



1724-B Townhurst Dr, Houston, Tx 77043
(713) 827-8302
www.nevisenergy.com

Job Number: 71331
Company: Black Hills Gas Resources
Lease/Well: Jicarilla 459-18 #112
Location: Rio Arriba Co., NM
Rig Name: Patt. 744
RKB: 13'
G.L. or M.S.L.: 7034'

State/Country: NM/USA
Declination: 10.10303
Grid: -0.32
File name: Z:\BLACKH-1\71331J-1\45918#12.SVY
Date/Time: 27-Sep-07 / 09:00
Curve Name: Jic 459-18 #12 surveys

30-039-29859

Lateral origin 189/N 2170/E, M24275, TVD 3707
Jic 459-18 #12 surveys

JIC 459-18 #112

WINSERVE SURVEY CALCULATIONS
Minimum Curvature Method
Vertical Section Plane 80.42
Vertical Section Referenced to Wellhead
Rectangular Coordinates Referenced to Wellh

SURF 1100 FM 1440 FW
C -859 2602
241 FN 4042 FW
BH -1457
A -2641
56 FE

10-18-07

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Vertical Section FT	N-S FT	E-W FT	CLOSURE Distance FT	Direction Deg	Dogleg Severity Deg/100
Surface Tie-In									
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
First Nevis MWD Survey									
369.00	1.20	25.50	368.97	2.22	3.49	1.66	3.86	25.50	.33
559.00	.20	25.10	558.96	3.55	5.58	2.66	6.19	25.48	.53
749.00	.00	187.60	748.96	3.74	5.88	2.80	6.52	25.46	.11
939.00	.20	255.10	938.96	3.41	5.80	2.48	6.31	23.16	.11
1159.00	.30	241.80	1158.95	2.48	5.43	1.60	5.66	16.45	.05
1369.00	.30	197.70	1368.95	1.71	4.64	.95	4.74	11.57	.11
1575.00	1.90	171.00	1574.91	1.43	.76	1.32	1.52	60.17	.79
1727.00	1.80	161.90	1726.83	1.76	-4.00	2.46	4.69	148.45	.20
1875.00	1.40	162.20	1874.77	2.36	-7.93	3.73	8.77	154.80	.27
2056.00	1.80	186.40	2055.70	1.89	-12.86	4.09	13.50	162.36	.43
2236.00	1.40	182.40	2235.63	.66	-17.87	3.68	18.24	168.35	.23
2417.00	1.50	177.90	2416.57	-.11	-22.44	3.68	22.74	170.69	.08
2478.00	.80	182.90	2477.56	-.30	-23.67	3.69	23.95	171.15	1.16
2507.00	.90	193.80	2506.56	-.44	-24.09	3.62	24.36	171.45	.65
2537.00	1.10	345.20	2536.56	-.56	-24.04	3.49	24.29	171.74	6.46
2568.00	3.50	352.10	2567.53	-.56	-22.82	3.28	23.05	171.81	7.78
2598.00	5.70	350.00	2597.43	-.54	-20.44	2.90	20.65	171.92	7.35
2629.00	8.20	349.00	2628.20	-.61	-16.76	2.21	16.90	172.48	8.07
2660.00	10.80	349.80	2658.77	-.69	-11.73	1.27	11.79	173.80	8.40
2692.00	13.10	349.70	2690.08	-.77	-5.21	.10	5.21	178.95	7.19

RCVD OCT 12 '07
OIL CONS. DIV.
DIST. 3

W

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Vertical Section FT	N-S FT	E-W FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
2724.00	14.90	349.10	2721.12	-.91	2.40	-1.33	2.75	331.01	5.64
2755.00	17.40	349.60	2750.90	-1.07	10.88	-2.92	11.26	344.96	8.08
2786.00	19.30	350.50	2780.32	-1.13	20.49	-4.60	21.00	347.33	6.20
2819.00	20.50	352.10	2811.35	-.95	31.59	-6.30	32.21	348.72	3.99
2850.00	21.30	353.80	2840.31	-.46	42.57	-7.65	43.25	349.81	3.24
2882.00	21.90	355.10	2870.06	.37	54.29	-8.79	55.00	350.80	2.40
2914.00	23.70	356.10	2899.56	1.49	66.65	-9.74	67.36	351.69	5.75
2945.00	25.20	355.90	2927.78	2.74	79.45	-10.63	80.16	352.38	4.85
2976.00	27.20	355.10	2955.59	3.95	93.10	-11.71	93.83	352.83	6.55
3008.00	28.90	354.60	2983.83	5.11	108.08	-13.06	108.87	353.11	5.36
3039.00	30.80	354.80	3010.72	6.26	123.45	-14.49	124.29	353.31	6.14
3071.00	32.50	356.10	3037.96	7.74	140.18	-15.81	141.07	353.56	5.72
3103.00	33.80	358.20	3064.75	9.79	157.66	-16.68	158.54	353.96	5.42
3134.00	33.90	2.00	3090.50	12.69	174.92	-16.65	175.71	354.56	6.83
3166.00	34.20	5.50	3117.02	16.83	192.79	-15.47	193.41	355.41	6.19
3198.00	34.50	8.70	3143.44	22.01	210.70	-13.24	211.12	356.40	5.72
3229.00	34.60	12.30	3168.97	28.04	227.98	-10.04	228.20	357.48	6.59
3261.00	35.10	15.60	3195.24	35.34	245.72	-5.63	245.79	358.69	6.10
3292.00	35.20	18.90	3220.59	43.40	262.76	-.34	262.76	359.93	6.14
3324.00	35.60	21.80	3246.67	52.65	280.13	6.11	280.20	1.25	5.40
3355.00	36.80	23.90	3271.69	62.47	297.00	13.22	297.30	2.55	5.57
3387.00	38.70	25.50	3296.99	73.50	314.80	21.41	315.52	3.89	6.68
3419.00	40.00	27.30	3321.74	85.43	332.97	30.44	334.35	5.22	5.41
3450.00	41.40	29.10	3345.24	97.81	350.78	39.99	353.05	6.50	5.89
3482.00	42.90	30.40	3368.96	111.43	369.42	50.65	372.87	7.81	5.42
3514.00	44.60	31.50	3392.08	125.81	388.39	62.03	393.32	9.07	5.82
3545.00	46.30	32.50	3413.82	140.47	407.13	73.74	413.75	10.27	5.95
3577.00	48.20	33.70	3435.55	156.40	426.81	86.58	435.50	11.47	6.54
3609.00	50.20	34.60	3456.45	173.15	446.85	100.18	457.94	12.64	6.60
3640.00	51.90	34.90	3475.94	189.99	466.66	113.92	480.36	13.72	5.54
3671.00	54.20	35.20	3494.58	207.40	486.94	128.15	503.52	14.74	7.46
3703.00	56.20	35.70	3512.84	225.99	508.34	143.39	528.18	15.75	6.38
3735.00	57.60	35.60	3530.31	245.02	530.12	159.01	553.46	16.70	4.38
3766.00	58.90	35.80	3546.62	263.75	551.53	174.39	578.44	17.55	4.23
3798.00	60.80	36.10	3562.70	283.50	573.93	190.64	604.76	18.37	5.99
3829.00	63.10	36.60	3577.27	303.15	595.96	206.85	630.84	19.14	7.55
3861.00	65.20	37.00	3591.22	324.00	619.02	224.10	658.34	19.90	6.66
3893.00	67.20	37.10	3604.14	345.28	642.39	241.74	686.37	20.62	6.26
3924.00	68.50	37.10	3615.82	366.17	665.29	259.06	713.95	21.28	4.19
3987.00	72.30	37.80	3636.95	409.59	712.39	295.15	771.11	22.50	6.12
4018.00	72.30	37.90	3646.38	431.34	735.71	313.27	799.63	23.06	.31
4050.00	72.60	38.90	3656.03	454.01	759.62	332.22	829.09	23.62	3.12
✕ 4082.00	73.20	40.40	✕ 3665.44	477.17	783.17	351.74	858.53	24.19	4.86
4119.00	74.10	41.00	3675.85	504.48	810.08	374.89	892.62	24.83	2.89
4148.00	74.80	41.50	3683.63	526.14	831.09	393.31	919.46	25.33	2.93

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Vertical Section FT	CLOSURE				Dogleg Severity Deg/100
					N-S FT	E-W FT	Distance FT	Direction Deg	
4180.00	76.70	44.60	3691.51	550.79	853.75	414.48	949.04	25.90	11.11
4212.00	80.40	49.50	3697.86	576.97	875.10	437.43	978.34	26.56	18.94
4243.00	82.30	54.40	3702.53	603.90	893.98	461.56	1006.10	27.31	16.78
4275.00	85.00	59.00	3706.07	633.01	911.43	488.13	1033.92	28.17	16.59
4306.00	87.10	64.20	3708.20	662.27	926.13	515.33	1059.85	29.09	18.05
4337.00	88.70	69.90	3709.34	692.40	938.21	543.84	1084.43	30.10	19.09
4368.00	90.40	74.80	3709.59	723.08	947.60	573.37	1107.57	31.18	16.73
4400.00	91.50	80.80	3709.05	755.03	954.36	604.63	1129.77	32.36	19.06
4432.00	92.00	87.10	3708.08	786.93	957.73	636.42	1149.90	33.60	19.74
4472.00	91.50	93.70	3706.85	826.29	957.45	676.38	1172.26	35.24	16.54
4503.00	92.10	93.20	3705.88	856.48	955.59	707.31	1188.88	36.51	2.52
4535.00	92.60	92.70	3704.57	887.69	953.94	739.24	1206.85	37.77	2.21
4566.00	92.80	92.20	3703.11	917.97	952.62	770.17	1225.01	38.95	1.74
4597.00	91.40	92.80	3701.97	948.26	951.27	801.12	1243.67	40.10	4.91
4629.00	91.70	92.90	3701.11	979.50	949.68	833.07	1263.29	41.26	.99
4661.00	92.00	93.40	3700.07	1010.70	947.92	865.01	1283.27	42.38	1.82
4692.00	90.80	94.30	3699.31	1040.84	945.84	895.93	1302.80	43.45	4.84
4723.00	91.10	94.20	3698.80	1070.94	943.54	926.84	1322.61	44.49	1.02
4755.00	91.40	94.10	3698.10	1102.02	941.23	958.75	1343.54	45.53	.99
4786.00	91.30	94.00	3697.37	1132.14	939.04	989.66	1364.26	46.50	.46
4817.00	91.50	93.60	3696.62	1162.29	936.98	1020.58	1385.47	47.45	1.44
4849.00	91.90	93.60	3695.67	1193.43	934.97	1052.50	1407.81	48.38	1.25
4880.00	92.10	93.20	3694.58	1223.62	933.14	1083.43	1429.88	49.26	1.44
4912.00	92.50	93.10	3693.30	1254.81	931.38	1115.36	1453.10	50.14	1.29
4943.00	93.20	93.10	3691.76	1285.01	929.71	1146.27	1475.90	50.96	2.26
4975.00	91.70	93.50	3690.39	1316.18	927.87	1178.19	1499.69	51.78	4.85
5006.00	92.10	93.60	3689.36	1346.35	925.95	1209.11	1522.94	52.55	1.33
5037.00	92.50	93.70	3688.12	1376.50	923.97	1240.03	1546.41	53.31	1.33
5069.00	90.10	92.50	3687.39	1407.71	922.25	1271.97	1571.13	54.06	8.38
5101.00	90.10	92.30	3687.34	1439.02	920.91	1303.94	1596.35	54.77	.62
5132.00	90.20	92.50	3687.26	1469.34	919.61	1334.91	1621.01	55.44	.72
5164.00	90.80	92.80	3686.98	1500.61	918.13	1366.88	1646.61	56.11	2.10
5195.00	91.00	93.10	3686.49	1530.87	916.53	1397.83	1671.52	56.75	1.16
5227.00	91.50	92.90	3685.79	1562.10	914.86	1429.78	1697.42	57.39	1.68
5258.00	91.70	93.10	3684.93	1592.34	913.24	1460.73	1722.71	57.99	.91
5289.00	91.90	93.50	3683.95	1622.54	911.45	1491.66	1748.08	58.57	1.44
5321.00	92.30	93.40	3682.78	1653.70	909.53	1523.58	1774.41	59.16	1.29
5352.00	92.40	93.70	3681.51	1683.86	907.61	1554.49	1800.06	59.72	1.02
5415.00	91.20	91.30	3679.53	1745.43	904.86	1617.40	1853.31	60.77	4.26
5477.00	91.20	90.90	3678.23	1806.34	903.67	1679.37	1907.07	61.72	.65
5540.00	93.00	91.30	3675.92	1868.21	902.47	1742.31	1962.17	62.62	2.93
5601.00	92.00	92.60	3673.26	1927.92	900.39	1803.22	2015.52	63.47	2.69
5663.00	90.50	93.40	3671.91	1988.41	897.15	1865.12	2069.67	64.31	2.74
5726.00	91.40	93.20	3670.86	2049.82	893.52	1928.00	2124.99	65.13	1.46
5789.00	92.90	93.10	3668.50	2111.23	890.06	1990.86	2180.77	65.91	2.39

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	
5851.00	92.10	92.90	3665.80	2171.68	886.82	2052.72	2236.09	66.63	1.33
5914.00	91.80	93.60	3663.65	2233.07	883.25	2115.58	2292.56	67.34	1.21
5977.00	92.00	95.20	3661.56	2294.17	878.42	2178.36	2348.80	68.04	2.56
6040.00	91.70	94.80	3659.53	2355.11	872.93	2241.08	2405.09	68.72	.79
6102.00	92.70	94.80	3657.15	2415.12	867.75	2302.82	2460.89	69.35	1.61
6166.00	89.80	92.30	3655.75	2477.42	863.79	2366.67	2519.38	69.95	5.98
6229.00	90.60	91.70	3655.53	2539.14	861.59	2429.63	2577.88	70.47	1.59
6292.00	91.60	91.20	3654.32	2600.96	860.00	2492.60	2636.79	70.96	1.77
6323.00	91.80	90.90	3653.40	2631.42	859.43	2523.58	2665.91	71.19	1.16
Last Nevis MWD Survey									
6354.00	92.20	90.70	3652.32	2661.89	859.00	2554.56	2695.11	71.41	1.44
Survey Projection to TD									
6402.00	92.20	90.39	3650.48	2709.11	858.54	2602.52	2740.47	71.74	.65