

30-039-20648



1724-B Townhurst Dr, Houston, Tx 77043
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Job Number: 61089
Company: Black Hills EP
Lease/Well: Carson 29-04-24 #4H
Location: Rio Arriba Co., NM
Rig Name: Patterson 744
RKB:
G.L. or M.S.L.: API #30-039-20649

State/Country: NM/USA
Declination: 10.6° East
Grid:
File name: N:\BLACKH-1\2006\61089C-1\290428.SVY
Date/Time: 20-Jun-06 / 15:37
Curve Name: Actual Surveys

Surface 1100/S 1485/W
BHL 1 1092/S 1565/W
BHL 2 1019/S 2597/W

TV01 3778 MD1 3820
TV02 3718 MD2 4963

WINSERVE SURVEY CALCULATIONS
Minimum Curvature Method
Vertical Section Plane 93.45
Vertical Section Referenced to Wellhead
Rectangular Coordinates Referenced to Wellhead



Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Vertical Section FT	N-S FT	E-W FT	CLOSURE		Dogleg Severity Deg/100
Distance FT	Direction Deg								
Tie-In Hole									
3665.00	1.60	293.20	3664.30	2.50	24.80	4.00	25.12	9.16	.00
First Gyro Data Survey									
3701.00	13.10	98.60	3700.02	6.11	24.39	7.59	25.54	17.29	40.70
3732.00	29.30	112.90	3728.84	16.84	20.88	18.13	27.65	40.96	54.49
3764.00	45.80	115.90	3754.13	34.95	12.77	35.78	37.99	70.36	51.86
3795.00	64.90	115.10	3771.67	58.49	1.86	58.70	58.73	88.19	61.65
Last Gyro Data Survey									
3807.00	72.90	115.20	3775.99	68.88	-2.89	68.83	68.89	92.41	66.67
First Nevis MWD Survey									
3820.00	83.00	114.40	3778.70	80.71	-8.22	80.36	80.78	95.84	77.92
3851.00	94.80	111.50	3779.29	109.87	-20.28	108.84	110.72	100.55	39.19
3883.00	95.80	106.00	3776.33	140.59	-30.52	139.00	142.32	102.38	17.40
3914.00	95.70	101.10	3773.23	170.95	-37.74	168.98	173.14	102.59	15.73
3945.00	95.60	99.70	3770.17	201.57	-43.31	199.32	203.97	102.26	4.51
3977.00	96.20	99.40	3766.88	233.22	-48.59	230.71	235.77	101.89	2.09
4008.00	95.60	95.50	3763.70	263.97	-52.59	261.28	266.52	101.38	12.66
4039.00	95.30	93.90	3760.75	294.82	-55.12	292.04	297.19	100.69	5.23
4070.00	95.30	93.10	3757.89	325.69	-57.00	322.85	327.84	100.01	2.57
4102.00	94.80	94.20	3755.07	357.57	-59.00	354.66	359.54	99.45	3.76

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Vertical Section FT	N-S FT	E-W FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
4133.00	95.10	93.60	3752.40	388.45	-61.13	385.47	390.29	99.01	2.16
4165.00	96.50	90.30	3749.16	420.27	-62.22	417.28	421.89	98.48	11.15
4196.00	96.90	89.70	3745.55	451.00	-62.22	448.07	452.37	97.91	2.32
4227.00	97.60	89.30	3741.63	481.68	-61.95	478.82	482.81	97.37	2.60
4259.00	98.50	89.50	3737.15	513.29	-61.62	510.50	514.21	96.88	2.88
4290.00	97.40	92.00	3732.86	543.95	-62.02	541.20	544.74	96.54	8.74
4322.00	95.20	92.10	3729.35	575.75	-63.16	572.98	576.45	96.29	6.88
4354.00	91.30	91.60	3727.54	607.68	-64.19	604.91	608.31	96.06	12.29
4385.00	89.90	91.70	3727.21	638.66	-65.08	635.89	639.22	95.84	4.53
4417.00	90.10	92.30	3727.21	670.65	-66.20	667.87	671.15	95.66	1.98
4448.00	90.60	92.90	3727.03	701.64	-67.60	698.84	702.10	95.53	2.52
4480.00	90.60	92.90	3726.69	733.64	-69.22	730.80	734.07	95.41	.00
4512.00	91.10	92.80	3726.22	765.63	-70.81	762.76	766.04	95.30	1.59
4544.00	91.40	93.00	3725.52	797.63	-72.43	794.71	798.00	95.21	1.13
4575.00	91.60	92.40	3724.71	828.61	-73.89	825.66	828.96	95.11	2.04
4607.00	91.90	92.10	3723.73	860.59	-75.15	857.62	860.91	95.01	1.33
4638.00	89.80	92.10	3723.27	891.58	-76.28	888.60	891.86	94.91	6.77
4670.00	90.10	92.80	3723.30	923.57	-77.65	920.57	923.84	94.82	2.38
4701.00	90.80	92.40	3723.05	954.57	-79.06	951.53	954.81	94.75	2.60
4733.00	91.60	91.70	3722.38	986.55	-80.20	983.51	986.77	94.66	3.32
4764.00	92.10	90.30	3721.38	1017.50	-80.74	1014.48	1017.69	94.55	4.79
Last Nevils MWD Survey									
4795.00	92.50	89.80	3720.14	1048.42	-80.77	1045.46	1048.57	94.42	2.06
Projection to TD									
4863.00	90.50	90.00	3718.36	1116.27	-80.65	1113.43	1116.35	94.14	2.96