

UNITED STATES
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		Lease Serial No. SHL & BHL NMNM086
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) 330' FNL & 330' FWL, Unit D (NWNW) Sec25-T19S-R34E 330' FSL & 380' FWL, Unit M (SWSW) Sec25-T19S-R34E		8. Well Name and No. Hawg Federal #2H
Lat. Long.		9. API Well No. 30-025-39555
		10. Field and Pool, or Exploratory Area Lea; Bone Springs
		11. County or Parish, State Lea 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	BHL Change
	☐ 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 or pertinent markers and sands. Attach the Bond under which the work will 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 recompleat 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 reclamantion, have been completed, and the operator has determined that the site is ready for final inspection.)

COG Operating LLC respectfully request approval for the following change in BHL.

From: 430' FNL & 330' FEL

* To: 330' FSL & 380' FWL *

Drill 8 3/4" hole to 10,370'

Drill 7 7/8" to 10,370' - 15,270' (10,850' TVD)

Run 15,270' of 5 1/2" 17# P110 LTC CSG

CMT with the following:

1st Stag: 400 SX of class H & acid soluble @ 15.0 ppg/2.62 cuft/sx

2nd Stag: Lead: 1300 sx class H + Bentonite + HALAD-322 + HR-800 @ 12.7 ppg/1.89 cuft/sx

Tail: 100 sx class H neat @ 15.6 ppg/1.19 cuft/sx

TOC @ 3300' DVT @ 10,370'

Original COAs Apply

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

Name (Printed/ Typed)

Mayte Reyes

Title:

Regulatory Analyst

Signature:

Date:

4/13/11

APPROVED

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:

MAY 2 2011
Is/ Chris Walls

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 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)

MAY 04 2011

DISTRICT I
1625 N. FRENCH DR., HOBBS, NM 88240

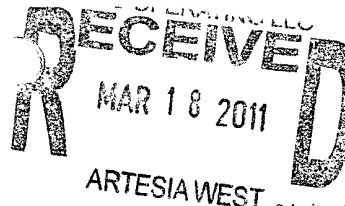
DISTRICT II
1301 W. GRAND AVENUE, ARTESIA, NM 88210

DISTRICT III
1000 RIO BRAZOS RD., AZTEC, NM 87410

DISTRICT IV
11885 S. ST. FRANCIS DR., SANTA FE, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

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



Form C-102
Revised October 12, 2005
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number	Pool Code	Pool Name
Property Code	Property Name HAWG FEDERAL	Well Number 2
OGRID No.	Operator Name COG OPERATING, LLC	Elevation 3773'

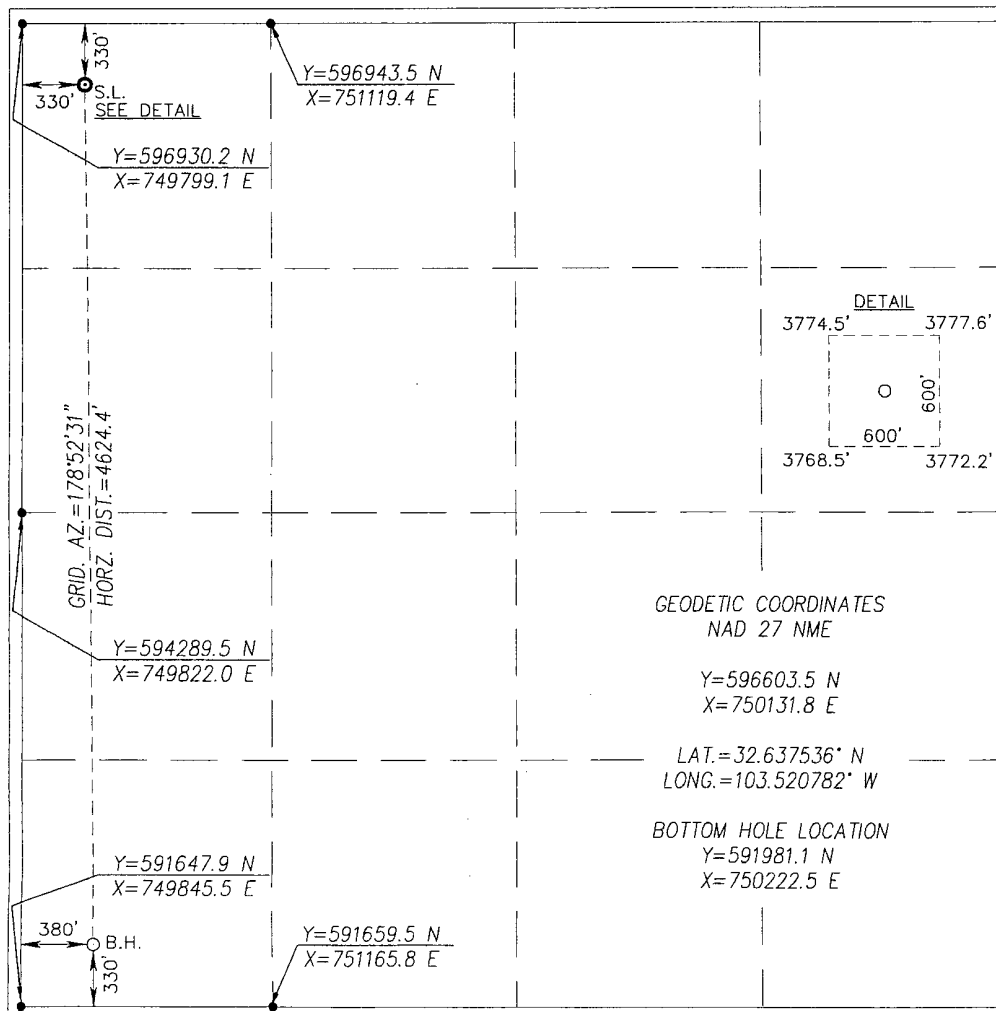
Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	25	19-S	34-E		330	NORTH	330	WEST	LEA

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	25	19-S	34-E		330	SOUTH	380	WEST	LEA
Dedicated Acres	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



OPERATOR CERTIFICATION

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.

Signature: *[Signature]* Date: 3-14-11
Printed Name: Rand French

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.

AUGUST 17, 2009

Date Surveyed: _____ DSS

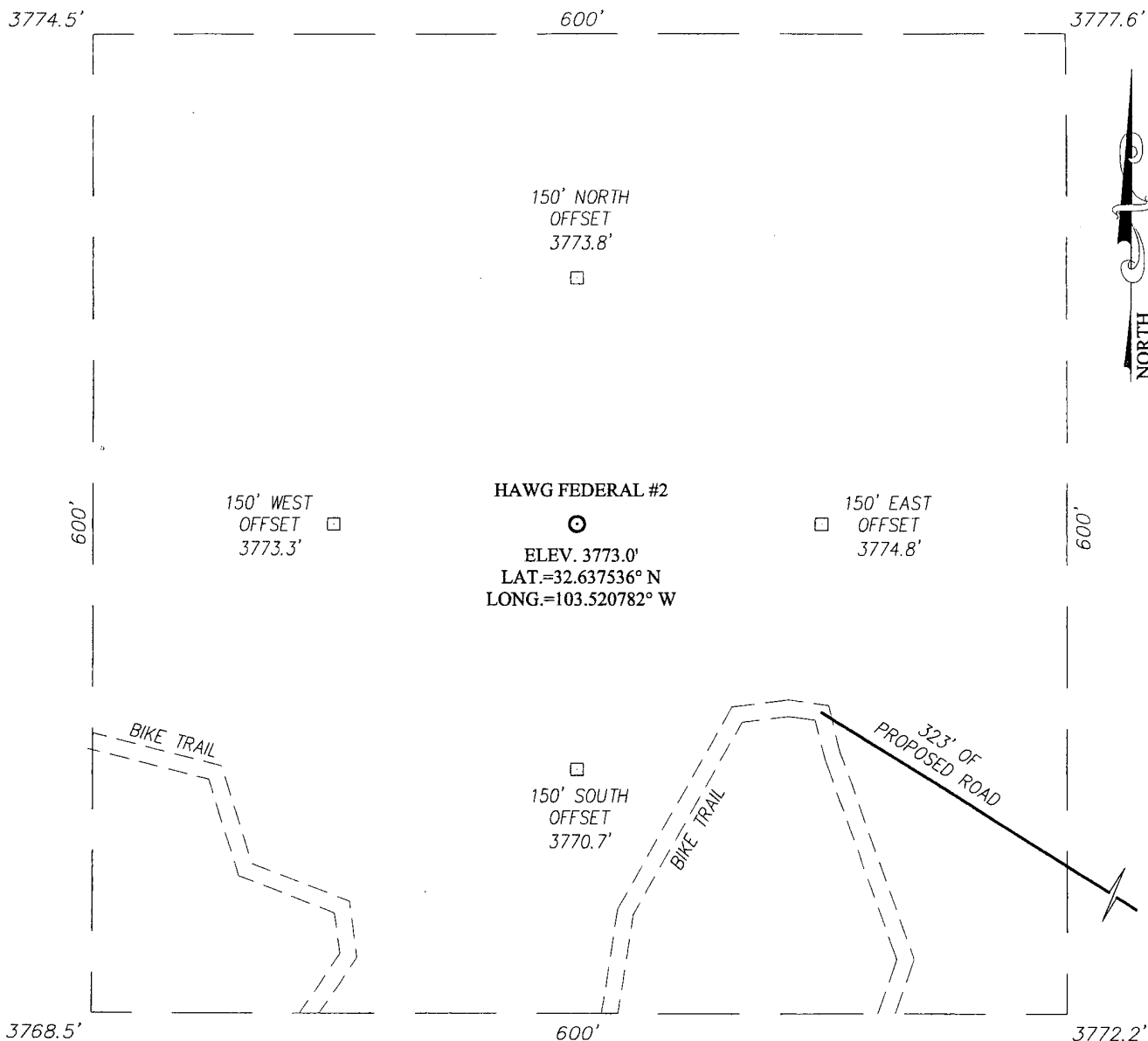
Signature & Seal of Professional Surveyor

GARY EIDSON
NEW MEXICO
11.13.0581

Certificate No. GARY EIDSON 12641
RONALD EIDSON 3239

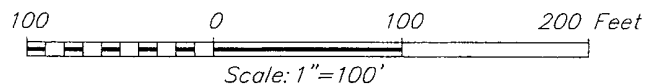
MAY 04 2011

SECTION 25, TOWNSHIP 19 SOUTH, RANGE 34 EAST, N.M.P.M.,
LEA COUNTY, NEW MEXICO



DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF U.S. HWY. #62-180 AND MARATHON RD. GO WEST ON HWY. 62-180 APPROX. 0.3 MILES. TURN RIGHT AND GO NORTH THRU CATTLE GUARD APPROX. 0.2 MILES TO THE EXISTING ARMSTRONG WELL AND PROPOSED ROAD SURVEY. FOLLOW ROAD SURVEY NORTHWEST 323 FEET TO THIS LOCATION.



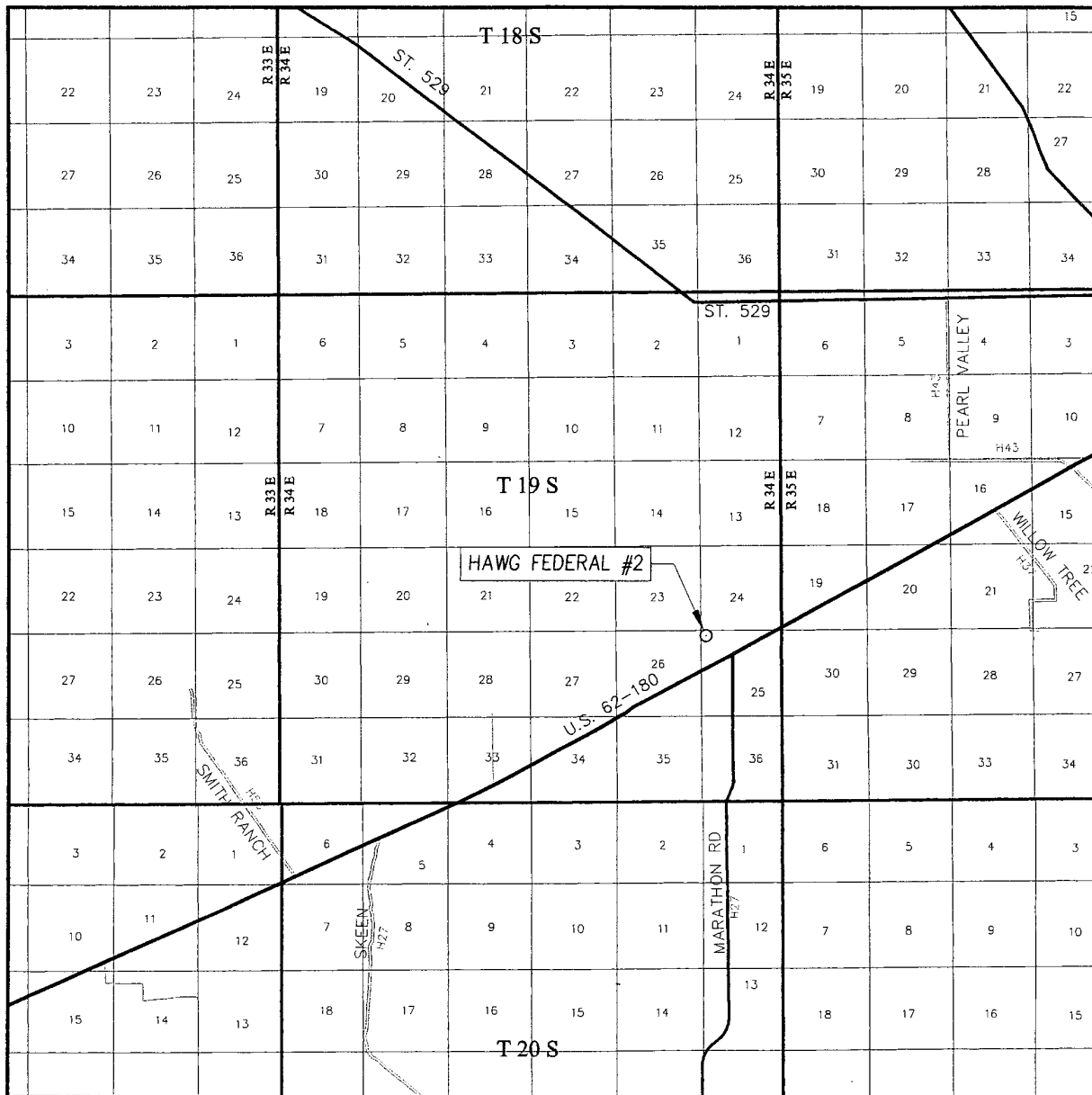
PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(575) 393-3117

COG OPERATING, LLC

HAWG FEDERAL #2 WELL
LOCATED 330 FEET FROM THE NORTH LINE
AND 330 FEET FROM THE WEST LINE OF SECTION 25,
TOWNSHIP 19 SOUTH, RANGE 34 EAST, N.M.P.M.,
LEA COUNTY, NEW MEXICO.

Survey Date: 8/17/09		Sheet 1 of 1 Sheets	
W.O. Number: 11.13.0581		Dr By: DSS	Rev 1: N/A
Date: 3/14/11	Rel. W.O.: 09110731	11130581	Scale: 1"=100'

VICINITY MAP

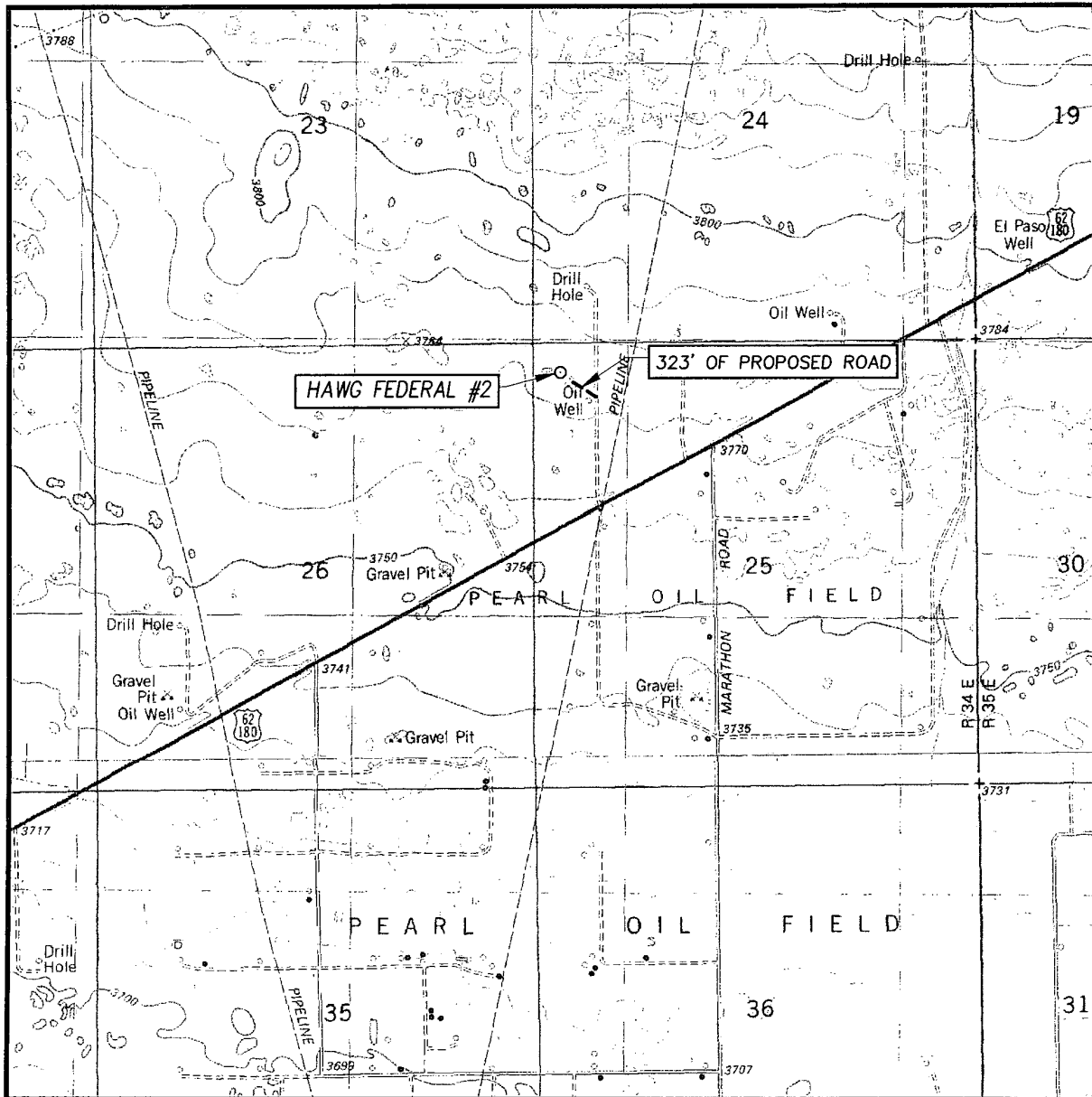


SCALE: 1" = 2 MILES

SEC. 25 TWP. 19-S RGE. 34-E
 SURVEY N.M.P.M.
 COUNTY LEA STATE NEW MEXICO
 DESCRIPTION 330' FNL & 330' FWL
 ELEVATION 3773'
 OPERATOR COG OPERATING, LLC
 LEASE HAWG FEDERAL

PROVIDING SURVEYING SERVICES
 SINCE 1946
JOHN WEST SURVEYING COMPANY
 412 N. DAL PASO
 HOBBS, N.M. 88240
 (575) 393-3117

LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL:
IRONHOUSE WELL, N.M. - 10'

SEC. 25 TWP. 19-S RGE. 34-E

SURVEY N.M.P.M.

COUNTY LEA STATE NEW MEXICO

DESCRIPTION 330' FNL & 330' FWL

ELEVATION 3773'

OPERATOR COG OPERATING, LLC

LEASE HAWG FEDERAL

U.S.G.S. TOPOGRAPHIC MAP
IRONHOUSE WELL, N.M.



PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(575) 393-3117



A Schlumberger Company

HOBBS OCD

MAY 03 2011

RECEIVED

Cog Operating LLC- Eastern NM

Lea County
Hawg Federal
#2H
OH

Plan: Plan #1

Pathfinder X & Y Planning Report

13 April, 2011



A Schlumberger Company

Company: Cog Operating LLC- Eastern NM
Project: Lea County
Site: Hawg Federal
Well: #2H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well #2H
TVD Reference: WELL @ 3795.00usft (Original Well Elev)
MD Reference: WELL @ 3795.00usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

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

Site	Hawg Federal		
Site Position:		Northing:	596,603.500 usft
From: Map		Easting:	750,131.800 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 38' 15.130 N
		Longitude:	103° 31' 14.814 W
		Grid Convergence:	0.44 °

Well	#2H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 38' 15.130 N
		Longitude:	103° 31' 14.814 W
		Ground Level:	3,773.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
	IGRF200510	04/13/11	(°)
			7.60
			Dip Angle
			(°)
			60.61
			Field Strength
			(nT)
			48,921

Design	Plan #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			178.88

Survey Tool Program	Date 04/13/11		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
0.00	15,268.42	Plan #1 (OH)	MWD
			Description
			MWD - Standard



A Schlumberger Company

Pathfinder
Pathfinder X & Y Planning Report



A Schlumberger Company

Company: Cog Operating LLC- Eastern NM
Project: Lea County
Site: Hawg Federal
Well: #2H
Wellbore: OH
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Survey Calculation Method: Minimum Curvature
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Planned Survey										
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	3,795.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
100.00	0.00	0.00	100.00	3,695.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
200.00	0.00	0.00	200.00	3,595.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
300.00	0.00	0.00	300.00	3,495.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
400.00	0.00	0.00	400.00	3,395.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
500.00	0.00	0.00	500.00	3,295.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
600.00	0.00	0.00	600.00	3,195.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
700.00	0.00	0.00	700.00	3,095.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
800.00	0.00	0.00	800.00	2,995.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
900.00	0.00	0.00	900.00	2,895.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
1,000.00	0.00	0.00	1,000.00	2,795.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
1,100.00	0.00	0.00	1,100.00	2,695.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
1,200.00	0.00	0.00	1,200.00	2,595.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
1,300.00	0.00	0.00	1,300.00	2,495.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
1,400.00	0.00	0.00	1,400.00	2,395.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
1,500.00	0.00	0.00	1,500.00	2,295.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
1,600.00	0.00	0.00	1,600.00	2,195.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
1,700.00	0.00	0.00	1,700.00	2,095.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
1,800.00	0.00	0.00	1,800.00	1,995.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
1,900.00	0.00	0.00	1,900.00	1,895.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
2,000.00	0.00	0.00	2,000.00	1,795.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
2,100.00	0.00	0.00	2,100.00	1,695.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
2,200.00	0.00	0.00	2,200.00	1,595.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
2,300.00	0.00	0.00	2,300.00	1,495.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
2,400.00	0.00	0.00	2,400.00	1,395.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
2,500.00	0.00	0.00	2,500.00	1,295.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
2,600.00	0.00	0.00	2,600.00	1,195.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80

Company: Cog Operating LLC- Eastern NM
Project: Lea County
Site: Hawg Federal
Well: #2H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well #2H
TVD Reference: WELL @ 3795.00usft (Original Well Elev)
MD Reference: WELL @ 3795.00usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey											
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
2,700.00	0.00	0.00	2,700.00	1,095.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
2,800.00	0.00	0.00	2,800.00	995.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
2,900.00	0.00	0.00	2,900.00	895.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
3,000.00	0.00	0.00	3,000.00	795.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
3,100.00	0.00	0.00	3,100.00	695.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
3,200.00	0.00	0.00	3,200.00	595.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
3,300.00	0.00	0.00	3,300.00	495.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
3,400.00	0.00	0.00	3,400.00	395.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
3,500.00	0.00	0.00	3,500.00	295.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
3,600.00	0.00	0.00	3,600.00	195.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
3,700.00	0.00	0.00	3,700.00	95.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
3,800.00	0.00	0.00	3,800.00	-5.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
3,900.00	0.00	0.00	3,900.00	-105.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
4,000.00	0.00	0.00	4,000.00	-205.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
4,100.00	0.00	0.00	4,100.00	-305.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
4,200.00	0.00	0.00	4,200.00	-405.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
4,300.00	0.00	0.00	4,300.00	-505.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
4,400.00	0.00	0.00	4,400.00	-605.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
4,500.00	0.00	0.00	4,500.00	-705.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
4,600.00	0.00	0.00	4,600.00	-805.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
4,700.00	0.00	0.00	4,700.00	-905.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
4,800.00	0.00	0.00	4,800.00	-1,005.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
4,900.00	0.00	0.00	4,900.00	-1,105.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
5,000.00	0.00	0.00	5,000.00	-1,205.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
5,100.00	0.00	0.00	5,100.00	-1,305.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
5,200.00	0.00	0.00	5,200.00	-1,405.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	
5,300.00	0.00	0.00	5,300.00	-1,505.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80	

Company: Cog Operating LLC- Eastern NM
Project: Lea County
Site: Hawg Federal
Well: #2H
Wellbore: OH
Design: Plan #1

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5,400.00	0.00	0.00	5,400.00	-1,605.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
5,500.00	0.00	0.00	5,500.00	-1,705.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
5,600.00	0.00	0.00	5,600.00	-1,805.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
5,700.00	0.00	0.00	5,700.00	-1,905.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
5,800.00	0.00	0.00	5,800.00	-2,005.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
5,900.00	0.00	0.00	5,900.00	-2,105.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
6,000.00	0.00	0.00	6,000.00	-2,205.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
6,100.00	0.00	0.00	6,100.00	-2,305.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
6,200.00	0.00	0.00	6,200.00	-2,405.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
6,300.00	0.00	0.00	6,300.00	-2,505.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
6,400.00	0.00	0.00	6,400.00	-2,605.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
6,500.00	0.00	0.00	6,500.00	-2,705.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
6,600.00	0.00	0.00	6,600.00	-2,805.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
6,700.00	0.00	0.00	6,700.00	-2,905.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
6,800.00	0.00	0.00	6,800.00	-3,005.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
6,900.00	0.00	0.00	6,900.00	-3,105.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
7,000.00	0.00	0.00	7,000.00	-3,205.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
7,100.00	0.00	0.00	7,100.00	-3,305.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
7,200.00	0.00	0.00	7,200.00	-3,405.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
7,300.00	0.00	0.00	7,300.00	-3,505.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
7,400.00	0.00	0.00	7,400.00	-3,605.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
7,500.00	0.00	0.00	7,500.00	-3,705.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
7,600.00	0.00	0.00	7,600.00	-3,805.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
7,700.00	0.00	0.00	7,700.00	-3,905.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
7,800.00	0.00	0.00	7,800.00	-4,005.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
7,900.00	0.00	0.00	7,900.00	-4,105.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
8,000.00	0.00	0.00	8,000.00	-4,205.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80



A Schlumberger Company

Pathfinder Pathfinder X & Y Planning Report



A Schlumberger Company

Company: Cog Operating LLC- Eastern NM
Project: Lea County
Site: Hawg Federal
Well: #2H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well #2H
TVD Reference: WELL @ 3795.00usft (Original Well Elev)
MD Reference: WELL @ 3795.00usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey

MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
8,100.00	0.00	0.00	8,100.00	-4,305.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
8,200.00	0.00	0.00	8,200.00	-4,405.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
8,300.00	0.00	0.00	8,300.00	-4,505.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
8,400.00	0.00	0.00	8,400.00	-4,605.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
8,500.00	0.00	0.00	8,500.00	-4,705.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
8,600.00	0.00	0.00	8,600.00	-4,805.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
8,700.00	0.00	0.00	8,700.00	-4,905.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
8,800.00	0.00	0.00	8,800.00	-5,005.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
8,900.00	0.00	0.00	8,900.00	-5,105.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
9,000.00	0.00	0.00	9,000.00	-5,205.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
9,100.00	0.00	0.00	9,100.00	-5,305.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
9,200.00	0.00	0.00	9,200.00	-5,405.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
9,300.00	0.00	0.00	9,300.00	-5,505.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
9,400.00	0.00	0.00	9,400.00	-5,605.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
9,500.00	0.00	0.00	9,500.00	-5,705.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
9,600.00	0.00	0.00	9,600.00	-5,805.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
9,700.00	0.00	0.00	9,700.00	-5,905.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
9,800.00	0.00	0.00	9,800.00	-6,005.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
9,900.00	0.00	0.00	9,900.00	-6,105.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
10,000.00	0.00	0.00	10,000.00	-6,205.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
10,100.00	0.00	0.00	10,100.00	-6,305.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
10,200.00	0.00	0.00	10,200.00	-6,405.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
10,300.00	0.00	0.00	10,300.00	-6,505.00	0.00	0.00	0.00	0.00	596,603.50	750,131.80
10,372.60	0.00	0.00	10,372.60	-6,577.60	0.00	0.00	0.00	0.00	596,603.50	750,131.80
Start Build 12.00										
10,375.00	0.29	178.88	10,375.00	-6,580.00	-0.01	0.00	0.01	12.00	596,603.49	750,131.80
10,400.00	3.29	178.88	10,399.98	-6,604.98	-0.79	0.02	0.79	12.00	596,602.71	750,131.82

Company: Cog Operating LLC- Eastern NM
Project: Lea County
Site: Hawg Federal
Well: #2H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well #2H
TVD Reference: WELL @ 3795.00usft (Original Well Elev)
MD Reference: WELL @ 3795.00usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey											
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
10,425.00	6.29	178.88	10,424.89	-6,629.89	-2.87	0.06	2.87	12.00	596,600.63	750,131.86	
10,450.00	9.29	178.88	10,449.66	-6,654.66	-6.26	0.12	6.26	12.00	596,597.24	750,131.92	
10,475.00	12.29	178.88	10,474.22	-6,679.22	-10.94	0.21	10.94	12.00	596,592.56	750,132.01	
10,500.00	15.29	178.88	10,498.49	-6,703.49	-16.89	0.33	16.90	12.00	596,586.61	750,132.13	
10,525.00	18.29	178.88	10,522.43	-6,727.43	-24.11	0.47	24.12	12.00	596,579.39	750,132.27	
10,550.00	21.29	178.88	10,545.95	-6,750.95	-32.57	0.64	32.58	12.00	596,570.93	750,132.44	
10,575.00	24.29	178.88	10,568.99	-6,773.99	-42.25	0.83	42.26	12.00	596,561.25	750,132.63	
10,600.00	27.29	178.88	10,591.50	-6,796.50	-53.13	1.04	53.14	12.00	596,550.37	750,132.84	
10,625.00	30.29	178.88	10,613.41	-6,818.41	-65.16	1.28	65.17	12.00	596,538.34	750,133.08	
10,650.00	33.29	178.88	10,634.66	-6,839.66	-78.33	1.54	78.34	12.00	596,525.17	750,133.34	
10,675.00	36.29	178.88	10,655.18	-6,860.18	-92.59	1.82	92.60	12.00	596,510.91	750,133.62	
10,700.00	39.29	178.88	10,674.94	-6,879.94	-107.90	2.12	107.92	12.00	596,495.60	750,133.92	
10,725.00	42.29	178.88	10,693.87	-6,898.87	-124.23	2.44	124.25	12.00	596,479.27	750,134.24	
10,750.00	45.29	178.88	10,711.91	-6,916.91	-141.52	2.78	141.55	12.00	596,461.98	750,134.58	
10,775.00	48.29	178.88	10,729.03	-6,934.03	-159.74	3.13	159.77	12.00	596,443.76	750,134.93	
10,800.00	51.29	178.88	10,745.17	-6,950.17	-178.82	3.51	178.86	12.00	596,424.68	750,135.31	
10,825.00	54.29	178.88	10,760.28	-6,965.28	-198.72	3.90	198.76	12.00	596,404.78	750,135.70	
10,850.00	57.29	178.88	10,774.34	-6,979.34	-219.39	4.30	219.43	12.00	596,384.11	750,136.10	
10,875.00	60.29	178.88	10,787.29	-6,992.29	-240.77	4.72	240.81	12.00	596,362.73	750,136.52	
10,900.00	63.29	178.88	10,799.11	-7,004.11	-262.79	5.16	262.84	12.00	596,340.71	750,136.96	
10,925.00	66.29	178.88	10,809.76	-7,014.76	-285.40	5.60	285.46	12.00	596,318.10	750,137.40	
10,950.00	69.29	178.88	10,819.21	-7,024.21	-308.54	6.05	308.60	12.00	596,294.96	750,137.85	
10,975.00	72.29	178.88	10,827.43	-7,032.43	-332.14	6.52	332.20	12.00	596,271.36	750,138.32	
11,000.00	75.29	178.88	10,834.41	-7,039.41	-356.14	6.99	356.21	12.00	596,247.36	750,138.79	
11,025.00	78.29	178.88	10,840.12	-7,045.12	-380.47	7.47	380.54	12.00	596,223.03	750,139.27	
11,050.00	81.29	178.88	10,844.56	-7,049.56	-405.07	7.95	405.14	12.00	596,198.43	750,139.75	
11,075.00	84.29	178.88	10,847.69	-7,052.69	-429.86	8.43	429.94	12.00	596,173.64	750,140.23	

Company: Cog Operating LLC- Eastern NM
Project: Lea County
Site: Hawg Federal
Well: #2H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well #2H
TVD Reference: WELL @ 3795.00usft (Original Well Elev)
MD Reference: WELL @ 3795.00usft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Planned Survey											
MD (usft)	Inc (°)	Azi (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
11,100.00	87.29	178.88	10,849.53	-7,054.53	-454.79	8.92	454.87	12.00	596,148.71	750,140.72	
11,122.60	90.00	178.88	10,850.06	-7,055.06	-477.37	9.37	477.46	12.00	596,126.13	750,141.17	
11,122.61	90.00	178.88	10,850.06	-7,055.06	-477.38	9.37	477.47	0.00	596,126.12	750,141.17	
Start 4146.83 hold at 11122.61 MD											
11,138.15	90.00	178.88	10,850.06	-7,055.06	-492.92	9.67	493.01	0.00	596,110.58	750,141.47	
11,200.00	90.00	178.88	10,850.06	-7,055.06	-554.76	10.89	554.86	0.00	596,048.74	750,142.69	
11,300.00	90.00	178.88	10,850.06	-7,055.06	-654.74	12.85	654.86	0.00	595,948.76	750,144.65	
11,400.00	90.00	178.88	10,850.06	-7,055.06	-754.72	14.81	754.86	0.00	595,848.78	750,146.61	
11,500.00	90.00	178.88	10,850.06	-7,055.06	-854.70	16.77	854.86	0.00	595,748.80	750,148.57	
11,600.00	90.00	178.88	10,850.06	-7,055.06	-954.68	18.73	954.86	0.00	595,648.82	750,150.53	
11,700.00	90.00	178.88	10,850.06	-7,055.06	-1,054.66	20.69	1,054.86	0.00	595,548.84	750,152.49	
11,800.00	90.00	178.88	10,850.06	-7,055.06	-1,154.64	22.66	1,154.86	0.00	595,448.86	750,154.46	
11,900.00	90.00	178.88	10,850.06	-7,055.06	-1,254.62	24.62	1,254.86	0.00	595,348.88	750,156.42	
12,000.00	90.00	178.88	10,850.06	-7,055.06	-1,354.60	26.58	1,354.86	0.00	595,248.90	750,158.38	
12,100.00	90.00	178.88	10,850.06	-7,055.06	-1,454.58	28.54	1,454.86	0.00	595,148.92	750,160.34	
12,200.00	90.00	178.88	10,850.06	-7,055.06	-1,554.57	30.50	1,554.86	0.00	595,048.93	750,162.30	
12,300.00	90.00	178.88	10,850.06	-7,055.06	-1,654.55	32.47	1,654.86	0.00	594,948.95	750,164.27	
12,400.00	90.00	178.88	10,850.06	-7,055.06	-1,754.53	34.43	1,754.86	0.00	594,848.97	750,166.23	
12,500.00	90.00	178.88	10,850.06	-7,055.06	-1,854.51	36.39	1,854.86	0.00	594,748.99	750,168.19	
12,600.00	90.00	178.88	10,850.06	-7,055.06	-1,954.49	38.35	1,954.86	0.00	594,649.01	750,170.15	
12,700.00	90.00	178.88	10,850.06	-7,055.06	-2,054.47	40.31	2,054.86	0.00	594,549.03	750,172.11	
12,800.00	90.00	178.88	10,850.06	-7,055.06	-2,154.45	42.27	2,154.86	0.00	594,449.05	750,174.07	
12,900.00	90.00	178.88	10,850.06	-7,055.06	-2,254.43	44.24	2,254.86	0.00	594,349.07	750,176.04	
13,000.00	90.00	178.88	10,850.06	-7,055.06	-2,354.41	46.20	2,354.86	0.00	594,249.09	750,178.00	
13,100.00	90.00	178.88	10,850.06	-7,055.06	-2,454.39	48.16	2,454.86	0.00	594,149.11	750,179.96	
13,200.00	90.00	178.88	10,850.06	-7,055.06	-2,554.37	50.12	2,554.86	0.00	594,049.13	750,181.92	
13,300.00	90.00	178.88	10,850.06	-7,055.06	-2,654.35	52.08	2,654.86	0.00	593,949.15	750,183.88	

Company: Cog Operating LLC- Eastern NM
Project: Lea County
Site: Hawg Federal
Well: #2H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well #2H
TVD Reference: WELL @ 3795.00usft (Original Well Elev)
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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 (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
13,400.00	90.00	178.88	10,850.06	-7,055.06	-2,754.33	54.05	2,754.86	0.00	593,849.17	750,185.85
13,500.00	90.00	178.88	10,850.06	-7,055.06	-2,854.32	56.01	2,854.86	0.00	593,749.18	750,187.81
13,600.00	90.00	178.88	10,850.06	-7,055.06	-2,954.30	57.97	2,954.86	0.00	593,649.20	750,189.77
13,700.00	90.00	178.88	10,850.06	-7,055.06	-3,054.28	59.93	3,054.86	0.00	593,549.22	750,191.73
13,800.00	90.00	178.88	10,850.06	-7,055.06	-3,154.26	61.89	3,154.86	0.00	593,449.24	750,193.69
13,900.00	90.00	178.88	10,850.06	-7,055.06	-3,254.24	63.85	3,254.86	0.00	593,349.26	750,195.65
14,000.00	90.00	178.88	10,850.06	-7,055.06	-3,354.22	65.82	3,354.86	0.00	593,249.28	750,197.62
14,100.00	90.00	178.88	10,850.06	-7,055.06	-3,454.20	67.78	3,454.86	0.00	593,149.30	750,199.58
14,200.00	90.00	178.88	10,850.06	-7,055.06	-3,554.18	69.74	3,554.86	0.00	593,049.32	750,201.54
14,300.00	90.00	178.88	10,850.06	-7,055.06	-3,654.16	71.70	3,654.86	0.00	592,949.34	750,203.50
14,400.00	90.00	178.88	10,850.06	-7,055.06	-3,754.14	73.66	3,754.86	0.00	592,849.36	750,205.46
14,500.00	90.00	178.88	10,850.06	-7,055.06	-3,854.12	75.62	3,854.86	0.00	592,749.38	750,207.42
14,600.00	90.00	178.88	10,850.06	-7,055.06	-3,954.10	77.59	3,954.86	0.00	592,649.40	750,209.39
14,700.00	90.00	178.88	10,850.06	-7,055.06	-4,054.08	79.55	4,054.86	0.00	592,549.42	750,211.35
14,800.00	90.00	178.88	10,850.06	-7,055.06	-4,154.07	81.51	4,154.86	0.00	592,449.43	750,213.31
14,900.00	90.00	178.88	10,850.06	-7,055.06	-4,254.05	83.47	4,254.86	0.00	592,349.45	750,215.27
15,000.00	90.00	178.88	10,850.06	-7,055.06	-4,354.03	85.43	4,354.86	0.00	592,249.47	750,217.23
15,100.00	90.00	178.88	10,850.06	-7,055.06	-4,454.01	87.40	4,454.86	0.00	592,149.49	750,219.20
15,200.00	90.00	178.88	10,850.06	-7,055.06	-4,553.99	89.36	4,554.86	0.00	592,049.51	750,221.16
15,268.42	90.00	178.88	10,850.00	-7,055.00	-4,622.40	90.70	4,623.29	0.00	591,981.10	750,222.50
PBHL(HA#2H)										

Company: Cog Operating LLC- Eastern NM
Project: Lea County
Site: Hawg Federal
Well: #2H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well #2H
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,372.60	10,372.60	0.00	0.00	Start Build 12.00
11,122.61	10,850.06	-5.51	477.44	Start 4146.83 hold at 11122.61 MD
15,269.44	10,850.00	-53.40	4,624.00	TD at 15269.44

Checked By: _____ Approved By: _____ Date: _____



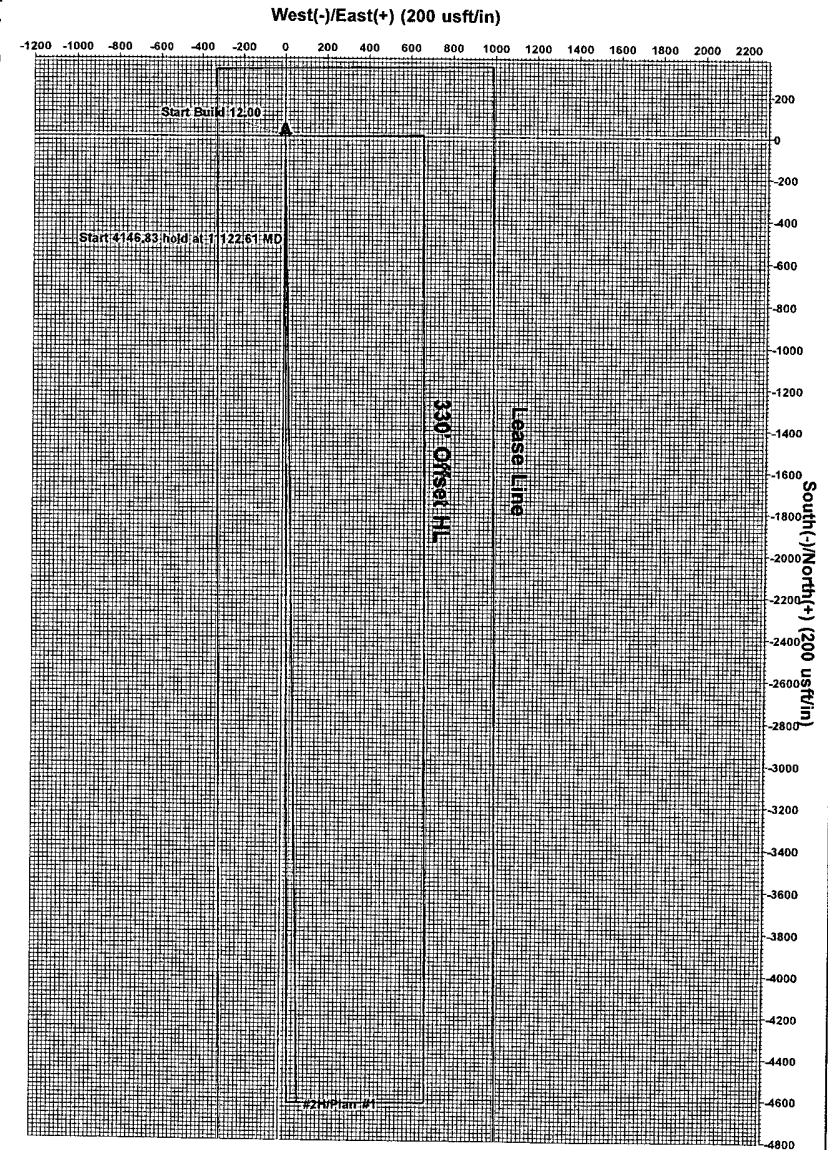
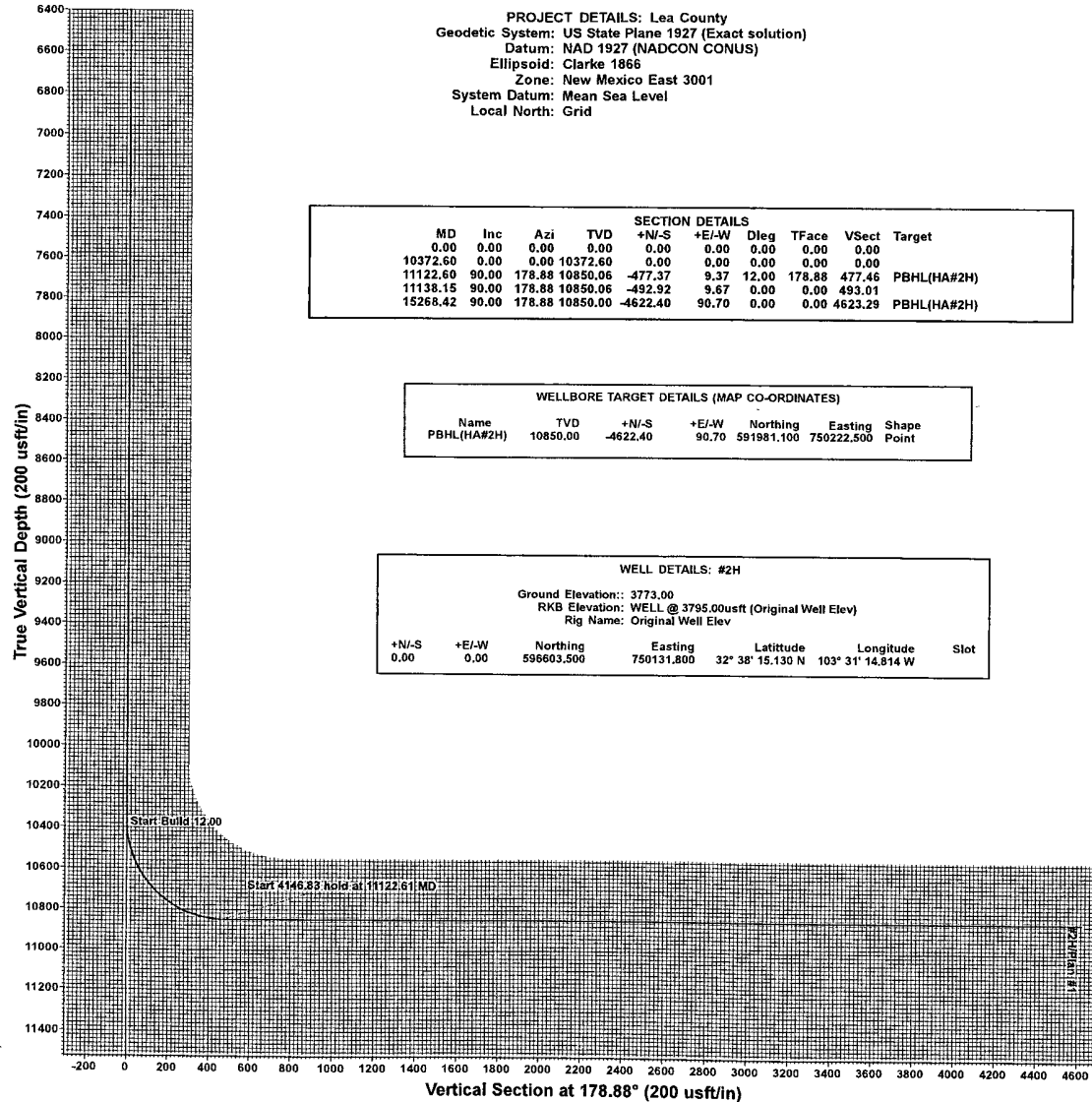
Project: Lea County
Site: Hawg Federal
Well: #2H
Wellbore: OH
Plan: Plan #1 (#2H/OH)



Azimuths to Grid North
True North: -0.44°
Magnetic North: 7.16°

Magnetic Field
Strength: 48921.0snT
Dip Angle: 60.61°
Date: 04/13/2011
Model: IGRF200510

PATHFINDER
A Schlumberger Company



Plan: Plan #1 (#2H/OH)

Created By: Nate Bingham Date: 11:28, April 13 2011

Checked: _____ Date: _____