

OPERATOR
WELL/LEASE
COUNTY

MEWBOURNE OIL COMPANY
Derringer 18 LI Federal 1H
EDDY

045-0105

STATE OF NEW MEXICO
DEVIATION REPORT

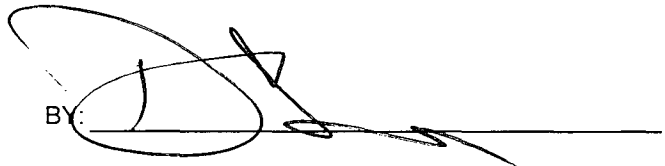
30 015 41951

213	1.5
418	1.62
610	1.88
770	1.49
921	1.48

NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 12 2014

RECEIVED

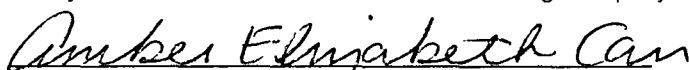
BY: 

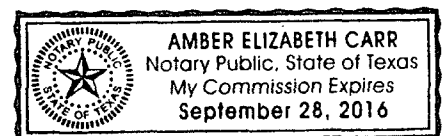
STATE OF TEXAS

COUNTY OF MIDLAND

The foregoing instrument was acknowledged before me on
Daisy Carrillo on behalf of Patterson-UTI Drilling Company LLC.

7/16/14, by


Notary Public for Midland County, Texas
My Commission Expires:





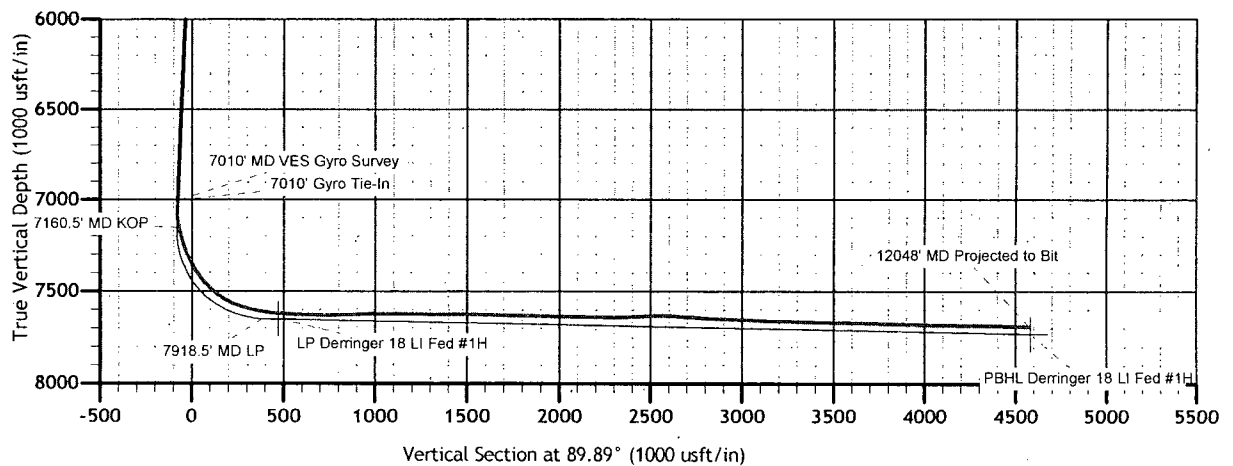
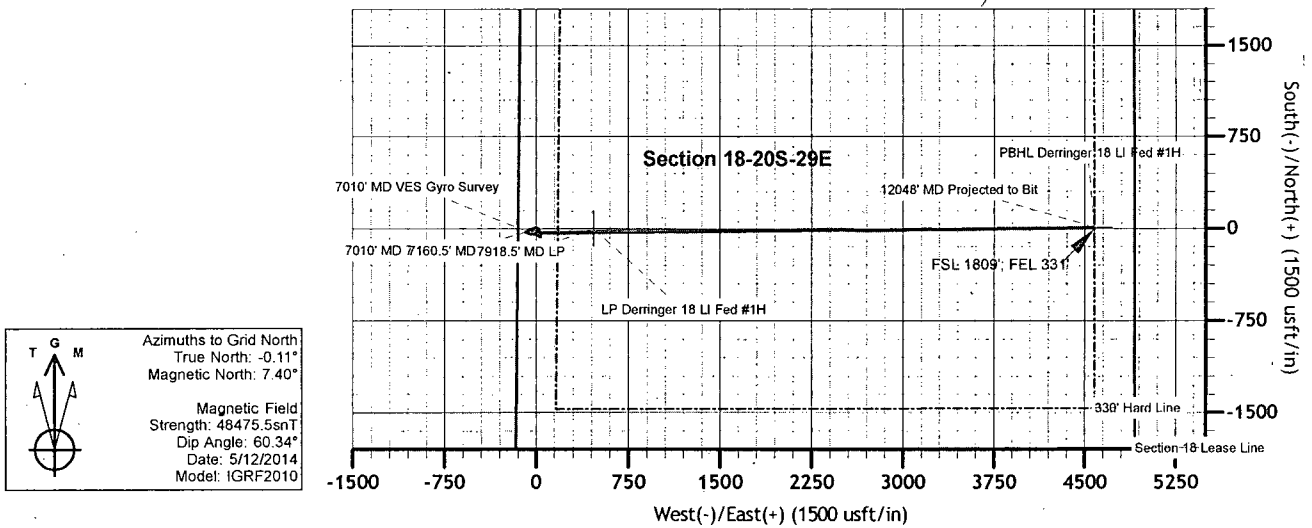
COMPANY: Mewbourne Oil Company
 WELL: Derringer 18 LI Fed #1H
 COUNTY: Eddy County, N.M. Nad (83)
 DATUM: North American Datum 1983
 RIG: Patterson #45

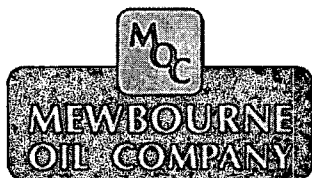


GRID CORRECTION: To convert a Magnetic Direction to a Grid Direction, Add 7.39°

GEODETIC ZONE: New Mexico Eastern Zone								Slot
GL 3254 + 20 @ 3274.0usft (Patterson #45)								
GROUND ELEVATION: 3254.0								
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude			
0.0	0.0	571595.00	606523.20	32° 34' 16.290 N	104° 7' 18.216 W			

PLAN SECTIONS											
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target	
1	7010.0	2.47	235.56	7004.3	-27.7	-75.2	0.00	0.00	-75.2		
2	7160.5	2.47	235.56	7154.6	-31.3	-80.5	0.00	0.00	-80.5		
3	7918.5	88.91	89.36	7649.0	-37.8	387.8	12.00	-146.20	387.5		
4	12112.2	88.91	89.36	7729.0	8.9	4580.3	0.00	0.00	4580.3	PBHL Derringer 18 LI Fed #1H	





Mewbourne Oil Company .

Eddy County, N.M. Nad (83)

Section 18-20S-29E Derringer 18 LI Fed #1H

Derringer 18 LI Fed #1H

Original Hole

Design: Original Hole

Standard Survey Report

17 June, 2014





Stryker Directional Survey Report



Company:	Mewbourne Oil Company	Local Co-ordinate Reference:	Well Derringer 18 LI Fed #1H
Project:	Eddy County, N.M. Nad (83)	TVD Reference:	GL 3254 + 20 @ 3274.0usft (Patterson #45)
Site:	Section 18-20S-29E Derringer 18 LI Fed #1H	MD Reference:	GL 3254 + 20 @ 3274.0usft (Patterson #45)
Well:	Derringer 18 LI Fed #1H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Stryker_EDM

Project	Eddy County, N.M. Nad (83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Section 18-20S-29E Derringer 18 LI Fed #1H		
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Site Position:		Northing:	571,595.00 usft	Latitude:	32° 34' 16.290 N
From:	Map	Easting:	606,523.20 usft	Longitude:	104° 7' 18.216 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.11 °

Well	Derringer 18 LI Fed #1H				
Well Position	+N/-S	0.0 usft	Northing:	571,595.00 usft	Latitude: 32° 34' 16.290 N
	+E/-W	0.0 usft	Easting:	606,523.20 usft	Longitude: 104° 7' 18.216 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level: 3,254.0 usft

Wellbore	Original Hole				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/12/2014	7.51	60.34	48,476

Design	Original Hole				
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Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	89.89

Survey Program		Date 6/17/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	7,010.0	Ves Gyro Survey #1 (Original Hole)	GyroFlex		
7,059.0	12,048.0	MWD Survey #2 (Original Hole)	MWD	MWD v3: standard declination	

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.27	143.81	100.0	-0.2	0.1	0.1	0.27	0.27	0.00
200.0	0.82	153.75	200.0	-1.0	0.6	0.6	0.56	0.55	9.94
300.0	1.12	194.80	300.0	-2.6	0.7	0.7	0.74	0.30	41.05
400.0	1.45	195.11	400.0	-4.8	0.1	0.1	0.33	0.33	0.31
500.0	1.72	179.13	499.9	-7.5	-0.2	-0.2	0.52	0.27	-15.98
600.0	1.79	175.96	599.9	-10.6	-0.1	-0.1	0.12	0.07	-3.17
700.0	1.50	142.92	699.8	-13.2	0.8	0.8	0.98	-0.29	-33.04
800.0	1.62	166.34	799.8	-15.6	1.9	1.9	0.64	0.12	23.42
900.0	1.29	153.10	899.8	-18.0	2.8	2.7	0.47	-0.33	-13.24



Stryker Directional Survey Report



Company:	Mewbourne Oil Company	Local Co-ordinate Reference:	Well Derringer-18 LI Fed #1H
Project:	Eddy County, N.M. Nad. (83)	TVD Reference:	GL 3254 + 20 @ 3274.0usft (Patterson #45)
Site:	Section 18-20S-29E Derringer-18 LI Fed #1H	MD Reference:	GL 3254 + 20 @ 3274.0usft (Patterson #45)
Well:	Derringer-18 LI Fed #1H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Stryker_EDM

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,000.0	1.40	151.02	999.7	-20.0	3.9	3.8	0.12	0.11	-2.08
1,100.0	5.29	164.93	1,099.5	-25.5	5.7	5.6	3.95	3.89	13.91
1,200.0	5.48	155.29	1,199.1	-34.3	8.9	8.8	0.92	0.19	-9.64
1,300.0	5.00	151.01	1,298.7	-42.5	13.0	12.9	0.62	-0.48	-4.28
1,400.0	4.65	144.06	1,398.3	-49.6	17.5	17.4	0.68	-0.35	-6.95
1,500.0	3.95	140.93	1,498.1	-55.5	22.0	21.9	0.74	-0.70	-3.13
1,600.0	3.10	132.77	1,597.9	-60.0	26.2	26.0	0.98	-0.85	-8.16
1,700.0	2.32	120.23	1,697.8	-62.9	29.9	29.8	0.98	-0.78	-12.54
1,800.0	1.83	96.54	1,797.7	-64.1	33.2	33.1	0.98	-0.49	-23.69
1,900.0	1.68	64.97	1,897.6	-63.7	36.1	36.0	0.97	-0.15	-31.57
2,000.0	1.14	31.86	1,997.6	-62.2	38.0	37.9	0.96	-0.54	-33.11
2,100.0	1.19	342.37	2,097.6	-60.4	38.2	38.1	0.98	0.05	-49.49
2,200.0	2.11	330.14	2,197.6	-57.8	37.0	36.9	0.98	0.92	-12.23
2,300.0	2.57	309.96	2,297.5	-54.7	34.3	34.2	0.94	0.46	-20.18
2,400.0	2.27	326.54	2,397.4	-51.6	31.5	31.4	0.76	-0.30	16.58
2,500.0	2.32	336.79	2,497.3	-48.1	29.6	29.6	0.41	0.05	10.25
2,600.0	3.42	356.84	2,597.2	-43.3	28.7	28.6	1.47	1.10	20.05
2,700.0	3.64	353.86	2,697.0	-37.2	28.2	28.1	0.29	0.22	-2.98
2,800.0	3.40	348.07	2,796.8	-31.1	27.2	27.2	0.43	-0.24	-5.79
2,900.0	2.92	349.56	2,896.7	-25.7	26.2	26.1	0.49	-0.48	1.49
3,000.0	2.64	345.06	2,996.5	-21.0	25.1	25.1	0.35	-0.28	-4.50
3,100.0	2.25	349.21	3,096.4	-16.8	24.1	24.1	0.43	-0.39	4.15
3,200.0	1.90	347.12	3,196.4	-13.3	23.4	23.4	0.36	-0.35	-2.09
3,300.0	1.84	341.58	3,296.3	-10.1	22.5	22.5	0.19	-0.06	-5.54
3,400.0	1.41	336.63	3,396.3	-7.5	21.5	21.5	0.45	-0.43	-4.95
3,500.0	1.17	339.03	3,496.3	-5.4	20.7	20.7	0.25	-0.24	2.40
3,600.0	0.82	340.80	3,596.2	-3.8	20.1	20.1	0.35	-0.35	1.77
3,700.0	0.82	328.40	3,696.2	-2.5	19.5	19.5	0.18	0.00	-12.40
3,800.0	0.67	312.29	3,796.2	-1.5	18.7	18.7	0.26	-0.15	-16.11
3,900.0	0.85	293.94	3,896.2	-0.8	17.5	17.5	0.30	0.18	-18.35
4,000.0	1.33	278.83	3,996.2	-0.3	15.7	15.7	0.56	0.48	-15.11
4,100.0	1.35	280.58	4,096.2	0.1	13.4	13.4	0.05	0.02	1.75
4,200.0	1.32	274.54	4,196.1	0.4	11.1	11.1	0.14	-0.03	-6.04
4,300.0	1.41	274.64	4,296.1	0.6	8.7	8.7	0.09	0.09	0.10
4,400.0	1.49	276.57	4,396.1	0.8	6.2	6.2	0.09	0.08	1.93
4,500.0	1.28	274.37	4,496.1	1.1	3.8	3.8	0.22	-0.21	-2.20
4,600.0	1.42	282.98	4,596.0	1.4	1.5	1.5	0.25	0.14	8.61
4,700.0	1.35	286.83	4,696.0	2.1	-0.8	-0.8	0.12	-0.07	3.85
4,800.0	1.14	285.91	4,796.0	2.7	-2.9	-2.9	0.21	-0.21	-0.92
4,900.0	0.83	266.15	4,896.0	2.9	-4.6	-4.6	0.46	-0.31	-19.76
5,000.0	0.98	260.55	4,995.9	2.7	-6.2	-6.2	0.17	0.15	-5.60
5,100.0	1.00	264.72	5,095.9	2.5	-7.9	-7.9	0.07	0.02	4.17
5,200.0	1.05	254.50	5,195.9	2.2	-9.6	-9.6	0.19	0.05	-10.22



Stryker Directional Survey Report



Company:	Mewbourne Oil Company	Local Co-ordinate Reference:	Well Derringer 18 LI Fed #1H
Project:	Eddy County, N.M. Nad (83)	TVD Reference:	GL 3254 + 20 @ 3274.0usft (Patterson #45)
Site:	Section 18-20S-29E Derringer 18 LI Fed #1H	MD Reference:	GL 3254 + 20 @ 3274.0usft (Patterson #45)
Well:	Derringer 18 LI Fed #1H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Stryker_EDM

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,300.0	1.33	244.56	5,295.9	1.4	-11.6	-11.6	0.35	0.28	-9.94	
5,400.0	1.36	244.23	5,395.9	0.4	-13.7	-13.7	0.03	0.03	-0.33	
5,500.0	1.37	235.01	5,495.8	-0.8	-15.7	-15.7	0.22	0.01	-9.22	
5,600.0	1.42	246.17	5,595.8	-2.0	-17.8	-17.9	0.28	0.05	11.16	
5,700.0	1.88	252.63	5,695.8	-3.0	-20.5	-20.6	0.50	0.46	6.46	
5,800.0	2.06	251.80	5,795.7	-4.0	-23.8	-23.8	0.18	0.18	-0.83	
5,900.0	2.98	258.28	5,895.6	-5.1	-28.1	-28.1	0.96	0.92	6.48	
6,000.0	3.07	259.61	5,995.5	-6.1	-33.2	-33.3	0.11	0.09	1.33	
6,100.0	2.64	262.25	6,095.3	-6.9	-38.2	-38.2	0.45	-0.43	2.64	
6,200.0	2.55	262.03	6,195.2	-7.5	-42.7	-42.7	0.09	-0.09	-0.22	
6,300.0	2.39	260.55	6,295.1	-8.2	-46.9	-46.9	0.17	-0.16	-1.48	
6,400.0	2.34	261.33	6,395.1	-8.8	-51.0	-51.0	0.06	-0.05	0.78	
6,500.0	2.30	246.52	6,495.0	-10.0	-54.8	-54.9	0.60	-0.04	-14.81	
6,600.0	2.63	230.02	6,594.9	-12.2	-58.4	-58.5	0.78	0.33	-16.50	
6,700.0	3.39	228.25	6,694.8	-15.7	-62.4	-62.4	0.77	0.76	-1.77	
6,800.0	3.53	224.21	6,794.6	-19.8	-66.8	-66.8	0.28	0.14	-4.04	
6,900.0	3.32	225.35	6,894.4	-24.1	-71.0	-71.0	0.22	-0.21	1.14	
7,010.0	2.47	235.56	7,004.3	-27.7	-75.2	-75.2	0.90	-0.77	9.28	
7010 MD VES Gyro Survey										
7,059.0	2.20	240.50	7,053.2	-28.7	-76.9	-76.9	0.69	-0.55	10.08	
7,090.0	1.80	142.40	7,084.2	-29.4	-77.1	-77.2	9.78	-1.29	-316.45	
7,122.0	5.50	110.60	7,116.1	-30.3	-75.4	-75.4	12.75	11.56	-99.38	
7,154.0	9.90	103.90	7,147.8	-31.5	-71.2	-71.3	14.01	13.75	-20.94	
7,186.0	13.90	102.50	7,179.1	-33.0	-64.8	-64.9	12.53	12.50	-4.38	
7,217.0	17.00	101.60	7,209.0	-34.8	-56.7	-56.8	10.03	10.00	-2.90	
7,249.0	19.40	98.40	7,239.4	-36.5	-46.9	-47.0	8.12	7.50	-10.00	
7,281.0	22.10	93.90	7,269.3	-37.7	-35.6	-35.7	9.79	8.44	-14.06	
7,313.0	25.00	88.10	7,298.7	-37.8	-22.9	-22.9	11.59	9.06	-18.13	
7,345.0	26.60	84.70	7,327.5	-37.0	-9.0	-9.0	6.81	5.00	-10.63	
7,376.0	28.40	84.40	7,355.0	-35.6	5.3	5.2	5.82	5.81	-0.97	
7,408.0	31.40	86.10	7,382.7	-34.3	21.2	21.1	9.74	9.38	-5.31	
7,440.0	35.30	88.10	7,409.4	-33.4	38.7	38.7	12.66	12.19	6.25	
7,472.0	37.80	89.00	7,435.2	-32.9	57.8	57.7	7.99	7.81	2.81	
7,503.0	41.00	89.90	7,459.1	-32.8	77.5	77.4	10.49	10.32	2.90	
7,535.0	45.40	90.50	7,482.4	-32.8	99.4	99.3	13.81	13.75	1.88	
7,567.0	50.20	90.90	7,503.9	-33.1	123.1	123.0	15.03	15.00	1.25	
7,599.0	55.20	91.10	7,523.3	-33.6	148.5	148.4	15.63	15.63	0.63	
7,630.0	60.20	90.50	7,539.9	-33.9	174.7	174.6	16.21	16.13	-1.94	
7,662.0	63.40	89.00	7,555.0	-33.8	202.9	202.8	10.82	10.00	-4.69	
7,694.0	66.80	88.20	7,568.4	-33.1	231.9	231.8	10.86	10.63	-2.50	
7,726.0	70.20	87.40	7,580.2	-31.9	261.6	261.6	10.88	10.63	-2.50	
7,757.0	73.70	87.50	7,589.8	-30.6	291.1	291.0	11.29	11.29	0.32	
7,789.0	76.30	88.40	7,598.1	-29.5	322.0	321.9	8.57	8.13	2.81	



Stryker Directional Survey Report



Company:	Mewbourne Oil Company	Local Co-ordinate Reference:	Well Derringer 18 LI Fed #1H
Project:	Eddy County, N.M. Nad. (83)	TVD Reference:	GL 3254 + 20 @ 3274.0usft (Patterson #45)
Site:	Section 18-20S-29E Derringer 18 LI Fed #1H	MD Reference:	GL 3254 + 20 @ 3274.0usft (Patterson #45)
Well:	Derringer 18 LI Fed #1H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Stryker_EDM

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
7,821.0	78.80	89.10	7,605.0	-28.9	353.2	353.2	8.10	7.81	2.19	
7,852.0	80.70	88.40	7,610.5	-28.2	383.7	383.6	6.52	6.13	-2.26	
7,884.0	82.70	88.10	7,615.1	-27.2	415.4	415.3	6.32	6.25	-0.94	
7,916.0	84.20	87.50	7,618.7	-26.0	447.1	447.1	5.04	4.69	-1.88	
7,943.1	85.05	87.50	7,621.3	-24.8	474.1	474.0	3.13	3.13	0.00	
LP Derringer 18 LI Fed #1H										
7,948.0	85.20	87.50	7,621.7	-24.6	479.0	478.9	3.13	3.13	0.00	
7,979.0	87.10	88.10	7,623.8	-23.4	509.9	509.8	6.43	6.13	1.94	
8,011.0	87.80	88.40	7,625.2	-22.4	541.8	541.8	2.38	2.19	0.94	
8,043.0	88.40	88.40	7,626.3	-21.6	573.8	573.7	1.88	1.88	0.00	
8,075.0	88.30	88.10	7,627.2	-20.6	605.8	605.7	0.99	-0.31	-0.94	
8,107.0	88.00	89.10	7,628.2	-19.8	637.7	637.7	3.26	-0.94	3.13	
8,138.0	87.60	89.50	7,629.4	-19.4	668.7	668.7	1.82	-1.29	1.29	
8,170.0	87.50	89.50	7,630.8	-19.1	700.7	700.6	0.31	-0.31	0.00	
8,202.0	89.00	89.50	7,631.8	-18.9	732.7	732.6	4.69	4.69	0.00	
8,234.0	91.60	89.30	7,631.6	-18.5	764.6	764.6	8.15	8.13	-0.63	
8,265.0	93.40	89.30	7,630.2	-18.1	795.6	795.6	5.81	5.81	0.00	
8,297.0	93.90	89.10	7,628.2	-17.7	827.5	827.5	1.68	1.56	-0.63	
8,329.0	92.20	89.30	7,626.5	-17.3	859.5	859.5	5.35	-5.31	0.63	
8,360.0	91.40	89.70	7,625.5	-17.0	890.5	890.4	2.88	-2.58	1.29	
8,392.0	91.40	89.70	7,624.7	-16.8	922.5	922.4	0.00	0.00	0.00	
8,424.0	91.40	89.30	7,624.0	-16.5	954.5	954.4	1.25	0.00	-1.25	
8,488.0	89.00	89.30	7,623.7	-15.8	1,018.4	1,018.4	3.75	-3.75	0.00	
8,551.0	89.50	89.30	7,624.6	-15.0	1,081.4	1,081.4	0.79	0.79	0.00	
8,615.0	90.20	88.80	7,624.7	-13.9	1,145.4	1,145.4	1.34	1.09	-0.78	
8,710.0	90.10	90.00	7,624.5	-12.9	1,240.4	1,240.4	1.27	-0.11	1.26	
8,805.0	89.20	90.40	7,625.1	-13.3	1,335.4	1,335.4	1.04	-0.95	0.42	
8,901.0	89.70	89.30	7,626.0	-13.0	1,431.4	1,431.4	1.26	0.52	-1.15	
8,996.0	89.30	90.50	7,626.8	-12.8	1,526.4	1,526.4	1.33	-0.42	1.26	
9,091.0	87.90	91.10	7,629.1	-14.2	1,621.4	1,621.3	1.60	-1.47	0.63	
9,187.0	88.50	90.00	7,632.1	-15.1	1,717.3	1,717.3	1.30	0.63	-1.15	
9,282.0	89.80	89.00	7,633.6	-14.3	1,812.3	1,812.3	1.73	1.37	-1.05	
9,377.0	88.20	89.70	7,635.2	-13.2	1,907.3	1,907.2	1.84	-1.68	0.74	
9,473.0	89.10	89.00	7,637.5	-12.1	2,003.2	2,003.2	1.19	0.94	-0.73	
9,568.0	88.40	89.70	7,639.5	-11.0	2,098.2	2,098.2	1.04	-0.74	0.74	
9,664.0	89.30	89.30	7,641.5	-10.2	2,194.2	2,194.2	1.03	0.94	-0.42	
9,759.0	90.20	88.80	7,641.9	-8.6	2,289.2	2,289.1	1.08	0.95	-0.53	
9,854.0	92.70	89.00	7,639.5	-6.8	2,384.1	2,384.1	2.64	2.63	0.21	
9,950.0	92.50	90.50	7,635.1	-6.4	2,480.0	2,480.0	1.57	-0.21	1.56	
9,982.0	92.70	91.60	7,633.7	-6.9	2,512.0	2,512.0	3.49	0.63	3.44	
10,010.0	91.50	92.00	7,632.7	-7.8	2,539.9	2,539.9	4.52	-4.29	1.43	
10,042.0	89.10	92.60	7,632.5	-9.1	2,571.9	2,571.9	7.73	-7.50	1.88	
10,074.0	87.00	92.10	7,633.6	-10.4	2,603.9	2,603.8	6.75	-6.56	-1.56	
10,105.0	86.20	91.30	7,635.4	-11.3	2,634.8	2,634.8	3.65	-2.58	-2.58	



Stryker Directional Survey Report



Company:	Mewbourne Oil Company	Local Co-ordinate Reference:	Well Derringer 18 LI Fed #1H
Project:	Eddy County N.M. Nad (83)	TVD Reference:	GL 3254 + 20 @ 3274.0usft (Patterson #45)
Site:	Section 18-20S-29E Derringer 18 LI Fed #1H	MD Reference:	GL 3254 + 20 @ 3274.0usft (Patterson #45)
Well:	Derringer 18 LI Fed #1H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Stryker_EDM

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,137.0	85.80	90.70	7,637.6	-11.9	2,666.7	2,666.7	2.25	-1.25	-1.88
10,169.0	86.10	90.30	7,639.9	-12.2	2,698.6	2,698.6	1.56	0.94	-1.25
10,201.0	85.90	89.50	7,642.1	-12.1	2,730.5	2,730.5	2.57	-0.63	-2.50
10,232.0	85.80	88.80	7,644.4	-11.7	2,761.5	2,761.4	2.28	-0.32	-2.26
10,264.0	86.10	88.40	7,646.6	-10.9	2,793.4	2,793.3	1.56	0.94	-1.25
10,296.0	87.50	88.80	7,648.4	-10.1	2,825.3	2,825.3	4.55	4.38	1.25
10,327.0	88.30	88.80	7,649.6	-9.5	2,856.3	2,856.3	2.58	2.58	0.00
10,359.0	88.70	88.20	7,650.4	-8.6	2,888.3	2,888.2	2.25	1.25	-1.88
10,391.0	89.00	87.70	7,651.0	-7.5	2,920.2	2,920.2	1.82	0.94	-1.56
10,422.0	87.50	88.80	7,652.0	-6.5	2,951.2	2,951.2	6.00	-4.84	3.55
10,454.0	87.20	89.30	7,653.5	-6.0	2,983.2	2,983.2	1.82	-0.94	1.56
10,486.0	87.30	90.00	7,655.0	-5.8	3,015.1	3,015.1	2.21	0.31	2.19
10,518.0	87.40	90.00	7,656.5	-5.8	3,047.1	3,047.1	0.31	0.31	0.00
10,613.0	87.80	88.80	7,660.5	-4.8	3,142.0	3,142.0	1.33	0.42	-1.26
10,707.0	88.00	90.70	7,663.9	-4.4	3,235.9	3,235.9	2.03	0.21	2.02
10,803.0	88.50	90.20	7,666.8	-5.1	3,331.9	3,331.9	0.74	0.52	-0.52
10,897.0	88.90	89.50	7,669.0	-4.9	3,425.9	3,425.8	0.86	0.43	-0.74
10,993.0	89.30	89.00	7,670.5	-3.6	3,521.8	3,521.8	0.67	0.42	-0.52
11,088.0	89.60	88.20	7,671.4	-1.3	3,616.8	3,616.8	0.90	0.32	-0.84
11,183.0	88.50	89.30	7,673.0	0.7	3,711.8	3,711.8	1.64	-1.16	1.16
11,279.0	88.80	89.10	7,675.2	2.1	3,807.7	3,807.7	0.38	0.31	-0.21
11,374.0	87.30	90.00	7,678.5	2.8	3,902.7	3,902.7	1.84	-1.58	0.95
11,469.0	89.10	90.00	7,681.4	2.8	3,997.6	3,997.6	1.89	1.89	0.00
11,565.0	89.90	89.70	7,682.3	3.1	4,093.6	4,093.6	0.89	0.83	-0.31
11,660.0	90.00	88.80	7,682.4	4.3	4,188.6	4,188.6	0.95	0.11	-0.95
11,755.0	88.10	89.80	7,683.9	5.5	4,283.6	4,283.6	2.26	-2.00	1.05
11,851.0	88.50	89.00	7,686.8	6.5	4,379.5	4,379.5	0.93	0.42	-0.83
11,946.0	88.90	88.40	7,688.9	8.6	4,474.5	4,474.5	0.76	0.42	-0.63
11,995.0	89.20	88.10	7,689.8	10.1	4,523.5	4,523.5	0.87	0.61	-0.61
12,048.0	89.20	88.10	7,690.5	11.9	4,576.4	4,576.4	0.00	0.00	0.00

12048' MD Projected to Bit - PBHL Derringer 18 LI Fed #1H

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,010.0	7,004.3	-27.7	-75.2	7010' MD VES Gyro Survey
12,048.0	7,690.5	11.9	4,576.4	12048' MD Projected to Bit



Company: Mewbourne Oil
Lease/Well: Derringer 18 LI Federal/No 001H
Location: S18 T20S R29E
Rig Name: Patterson 45
State/County: New Mexico/Eddy
Latitude: 32.34, Longitude: -104.07
GRID North is 0.14 Degrees East of True North
VS-Azi: 89.89 Degrees



Depth Reference : R.K.B. = 17 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut

Minimum Curvature Method

Report Date/Time: 6/12/2014 / 13:01

VES Survey International

Midland, TX

432-563-5444

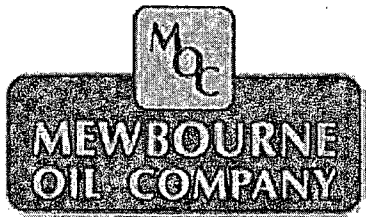
Surveyor: Andrew Askew

Derringer 18 LI Federal No 001H / API 30-015-41951

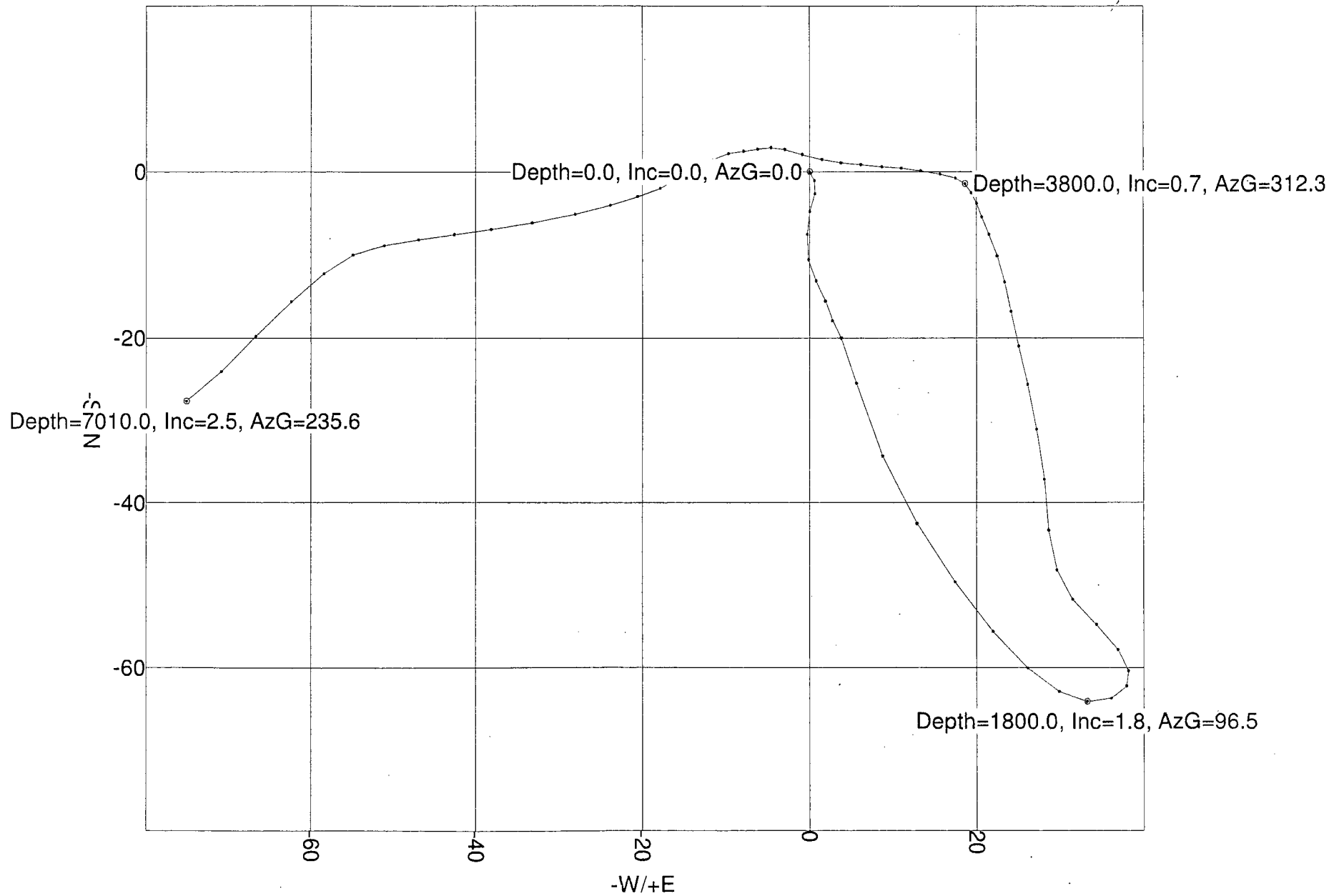
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.27	143.81	100.00	-0.19	0.14	0.14	0.24	143.81	0.27
200.00	0.82	153.75	199.99	-1.02	0.60	0.59	1.18	149.77	0.55
300.00	1.12	194.80	299.98	-2.60	0.66	0.66	2.68	165.72	0.73
400.00	1.45	195.11	399.96	-4.77	0.08	0.07	4.77	179.00	0.34
500.00	1.72	179.13	499.92	-7.49	-0.22	-0.24	7.50	181.72	0.52
600.00	1.79	175.96	599.87	-10.55	-0.09	-0.11	10.55	180.50	0.12
700.00	1.50	142.92	699.83	-13.15	0.81	0.78	13.17	176.48	0.97
800.00	1.62	166.34	799.80	-15.57	1.93	1.90	15.68	172.93	0.64
900.00	1.29	153.10	899.76	-17.94	2.77	2.74	18.15	171.22	0.47
1000.00	1.40	151.02	999.74	-20.01	3.87	3.84	20.38	169.04	0.13
1100.00	5.29	164.93	1099.55	-25.54	5.67	5.62	26.16	167.49	3.94
1200.00	5.48	155.29	1199.11	-34.33	8.86	8.80	35.46	165.52	0.92
1300.00	5.00	151.01	1298.69	-42.48	12.97	12.89	44.42	163.02	0.62
1400.00	4.65	144.06	1398.34	-49.58	17.46	17.37	52.56	160.59	0.68
1500.00	3.95	140.93	1498.05	-55.54	22.02	21.91	59.74	158.37	0.74
1600.00	3.10	132.77	1597.86	-60.05	26.18	26.06	65.51	156.45	0.99
1700.00	2.32	120.23	1697.75	-62.90	29.91	29.79	69.65	154.57	0.97
1800.00	1.83	96.54	1797.69	-64.10	33.25	33.12	72.21	152.59	0.98
1900.00	1.68	64.97	1897.64	-63.67	36.16	36.04	73.22	150.41	0.97
2000.00	1.14	31.86	1997.62	-62.21	38.01	37.89	72.90	148.57	0.95

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
2100.00	1.19	342.37	2097.60	-60.37	38.22	38.10	71.45	147.66	0.98
2200.00	2.11	330.14	2197.55	-57.78	36.98	36.87	68.60	147.38	0.98
2300.00	2.57	309.96	2297.47	-54.74	34.35	34.24	64.62	147.89	0.93
2400.00	2.27	326.54	2397.38	-51.65	31.54	31.44	60.52	148.59	0.76
2500.00	2.32	336.79	2497.31	-48.14	29.65	29.56	56.54	148.37	0.41
2600.00	3.42	356.84	2597.18	-43.29	28.69	28.61	51.94	146.47	1.47
2700.00	3.64	353.86	2696.99	-37.16	28.19	28.11	46.64	142.82	0.28
2800.00	3.40	348.07	2796.80	-31.11	27.23	27.17	41.34	138.80	0.42
2900.00	2.92	349.56	2896.65	-25.70	26.16	26.11	36.67	134.49	0.49
3000.00	2.64	345.06	2996.53	-20.97	25.10	25.06	32.71	129.88	0.35
3100.00	2.25	349.21	3096.44	-16.82	24.14	24.11	29.42	124.86	0.43
3200.00	1.90	347.12	3196.38	-13.27	23.40	23.38	26.90	119.55	0.36
3300.00	1.84	341.58	3296.32	-10.12	22.53	22.51	24.70	114.20	0.19
3400.00	1.41	336.63	3396.28	-7.47	21.53	21.52	22.79	109.14	0.46
3500.00	1.17	339.03	3496.26	-5.39	20.68	20.67	21.37	104.61	0.24
3600.00	0.82	340.80	3596.24	-3.77	20.08	20.07	20.43	100.62	0.36
3700.00	0.82	328.40	3696.23	-2.48	19.47	19.46	19.63	97.27	0.18
3800.00	0.67	312.29	3796.22	-1.48	18.66	18.66	18.72	94.53	0.26
3900.00	0.85	293.94	3896.21	-0.78	17.55	17.55	17.57	92.56	0.30
4000.00	1.33	278.83	3996.20	-0.30	15.72	15.72	15.73	91.11	0.55
4100.00	1.35	280.58	4096.17	0.09	13.42	13.42	13.42	89.62	0.04
4200.00	1.32	274.54	4196.14	0.40	11.12	11.12	11.12	87.96	0.14
4300.00	1.41	274.64	4296.11	0.59	8.74	8.74	8.76	86.16	0.09
4400.00	1.49	276.57	4396.08	0.84	6.22	6.23	6.28	82.36	0.10
4500.00	1.28	274.37	4496.05	1.07	3.82	3.82	3.97	74.36	0.22
4600.00	1.42	282.98	4596.02	1.43	1.50	1.50	2.07	46.25	0.25
4700.00	1.35	286.83	4695.99	2.05	-0.84	-0.84	2.22	337.74	0.12
4800.00	1.14	285.91	4795.97	2.67	-2.92	-2.92	3.96	312.38	0.21
4900.00	0.83	266.15	4895.96	2.89	-4.60	-4.60	5.43	302.13	0.45
5000.00	0.98	260.55	4995.94	2.70	-6.17	-6.16	6.73	293.65	0.17
5100.00	1.00	264.72	5095.93	2.48	-7.88	-7.87	8.26	287.48	0.07
5200.00	1.05	254.50	5195.91	2.15	-9.63	-9.63	9.87	282.61	0.19
5300.00	1.33	244.56	5295.89	1.41	-11.57	-11.56	11.65	276.95	0.35
5400.00	1.36	244.23	5395.86	0.40	-13.68	-13.68	13.69	271.66	0.02
5500.00	1.37	235.01	5495.84	-0.80	-15.73	-15.73	15.75	267.07	0.22
5600.00	1.42	246.17	5595.81	-1.99	-17.83	-17.84	17.94	263.64	0.27
5700.00	1.88	252.63	5695.76	-2.98	-20.53	-20.54	20.75	261.75	0.50
5800.00	2.06	251.80	5795.71	-4.03	-23.80	-23.81	24.14	260.40	0.18
5900.00	2.98	258.28	5895.61	-5.12	-28.05	-28.06	28.52	259.67	0.96
6000.00	3.07	259.61	5995.47	-6.13	-33.23	-33.25	33.79	259.55	0.12
6100.00	2.64	262.25	6095.34	-6.92	-38.16	-38.17	38.78	259.72	0.45
6200.00	2.55	262.03	6195.24	-7.54	-42.64	-42.65	43.30	259.97	0.10

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
6300.00	2.39	260.55	6295.15	-8.19	-46.90	-46.91	47.61	260.09	0.17
6400.00	2.34	261.33	6395.06	-8.84	-50.98	-50.99	51.74	260.16	0.06
6500.00	2.30	246.52	6494.98	-9.95	-54.84	-54.86	55.73	259.72	0.60
6600.00	2.63	230.02	6594.89	-12.22	-58.43	-58.46	59.70	258.19	0.78
6700.00	3.39	228.25	6694.75	-15.66	-62.39	-62.42	64.33	255.91	0.76
6800.00	3.53	224.21	6794.57	-19.84	-66.75	-66.78	69.63	253.45	0.28
6900.00	3.32	225.35	6894.39	-24.08	-70.96	-71.00	74.93	251.25	0.22
7010.00	2.47	235.56	7004.25	-27.67	-75.18	-75.24	80.11	249.80	0.90



VES Survey International
Midland, TX
432-563-5444
Surveyor: Andrew Askew
Derringer 18 LI Federal No 001H / API 30-015-41951



VES Survey Date: 06/08/2014