



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

Job Number: 71076
Company: Black Hills
Lease/Well: Jicarilla 460-21 #1
Location: Rio Arriba Co., NM
Rig Name: Patterson 744
RKB: 13'
G.L. or M.S.L.: 7268'

State/Country: NM/USA
Declination: 10.14651
Grid: -0.34
File name: Z:\BLACKH-1\71076J-1\46021122.SVY
Date/Time: 26-Mar-07 / 15:09
Curve Name: Actual Surveys

JIC 460-21 #1
SURF: 1456' FN 1476' FW
+ 118 1696
1574' FN 3172' FW
5304
2132' FE

30-039-25866 Surface 1456/N 1476/W
md 3926 TD 3874 BH1 1400/N 1598/W
md 5517 TD 5792 BH2 1574/N 2132/E
WINSERVE SURVEY CALCULATIONS
Minimum Curvature Method
Vertical Section Plane 95.34
Vertical Section Referenced to Wellhead
angular 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 Distance FT	Direction Deg	Dogleg Severity Deg/100
Gyro Tie-in									
3779.00	1.40	38.90	3778.10	22.68	58.00	28.20	64.49	25.93	.00
First Nevis MWD Survey									
3824.00	28.70	92.20	3821.18	34.00	58.01	39.57	70.22	34.30	61.96
3841.00	38.30	91.80	3835.34	43.35	57.69	48.93	75.65	40.31	56.49
3856.00	46.20	92.60	3846.44	53.42	57.30	59.00	82.25	45.84	52.79
3872.00	55.90	91.70	3856.48	65.82	56.84	71.42	91.28	51.49	60.78
3895.00	69.40	90.50	3867.03	86.15	56.46	91.80	107.77	58.41	58.88
3926.00	85.20	91.10	3873.82	116.20	56.03	121.94	134.20	65.32	51.00
3957.00	91.30	96.50	3874.77	147.15	53.98	152.83	162.09	70.55	26.27
3989.00	97.40	101.90	3872.34	178.96	48.89	184.31	190.68	75.14	25.42
4020.00	98.60	103.40	3868.02	209.40	42.17	214.26	218.37	78.87	6.16
4052.00	99.10	100.20	3863.10	240.82	35.70	245.20	247.79	81.72	10.00
4084.00	100.80	98.70	3857.57	272.25	30.53	276.29	277.97	83.70	7.04
4115.00	100.70	98.60	3851.79	302.66	25.95	306.40	307.50	85.16	.45
4147.00	100.20	99.10	3845.98	334.07	21.10	337.50	338.16	86.42	2.19
4178.00	99.70	98.90	3840.63	364.54	16.33	367.65	368.02	87.46	1.73
4209.00	99.70	99.40	3835.40	395.03	11.47	397.82	397.99	88.35	1.59
4241.00	99.20	99.70	3830.15	426.51	6.23	428.95	429.00	89.17	1.82
4272.00	99.40	100.20	3825.14	457.00	.95	459.08	459.08	89.88	1.72
4304.00	99.20	99.80	3819.97	488.48	-4.54	490.18	490.20	90.53	1.38
4335.00	99.70	97.90	3814.88	519.00	-9.24	520.40	520.48	91.02	6.26
4366.00	99.30	98.10	3809.76	549.54	-13.50	550.67	550.84	91.40	1.44

File amended C-102
(acreage plat) w/correct
BHL's

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	
4398.00	95.60	98.20	3805.61	581.23	-18.00	582.08	582.36	91.77	11.57
4429.00	95.30	98.10	3802.67	612.05	-22.37	612.63	613.03	92.09	1.02
4461.00	92.00	96.20	3800.63	643.96	-26.34	644.31	644.85	92.34	11.89
4492.00	92.00	96.00	3799.55	674.94	-29.64	675.11	675.76	92.51	.64
4523.00	92.60	95.90	3798.31	705.91	-32.85	705.92	706.68	92.66	1.96
4555.00	90.10	95.90	3797.55	737.90	-36.13	737.74	738.62	92.80	7.81
4585.00	90.20	95.80	3797.47	767.90	-39.19	767.58	768.58	92.92	.47
4618.00	90.50	95.40	3797.27	800.90	-42.41	800.42	801.55	93.03	1.52
4650.00	90.20	95.20	3797.08	832.90	-45.37	832.29	833.52	93.12	1.13
4681.00	90.00	95.00	3797.02	863.90	-48.12	863.16	864.51	93.19	.91
4712.00	89.80	95.20	3797.08	894.90	-50.88	894.04	895.49	93.26	.91
4742.00	89.40	95.20	3797.29	924.90	-53.60	923.92	925.47	93.32	1.33
4774.00	91.40	96.00	3797.06	956.89	-56.72	955.76	957.44	93.40	6.73
4805.00	90.80	95.90	3796.47	987.89	-59.93	986.59	988.41	93.48	1.96
4837.00	90.60	95.60	3796.08	1019.88	-63.14	1018.43	1020.38	93.55	1.13
4869.00	90.70	95.20	3795.71	1051.88	-66.15	1050.28	1052.36	93.60	1.29
4900.00	90.70	94.90	3795.34	1082.88	-68.88	1081.16	1083.35	93.65	.97
4931.00	91.10	94.60	3794.85	1113.87	-71.45	1112.05	1114.34	93.68	1.61
4962.00	91.40	94.40	3794.17	1144.86	-73.88	1142.95	1145.33	93.70	1.16
4994.00	91.40	95.80	3793.39	1176.85	-76.72	1174.81	1177.31	93.74	4.37
5025.00	91.80	96.00	3792.53	1207.84	-79.91	1205.63	1208.28	93.79	1.44
5056.00	92.10	95.90	3791.47	1238.82	-83.12	1236.45	1239.24	93.85	1.02
5088.00	89.80	96.20	3790.94	1270.81	-86.49	1268.26	1271.21	93.90	7.25
5119.00	89.60	95.80	3791.10	1301.81	-89.73	1299.09	1302.19	93.95	1.44
5150.00	89.70	95.60	3791.29	1332.80	-92.81	1329.94	1333.17	93.99	.72
5182.00	90.60	95.90	3791.21	1364.80	-96.02	1361.78	1365.16	94.03	2.96
5213.00	90.70	94.70	3790.86	1395.80	-98.88	1392.64	1396.15	94.06	3.88
5244.00	87.70	95.00	3791.29	1426.79	-101.50	1423.52	1427.14	94.08	9.73
5276.00	87.00	93.80	3792.77	1458.75	-103.95	1455.40	1459.10	94.09	4.34
5307.00	87.20	93.10	3794.34	1489.70	-105.82	1486.30	1490.06	94.07	2.35
5339.00	87.60	92.20	3795.79	1521.63	-107.29	1518.23	1522.02	94.04	3.08
5370.00	88.70	91.80	3796.79	1552.56	-108.37	1549.20	1552.98	94.00	3.78
5402.00	91.40	93.70	3796.76	1584.52	-109.91	1581.15	1584.97	93.98	10.32
5433.00	93.10	94.00	3795.54	1615.49	-111.99	1612.06	1615.95	93.97	5.57
Last Nevis MWD Survey									
5464.00	92.80	93.70	3793.95	1646.43	-114.07	1642.95	1646.90	93.97	1.37
Survey Projection to TD									
5517.00	92.00	94.00	3791.73	1699.37	-117.62	1695.78	1699.86	93.97	1.61