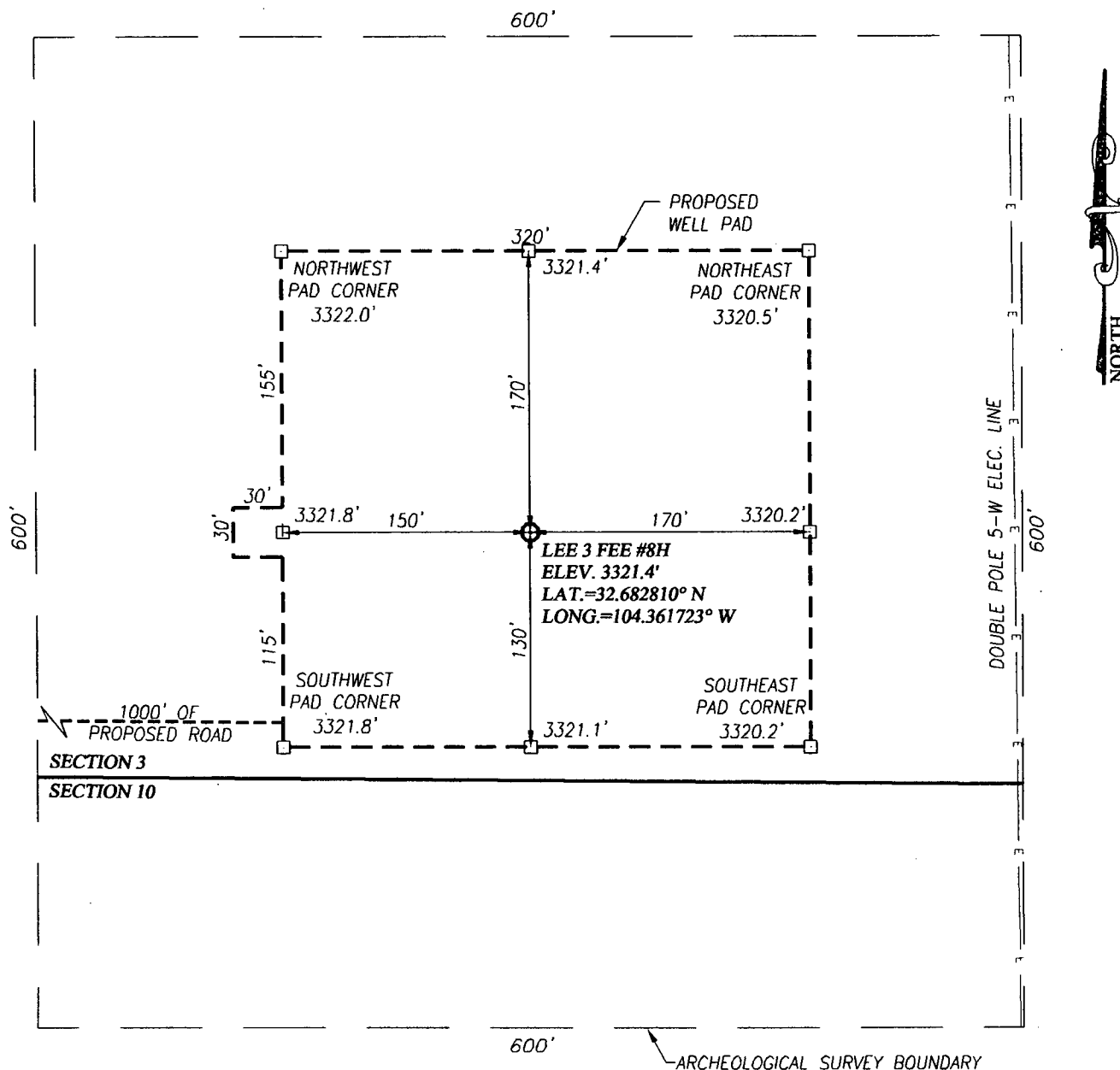


Estimated
Completed
Interval:
330 FSL
330 FWL

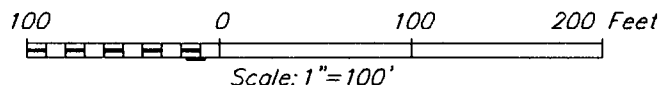
SECTION 3, TOWNSHIP 19 SOUTH, RANGE 26 EAST, N.M.P.M.
EDDY COUNTY **NEW MEXICO**



NOTE:
 SEE "LOCATION VERIFICATION MAP"
 FOR PROPOSED ROAD LOCATION.

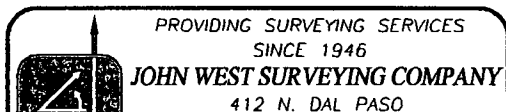
DIRECTIONS TO LEE 3 FEE #8H:

FROM THE INTERSECTION OF U.S. HIGHWAY 285 AND CO. RD. 38 (KINCAID RANCH) GO EAST APPROX. 1.0 MILES; TURN RIGHT AND GO SOUTH ON CO. RD. 34 (LAKE RD.) APPROX. 1.9 MILES. FOLLOW ROAD SURVEY STAKES APPROX. 5038 FEET EAST TO THIS LOCATION.



COG OPERATING, LLC

LEE 3 FEE #8H WELL
 LOCATED 150 FEET FROM THE SOUTH LINE
 AND 330 FEET FROM THE EAST LINE OF SECTION 3,
 TOWNSHIP 19 SOUTH, RANGE 26 EAST, N.M.P.M.,
 EDDY COUNTY, NEW MEXICO

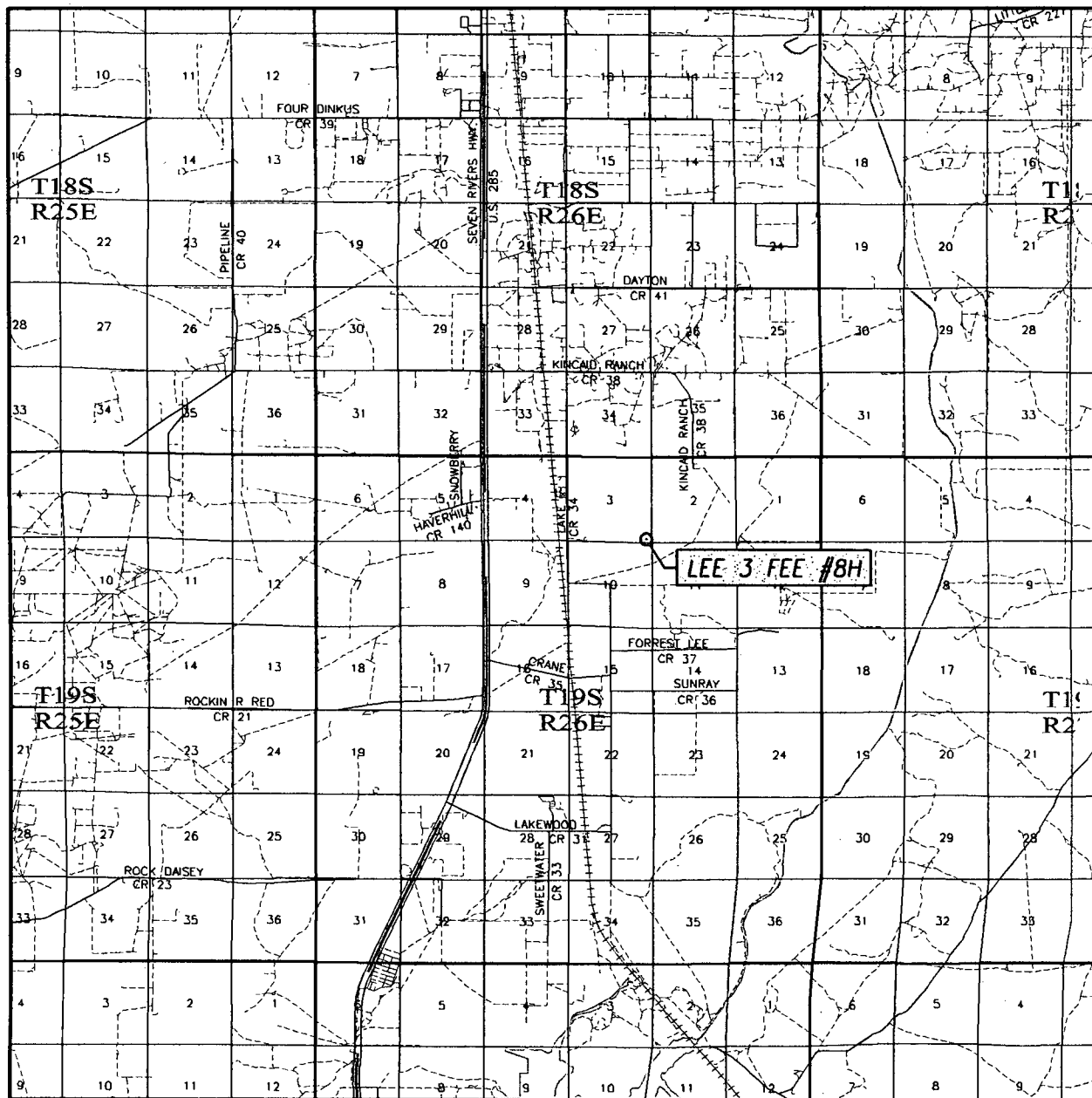


Survey Date: 5/30/13

CAD Date: 6/12/12

Drawn By: BKL

VICINITY MAP



SCALE: 1" = 2 MILES

SEC. 3 TWP. 19-S RGE. 26-E

SURVEY N.M.P.M.

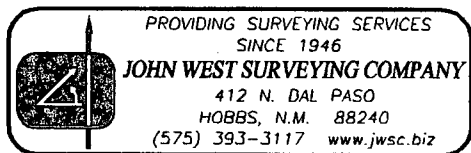
COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 150' FSL & 330' FEL

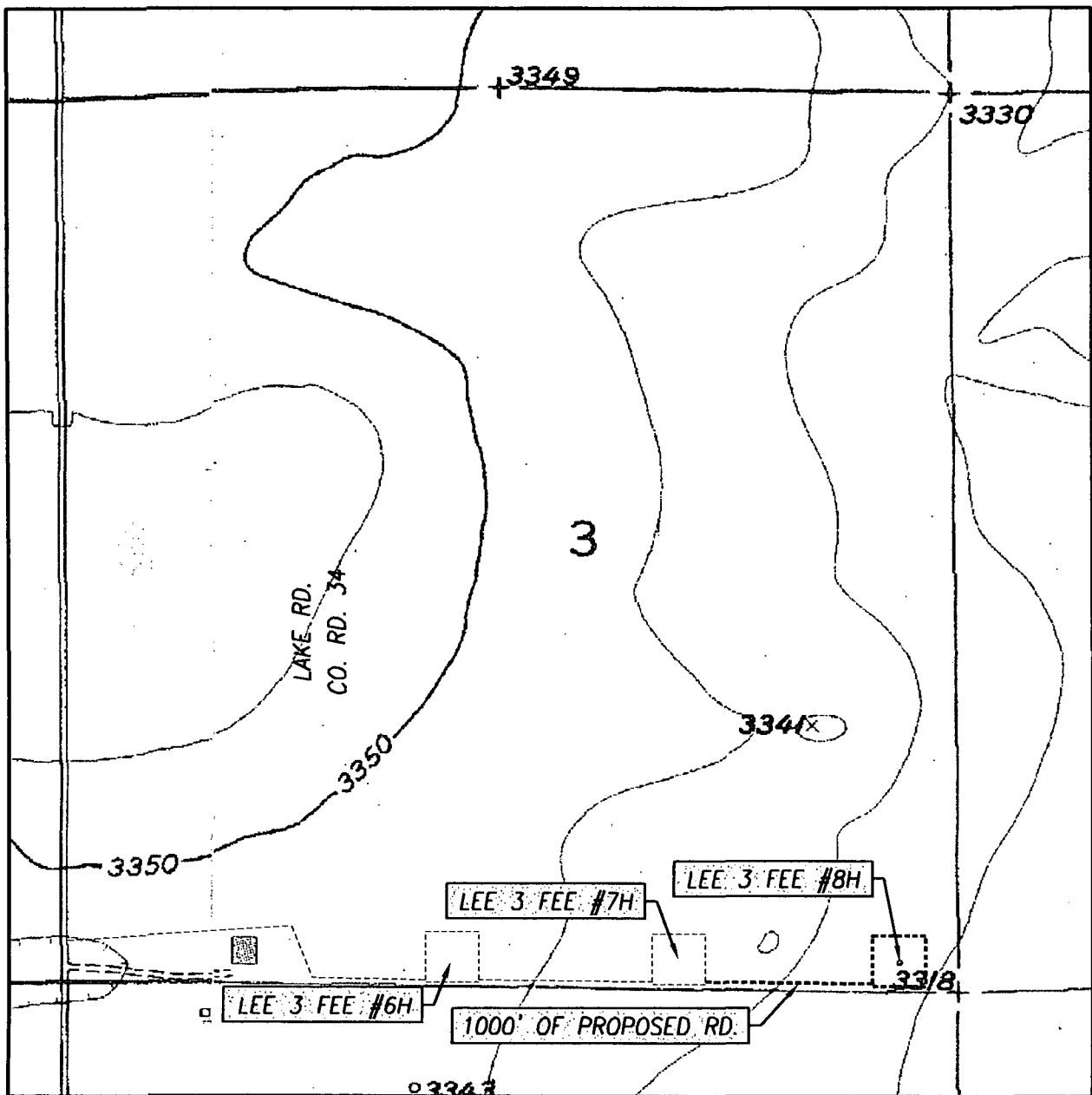
ELEVATION 3321'

OPERATOR COG OPERATING, LLC

LEASE LEE 3 FEE



LOCATION VERIFICATION MAP



SCALE: 1" = 1000'

CONTOUR INTERVAL:
LAKE McMILLAN N., N.M. - 10'
DAYTON, N.M. - 5'

SEC. 3 TWP. 19-S RGE. 26-E

SURVEY _____ N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 150' FSL & 330' FEL

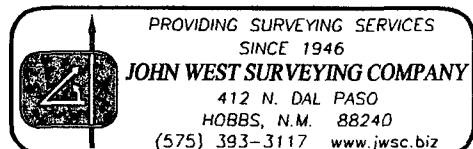
ELEVATION 3321'

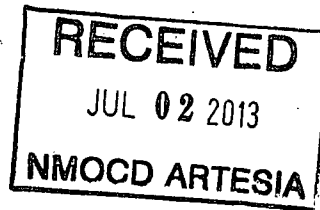
OPERATOR COG OPERATING, LLC

LEASE LEE 3 FEE

U.S.G.S. TOPOGRAPHIC MAP

LAKE McMILLAN N., N.M.





COG Operating LLC

Eddy County, New Mexico (NAD 27 NME)

Lee 3 Fee

#8H

OH

Plan: Plan #1 06-27-13

Surface: 150' FSL, 330' FWL, Sec 3, T19S, R26E, Unit P

PP: 330' FSL, 330' FWL, Sec 3, T19S, R26E, Unit P

BHL: 330' FNL, 330' FEL, Sec 3, T19S, R26E, Unit A

Standard Planning Report

27 June, 2013





Phoenix Technology Services
Planning Report



Database:	GCR DB	Local Co-ordinate Reference:	Well #8H
Company:	COG Operating LLC	TVD Reference:	GL @ 3321.00usft
Project:	Eddy County, New Mexico (NAD 27 NME)	MD Reference:	GL @ 3321.00usft
Site:	Lee 3 Fee	North Reference:	Grid
Well:	#8H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 06-27-13		

Project:	Eddy County, New Mexico (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:	Lee 3 Fee		
Site Position:		Northing:	612,139.80 usft
From:	Map	Easting:	488,590.40 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Grid Convergence:	-0.02 °

Well:	#8H		
Well Position	+N/-S	-21.40 usft	Northing:
	+E/-W	2,674.80 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	Ground Level:

Wellbore:	OH		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010_14	06/17/13	7.74
			60.43
			48,605

Design:	Plan #1 06-27-13		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			359.42

Plan Sections:										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)	
(usft)			(usft)			(°/100usft)	(°/100usft)	(°/100usft)		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,727.27	91.00	359.42	3,420.79	529.93	-5.37	11.00	11.00	0.00	359.42	
7,985.60	91.00	359.42	3,346.47	4,787.40	-48.50	0.00	0.00	0.00	0.00	PBHL-Lee 3 Fee #8H



Phoenix Technology Services
Planning Report



Database:	GCR DB	Local Co-ordinate Reference:	Well #8H
Company:	COG Operating LLC	TVD Reference:	GL @ 3321.00usft
Project:	Eddy County, New Mexico (NAD:27 NME)	MD Reference:	GL @ 3321.00usft
Site:	Lee 3 Fee	North Reference:	Grid
Well:	#8H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1 06-27-13		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP Start Build 11.00									
3,000.00	11.00	359.42	2,999.39	9.57	-0.10	9.57	11.00	11.00	0.00
3,100.00	22.00	359.42	3,095.12	37.93	-0.38	37.93	11.00	11.00	0.00
3,200.00	33.00	359.42	3,183.69	84.03	-0.85	84.03	11.00	11.00	0.00
3,300.00	44.00	359.42	3,261.83	146.18	-1.48	146.19	11.00	11.00	0.00
3,346.59	49.12	359.42	3,293.85	180.00	-1.82	180.01	11.00	11.00	0.00
PP-Lee 3 Fee #8H									
3,400.00	55.00	359.42	3,326.67	222.10	-2.25	222.11	11.00	11.00	0.00
3,500.00	66.00	359.42	3,375.84	309.00	-3.13	309.02	11.00	11.00	0.00
3,600.00	77.00	359.42	3,407.52	403.68	-4.09	403.70	11.00	11.00	0.00
3,700.00	88.00	359.42	3,420.55	502.67	-5.09	502.70	11.00	11.00	0.00
3,720.92	90.30	359.42	3,420.86	523.59	-5.30	523.62	11.00	11.00	0.00
TL 3430° TVD @ 0° VZ, 91° Inc									
3,727.27	91.00	359.42	3,420.79	529.93	-5.37	529.96	11.00	11.00	0.00
LP Start 4258.33 hold at 3727.27 MD									
3,800.00	91.00	359.42	3,419.52	602.65	-6.11	602.68	0.00	0.00	0.00
3,900.00	91.00	359.42	3,417.77	702.63	-7.12	702.67	0.00	0.00	0.00
4,000.00	91.00	359.42	3,416.03	802.61	-8.13	802.65	0.00	0.00	0.00
4,100.00	91.00	359.42	3,414.28	902.59	-9.14	902.63	0.00	0.00	0.00
4,200.00	91.00	359.42	3,412.54	1,002.57	-10.16	1,002.62	0.00	0.00	0.00
4,300.00	91.00	359.42	3,410.79	1,102.55	-11.17	1,102.60	0.00	0.00	0.00
4,400.00	91.00	359.42	3,409.05	1,202.53	-12.18	1,202.59	0.00	0.00	0.00
4,500.00	91.00	359.42	3,407.30	1,302.51	-13.20	1,302.57	0.00	0.00	0.00
4,600.00	91.00	359.42	3,405.56	1,402.49	-14.21	1,402.56	0.00	0.00	0.00
4,700.00	91.00	359.42	3,403.81	1,502.47	-15.22	1,502.54	0.00	0.00	0.00
4,800.00	91.00	359.42	3,402.07	1,602.45	-16.23	1,602.53	0.00	0.00	0.00
4,900.00	91.00	359.42	3,400.32	1,702.43	-17.25	1,702.51	0.00	0.00	0.00
5,000.00	91.00	359.42	3,398.58	1,802.41	-18.26	1,802.50	0.00	0.00	0.00
5,100.00	91.00	359.42	3,396.83	1,902.39	-19.27	1,902.48	0.00	0.00	0.00
5,200.00	91.00	359.42	3,395.09	2,002.36	-20.29	2,002.47	0.00	0.00	0.00
5,300.00	91.00	359.42	3,393.34	2,102.34	-21.30	2,102.45	0.00	0.00	0.00
5,400.00	91.00	359.42	3,391.60	2,202.32	-22.31	2,202.44	0.00	0.00	0.00
5,500.00	91.00	359.42	3,389.85	2,302.30	-23.32	2,302.42	0.00	0.00	0.00
5,600.00	91.00	359.42	3,388.10	2,402.28	-24.34	2,402.41	0.00	0.00	0.00
5,700.00	91.00	359.42	3,386.36	2,502.26	-25.35	2,502.39	0.00	0.00	0.00
5,800.00	91.00	359.42	3,384.61	2,602.24	-26.36	2,602.38	0.00	0.00	0.00
5,900.00	91.00	359.42	3,382.87	2,702.22	-27.38	2,702.36	0.00	0.00	0.00
6,000.00	91.00	359.42	3,381.12	2,802.20	-28.39	2,802.35	0.00	0.00	0.00
6,100.00	91.00	359.42	3,379.38	2,902.18	-29.40	2,902.33	0.00	0.00	0.00
6,200.00	91.00	359.42	3,377.63	3,002.16	-30.41	3,002.32	0.00	0.00	0.00
6,300.00	91.00	359.42	3,375.89	3,102.14	-31.43	3,102.30	0.00	0.00	0.00
6,400.00	91.00	359.42	3,374.14	3,202.12	-32.44	3,202.28	0.00	0.00	0.00
6,500.00	91.00	359.42	3,372.40	3,302.10	-33.45	3,302.27	0.00	0.00	0.00
6,600.00	91.00	359.42	3,370.65	3,402.08	-34.47	3,402.25	0.00	0.00	0.00
6,700.00	91.00	359.42	3,368.91	3,502.06	-35.48	3,502.24	0.00	0.00	0.00
6,800.00	91.00	359.42	3,367.16	3,602.04	-36.49	3,602.22	0.00	0.00	0.00
6,900.00	91.00	359.42	3,365.42	3,702.02	-37.50	3,702.21	0.00	0.00	0.00
7,000.00	91.00	359.42	3,363.67	3,802.00	-38.52	3,802.19	0.00	0.00	0.00
7,100.00	91.00	359.42	3,361.93	3,901.98	-39.53	3,902.18	0.00	0.00	0.00
7,200.00	91.00	359.42	3,360.18	4,001.96	-40.54	4,002.16	0.00	0.00	0.00
7,300.00	91.00	359.42	3,358.44	4,101.94	-41.56	4,102.15	0.00	0.00	0.00
7,400.00	91.00	359.42	3,356.69	4,201.92	-42.57	4,202.13	0.00	0.00	0.00



Phoenix Technology Services
Planning Report



Database:	GCR DB	Local Co-ordinate Reference:	Well #8H
Company:	COG Operating LLC	TVD Reference:	GL @ 3321.00usft
Project:	Eddy County New Mexico (NAD 27 NME)	MD Reference:	GL @ 3321.00usft
Site:	Lee 3 Fee	North Reference:	Grid
Well:	#8H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1.06-27-13		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,500.00	91.00	359.42	3,354.95	4,301.90	-43.58	4,302.12	0.00	0.00	0.00
7,600.00	91.00	359.42	3,353.20	4,401.88	-44.59	4,402.10	0.00	0.00	0.00
7,700.00	91.00	359.42	3,351.45	4,501.86	-45.61	4,502.09	0.00	0.00	0.00
7,800.00	91.00	359.42	3,349.71	4,601.84	-46.62	4,602.07	0.00	0.00	0.00
7,900.00	91.00	359.42	3,347.96	4,701.81	-47.63	4,702.06	0.00	0.00	0.00
7,985.60	91.00	359.42	3,346.47	4,787.40	-48.50	4,787.65	0.00	0.00	0.00
TD at 7985.60 - PBHL-Lee 3 Fee #8H									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
hit/miss target									
Shape									
PP-Lee 3 Fee #8H	0.00	360.00	3,293.85	180.00	-1.82	612,298.40	491,263.38	32° 40' 59.896081 N 104° 21' 42.224638 W	
- plan hits target center									
- Point									
PBHL-Lee 3 Fee #8H	-90.40	0.07	3,346.47	4,787.40	-48.50	616,905.80	491,216.70	32° 41' 45.489134 N 104° 21' 42.785295 W	
- plan hits target center									
- Point									

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,720.92	3,420.86	TL, 3430' TVD @ 0 VZ, 91° Inc		-1.00	359.42

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,900.00	2,900.00	0.00	0.00	KOP Start Build 11.00
3,727.27	3,420.79	529.93	-5.37	LP Start 4258.33 hold at 3727.27 MD
7,985.60	3,346.47	4,787.40	-48.50	TD at 7985.60



Project: Eddy County, New Mexico (NAD 27 NME)
Site: Lee 3 Fee
Well: #8H
Wellbore: OH
Design: Plan #1 06-27-13



PHOENIX
TECHNOLOGY SERVICES



Azimuths to Grid North
True North: 0.01°
Magnetic North: 7.75°
Magnetic Field
Strength: 48604.9nT
Dip Angle: 60.43°
Date: 06/17/2013
Model: IGRF2010_14

