

Results of Directional Survey

HORIZONTAL LAT 2

API number:	30-005-29114		
OGRID:		Operator:	MARSHALL & WINSTON, INC
		Property:	CAPROCK 35 STATE # 1H

surface	ULSTR:	M	35	T 14S	R 31E
				660 FSL	330 FEL

BH Loc	ULSTR:	M	36	T 14S	R 31E
14301	MD	8859.5	TVD	410 FSL	701 FWL

Top Perf/OH	ULSTR:	M	35	T 14S	R 31E
9015	MD	8757.5	TVD	360 FSL	701 FWL

Bot Perf/OH	ULSTR:	P	36	T 14S	R 31E
13940	MD	8849.1	TVD	410 FSL	340 FWL

	MD	N/S	E/W	VD
	8987	-301.65	343.33	8752.32
TOP PERFS/OH	9015	-299.59	370.75	8757.52
	9019	-299.29	374.67	8758.26
	13911	-249.56	5261.03	8848.37
BOT PERFS/OH	13940	-249.51	5290.01	8849.13
	13943	-249.50	5293.01	8849.21

NEXT TO LAST	14229	-249.73	5578.90	8857.22
LAST READING	14237	-249.71	5586.90	8857.47
TD	14301	-249.55	5650.90	8859.47

Surface Location	660	FS	330	FW
Projected BHL	410	FS	5981	FW
Location of				
Top Perfs/OH	360	FS	701	FW
Bottom Perfs/OH	410	FS	5620	FW

SUMMARY of Subsurface Locations

Surface Location	M-35-14S-31E	660	FS	330	FW	Vert. Depth
Top Perfs/OH	M-35-14S-31E	360	FS	701	FW	8757.52
Bottom Perfs/OH	M-36-14S-31E	410	FS	5620	FW	8849.13
Projected TD	M-36-14S-31E	410	FS	5981	FW	8859.47

MAR 21 2012



PHOENIX
TECHNOLOGY SERVICES

Marshall & Winston Inc.

Chaves County, NM (Nad27)
Caprock Sec 35, T14S, R31E
Caprock State 35 1H
Wellbore #1

Survey: Phoenix ST MWD Surveys

Marshall & Winston

14 January, 2012

SUR: M-35-14s-31e, 660/S & 330/W
BHL: M-36-14s-31e, 410/S & 5981/W
API# 30-005-29114



PHOENIX
TECHNOLOGY SERVICES

Company:	Marshall & Winston Inc.	Local Co-ordinate Reference:	Well Caprock, State 35 1H
Project:	Chaves County, NM (Nad27)	TVD Reference:	WELL @ 4420.00usft (Original Well Elev +18' KB)
Site:	Caprock Sec 35, T14S, R31E	MD Reference:	WELL @ 4420.00usft (Original Well Elev + 18' KB)
Well:	Caprock State 35 1H	North Reference:	Grnd
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	GCR-DB v5000

Project:	Chaves County, NM (Nad27)	System Datum:	Mean Sea Level
Map System:	US State Plane 1927 (Exact solution)		
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site:	Caprock Sec 35, T14S, R31E		
Site Position:		Northing:	747,573.60 usft
From:	Map	Easting:	663,606.40 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	33° 3' 14.3892 N
		Longitude:	103° 47' 57.7203 W
		Grid Convergence:	0.29 °

Well	Caprock State 35 1H					
Well Position	+N/-S	0.00 usft	Northing:	747,573.60 usft	Latitude:	33° 3' 14.3892 N
	+E/-W	0.00 usft	Easting:	663,606.40 usft	Longitude:	103° 47' 57.7203 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,402.00 usft

Wellbore		Wellbore #1			
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010_14	10/10/11	7.72	60.91	49,051

Design:		Wellbore #1			
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.00	0.00	0.00	92.10	



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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	GCR DB v5000

Survey Program		Date	01/14/12		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	8,148.00	Baker MWD Surveys (Wellbore #1)	MWD	MWD - Standard	
8,157.00	14,237.00	Phoenix ST MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

Survey	MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
	8,100.00	0.39	79.02	3,679.72	8,099.72	9.95	-11.07	-11.43	0.00	747,583.55	663,595.33
	8,157.00	5.70	177.20	3,736.63	8,156.63	7.15	-10.75	-11.00	10.12	747,580.75	663,595.65
	8,171.00	6.50	178.60	3,750.55	8,170.55	5.67	-10.69	-10.89	5.81	747,579.27	663,595.71
	8,203.00	13.00	175.00	3,782.07	8,202.07	0.27	-10.33	-10.34	20.39	747,573.87	663,596.07
	8,234.00	19.30	167.20	3,811.83	8,231.83	-8.21	-8.89	-8.59	21.45	747,565.39	663,597.51
	8,266.00	23.70	154.80	3,841.62	8,261.62	-19.20	-4.98	-4.27	19.70	747,554.40	663,601.42
	8,297.00	24.70	147.80	3,869.90	8,289.90	-30.32	1.13	2.24	9.80	747,543.28	663,607.53
	8,329.00	26.40	145.40	3,898.77	8,318.77	-41.84	8.73	10.26	6.22	747,531.76	663,615.13
	8,360.00	26.70	144.40	3,926.50	8,346.50	-53.17	16.70	18.63	1.74	747,520.43	663,623.10
	8,392.00	25.90	145.50	3,955.19	8,375.19	-64.78	24.84	27.20	2.93	747,508.82	663,631.24
	8,424.00	27.00	152.40	3,983.84	8,403.84	-76.98	32.17	34.97	10.19	747,496.62	663,638.57
	8,455.00	28.70	155.40	4,011.25	8,431.25	-89.98	38.53	41.80	7.11	747,483.62	663,644.93
	8,487.00	33.00	156.10	4,038.72	8,458.72	-104.94	45.26	49.07	13.48	747,468.66	663,651.66
	8,518.00	38.20	156.80	4,063.92	8,483.92	-121.48	52.46	56.88	16.83	747,452.12	663,658.86
	8,550.00	41.40	158.20	4,088.50	8,508.50	-140.41	60.29	65.39	10.38	747,433.19	663,666.69
	8,582.00	43.70	158.10	4,112.07	8,532.07	-160.49	68.34	74.18	7.19	747,413.11	663,674.74
	8,614.00	45.30	154.20	4,134.90	8,554.90	-180.99	77.42	84.00	9.90	747,392.61	663,683.82
	8,646.00	46.20	148.30	4,157.24	8,577.24	-201.06	88.44	95.75	13.50	747,372.54	663,694.84
	8,677.00	47.70	140.90	4,178.41	8,598.41	-219.49	101.56	109.54	18.10	747,354.11	663,707.96
	8,709.00	48.90	132.80	4,199.72	8,619.72	-236.89	117.89	126.49	19.26	747,336.71	663,724.29
	8,741.00	52.00	126.60	4,220.11	8,640.11	-252.61	136.87	146.04	17.80	747,320.99	663,743.27



Phoenix Technology Services

Marshall & Winston



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Site:	Caprock Sec.35, T14S, R31E	MD Reference:	WELL @ 4420.00usft (Original Well Elev + 18" KB)
Well:	Caprock State 35 1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	GCR DB v5000

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
8,773.00	53.50	119.50	4,239.49	8,659.49	-266.47	158.21	167.86	18.27	747,307.13	663,764.61	
8,805.00	54.80	112.40	4,258.25	8,678.25	-277.80	181.51	191.57	18.43	747,295.80	663,787.91	
8,837.00	58.40	106.80	4,275.87	8,695.87	-286.73	206.66	217.03	18.43	747,286.87	663,813.06	
8,868.00	62.50	102.50	4,291.16	8,711.16	-293.52	232.75	243.35	17.90	747,280.08	663,839.15	
8,900.00	66.50	98.70	4,304.94	8,724.94	-298.82	261.13	271.90	16.46	747,274.78	663,867.53	
8,932.00	69.70	93.90	4,316.88	8,736.88	-302.06	290.62	301.50	17.13	747,271.54	663,897.02	
8,963.00	74.50	88.30	4,326.41	8,746.41	-302.61	320.10	330.97	23.13	747,270.99	663,926.50	
8,987.00	77.00	87.00	4,332.32	8,752.32	-301.65	343.33	354.16	11.66	747,271.95	663,949.73	
9,019.00	81.50	84.40	4,338.29	8,758.29	-299.29	374.67	385.39	16.17	747,274.31	663,981.07	
9,050.00	82.30	83.80	4,342.65	8,762.65	-296.14	405.20	415.78	3.21	747,277.46	664,011.60	
9,082.00	82.10	83.60	4,347.00	8,767.00	-292.66	436.71	447.14	0.88	747,280.94	664,043.11	
9,113.00	82.30	83.60	4,351.20	8,771.20	-289.23	467.24	477.52	0.65	747,284.37	664,073.64	
9,145.00	85.90	83.20	4,354.49	8,774.49	-285.58	498.85	508.98	11.32	747,288.02	664,105.25	
9,177.00	89.90	82.90	4,355.67	8,775.67	-281.71	530.59	540.55	12.54	747,291.89	664,136.99	
9,208.00	90.50	83.50	4,355.56	8,775.56	-278.04	561.37	571.18	2.74	747,295.56	664,167.77	
9,240.00	89.60	85.30	4,355.53	8,775.53	-274.91	593.21	602.89	6.29	747,298.69	664,199.61	
9,272.00	89.40	85.60	4,355.81	8,775.81	-272.37	625.11	634.67	1.13	747,301.23	664,231.51	
9,304.00	88.50	87.10	4,356.40	8,776.40	-270.34	657.04	666.51	5.47	747,303.26	664,263.44	
9,335.00	86.50	87.80	4,357.75	8,777.75	-268.96	687.98	697.37	6.83	747,304.64	664,294.38	
9,367.00	86.00	87.90	4,359.84	8,779.84	-267.76	719.89	729.22	1.59	747,305.84	664,326.29	
9,399.00	83.70	88.60	4,362.71	8,782.71	-266.79	751.74	761.01	7.51	747,306.81	664,358.14	
9,430.00	83.90	88.70	4,366.06	8,786.06	-266.06	782.55	791.77	0.72	747,307.54	664,388.95	
9,462.00	83.80	88.60	4,369.49	8,789.49	-265.31	814.36	823.53	0.44	747,308.29	664,420.76	
9,494.00	83.60	88.10	4,373.00	8,793.00	-264.40	846.15	855.27	1.67	747,309.20	664,452.55	
9,526.00	83.90	89.00	4,376.48	8,796.48	-263.59	877.95	887.02	2.95	747,310.01	664,484.35	
9,557.00	85.60	88.80	4,379.32	8,799.32	-263.00	908.81	917.84	5.52	747,310.60	664,515.21	
9,588.00	86.60	89.40	4,381.43	8,801.43	-262.51	939.74	948.73	3.76	747,311.09	664,546.14	



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Well:	Caprock State 35 1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	GCR DB v5000

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
9,619.00	87.60	89.90	4,383.00	8,803.00	-262.32	970.70	979.66	3.61	747,311.28	664,577.10	
9,651.00	87.20	89.50	4,384.45	8,804.45	-262.16	1,002.66	1,011.60	1.77	747,311.44	664,609.06	
9,683.00	86.80	89.50	4,386.12	8,806.12	-261.88	1,034.62	1,043.52	1.25	747,311.72	664,641.02	
9,715.00	87.20	90.20	4,387.80	8,807.80	-261.79	1,066.57	1,075.45	2.52	747,311.81	664,672.97	
9,746.00	89.10	90.30	4,388.80	8,808.80	-261.93	1,097.56	1,106.42	6.14	747,311.67	664,703.96	
9,778.00	88.80	90.30	4,389.39	8,809.39	-262.10	1,129.55	1,138.40	0.94	747,311.50	664,735.95	
9,810.00	88.70	90.50	4,390.08	8,810.08	-262.32	1,161.54	1,170.37	0.70	747,311.28	664,767.94	
9,841.00	88.40	90.50	4,390.87	8,810.87	-262.59	1,192.53	1,201.35	0.97	747,311.01	664,798.93	
9,873.00	88.30	90.50	4,391.79	8,811.79	-262.87	1,224.52	1,233.33	0.31	747,310.73	664,830.92	
9,905.00	88.40	90.90	4,392.71	8,812.71	-263.26	1,256.50	1,265.30	1.29	747,310.34	664,862.90	
9,937.00	88.20	90.80	4,393.66	8,813.66	-263.74	1,288.48	1,297.28	0.70	747,309.86	664,894.88	
9,968.00	88.40	90.90	4,394.58	8,814.58	-264.20	1,319.47	1,328.26	0.72	747,309.40	664,925.87	
10,000.00	88.20	90.90	4,395.53	8,815.53	-264.70	1,351.45	1,360.24	0.62	747,308.90	664,957.85	
10,032.00	88.10	91.20	4,396.56	8,816.56	-265.28	1,383.43	1,392.22	0.99	747,308.32	664,989.83	
10,063.00	87.80	91.20	4,397.67	8,817.67	-265.93	1,414.40	1,423.19	0.97	747,307.67	665,020.80	
10,095.00	88.20	91.40	4,398.79	8,818.79	-266.66	1,446.37	1,455.17	1.40	747,306.94	665,052.77	
10,127.00	89.60	90.70	4,399.40	8,819.40	-267.24	1,478.36	1,487.16	4.89	747,306.36	665,084.76	
10,159.00	90.50	89.90	4,399.37	8,819.37	-267.41	1,510.36	1,519.14	3.76	747,306.19	665,116.76	
10,190.00	90.40	90.10	4,399.13	8,819.13	-267.41	1,541.36	1,550.12	0.72	747,306.19	665,147.76	
10,222.00	90.20	90.10	4,398.96	8,818.96	-267.47	1,573.36	1,582.10	0.62	747,306.13	665,179.76	
10,254.00	89.90	90.20	4,398.94	8,818.94	-267.55	1,605.36	1,614.08	0.99	747,306.05	665,211.76	
10,285.00	89.50	90.00	4,399.10	8,819.10	-267.61	1,636.36	1,645.06	1.44	747,305.99	665,242.76	
10,317.00	89.20	90.00	4,399.46	8,819.46	-267.61	1,668.35	1,677.04	0.94	747,305.99	665,274.75	
10,349.00	89.10	89.90	4,399.94	8,819.94	-267.58	1,700.35	1,709.01	0.44	747,306.02	665,306.75	
10,380.00	89.90	90.30	4,400.21	8,820.21	-267.63	1,731.35	1,739.99	2.89	747,305.97	665,337.75	
10,412.00	91.00	90.30	4,399.95	8,819.95	-267.80	1,763.35	1,771.98	3.44	747,305.80	665,369.75	
10,444.00	91.10	90.50	4,399.37	8,819.37	-268.02	1,795.34	1,803.96	0.70	747,305.58	665,401.74	



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10,476.00	91.10	90.50	4,398.75	8,818.75	-268.30	1,827.33	1,835.94	0.00	747,305.30	665,433.73	
10,508.00	91.10	90.40	4,398.14	8,818.14	-268.55	1,859.33	1,867.92	0.31	747,305.05	665,465.73	
10,539.00	90.90	90.20	4,397.60	8,817.60	-268.72	1,890.32	1,898.90	0.91	747,304.88	665,496.72	
10,571.00	90.10	89.90	4,397.32	8,817.32	-268.74	1,922.32	1,930.88	2.67	747,304.86	665,528.72	
10,603.00	89.80	89.70	4,397.35	8,817.35	-268.63	1,954.32	1,962.85	1.13	747,304.97	665,560.72	
10,634.00	88.50	89.90	4,397.81	8,817.81	-268.52	1,985.32	1,993.82	4.24	747,305.08	665,591.72	
10,666.00	88.20	89.90	4,398.73	8,818.73	-268.47	2,017.30	2,025.78	0.94	747,305.13	665,623.70	
10,697.00	87.90	89.70	4,399.78	8,819.78	-268.36	2,048.28	2,056.74	1.16	747,305.24	665,654.68	
10,729.00	87.70	89.80	4,401.01	8,821.01	-268.22	2,080.26	2,088.69	0.70	747,305.38	665,686.66	
10,760.00	87.30	89.60	4,402.36	8,822.36	-268.06	2,111.23	2,119.63	1.44	747,305.54	665,717.63	
10,786.00	87.10	87.60	4,403.63	8,823.63	-267.42	2,137.19	2,145.55	7.72	747,306.18	665,743.59	
10,817.00	87.20	87.60	4,405.18	8,825.18	-266.13	2,168.12	2,176.42	0.32	747,307.47	665,774.52	
10,849.00	87.20	87.70	4,406.74	8,826.74	-264.82	2,200.06	2,208.29	0.31	747,308.78	665,806.46	
10,880.00	87.20	87.50	4,408.25	8,828.25	-263.52	2,230.99	2,239.15	0.64	747,310.08	665,837.39	
10,912.00	87.40	87.70	4,409.76	8,829.76	-262.18	2,262.93	2,271.02	0.88	747,311.42	665,869.33	
10,943.00	88.20	88.50	4,410.95	8,830.95	-261.15	2,293.89	2,301.92	3.65	747,312.45	665,900.29	
10,975.00	88.80	88.70	4,411.79	8,831.79	-260.37	2,325.87	2,333.85	1.98	747,313.23	665,932.27	
11,006.00	88.60	88.60	4,412.49	8,832.49	-259.64	2,356.85	2,364.78	0.72	747,313.96	665,963.25	
11,038.00	88.70	88.90	4,413.25	8,833.25	-258.94	2,388.84	2,396.72	0.99	747,314.66	665,995.24	
11,070.00	88.50	89.50	4,414.03	8,834.03	-258.50	2,420.82	2,428.67	1.98	747,315.10	666,027.22	
11,101.00	88.50	89.50	4,414.84	8,834.84	-258.23	2,451.81	2,459.63	0.00	747,315.37	666,058.21	
11,133.00	88.00	89.90	4,415.82	8,835.82	-258.06	2,483.80	2,491.58	2.00	747,315.54	666,090.20	
11,165.00	87.80	90.00	4,416.99	8,836.99	-258.03	2,515.78	2,523.54	0.70	747,315.57	666,122.18	
11,197.00	88.30	90.30	4,418.08	8,838.08	-258.12	2,547.76	2,555.50	1.82	747,315.48	666,154.16	
11,229.00	88.00	90.10	4,419.11	8,839.11	-258.23	2,579.74	2,587.47	1.13	747,315.37	666,186.14	
11,260.00	88.40	90.10	4,420.08	8,840.08	-258.28	2,610.72	2,618.44	1.29	747,315.32	666,217.12	
11,292.00	90.00	90.40	4,420.53	8,840.53	-258.42	2,642.72	2,650.41	5.09	747,315.18	666,249.12	



Phoenix Technology Services

Marshall & Winston



Company:	Marshall & Winston Inc.	Local Co-ordinate Reference:	Well Caprock State 35-1H
Project:	Chaves County, NM (Nad27)	TVD Reference:	WELL @ 4420.00usft (Original Well Elev + 18' KB)
Site:	Caprock Sec 35, T14S, R31E	MD Reference:	WELL @ 4420.00usft (Original Well Elev + 18' KB)
Well:	Caprock State 35 1H	North Reference:	Grid.
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	GCR DB v5000

Survey												
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)		
11,324.00	90.50	90 60	4,420.39	8,840 39	-258 70	2,674.72	2,682.40	1 68	747,314.90	666,281.12		
11,356.00	90.40	90.30	4,420.14	8,840 14	-258 95	2,706.72	2,714 39	0 99	747,314.65	666,313 12		
11,387.00	90.30	90.00	4,419 95	8,839.95	-259.03	2,737.72	2,745 37	1.02	747,314 57	666,344.12		
11,419.00	90.30	89 60	4,419.78	8,839.78	-258 92	2,769 71	2,777.34	1.25	747,314.68	666,376.11		
11,450.00	90.40	89.60	4,419.59	8,839.59	-258 71	2,800 71	2,808.31	0.32	747,314.89	666,407.11		
11,481.00	90.10	89.10	4,419 46	8,839.46	-258.35	2,831.71	2,839 28	1.88	747,315.25	666,438.11		
11,513.00	89.70	89.20	4,419.51	8,839 51	-257.88	2,863.71	2,871.23	1.29	747,315 72	666,470.11		
11,545.00	89.50	89.80	4,419.74	8,839 74	-257 60	2,895.71	2,903.20	1.98	747,316.00	666,502 11		
11,576.00	89.80	90 70	4,419.93	8,839.93	-257 73	2,926.70	2,934.18	3 06	747,315 87	666,533 10		
11,608.00	90.00	90 60	4,419.98	8,839 98	-258.10	2,958.70	2,966 17	0.70	747,315.50	666,565.10		
11,638.00	90.90	90.70	4,419 75	8,839 75	-258.44	2,988.70	2,996 16	3.02	747,315 16	666,595 10		
11,669.00	91.10	90.70	4,419.21	8,839.21	-258.82	3,019 69	3,027.15	0.65	747,314 78	666,626.09		
11,701.00	91.20	90.70	4,418.56	8,838.56	-259.21	3,051.68	3,059.13	0.31	747,314.39	666,658.08		
11,732.00	91.40	90 30	4,417.86	8,837 86	-259.48	3,082 67	3,090.11	1.44	747,314.12	666,689.07		
11,763.00	91.60	90.30	4,417.05	8,837.05	-259.64	3,113.66	3,121 09	0.65	747,313.96	666,720 06		
11,795.00	91.90	89.90	4,416.07	8,836.07	-259 70	3,145.65	3,153.05	1.56	747,313.90	666,752.05		
11,826.00	91.90	89.90	4,415 04	8,835.04	-259 64	3,176.63	3,184.01	0.00	747,313 96	666,783.03		
11,857.00	90 90	90 00	4,414.29	8,834.29	-259.62	3,207.62	3,214 98	3.24	747,313.98	666,814.02		
11,889.00	90 80	89.90	4,413.81	8,833.81	-259.59	3,239 62	3,246.95	0.44	747,314.01	666,846.02		
11,921 00	90 90	89.70	4,413 34	8,833.34	-259 48	3,271.61	3,278.92	0 70	747,314.12	666,878 01		
11,952.00	90.70	89.60	4,412.90	8,832.90	-259.29	3,302.61	3,309.89	0.72	747,314.31	666,909.01		
11,984 00	90.60	89.30	4,412.54	8,832 54	-258.98	3,334.61	3,341.86	0.99	747,314.62	666,941.01		
12,016.00	90.50	89 40	4,412.23	8,832.23	-258.62	3,366.60	3,373.82	0.44	747,314 98	666,973.00		
12,047.00	90.40	89.60	4,411.99	8,831 99	-258 35	3,397 60	3,404 79	0.72	747,315 25	667,004.00		
12,079 00	90 50	89 30	4,411.74	8,831.74	-258.04	3,429.60	3,436 75	0 99	747,315.56	667,036.00		
12,110.00	90 50	89.10	4,411 47	8,831.47	-257.61	3,460.59	3,467.71	0 65	747,315.99	667,066.99		
12,142.00	90.50	89.10	4,411.19	8,831 19	-257.10	3,492 59	3,499.66	0 00	747,316.50	667,098.99		

Company:	Marshall & Winston Inc.	Local Co-ordinate Reference:	Well Caprock State 35 1H
Project:	Chaves County, NM (Nad27)	TVD Reference:	WELL @ 4420.00usft (Original Well Elev + 18' KB)
Site:	Caprock Sec 35, T14S, R31E	MD Reference:	WELL @ 4420.00usft (Original Well Elev + 18' KB)
Well:	Caprock State 35 1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	GCR DB v5000

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
12,173.00	89 90	89 20	4,411.08	8,831.08	-256.64	3,523.58	3,530.62	1.96	747,316.96	667,129.98	
12,205.00	90.00	89.20	4,411.11	8,831.11	-256.20	3,555.58	3,562.58	0.31	747,317.40	667,161.98	
12,237.00	90.00	89.30	4,411.11	8,831.11	-255.78	3,587.58	3,594.54	0.31	747,317.82	667,193.98	
12,268.00	90.10	89.30	4,411.08	8,831.08	-255.40	3,618.58	3,625.50	0.32	747,318.20	667,224.98	
12,300.00	90.10	89.20	4,411.03	8,831.03	-254.98	3,650.57	3,657.47	0.31	747,318.62	667,256.97	
12,331.00	90.10	89 20	4,410.97	8,830.97	-254.55	3,681.57	3,688.43	0.00	747,319.05	667,287.97	
12,363.00	89.60	89.70	4,411.06	8,831.06	-254.24	3,713.57	3,720.39	2.21	747,319.36	667,319.97	
12,395.00	89.90	89.40	4,411.20	8,831.20	-253.99	3,745.57	3,752.36	1.33	747,319.61	667,351.97	
12,426.00	89.90	89 20	4,411.25	8,831.25	-253.61	3,776.57	3,783.32	0.65	747,319.99	667,382.97	
12,458.00	90.00	89.20	4,411.28	8,831.28	-253.16	3,808.56	3,815.28	0.31	747,320.44	667,414.96	
12,489.00	89.50	89.40	4,411.41	8,831.41	-252.78	3,839.56	3,846.24	1.74	747,320.82	667,445.96	
12,520.00	89.70	89.30	4,411.63	8,831.63	-252.43	3,870.56	3,877.21	0.72	747,321.17	667,476.96	
12,551.00	89.00	89.90	4,411.98	8,831.98	-252.22	3,901.55	3,908.18	2.97	747,321.38	667,507.95	
12,582.00	88 90	90.10	4,412.55	8,832.55	-252.22	3,932.55	3,939.15	0.72	747,321.38	667,538.95	
12,614.00	88.70	90.00	4,413.22	8,833.22	-252.24	3,964.54	3,971.12	0.70	747,321.36	667,570.94	
12,645.00	88.70	90 10	4,413.92	8,833.92	-252.27	3,995.53	4,002.09	0.32	747,321.33	667,601.93	
12,677.00	88.30	90.50	4,414.76	8,834.76	-252.44	4,027.52	4,034.07	1.77	747,321.16	667,633.92	
12,708.00	88.30	90 50	4,415.68	8,835.68	-252.71	4,058.51	4,065.04	0.00	747,320.89	667,664.91	
12,740.00	88.30	90.50	4,416.63	8,836.63	-252.99	4,090.49	4,097.01	0.00	747,320.61	667,696.89	
12,772.00	88.30	90 40	4,417.58	8,837.58	-253.24	4,122.48	4,128.99	0.31	747,320.36	667,728.88	
12,804.00	88.40	90.40	4,418.50	8,838.50	-253.46	4,154.46	4,160.96	0.31	747,320.14	667,760.86	
12,836.00	88.70	90.20	4,419.31	8,839.31	-253.63	4,186.45	4,192.93	1.13	747,319.97	667,792.85	
12,867.00	88.70	90.40	4,420.01	8,840.01	-253.79	4,217.44	4,223.91	0.64	747,319.81	667,823.84	
12,898.00	88 90	90 30	4,420.66	8,840.66	-253.98	4,248.44	4,254.89	0.72	747,319.62	667,854.84	
12,930.00	89.10	90.00	4,421.22	8,841.22	-254.07	4,280.43	4,286.87	1.13	747,319.53	667,886.83	
12,962.00	89.10	89 90	4,421.72	8,841.72	-254.04	4,312.43	4,318.84	0.31	747,319.56	667,918.83	
12,994.00	89.20	89.90	4,422.20	8,842.20	-253.98	4,344.42	4,350.81	0.31	747,319.62	667,950.82	



Phoenix Technology Services

Marshall & Winston



Company:	Marshall & Winston Inc.	Local Co-ordinate Reference:	Well: Caprock State 35 1H
Project:	Chaves County, NM (Nad27)	TVD Reference:	WELL @ 4420.00usft (Original Well Elev + 18' KB)
Site:	Caprock Sec 35, T14S, R31E	MD Reference:	WELL @ 4420.00usft (Original Well Elev + 18' KB)
Well:	Caprock State 35 1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	GCR DB v5000

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
13,025.00	89.50	90 20	4,422.55	8,842.55	-254.01	4,375.42	4,381.79	1.37	747,319.59	667,981.82	
13,057.00	89.40	90 30	4,422.86	8,842.86	-254.15	4,407.42	4,413.77	0.44	747,319.45	668,013.82	
13,089.00	89.70	90.00	4,423.11	8,843.11	-254.23	4,439.42	4,445.75	1.33	747,319.37	668,045.82	
13,121.00	89.70	90 00	4,423.28	8,843.28	-254.23	4,471.42	4,477.73	0.00	747,319.37	668,077.82	
13,152.00	90.00	89.80	4,423.36	8,843.36	-254.18	4,502.42	4,508.71	1.16	747,319.42	668,108.82	
13,183.00	90 20	92.60	4,423.30	8,843.30	-254.83	4,533.41	4,539.70	9.06	747,318.77	668,139.81	
13,214.00	90.00	92 30	4,423.25	8,843.25	-256.15	4,564.38	4,570.70	1.16	747,317.45	668,170.78	
13,246.00	89.90	92.40	4,423.28	8,843.28	-257.46	4,596.35	4,602.70	0.44	747,316.14	668,202.75	
13,278.00	88.80	92.00	4,423.64	8,843.64	-258.69	4,628.33	4,634.70	3.66	747,314.91	668,234.73	
13,310.00	88.80	91.90	4,424.31	8,844.31	-259.78	4,660.30	4,666.69	0.31	747,313.82	668,266.70	
13,342.00	88.50	91.00	4,425.06	8,845.06	-260.59	4,692.28	4,698.68	2.96	747,313.01	668,298.68	
13,374.00	88.40	90.70	4,425.93	8,845.93	-261.07	4,724.27	4,730.66	0.99	747,312.53	668,330.67	
13,405.00	88.50	90.50	4,426.77	8,846.77	-261.39	4,755.25	4,761.64	0.72	747,312.21	668,361.65	
13,437.00	88.60	90.30	4,427.58	8,847.58	-261.61	4,787.24	4,793.61	0.70	747,311.99	668,393.64	
13,469.00	88.80	90 00	4,428.30	8,848.30	-261.70	4,819.23	4,825.59	1.13	747,311.90	668,425.63	
13,500.00	89.30	89 00	4,428.82	8,848.82	-261.43	4,850.23	4,856.55	3.61	747,312.17	668,456.63	
13,532.00	89.50	88.90	4,429.15	8,849.15	-260.84	4,882.22	4,888.50	0.70	747,312.76	668,488.62	
13,564.00	89.70	88.70	4,429.38	8,849.38	-260.17	4,914.21	4,920.45	0.88	747,313.43	668,520.61	
13,595.00	89.90	88.50	4,429.48	8,849.48	-259.41	4,945.20	4,951.39	0.91	747,314.19	668,551.60	
13,627.00	90.10	88.20	4,429.48	8,849.48	-258.49	4,977.19	4,983.32	1.13	747,315.11	668,583.59	
13,659.00	90.30	88.20	4,429.37	8,849.37	-257.49	5,009.17	5,015.24	0.62	747,316.11	668,615.57	
13,690.00	90.30	88.00	4,429.21	8,849.21	-256.46	5,040.16	5,046.17	0.65	747,317.14	668,646.56	
13,722.00	90.40	87.70	4,429.02	8,849.02	-255.26	5,072.13	5,078.08	0.99	747,318.34	668,678.53	
13,753.00	90 80	87 50	4,428.69	8,848.69	-253.96	5,103.10	5,108.98	1.44	747,319.64	668,709.50	
13,785.00	90.80	87.50	4,428.24	8,848.24	-252.56	5,135.07	5,140.88	0.00	747,321.04	668,741.47	
13,817.00	90.00	88.40	4,428.02	8,848.02	-251.42	5,167.05	5,172.79	3.76	747,322.18	668,773.45	
13,848.00	89.80	88.60	4,428.07	8,848.07	-250.61	5,198.04	5,203.73	0.91	747,322.99	668,804.44	



Phoenix Technology Services

Marshall & Winston



Company: Marshall & Winston, Inc.
Project: Chaves County, NM (Nad27)
Site: Caprock Sec 35, T14S, R31E
Well: Caprock State 35 1H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Caprock State 35 1H
TVD Reference: WELL @ 4420.00usft (Original Well Elev + 18' KB)
MD Reference: WELL @ 4420 00usft (Original Well Elev + 18' KB)
North Reference: Grd
Survey Calculation Method: Minimum Curvature
Database: GCR DB v5000

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg: (°/100usft)	Northing (usft)	Easting (usft)	
13,880.00	90.10	89.00	4,428.10	8,848.10	-249.94	5,230.03	5,235.68	1.56	747,323.66	668,836.43	
13,911.00	88.90	89.60	4,428.37	8,848.37	-249.56	5,261.03	5,266.64	4.33	747,324.04	668,867.43	
13,943.00	88.10	90.20	4,429.21	8,849.21	-249.50	5,293.01	5,298.60	3.12	747,324.10	668,899.41	
13,975.00	88.00	90.40	4,430.30	8,850.30	-249.67	5,325.00	5,330.57	0.70	747,323.93	668,931.40	
14,007.00	88.20	90.30	4,431.36	8,851.36	-249.87	5,356.98	5,362.54	0.70	747,323.73	668,963.38	
14,038.00	88.40	89.90	4,432.28	8,852.28	-249.92	5,387.96	5,393.50	1.44	747,323.68	668,994.36	
14,070.00	88.70	89.80	4,433.09	8,853.09	-249.84	5,419.95	5,425.47	0.99	747,323.76	669,026.35	
14,102.00	88.60	90.30	4,433.84	8,853.84	-249.86	5,451.94	5,457.44	1.59	747,323.74	669,058.34	
14,134.00	88.40	89.90	4,434.68	8,854.68	-249.92	5,483.93	5,489.41	1.40	747,323.68	669,090.33	
14,165.00	88.50	89.90	4,435.52	8,855.52	-249.87	5,514.92	5,520.37	0.32	747,323.73	669,121.32	
14,197.00	88.60	89.90	4,436.33	8,856.33	-249.81	5,546.91	5,552.34	0.31	747,323.79	669,153.31	
14,229.00	88.20	89.80	4,437.22	8,857.22	-249.73	5,578.90	5,584.30	1.29	747,323.87	669,185.30	
14,237.00	88.30	89.90	4,437.47	8,857.47	-249.71	5,586.90	5,592.29	1.77	747,323.89	669,193.30	

Checked By: _____ Approved By: _____ Date: _____