

Results of Directional Survey

DD

API number:	30-025-40337			
OGRID:		Operator:	MACK ENERGY CORP	
		Property:	BROOK FEDERAL	# 2

surface	ULSTR:	A	30	T 17S	R 32E
				360 FNL	1180 FEL

BH Loc	ULSTR:	A	30	T 17S	R 32E
7105 MD		7097.1	TVD	352 FNL	965 FEL

Top Perf/OH	ULSTR:	A	30	T 17S	R 32E
5313 MD		5305.2	TVD	343 FNL	956 FEL

Bot Perf/OH	ULSTR:	A	30	T 17S	R 32E
7050 MD		7042.1	TVD	351 FNL	965 FEL

	MD	N/S	E/W	VD
	5229	16.40	223.60	5221.2
TOP PERFS/OH	5313	16.62	223.73	5305.20
	5420	16.90	223.90	5412.20
	7048	8.80	215.00	7040.10
BOT PERFS/OH	7050	8.77	215.00	7042.10
	7102	8.10	215.10	7094.10

NEXT TO LAST	7048	8.80	215.00	7040.10
LAST READING	7102	8.10	215.10	7094.10
TD	7105	8.06	215.11	7097.10

Surface Location	360	FN	1180	FE
Projected BHL	352	FN	965	FE
Location of				
Top Perfs/OH	343	FN	956	FE
Bottom Perfs/OH	351	FN	965	FE

SUMMARY of Subsurface Locations

Surface Location	A-30-17S-32E	360	FN	1180	FE	Vert. Depth
Top Perfs/OH	A-30-17S-32E	343	FN	956	FE	5305.20
Bottom Perfs/OH	A-30-17S-32E	351	FN	965	FE	7042.10
Projected TD	A-30-17S-32E	352	FN	965	FE	7097.10



PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288

HOBBS OCD

AUG 22 2012

RECEIVED

May 30, 2012

Mack Energy Corporation
PO Box 960
Artesia, NM 88211-0960

RE: Brook Federal #2
330' FNL & 990' FEL
Sec. 30, T17S, R32E
Lea County, New Mexico

Dear Sir,

The attached is the Deviation Survey for the above captioned well.

Very truly yours,

Chris Graham
Drilling Superintendent

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 30th day of May, 2012.

Notary Public

SUR: A-30-17s-32e, 360/N & 1180/E
BHL: A-30-17s-32e, 352/N & 965/E
API # 30-025-40337

Brook Federal #2

Date	Depth	Deviation	Direction	TVD
5/17/2012	149	0.30	350.70	
5/18/2012	329	0.40	77.70	
5/18/2012	500	0.30	57.70	
5/18/2012	539	0.30	58.70	
5/18/2012	678	0.30	28.70	
5/19/2012	808	0.70	34.84	
5/19/2012	1010	0.88	62.88	
5/19/2012	1200	1.06	45.21	
5/19/2012	1580	1.32	46.09	
5/20/2012	170	2.29	57.69	1579.00
5/20/2012	1960	0.29	52.42	2014.00
5/20/2012	2087	2.11	46.79	
5/20/2012	2278	3.78	71.14	
5/20/2012	2373	3.43	66.83	
5/20/2012	2468	4.75	80.02	
5/20/2012	2754	3.52	90.39	2752.00
5/21/2012	2944	3.87	90.30	2942.00
5/21/2012	3039	4.66	91.88	3090.00
5/21/2012	3134	4.48	91.71	
5/21/2012	3230	4.84	102.60	
5/21/2012	3420	4.13	96.89	
5/21/2012	3516	4.13	95.48	
5/21/2012	3611	4.04	90.74	3607.00
5/21/2012	3801	3.96	91.44	3796.00
5/21/2012	3897	5.28	96.71	3892.00
5/22/2012	3992	5.01	100.58	3986.89
5/22/2012	4086	5.10	105.06	4080.53
5/22/2012	4182	5.28	101.81	4229.00
5/22/2012	4277	5.10	104.19	4277.00
5/22/2012	4372	5.36	108.93	4415.00
5/22/2012	4521	5.54	107.00	4467.00
5/22/2012	4562	4.04	97.42	
5/22/2012	4658	3.25	76.76	
5/22/2012	4753	2.46	91.09	
5/22/2012	4848	1.49	81.07	
5/22/2012	4944	1.06	80.63	
5/23/2012	5039	1.23	75.53	5085.00
5/23/2012	5134	0.44	52.22	5180.00
5/23/2012	5229	0.79	39.15	
5/23/2012	5420	0.44	226.71	
5/24/2012	5808	0.35	226.27	
5/24/2012	5999	0.44	244.28	
5/24/2012	6188	0.44	273.62	

Date	Depth	Deviation	Direction	TVD
5/25/2012	6379	0.53	232.77	6425.00
5/25/2012	6569	0.44	203.33	
5/26/2012	6814	0.44	209.74	
5/26/2012	6950	0.44	208.95	6996.00
5/27/2012	7048	0.70	177.31	7040.11



Mack Energy Corp.

Lea

Brook Federal
Brook Federal #2

OH

HOBBS OCD

AUG 22 2012

RECEIVED

Design: OH

Pathfinder X & Y Report

29 May, 2012

SUR: A-30-17s-32e, 360/N & 1180/E
BHL: A-30-17s-32e, 352/N & 965/E
API # 30-025-40337

PATHFINDER®

A Schlumberger Company



Pathfinder

Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company: Mack Energy Corp
Project: Lea
Site: Brook Federal
Well: Brook Federal #2
Wellbore: OH
Design: OH

Local Co-ordinate Reference:
TVD Reference: Well Brook Federal #2
MD Reference: WELL @ 3932.0usft (Original Well Elev)
North Reference: WELL @ 3932.0usft (Original Well Elev)
Survey Calculation Method: Gnd
Database: Minimum Curvature
EDM 5000 1 Single User Db

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

Site	Brook Federal	Northing:	659,184.00 usft	Latitude:	32° 48' 39.727 N
Site Position:		Easting:	664,867.10 usft	Longitude:	103° 47' 48.196 W
From:	Map	Slot Radius:	13-3/16 "	Grid Convergence:	0.29 °
Position Uncertainty:	0.0 usft				

Well	Brook Federal #2	Northing:	659,454.60 usft	Latitude:	32° 48' 42.463 N
Well Position	+N/-S +E/-W	Easting:	663,695.90 usft	Longitude:	103° 48' 1.903 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	3,913.0 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/16/2012	7.62	60.67	48,849

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:		Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
		0.0	0.0	0.0	88.45

Survey Program	Date	5/29/2012			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
149.0	7,102.0	MWD #1 (OH)	MWD	MWD - Standard	



Pathfinder

Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company: Mack Energy Corp
Project: Lea
Site: Brook Federal
Well: Brook Federal #2
Wellbore: OH
Design: OH

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well Brook Federal #2
WELL @ 3932 Ousft (Original Well Elev)
WELL @ 3932 Ousft (Original Well Elev)
Grd
Minimum Curvature
EDM 5000.1 Single User Db

Survey	MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
	0.0	0.00	0.00	0.0	-3,932.0	0.0	0.0	0.0	0.00	659,454.60	663,695.90
	149.0	0.30	351.00	149.0	-3,783.0	0.4	-0.1	-0.1	0.20	659,454.99	663,695.84
	329.0	0.40	78.00	329.0	-3,603.0	1.0	0.5	0.5	0.27	659,455.58	663,696.38
	500.0	0.30	59.00	500.0	-3,432.0	1.3	1.4	1.5	0.09	659,455.94	663,697.35
	678.0	0.30	29.00	678.0	-3,254.0	2.0	2.1	2.1	0.09	659,456.58	663,697.97
	818.0	0.70	34.84	818.0	-3,114.0	3.0	2.7	2.8	0.29	659,457.61	663,698.64
	1,010.0	0.88	62.88	1,010.0	-2,922.0	4.6	4.7	4.8	0.22	659,459.24	663,700.62
	1,200.0	1.06	45.21	1,199.9	-2,732.1	6.5	7.3	7.4	0.18	659,461.14	663,703.17
	1,391.0	1.06	23.85	1,390.9	-2,541.1	9.4	9.2	9.5	0.21	659,464.00	663,705.14
	1,580.0	1.32	46.09	1,579.9	-2,352.1	12.5	11.5	11.8	0.28	659,467.11	663,707.41
	1,770.0	2.29	57.69	1,769.8	-2,162.2	16.1	16.3	16.7	0.54	659,470.66	663,712.20
	1,960.0	2.29	52.42	1,959.6	-1,972.4	20.4	22.5	23.1	0.11	659,475.00	663,718.41
	2,087.0	2.11	46.79	2,086.5	-1,845.5	23.6	26.2	26.9	0.22	659,478.15	663,722.13
	2,182.0	2.29	50.48	2,181.5	-1,750.5	26.0	29.0	29.7	0.24	659,480.56	663,724.87
	2,278.0	3.78	71.14	2,277.3	-1,654.7	28.2	33.4	34.2	1.90	659,482.80	663,729.34
	2,373.0	3.43	66.83	2,372.1	-1,559.9	30.3	39.0	39.8	0.47	659,484.93	663,734.92
	2,468.0	4.75	80.02	2,466.9	-1,465.1	32.1	45.5	46.4	1.70	659,486.73	663,741.40
	2,563.0	3.43	86.52	2,561.7	-1,370.3	33.0	52.2	53.1	1.47	659,487.59	663,748.11
	2,659.0	2.99	88.54	2,657.5	-1,274.5	33.2	57.6	58.5	0.47	659,487.82	663,753.48
	2,754.0	3.52	90.39	2,752.3	-1,179.7	33.3	63.0	63.9	0.57	659,487.87	663,758.88
	2,849.0	3.17	89.95	2,847.2	-1,084.8	33.2	68.5	69.4	0.37	659,487.85	663,764.42
	2,944.0	3.87	90.30	2,942.0	-990.0	33.2	74.4	75.2	0.74	659,487.83	663,770.25
	3,039.0	4.66	91.88	3,036.7	-895.3	33.1	81.4	82.3	0.84	659,487.69	663,777.32
	3,134.0	4.48	91.71	3,131.4	-800.6	32.9	89.0	89.8	0.19	659,487.45	663,784.88
	3,230.0	4.84	102.60	3,227.1	-704.9	31.9	96.7	97.5	0.99	659,486.46	663,792.58
	3,325.0	4.48	96.71	3,321.8	-610.2	30.6	104.3	105.1	0.63	659,485.15	663,800.18
	3,420.0	4.13	96.89	3,416.5	-515.5	29.7	111.4	112.1	0.37	659,484.31	663,807.26



Pathfinder

Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company: Mack Energy Corp.
Project: Lea
Site: Brook Federal
Well: Brook Federal #2
Wellbore: OH
Design: OH

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well Brook Federal #2
WELL @ 3932.0usft (Original Well Elev)
WELL @ 3932.0usft (Original Well Elev)
Grid
Minimum Curvature
EDM 5000 1 Single User Db

Survey												
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	D Leg (°/100usft)	Northing (usft)	Easting (usft)		
3,516.0	4.13	95.48	3,512.3	-419.7	29.0	118.2	119.0	0.11	659,483.56	663,814.13		
3,611.0	4.04	90.74	3,607.1	-324.9	28.6	125.0	125.7	0.37	659,483.19	663,820.88		
3,706.0	3.96	92.32	3,701.8	-230.2	28.4	131.6	132.3	0.14	659,483.02	663,827.51		
3,801.0	3.96	91.44	3,796.6	-135.4	28.2	138.2	138.9	0.06	659,482.80	663,834.06		
3,897.0	5.28	96.71	3,892.3	-39.7	27.6	145.9	146.6	1.44	659,482.20	663,841.76		
3,992.0	5.01	100.58	3,986.9	54.9	26.3	154.3	154.9	0.46	659,480.93	663,850.18		
4,086.0	5.10	105.06	4,080.5	148.5	24.5	162.4	163.0	0.43	659,479.09	663,858.25		
4,182.0	5.28	101.81	4,176.1	244.1	22.5	170.8	171.3	0.36	659,477.08	663,866.70		
4,277.0	5.10	104.19	4,270.7	338.7	20.5	179.2	179.7	0.30	659,475.15	663,875.07		
4,372.0	5.36	108.93	4,365.4	433.4	18.1	187.5	187.9	0.53	659,472.67	663,883.36		
4,467.0	5.54	107.00	4,459.9	527.9	15.3	196.0	196.4	0.27	659,469.89	663,891.94		
4,563.0	4.04	97.42	4,555.6	623.6	13.5	203.8	204.1	1.77	659,468.10	663,899.73		
4,658.0	3.25	76.76	4,650.4	718.4	13.7	209.8	210.1	1.60	659,468.29	663,905.67		
4,753.0	2.46	91.09	4,745.3	813.3	14.3	214.4	214.7	1.11	659,468.86	663,910.33		
4,848.0	1.48	81.07	4,840.2	908.2	14.4	217.7	218.0	1.09	659,469.02	663,913.58		
4,944.0	1.06	80.63	4,936.2	1,004.2	14.8	219.8	220.1	0.44	659,469.35	663,915.68		
5,039.0	1.23	75.53	5,031.2	1,099.2	15.2	221.6	222.0	0.21	659,469.75	663,917.53		
5,134.0	0.44	52.42	5,126.2	1,194.2	15.6	222.9	223.3	0.89	659,470.23	663,918.81		
5,229.0	0.79	39.15	5,221.2	1,289.2	16.4	223.6	224.0	0.40	659,470.96	663,919.51		
5,420.0	0.44	226.71	5,412.2	1,480.2	16.9	223.9	224.3	0.64	659,471.48	663,919.81		
5,617.0	0.53	236.90	5,609.2	1,677.2	15.9	222.6	222.9	0.06	659,470.46	663,918.50		
5,808.0	0.35	226.27	5,800.1	1,868.1	15.0	221.4	221.8	0.10	659,469.57	663,917.33		
5,999.0	0.44	244.28	5,991.1	2,059.1	14.3	220.4	220.7	0.08	659,468.85	663,916.25		
6,188.0	0.44	273.02	6,180.1	2,248.1	14.0	219.0	219.3	0.12	659,468.58	663,914.87		
6,379.0	0.53	232.77	6,371.1	2,439.1	13.5	217.5	217.8	0.18	659,468.08	663,913.44		
6,569.0	0.44	203.33	6,561.1	2,629.1	12.3	216.5	216.8	0.14	659,466.88	663,912.45		
6,760.0	0.44	209.74	6,752.1	2,820.1	11.0	215.9	216.1	0.03	659,465.57	663,911.80		



Pathfinder

Pathfinder X & Y Report

PATHFINDER
A Schlumberger Company

Company: Mack Energy Corp.
Project: Lea
Site: Brook Federal
Well: Brook Federal #2
Wellbore: OH
Design: OH

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well Brook Federal #2
WELL @ 3932.0usft (Original Well Elev)
WELL @ 3932.0usft (Original Well Elev)
Grid
Minimum Curvature
EDM 5000 1 Single User Db

Survey									
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/1000usft)	Easting (usft)
6,950.0	0.44	208.95	6,942.1	3,010.1	9.7	215.2	215.4	0.00	663,911.08
7,048.0	0.70	177.31	7,040.1	3,108.1	8.8	215.0	215.2	0.41	663,910.93
7,102.0	0.70	177.31	7,094.1	3,162.1	8.1	215.1	215.2	0.00	663,910.96
BHL - 7102.0 'MD, 7094.1 'TVD, 177.31 'AZI, 0.70 'INC, 8.1 'N, 215.1 'E									

Design Annotations			
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates	
		+N/-S (usft)	+E/-W (usft)
7,102.0	7,094.1	8.1	215.1
BHL - 7102.0 'MD, 7094.1 'TVD, 177.31 'AZI, 0.70 'INC, 8.1 'N, 215.1 'E			

Checked By: _____	Approved By: _____	Date: _____
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