

PATHFINDER

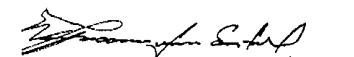
DIRECTIONAL SURVEY COMPANY REPORT

- 1 NAME OF SURVEYING COMPANY PATHFINDER ENERGY SERVICES
- 2 NAME OF PERSON(S) PERFORMING SURVEY
A) MATT SHIPP
- 3 POSITION OF SAID PERSON(S) (A-F) SURVEYORS (FIELD ENGINEERS)
- 4 DATE(S) ON WHICH SURVEY WAS PERFORMED 03/21/09 TO 04/05/09
- 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

BOPCO, LP
POKER LAKE UNIT # 300H
EDDY COUNTY, NM
RIG H & P # 317

- 9 SURVEY CERTIFIED FROM 7143 TO 12380 FEET MEASURED DEPTH

THIS IS TO VERIFY THAT ATTACHED DOCUMENTS SHOWING THE WELL TO BE
DISPLACED AT 4861.93 FEET ON A BEARING OF 326 86 DEGREES FROM THE
CENTER OF THE ROTARY TABLE AT A PROJECTED BIT DEPTH OF 12442 FEET,
ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE


FRANCISCO SINISTERRA
M/LWD SERVICE COORDINATOR

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



PathFinder Energy Services, Inc.

BHL Report

Page 01/01
Tie-in Date: 03/21/2009
Date Completed: 04/05/2009

BOPCO, L.P.
POKER LAKE UNIT #300H
EDDY COUNTY, NM
Rig:H & P #317
PathFinder Office Supervisor: Francisco Sinisterra
PathFinder Field Engineers:Matt Shipp
Hafa Donarumma

Survey Horiz. Reference:WELLHEAD
Ref Coordinates: LAT:32.10.59.2613 N LON:103.52.11.9108 W
GRID Reference:NAD27 new mexico east Transverse Mercator
Ref GRID Coord: X: 643353.0240 Y: 430651.0980
North Aligned To:GRID NORTH
Total Magnetic Correction: 7.73° EAST TO GRID
Vertical Section Plane: 325.92
Survey Vert. Reference: 25.00' Rotary Table To Ground
Altitude:3374.00' Ground To MSL

Measured Depth	12442.00	(feet)
Inclination	88.11	(deg)
Azimuth	328.92	(deg)
True Vertical Depth	7645.25	(feet)
Vertical Section	4861.27	(feet)
Survey X cord	640695.26	(feet)
Survey Y cord	434722.29	(feet)
Survey Lat	32.19435074 N	(deg)
Survey Lon	103.87850999 W	(deg)
Rectangular Corr. N/S	4071.20 N	(feet)
Rectangular Corr. E/W	2657.76 W	(feet)
Closure Distance	4861.93	(feet)
Direction of Closure	326.86	(deg)
Dogleg Severity	0.00	(deg/100ft)

PathFinder Energy Services, Inc.

Survey Report

BOPCO, L.P.
POKER LAKE UNIT #300H
EDDY COUNTY, NM
Rig: H & P #317
PathFinder Office Supervisor: Francisco Sinisterra
PathFinder Field Engineers: Matt Shipp
Hafa Donarumma

Page 01/04
Tie-In Date: 03/21/2009
Date Completed: 04/05/2009

Survey Horiz. Reference: WELLHEAD
Ref Coordinates: LAT: 32.10.59.2613 N LON: 103 52.11.9108 W
Reference: NAD27 new mexico east Transverse Mercator
Ref GRID Coord: X: 643353.0240 Y: 430651.0980
North Aligned To: GRID NORTH
Total Magnetic Correction: 7.73° EAST TO GRID
Vertical Section Plane: 325.92
Survey Vert. Reference: 25.00' Rotary Table To Ground
Altitude: 3374.00' Ground To MSL

Survey Calculations by RX5 V5.11i using Minimum Curvature

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft)	Closure Dist Dir (ft) (deg)	DLS (dg/100ft)
TIE IN TO SCIENTIFIC GYRO SURVEY @ 7100' MD.								
7100.00	1.39	181.29	7097.49	0.00	-132.69	114.07 S 68.19 E	132.90@ 149.13	0.00
THE FOLLOWING ARE PATHFINDER MWD SURVEYS.								
7143.00	0.97	184.99	7140.48	43.00	-133.40	114.95 S 68.15 E	133.64@ 149.34	0.99
7179.00	0.53	299.03	7176.48	36.00	-133.49	115.18 S 67.97 E	133.74@ 149.45	3.56
7211.00	2.90	338.35	7208.48	32.00	-132.56	114.35 S 67.55 E	132.81@ 149.43	7.85
7242.00	7.03	338.96	7239.34	31.00	-129.95	111.85 S 66.58 E	130.17@ 149.24	13.32
7274.00	12.66	335.92	7270.86	32.00	-124.58	106.82 S 64.44 E	124.75@ 148.90	17.66
7305.00	19.43	333.82	7300.63	31.00	-116.12	99.08 S 60.77 E	116.24@ 148.48	21.92
7337.00	25.59	329.86	7330.18	32.00	-103.94	88.32 S 54.95 E	104.02@ 148.11	19.81
7368.00	28.93	328.35	7357.73	31.00	-89.77	76.14 S 47.65 E	89.82@ 147.96	11.00
7400.00	32.80	329.56	7385.20	32.00	-73.38	62.07 S 39.20 E	73.41@ 147.73	12.25
7431.00	36.58	330.83	7410.68	31.00	-55.79	46.76 S 30.44 E	55.80@ 146.94	12.41
7463.00	38.95	331.46	7435.98	32.00	-36.27	29.60 S 20.98 E	36.28@ 144.67	7.50
7494.00	40.01	330.28	7459.91	31.00	-16.64	12.38 S 11.39 E	16.82@ 137.40	4.19
7526.00	43.09	329.25	7483.85	32.00	4.54	5.95 N 0.70 E	5.99@ 6.67	9.86
7557.00	46.78	328.47	7505.79	31.00	26.40	24.68 N 10.63 W	26.87@ 336.70	12.03
7589.00	50.74	328.68	7526.88	32.00	50.43	45.21 N 23.17 W	50.80@ 332.86	12.39
7620.00	54.17	328.97	7545.77	31.00	74.97	66.24 N 35.89 W	75.34@ 331.55	11.09
7652.00	56.54	328.10	7563.96	32.00	101.27	88.69 N 48.63 W	101.63@ 330.77	7.74
7683.00	57.77	327.36	7580.77	31.00	127.30	110.71 N 63.54 W	127.65@ 330.16	4.45
7715.00	58.83	325.89	7597.59	32.00	154.52	133.44 N 78.52 W	154.83@ 329.53	5.12
7746.00	60.67	324.17	7613.21	31.00	181.30	155.38 N 93.87 W	181.54@ 328.86	7.63
7777.00	63.31	324.28	7627.76	31.00	208.65	177.59 N 109.87 W	208.83@ 328.26	8.52
7809.00	67.71	325.39	7641.03	32.00	237.76	201.39 N 126.63 W	237.89@ 327.84	14.11
7840.00	72.46	326.14	7651.58	31.00	266.90	225.48 N 143.02 W	267.01@ 327.61	15.49

PathFinder Energy Services, Inc. Survey Report

BOPCO, L.P.
POKER LAKE UNIT #300H
EDDY COUNTY, NM
RIG:H & P #317

Page 02/04

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)
7872.00	77.65	326.88	7659.83	32.00	297.80	251.26 N	160.07 W	297.92@	327.50	16.37
7903.00	82.75	326.90	7665.11	31.00	328.34	276.84 N	176.75 W	328.45@	327.44	16.45
7916.00	85.21	326.81	7666.47	13.00	341.26	287.66 N	183.82 W	341.38@	327.42	18.94
7948.00	88.11	326.72	7668.34	32.00	373.20	314.38 N	201.33 W	373.32@	327.36	9.07
8011.00	90.22	327.78	7669.25	63.00	436.17	367.35 N	235.40 W	436.31@	327.35	3.75
8105.00	92.42	327.85	7667.09	94.00	530.09	446.88 N	285.46 W	530.27@	327.43	2.34
8199.00	92.77	327.12	7662.83	94.00	623.96	526.07 N	336.93 W	624.18@	327.44	0.86
8294.00	88.90	326.83	7661.45	95.00	718.92	605.24 N	388.38 W	719.14@	327.31	4.29
8388.00	89.87	325.17	7662.46	94.00	812.91	682.70 N	441.62 W	813.09@	327.10	1.25
8483.00	90.31	323.72	7662.31	95.00	907.88	759.99 N	496.86 W	907.99@	326.82	1.59
8577.00	89.43	322.08	7662.52	94.00	1001.74	834.96 N	553.56 W	1001.79@	326.46	1.98
8672.00	90.75	322.24	7662.37	95.00	1096.54	909.98 N	611.84 W	1096.54@	326.08	1.40
8766.00	89.96	321.20	7661.79	94.00	1190.28	983.76 N	670.07 W	1190.29@	325.74	1.39
8861.00	90.22	322.30	7661.64	95.00	1285.03	1058.37 N	726.88 W	1285.07@	325.45	1.19
8955.00	91.10	321.71	7660.56	94.00	1378.80	1132.44 N	786.74 W	1378.91@	325.21	1.13
9049.00	89.96	323.25	7659.69	94.00	1472.62	1206.99 N	843.99 W	1472.80@	325.04	2.04
9144.00	92.15	324.21	7657.94	95.00	1567.53	1283.56 N	900.17 W	1567.75@	324.96	2.52
9238.00	91.89	327.34	7654.62	94.00	1661.46	1361.23 N	953.00 W	1661.67@	325.00	3.34
9333.00	90.75	327.53	7652.44	95.00	1756.40	1441.27 N	1004.12 W	1756.57@	325.14	1.22
9427.00	92.15	328.65	7650.06	84.00	1850.30	1521.03 N	1053.79 W	1850.41@	325.29	1.91
9522.00	92.77	328.81	7645.98	95.00	1945.10	1602.16 N	1103.06 W	1945.16@	325.45	0.67
9616.00	90.92	328.04	7642.95	94.00	2038.95	1682.20 N	1152.25 W	2038.99@	325.59	2.13
9711.00	91.45	327.93	7640.99	95.00	2133.87	1762.73 N	1202.60 W	2133.89@	325.70	0.57
9805.00	89.87	326.00	7639.91	94.00	2227.84	1841.52 N	1253.84 W	2227.85@	325.75	2.65
9837.00	89.60	325.80	7640.05	32.00	2259.84	1868.02 N	1271.78 W	2259.85@	325.75	1.05
9900.00	90.84	325.85	7639.81	63.00	2322.84	1920.14 N	1307.17 W	2322.85@	325.75	1.97

PathFinder Energy Services, Inc. Survey Report

BOPCO, L.P.
POKER LAKE UNIT #300H
EDDY COUNTY, NM
RIG:H & P #317

Page 04/04

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)
12380.00	88.11	328.92	7643.21	25.00	4799.39	4018.13 N 2625.78 W	4800.00@ 326.84	1.30
STRAIGHT-LINE PROJECTION TO BIT @ 12442' MD.								
12442.00	88.11	328.92	7645.25	62.00	4861.27	4071.20 N 2657.76 W	4861.93@ 326.86	0.00

PATHFINDER

ENERGY SERVICES

TIE-IN SURVEY INFORMATION SHEET

CLIENT INFORMATION

CLIENT:	BOPCO, L.P.		
LEASE / WELL No.:	POKER LAKE PLU	#300H	
WELL LOCATION:	EDDY CO.		
COUNTY / STATE / COUNTRY:	EDDY	NM	USA
RIG:	H & P #317		
API WELL No:	30-015-36950		
JOB No:	101008387-WT-WT		
P.O. / AFE No.			
DIRECTIONAL COMPANY:	PES		

WELL SITE INFORMATION

TOTAL MAGNETIC CORRECTION (TMC):			
On Wall Plat	7.71	LWD Calculated	7.73
Agreed Upon:		7.73	
X =	643353.024000	Feet	Y =
430651.098000		Feet	
SITE LATITUDE:	32.183128N	SITE LONGITUDE:	103.869975W
GRID SYSTEM:	TRUE ☐ UTM ☒ LAMBERT ☐	ZONE:	NEW MEXICO EAST
PROPOSED DRIFT DIRECTION:	325.92		
KELLY BUSHING ELEVATION:			
ALTITUDE:	3377	Feet	WATER DEPTH:
		Feet	

TIE-IN SURVEY

MEASURED DEPTH:	7100		
DRIFT ANGLE:	1.39		
DRIFT DIRECTION:	181.29		
TRUE VERTICAL DEPTH:	7097.49		
VERTICAL SECTION:	-132.69		
RECTANGULAR COORDINATE (N / S) :	-114.07		
RECTANGULAR COORDINATE (E / W) :	68.19		
CLOSURE DISTANCE / DIRECTION:	147.02	153.49	
SURVEY CALCULATION METHOD:	AA ☐ MC ☒ RC ☐ BT ☐		
SOURCE OF TIE-IN DATA (COMPANY):	SCIENTIFIC DRILLING CONTROLS		
COPY OF TIE-IN SURVEY REPORT	☒ YES ☐ NO		

WELL PLAN

KICKOFF DEPTH:	7174.5	TOTAL DEPTH:	12307.03
KICKOFF ANGLE:	1.39	MAX ANGLE:	90.72

PES Engineers:

MATT SHIPT

HAPA DONARUMMA

*Signature of both field engineers required if applicable

Directional Driller: P.A. GONZALEZ

DATE: 20-Mar-2009

SCIENTIFIC DRILLING CONTROLS

KILLIP GYFO SURVEY

Directional Survey Report

TOP

R.A.S.S.

Well Number	#	FOUR FIVE ONE # 5001
Well Location	#	FOUR COUNTY, NEW MEXICO
Job Number	#	196509026
Location Latitude	#	32° 13'
Survey Date	#	15 MAR 1965
SuDoc Personnel	#	11000020
Length Units	#	Feet
North Reference	#	GRID NORTH
Grid Correction	#	0.25 Degrees
Survey Depth Zero	#	RKB
Proposed Direction	#	325.92
Calculation Method	#	Minimum Curvature

Remarks: The KILLIP survey well is located about 190

SCIENTIFIC DRILLING CONTROLS

Initial Survey

on

Barro Colorado

Page 1

Well No.: F0001 F0001 F0001

Date: 15 MAR 2009

Job No.: 32509095

BL10

Proposed: 325092

Depth (Feet) (Feet) (Feet) Depth (Feet) Depth (Feet) (Feet) (Feet) (Feet) (Feet)

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	100.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
200.00	200.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00
300.00	300.00	0.64	0.00	0.00	0.00	0.00	0.00	0.00
400.00	400.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00
500.00	499.99	1.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	599.99	1.09	0.00	0.00	0.00	0.00	0.00	0.00
700.00	699.98	1.15	0.00	0.00	0.00	0.00	0.00	0.00
800.00	799.97	1.21	0.00	0.00	0.00	0.00	0.00	0.00
900.00	899.96	0.93	0.00	0.00	0.00	0.00	0.00	0.00
1000.00	999.95	0.42	0.00	0.00	0.00	0.00	0.00	0.00
1100.00	1099.94	0.58	0.00	0.00	0.00	0.00	0.00	0.00
1200.00	1199.93	0.15	0.00	0.00	0.00	0.00	0.00	0.00
1300.00	1299.92	0.14	0.00	0.00	0.00	0.00	0.00	0.00
1400.00	1399.91	0.46	0.00	0.00	0.00	0.00	0.00	0.00
1500.00	1499.90	0.09	0.00	0.00	0.00	0.00	0.00	0.00
1600.00	1599.89	0.09	0.00	0.00	0.00	0.00	0.00	0.00
1700.00	1699.88	0.09	0.00	0.00	0.00	0.00	0.00	0.00
1800.00	1799.87	0.09	0.00	0.00	0.00	0.00	0.00	0.00
1900.00	1899.86	0.12	0.00	0.00	0.00	0.00	0.00	0.00
2000.00	1999.85	0.09	0.00	0.00	0.00	0.00	0.00	0.00
2100.00	2099.84	0.09	0.00	0.00	0.00	0.00	0.00	0.00
2200.00	2199.83	0.09	0.00	0.00	0.00	0.00	0.00	0.00
2300.00	2299.82	0.09	0.00	0.00	0.00	0.00	0.00	0.00
2400.00	2399.81	0.09	0.00	0.00	0.00	0.00	0.00	0.00
2500.00	2499.80	0.09	0.00	0.00	0.00	0.00	0.00	0.00
2600.00	2599.79	0.09	0.00	0.00	0.00	0.00	0.00	0.00
2700.00	2699.78	0.09	0.00	0.00	0.00	0.00	0.00	0.00
2800.00	2799.77	0.09	0.00	0.00	0.00	0.00	0.00	0.00
2900.00	2899.76	0.09	0.00	0.00	0.00	0.00	0.00	0.00
3000.00	2999.75	0.09	0.00	0.00	0.00	0.00	0.00	0.00
3100.00	3099.74	0.09	0.00	0.00	0.00	0.00	0.00	0.00
3200.00	3199.73	0.09	0.00	0.00	0.00	0.00	0.00	0.00
3300.00	3299.72	0.09	0.00	0.00	0.00	0.00	0.00	0.00
3400.00	3399.71	0.09	0.00	0.00	0.00	0.00	0.00	0.00
3500.00	3499.70	0.09	0.00	0.00	0.00	0.00	0.00	0.00
3600.00	3599.69	0.09	0.00	0.00	0.00	0.00	0.00	0.00
3700.00	3699.68	0.09	0.00	0.00	0.00	0.00	0.00	0.00
3800.00	3799.67	0.09	0.00	0.00	0.00	0.00	0.00	0.00
3900.00	3899.66	0.09	0.00	0.00	0.00	0.00	0.00	0.00

SCIENTIFIC DRILLING CONTROLS

Form Survey
for
B.A.S.S.

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Well No.: FORT LEE DEEP H390H Date: 15 MAR 2009

Job No.: 32K030/096 GR10 Proposed: 32K092

Depth T.V.D. V.S. Inc Azimuth Latitude Depth to 0 Log
(Feet) (Feet) (Feet) Deg. Deg. (Feet) (Feet) -100

4000.00	3998.01	93.32	1.08	144.19	70.12	67.00	0.12
4100.00	4097.92	96.48	1.27	147.31	71.26	65.77	0.31
4200.00	4197.94	98.62	1.11	153.95	73.80	66.79	0.33
4300.00	4297.93	100.38	0.94	167.77	76.15	68.05	0.18
4400.00	4397.91	102.03	1.05	173.39	76.26	69.38	0.26
4500.00	4497.90	103.45	0.75	188.73	77.08	70.72	0.31
4600.00	4597.89	104.71	0.81	126.74	77.81	71.86	0.12
4700.00	4697.88	106.00	0.73	130.34	78.63	72.91	0.09
4800.00	4797.88	107.00	0.45	136.7	79.34	73.62	0.29
4900.00	4897.88	107.46	0.94	217.75	79.80	73.82	0.45
5000.00	4997.87	107.68	0.38	215.86	80.25	73.51	0.14
5100.00	5097.87	107.83	0.45	277.05	80.77	73.04	0.09
5200.00	5197.87	107.91	0.33	271.68	81.21	72.54	0.10
5300.00	5297.87	107.94	0.55	274.25	81.65	71.94	0.20
5400.00	5397.86	108.00	0.69	291.30	82.36	71.14	0.19
5500.00	5497.85	108.34	0.78	223.89	83.98	70.45	0.09
5600.00	5597.84	108.71	0.87	219.76	84.37	69.29	0.12
5700.00	5697.83	109.27	0.92	215.02	85.68	68.30	0.11
5800.00	5797.81	109.47	1.04	213.49	87.11	67.32	0.07
5900.00	5897.80	110.56	1.07	211.43	88.62	66.33	0.01
6000.00	5997.78	111.72	1.06	216.09	90.11	65.28	0.06
6100.00	6097.76	112.10	1.16	201.85	91.80	64.36	0.22
6200.00	6197.74	113.47	1.16	185.27	93.75	63.93	0.38
6300.00	6297.71	114.63	1.08	160.35	96.30	64.15	0.53
6400.00	6397.66	118.37	1.86	157.13	99.22	64.80	0.19
6500.00	6497.63	121.01	1.16	148.59	101.67	65.67	0.35
6600.00	6597.61	127.01	1.13	150.19	103.39	65.76	0.04
6700.00	6697.59	134.85	1.04	165.83	105.17	65.47	0.30
6800.00	6797.57	137.71	1.36	152.67	107.08	67.164	0.24
6900.00	6897.55	139.77	1.35	175.97	109.73	68.10	0.19
7000.00	6997.52	140.71	1.54	176.68	111.69	68.19	0.04
7100.00	7097.49	142.69	1.39	181.29	113.07	68.19	0.08
7200.00	7197.45	144.77	1.53	177.22	116.61	68.23	0.17
7300.00	7297.42	147.00	1.34	172.89	119.11	68.44	0.22
7400.00	7397.40	148.91	1.61	157.67	121.85	68.47	0.34
7500.00	7497.37	150.85	1.75	148.33	123.67	68.17	0.10
7600.00	7597.35	152.77	1.31	148.35	125.88	67.20	0.08
7700.00	7697.32	153.77	1.45	193.77	129.79	67.48	0.12
7800.00	7797.28	155.11	1.66	215.16	130.67	66.55	0.24
7900.00	7897.25	156.64	1.79	201.31	131.96	65.67	0.30

The data recorded by the instrument is in Feet and

SCIENTIFIC DRILLING CONTROLS

Internal Survey

101

12000 3

$$X_n \otimes Y_n \rightarrow Z_n \otimes Y_n$$

Wavelength: 1100 nm; Filter: 100 nm; Slit: 0.5 mm; Resolution: 0.5 nm

Date: 15 March 2009

Анализ H_{∞} и H_2/H_∞ регуляторов

14270

Figure 11: $\Delta \chi^2_{\text{min}}$

Depth (Feet)	$\frac{1}{8}$ " $V_n D_n$ (Feet)	$\frac{1}{4}$ " $V_n D_n$ (Feet)	In. Depth	Average Weight (Lbs.)	Depth (Feet)	Bottom (Feet)	Log
							LOG

Maximum Depth 733 fathoms, 12,500 in a Dive, Length of 15,490 Decimals.

PathFinder Energy Services, Inc.

Magnetic & Grid Calculations

BOPCO, L.P.
Poker Lake Unit PLU #30011
Eddy County, NM
Rig:HP 314

Fri Mar 20 13:23:26 2009

Coordinates

Latitude: 32.183128 N (32 deg. 10 min. 59.2613 sec.)
Longitude: 103.869975 W (-103 deg. 52 min. 11.9108 sec.)
Elevation: 3377.00 feet.
Calculation Date: Mar/20/2009

Magnetic Calculations

Model: IGRF2005
Dip Angle: 60.1665 degrees
Total Magnetic Field: 0.48810 gauss
Magnetic Declination: 7.974726 degrees
Horizontal Intensity: 0.242820 gauss
To Convert a Magnetic Dir. to a TRUE North Dir. Add 7.974726 Degr

Transverse Mercator Grid Calculations NAD27

Grid System: Transverse Mercator: new mexico east
Ellipsoid: Clarke 1866
X: 643353.0240 feet
Y: 430651.0980 feet
True to Grid: (convergence) -0.246801 degrees
Magnetic to Grid: 7.727925 degrees
To Convert a Magnetic Dir. to a GRID dir. Add 7.727925 Degr

PathFinder Energy Services, Inc.

Magnetic & Grid Calculations

BOPCO, L.P.
POKER LAKE UNIT #300H
NASH DRAW
Rig:H_P #317

Sun Mar 22 15:25:50 2009

Coordinates

Latitude: 32.183128 N (32 deg. 10 min. 59.2613 sec.)
Longitude: 103.869975 W (-103 deg. 52 min. 11.9108 sec.)
Elevation: 3377.00 feet.
Calculation Date: Mar/21/2009

Magnetic Calculations

Model: IGRF2005
Dip Angle: 60.1665 degrees
Total Magnetic Field: 0.48810 gauss
Magnetic Declination: 7.974402 degrees
Horizontal Intensity: 0.242819 gauss
To Convert a Magnetic Dir. to a TRUE North Dir. Add 7.974402 Degr

Transverse Mercator Grid Calculations NAD27

Grid System: Transverse Mercator: new mexico east
Ellipsoid: Clarke 1866
X: 643353.0240 feet
Y: 430651.0980 feet
True to Grid: (convergence) -0.246801 degrees
Magnetic to Grid: 7.727601 degrees
To Convert a Magnetic Dir. to a GRID dir. Add 7.727601 Degr.

