

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

WELL COMPLETION OR RECOMPLETION REPORT AND LOG

AUG 06 2007

OCD-ARTESIA

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

1a. Type of Well ☒ Oil Well ☐ Gas Well ☐ Dry ☐ Other			5. Lease Serial No. NM-105557		
b. Type of Completion ☐ New Well ☐ Work Over ☐ Deepen ☐ Plug Back ☐ Diff. Resvr., Other <u>Re Entry & horizontal</u>			6. If Indian, Allottee or Tribe Name		
2. Name of Operator Latigo Petroleum, Inc.			7. Unit or CA Agreement Name and no.		
3. Address P.O. Box 10340 Midland TX 79702-7340		3.a. Phone No. (Include area code) (432)685-8229			
4. Location of Well (Report location clearly and in accordance with Federal requirements)* At Surface 660' FSL & 1980' FWL, Unit N, Sec 27, T23S, R29E At top prod. interval reported below At total depth 751.96' FSL & 331.44 FEL, Unit P, Sec 27, T23S, R29E			8. Lease Name and Well No. Goodnight "27" Federal 1		
			9. API Well No. 30-015-22157		
			10. Field and Pool, or Exploratory Laguna Salado; Bone Spring, South		
			11. Sec., T., R., M., on Block and Survey or Area		
			12. County or Parish Eddy		13. State NM
14. Date Spudded 05/03/2007		15. Date T.D. Reached 06/23/2007		16. Date Completed ☐ D & A ☒ Ready to Prod. 07/19/2007	
17. Elevations (DF, RKB, RT, GL)* 3012'		18. Total Depth: MD 10,705' TVD 7,872'			
		19. Plug Back T.D.: MD TVD		20. Depth Bridge Plug Set: MD TVD	
21. Type of Electric & Other Mechanical Logs Run (Submit copy of each) GR			22. Was well cored? ☒ No ☐ Yes (Submit analysis) Was DST run? ☒ No ☐ Yes (Submit analysis) Directional Survey? ☐ No ☒ Yes (Submit copy)		

23. Casing and Liner Record (Report all strings set in well)

Hole Size	Size/Grade	Wt. (#/ft.)	Top (MD)	Bottom (MD)	Stage Cementer Depth	No. of Sks. & Type of Cement	Slurry Vol. (BBL)	Cement Top*	Amount Pulled
17-1/2"	3-3/8"	48#		363'		650 "C"		Surf	
12-1/4"	10-3/4"	51#		2901'		1200 "C"		Surf	
9-1/2"	7-7/8"	29.7/33.7#		10745'		1825 "C"		6450' TS	

24. Tubing Record

Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)
2-3/8"	7600'							

25. Producing Intervals

Formation	Top	Bottom	Perforated Interval	Size	No Holes	Perf. Status
A) 1st Bone Spring Sand	7780' TVD	(Horizontal)	8156-10540		59	
B)						
C)						
D)						

27. Acid, Fracture, Treatment, Cement Squeeze, Etc.

Depth Interval	Amount and Type of Material
8156 - 10540	11,000g. 7.5% acid, 1170 bbl 10# slick wtr prepad, 1932 bbls 24# pad, 1984 g. 24# w/2#, 20/40 sand plug, 2746 bbls 24# pad, 2800 bbl 24# w/3#, 3562 bbls 24# w/3#, 3562 bbls 24# pad Ramping 450,000 # 20/40 sand, 50,000 SLC sand

28. Production - Interval A

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
7/20/07	7/27/07	24	→	742	1543	241			Flowing
Choke Size	Tbg Press Flwg	Csg Press	24 Hr Rate	Oil BBL	Gas MCF	Water BBL	Gas Oil Ratio	Well Status	
22/64	SI 1223	2030	→					Producing	

Production - Interval B

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
			→						
Choke Size	Tbg Press Flwg	Csg Press	24 Hr Rate	Oil BBL	Gas MCF	Water BBL	Gas Oil Ratio	Well Status	
	SI		→						

(See Instructions and spaces for additional data on page 2)

28b. Production - Interval C

Date First Produced	Test Date	Hours Tested	Test Production →	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke Size	Tbg Press Flwg SI	Csg. Press	24 Hr. Rate →	Oil BBL	Gas MCF	Water BBL	Gas Oil Ratio	Well Status	

28c. Production - Interval D

Date First Produced	Test Date	Hours Tested	Test Production →	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke Size	Tbg Press Flwg SI	Csg. Press	24 Hr. Rate →	Oil BBL	Gas MCF	Water BBL	Gas Oil Ratio	Well Status	

29. Disposition of Gas (Sold, used for fuel, vented, etc.)

Sold

30. Summary of Porous Zones (Include Aquifers)

Show all important zones or porosity and contents thereof. Cored intervals and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures and recoveries.

31. Formation (Log) Markers

Formation	Top	Bottom	Descriptions, Contents, etc.	Name	Top
					Meas. Depth
				Basal Anhydrite	2805'
				Lamar	3032'
				Bell Canyon	3062'
				Cherry Canyon	3945'
				Brushy Canyon	5112'
				Bone Spring	6790
				1st Bone Spring Sand	7780 (TVD)

32. Additional remarks (include plugging procedure):

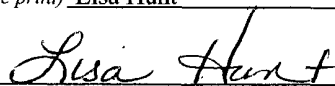
33. Indicate which items have been attached by placing a check in the appropriate boxes:

- ☒ Electrical/Mechanical Logs (1 full set req'd.)
 ☐ Geological Report
 ☐ DST Report
 ☒ Directional Survey
☐ Sundry Notice for plugging and cement verification
☐ Core Analysis
☐ Other

34. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records (see attached instructions)*

Name (please print) Lisa HuntTitle Regulatory Analyst

Signature

Date 07/30/2007

Title 18 U.S.C. Section 101 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 and false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction

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

1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico

Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.

Santa Fe, NM 87505

Form C-102

Revised October 12, 2005

Submit to Appropriate District Office

State Lease - 4 Copies

Fee Lease - 3 Copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-015-22157	² Pool Code 96857	³ Pool Name Laguna Salado; Bone Spring, South
⁴ Property Code	⁵ Property Name Goodnight "27" Federal	⁶ Well Number 1
⁷ OGRID No. 227001	⁸ Operator Name Latigo Petroleum, Inc.	⁹ Elevation 3012'

¹⁰ Surface Location

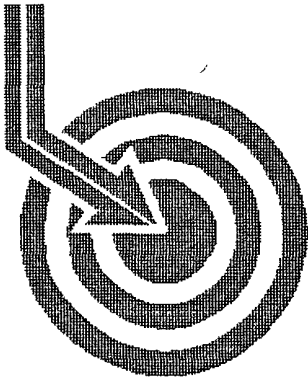
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	27	23S	29E		660	S	1980	W	Eddy

¹¹ 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	27	23S	29E		751.96	S	331.44	E	Eddy
¹² Dedicated Acres 120	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ 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.

16					¹⁷ OPERATOR CERTIFICATION I hereby certify that the information contained 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 a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. <u>Lisa Hunt</u> 07/30/2007 Signature Date Lisa Hunt Printed Name
					¹⁸ 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. Date of Survey Signature and Seal of Professional Surveyor Certificate Number



Scientific Drilling

POGO

Field: Goodnight
Site: Eddy County, NM
Well: Goodnight 27 Federal #1
Wellpath: VH - Job #32K0607479
Survey: 06/10/07

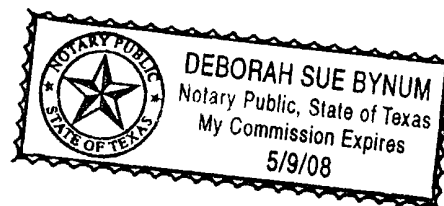
This survey is correct to the best of my knowledge
and is supported by actual field data.

.....*Blair*.....Company Representative

Notorized this date 11th of July, 2007.

Deborah Sue Bynum
Notary Signature

County of Midland
State of Texas





Scientific Drilling International

Survey Report

Company: POGO	Date: 06/26/2007	Time: 20:58:36	Page: 1
Field: Goodnight	Co-ordinate(NE) Reference:	Site: Eddy County, NM, Grid North	
Site: Eddy County, NM	Vertical (TVD) Reference:	SITE: 0.0	
Well: Goodnight 27 Federal #1	Section (VS) Reference:	Well: (0.00N,0.00E,90.00Azi)	
Wellpath: VH - Job #32K0607479	Survey Calculation Method: Minimum Curvature	Db: Sybase	

Survey: 06/10/07	Start Date: 06/10/2007
KSRG 0'-7614'	
Company: Scientific Drilling Internatio	Engineer: Gonzales w/GeoGyro
Tool: Keeper;Keeper Gyro	Tied-to: From Surface

Survey

MD ft	Incl deg	Azim deg	TVD ft	VS ft	N/S ft	E/W ft	DLS deg/100ft	ClsD ft	ClsA deg
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.17	286.19	100.00	-0.14	0.04	-0.14	0.17	0.15	286.19
200.00	0.21	21.79	200.00	-0.22	0.25	-0.22	0.28	0.33	319.38
300.00	0.36	281.58	300.00	-0.46	0.49	-0.46	0.45	0.67	316.79
400.00	0.20	307.02	400.00	-0.90	0.65	-0.90	0.20	1.12	305.90
500.00	0.43	319.34	500.00	-1.29	1.04	-1.29	0.24	1.66	309.04
600.00	0.31	264.39	599.99	-1.80	1.30	-1.80	0.36	2.22	305.86
700.00	0.30	311.48	699.99	-2.27	1.45	-2.27	0.24	2.69	302.59
800.00	0.06	267.21	799.99	-2.52	1.62	-2.52	0.26	2.99	302.79
900.00	0.34	265.15	899.99	-2.86	1.59	-2.86	0.28	3.28	299.08
1000.00	0.32	299.11	999.99	-3.40	1.70	-3.40	0.19	3.81	296.59
1100.00	0.41	308.24	1099.99	-3.93	2.06	-3.93	0.11	4.44	297.68
1200.00	0.38	324.52	1199.99	-4.40	2.55	-4.40	0.12	5.09	300.11
1300.00	0.47	299.61	1299.98	-4.95	3.02	-4.95	0.20	5.80	301.43
1400.00	0.49	300.37	1399.98	-5.68	3.44	-5.68	0.02	6.64	301.25
1500.00	0.47	292.79	1499.98	-6.42	3.82	-6.42	0.07	7.47	300.73
1600.00	0.46	288.47	1599.97	-7.18	4.10	-7.18	0.04	8.27	299.75
1700.00	0.47	323.54	1699.97	-7.81	4.56	-7.81	0.28	9.04	300.30
1800.00	0.33	287.98	1799.97	-8.32	4.98	-8.32	0.28	9.70	300.89
1900.00	0.28	293.42	1899.97	-8.82	5.17	-8.82	0.06	10.22	300.35
2000.00	0.27	281.22	1999.96	-9.28	5.31	-9.28	0.06	10.69	299.78
2100.00	0.58	322.00	2099.96	-9.82	5.75	-9.82	0.41	11.38	300.37
2200.00	0.24	293.46	2199.96	-10.32	6.24	-10.32	0.39	12.06	301.14
2300.00	0.11	309.93	2299.96	-10.59	6.38	-10.59	0.14	12.36	301.07
2400.00	0.27	315.22	2399.96	-10.83	6.61	-10.83	0.16	12.69	301.40
2500.00	0.29	96.99	2499.96	-10.74	6.75	-10.74	0.53	12.69	302.13
2600.00	0.37	106.22	2599.96	-10.18	6.63	-10.18	0.10	12.15	303.05
2700.00	0.51	137.66	2699.95	-9.57	6.21	-9.57	0.27	11.41	302.96
2800.00	0.44	113.95	2799.95	-8.92	5.72	-8.92	0.21	10.60	302.67
2900.00	0.58	118.09	2899.95	-8.12	5.33	-8.12	0.14	9.72	303.25
3000.00	0.58	127.10	2999.94	-7.27	4.78	-7.27	0.09	8.71	303.33
3100.00	0.59	124.19	3099.94	-6.44	4.19	-6.44	0.03	7.69	303.02
3200.00	0.60	125.08	3199.93	-5.59	3.60	-5.59	0.01	6.65	302.77
3300.00	0.63	122.16	3299.92	-4.70	3.01	-4.70	0.04	5.58	302.62
3400.00	0.54	120.01	3399.92	-3.82	2.48	-3.82	0.09	4.56	302.94
3500.00	0.58	120.34	3499.91	-2.98	1.99	-2.98	0.04	3.58	303.69
3600.00	0.64	121.32	3599.91	-2.06	1.44	-2.06	0.06	2.52	304.89
3700.00	0.58	124.60	3699.90	-1.17	0.86	-1.17	0.07	1.45	306.37
3800.00	0.67	129.11	3799.90	-0.30	0.21	-0.30	0.10	0.36	304.42
3900.00	0.59	124.13	3899.89	0.58	-0.45	0.58	0.10	0.73	127.95
4000.00	0.63	119.56	3999.89	1.48	-1.01	1.48	0.06	1.80	124.29
4100.00	0.52	120.22	4099.88	2.35	-1.51	2.35	0.11	2.80	122.70
4200.00	0.55	127.75	4199.88	3.13	-2.03	3.13	0.08	3.73	123.05
4300.00	0.62	123.25	4299.87	3.96	-2.62	3.96	0.08	4.75	123.55
4400.00	0.64	124.16	4399.86	4.87	-3.23	4.87	0.02	5.85	123.58
4500.00	0.68	130.35	4499.86	5.79	-3.93	5.79	0.08	7.00	124.20
4600.00	0.53	128.33	4599.85	6.60	-4.60	6.60	0.15	8.05	124.89
4700.00	0.65	126.29	4699.85	7.42	-5.23	7.42	0.12	9.08	125.15
4800.00	0.55	131.34	4799.84	8.24	-5.88	8.24	0.11	10.12	125.51



Scientific Drilling International

Survey Report

Company: POGO	Date: 06/26/2007	Time: 20:58:36	Page: 2
Field: Goodnight	Co-ordinate(NE) Reference:	Site: Eddy County; NM, Grid North	
Site: Eddy County, NM	Vertical (TVD) Reference:	SITE 0.0	
Well: Goodnight 27 Federal #1	Section (VS) Reference:	Well (0.00N,0.00E,90.00Azi)	
Wellpath: VH - Job #32K0607479	Survey Calculation Method: Minimum Curvature	Db: Sybase	

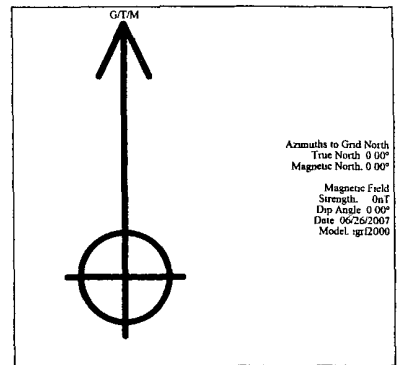
Survey

MD ft	Incl deg	Azim deg	TVD ft	VS ft	N/S ft	E/W ft	DLS deg/100ft	ClsD ft	ClsA deg
4900.00	0.62	126.23	4899.84	9.04	-6.52	9.04	0.09	11.14	125.79
5000.00	0.60	128.41	4999.83	9.88	-7.16	9.88	0.03	12.20	125.93
5100.00	0.67	134.43	5099.82	10.71	-7.90	10.71	0.10	13.31	126.40
5200.00	0.60	139.10	5199.82	11.47	-8.70	11.47	0.09	14.40	127.18
5300.00	0.68	143.61	5299.81	12.17	-9.57	12.17	0.09	15.48	128.20
5400.00	0.83	144.69	5399.80	12.94	-10.64	12.94	0.15	16.75	129.44
5500.00	0.71	147.36	5499.79	13.69	-11.76	13.69	0.13	18.04	130.65
5600.00	0.66	143.52	5599.79	14.37	-12.74	14.37	0.07	19.20	131.57
5700.00	0.71	146.14	5699.78	15.05	-13.72	15.05	0.06	20.37	132.34
5800.00	0.72	150.52	5799.77	15.71	-14.78	15.71	0.06	21.57	133.25
5900.00	0.78	149.06	5899.76	16.37	-15.91	16.37	0.06	22.83	134.19
6000.00	0.91	149.00	5999.75	17.13	-17.17	17.13	0.13	24.25	135.08
6100.00	0.78	145.06	6099.74	17.92	-18.41	17.92	0.14	25.70	135.77
6200.00	1.05	152.56	6199.73	18.74	-19.78	18.74	0.29	27.25	136.56
6300.00	0.90	147.36	6299.72	19.58	-21.26	19.58	0.17	28.90	137.35
6400.00	0.99	150.56	6399.70	20.43	-22.67	20.43	0.10	30.52	137.98
6500.00	0.93	150.60	6499.69	21.25	-24.13	21.25	0.06	32.16	138.63
6600.00	1.06	149.57	6599.67	22.12	-25.64	22.12	0.13	33.86	139.21
6700.00	1.08	145.99	6699.65	23.12	-27.21	23.12	0.07	35.71	139.66
6800.00	1.07	152.86	6799.64	24.07	-28.83	24.07	0.13	37.55	140.14
6900.00	1.02	150.60	6899.62	24.93	-30.43	24.93	0.06	39.34	140.67
7000.00	0.81	130.65	6999.61	25.91	-31.67	25.91	0.38	40.92	140.72
7100.00	0.45	143.46	7099.60	26.68	-32.45	26.68	0.38	42.00	140.57
7200.00	0.42	70.65	7199.60	27.26	-32.64	27.26	0.52	42.52	140.14
7300.00	0.87	20.81	7299.59	27.87	-31.81	27.87	0.68	42.29	138.77
7400.00	0.95	22.18	7399.58	28.45	-30.33	28.45	0.08	41.59	136.83
7500.00	0.97	19.53	7499.57	29.05	-28.77	29.05	0.05	40.88	134.72
7600.00	1.19	353.51	7599.55	29.22	-26.94	29.22	0.53	39.74	132.68
7614.00	1.22	350.66	7613.55	29.17	-26.64	29.17	0.48	39.51	132.40

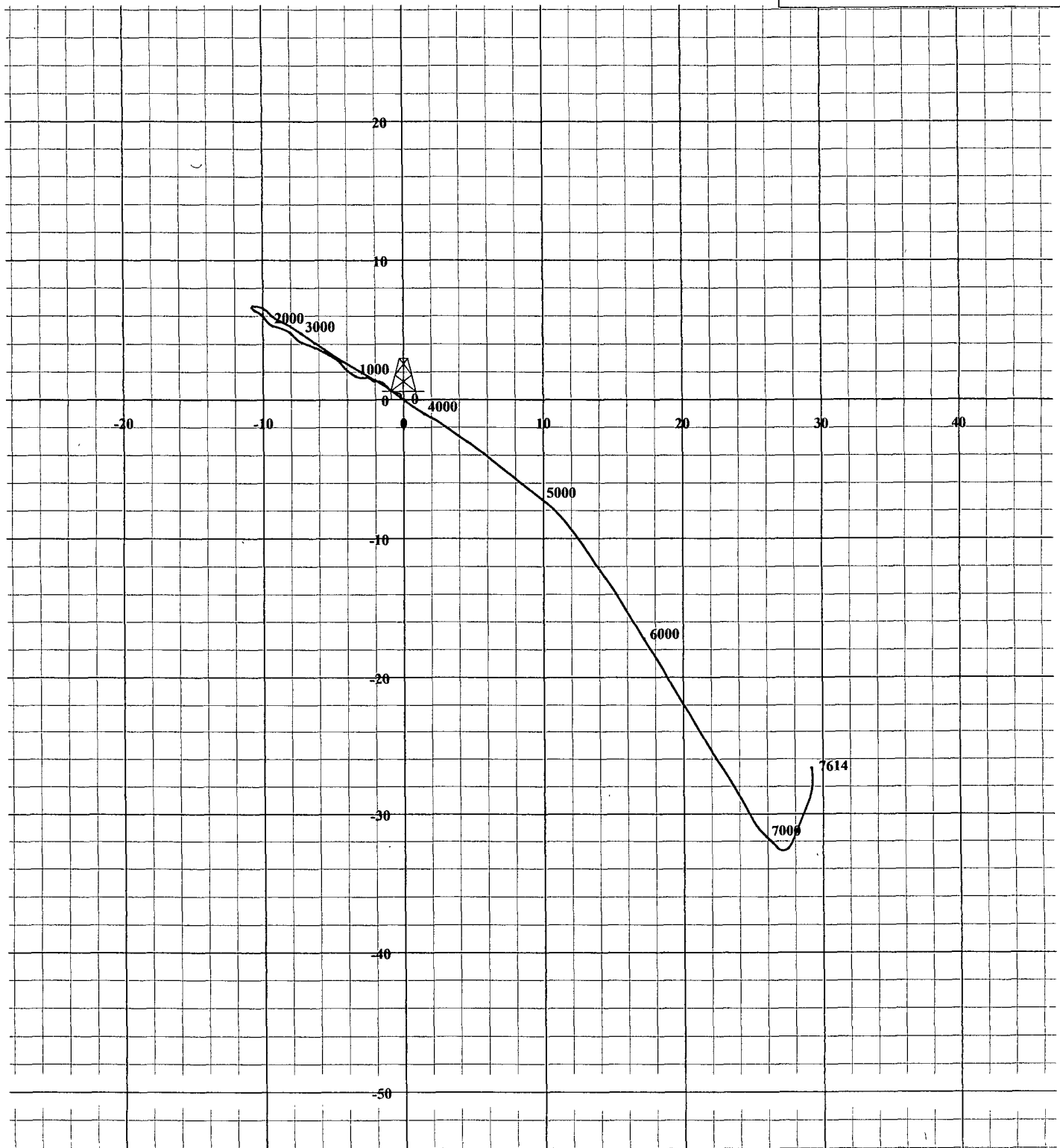


Scientific
Drilling

Field: Goodnight
Site: Eddy County, NM
Well: Goodnight 27 Federal #1
Wellpath: VH - Job #32K0607479
Survey: 06/10/07



South(-)/North(+) [5ft/in]



West(-)/East(+) [5ft/in]

DIRECTIONAL SURVEY REPORT

POGO PRODUCING

GOODNIGHT 27 FED #1H

EDDY COUNTY, NEW MEXICO

PREPARED BY: FRANCISCO SINISTERRA

DIRECTIONAL SURVEY COMPANY REPORT:

1. NAME OF SURVEYING COMPANY: PATHFINDER ENERGY SERVICES
2. NAME OF PERSON(S) PERFORMING SURVEY:
A) JOHN PATTERSON
3. POSITION OF SAID PERSON(S): (A-F) SURVEYORS (FIELD ENGINEERS)
4. DATE(S) ON WHICH SURVEY WAS PERFORMED: 04/20/07 TO 04/29/07
5. STATE IN WHICH SURVEY WAS PERFORMED: NEW MEXICO
6. LOCATION OF WELL: EDDY COUNTY, NM
7. TYPE OF SURVEY(S) PERFORMED: MWD
8. COMPLETE IDENTIFICATION OF WELL:

POGO PRODUCING
GOODNIGHT 27 FED #1H
EDDY COUNTY, NM
RIG: PATTERSON #78
9. SURVEY CERTIFIED FROM: 7678 TO 10651 FEET MEASURED DEPTH.

THIS IS TO VERIFY THAT ATTACHED DOCUMENTS SHOWING THE WELL TO BE DISPLACED AT 2974.96 FEET ON A BEARING OF 88.22 DEGREES FROM THE CENTER OF THE ROTARY TABLE AT A PROJECTED BIT DEPTH OF 10710 FEET, ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.



Francisco Sinisterra
M/LWD SERVICE COORDINATOR

PATHFINDER

ENERGY SERVICES

DIRECTIONAL SURVEY INFORMATION

Prepared By: Francisco Sinisterra

Name of Client: Pogo Producing

Attention: _____

☐ Directional Only Job OR ☒ Logging Job

Name(s) of Persons Performing Surveys:

A) John Patterson D) _____
B) Chris Carson E) _____
C) _____ F) _____

Positions of Said Persons: Surveyors / Field Engineers: Other _____

Date(s) Survey was Performed: From 13-Jun To 22-Jun

Type of Survey Performed: (Specify if other than MWD) _____

IDENTIFICATION OF WELL:

Client:	<u>Pogo Producing</u>	Rig Name:	<u>Patterson #78</u>
Well No.:	<u>Laguna Grande Goodnight 27 Fed #1H</u>	API No.:	<u>30-01522157</u>
Location:	<u>Eddy County</u>	Job No.:	<u>101006470 WT-WT</u>
State:	<u>NM</u>		

TEXAS RAILROAD COMMISSION INFORMATION:

Field: _____

Abstract No.: _____

Well Plat Survey Co.: _____

Surveys Performed From 7678 Feet TO 10651 Feet

MMS / ASCII / LAS Diskette Filename: _____

THIS IS TO VERIFY THAT ATTACHED DOCUMENTS SHOW THE WELL TO BE DISPLACED AT 2969.98
FEET ON A BEARING OF 88.23 DEGREES FROM THE CENTER OF THE ROTARY TABLE AT
A PROJECTED DEPTH OF 10705 FEET, ARE TRUE AND
CORRECT TO THE BEST OF MY KNOWLEDGE.

PathFinder Energy Services, Inc.

BHL Report

Page 01/01
Tie-in Date: 06/17/2007
Date Completed: 06/23/2007

POGO PRODUCING
GOODNIGHT 27 FED #1H
EDDY COUNTY, NM
Rig:PATTERSON 78
PathFinder Office Supervisor: FRANCISCO SINISTERRA
PathFinder Field Engineers:JOHN PATTERSON
CHRIS CARSON

Survey Horiz. Reference:WELLHEAD
Ref Coordinates: LAT:32.15.53.1000 N LON:104.58.31.1988 W
GRID Reference:NAD27 new mexico east Transverse Mercator
Ref GRID Coord: X: 301555.6759 Y: 460627.3935
North Aligned To:GRID NORTH
Total Magnetic Correction: 9.02° EAST TO GRID
Vertical Section Plane: 90.00
Survey Vert. Reference: 0.00' Rotary Table To Ground
Altitude:3012.00' Ground To MSL

Measured Depth	10705.00	(feet)
Inclination	86.70	(deg)
Azimuth	85.56	(deg)
True Vertical Depth	7871.96	(feet)
Course Length	54.00	(feet)
Vertical Section	2968.55	(feet)
Rectangular Corr. N/S	91.96 N	(feet)
Rectangular Corr. E/W	2968.55 E	(feet)
Closure Distance	2969.98	(feet)
Direction of Closure	88.23	(deg)
Dogleg Severity	0.00	(deg/100ft)

PathFinder Energy Services, Inc.

Survey Report

POGO PRODUCING
GOODNIGHT 27 FED #1H
EDDY COUNTY, NM
Rig:PATTERSON 78
PathFinder Office Supervisor: FRANCISCO SINISTERRA
PathFinder Field Engineers: JOHN PATTERSON
CHRIS CARSON

Survey Horiz. Reference:WELLHEAD
Ref Coordinates: LAT:32.15.53.1000 N LON:104.58.31.1988 W
Reference:NAD27 new mexico east Transverse Mercator
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Total Magnetic Correction: 9.02° EAST TO GRID
Vertical Section Plane: 90.00
Survey Vert. Reference: 0.00' Rotary Table To Ground
Altitude:3012.00' Ground To MSL

Survey Calculations by PathCalc v1.95U using Minimum Curvature

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Retangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
TIE-IN TO SCIENTIFIC GYRO SURVEY @ 7614' MD.										
7614.00	1.22	350.66	7613.54	0.00	29.17	26.64 S	29.17 E	39.50@	132.40	0.00
THE FOLLOWING ARE PATHFINDER MWD SURVEYS.										
7678.00	18.99	85.78	7676.38	64.00	39.54	25.19 S	39.54 E	46.88@	122.50	29.90
7709.00	24.62	83.94	7705.15	31.00	51.00	24.13 S	51.00 E	56.42@	115.32	18.29
7739.00	31.39	83.12	7731.62	30.00	64.99	22.54 S	64.99 E	68.79@	109.13	22.60
7770.00	37.64	81.93	7757.15	31.00	82.39	20.24 S	82.39 E	84.84@	103.80	20.28
7801.00	43.79	81.43	7780.64	31.00	102.39	17.31 S	102.39 E	103.84@	99.59	19.87
7831.00	50.47	83.20	7801.03	30.00	124.17	14.39 S	124.17 E	125.00@	96.61	22.68
7862.00	57.16	86.31	7819.33	31.00	149.07	12.13 S	149.07 E	149.56@	94.65	23.05
7893.00	63.49	90.16	7834.67	31.00	175.97	11.33 S	175.97 E	176.33@	93.68	23.09
7923.00	70.43	93.11	7846.41	30.00	203.54	12.14 S	203.54 E	203.90@	93.41	24.84
7954.00	77.29	94.10	7855.02	31.00	233.24	14.01 S	233.24 E	233.66@	93.44	22.34
7982.00	82.92	94.75	7859.83	28.00	260.73	16.14 S	260.73 E	261.23@	93.54	20.24
8013.00	87.49	95.99	7862.42	31.00	291.48	19.03 S	291.48 E	292.10@	93.74	15.27
8043.00	87.23	96.15	7863.80	30.00	321.28	22.20 S	321.28 E	322.05@	93.95	1.02
8074.00	87.32	96.27	7865.28	31.00	352.06	25.55 S	352.06 E	352.99@	94.15	0.48
8105.00	86.97	95.91	7866.82	31.00	382.85	28.84 S	382.85 E	383.94@	94.31	1.62
8137.00	87.58	96.03	7868.34	32.00	414.64	32.16 S	414.64 E	415.89@	94.44	1.94
8166.00	88.90	96.21	7869.23	29.00	443.46	35.25 S	443.46 E	444.86@	94.54	4.59
8197.00	89.16	96.32	7869.76	31.00	474.27	38.63 S	474.27 E	475.84@	94.66	0.91
8258.00	88.90	96.11	7870.79	61.00	534.91	45.24 S	534.91 E	536.81@	94.83	0.55
8289.00	89.08	96.05	7871.34	31.00	565.73	48.52 S	565.73 E	567.80@	94.90	0.61
8320.00	88.55	96.30	7871.98	31.00	596.54	51.85 S	596.54 E	598.79@	94.97	1.89
8350.00	88.46	96.17	7872.76	30.00	626.35	55.11 S	626.35 E	628.77@	95.03	0.53
8381.00	88.64	96.14	7873.55	31.00	657.16	58.43 S	657.16 E	659.76@	95.08	0.59
8442.00	89.34	96.24	7874.62	61.00	717.80	65.01 S	717.80 E	720.74@	95.17	1.16

PathFinder Energy Services, Inc.

Survey Report

POGO PRODUCING
GOODNIGHT 27 FED #1H
EDDY COUNTY, NM
RIG:PATTERSON 78

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Retangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
8534.00	91.45	95.76	7873.99	92.00	809.29	74.62 S	809.29 E	812.72@	95.27	2.35
8564.00	88.29	94.60	7874.06	30.00	839.16	77.33 S	839.16 E	842.71@	95.27	11.22
8630.00	86.61	92.29	7876.99	66.00	904.97	81.29 S	904.97 E	908.61@	95.13	4.32
8661.00	86.44	92.34	7878.87	31.00	935.89	82.54 S	935.89 E	939.52@	95.04	0.57
8692.00	86.53	92.27	7880.77	31.00	966.80	83.79 S	966.80 E	970.43@	94.95	0.37
8723.00	85.56	90.66	7882.91	31.00	997.72	84.58 S	997.72 E	1001.30@	94.85	6.05
8749.00	85.30	90.21	7884.98	26.00	1023.63	84.78 S	1023.63 E	1027.14@	94.73	1.99
8779.00	89.60	90.79	7886.32	30.00	1053.60	85.04 S	1053.60 E	1057.02@	94.61	14.46
8810.00	91.36	90.94	7886.06	31.00	1084.59	85.51 S	1084.59 E	1087.96@	94.51	5.70
8841.00	90.84	90.87	7885.46	31.00	1115.58	86.00 S	1115.58 E	1118.89@	94.41	1.69
8871.00	89.78	89.72	7885.30	30.00	1145.58	86.15 S	1145.58 E	1148.81@	94.30	5.21
8906.00	89.25	89.53	7885.60	35.00	1180.58	85.92 S	1180.58 E	1183.70@	94.16	1.61
8937.00	88.02	88.78	7886.33	31.00	1211.56	85.46 S	1211.56 E	1214.57@	94.04	4.65
8968.00	87.93	88.52	7887.43	31.00	1242.53	84.73 S	1242.53 E	1245.42@	93.90	0.89
8998.00	88.20	88.02	7888.44	30.00	1272.50	83.83 S	1272.50 E	1275.26@	93.77	1.89
9029.00	90.48	87.68	7888.80	31.00	1303.48	82.67 S	1303.48 E	1306.10@	93.63	7.44
9056.00	91.71	87.35	7888.28	27.00	1330.45	81.50 S	1330.45 E	1332.94@	93.51	4.72
9086.00	92.59	87.73	7887.16	30.00	1360.40	80.21 S	1360.40 E	1362.76@	93.37	3.19
9117.00	92.77	87.29	7885.71	31.00	1391.33	78.86 S	1391.33 E	1393.57@	93.24	1.53
9148.00	93.30	86.70	7884.07	31.00	1422.25	77.24 S	1422.25 E	1424.34@	93.11	2.56
9178.00	93.56	86.48	7882.27	30.00	1452.14	75.46 S	1452.14 E	1454.10@	92.97	1.13
9209.00	94.00	86.80	7880.23	31.00	1483.02	73.65 S	1483.02 E	1484.85@	92.84	1.75
9240.00	94.26	86.37	7878.00	31.00	1513.89	71.81 S	1513.89 E	1515.59@	92.72	1.62
9270.00	94.09	86.17	7875.81	30.00	1543.74	69.86 S	1543.74 E	1545.32@	92.59	0.87
9301.00	93.91	85.06	7873.65	31.00	1574.58	67.49 S	1574.58 E	1576.02@	92.45	3.62
9332.00	94.18	85.98	7871.46	31.00	1605.40	65.08 S	1605.40 E	1606.72@	92.32	3.09
9363.00	93.42	85.17	7869.41	31.00	1636.24	62.69 S	1636.24 E	1637.44@	92.19	3.58
9393.00	93.39	85.16	7867.63	30.00	1666.08	60.17 S	1666.08 E	1667.17@	92.07	0.11
9424.00	91.28	85.19	7866.36	31.00	1696.95	57.56 S	1696.95 E	1697.92@	91.94	6.81

PathFinder Energy Services, Inc.

Survey Report

POGO PRODUCING
GOODNIGHT 27 FED #1H
EDDY COUNTY, NM
RIG:PATTERSON 78

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Retangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
9455.00	91.45	84.87	7865.62	31.00	1727.82	54.88 S	1727.82 E	1728.69@	91.82	1.17
9485.00	91.71	84.41	7864.80	30.00	1757.68	52.08 S	1757.68 E	1758.45@	91.70	1.76
9516.00	91.71	84.81	7863.87	31.00	1788.53	49.17 S	1788.53 E	1789.20@	91.57	1.29
9547.00	90.40	84.67	7863.30	31.00	1819.39	46.32 S	1819.39 E	1819.98@	91.46	4.25
9577.00	90.40	84.79	7863.09	30.00	1849.26	43.57 S	1849.26 E	1849.78@	91.35	0.40
9608.00	90.22	84.23	7862.92	31.00	1880.12	40.60 S	1880.12 E	1880.56@	91.24	1.90
9639.00	90.40	84.33	7862.76	31.00	1910.97	37.51 S	1910.97 E	1911.33@	91.12	0.66
9670.00	90.22	84.24	7862.59	31.00	1941.81	34.43 S	1941.81 E	1942.12@	91.02	0.65
9700.00	90.04	83.96	7862.52	30.00	1971.65	31.34 S	1971.65 E	1971.90@	90.91	1.11
9730.00	89.69	83.77	7862.59	30.00	2001.48	28.14 S	2001.48 E	2001.68@	90.81	1.33
9761.00	88.81	83.25	7863.00	31.00	2032.28	24.63 S	2032.28 E	2032.43@	90.69	3.30
9792.00	88.81	82.74	7863.64	31.00	2063.04	20.85 S	2063.04 E	2063.15@	90.58	1.64
9823.00	88.46	82.89	7864.38	31.00	2093.79	16.98 S	2093.79 E	2093.86@	90.46	1.23
9853.00	88.90	82.38	7865.07	30.00	2123.53	13.13 S	2123.53 E	2123.57@	90.35	2.24
9884.00	89.16	82.32	7865.60	31.00	2154.25	9.01 S	2154.25 E	2154.27@	90.24	0.86
9915.00	89.96	82.01	7865.83	31.00	2184.96	4.78 S	2184.96 E	2184.97@	90.13	2.77
9945.00	90.22	82.32	7865.79	30.00	2214.68	0.69 S	2214.68 E	2214.68@	90.02	1.35
9976.00	90.40	82.24	7865.62	31.00	2245.40	3.47 N	2245.40 E	2245.40@	89.91	0.64
10007.00	91.36	82.00	7865.14	31.00	2276.10	7.72 N	2276.10 E	2276.12@	89.81	3.19
10038.00	91.54	81.47	7864.36	31.00	2306.77	12.18 N	2306.77 E	2306.80@	89.70	1.81
10069.00	90.57	81.95	7863.79	31.00	2337.44	16.65 N	2337.44 E	2337.50@	89.59	3.49
10099.00	90.22	82.24	7863.58	30.00	2367.16	20.77 N	2367.16 E	2367.25@	89.50	1.52
10130.00	90.22	82.14	7863.46	31.00	2397.87	24.98 N	2397.87 E	2398.00@	89.40	0.32
10161.00	90.40	82.08	7863.29	31.00	2428.57	29.24 N	2428.57 E	2428.75@	89.31	0.61
10191.00	91.01	82.44	7862.93	30.00	2458.30	33.28 N	2458.30 E	2458.52@	89.22	2.36
10222.00	91.19	82.22	7862.33	31.00	2489.02	37.42 N	2489.02 E	2489.30@	89.14	0.92
10253.00	90.22	82.15	7861.95	31.00	2519.72	41.63 N	2519.72 E	2520.07@	89.05	3.14
10283.00	90.31	82.17	7861.81	30.00	2549.44	45.72 N	2549.44 E	2549.85@	88.97	0.31
10314.00	90.48	82.46	7861.60	31.00	2580.17	49.87 N	2580.17 E	2580.65@	88.89	1.08

PathFinder Energy Services, Inc.

Survey Report

POGO PRODUCING
GOODNIGHT 27 FED #1H
EDDY COUNTY, NM
RIG:PATTERSON 78

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Retangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
10345.00	90.40	82.67	7861.36	31.00	2610.90	53.88 N	2610.90 E	2611.46@	88.82	0.72
10375.00	90.51	82.57	7861.12	30.00	2640.65	57.73 N	2640.65 E	2641.29@	88.75	0.50
10406.00	90.22	82.37	7860.92	31.00	2671.39	61.80 N	2671.39 E	2672.10@	88.67	1.14
10437.00	89.25	82.83	7861.07	31.00	2702.13	65.79 N	2702.13 E	2702.93@	88.61	3.46
10468.00	88.53	83.31	7861.67	31.00	2732.89	69.53 N	2732.89 E	2733.78@	88.54	2.79
10498.00	88.81	83.19	7862.36	30.00	2762.68	73.05 N	2762.68 E	2763.64@	88.49	1.02
10529.00	88.46	83.78	7863.10	31.00	2793.47	76.57 N	2793.47 E	2794.52@	88.43	2.21
10560.00	88.11	84.38	7864.03	31.00	2824.29	79.77 N	2824.29 E	2825.42@	88.38	2.24
10590.00	87.05	84.84	7865.30	30.00	2854.13	82.58 N	2854.13 E	2855.32@	88.34	3.85
10621.00	86.44	84.99	7867.06	31.00	2884.96	85.32 N	2884.96 E	2886.22@	88.31	2.03
10651.00	86.70	85.56	7868.85	30.00	2914.80	87.79 N	2914.80 E	2916.12@	88.27	2.09
STRAIGHT LINE PROJECTION TO BIT @ 10705' MD.										
10705.00	86.70	85.56	7871.96	54.00	2968.55	91.96 N	2968.55 E	2969.98@	88.23	0.00



ENERGY SERVICES

TIE-IN SURVEY INFORMATION SHEET

CLIENT:	Pogo Producing		
LEASE / WELL No.:	Laguna Grande	Goodnight 27 Fed #1H	
WELL LOCATION:			
COUNTY / STATE / COUNTRY:	Eddy	NM	USA
RIG:	Patterson #78		
API WELL No:	30-01522157		
JOB No:	101006470 WT-WT		
P.O. / AFE No.			
DIRECTIONAL COMPANY:	Pathfinder Energy Services		

WELL SITE INFORMATION

MAGNETIC DECLINATION:			
On Wall Plat:	LWD Calculated:	9.016781	Agreed Upon: 9.02
X = 301555.583100	Feet	Y = 460627.394000	Feet
SITE LATITUDE:	32.26475	SITE LONGITUDE:	104.975333
GRID SYSTEM:	TRUE ☐ UTM ☐ LAMBERT ☒	ZONE:	New Mexico East
PROPOSED DRIFT DIRECTION:	#	90	
KELLY BUSHING ELEVATION:	20 feet		
ALTITUDE:	3012	Feet	WATER DEPTH: 0 Feet

TIE-IN SURVEY

MEASURED DEPTH:	7614
DRIFT ANGLE:	1.22
DRIFT DIRECTION:	350.66
TRUE VERTICAL DEPTH:	7613.54
VERTICAL SECTION:	
RECTANGULAR COORDINATE (N / S) :	-26.64
RECTANGULAR COORDINATE (E / W) :	29.17
CLOSURE DISTANCE / DIRECTION:	
SURVEY CALCULATION METHOD:	AA ☐ MC ☐ RC ☐ BT ☐
SOURCE OF TIE-IN DATA (COMPANY):	Scientific Gyro
COPY OF TIE-IN SURVEY REPORT	☐ YES ☒ NO

WELL PLAN

KICKOFF DEPTH:	7610'	TOTAL DEPTH:	10728
KICKOFF ANGLE:	1.22 deg	MAX ANGLE:	90

PES Engineers:

**Signature of both field engineers required if applicable

Directional Driller:

DATE: 6-13-07

PATHFINDER

ENERGY SERVICES

MAGNETIC DECLINATION / TOOLFACE OFFSET WORKSHEET

Client: <u>Pogo Producing</u>	LWD Run No: <u>1</u>
Well: <u>Goodnight 27 Fed #1H 30-01522157</u>	DTA No: _____
Location: _____	HDAS No: _____
Rig: <u>Patterson #78</u>	TrkrElec No: _____
Job No: <u>101006470 WT-WT</u>	

Magnetic Declination:

GRID SYSTEM USED: ☒ TRUE ☐ UTM ☐ LAMBERT ☒ ZONE: New Mexico East

X = 301555.5831 Y = 460627.394

SITE LATITUDE: 32.26475 SITE LONGITUDE: 104.975333

Magnetic Declination: 1

On Wall Plat _____

LWD Calculated: 9 016781 Directional Driller Approval: [Signature]

Agreed Upon: 9.02 LWD Engineers Approval: [Signature]

Supervisor Approval: [Signature]

ToolFace Offset Calculation:

1. Ensure all connections between M/LWD are torqued correctly
2. Estimate toolface offset.
3. Measure the distance from the M/LWD scribe line to the motor scribe line in a clockwise direction looking down hole.
4. Measure the circumference of the tool.
5. Calculate Tool Face Offset using.

$$\text{TOOL FACE OFFSET} = \frac{\text{Distance from M/LWD to Motor}}{\text{Circumference}} \times 360^\circ$$

ToolFace Offset Using Protractor:

1. Hook protractor onto the M/LWD tool.
2. Read Tool Face Offset from top of protractor where the motor scribe line intersects protractor.
3. If motor scribe line does not intersect protractor flip protractor over and repeat steps 1 and 2.

Distance from M/LWD to Motor: 0

Circumference: 0

OTF Estimate: 0 OTF Calculated: _____ MWD OTF Protractor: 0

Offset Tool Face Used = 0

M/LWD Engineer #1: [Signature]

M/LWD Engineer #2: [Signature]

Directional Driller: [Signature]

PATHFINDER

ENERGY SERVICES

MAGNETIC DECLINATION / TOOLFACE OFFSET WORKSHEET

Client: Pogo Producing	LWD Run No: 2
Well: Goodnight 27 Fed #1H 30-01522157	DTA No: _____
Location: _____	HDAS No: _____
Rig: Patterson #78	TrkrElec No: _____
Job No: 101006470 WT-WT	

Magnetic Declination:

GRID SYSTEM USED: TRUE ☐ UTM ☐ LAMBERT ☒ ZONE: New Mexico East

X = 301555.5831 Y = 460627.394

SITE LATITUDE: 32.26475 SITE LONGITUDE: 104.975333

Magnetic Declination:

On Wall Plat _____

LWD Calculated 9 016781 Directional Driller Approval: *B. Brown*

Agreed Upon: 9.02 LWD Engineers Approval: *John Patterson*

Supervisor Approval: _____

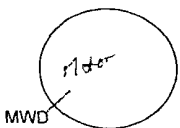
ToolFace Offset Calculation:

1. Ensure all connections between M/LWD are torqued correctly.
2. Estimate toolface offset.
3. Measure the distance from the M/LWD scribe line to the motor scribe line in a clockwise direction looking down hole
4. Measure the circumference of the tool
5. Calculate Tool Face Offset using.

$$\text{TOOL FACE OFFSET} = \frac{\text{Distance from M/LWD to Motor}}{\text{Circumference}} \times 360^\circ$$

ToolFace Offset Using Protractor:

1. Hook protractor onto the M/LWD tool
2. Read Tool Face Offset from top of protractor where the motor scribe line intersects protractor.
3. If motor scribe line does not intersect protractor flip protractor over and repeat steps 1 and 2.

Distance from M/LWD to Motor: 0	
Circumference: 0	
	
OTF Estimate: 0	OTF Calculated: MWD OTF Protractor: 0
Offset Tool Face Used = 0	M/LWD Engineer #1: <i>John Patterson</i>
	M/LWD Engineer #2: _____
	Directional Driller: <i>B. Brown</i>



MAGNETIC DECLINATION / TOOLFACE OFFSET WORKSHEET

Client:	Pogo Producing	LWD Run No.:	3
Well:	Goodnight 27 Fed #1H 30-01522157	DTA No.:	
Location:		HDAS No.:	
Rig:	Patterson #78	TrkrElec No.:	
Job No.:	101006470 WT-WT		

Magnetic Declination:

GRID SYSTEM USED: TRUE ☐ UTM ☐ LAMBERT ☒ ZONE. New Mexico East

X = 301555.5831 Y = 460627.394

SITE LATITUDE: 32.26475 SITE LONGITUDE: 104 975333

Magnetic Declination:

On Wall Plat: _____

LWD Calculated: 9 016781 Directional Driller Approval: [Signature]

Agreed Upon: 9.02 LWD Engineers Approval: [Signature]

Supervisor Approval: _____

ToolFace Offset Calculation:

1. Ensure all connections between M/LWD are torqued correctly
2. Estimate toolface offset.
3. Measure the distance from the M/LWD scribe line to the motor scribe line in a clockwise direction looking down hole
4. Measure the circumference of the tool
5. Calculate Tool Face Offset using

$$\text{TOOL FACE OFFSET} = \frac{\text{Distance from M/LWD to Motor}}{\text{Circumference}} \times 360^\circ$$

ToolFace Offset Using Protractor:

1. Hook protractor onto the M/LWD tool.
2. Read Tool Face Offset from top of protractor where the motor scribe line intersects protractor.
3. If motor scribe line does not intersect protractor flip protractor over and repeat steps 1 and 2

RD0'

Distance from M/LWD to Motor: 0

Circumference: 0

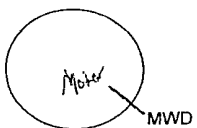
OTF Estimate: 0 OTF Calculated: _____ MWD OTF Protractor: 0

Offset Tool Face Used = 0

M/LWD Engineer #1: [Signature]

M/LWD Engineer #2: [Signature]

Directional Driller: [Signature]





MAGNETIC DECLINATION / TOOLFACE OFFSET WORKSHEET

Client:	Pogo Producing	LWD Run No.	4
Well	Laguna Grande Goodnight 27 Fed #1H	DTA No:	
Location:		HDAS No:	
Rig:	Patterson #78	TrkrElec No.	
Job No	101006470 WT-WT		

Magnetic Declination:

GRID SYSTEM USED: TRUE ☐ UTM ☐ LAMBERT ☒ ZONE. New Mexico East

X = 301555.5831 Y= 460627.394

SITE LATITUDE: 32.26475 SITE LONGITUDE: 104.97533

Magnetic Declination:

On Wall Plat: _____

LWD Calculated: 9 016781 Directional Driller Approval: *[Signature]*

Agreed Upon: 9.02 LWD Engineers Approval: *[Signature]*

Supervisor Approval: _____

ToolFace Offset Calculation:

1. Ensure all connections between M/LWD are torqued correctly.
2. Estimate toolface offset.
3. Measure the distance from the M/LWD scribe line to the motor scribe line in a clockwise direction looking down hole
4. Measure the circumference of the tool
5. Calculate Tool Face Offset using.

$$\text{TOOL FACE OFFSET} = \frac{\text{Distance from M/LWD to Motor}}{\text{Circumference}} \times 360^\circ$$

ToolFace Offset Using Protractor:

1. Hook protractor onto the M/LWD tool
2. Read Tool Face Offset from top of protractor where the motor scribe line intersects protractor.
3. If motor scribe line does not intersect protractor flip protractor over and repeat steps 1 and 2

RD0'

Distance from M/LWD to Motor 0

Circumference: 0

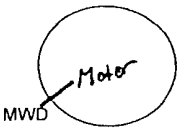
OTF Estimate: 0 OTF Calculated: _____ MWD OTF Protractor: 0

Offset Tool Face Used = 0

M/LWD Engineer #1: *[Signature]*

M/LWD Engineer #2: _____

Directional Driller: *[Signature]*



PathFinder Energy Services, Inc.

Magnetic & Grid Calculations

POGO PRODUCING
GOODNIGHT 27 FED. # 1H
EDDY Co., NM
Rig: PATTERSON 78

Tue Jun 12 15:02:01 2007

Coordinates

Latitude: 32.264750 N (32 deg. 15 min. 53.1000 sec.)
Longitude: 104.975333 W (-104 deg. 58 min. 31.1999 sec.)
Elevation: 3012.00 feet.
Calculation Date: Jun/12/2007

Magnetic Calculations

Model: IGRF2005
Dip Angle: 60.0718 degrees
Total Magnetic Field: 0.48897 gauss
Magnetic Declination: 8.674050 degrees
Horizontal Intensity: 0.243954 gauss
To Convert a Magnetic Dir. to a TRUE North Dir. Add 8.674050 Degs

Transverse Mercator Grid Calculations NAD27

Grid System: Transverse Mercator: new mexico east
Ellipsoid: Clarke 1866
X: 301555.5831 feet
Y: 460627.3940 feet
True to Grid: (convergence) 0.342731 degrees
Magnetic to Grid: 9.016781 degrees
To Convert a Magnetic Dir. to a GRID dir. Add 9.016781 Degs.

GOODNIGHT 27 FED#1.txt

600.00	599.99	-1.80	0.31	264.39	1.30	-1.80	0.36
700.00	699.99	-2.27	0.30	311.48	1.45	-2.27	0.24
800.00	799.99	-2.52	0.06	267.21	1.62	-2.52	0.26
900.00	899.99	-2.86	0.34	265.15	1.59	-2.86	0.28
1000.00	999.99	-3.40	0.32	299.11	1.70	-3.40	0.19
1100.00	1099.99	-3.93	0.41	308.24	2.06	-3.93	0.11
1200.00	1199.98	-4.40	0.38	324.52	2.55	-4.40	0.12
1300.00	1299.98	-4.95	0.47	299.61	3.02	-4.95	0.20
1400.00	1399.98	-5.68	0.49	300.37	3.44	-5.68	0.02
1500.00	1499.97	-6.42	0.47	292.79	3.82	-6.42	0.07
1600.00	1599.97	-7.18	0.46	288.47	4.11	-7.18	0.04
1700.00	1699.97	-7.81	0.47	323.54	4.56	-7.81	0.28
1800.00	1799.96	-8.32	0.33	287.98	4.98	-8.32	0.28
1900.00	1899.96	-8.82	0.28	293.42	5.17	-8.82	0.06
2000.00	1999.96	-9.28	0.27	281.22	5.31	-9.28	0.06
2100.00	2099.96	-9.82	0.58	322.00	5.75	-9.82	0.41
2200.00	2199.96	-10.32	0.24	293.46	6.24	-10.32	0.39
2300.00	2299.95	-10.59	0.11	309.93	6.38	-10.59	0.14
2400.00	2399.95	-10.83	0.27	315.22	6.61	-10.83	0.16
2500.00	2499.95	-10.74	0.29	96.99	6.75	-10.74	0.53
2600.00	2599.95	-10.18	0.37	106.22	6.63	-10.18	0.10
2700.00	2699.95	-9.57	0.51	137.66	6.21	-9.57	0.27
2800.00	2799.95	-8.92	0.44	113.95	5.72	-8.92	0.21
2900.00	2899.94	-8.12	0.58	118.09	5.33	-8.12	0.14
3000.00	2999.94	-7.27	0.58	127.10	4.78	-7.27	0.09
3100.00	3099.93	-6.45	0.59	124.19	4.19	-6.45	0.03
3200.00	3199.93	-5.59	0.60	125.08	3.60	-5.59	0.01
3300.00	3299.92	-4.70	0.63	122.16	3.00	-4.70	0.04
3400.00	3399.91	-3.82	0.54	120.01	2.48	-3.82	0.09
3500.00	3499.91	-2.98	0.58	120.34	1.99	-2.98	0.04
3600.00	3599.90	-2.06	0.64	121.32	1.44	-2.06	0.06
3700.00	3699.90	-1.17	0.58	124.60	0.86	-1.17	0.07
3800.00	3799.89	-0.30	0.67	129.11	0.21	-0.30	0.10
3900.00	3899.89	0.58	0.59	124.13	-0.45	0.58	0.10
4000.00	3999.88	1.48	0.63	119.56	-1.01	1.48	0.06
4100.00	4099.88	2.35	0.52	120.22	-1.51	2.35	0.11
4200.00	4199.87	3.13	0.55	127.75	-2.03	3.13	0.08
4300.00	4299.87	3.96	0.62	123.25	-2.62	3.96	0.08
4400.00	4399.86	4.87	0.64	124.16	-3.23	4.87	0.02
4500.00	4499.85	5.79	0.68	130.35	-3.93	5.79	0.08
4600.00	4599.85	6.60	0.53	128.33	-4.60	6.60	0.15
4700.00	4699.84	7.42	0.65	126.29	-5.23	7.42	0.12
4800.00	4799.84	8.24	0.55	131.34	-5.88	8.24	0.11
4900.00	4899.83	9.04	0.62	126.23	-6.52	9.04	0.09
5000.00	4999.83	9.88	0.60	128.41	-7.16	9.88	0.03
5100.00	5099.82	10.71	0.67	134.43	-7.89	10.71	0.10
5200.00	5199.81	11.47	0.60	139.10	-8.70	11.47	0.09
5300.00	5299.81	12.17	0.68	143.61	-9.57	12.17	0.09
5400.00	5399.80	12.94	0.83	144.69	-10.64	12.94	0.15
5500.00	5499.79	13.69	0.71	147.36	-11.76	13.69	0.13
5600.00	5599.78	14.37	0.66	143.52	-12.74	14.37	0.07
5700.00	5699.77	15.05	0.71	146.14	-13.72	15.05	0.06
5800.00	5799.77	15.71	0.72	150.52	-14.78	15.71	0.06
5900.00	5899.76	16.37	0.78	149.06	-15.91	16.37	0.06
6000.00	5999.75	17.13	0.91	149.00	-17.17	17.13	0.13
6100.00	6099.74	17.93	0.78	145.06	-18.41	17.93	0.14
6200.00	6199.72	18.74	1.05	152.56	-19.78	18.74	0.29
6300.00	6299.71	19.58	0.90	147.36	-21.26	19.58	0.17
6400.00	6399.70	20.43	0.99	150.56	-22.67	20.43	0.10
6500.00	6499.68	21.25	0.93	150.60	-24.13	21.25	0.06
6600.00	6599.67	22.12	1.06	149.57	-25.64	22.12	0.13
6700.00	6699.65	23.12	1.08	145.99	-27.21	23.12	0.07
6800.00	6799.63	24.07	1.07	152.86	-28.83	24.07	0.13

GOODNIGHT 27 FED#1.txt

6900.00	6899.61	24.93	1.02	150.60	-30.43	24.93	0.06
7000.00	6999.60	25.91	0.81	130.65	-31.67	25.91	0.38
7100.00	7099.60	26.68	0.45	143.46	-32.45	26.68	0.38
7200.00	7199.59	27.25	0.42	70.65	-32.64	27.25	0.52
7300.00	7299.59	27.87	0.87	20.81	-31.81	27.87	0.68
7400.00	7399.57	28.45	0.95	22.18	-30.33	28.45	0.08
7500.00	7499.56	29.05	0.97	19.53	-28.77	29.05	0.05
7600.00	7599.54	29.21	1.19	353.51	-26.94	29.21	0.53
7614.00	7613.54	29.17	1.22	350.66	-26.64	29.17	0.48

The Horizontal Displacement (in Feet) at
 Measured Depth 7614.00 is 39.51 in a Direction of 132.41 Degrees
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## ° SCIENTIFIC DRILLING CONTROLS °

[illegible][illegible]

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**3**

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[illegible]

Well Number : GOODNIGHT 27 FED#1

Well Location : EDDY COUNTY, NEW MEXICO

Job Number : 32K0607479

Location Latitude : 32.270

Survey Date : 10-JUN-2007

S.D.C. Personnel : ROBERT GONZALES

Length Units : Feet

North Reference : TRUE North

Grid Correction : 0.00 Degrees

Survey Depth Zero : RKB

Proposal Direction : 90.00

Calculation Method : Minimum Curvature

Remarks : The INRUN Survey will be called definitive

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° SCIENTIFIC DRILLING CONTROLS °

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## Inrun Survey

for

Well No : GOODNIGHT 27 FED#1

Date : 10-JUN-2007

Job No. : 32K0607479      TRUE      Proposal : 90.00

| Depth<br>( Feet ) | T.V.D<br>( Feet ) | V.S.<br>( Feet ) | Inc<br>Deg. | Azimuth<br>Deg. | Latitude<br>( Feet ) | Departure<br>( Feet ) | D-leg<br>/100 |
|-------------------|-------------------|------------------|-------------|-----------------|----------------------|-----------------------|---------------|
|-------------------|-------------------|------------------|-------------|-----------------|----------------------|-----------------------|---------------|

|      |         |        |      |        |       |        |      |
|------|---------|--------|------|--------|-------|--------|------|
| 0    | 0       | 0      | 0    | 0      | 0     | 0      | 0    |
| 100  | 100     | -0.14  | 0.17 | 286.19 | 0.04  | -0.14  | 0.17 |
| 200  | 200     | -0.22  | 0.21 | 21.79  | 0.25  | -0.22  | 0.28 |
| 300  | 300     | -0.46  | 0.36 | 281.58 | 0.49  | -0.46  | 0.45 |
| 400  | 400     | -0.9   | 0.2  | 307.02 | 0.65  | -0.9   | 0.2  |
| 500  | 500     | -1.29  | 0.43 | 319.34 | 1.04  | -1.29  | 0.24 |
| 600  | 599.99  | -1.8   | 0.31 | 264.39 | 1.3   | -1.8   | 0.36 |
| 700  | 699.99  | -2.27  | 0.3  | 311.48 | 1.45  | -2.27  | 0.24 |
| 800  | 799.99  | -2.52  | 0.06 | 267.21 | 1.62  | -2.52  | 0.26 |
| 900  | 899.99  | -2.86  | 0.34 | 265.15 | 1.59  | -2.86  | 0.28 |
| 1000 | 999.99  | -3.4   | 0.32 | 299.11 | 1.7   | -3.4   | 0.19 |
| 1100 | 1099.99 | -3.93  | 0.41 | 308.24 | 2.06  | -3.93  | 0.11 |
| 1200 | 1199.98 | -4.4   | 0.38 | 324.52 | 2.55  | -4.4   | 0.12 |
| 1300 | 1299.98 | -4.95  | 0.47 | 299.61 | 3.02  | -4.95  | 0.2  |
| 1400 | 1399.98 | -5.68  | 0.49 | 300.37 | 3.44  | -5.68  | 0.02 |
| 1500 | 1499.97 | -6.42  | 0.47 | 292.79 | 3.82  | -6.42  | 0.07 |
| 1600 | 1599.97 | -7.18  | 0.46 | 288.47 | 4.11  | -7.18  | 0.04 |
| 1700 | 1699.97 | -7.81  | 0.47 | 323.54 | 4.56  | -7.81  | 0.28 |
| 1800 | 1799.96 | -8.32  | 0.33 | 287.98 | 4.98  | -8.32  | 0.28 |
| 1900 | 1899.96 | -8.82  | 0.28 | 293.42 | 5.17  | -8.82  | 0.06 |
| 2000 | 1999.96 | -9.28  | 0.27 | 281.22 | 5.31  | -9.28  | 0.06 |
| 2100 | 2099.96 | -9.82  | 0.58 | 322    | 5.75  | -9.82  | 0.41 |
| 2200 | 2199.96 | -10.32 | 0.24 | 293.46 | 6.24  | -10.32 | 0.39 |
| 2300 | 2299.95 | -10.59 | 0.11 | 309.93 | 6.38  | -10.59 | 0.14 |
| 2400 | 2399.95 | -10.83 | 0.27 | 315.22 | 6.61  | -10.83 | 0.16 |
| 2500 | 2499.95 | -10.74 | 0.29 | 96.99  | 6.75  | -10.74 | 0.53 |
| 2600 | 2599.95 | -10.18 | 0.37 | 106.22 | 6.63  | -10.18 | 0.1  |
| 2700 | 2699.95 | -9.57  | 0.51 | 137.66 | 6.21  | -9.57  | 0.27 |
| 2800 | 2799.95 | -8.92  | 0.44 | 113.95 | 5.72  | -8.92  | 0.21 |
| 2900 | 2899.94 | -8.12  | 0.58 | 118.09 | 5.33  | -8.12  | 0.14 |
| 3000 | 2999.94 | -7.27  | 0.58 | 127.1  | 4.78  | -7.27  | 0.09 |
| 3100 | 3099.93 | -6.45  | 0.59 | 124.19 | 4.19  | -6.45  | 0.03 |
| 3200 | 3199.93 | -5.59  | 0.6  | 125.08 | 3.6   | -5.59  | 0.01 |
| 3300 | 3299.92 | -4.7   | 0.63 | 122.16 | 3     | -4.7   | 0.04 |
| 3400 | 3399.91 | -3.82  | 0.54 | 120.01 | 2.48  | -3.82  | 0.09 |
| 3500 | 3499.91 | -2.98  | 0.58 | 120.34 | 1.99  | -2.98  | 0.04 |
| 3600 | 3599.9  | -2.06  | 0.64 | 121.32 | 1.44  | -2.06  | 0.06 |
| 3700 | 3699.9  | -1.17  | 0.58 | 124.6  | 0.86  | -1.17  | 0.07 |
| 3800 | 3799.89 | -0.3   | 0.67 | 129.11 | 0.21  | -0.3   | 0.1  |
| 3900 | 3899.89 | 0.58   | 0.59 | 124.13 | -0.45 | 0.58   | 0.1  |
| 4000 | 3999.88 | 1.48   | 0.63 | 119.56 | -1.01 | 1.48   | 0.06 |
| 4100 | 4099.88 | 2.35   | 0.52 | 120.22 | -1.51 | 2.35   | 0.11 |
| 4200 | 4199.87 | 3.13   | 0.55 | 127.75 | -2.03 | 3.13   | 0.08 |
| 4300 | 4299.87 | 3.96   | 0.62 | 123.25 | -2.62 | 3.96   | 0.08 |
| 4400 | 4399.86 | 4.87   | 0.64 | 124.16 | -3.23 | 4.87   | 0.02 |
| 4500 | 4499.85 | 5.79   | 0.68 | 130.35 | -3.93 | 5.79   | 0.08 |
| 4600 | 4599.85 | 6.6    | 0.53 | 128.33 | -4.6  | 6.6    | 0.15 |
| 4700 | 4699.84 | 7.42   | 0.65 | 126.29 | -5.23 | 7.42   | 0.12 |

|      |         |       |      |        |        |       |      |
|------|---------|-------|------|--------|--------|-------|------|
| 4800 | 4799.84 | 8.24  | 0.55 | 131.34 | -5.88  | 8.24  | 0.11 |
| 4900 | 4899.83 | 9.04  | 0.62 | 126.23 | -6.52  | 9.04  | 0.09 |
| 5000 | 4999.83 | 9.88  | 0.6  | 128.41 | -7.16  | 9.88  | 0.03 |
| 5100 | 5099.82 | 10.71 | 0.67 | 134.43 | -7.89  | 10.71 | 0.1  |
| 5200 | 5199.81 | 11.47 | 0.6  | 139.1  | -8.7   | 11.47 | 0.09 |
| 5300 | 5299.81 | 12.17 | 0.68 | 143.61 | -9.57  | 12.17 | 0.09 |
| 5400 | 5399.8  | 12.94 | 0.83 | 144.69 | -10.64 | 12.94 | 0.15 |
| 5500 | 5499.79 | 13.69 | 0.71 | 147.36 | -11.76 | 13.69 | 0.13 |
| 5600 | 5599.78 | 14.37 | 0.66 | 143.52 | -12.74 | 14.37 | 0.07 |
| 5700 | 5699.77 | 15.05 | 0.71 | 146.14 | -13.72 | 15.05 | 0.06 |
| 5800 | 5799.77 | 15.71 | 0.72 | 150.52 | -14.78 | 15.71 | 0.06 |
| 5900 | 5899.76 | 16.37 | 0.78 | 149.06 | -15.91 | 16.37 | 0.06 |
| 6000 | 5999.75 | 17.13 | 0.91 | 149    | -17.17 | 17.13 | 0.13 |
| 6100 | 6099.74 | 17.93 | 0.78 | 145.06 | -18.41 | 17.93 | 0.14 |
| 6200 | 6199.72 | 18.74 | 1.05 | 152.56 | -19.78 | 18.74 | 0.29 |
| 6300 | 6299.71 | 19.58 | 0.9  | 147.36 | -21.26 | 19.58 | 0.17 |
| 6400 | 6399.7  | 20.43 | 0.99 | 150.56 | -22.67 | 20.43 | 0.1  |
| 6500 | 6499.68 | 21.25 | 0.93 | 150.6  | -24.13 | 21.25 | 0.06 |
| 6600 | 6599.67 | 22.12 | 1.06 | 149.57 | -25.64 | 22.12 | 0.13 |
| 6700 | 6699.65 | 23.12 | 1.08 | 145.99 | -27.21 | 23.12 | 0.07 |
| 6800 | 6799.63 | 24.07 | 1.07 | 152.86 | -28.83 | 24.07 | 0.13 |
| 6900 | 6899.61 | 24.93 | 1.02 | 150.6  | -30.43 | 24.93 | 0.06 |
| 7000 | 6999.6  | 25.91 | 0.81 | 130.65 | -31.67 | 25.91 | 0.38 |
| 7100 | 7099.6  | 26.68 | 0.45 | 143.46 | -32.45 | 26.68 | 0.38 |
| 7200 | 7199.59 | 27.25 | 0.42 | 70.65  | -32.64 | 27.25 | 0.52 |
| 7300 | 7299.59 | 27.87 | 0.87 | 20.81  | -31.81 | 27.87 | 0.68 |
| 7400 | 7399.57 | 28.45 | 0.95 | 22.18  | -30.33 | 28.45 | 0.08 |
| 7500 | 7499.56 | 29.05 | 0.97 | 19.53  | -28.77 | 29.05 | 0.05 |
| 7600 | 7599.54 | 29.21 | 1.19 | 353.51 | -26.94 | 29.21 | 0.53 |
| 7614 | 7613.54 | 29.17 | 1.22 | 350.66 | -26.64 | 29.17 | 0.48 |

The Horizontal Displacement ( in Feet ) at  
Measured Depth 7614.00 is 39.51 in a Direction of 132.41 Degrees

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# Pathfinder Energy

## Survey Report

|                                                |  |                                                                          |  |                       |  |                |  |
|------------------------------------------------|--|--------------------------------------------------------------------------|--|-----------------------|--|----------------|--|
| <b>Company:</b> Latigo                         |  | <b>Date:</b> 07/31/2007                                                  |  | <b>Time:</b> 15:00:38 |  | <b>Page:</b> 1 |  |
| <b>Field:</b> Goodnight 27 Federal #1 Re-Entry |  | <b>Co-ordinate(NE) Reference:</b> Site: Goodnight 27 Federal #1 Re-Entry |  |                       |  |                |  |
| <b>Site:</b> Goodnight 27 Federal #1 Re-Entry  |  | <b>Vertical (TVD) Reference:</b> SITE 0.0                                |  |                       |  |                |  |
| <b>Well:</b> Goodnight 27 Federal #1 Re-Ent    |  | <b>Section (VS) Reference:</b> Well (0.00N,0.00E,90.00Azi)               |  |                       |  |                |  |
| <b>Wellpath:</b> OH                            |  | <b>Survey Calculation Method:</b> Minimum Curvature                      |  | <b>Db:</b> Sybase     |  |                |  |

|                                                          |  |                                           |  |
|----------------------------------------------------------|--|-------------------------------------------|--|
| <b>Field:</b> Goodnight 27 Federal #1 Re-Entry           |  |                                           |  |
| <b>Map System:</b> US State Plane Coordinate System 1927 |  | <b>Map Zone:</b> New Mexico, Eastern Zone |  |
| <b>Geo Datum:</b> NAD27 (Clarke 1866)                    |  | <b>Coordinate System:</b> Site Centre     |  |
| <b>Sys Datum:</b> Mean Sea Level                         |  | <b>Geomagnetic Model:</b> igrf2005        |  |

|                                               |                               |                                    |  |
|-----------------------------------------------|-------------------------------|------------------------------------|--|
| <b>Site:</b> Goodnight 27 Federal #1 Re-Entry |                               |                                    |  |
| <b>Site Position:</b>                         | <b>Northing:</b> 460627.39 ft | <b>Latitude:</b> 32 15 53.100 N    |  |
| <b>From:</b> Geographic                       | <b>Easting:</b> 301555.57 ft  | <b>Longitude:</b> 104 58 31.200 W  |  |
| <b>Position Uncertainty:</b> 0.00 ft          |                               | <b>North Reference:</b> Grid       |  |
| <b>Ground Level:</b> 0.00 ft                  |                               | <b>Grid Convergence:</b> -0.34 deg |  |

|                                             |                      |                               |                                   |
|---------------------------------------------|----------------------|-------------------------------|-----------------------------------|
| <b>Well:</b> Goodnight 27 Federal #1 Re-Ent |                      | <b>Slot Name:</b>             |                                   |
| <b>Well Position:</b>                       | <b>+N/-S</b> 0.00 ft | <b>Northing:</b> 460627.39 ft | <b>Latitude:</b> 32 15 53.100 N   |
|                                             | <b>+E/-W</b> 0.00 ft | <b>Easting:</b> 301555.57 ft  | <b>Longitude:</b> 104 58 31.200 W |
| <b>Position Uncertainty:</b> 0.00 ft        |                      |                               |                                   |

|                                           |                       |                                           |                  |
|-------------------------------------------|-----------------------|-------------------------------------------|------------------|
| <b>Wellpath:</b> OH                       |                       | <b>Drilled From:</b> Surface              |                  |
| <b>Current Datum:</b> SITE                | <b>Height</b> 0.00 ft | <b>Tie-on Depth:</b> 0.00 ft              |                  |
| <b>Magnetic Data:</b> 05/30/2007          |                       | <b>Above System Datum:</b> Mean Sea Level |                  |
| <b>Field Strength:</b> 0 nT               |                       | <b>Declination:</b> 0.00 deg              |                  |
| <b>Vertical Section:</b> Depth From (TVD) | <b>+N/-S</b>          | <b>Mag Dip Angle:</b> 0.00 deg            |                  |
| ft                                        | ft                    | <b>+E/-W</b>                              | <b>Direction</b> |
|                                           |                       | ft                                        | deg              |
| 0.00                                      | 0.00                  | 0.00                                      | 90.00            |

|                                   |  |                                       |  |
|-----------------------------------|--|---------------------------------------|--|
| <b>Survey:</b> Pathfinder MWD     |  | <b>Start Date:</b> 06/15/2007         |  |
| <b>Company:</b> Pathfinder Energy |  | <b>Engineer:</b>                      |  |
| <b>Tool:</b>                      |  | <b>Tied-to:</b> From: Definitive Path |  |

| <b>Survey:</b> Pathfinder MWD |             |             |           |             |             |          |                  |                    |                   |                           |
|-------------------------------|-------------|-------------|-----------|-------------|-------------|----------|------------------|--------------------|-------------------|---------------------------|
| MD<br>ft                      | Incl<br>deg | Azim<br>deg | TVD<br>ft | +N/-S<br>ft | +E/-W<br>ft | VS<br>ft | DLS<br>deg/100ft | Build<br>deg/100ft | Turn<br>deg/100ft | Tool/Comment              |
| 7609.54                       | 1.21        | 351.55      | 7609.09   | -26.74      | 29.19       | 29.19    | 0.00             | 0.00               | 0.00              | KOP @ 7610' MD/, Begin Bu |
| 7614.00                       | 1.22        | 350.66      | 7613.55   | -26.64      | 29.17       | 29.17    | 0.48             | 0.22               | -20.01            |                           |
| 7678.00                       | 18.99       | 85.78       | 7676.38   | -25.19      | 39.55       | 39.55    | 29.90            | 27.77              | 148.63            |                           |
| 7709.00                       | 24.62       | 83.94       | 7705.15   | -24.14      | 51.01       | 51.01    | 18.29            | 18.16              | -5.94             |                           |
| 7739.00                       | 31.39       | 83.12       | 7731.63   | -22.54      | 64.99       | 64.99    | 22.60            | 22.57              | -2.73             |                           |
| 7770.00                       | 37.64       | 81.93       | 7757.16   | -20.24      | 82.40       | 82.40    | 20.28            | 20.16              | -3.84             |                           |
| 7801.00                       | 43.79       | 81.43       | 7780.64   | -17.31      | 102.40      | 102.40   | 19.87            | 19.84              | -1.61             |                           |
| 7831.00                       | 50.47       | 83.20       | 7801.04   | -14.39      | 124.17      | 124.17   | 22.68            | 22.27              | 5.90              |                           |
| 7862.00                       | 57.16       | 86.31       | 7819.34   | -12.14      | 149.07      | 149.07   | 23.05            | 21.58              | 10.03             |                           |
| 7893.00                       | 63.49       | 90.16       | 7834.68   | -11.34      | 175.97      | 175.97   | 23.09            | 20.42              | 12.42             |                           |
| 7923.00                       | 70.43       | 93.11       | 7846.42   | -12.14      | 203.55      | 203.55   | 24.84            | 23.13              | 9.83              |                           |
| 7954.00                       | 77.29       | 94.10       | 7855.03   | -14.02      | 233.25      | 233.25   | 22.34            | 22.13              | 3.19              |                           |
| 7982.00                       | 82.92       | 94.75       | 7859.84   | -16.15      | 260.74      | 260.74   | 20.24            | 20.11              | 2.32              |                           |
| 8013.00                       | 87.49       | 95.99       | 7862.43   | -19.04      | 291.49      | 291.49   | 15.27            | 14.74              | 4.00              |                           |
| 8016.26                       | 87.46       | 96.01       | 7862.57   | -19.38      | 294.72      | 294.72   | 1.02             | -0.87              | 0.53              | EOC @ 8016' MD, 7870' TVD |
| 8043.00                       | 87.23       | 96.15       | 7863.81   | -22.21      | 321.29      | 321.29   | 1.02             | -0.87              | 0.53              |                           |
| 8074.00                       | 87.32       | 96.27       | 7865.29   | -25.56      | 352.07      | 352.07   | 0.48             | 0.29               | 0.39              |                           |
| 8105.00                       | 86.97       | 95.91       | 7866.83   | -28.84      | 382.86      | 382.86   | 1.62             | -1.13              | -1.16             |                           |
| 8137.00                       | 87.58       | 96.03       | 7868.35   | -32.16      | 414.65      | 414.65   | 1.94             | 1.91               | 0.37              |                           |
| 8166.00                       | 88.90       | 96.21       | 7869.24   | -35.25      | 443.47      | 443.47   | 4.59             | 4.55               | 0.62              |                           |
| 8197.00                       | 89.16       | 96.32       | 7869.77   | -38.64      | 474.28      | 474.28   | 0.91             | 0.84               | 0.35              |                           |
| 8258.00                       | 88.90       | 96.11       | 7870.80   | -45.24      | 534.91      | 534.91   | 0.55             | -0.43              | -0.34             |                           |
| 8289.00                       | 89.08       | 96.05       | 7871.35   | -48.52      | 565.73      | 565.73   | 0.61             | 0.58               | -0.19             |                           |
| 8320.00                       | 88.55       | 96.30       | 7871.99   | -51.86      | 596.54      | 596.54   | 1.89             | -1.71              | 0.81              |                           |

# Pathfinder Energy

## Survey Report

|                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Company:</b> Latigo<br><b>Field:</b> Goodnight 27 Federal #1 Re-Entry<br><b>Site:</b> Goodnight 27 Federal #1 Re-Entry<br><b>Well:</b> Goodnight 27 Federal #1 Re-Ent<br><b>Wellpath:</b> OH | <b>Date:</b> 07/31/2007<br><b>Co-ordinate(N/E) Reference:</b> Site: Goodnight 27 Federal #1 Re-Entry<br><b>Vertical (TVD) Reference:</b> SITE 0.0<br><b>Section (VS) Reference:</b> Well (0.00N,0.00E,90.00Azi)<br><b>Survey Calculation Method:</b> Minimum Curvature <b>Db:</b> Sybase |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Survey: Pathfinder MWD

| MD<br>ft | Incl<br>deg | Azim<br>deg | TVD<br>ft | +N/-S<br>ft | +E/-W<br>ft | VS<br>ft | DLS<br>deg/100ft | Build<br>deg/100ft | Turn<br>deg/100ft | Tool/Comment |
|----------|-------------|-------------|-----------|-------------|-------------|----------|------------------|--------------------|-------------------|--------------|
| 8350.00  | 88.46       | 96.17       | 7872.77   | -55.11      | 626.36      | 626.36   | 0.53             | -0.30              | -0.43             |              |
| 8381.00  | 88.64       | 96.14       | 7873.55   | -58.44      | 657.17      | 657.17   | 0.59             | 0.58               | -0.10             |              |
| 8442.00  | 89.34       | 96.24       | 7874.63   | -65.01      | 717.80      | 717.80   | 1.16             | 1.15               | 0.16              |              |
| 8534.00  | 91.45       | 95.76       | 7873.99   | -74.63      | 809.29      | 809.29   | 2.35             | 2.29               | -0.52             |              |
| 8564.00  | 88.29       | 94.60       | 7874.06   | -77.34      | 839.16      | 839.16   | 11.22            | -10.53             | -3.87             |              |
| 8630.00  | 86.61       | 92.29       | 7877.00   | -81.30      | 904.97      | 904.97   | 4.32             | -2.55              | -3.50             |              |
| 8661.00  | 86.44       | 92.34       | 7878.88   | -82.55      | 935.89      | 935.89   | 0.57             | -0.55              | 0.16              |              |
| 8692.00  | 86.53       | 92.27       | 7880.78   | -83.79      | 966.81      | 966.81   | 0.37             | 0.29               | -0.23             |              |
| 8723.00  | 85.56       | 90.66       | 7882.92   | -84.58      | 997.72      | 997.72   | 6.05             | -3.13              | -5.19             |              |
| 8749.00  | 85.30       | 90.21       | 7884.99   | -84.78      | 1023.64     | 1023.64  | 1.99             | -1.00              | -1.73             |              |
| 8779.00  | 89.60       | 90.79       | 7886.32   | -85.04      | 1053.60     | 1053.60  | 14.46            | 14.33              | 1.93              |              |
| 8810.00  | 91.36       | 90.94       | 7886.06   | -85.51      | 1084.59     | 1084.59  | 5.70             | 5.68               | 0.48              |              |
| 8841.00  | 90.84       | 90.87       | 7885.47   | -86.00      | 1115.58     | 1115.58  | 1.69             | -1.68              | -0.23             |              |
| 8871.00  | 89.78       | 89.72       | 7885.31   | -86.16      | 1145.58     | 1145.58  | 5.21             | -3.53              | -3.83             |              |
| 8906.00  | 89.25       | 89.53       | 7885.60   | -85.93      | 1180.58     | 1180.58  | 1.61             | -1.51              | -0.54             |              |
| 8937.00  | 88.02       | 88.78       | 7886.34   | -85.47      | 1211.57     | 1211.57  | 4.65             | -3.97              | -2.42             |              |
| 8968.00  | 87.93       | 88.52       | 7887.44   | -84.74      | 1242.54     | 1242.54  | 0.89             | -0.29              | -0.84             |              |
| 8998.00  | 88.20       | 88.02       | 7888.45   | -83.83      | 1272.51     | 1272.51  | 1.89             | 0.90               | -1.67             |              |
| 9029.00  | 90.48       | 87.68       | 7888.81   | -82.67      | 1303.48     | 1303.48  | 7.44             | 7.35               | -1.10             |              |
| 9056.00  | 91.71       | 87.35       | 7888.29   | -81.50      | 1330.45     | 1330.45  | 4.72             | 4.56               | -1.22             |              |
| 9086.00  | 92.59       | 87.73       | 7887.17   | -80.21      | 1360.40     | 1360.40  | 3.19             | 2.93               | 1.27              |              |
| 9117.00  | 92.77       | 87.29       | 7885.72   | -78.87      | 1391.34     | 1391.34  | 1.53             | 0.58               | -1.42             |              |
| 9148.00  | 93.30       | 86.70       | 7884.07   | -77.25      | 1422.25     | 1422.25  | 2.56             | 1.71               | -1.90             |              |
| 9178.00  | 93.56       | 86.48       | 7882.28   | -75.46      | 1452.15     | 1452.15  | 1.13             | 0.87               | -0.73             |              |
| 9209.00  | 94.00       | 86.80       | 7880.24   | -73.65      | 1483.03     | 1483.03  | 1.75             | 1.42               | 1.03              |              |
| 9240.00  | 94.26       | 86.37       | 7878.00   | -71.81      | 1513.89     | 1513.89  | 1.62             | 0.84               | -1.39             |              |
| 9270.00  | 94.09       | 86.17       | 7875.82   | -69.86      | 1543.75     | 1543.75  | 0.87             | -0.57              | -0.67             |              |
| 9301.00  | 93.91       | 85.06       | 7873.66   | -67.50      | 1574.58     | 1574.58  | 3.62             | -0.58              | -3.58             |              |
| 9332.00  | 94.18       | 85.98       | 7871.47   | -65.08      | 1605.41     | 1605.41  | 3.09             | 0.87               | 2.97              |              |
| 9363.00  | 93.42       | 85.17       | 7869.42   | -62.70      | 1636.25     | 1636.25  | 3.58             | -2.45              | -2.61             |              |
| 9393.00  | 93.39       | 85.16       | 7867.63   | -60.17      | 1666.09     | 1666.09  | 0.11             | -0.10              | -0.03             |              |
| 9424.00  | 91.28       | 85.19       | 7866.37   | -57.57      | 1696.95     | 1696.95  | 6.81             | -6.81              | 0.10              |              |
| 9455.00  | 91.45       | 84.87       | 7865.63   | -54.88      | 1727.83     | 1727.83  | 1.17             | 0.55               | -1.03             |              |
| 9485.00  | 91.71       | 84.41       | 7864.80   | -52.08      | 1757.68     | 1757.68  | 1.76             | 0.87               | -1.53             |              |
| 9516.00  | 91.71       | 84.81       | 7863.88   | -49.17      | 1788.53     | 1788.53  | 1.29             | 0.00               | 1.29              |              |
| 9547.00  | 90.40       | 84.67       | 7863.31   | -46.33      | 1819.40     | 1819.40  | 4.25             | -4.23              | -0.45             |              |
| 9577.00  | 90.40       | 84.79       | 7863.10   | -43.57      | 1849.27     | 1849.27  | 0.40             | 0.00               | 0.40              |              |
| 9608.00  | 90.22       | 84.23       | 7862.93   | -40.61      | 1880.13     | 1880.13  | 1.90             | -0.58              | -1.81             |              |
| 9639.00  | 90.40       | 84.33       | 7862.76   | -37.52      | 1910.97     | 1910.97  | 0.66             | 0.58               | 0.32              |              |
| 9670.00  | 90.22       | 84.24       | 7862.60   | -34.43      | 1941.82     | 1941.82  | 0.65             | -0.58              | -0.29             |              |
| 9700.00  | 90.04       | 83.96       | 7862.53   | -31.35      | 1971.66     | 1971.66  | 1.11             | -0.60              | -0.93             |              |
| 9730.00  | 89.69       | 83.77       | 7862.60   | -28.14      | 2001.48     | 2001.48  | 1.33             | -1.17              | -0.63             |              |
| 9761.00  | 88.81       | 83.25       | 7863.00   | -24.64      | 2032.28     | 2032.28  | 3.30             | -2.84              | -1.68             |              |
| 9792.00  | 88.81       | 82.74       | 7863.65   | -20.86      | 2063.04     | 2063.04  | 1.64             | 0.00               | -1.65             |              |
| 9823.00  | 88.46       | 82.89       | 7864.39   | -16.98      | 2093.79     | 2093.79  | 1.23             | -1.13              | 0.48              |              |
| 9853.00  | 88.90       | 82.38       | 7865.08   | -13.14      | 2123.54     | 2123.54  | 2.24             | 1.47               | -1.70             |              |
| 9884.00  | 89.16       | 82.32       | 7865.60   | -9.01       | 2154.26     | 2154.26  | 0.86             | 0.84               | -0.19             |              |
| 9915.00  | 89.96       | 82.01       | 7865.84   | -4.79       | 2184.97     | 2184.97  | 2.77             | 2.58               | -1.00             |              |
| 9945.00  | 90.22       | 82.32       | 7865.79   | -0.70       | 2214.69     | 2214.69  | 1.35             | 0.87               | 1.03              |              |
| 9976.00  | 90.40       | 82.24       | 7865.63   | 3.47        | 2245.40     | 2245.40  | 0.64             | 0.58               | -0.26             |              |
| 10007.00 | 91.36       | 82.00       | 7865.15   | 7.72        | 2276.11     | 2276.11  | 3.19             | 3.10               | -0.77             |              |
| 10038.00 | 91.54       | 81.47       | 7864.37   | 12.17       | 2306.78     | 2306.78  | 1.81             | 0.58               | -1.71             |              |
| 10069.00 | 90.57       | 81.95       | 7863.79   | 16.64       | 2337.45     | 2337.45  | 3.49             | -3.13              | 1.55              |              |

# Pathfinder Energy

## Survey Report

|                                                |                                   |                                               |                   |
|------------------------------------------------|-----------------------------------|-----------------------------------------------|-------------------|
| <b>Company:</b> Latigo                         | <b>Date:</b> 07/31/2007           | <b>Time:</b> 15:00:38                         | <b>Page:</b> 3    |
| <b>Field:</b> Goodnight 27 Federal #1 Re-Entry | <b>Co-ordinate(NE) Reference:</b> | <b>Site:</b> Goodnight 27 Federal #1 Re-Entry |                   |
| <b>Site:</b> Goodnight 27 Federal #1 Re-Entry  | <b>Vertical (TVD) Reference:</b>  | <b>SITE</b> 0.0                               |                   |
| <b>Well:</b> Goodnight 27 Federal #1 Re-Ent    | <b>Section (VS) Reference:</b>    | <b>Well</b> (0.00N,0.00E,90.00Azi)            |                   |
| <b>Wellpath:</b> OH                            | <b>Survey Calculation Method:</b> | Minimum Curvature                             | <b>Db:</b> Sybase |

### Survey: Pathfinder MWD

| MD<br>ft | Incl<br>deg | Azim<br>deg | TVD<br>ft | +N/-S<br>ft | +E/-W<br>ft | VS<br>ft | DLS<br>deg/100ft | Build<br>deg/100ft | Turn<br>deg/100ft | Tool/Comment              |
|----------|-------------|-------------|-----------|-------------|-------------|----------|------------------|--------------------|-------------------|---------------------------|
| 10099.00 | 90.22       | 82.24       | 7863.59   | 20.77       | 2367.16     | 2367.16  | 1.52             | -1.17              | 0.97              |                           |
| 10130.00 | 90.22       | 82.14       | 7863.47   | 24.98       | 2397.87     | 2397.87  | 0.32             | 0.00               | -0.32             |                           |
| 10161.00 | 90.40       | 82.08       | 7863.30   | 29.24       | 2428.58     | 2428.58  | 0.61             | 0.58               | -0.19             |                           |
| 10191.00 | 91.01       | 82.44       | 7862.93   | 33.28       | 2458.30     | 2458.30  | 2.36             | 2.03               | 1.20              |                           |
| 10222.00 | 91.19       | 82.22       | 7862.34   | 37.41       | 2489.02     | 2489.02  | 0.92             | 0.58               | -0.71             |                           |
| 10253.00 | 90.22       | 82.15       | 7861.96   | 41.63       | 2519.73     | 2519.73  | 3.14             | -3.13              | -0.23             |                           |
| 10283.00 | 90.31       | 82.17       | 7861.82   | 45.72       | 2549.45     | 2549.45  | 0.31             | 0.30               | 0.07              |                           |
| 10314.00 | 90.48       | 82.46       | 7861.60   | 49.86       | 2580.17     | 2580.17  | 1.08             | 0.55               | 0.94              |                           |
| 10345.00 | 90.40       | 82.67       | 7861.37   | 53.88       | 2610.91     | 2610.91  | 0.72             | -0.26              | 0.68              |                           |
| 10375.00 | 90.51       | 82.57       | 7861.13   | 57.73       | 2640.66     | 2640.66  | 0.50             | 0.37               | -0.33             |                           |
| 10406.00 | 90.22       | 82.37       | 7860.93   | 61.79       | 2671.39     | 2671.39  | 1.14             | -0.94              | -0.65             |                           |
| 10437.00 | 89.25       | 82.83       | 7861.07   | 65.78       | 2702.13     | 2702.13  | 3.46             | -3.13              | 1.48              |                           |
| 10468.00 | 88.53       | 83.31       | 7861.67   | 69.52       | 2732.90     | 2732.90  | 2.79             | -2.32              | 1.55              |                           |
| 10498.00 | 88.81       | 83.19       | 7862.37   | 73.05       | 2762.68     | 2762.68  | 1.02             | 0.93               | -0.40             |                           |
| 10529.00 | 88.46       | 83.78       | 7863.11   | 76.56       | 2793.47     | 2793.47  | 2.21             | -1.13              | 1.90              |                           |
| 10560.00 | 88.11       | 84.38       | 7864.04   | 79.76       | 2824.29     | 2824.29  | 2.24             | -1.13              | 1.94              |                           |
| 10590.00 | 87.05       | 84.84       | 7865.30   | 82.58       | 2854.13     | 2854.13  | 3.85             | -3.53              | 1.53              |                           |
| 10621.00 | 86.44       | 84.99       | 7867.06   | 85.32       | 2884.96     | 2884.96  | 2.03             | -1.97              | 0.48              |                           |
| 10651.00 | 86.70       | 85.56       | 7868.86   | 87.79       | 2914.81     | 2914.81  | 2.09             | 0.87               | 1.90              | Final MWD Survey @ 10651' |
| 10705.00 | 86.70       | 85.56       | 7871.97   | 91.96       | 2968.56     | 2968.56  | 0.00             | 0.00               | 0.00              | Proj. to Bit @ 10705' MD  |

### Targets

| Name | Description<br>Dip. Dir. | TVD<br>ft | +N/-S<br>ft | +E/-W<br>ft | Map<br>Northing<br>ft | Map<br>Easting<br>ft | ← Latitude →<br>Deg Min Sec |    |          | ← Longitude →<br>Deg Min Sec |    |          |
|------|--------------------------|-----------|-------------|-------------|-----------------------|----------------------|-----------------------------|----|----------|------------------------------|----|----------|
| PBHL |                          | 7900.00   | 0.00        | 2970.00     | 460627.39             | 304525.57            | 32                          | 15 | 53.274 N | 104                          | 57 | 56.611 W |

### Annotation

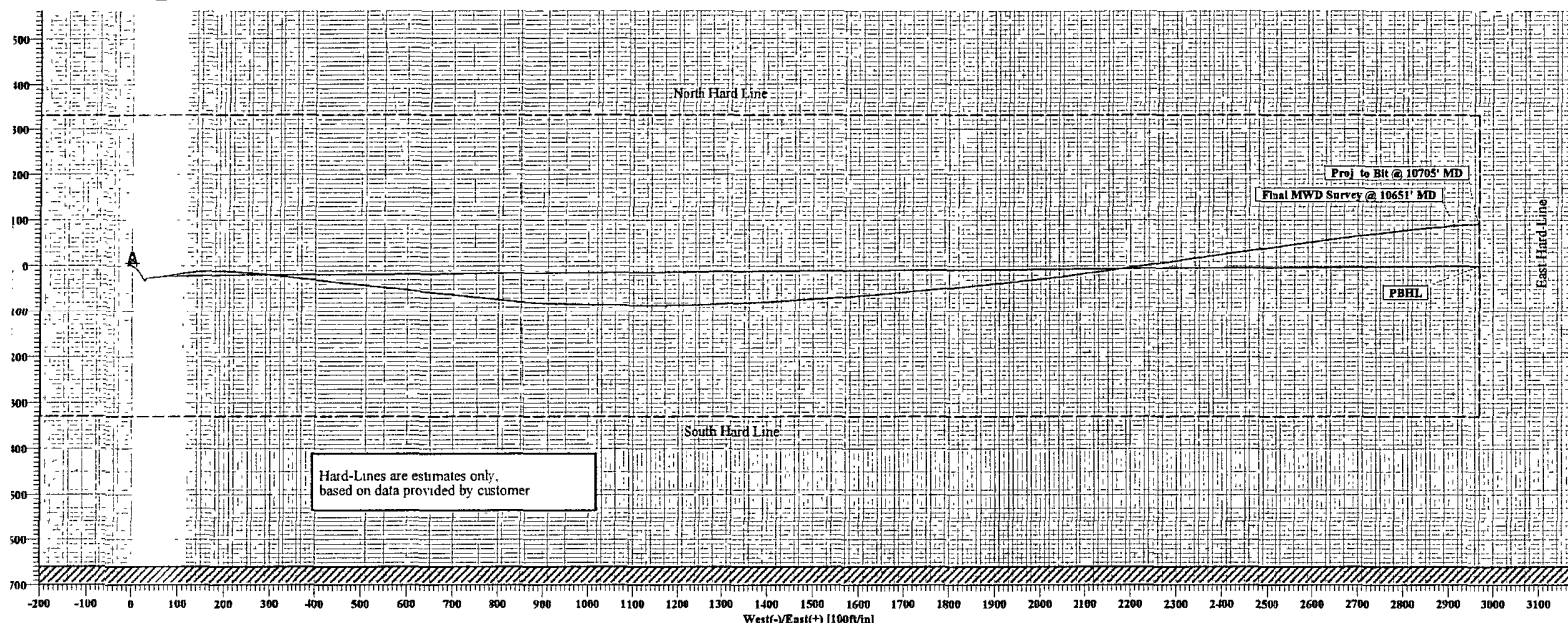
| MD<br>ft | TVD<br>ft |                                         |
|----------|-----------|-----------------------------------------|
| 7609.54  | 7609.09   | KOP @ 7610' MD/, Begin Build @ 22°/100' |
| 8016.26  | 7862.57   | EOC @ 8016' MD, 7870' TVD, 89.36° INC   |
| 10651.00 | 7868.86   | Final MWD Survey @ 10651' MD            |
| 10705.00 | 7871.97   | Proj. to Bit @ 10705' MD                |



Field: Goodnight 27 Federal #1 Re-Entry  
Site: Goodnight 27 Federal #1 Re-Entry  
Well: Goodnight 27 Federal #1 Re-Entry  
Wellpath: OH  
Survey: Pathfinder MWD

# PATHFINDER

## Latigo



| WELLPATH DETAILS |             |        |          |      |
|------------------|-------------|--------|----------|------|
| OH               |             |        |          |      |
| Rig              | SITE 0 00ft |        |          |      |
| Ref Datum        | Origin      | Origin | Starting |      |
| V Section        | +N/-S       | +E/-W  | From TVD |      |
| Angle            | 90 00°      | 0 00   | 0 00     | 0 00 |

| TARGET DETAILS |         |       |         |       |
|----------------|---------|-------|---------|-------|
| Name           | TVD     | +N/-S | +E/-W   | Shape |
| PBHL           | 7900 00 | 0 00  | 2970 00 | Point |

| ANNOTATIONS |         |          |                                         |
|-------------|---------|----------|-----------------------------------------|
| No          | TVD     | MD       | Annotation                              |
| 1           | 7609 09 | 7609 54  | KOP @ 7610' MD/, Begin Build @ 22°/100' |
| 2           | 7862 57 | 8016 26  | EOC @ 8016' MD, 7870' TVD, 89 36° INC   |
| 3           | 7868 86 | 10651 00 | Final MWD Survey @ 10651' MD            |
| 4           | 7871 97 | 10705 00 | Proj to Bit @ 10705' MD                 |

| Survey Pathfinder MWD (Goodnight 27 Federal #1 Re-Entry/OH) |          |       |       |         |       |         |      |        |         |  |
|-------------------------------------------------------------|----------|-------|-------|---------|-------|---------|------|--------|---------|--|
| No                                                          | MD       | Inc   | Az    | TVD     | +N/-S | +E/-W   | DLeg | TFace  | VSec    |  |
| 89                                                          | 10498 00 | 88 81 | 83 19 | 7862 37 | 73 05 | 2762 68 | 1 02 | -23 19 | 2762 68 |  |
| 90                                                          | 10529 00 | 88 46 | 83 78 | 7863 11 | 76 56 | 2793 47 | 2 21 | 120 69 | 2793 47 |  |
| 91                                                          | 10560 00 | 88 11 | 84 38 | 7864 04 | 79 76 | 2824 29 | 2 24 | 120 28 | 2824 29 |  |
| 92                                                          | 10590 00 | 87 05 | 84 84 | 7865 30 | 82 58 | 2854 13 | 3 85 | 156 57 | 2854 13 |  |
| 93                                                          | 10621 00 | 86 44 | 84 99 | 7867 06 | 85 32 | 2884 96 | 2 03 | 166 21 | 2884 96 |  |
| 94                                                          | 10651 00 | 86 70 | 85 56 | 7868 86 | 87 79 | 2914 81 | 2 09 | 65 46  | 2914 81 |  |
| 95                                                          | 10705 00 | 86 70 | 85 56 | 7871 97 | 91 96 | 2968 56 | 0 00 | 0 00   | 2968 56 |  |

LEGEND  
— Goodnight 27 Federal #1 Re-Entry, OH, Plan #2 6-11-07  
— OH  
— Pathfinder MWD

