



MWD SERVICES, INC.

FIELD SURVEY CALCULATIONS

DATE PRINTED: 06/11/03 MWD.REP.: G. HENDRIX
 COMPANY: BP AMERICA PRODUCTION CO. WELL_NAME: HORSETAIL GAS COM FED #1
 LOCATION: EDDY COUNTY, NM RIG: NABORS DRILLING 730
 FILE NAME: 03063.SRV VERT. SEC. DIR.: N 42.99 W
 CALCULATION MODEL: MINIMUM CURVATURE METHOD DEPTH DATUM: RKB
 GRID CONVERGENCE: 0.04 E MAGN. DEC.: 8.97 E MAGN. TO MAP CORR.: 8.93 E
 COMMENTS: SURVEY #0 = TIE IN SURVEY FROM SCIENTIFIC DRCG. INTL.
 SURVEY #1 = SINGLE SHOT SURVEY PROVIDED BY RIG
 SURVEY #46 = STRAIGHT LINE PROJECTED SURVEY TO WELL TD

===== MWD SURVEY PROGRAM

Ver: 3.10 PC (4-Jun-87) =====

Date: 6/11/2003 Time: 8: 7:31 PAGE: 1
 Filename: "03063.SRV" Description: "Horsetail Gas Com Federal #1"
 Target Coordinates: 91.4 N 85.2 W Target TVD: 10200.000
 Using Minimum Curvature Method.

S #	MEASURED DEPTH (feet)	DRIFT ANGLE (deg)	DRIFT DIRECTION (deg)	COURSE LENGTH (feet)	TRUE VERTICAL DEPTH (feet)	VERTICAL SECTION (feet)	RECTANGULAR COORDINATES (feet)	DOGLEG SEVERITY DG/100FT
0	6392.0	8.50	304.000	0.0	6386.7	97.9	97.9 N 3.7 W	0.00
1	6423.0	8.75	303.000	31.0	6417.3	78.6	100.4 N 7.5 W	0.94
2	6506.0	7.80	316.000	83.0	6499.3	90.4	107.9 N 16.7 W	2.52
3	6601.0	6.90	310.800	95.0	6593.7	102.5	116.3 N 25.5 W	1.18
4	6695.0	5.30	299.400	94.0	6687.2	112.2	122.1 N 33.6 W	2.13
5	6790.0	4.20	290.000	95.0	6781.9	119.5	125.5 N 40.7 W	1.41
6	6886.0	3.50	278.200	96.0	6877.6	124.9	127.1 N 46.9 W	1.18
7	6980.0	2.60	257.000	94.0	6971.3	128.2	127.0 N 51.8 W	1.52
8	7075.0	2.80	218.100	95.0	7066.4	129.0	124.7 N 55.3 W	1.90
9	7170.0	4.70	199.600	95.0	7161.2	126.8	119.2 N 58.1 W	2.35
10	7263.0	5.30	193.100	93.0	7253.9	122.6	111.4 N 60.3 W	0.89
11	7358.0	5.10	196.000	95.0	7348.3	118.0	103.1 N 62.5 W	0.35
12	7453.0	4.80	199.800	95.0	7443.1	114.0	95.3 N 63.8 W	0.47
13	7547.0	4.10	204.100	94.0	7536.8	110.9	88.5 N 67.7 W	0.82
14	7642.0	3.60	180.700	95.0	7631.6	107.4	82.4 N 69.1 W	1.72
15	7736.0	2.90	177.100	94.0	7725.5	103.5	77.1 N 69.6 W	0.78
16	7830.0	1.40	186.400	94.0	7819.4	100.9	73.6 N 69.1 W	1.63
17	7924.0	1.80	161.800	94.0	7913.4	98.8	71.1 N 68.7 W	0.84
18	8018.0	4.80	135.100	94.0	8007.2	93.6	66.9 N 68.5 W	3.50
19	8113.0	4.60	135.600	95.0	8101.9	85.8	61.3 N 68.6 W	0.21
20	8208.0	4.90	135.300	95.0	8196.6	77.9	55.7 N 54.5 W	0.32
21	8302.0	5.50	140.500	94.0	8290.0	69.4	49.4 N 48.8 W	0.81
22	8366.0	4.90	139.900	64.0	8353.9	63.6	44.9 N 45.1 W	0.94
23	8428.0	3.40	144.300	62.0	8415.7	59.2	41.4 N 42.5 W	2.47
24	8492.0	2.60	139.500	64.0	8479.6	55.8	38.8 N 40.3 W	1.31
25	8555.0	2.50	142.300	63.0	8542.6	53.0	36.6 N 38.5 W	0.25
26	8618.0	2.80	143.900	63.0	8605.6	50.1	34.6 N 36.7 W	0.49
27	8681.0	2.70	144.300	63.0	8668.4	47.1	31.8 N 33.9 W	0.16
28	8776.0	2.50	142.600	95.0	8763.3	42.8	28.4 N 32.4 W	0.23
29	8871.0	2.30	146.700	95.0	8858.3	38.9	25.1 N 30.1 W	0.28
30	8934.0	2.00	143.400	63.0	8921.2	36.6	23.2 N 28.8 W	0.51
31	9028.0	1.80	142.300	94.0	9015.2	33.5	20.7 N 28.9 W	0.22
32	9123.0	1.40	134.200	95.0	9110.1	30.8	18.7 N 25.1 W	0.48
33	9217.0	1.60	149.600	94.0	9204.1	28.4	16.8 N 23.6 W	0.48
34	9280.0	1.40	135.700	63.0	9267.1	26.8	15.5 N 22.7 W	0.66
35	9374.0	1.20	211.300	94.0	9361.1	25.4	13.8 N 22.4 W	1.70

S #	MEASURED DEPTH (feet)	DRIFT ANGLE (deg)	DRIFT DIRECTION (deg)	COURSE LENGTH (feet)	TRUE VERTICAL DEPTH (feet)	VERTICAL SECTION (feet)	RECTANGULAR COORDINATES (feet)	DOGLEG SEVERITY DG/100FT
36	9438.0	0.10	168.400	64.0	9425.1	25.1	13.2 N	22.7 W 1.76
37	9502.0	1.20	38.300	64.0	9489.0	25.2	13.7 N	22.3 W 1.98
38	9564.0	1.30	33.700	62.0	9551.0	25.4	14.7 N	21.5 W 0.23
39	9627.0	1.50	28.900	63.0	9614.0	25.9	16.1 N	20.7 W 0.37
40	9691.0	1.30	29.100	64.0	9678.0	26.3	17.4 N	19.9 W 0.31
41	9754.0	1.50	22.000	63.0	9741.0	25.9	18.8 N	19.3 W 0.42
42	9786.0	1.10	21.300	62.0	9773.0	27.2	19.5 N	19.0 W 1.25
43	9849.0	1.00	17.700	63.0	9836.0	27.8	20.6 N	18.6 W 0.19
44	9944.0	1.30	1.500	95.0	9930.9	28.9	22.4 N	18.3 W 0.46
45	10038.0	1.20	15.600	94.0	10024.9	30.2	24.5 N	18.1 W 0.34
46	10090.0	1.20	15.600	52.0	10076.9	30.8	25.5 N	17.8 W 0.80

--- Final Closure Direction: 325.156
 --- Final Closure Distance: 31.082 feet

50'

LOCATION HORSETAIL GAS FED #1
LEASE & WELL EMPIRE DEEP, SEC 10 T18S, R27E EDDY COUNTY, NEW MEXICO
 (Give Unit, Section, Township and Range)
OPERATOR BP AMERICA 501 WEST LAKE PARK BLVD ROOM 6.138
HOUSTON, TEXAS 77079 ATTN: AMY SPANG
DRILLING CONTRACTOR NABORS DRILLING USA, LP

The Undersigned hereby certifies that he is an authorized representative of the drilling contractor who drilled the above-described well and that he has conducted deviation tests and obtained the following results:

<u>DEGREES @ DEPTH</u>	<u>DEGREES @ DEPTH</u>	<u>DEGREES @ DEPTH</u>	<u>DEGREES @ DEPTH</u>
1/4 250			
3/4 430			
3/4 850			
1 3/4 1680			
1 1/2 2077			
3/4 2577			
3/4 2983			
1 3476			
1 1/2 3974			
1 4478			
3/4 4981			
2 1/2 5481			
4 1/2 5807			
6 1/4 6076			

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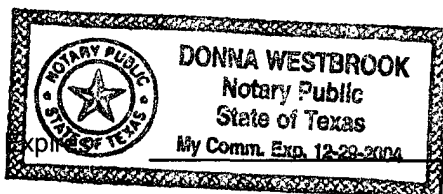
Drilling Contractor

Nabors Drilling USA, LP

By

Don Nelson
Don Nelson- District Drilling Superintendent

Subscribed and sworn to before me this 30 day of October, 2003



My Commission

Donna Westbrook
Notary Public

MIDLAND

County

TEXAS