



SEP 14 2009

DIRECTIONAL SURVEY REPORT

MACK ENERGY

WHITE HORSE FEDERAL # 1

CHAVES COUNTY, NEW MEXICO

PREPARED BY: FRANCISCO SINISTERRA

Pathfinder Energy Services, Inc.
6213 W. County Road 112 • Midland, TX • 79706
(432)681-6000

SEP 14 2009

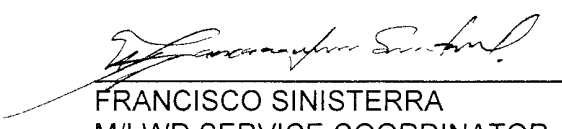
DIRECTIONAL SURVEY COMPANY REPORT

1. NAME OF SURVEYING COMPANY. PATHFINDER ENERGY SERVICES
2. NAME OF PERSON(S) PERFORMING SURVEY:
A) CHRIS CARSON
3. POSITION OF SAID PERSON(S): (A-F) SURVEYORS (FIELD ENGINEERS)
4. DATE(S) ON WHICH SURVEY WAS PERFORMED: 05/14/09 TO 05/22/09
5. STATE IN WHICH SURVEY WAS PERFORMED: NEW MEXICO
6. LOCATION OF WELL: CHAVES COUNTY, NM
7. TYPE OF SURVEY(S) PERFORMED: MWD
8. COMPLETE IDENTIFICATION OF WELL:

MACK ENERGY
WHITE HORSE FEDERAL #1
CHAVES COUNTY, NM
RIG: SILVEROAK # 2

9. SURVEY CERTIFIED FROM: 284 TO 4909 FEET MEASURED DEPTH.

INCLINATION ONLY CERTIFIED FOR SURVEYS @ 284' AND 469' MD DUE TO MAGNETIC INTERFERENCE. THIS IS TO VERIFY THAT ATTACHED DOCUMENTS SHOWING THE WELL TO BE DISPLACED AT 2087.30 FEET ON A BEARING OF 71.74 DEGREES FROM THE CENTER OF THE ROTARY TABLE AT A PROJECTED BIT DEPTH OF 4985 FEET, ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.


FRANCISCO SINISTERRA
M/LWD SERVICE COORDINATOR

PathFinder Energy Services, Inc.

BHL Report

SEP 14 2009

Page 01/01
Tie-in Date: 05/13/2009
Date Completed: 05/22/2009

MACK ENERGY CORP.
WHITEHORSE FED #1
CHAVES COUNTY, NEW MEXICO
Rig: Silver Oak #2
PathFinder Office Supervisor: FRANCISCO SINISTERRA
PathFinder Field Engineers: CHRIS CARSON
PAUL FOREMAN

Survey Horiz. Reference: WELLHEAD
Ref Coordinates: LAT: 32.59.2.9768 N LON: 104.3.58.8009 W
GRID Reference: NAD27 new mexico east Transverse Mercator
Ref GRID Coord: X: 581872.4000 Y: 721853.9000
North Aligned To: GRID NORTH
Total Magnetic Correction: 7.96° EAST TO GRID
Vertical Section Plane: 71.70
Survey Vert. Reference: 19.00' Rotary Table To Ground
Altitude: 3735.00' Ground To MSL

Measured Depth	4985.00	(feet)
Inclination	88.64	(deg)
Azimuth	72.27	(deg)
True Vertical Depth	3175.22	(feet)
Vertical Section	2087.29	(feet)
Survey X cord	583854.63	(feet)
Survey Y cord	722507.78	(feet)
Survey Lat	32.98594348 N	(deg)
Survey Lon	104.05986371 W	(deg)
Rectangular Corr. N/S	653.88 N	(feet)
Rectangular Corr. E/W	1982.23 E	(feet)
Closure Distance	2087.30	(feet)
Direction of Closure	71.74	(deg)
Dogleg Severity	0.00	(deg/100ft)

PathFinder Energy Services, Inc.

Survey Report

Page 01/03
Tie-in Date: 05/13/2009
Date Completed: 05/22/2009

Survey Horiz. Reference: WELLHEAD
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SEP 14 2009

Survey Calculations by RX5 V6.01 using Minimum Curvature

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
ORIGIN OF WELL AT SURFACE										
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00@	0.00	0.00
INTERPOLATED AZIMUTH DUE TO MAGNETIC INTERFERENCE.										
284.00	1.00	38.00	283.99	284.00	2.06	1.95 N	1.53 E	2.48@	38.00	0.35
408.00	2.25	60.00	407.93	124.00	5.35	4.02 N	4.30 E	5.89@	46.91	1.11
THE FOLLOWING ARE PATHFINDER MWD SURVEYS.										
469.00	2.64	76.69	468.88	61.00	7.92	4.94 N	6.70 E	8.33@	53.59	1.32
507.00	2.55	77.75	506.84	38.00	9.63	5.33 N	8.38 E	9.93@	57.57	0.27
601.00	2.55	78.18	600.75	94.00	13.79	6.20 N	12.47 E	13.93@	63.58	0.02
696.00	2.37	80.38	695.66	95.00	17.83	6.96 N	16.48 E	17.89@	67.10	0.21
791.00	2.11	81.79	790.59	95.00	21.49	7.54 N	20.14 E	21.51@	69.49	0.28
884.00	2.02	82.84	883.53	93.00	24.79	7.99 N	23.47 E	24.79@	71.21	0.10
977.00	1.85	84.42	976.47	93.00	27.86	8.34 N	26.59 E	27.86@	72.59	0.19
1070.00	1.67	86.27	1069.43	93.00	30.63	8.57 N	29.43 E	30.65@	73.77	0.20
1165.00	1.41	90.14	1164.40	95.00	33.08	8.66 N	31.98 E	33.13@	74.85	0.30
1259.00	1.23	94.09	1258.37	94.00	35.11	8.58 N	34.15 E	35.21@	75.89	0.21
1352.00	1.14	93.65	1351.35	93.00	36.89	8.45 N	36.06 E	37.04@	76.81	0.10
1447.00	1.14	99.19	1446.33	95.00	38.61	8.24 N	37.94 E	38.82@	77.74	0.12
1539.00	1.06	102.79	1538.31	92.00	40.15	7.91 N	39.67 E	40.45@	78.73	0.12
1633.00	0.88	106.92	1632.30	94.00	41.48	7.50 N	41.21 E	41.89@	79.68	0.21
1729.00	0.70	110.18	1728.29	96.00	42.55	7.09 N	42.47 E	43.06@	80.53	0.19
1824.00	0.79	105.96	1823.28	95.00	43.54	6.71 N	43.64 E	44.15@	81.26	0.11
1919.00	0.79	105.96	1918.28	95.00	44.62	6.35 N	44.90 E	45.35@	81.95	0.00
2014.00	0.79	102.27	2013.27	95.00	45.73	6.03 N	46.17 E	46.56@	82.56	0.05

PathFinder Energy Services, Inc.

Survey Report

MACK ENERGY CORP.
WHITEHORSE FED #1
CHAVES COUNTY, NEW MEXICO
RIG:Silver Oak #2

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
2123.00	0.53	15.15	2122.26	109.00	46.65	6.35 N	47.04 E	47.46@	82.31	0.85
2322.00	1.32	337.12	2321.23	199.00	46.98	9.35 N	46.39 E	47.32@	78.60	0.48
2508.00	1.58	329.03	2507.18	186.00	46.24	13.53 N	44.23 E	46.26@	73.00	0.18
2580.00	1.41	327.68	2579.15	72.00	45.81	15.13 N	43.25 E	45.82@	70.72	0.24
2611.00	1.49	325.71	2610.14	31.00	45.61	15.78 N	42.82 E	45.63@	69.77	0.30
2642.00	1.32	345.18	2641.13	31.00	45.52	16.46 N	42.50 E	45.58@	68.83	1.63
2673.00	2.90	55.88	2672.11	31.00	46.30	17.25 N	43.06 E	46.38@	68.17	8.90
2703.00	6.33	63.71	2702.01	30.00	48.66	18.40 N	45.17 E	48.78@	67.83	11.60
2734.00	9.94	65.35	2732.70	31.00	53.02	20.28 N	49.14 E	53.15@	67.57	11.67
2766.00	13.10	65.86	2764.05	32.00	59.37	22.91 N	54.96 E	59.54@	67.37	9.88
2796.00	16.27	66.84	2793.06	30.00	66.94	25.96 N	61.92 E	67.14@	67.26	10.60
2827.00	19.43	67.40	2822.57	31.00	76.41	29.65 N	70.68 E	76.65@	67.24	10.21
2858.00	22.77	68.07	2851.48	31.00	87.55	33.87 N	81.01 E	87.80@	67.31	10.80
2888.00	25.94	70.41	2878.81	30.00	99.90	38.24 N	92.58 E	100.16@	67.56	11.04
2919.00	29.37	71.30	2906.27	31.00	114.29	42.95 N	106.17 E	114.53@	67.97	11.14
2950.00	32.89	70.78	2932.80	31.00	130.31	48.16 N	121.32 E	130.53@	68.35	11.39
2981.00	35.96	70.41	2958.37	31.00	147.83	53.99 N	137.85 E	148.04@	68.61	9.93
3011.00	39.48	69.67	2982.09	30.00	166.17	60.25 N	155.10 E	166.39@	68.77	11.83
3042.00	42.82	69.95	3005.43	31.00	186.56	67.29 N	174.24 E	186.78@	68.88	10.79
3073.00	46.96	70.72	3027.39	31.00	208.42	74.65 N	194.84 E	208.65@	69.04	13.47
3104.00	51.53	72.08	3047.62	31.00	231.90	82.13 N	217.09 E	232.11@	69.28	15.11
3135.00	55.31	72.74	3066.09	31.00	256.79	89.65 N	240.82 E	256.96@	69.58	12.31
3166.00	58.74	72.91	3082.96	31.00	282.78	97.32 N	265.66 E	282.93@	69.88	11.07
3197.00	62.26	73.51	3098.23	31.00	309.75	105.11 N	291.49 E	309.86@	70.17	11.48
3228.00	65.69	73.15	3111.83	31.00	337.59	113.10 N	318.17 E	337.68@	70.43	11.11
3259.00	69.29	73.19	3123.69	31.00	366.22	121.39 N	345.58 E	366.28@	70.64	11.61
3291.00	72.98	74.13	3134.04	32.00	396.47	129.91 N	374.63 E	396.52@	70.88	11.86

PathFinder Energy Services, Inc.

Survey Report

MACK ENERGY CORP.
WHITEHORSE FED #1
CHAVES COUNTY, NEW MEXICO
RIG:Silver Oak #2

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Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
3323.00	76.59	73.97	3142.43	32.00	427.32	138.39 N	404.31 E	427.34@	71.10	11.29
3354.00	80.28	73.01	3148.65	31.00	457.67	147.02 N	433.43 E	457.68@	71.26	12.28
3386.00	83.89	71.53	3153.05	32.00	489.36	156.68 N	463.61 E	489.37@	71.33	12.18
3418.00	87.23	70.29	3155.53	32.00	521.25	167.11 N	493.76 E	521.27@	71.30	11.13
3450.00	87.85	69.65	3156.91	32.00	553.21	178.06 N	523.79 E	553.23@	71.22	2.78
3482.00	87.49	69.15	3158.21	32.00	585.16	189.31 N	553.72 E	585.19@	71.13	1.92
3514.00	87.76	68.87	3159.53	32.00	617.10	200.76 N	583.57 E	617.14@	71.02	1.22
3545.00	89.08	68.74	3160.39	31.00	648.04	211.97 N	612.46 E	648.10@	70.91	4.28
3640.00	89.96	69.09	3161.18	95.00	742.93	246.14 N	701.10 E	743.05@	70.65	1.00
3735.00	89.96	69.89	3161.25	95.00	837.86	279.43 N	790.08 E	838.03@	70.52	0.84
3829.00	89.08	70.33	3162.04	94.00	931.81	311.40 N	878.46 E	932.03@	70.48	1.05
3924.00	90.13	71.01	3162.69	95.00	1026.79	342.85 N	968.10 E	1027.02@	70.50	1.32
4018.00	89.60	71.98	3162.91	94.00	1120.79	372.68 N	1057.24 E	1121.01@	70.58	1.18
4113.00	89.69	73.01	3163.50	95.00	1215.78	401.26 N	1147.84 E	1215.95@	70.73	1.09
4208.00	90.13	72.81	3163.65	95.00	1310.76	429.17 N	1238.65 E	1310.89@	70.89	0.51
4302.00	89.52	74.36	3163.94	94.00	1404.70	455.74 N	1328.81 E	1404.79@	71.07	1.77
4396.00	89.69	73.87	3164.59	94.00	1498.62	481.46 N	1419.22 E	1498.66@	71.26	0.55
4490.00	89.25	74.60	3165.46	94.00	1592.52	507.00 N	1509.68 E	1592.54@	71.44	0.91
4584.00	89.25	73.71	3166.69	94.00	1686.43	532.67 N	1600.10 E	1686.43@	71.59	0.95
4679.00	88.81	72.22	3168.29	95.00	1781.39	560.49 N	1690.91 E	1781.39@	71.66	1.63
4773.00	88.64	72.00	3170.39	94.00	1875.36	589.36 N	1780.35 E	1875.36@	71.68	0.30
4866.00	88.81	72.48	3172.46	93.00	1968.33	617.72 N	1868.89 E	1968.33@	71.71	0.55
4909.00	88.64	72.27	3173.41	43.00	2011.32	630.74 N	1909.86 E	2011.32@	71.72	0.63
STRAIGHT LINE PROJECTION TO BIT @ 4985'MD.										
4985.00	88.64	72.27	3175.22	76.00	2087.29	653.88 N	1982.23 E	2087.30@	71.74	0.00

TIE-IN SURVEY INFORMATION SHEET

CLIENT INFORMATION

CLIENT:	Mack Energy		
LEASE / WELL No.:	White Horse Federal #1		
WELL LOCATION:	Chaves County		
COUNTY / STATE / COUNTRY:	Chaves County	New Mexico	USA
RIG:	Silver Oak 2		
API WELL No:	30-005-64096		
JOB No:	101008498-WT-WT		
P.O. # AFE No.			
DIRECTIONAL COMPANY:	PathFinder Energy		

WELL SITE INFORMATION

TOTAL MAGNETIC CORRECTION (TMC):			
On Wall Plat:	7.96	LWD Calculated:	7.96
		Agreed Upon:	7.96
X =	581872.400000	Feet	Y = 721853.900000
			Feet
SITE LATITUDE:	32.984160 N	SITE LONGITUDE:	104.066334 W
GRID SYSTEM:	TRUE ☒ UTM ☐ LAMBERT ☐	ZONE:	
PROPOSED DRIFT DIRECTION:	71.7		
KELLY BUSHING ELEVATION:	19		
ALTITUDE:	3754	Feet	WATER DEPTH:
			Feet

TIE-IN SURVEY

MEASURED DEPTH:	0		
DRIFT ANGLE:	0		
DRIFT DIRECTION:	71.7		
TRUE VERTICAL DEPTH:	0		
VERTICAL SECTION:	0		
RECTANGULAR COORDINATE (N / S):	0		
RECTANGULAR COORDINATE (E / W):	0		
CLOSURE DISTANCE / DIRECTION:	0	71.7	
SURVEY CALCULATION METHOD:	AA ☐	MC ☒	RC ☐ BT ☐
SOURCE OF TIE-IN DATA (COMPANY):			
COPY OF TIE-IN SURVEY REPORT	☐ YES ☒ NO		

WELL PLAN

KICKOFF DEPTH:	0	TOTAL DEPTH:	5040
KICKOFF ANGLE:	0	MAX ANGLE:	90

PES Engineers: Chris Carson
Paul Foreman

**Signature of both field engineers required if applicable

Directional Driller: Pat Dillon

DATE: _____

Oil Cons.
N.M. Div-Dist. 2
1301 W. Grand Avenue
Artesia, NM 88210

MAR 05 2009

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a Type of work- ☒ DRILL ☐ REENTER		5 Lease Serial No NMNM-0560397	
1b Type of Well. ☒ Oil Well ☐ Gas Well ☐ Other ☐ Single Zone ☐ Multiple Zone		6 If Indian, Allottee or Tribe Name	
2 Name of Operator Mack Energy Corporation		7 If Unit or CA Agreement, Name and No	
3a Address P.O. Box 960 Artesia, NM 88211-0960		8, Lease Name and Well No. <37616> Whitehorse Federal #1	
3b Phone No (include area code) (575)748-1288		9. API Well No. 30-005-640910	
4 Location of Well (Report location clearly and accurately with any State requirements*) At surface 1650 FSL & 2310 FEL Unit J		10 Field and Pool, or Exploratory Round Tank; San Andres	
At proposed prod zone		11 Sec., T. R. M. or Bk. and Survey or Area Sec. 30 T15S R29E	
14 Distance in miles and direction from nearest town or post office* 12 miles north/northwest of Loco Hills, NM		12 County or Parish Chaves	13 State NM
15 Distance from proposed location to nearest property or lease line, ft. (Also to nearest drlg unit line, if any) 330	16 No. of acres in lease 400	17. Spacing Unit dedicated to this well 40	
18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 1320	19. Proposed Depth 3500	20 BLM/BIA Bond No. on file NMB000286	
21 Elevations (Show whether DF, KDB, RT, GL, etc) 3737' GR	22 Approximate date work will start* 01/09/09	23 Estimated duration 10 days	

24. Attachments

ROSWELL CONTROLLED WATER BASIN

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, shall be attached to this form

- | | |
|--|---|
| 1. Well plat certified by a registered surveyor | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above), |
| 2. A Drilling Plan | 5. Operator certification |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office) | 6. Such other site specific information and/or plans as may be required by the authorized officer |

25. Signature <i>Jerry W. Sherrell</i>	Name (Printed/Typed) Jerry W. Sherrell	Date 12/10/08
Title Production Clerk		
Approved by (Signature) <i>/s/ Jerry Dutchover</i>	Name (Printed/Typed) <i>/s/ Jerry Dutchover</i>	Date MAR 03 2009
Title Acting Assistant Field Manager	Office ROSWELL FIELD OFFICE	APPROVED FOR 2 YEARS

Application approval 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
Conditions of approval, if any, are attached

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

*(Instructions on page 2)

DECLARED WATER BASIN

COMMENT BEHIND THE 25"
CASING MUST BE CIRCULATED

WITNESS



APPROVAL SUBJECT TO
GENERAL REQUIREMENTS AND
SPECIAL STIPULATIONS ATTACHED

DISTRICT I
1625 N FRENCH BL., 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 and Natural Resources Department

OIL CONSERVATION DIVISION
1220 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 30-005-64096	Pool Code 52770	Pool Name Round Tank; San Andres
Property Code 37616	Property Name WHITEHORSE FEDERAL	Well Number 1
OGRID No. 013837	Operator Name MACK ENERGY CORPORATION	Elevation 3737'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
J	30	15-S	29-E		1650	SOUTH	2310	EAST	CHAVES

Bottom Hole Location If Different From Surface

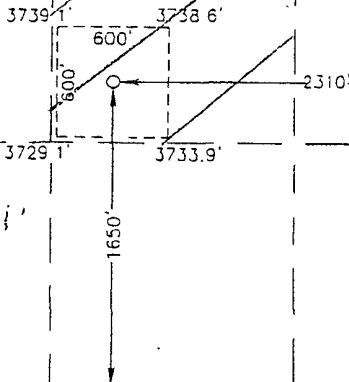
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
Dedicated Acres 40		Joint or Infill	Consolidation Code	Order No					

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

GEODETIC COORDINATES
NAD 27 NME

Y=721853.9 N
X=581872.4 E

LAT.=32.984160° N
LONG.=104.066336° W



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.

Jerry W. Sherrell 12-10-08
Signature Date

Jerry W. Sherrell
Printed Name

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

OCTOBER 21, 2008

Date Surveyed
Signature of Seal
Professional Surveyor

Ronald J. Eidson 10/22/08
3239
08.11.1822

Certificate No. 12641
Professional Surveyor 3239