

District I
1625 N. French Dr., Hobbs, NM 88240
Phone (575) 393-6161 Fax (575) 393-0720
District II
811 S First St., Artesia, NM 88210
Phone (575) 748-1283 Fax (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone (505) 334-6178 Fax (505) 334-6170
District IV
1220 S St Francis Dr., Santa Fe, NM 87505
Phone (505) 476-3460 Fax (505) 476-3462

State of New Mexico
Energy Minerals and Natural Resources
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-101
Revised August 1, 2011

Permit

HOBBS OCD
NOV 01 2011
RECEIVED

*** AMENDED REPORT**

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

¹ Operator Name and Address Marshall & Winston Incorporated P.O.B. 50880, Midland, TX 79710-0880		² OGRID Number 014187
		³ API Number 30-005-29114
⁴ Property Code 37951	⁵ Property Name Caprock State 35	⁶ Well No. 1 H

⁷ Surface Location

UL - Lot M	Section 35	Township 14S	Range 3 / E	Lot Idn	Feet from 660	N/S Line South	Feet From 330	E/W Line West	County Chaves
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⁸ Pool Information (Pool Code: 97715)

Wildcat Abo Wolfcamp BHL: N-36-14S-31E, 330' FSL & 2310' FWL,	Chaves
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Additional Well Information

⁹ Work Type N	¹⁰ Well Type O	¹¹ Cable/Rotary R	¹² Lease Type S	¹³ Ground Level Elevation 4402'
¹⁴ Multiple N	¹⁵ Proposed Depth 8730' TVD 15,933'	¹⁶ Formation MD, Lower Abo	¹⁷ Contractor Patterson	¹⁸ Spud Date 11/15/2011
Depth to Ground water		Distance from nearest fresh water well		Distance to nearest surface water

¹⁹ Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
H-60	17.5	13.375	48.0	340'		0'
J-55 std	12.25	9.625	36.0	3,030'		0'
J-55 std	12.25	9.625	40.0	" - 3,950		0'
P-110 ltc	8.25	7.0	26.0	8974'		0'
P-110 ltc	6.125	4.5	11.6	8,250-15,933		8250'

Casing/Cement Program: Additional Comments

This is an amendment to original APD, changing the BHL and 4.5" long string.

Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Annular Hydril with Double Rams	3K to 3950' 5K below 3950'	1500 psi on 3M 3500 psi on 5M	Hydril/Schaffer

I hereby certify that the information given above is true and complete to the best of my knowledge and belief
I further certify that the drilling pit will be constructed according to NMOCD guidelines ☐, a general permit ☐, or an (attached) alternative OCD-approved plan ☒. Steel Pits and Roll Offs

Printed name: Vernon D. Dyer
Title Agent representative

E-mail Address: Vdyeroil@cableone.com

Date 11-1-2011 Phone (575) 420-0355

OIL CONSERVATION DIVISION

Approved By

Title

Approved Date

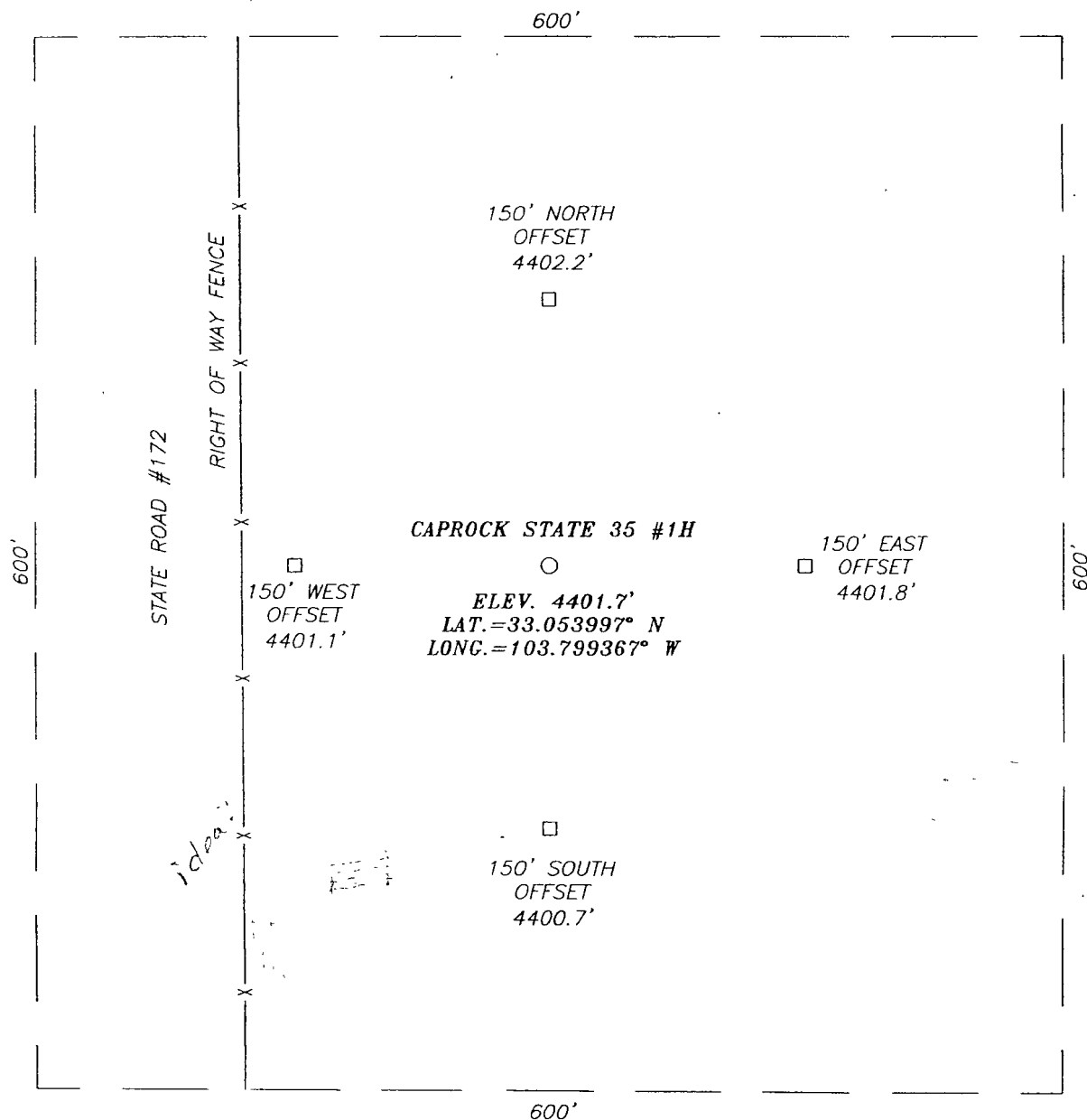
Expiration Date.

NOV 02 2011

Conditions of Approval Attached

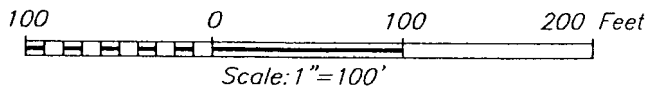
NOV 02 2011

SECTION 35, TOWNSHIP 14 SOUTH, RANGE 31 EAST, N.M.P.M.,
 CHAVES COUNTY, NEW MEXICO



DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF ST. HWY. #172 AND VENUS ROAD, GO NORTH ON ST. HWY. #172 APPROX. 660 FEET. THIS LOCATION IS APPROX. 200 FEET EAST OF RIGHT OF WAY FENCE.



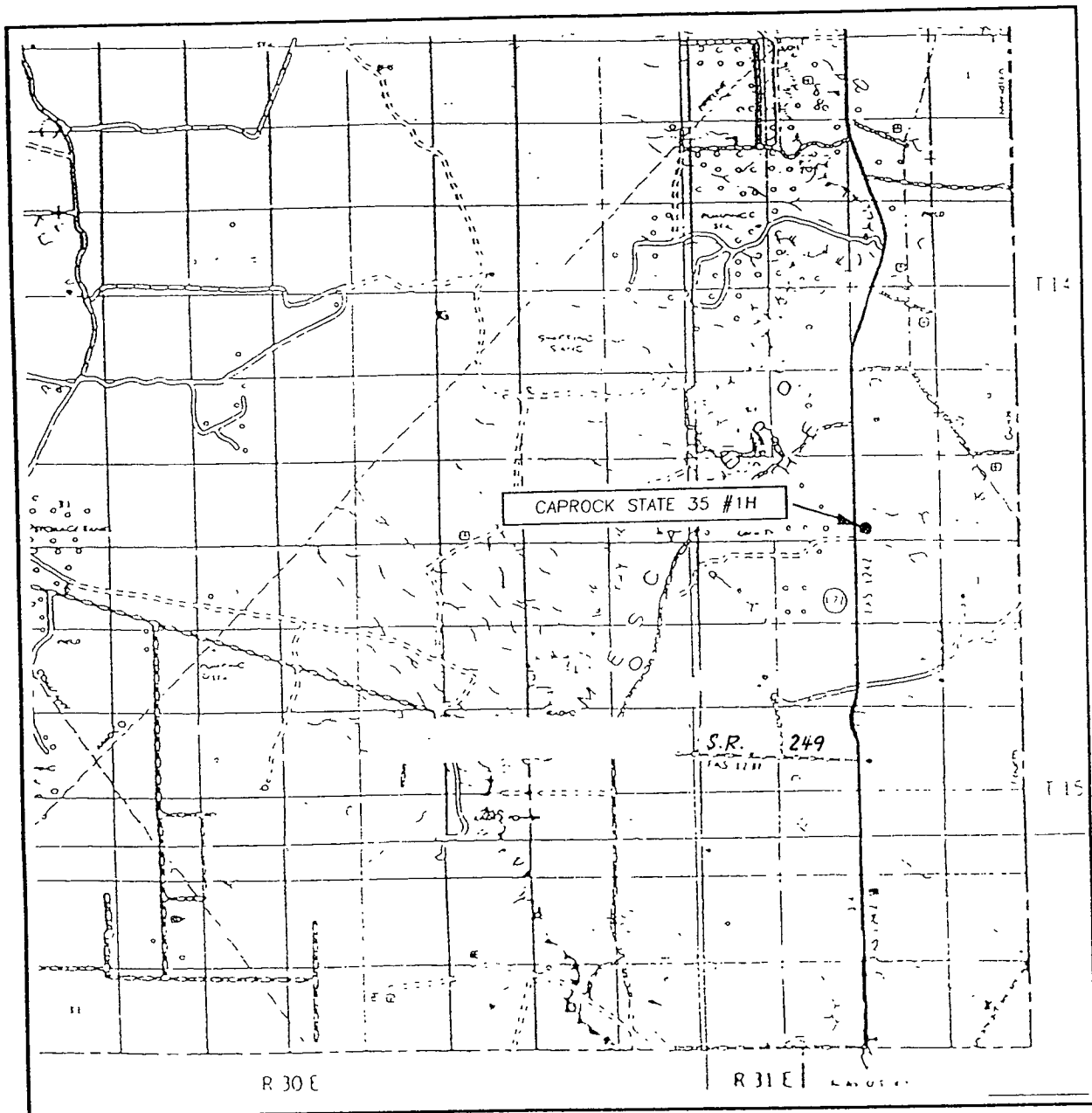
MARSHALL & WINSTON, INC.

CAPROCK STATE 35 #1H WELL
 LOCATED 660 FEET FROM THE SOUTH LINE
 AND 330 FEET FROM THE WEST LINE OF SECTION 35,
 TOWNSHIP 14 SOUTH, RANGE 31 EAST, N.M.P.M.,
 CHAVES COUNTY, NEW MEXICO.

Survey Date: 9/22/09	Sheet 1 of 1 Sheets
W.O. Number: 09.11.0871	Dr By: LA
Date: 9/30/09	09110871
	Scale: 1"=100'

PROVIDING SURVEYING SERVICES
 SINCE 1946
JOHN WEST SURVEYING COMPANY
 412 N. DAL PASO
 HOBBS, N.M. 88240
 (575) 393-3117

VICINITY MAP



SCALE: 1" = 2 MILES

SEC. 35 TWP. 14-S RGE. 31-E

SURVEY N.M.P.M

COUNTY CHAVES STATE NEW MEXICO

DESCRIPTION 660' FSL & 330' FWL

ELEVATION 4402'

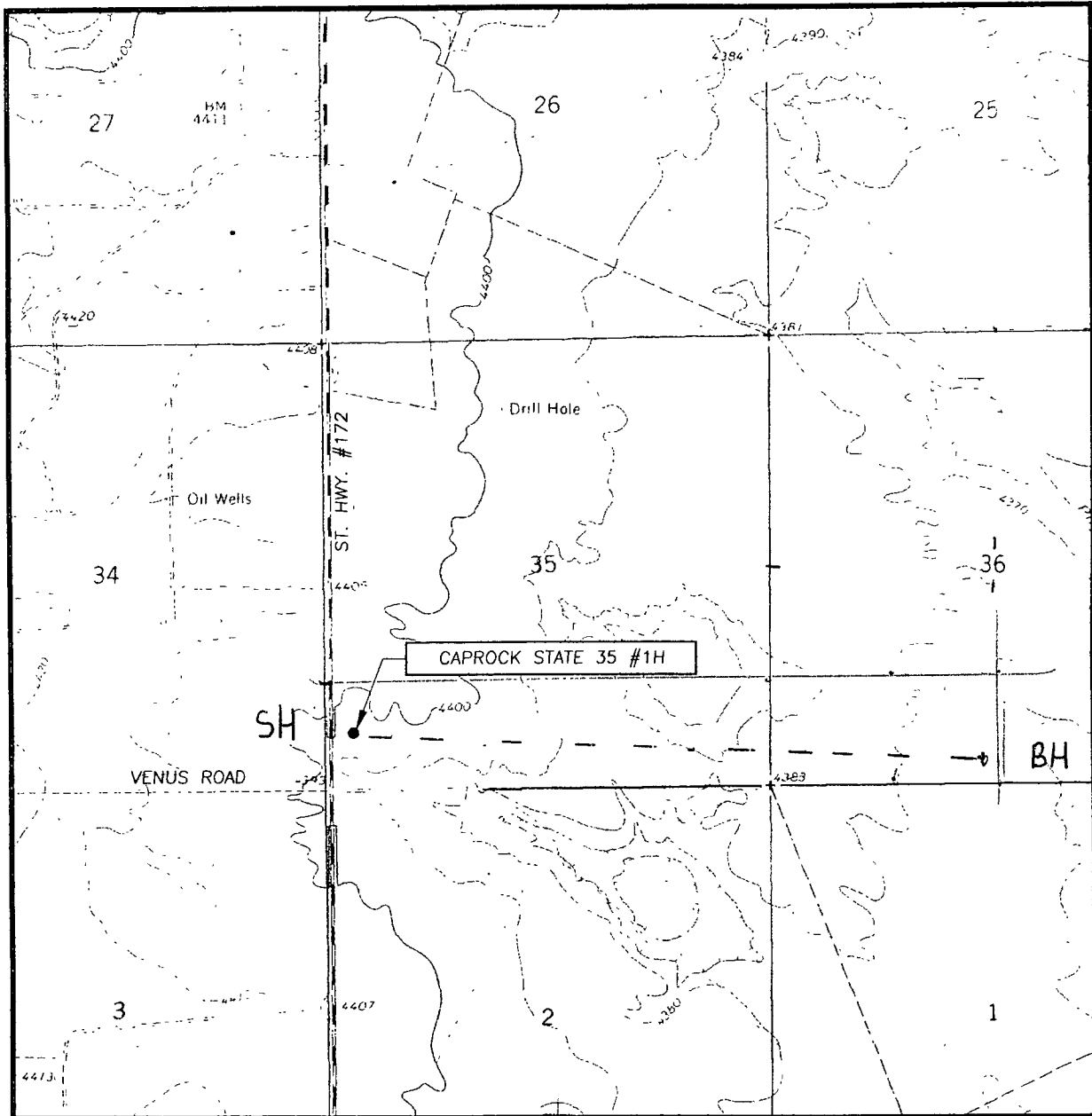
OPERATOR MARSHALL & WINSTON, INC.

LEASE CAPROCK STATE 35



PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(575) 393-3117

LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL:
CEDAR POINT SE, N.M. - 10'

SEC. 35 TWP. 14-S RGE. 31-E

SURVEY N.M.P.M.

COUNTY CHAVES STATE NEW MEXICO

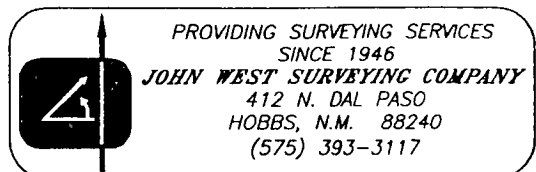
DESCRIPTION 660' FSL & 330' FWL

ELEVATION 4402'

OPERATOR MARSHALL & WINSTON, INC.

LEASE CAPROCK STATE 35

U.S.G.S. TOPOGRAPHIC MAP
CEDAR POINT SE, N.M.



COMPLETION PROGNOSIS
MARSHALL & WINSTON, INC.
CAPROCK STATE 35-1H
CHAVES COUNTY, NEW MEXICO

LOCATION:

SH: 660' FSL & 330' FWL, Sec. 35, T-14-S, R-31-E, Chaves County, New Mexico.
BH: 330' FSL & 2310' FWL, Sec. 36, T-14-S, R-31-E, Chaves County, New Mexico.

ELEVATION: 4402' GL

GEOLOGIC NAME OF SURFACE FORMATION: Quaternary Alluvium Deposits

PROPOSED TD: 15,933 MD 8730' TVD Lower Abo

SURFACE OWNER: Bill Medlin 575-390-9349

NEW MEXICO OCD.: Cindy Herrera 575-393-6151 ext 100. Emergency # 575-370-3186

API NUMBER: 30-005-29114

DRILLING CONTRACTOR: Patterson UTI, Kyle Hollingsworth 432-528-5978

DIRT CONTRACTOR: Lobos Services, Angel Sanchez, 432-664-8486

CEMENTING SERVICES: BJ Services, Artesia 575-746-3140

DRILLING MUD AND EQUIPMENT: MI Swaco, Landon Little, 432-664-1067 (c),
Mike Harrington , 432-296-0513 (c)

CASING: Padre Tubular, Sid Stallings 713-751-0877

MUDLOGGER: Morco Geological Services. Corky Stewart 800-748-2340 (8-5:00)
575-361-1270 (cell)

OPENHOLE LOGS: Schlumberger

WELLHEAD EQUIPMENT: Downing Wellhead, Inc. 432-687-0778

WATER HAULER: VMJ Services. Victor Hernandez 575-602-8551 (c)

SOLIDS DISPOSAL: Gandy Corporation, Wayne Tramell
575-370-2480 (o), 575-370-4560 (c)

WATERLINE: Rockhouse

FLOAT EQUIPMENT: S & K Float Equipment Judson Bennett 432-631-6301

LINER HANGER: TIW, Jimmy Stringer 432-528-3494

DRILLING PROCEDURE:

1. MIRU Patterson 74. ***Notify NMOCD – Hobbs of intent to spud and of all casing, cementing and BOP tests.***
2. Rig up H2S equipment and Mudloggers.
3. Drill five cement plugs using spud mud.
4. Circulate hole until all cement is clear. Go out into the lateral and clean open hole to 9500' using 8.4 – 8.9 PPG 2% KCL mud.
5. When hole is clean TOOH and pick up Directional BHA to begin side Track.
6. Begin side track around 9400' with a tri-cone bit.
7. When side track is complete circulate hole clean and TOOH to dial motor down and pick up PDC Bit.
8. When TIH go into side track without orientating the BHA.
9. Drill Lateral from side track to TD at 15,933'
10. When TD TOOH and again re-enter side track without orientating the BHA. (Whenever a trip is made in the lateral always re-enter side track without orientating).
11. When hole is clean run 4-1/2" Casing with liner hanger from TD to 8250'.
12. Cement from TD to the top of the liner hanger as per Baker recommendation.
13. Release rig and prepare location for Completion Operations.
14. Set anchors and MIRU pulling unit.
15. TIH and clean the top of the liner hanger and TOOH to PU 3-7/8" bit.
16. TIH and clean the lateral to the top of the cement plug.
17. Circulate well clean with fresh water and test entire well to 5000 psi.
18. If well test fine then circulate the well with 7.5 % NEFE acid and TOOH to PU TCP guns.
19. TIH with TCP guns to the top of the lateral and wait for acid job.
20. RU acid trucks and TIH with the TCP guns and get on depth.
21. Fire guns and begin pumping acid and water as per M&W.
22. When acid job is complete TIH and lay down guns and secure well for frac job.

MUD PROGRAM:

9000' – 15933' 2% KCL

8.4 – 8.9 PPG

Mud system will be a closed looped system

ESTIMATED FORMATION TOPS:

Tubb	6,699'
Abo Shale	7,489
Lower Abo Dolomite	8750

CASING PROGRAM:

O.D., In	Depth, MD	Weight, Lb/ft	Grade	Conn.	Pw Collapse Psi	Pw Burst Psi	Pw Tension, Kips	Test, Psi
13-3/8"	Surface To 340'	48.0	H-60	STC	770	1,730	322	N/A
9-5/8"	Surface To 3,030'	36.0	J-55	STC	2,020	3,520	394	1,500
9-5/8"	3030' To 3950'	40.0	J-55	STC	2,570	3,950	452	1,500
7"	Surface To 8,974'	26.0	P-110	LTC	6,210	9,960	693	1,500
4-1/2"	8180' To 15,933	11.6	P-110	LTC	7,560	15,933	279	1,500

LOGGING PROGRAM:

Mud logging 2 man unit for the entire lateral

POTENTIAL HAZARDS:

No abnormal pressures or temperatures are anticipated. (BHP 4000 psi, BHT 175 deg)
The area has a potential for H2S and the following measures will be taken:

- all personnel will be H2S trained and qualified
- H2S alarms and detection systems will be utilized
- A windsock will be visible at all times
- Flags or warning signs will be visible for road traffic

COMPANY PERSONNEL:

Shorty Sweeden (Wellsite Supervisor) 432-634-8722 (c)

Gabe Herrera (Marshall & Winston – Engineer) 432-684-6373 (o)
432-260-8650 (c)

Tom Brandt (Marshall & Winston – Operations) 432-684-6373 (o)
432-553-9747 (c)

George Watters (Marshall & Winston – Geologist) 432-684-6373 (o)
432-631-2051 (c)

Brent May (Marshall & Winston – Geologist) 432-684-6373 (o)
432-254-3525 (c)

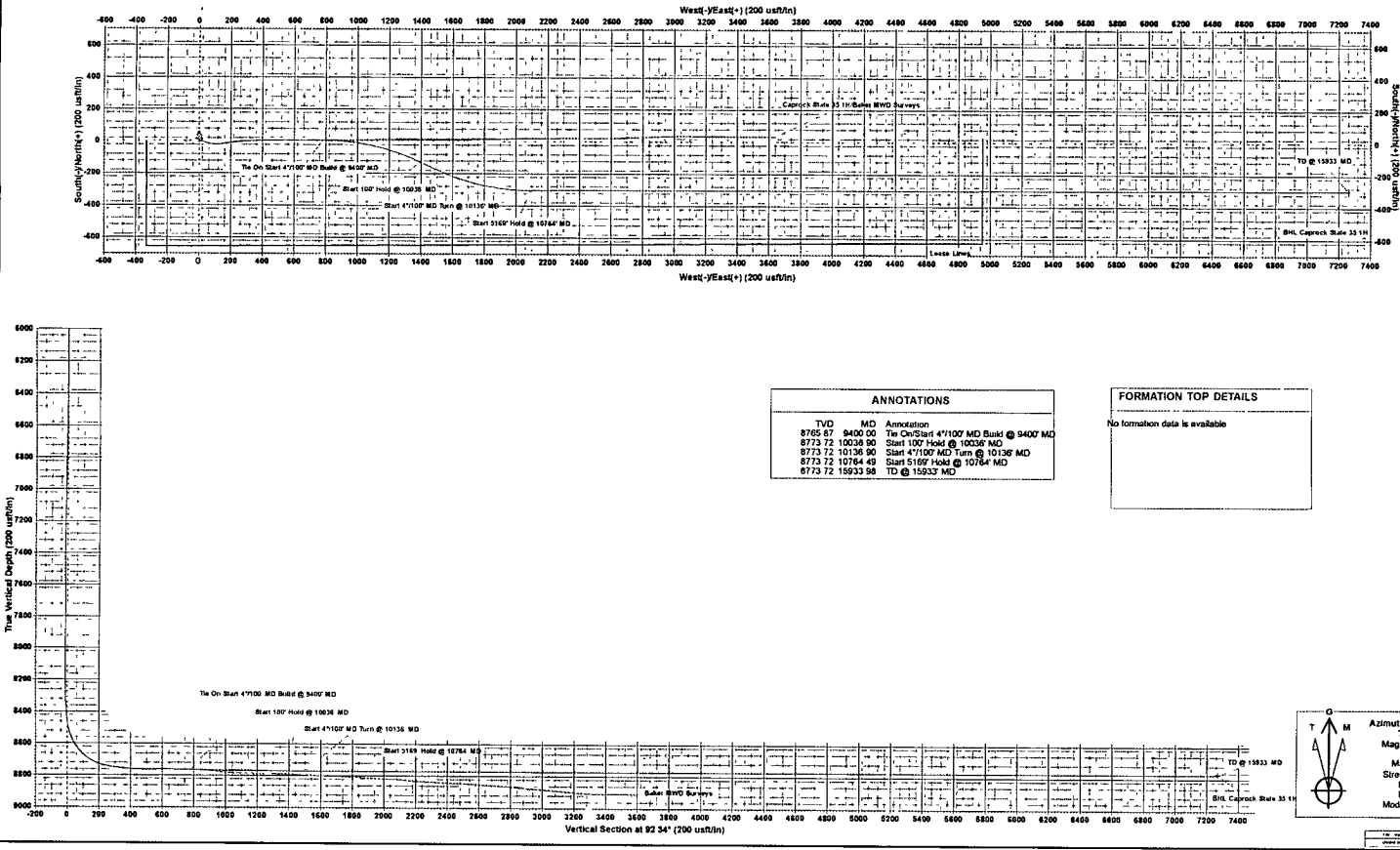
Marshall & Winston, Inc.
P.O. Box 50880
Midland, Tx. 79710-0880

432-684-6373 Office
432-687-2684 Fax

DIRECTIONS TO LOCATION:

From Lovington take HWY 82 W for 25 miles then turn right on HWY 249 going North. Go North for about 10 miles to the HWY 249 and HWY 172 junction. Proceed straight on HWY 172 for about 3 miles and enter lease road on the east side of the highway. Proceed east and north on the lease road to the location.

WELL DETAILS					SECTION DETAILS										WELLBORE TARGET DETAILS (MAP CO-ORDINATES)				
Caprock State 35 1H					MD	Inc	Azi	TVD	+N-S	+E-W	Diag	TFace	VSect	Name	TVD	+N-S	+E-W	North	East
Ground Level	4402.00	Latitude	Longitude		9400.00	88.61	89.56	8765.87	4.99	777.58	0.00	0.00	776.73	BHL Caprock State 35 1H	8768.00	-296.50	7262.80	747277.10	670869.20
North	747573.60	33° 3' 14.389 N	103° 47' 57.720 W		10036.80	90.00	115.00	8773.72	-129.37	1394.74	4.00	87.08	1398.86						
	663606.40				10136.80	90.00	115.00	8773.72	-171.63	1485.37	0.00	0.00	1491.14						
					10764.49	90.00	89.90	8773.72	-305.63	2093.32	4.00	-90.00	2104.05	BHL Caprock State 35 1H					
					15933.98	90.00	89.90	8773.72	-296.50	7262.80	0.00	0.00	7268.85	BHL Caprock State 35 1H					



BOPE Stacking 13 3/8" X 5,000 psi

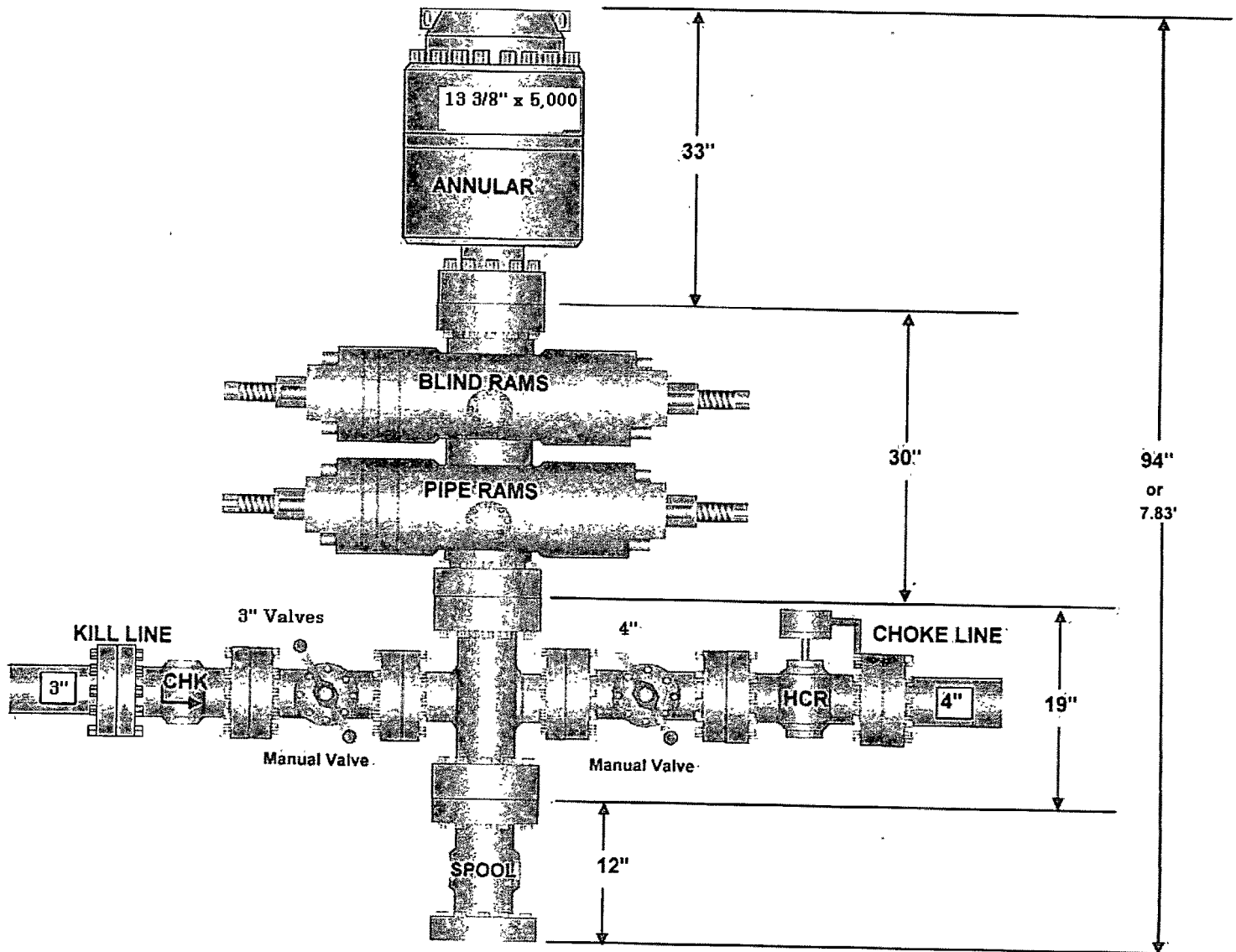


Exhibit 2



PHOENIX
TECHNOLOGY SERVICES

Marshall & Winston Inc.

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

Plan: ST Plan #1 100911

Marshall & Winston Inc.

10 October, 2011



PHOENIX
TECHNOLOGY SERVICES



Phoenix Technology Services
Marshall & Winston Inc



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:	Gnd
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ST Plan #1 100911	Database:	GCR DB v5000

Project	Chaves County, NM (Nad27)
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Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
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	Latitude:	33° 3' 14 389 N
From:	Map	Easting:	663,606 40 usft	Longitude:	103° 47' 57 720 W
Position Uncertainty:	0 00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0 29 °

Well	Caprock State 35 1H
------	---------------------

Well Position	+N-S	0 00 usft	Northing:	747,573 60 usft	Latitude:	33° 3' 14 389 N
	+E-W	0 00 usft	Easting:	663,606 40 usft	Longitude:	103° 47' 57 720 W
Position Uncertainty		0 00 usft	Wellhead Elevation:	usft	Ground Level:	4,402 00 usft

Wellbore	Wellbore #1
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	10/10/2011	7 72	60 91	49,051

Design	ST Plan #1 100911
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Audit Notes:					
Version:	Phase:	PROTOTYPE	Tie On Depth:	9,400 00	
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)	
	0 00	0 00	0 00	92 34	



Phoenix Technology Services
Marshall & Winston Inc



Company:	Marshall & Winston Inc	Local Co-ordinate Reference:	Well Caprock State 35 1H
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Well:	Caprock State 35 1H	North Reference:	Gnd
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ST Plan #1 100911	Database:	GCR DB v5000

Survey Tool Program	Date	10/10/2011			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100 00	9,400 00	Baker MWD Surveys (Wellbore #1)	MWD	MWD - Standard	
9,400 00	15,933 98	ST Plan #1 100911 (Wellbore #1)	MWD	MWD - Standard	

Planned 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)	
0 00	0 00	0 00	-4,420 00	0 00	0 00	0 00	0 00	0 00	747,573 60	663,606 40	
100 00	0 32	216 84	-4,320 00	100 00	-0 22	-0 17	-0 16	0 32	747,573 38	663,606 23	
200 00	0 30	192 49	-4,220 00	200 00	-0 70	-0 39	-0 36	0 13	747,572 90	663,606 01	
300 00	0 39	207 27	-4,120 00	300 00	-1 26	-0 60	-0 55	0 13	747,572 34	663,605 80	
400 00	0 50	188 63	-4,020 01	399 99	-1 99	-0 83	-0 74	0 18	747,571 61	663,605 57	
500 00	0 47	190 39	-3,920 01	499 99	-2 83	-0 96	-0 85	0 03	747,570 77	663,605 44	
600 00	0 61	190 48	-3,820 01	599 99	-3 76	-1 14	-0 98	0 14	747,569 84	663,605 26	
700 00	0 37	183 76	-3,720 02	699 98	-4 60	-1 25	-1 06	0 25	747,569 00	663,605 15	
800 00	0 49	187 92	-3,620 02	799 98	-5 35	-1 33	-1 11	0 12	747,568 25	663,605 07	
900 00	0 44	190 16	-3,520 02	899 98	-6 15	-1 46	-1 21	0 05	747,567 45	663,604 94	
1,000 00	0 35	194 92	-3,420 03	999 97	-6 82	-1 61	-1 33	0 10	747,566 78	663,604 79	
1,100 00	0 31	191 56	-3,320 03	1,099 97	-7 38	-1 74	-1 44	0 04	747,566 22	663,604 66	
1,200 00	0 18	182 02	-3,220 03	1,199 97	-7 80	-1 80	-1 48	0 14	747,565 80	663,604 60	
1,300 00	0 16	179 78	-3,120 03	1,299 97	-8 10	-1 80	-1 47	0 02	747,565 50	663,604 60	
1,400 00	0 12	152 60	-3,020 03	1,399 97	-8 33	-1 76	-1 41	0 08	747,565 27	663,604 64	
1,500 00	0 06	66 68	-2,920 03	1,499 97	-8 41	-1 66	-1 32	0 13	747,565 19	663,604 74	
1,600 00	0 11	38 72	-2,820 03	1,599 97	-8 31	-1 55	-1 21	0 06	747,565 29	663,604 85	
1,700 00	0 10	67 18	-2,720 03	1,699 97	-8 20	-1 41	-1 08	0 05	747,565 40	663,604 99	
1,800 00	0 32	48 27	-2,620 03	1,799 97	-7 98	-1 12	-0 80	0 23	747,565 62	663,605 28	
1,900 00	0 95	69 11	-2,520 04	1,899 96	-7 50	-0 14	0 17	0 66	747,566 10	663,606 26	
2,000 00	1 12	68 82	-2,420 05	1,999 95	-6 85	1 55	1 82	0 17	747,566 75	663,607 95	



Phoenix Technology Services
Marshall & Winston Inc



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)
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Well:	Caprock State 35 1H	North Reference:	Gnd
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ST Plan #1 100911	Database:	GCR DB v5000

Planned 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)
2,100 00	1 11	68 92	-2,320 07	2,099 93	-6 15	3 36	3 61	0 01	747,567 45	663,609 76
2,200 00	0 88	60 15	-2,220 09	2,199 91	-5 42	4 93	5 15	0 28	747,568 18	663,611 33
2,300 00	0 84	68 77	-2,120 10	2,299 90	-4 77	6 28	6 47	0 14	747,568 83	663,612 68
2,400 00	0 78	64 81	-2,020 11	2,399 89	-4 22	7 58	7 75	0 08	747,569 38	663,613 98
2,500 00	0 72	64 15	-1,920 12	2,499 88	-3 65	8 76	8 90	0 06	747,569 95	663,615 16
2,600 00	0 56	66 47	-1,820 12	2,599 88	-3 18	9 78	9 90	0 16	747,570 42	663,616 18
2,700 00	0 54	66 74	-1,720 13	2,699 87	-2 80	10 66	10 76	0 02	747,570 80	663,617 06
2,800 00	0 46	69 61	-1,620 13	2,799 87	-2 48	11 47	11 56	0 08	747,571 12	663,617 87
2,900 00	0 41	66 66	-1,520 14	2,899 86	-2 20	12 17	12 25	0 05	747,571 40	663,618 57
3,000 00	0 25	35 51	-1,420 14	2,999 86	-1 88	12 63	12 69	0 23	747,571 72	663,619 03
3,100 00	0 29	349 07	-1,320 14	3,099 86	-1 45	12 70	12 75	0 22	747,572 15	663,619 10
3,200 00	0 37	347 89	-1,220 14	3,199 86	-0 89	12 59	12 61	0 08	747,572 71	663,618 99
3,300 00	0 30	315 74	-1,120 14	3,299 86	-0 38	12 34	12 34	0 20	747,573 22	663,618 74
3,400 00	0 29	316 29	-1,020 14	3,399 86	-0 01	11 98	11 97	0 01	747,573 59	663,618 38
3,500 00	0 34	329 41	-920 14	3,499 86	0 43	11 65	11 63	0 09	747,574 03	663,618 05
3,600 00	0 28	316 44	-820 15	3,599 85	0 86	11 33	11 29	0 09	747,574 46	663,617 73
3,700 00	0 28	296 91	-720 15	3,699 85	1 15	10 95	10 89	0 09	747,574 75	663,617 35
3,800 00	0 30	295 07	-620 15	3,799 85	1 37	10 49	10 43	0 02	747,574 97	663,616 89
3,900 00	0 31	286 04	-520 15	3,899 85	1 55	10 00	9 92	0 05	747,575 15	663,616 40
4,000 00	0 31	281 15	-420 15	3,999 85	1 68	9 47	9 39	0 03	747,575 28	663,615 87
4,100 00	0 32	293 96	-320 15	4,099 85	1 85	8 95	8 87	0 07	747,575 45	663,615 35
4,200 00	0 33	304 64	-220 15	4,199 85	2 12	8 46	8 36	0 06	747,575 72	663,614 86
4,300 00	0 41	313 18	-120 16	4,299 84	2 53	7 96	7 85	0 10	747,576 13	663,614 36
4,400 00	0 44	322 79	-20 16	4,399 84	3 08	7 47	7 34	0 08	747,576 68	663,613 87
4,500 00	0 40	311 23	79 84	4,499 84	3 62	6 97	6 82	0 09	747,577 22	663,613 37
4,600 00	0 41	319 38	179 84	4,599 84	4 12	6 48	6 30	0 06	747,577 72	663,612 88
4,700 00	0 38	325 24	279 83	4,699 83	4 66	6 06	5 86	0 05	747,578 26	663,612 46



Phoenix Technology Services
Marshall & Winston Inc.



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:	Gnd
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ST Plan #1 100911	Database:	GCR DB v5000

Planned 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)	
4,800 00	0 16	277 75	379 83	4,799 83	4 96	5 73	5 52	0 30	747,578 56	663,612 13	
4,900 00	0 21	258 14	479 83	4,899 83	4 94	5 41	5 20	0 08	747,578 54	663,611 81	
5,000 00	0 23	311 18	579 83	4,999 83	5 03	5 08	4 87	0 20	747,578 63	663,611 48	
5,100 00	0 02	113 99	679 83	5,099 83	5 16	4 94	4 73	0 25	747,578 76	663,611 34	
5,200 00	0 08	143 28	779 83	5,199 83	5 09	5 00	4 79	0 06	747,578 69	663,611 40	
5,300 00	0 12	154 79	879 83	5,299 83	4 94	5 09	4 88	0 04	747,578 54	663,611 49	
5,400 00	0 14	207 28	979 83	5,399 83	4 74	5 08	4 88	0 12	747,578 34	663,611 48	
5,500 00	0 26	263 17	1,079 83	5,499 83	4 60	4 80	4 60	0 22	747,578 20	663,611 20	
5,600 00	0 27	287 00	1,179 83	5,599 83	4 65	4 35	4 15	0 11	747,578 25	663,610 75	
5,700 00	0 25	302 07	1,279 83	5,699 83	4 83	3 94	3 73	0 07	747,578 43	663,610 34	
5,800 00	0 24	304 60	1,379 83	5,799 83	5 06	3 58	3 37	0 01	747,578 66	663,609 98	
5,900 00	0 45	297 60	1,479 83	5,899 83	5 37	3 06	2 84	0 21	747,578 97	663,609 46	
6,000 00	0 57	281 80	1,579 82	5,999 82	5 65	2 22	1 99	0 18	747,579 25	663,608 62	
6,100 00	0 70	286 41	1,679 81	6,099 81	5 92	1 15	0 91	0 14	747,579 52	663,607 55	
6,200 00	0 73	283 74	1,779 81	6,199 81	6 25	-0 06	-0 31	0 04	747,579 85	663,606 34	
6,300 00	0 77	290 01	1,879 80	6,299 80	6 63	-1 31	-1 57	0 09	747,580 23	663,605 09	
6,400 00	0 77	285 61	1,979 79	6,399 79	7 04	-2 58	-2 87	0 06	747,580 64	663,603 82	
6,500 00	0 73	278 78	2,079 78	6,499 78	7 32	-3 86	-4 16	0 10	747,580 92	663,602 54	
6,600 00	0 73	283 21	2,179 77	6,599 77	7 56	-5 11	-5 41	0 06	747,581 16	663,601 29	
6,700 00	0 69	296 51	2,279 77	6,699 77	7 97	-6 27	-6 59	0 17	747,581 57	663,600 13	
6,800 00	0 70	299 94	2,379 76	6,799 76	8 55	-7 34	-7 68	0 04	747,582 15	663,599 06	
6,900 00	0 69	295 43	2,479 75	6,899 75	9 11	-8 41	-8 78	0 06	747,582 71	663,597 99	
7,000 00	0 55	296 73	2,579 74	6,999 74	9 59	-9 38	-9 77	0 14	747,583 19	663,597 02	
7,100 00	0 57	285 04	2,679 74	7,099 74	9 93	-10 29	-10 69	0 12	747,583 53	663,596 11	
7,200 00	0 62	273 48	2,779 73	7,199 73	10 09	-11 31	-11 71	0 13	747,583 69	663,595 09	
7,300 00	0 53	275 21	2,879 73	7,299 73	10 17	-12 31	-12 72	0 09	747,583 77	663,594 09	
7,400 00	0 35	276 01	2,979 73	7,399 73	10 24	-13 08	-13 48	0 18	747,583 84	663,593 32	



Phoenix Technology Services
Marshall & Winston Inc



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:	Gnd
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ST Plan #1 100911	Database:	GCR DB v5000

Planned 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)
7,500.00	0.15	103.33	3,079.73	7,499.73	10.24	-13.25	-13.66	0.50	747,583.84	663,593.15
7,600.00	0.19	117.16	3,179.73	7,599.73	10.14	-12.98	-13.38	0.06	747,583.74	663,593.42
7,700.00	0.16	131.92	3,279.73	7,699.73	9.97	-12.73	-13.12	0.05	747,583.57	663,593.67
7,800.00	0.15	107.88	3,379.72	7,799.72	9.84	-12.50	-12.89	0.07	747,583.44	663,593.90
7,900.00	0.21	75.82	3,479.72	7,899.72	9.84	-12.20	-12.59	0.11	747,583.44	663,594.20
8,000.00	0.35	90.33	3,579.72	7,999.72	9.88	-11.71	-12.11	0.16	747,583.48	663,594.69
8,100.00	0.39	79.02	3,679.72	8,099.72	9.95	-11.07	-11.47	0.08	747,583.55	663,595.33
8,200.00	0.48	78.85	3,779.72	8,199.72	10.09	-10.33	-10.73	0.09	747,583.69	663,596.07
8,300.00	0.69	99.31	3,879.71	8,299.71	10.08	-9.32	-9.73	0.29	747,583.68	663,597.08
8,400.00	4.53	111.77	3,979.63	8,399.63	9.33	-6.15	-6.52	3.85	747,582.93	663,600.25
8,500.00	13.20	118.07	4,078.49	8,498.49	2.85	6.72	6.60	8.72	747,576.45	663,613.12
8,600.00	29.36	108.94	4,171.60	8,591.60	-11.32	39.24	39.67	16.44	747,562.28	663,645.64
8,700.00	47.21	90.19	4,249.90	8,669.90	-21.56	99.65	100.45	21.13	747,552.04	663,706.05
8,800.00	67.60	81.69	4,304.46	8,724.46	-13.17	182.31	182.69	21.58	747,560.43	663,788.71
8,900.00	81.95	86.52	4,328.17	8,748.17	-2.87	278.57	278.46	15.09	747,570.73	663,884.97
9,000.00	84.55	87.93	4,340.14	8,760.14	1.58	377.75	377.37	2.95	747,575.18	663,984.15
9,100.00	89.05	89.35	4,344.56	8,764.56	3.39	477.60	477.06	4.71	747,576.99	664,084.00
9,200.00	89.86	90.22	4,345.08	8,765.08	4.11	577.59	576.94	1.19	747,577.71	664,183.99
9,300.00	89.96	89.69	4,345.24	8,765.24	3.79	677.59	676.87	0.54	747,577.39	664,283.99
9,400.00	88.61	89.56	4,345.87	8,765.87	4.99	777.58	776.73	1.36	747,578.59	664,383.98
Tie On/Start 4°/100' MD Build @ 9400' MD										
9,500.00	88.82	93.55	4,348.11	8,768.11	2.27	877.50	876.67	4.00	747,575.87	664,483.90
9,600.00	89.03	97.55	4,349.99	8,769.99	-7.40	976.99	976.48	4.00	747,568.20	664,583.39
9,700.00	89.25	101.54	4,351.50	8,771.50	-23.98	1,075.57	1,075.66	4.00	747,549.62	664,681.97
9,800.00	89.47	105.54	4,352.62	8,772.62	-47.39	1,172.77	1,173.72	4.00	747,526.21	664,779.17
9,900.00	89.69	109.53	4,353.36	8,773.36	-77.52	1,268.10	1,270.20	4.00	747,496.08	664,874.50
10,000.00	89.92	113.53	4,353.70	8,773.70	-114.21	1,361.10	1,364.63	4.00	747,459.39	664,967.50



Phoenix Technology Services
Marshall & Winston Inc



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:	Gnd
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ST Plan #1 100911	Database:	GCR DB v5000

Planned 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)	
10,036 90	90 00	115 00	4,353 72	8,773 72	-129 37	1,394 74	1,398 86	4 00	747,444 23	665,001 14	
Start 100' Hold @ 10036' MD											
10,100 00	90 00	115 00	4,353 72	8,773 72	-156 04	1,451 93	1,457 09	0 00	747,417 56	665,058 33	
10,136 90	90 00	115 00	4,353 72	8,773 72	-171 63	1,485 37	1,491 14	0 00	747,401 97	665,091 77	
Start 4°/100' MD Turn @ 10136' MD											
10,200 00	90 00	112 48	4,353 72	8,773 72	-197 03	1,543 13	1,549 88	4 00	747,376 57	665,149 53	
10,300 00	90 00	108 48	4,353 72	8,773 72	-232 01	1,636 79	1,644 89	4 00	747,341 59	665,243 19	
10,400 00	90 00	104 48	4,353 72	8,773 72	-260 36	1,732 67	1,741 84	4 00	747,313 24	665,339 07	
10,500 00	90 00	100 48	4,353 72	8,773 72	-281 96	1,830 28	1,840 26	4 00	747,291 64	665,436 68	
10,600 00	90 00	96 48	4,353 72	8,773 72	-296 70	1,929 17	1,939 67	4 00	747,278 90	665,535 57	
10,700 00	90 00	92 48	4,353 72	8,773 72	-304 50	2,028 85	2,039 58	4 00	747,269 10	665,635 25	
10,764 49	90 00	89 90	4,353 72	8,773 72	-305 83	2,093 32	2,104 05	4 00	747,267 77	665,699 72	
Start 5169' Hold @ 10764' MD											
10,800 00	90 00	89 90	4,353 72	8,773 72	-305 77	2,128 83	2,139 53	0 00	747,267 83	665,735 23	
10,900 00	90 00	89 90	4,353 72	8,773 72	-305 59	2,228 83	2,239 44	0 00	747,268 01	665,835 23	
11,000 00	90 00	89 90	4,353 72	8,773 72	-305 41	2,328 83	2,339 35	0 00	747,268 19	665,935 23	
11,100 00	90 00	89 90	4,353 72	8,773 72	-305 23	2,428 83	2,439 26	0 00	747,268 37	666,035 23	
11,200 00	90 00	89 90	4,353 72	8,773 72	-305 05	2,528 83	2,539 17	0 00	747,268 55	666,135 23	
11,300 00	90 00	89 90	4,353 72	8,773 72	-304 87	2,628 83	2,639 07	0 00	747,268 73	666,235 23	
11,400 00	90 00	89 90	4,353 72	8,773 72	-304 69	2,728 83	2,738 98	0 00	747,268 91	666,335 23	
11,500 00	90 00	89 90	4,353 72	8,773 72	-304 51	2,828 83	2,838 89	0 00	747,269 09	666,435 23	
11,600 00	90 00	89 90	4,353 72	8,773 72	-304 33	2,928 83	2,938 80	0 00	747,269 27	666,535 23	
11,700 00	90 00	89 90	4,353 72	8,773 72	-304 15	3,028 83	3,038 71	0 00	747,269 45	666,635 23	
11,800 00	90 00	89 90	4,353 72	8,773 72	-303 96	3,128 83	3,138 62	0 00	747,269 64	666,735 23	
11,900 00	90 00	89 90	4,353 72	8,773 72	-303 78	3,228 83	3,238 53	0 00	747,269 82	666,835 23	
12,000 00	90 00	89 90	4,353 72	8,773 72	-303 60	3,328 83	3,338 44	0 00	747,270 00	666,935 23	
12,100 00	90 00	89 90	4,353 72	8,773 72	-303 42	3,428 83	3,438 35	0 00	747,270 18	667,035 23	



Phoenix Technology Services
Marshall & Winston Inc



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:	Gnd
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ST Plan #1 100911	Database:	GCR DB v5000

Planned 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)
12,200 00	90 00	89 90	4,353 72	8,773 72	-303 24	3,528 83	3,538 26	0 00	747,270 36	667,135 23
12,300 00	90 00	89 90	4,353 72	8,773 72	-303 06	3,628 83	3,638 17	0 00	747,270 54	667,235 23
12,400 00	90 00	89 90	4,353 72	8,773 72	-302 88	3,728 83	3,738 08	0 00	747,270 72	667,335 23
12,500 00	90 00	89 90	4,353 72	8,773 72	-302 70	3,828 83	3,837 99	0 00	747,270 90	667,435 23
12,600 00	90 00	89 90	4,353 72	8,773 72	-302 52	3,928 82	3,937 89	0 00	747,271 08	667,535 22
12,700 00	90 00	89 90	4,353 72	8,773 72	-302 34	4,028 82	4,037 80	0 00	747,271 26	667,635 22
12,800 00	90 00	89 90	4,353 72	8,773 72	-302 16	4,128 82	4,137 71	0 00	747,271 44	667,735 22
12,900 00	90 00	89 90	4,353 72	8,773 72	-301 98	4,228 82	4,237 62	0 00	747,271 62	667,835 22
13,000 00	90 00	89 90	4,353 72	8,773 72	-301 80	4,328 82	4,337 53	0 00	747,271 80	667,935 22
13,100 00	90 00	89 90	4,353 72	8,773 72	-301 62	4,428 82	4,437 44	0 00	747,271 98	668,035 22
13,200 00	90 00	89 90	4,353 72	8,773 72	-301 44	4,528 82	4,537 35	0 00	747,272 16	668,135 22
13,300 00	90 00	89 90	4,353 72	8,773 72	-301 26	4,628 82	4,637 26	0 00	747,272 34	668,235 22
13,400 00	90 00	89 90	4,353 72	8,773 72	-301 08	4,728 82	4,737 17	0 00	747,272 52	668,335 22
13,500 00	90 00	89 90	4,353 72	8,773 72	-300 89	4,828 82	4,837 08	0 00	747,272 71	668,435 22
13,600 00	90 00	89 90	4,353 72	8,773 72	-300 71	4,928 82	4,936 99	0 00	747,272 89	668,535 22
13,700 00	90 00	89 90	4,353 72	8,773 72	-300 53	5,028 82	5,036 90	0 00	747,273 07	668,635 22
13,800 00	90 00	89 90	4,353 72	8,773 72	-300 35	5,128 82	5,136 81	0 00	747,273 25	668,735 22
13,900 00	90 00	89 90	4,353 72	8,773 72	-300 17	5,228 82	5,236 72	0 00	747,273 43	668,835 22
14,000 00	90 00	89 90	4,353 72	8,773 72	-299 99	5,328 82	5,336 62	0 00	747,273 61	668,935 22
14,100 00	90 00	89 90	4,353 72	8,773 72	-299 81	5,428 82	5,436 53	0 00	747,273 79	669,035 22
14,200 00	90 00	89 90	4,353 72	8,773 72	-299 63	5,528 82	5,536 44	0 00	747,273 97	669,135 22
14,300 00	90 00	89 90	4,353 72	8,773 72	-299 45	5,628 82	5,636 35	0 00	747,274 15	669,235 22
14,400 00	90 00	89 90	4,353 72	8,773 72	-299 27	5,728 82	5,736 26	0 00	747,274 33	669,335 22
14,500 00	90 00	89 90	4,353 72	8,773 72	-299 09	5,828 82	5,836 17	0 00	747,274 51	669,435 22
14,600 00	90 00	89 90	4,353 72	8,773 72	-298 91	5,928 82	5,936 08	0 00	747,274 69	669,535 22
14,700 00	90 00	89 90	4,353 72	8,773 72	-298 73	6,028 82	6,035 99	0 00	747,274 87	669,635 22
14,800 00	90 00	89 90	4,353 72	8,773 72	-298 55	6,128 82	6,135 90	0 00	747,275 05	669,735 22



Phoenix Technology Services
Marshall & Winston Inc



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:	Gnd
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	ST Plan #1 100911	Database:	GCR DB v5000

Planned 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)	
14,900.00	90.00	89.90	4,353.72	8,773.72	-298.37	6,228.82	6,235.81	0.00	747,275.23	669,835.22	
15,000.00	90.00	89.90	4,353.72	8,773.72	-298.19	6,328.82	6,335.72	0.00	747,275.41	669,935.22	
15,100.00	90.00	89.90	4,353.72	8,773.72	-298.01	6,428.82	6,435.63	0.00	747,275.59	670,035.22	
15,200.00	90.00	89.90	4,353.72	8,773.72	-297.83	6,528.82	6,535.54	0.00	747,275.77	670,135.22	
15,300.00	90.00	89.90	4,353.72	8,773.72	-297.64	6,628.82	6,635.44	0.00	747,275.96	670,235.22	
15,400.00	90.00	89.90	4,353.72	8,773.72	-297.46	6,728.82	6,735.35	0.00	747,276.14	670,335.22	
15,500.00	90.00	89.90	4,353.72	8,773.72	-297.28	6,828.82	6,835.26	0.00	747,276.32	670,435.22	
15,600.00	90.00	89.90	4,353.72	8,773.72	-297.10	6,928.82	6,935.17	0.00	747,276.50	670,535.22	
15,700.00	90.00	89.90	4,353.72	8,773.72	-296.92	7,028.82	7,035.08	0.00	747,276.68	670,635.22	
15,800.00	90.00	89.90	4,353.72	8,773.72	-296.74	7,128.82	7,134.99	0.00	747,276.86	670,735.22	
15,900.00	90.00	89.90	4,353.72	8,773.72	-296.56	7,228.82	7,234.90	0.00	747,277.04	670,835.22	
15,933.98	90.00	89.90	4,353.72	8,773.72	-296.50	7,262.80	7,268.85	0.00	747,277.10	670,869.20	
TD @ 15933' MD											

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
9,400.00	8,765.87	4.99	777.58	Tie On/Start 4°/100' MD Build @ 9400' MD	
10,036.90	8,773.72	-129.37	1,394.74	Start 100' Hold @ 10036' MD	
10,136.90	8,773.72	-171.63	1,485.37	Start 4°/100' MD Turn @ 10136' MD	
10,764.49	8,773.72	-305.83	2,093.32	Start 5169' Hold @ 10764' MD	
15,933.98	8,773.72	-296.50	7,262.80	TD @ 15933' MD	

Checked By	Approved By	Date
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