54	0.87	-4.45
8,928.0	89.87	88.20	6,587.1	1.7	2,542.9	2,542.9	6.50	-2.58	5.97
8,959.0	89.83	87.08	6,587.1	3.0	2,573.9	2,573.9	3.62	-0.13	-3.61
8,990.0	89.76	88.67	6,587.2	4.2	2,604.9	2,604.9	5.13	-0.23	5.13
9,021.0	89.90	88.48	6,587.3	4.9	2,635.9	2,635.9	0.76	0.45	-0.61
9,052.0	89.53	87.56	6,587.5	6.0	2,666.9	2,666.9	3.20	-1.19	-2.97
9,083.0	89.53	87.41	6,587.7	7.4	2,697.8	2,697.8	0.48	0.00	-0.48
9,115.0	89.76	89.05	6,587.9	8.4	2,729.8	2,729.8	5.18	0.72	5.12
9,146.0	90.00	89.54	6,588.0	8.7	2,760.8	2,760.8	1.76	0.77	1.58
9,177.0	90.17	89.50	6,588.0	9.0	2,791.8	2,791.8	0.56	0.55	-0.13
9,208.0	89.83	88.81	6,588.0	9.5	2,822.8	2,822.8	2.48	-1.10	-2.23
9,239.0	90.07	88.56	6,588.0	10.2	2,853.8	2,853.8	1.12	0.77	-0.81
9,270.0	89.39	91.33	6,588.1	10.2	2,884.8	2,884.8	9.20	-2.19	8.94
9,301.0	89.53	91.54	6,588.4	9.4	2,915.8	2,915.8	0.81	0.45	0.68
9,325.5	89.66	91.55	6,588.6	8.8	2,940.2	2,940.2	0.55	0.55	0.03
PBHL (RF #1)									
9,332.0	89.70	91.55	6,588.6	8.6	2,946.8	2,946.8	0.55	0.55	0.03
9,364.0	89.02	90.49	6,589.0	8.0	2,978.8	2,978.8	3.94	-2.12	-3.31
9,395.0	88.89	91.25	6,589.6	7.6	3,009.7	3,009.7	2.49	-0.42	2.45
9,426.0	88.62	91.75	6,590.2	6.7	3,040.7	3,040.7	1.83	-0.87	1.61
9,457.0	88.72	90.63	6,591.0	6.1	3,071.7	3,071.7	3.63	0.32	-3.61
9,488.0	88.89	90.94	6,591.6	5.7	3,102.7	3,102.7	1.14	0.55	1.00
9,519.0	88.96	90.72	6,592.2	5.2	3,133.7	3,133.7	0.74	0.23	-0.71
9,550.0	88.99	91.21	6,592.7	4.7	3,164.7	3,164.7	1.58	0.10	1.58
9,582.0	89.19	91.46	6,593.2	4.0	3,196.7	3,196.7	1.00	0.62	0.78

Scientific Drilling

Survey Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD 27 NME)
Site: Reindeer Federal #1
Well: Reindeer Federal #1
Wellbore: OH
Design: Actual

Local Co-ordinate Reference: Well Reindeer Federal #1
TVD Reference: GL=3589, KB=3607 @ 3607.0ft (GL=3589, KB=3607)
MD Reference: GL=3589, KB=3607 @ 3607.0ft (GL=3589, KB=3607)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 2003.14 Single User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,613.0	89.23	91.18	6,593.7	3.2	3,227.7	3,227.7	0.91	0.13	-0.90
9,639.0	89.23	90.81	6,594.0	2.8	3,253.7	3,253.7	1.42	0.00	-1.42
Last MWD Survey									
9,695.0	89.23	90.81	6,594.8	2.0	3,309.6	3,309.6	0.00	0.00	0.00
Projection to Bit									

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL (RF #1)	0.00	359.99	6,590.0	0.0	2,940.0	691,937.90	548,938.40	32° 54' 7.613 N	104° 10' 25.983 W
- actual wellpath misses by 8.9ft at 9325.5ft MD (6588.6 TVD, 8.8 N, 2940.2 E)									
- Point									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
9,639.0	6,594.0	2.8	3,253.7	Last MWD Survey
9,695.0	6,594.8	2.0	3,309.6	Projection to Bit

Checked By: _____ Approved By: _____ Date: _____

COG Operating LLC

Project: Eddy County, NM (NAD 27 NME)
 Site: Reindeer Federal #1
 Well: Reindeer Federal #1
 Wellbore: OH
 Design: Plan vs Actual



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	DLeg	TFace	VSec	Target
1	5090.0	0.52	135.10	6275.3	-23.6	-57.5	0.00	0.00	-57.5	
2	5844.5	88.49	88.49	6567.6	-22.4	419.6	11.66	-45.61	419.6	
3	9353.1	88.49	88.49	6590.0	0.0	2940.0	0.00	0.00	2940.0	PBHL (RF #1)
4	9725.1	89.49	89.49	6593.2	3.2	3300.0	0.00	0.00	3300.0	

WELL DETAILS: Reindeer Federal #1

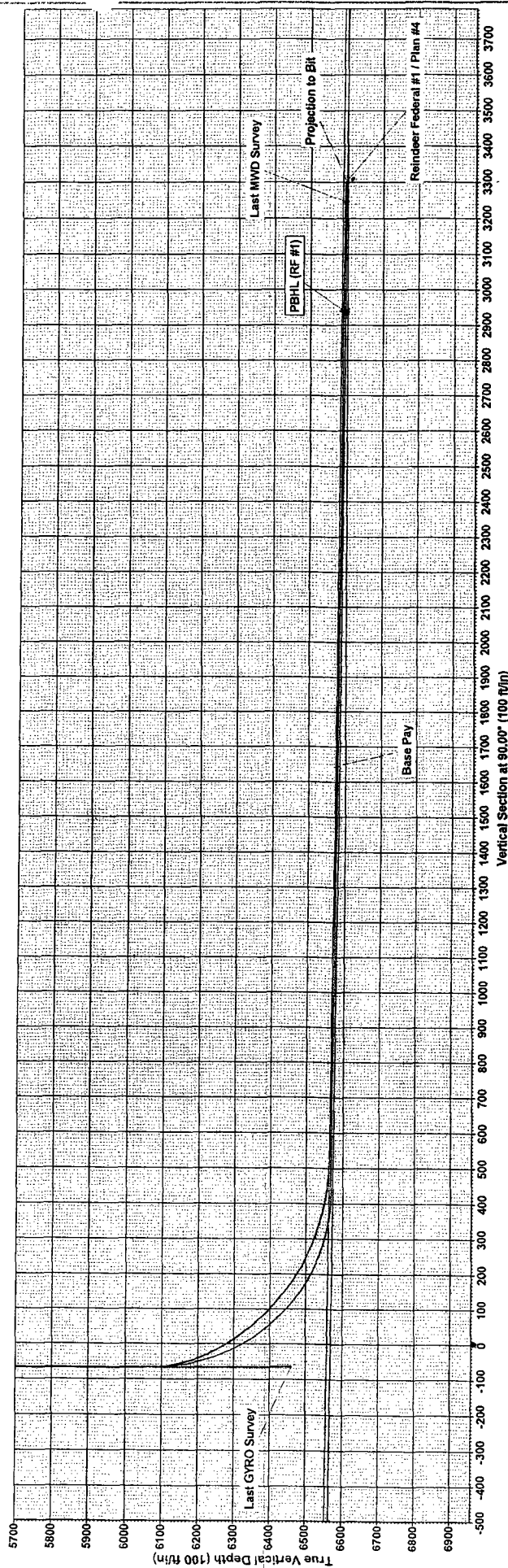
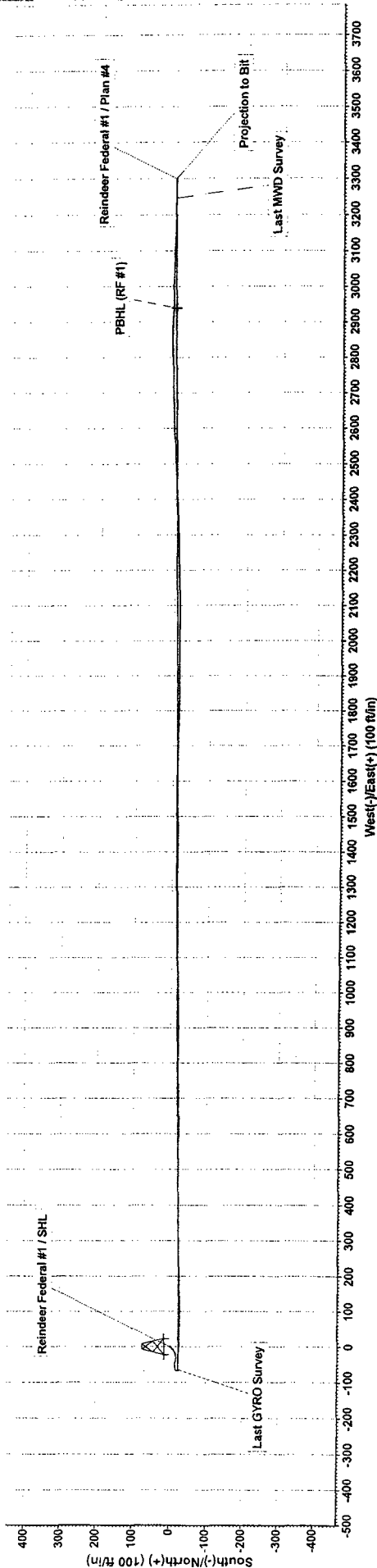
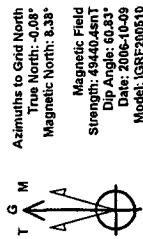
+N-S	0.0	+E-W	0.0	Northing	691937.90	Easting	54898.40	Ground Level:	3589.0	Latitude	32° 54' 7.655 N	Longitude	104° 11' 0.467 W	Slot
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WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

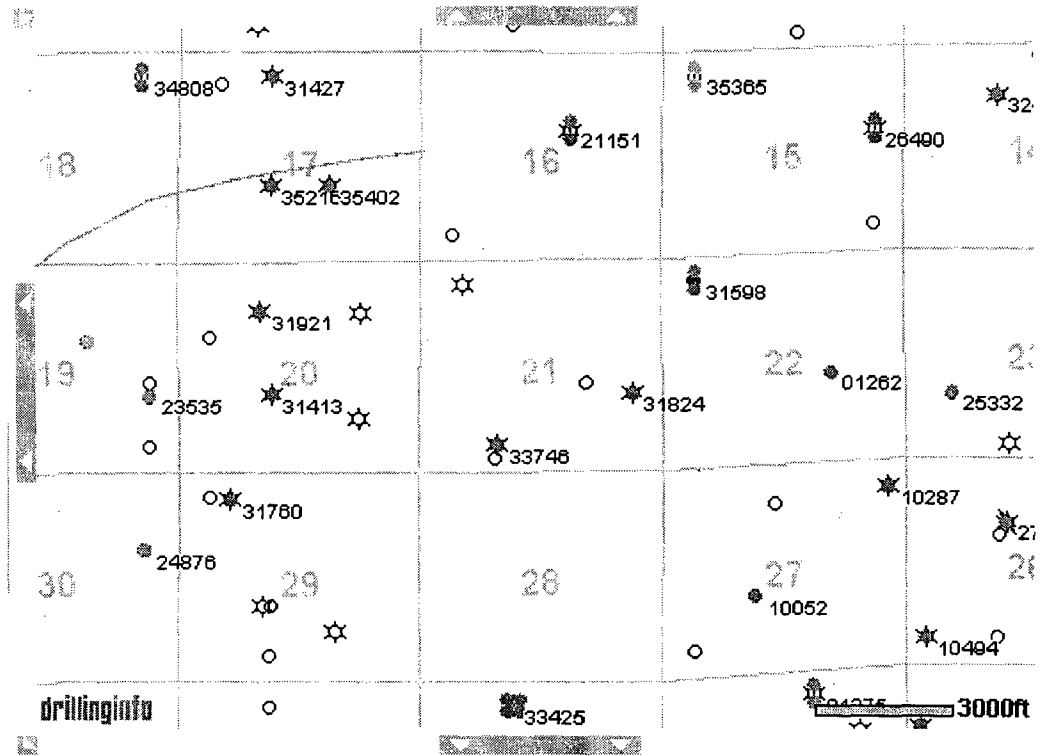
Name	TVD	+N-S	+E-W	Northing	Easting	Shape
PBHL (RF #1)	6590.0	0.0	2940.0	691937.90	54898.40	Point

PROJECT DETAILS: Eddy County, NM (NAD 27 NME)

Geodetic System:	US State Plane 1927 (Exact solution)	Created By:	Julio Pifa	Date:	08-Oct-06
Datum:	NAD 1927 (NADCON CONUS)	Checked:		Date:	
Ellipsoid:	Clarke 1866	Reviewed:		Date:	
Zone:	New Mexico East 3001	Approved:		Date:	
System Datum:	Mean Sea Level				



Offset Wells from Reindeer Federal #1



Offset Wells to Reindeer Federal #1

API#	Operator	Lease	Well#	County	Legal	First Prod.	Last Prod.	Field Name	Reservoir Name	Total Well Depth	Well Status
30-015-01262		BARBARA FEDERAL	001	EDDY	S:22, T:16S, R:28E	Sep 1964	Jun 1965	CROW FLATS	SAN ANDRES (ABANDONED)		Active
30-015-10052		SOUTHERN UNION FEDERAL	001	EDDY	S:27, T:16S, R:28E	Jan 1966	Dec 1967	VANDAGRIFF KEYES	QUEEN (GAS)		Active
30-015-10287		SOUTHERN UNION FEDERAL	001	EDDY	S:27, T:16S, R:28E	Jan 1965	Jan 1988	RED LAKE	QUEEN-GRAYBURG, EAST		Active
30-015-21151	CIMAREX ENERGY CO. OF COLORADO	CROW FLATS 16 STATE COM	1	EDDY	S:16, T:16S, R:28E			WILDCAT	ATOKA	9,575	Unknown
30-015-21151	CIMAREX ENERGY CO. OF COLORADO	CROW FLATS 16 STATE COM	1	EDDY	S:16, T:16S, R:28E			ATOKA GAS WILDCAT		9,575	Unknown
30-015-26490	DEVON ENERGY PRODUCTION COMPANY, LP	CROW FLATS 15 FEDERAL COM	001	EDDY	S:15, T:16S, R:28E	May 2002	Aug 2002	CAVE LAKE	GRAYBURG (G)	9,700	Flowing
30-015-26490	DEVON SFS OPERATING INC	CROW FLATS 15 FEDERAL COM	001	EDDY	S:15, T:16S, R:28E	Jan 2002	Apr 2002	WILDCAT	PENN (GAS)	9,700	Flowing
30-015-31413	DEVON ENERGY PRODUCTION COMPANY, LP	CROW FLAT 20 FEDERAL COM	001	EDDY	S:20, T:16S, R:28E	May 2001	Nov 2006	CROW FLATS	MORROW (GAS)	9,700	Flowing
30-015-31427	COG OPERATING LLC	BARBARY 17 COM	001	EDDY	S:17, T:16S, R:28E	Apr 2001	Nov 2006	CROW FLATS	MORROW (GAS)	9,700	Pumping
30-015-31598	COG OPERATING LLC	ELK 22 FEDERAL	001	EDDY	S:22, T:16S, R:28E	May 2001	Nov 2006	CROW FLATS	WOLFCAMP	9,800	Pumping
30-015-31598	MACCK ENERGY CORP	ELK 22 FEDERAL	001	EDDY	S:22, T:16S, R:28E			CROW FLATS	MORROW (GAS)	9,800	Pumping
30-015-31760	DEVON ENERGY PRODUCTION COMPANY, LP	CROW FLAT 29 FEDERAL	002	EDDY	S:29, T:16S, R:28E	Jan 2002	Nov 2006	CROW FLATS	MORROW (GAS)	9,800	Flowing
30-015-31921	DEVON ENERGY PRODUCTION COMPANY, LP	CROW FLAT 20 FEDERAL COM	002	EDDY	S:20, T:16S, R:28E	Jan 2002	Nov 2006	CROW FLATS	MORROW (GAS)	9,900	Flowing
30-015-35216	YATES PETROLEUM CORPORATION	JUNIOR AWW STATE COM	001	EDDY	S:17, T:16S, R:28E			CROW FLATS	MORROW (GAS)	9,600	Active Permit
30-015-35365	CIMAREX ENERGY CO. OF COLORADO	CROW FLATS 15 STATE COM	001	EDDY	S:15, T:16S, R:28E			DIAMOND MOUND	MORROW (GAS)		Active Permit
30-015-35365	CIMAREX ENERGY CO. OF COLORADO	CROW FLATS 15 STATE COM	001	EDDY	S:15, T:16S, R:28E			CROW FLATS	ATOKA (G)		Active Permit
30-015-35402	YATES PETROLEUM CORPORATION	JUNIOR AWW STATE COM	002	EDDY	S:17, T:16S, R:28E			CROW FLATS	MORROW (GAS)	9,600	Active Permit

**COG OPERATING LLC
550 W. TEXAS, SUITE 1300
MIDLAND, TX 79701**

2007 MAR 5 AM 10 07

March 2, 2007

New Mexico Oil Conservation Division
Attn: David Catanach
1220 South St. Francis
Santa Fe, NM 87505

Re: Non-standard BHL for the Reindeer Federal #1
API No. 30-015-33746
Eddy County, NM

Dear David,

Attached is COG's application check-list for NSL for the above mentioned well.

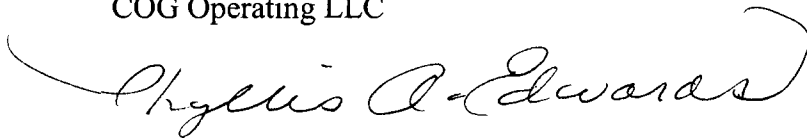
Please review at your earliest convenience.

If you require anything further, please call me at 432-685-4340 or e-mail @
pedwards@conchoresources.com.

Thank you for your attention to this matter.

Sincerely,

COG Operating LLC



Phyllis A. Edwards
Regulatory Analyst

Catanach, David, EMNRD

From: Phyllis Edwards [PEdwards@conchoresources.com]
Sent: Friday, March 16, 2007 1:56 PM
To: Catanach, David, EMNRD
Subject: RE: Reindeer Federal No. 1
Attachments: Reindeer Federal NSL explanation.doc

Dear David,

I checked with our landman Brent Robertson to confirm that all interests are the same. They are.

I re-calculated the BHL and the BHL at the bottom perforation.

Here is what I came up with:

BHL
662' FSL & 290' FEL

BHL at the bottom perforation:
667' FSL & 556' FEL

I am sending a corrected attachment in MS Word.

Sorry for the errors & please call if you need anything further.
Thanks for all your help !!!

Phyllis Edwards
COG Operating LLC
Fasken Tower II
550 W. Texas Avenue, Suite 1300
Midland, TX 79701
432-685-4340 P
432-685-4399 F
pedwards@conchoresources.com

-----Original Message-----

From: Catanach, David, EMNRD [mailto:david.catanach@state.nm.us]
Sent: Friday, March 16, 2007 11:40 AM
To: Phyllis Edwards
Subject: Reindeer Federal No. 1

Hi Phyllis,

I'm currently reviewing your nsl application for the Reindeer Fed No. 1. Can you please verify for me the bottomhole location at total depth, and the bottomhole location at the bottom perforation. I'm having a little trouble reconciling the directional survey and your well location numbers.

Also, can you verify that the interest ownership between the 120-acre project area, and the SW/4 SW/4 of

3/19/2007

Section 22,

Township 16S, R-28E (being the affected offset acreage) is exactly the same, including working, royalty and overriding royalty.

If it is not, then you have to notify the interest owners in the SW/4 SW/4 of Section 22.

Thanks,

David Catanach
Engineer

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3/19/2007