



Directional Survey Certification

2948 I-70 Business Loop
Grand Junction, CO 81504
(970)-245-9447 Fax (970)-245-9454

Operator	Terra Energy Partners
Well Name & No.	RU 412-7
County & State	Garfield, CO
SDI Job No.	420816DEFK379941
Rig	H&P 318

I, Janie Collins, having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 115 feet to a measured depth of 9,652 feet is true and correct as determined from all available records.

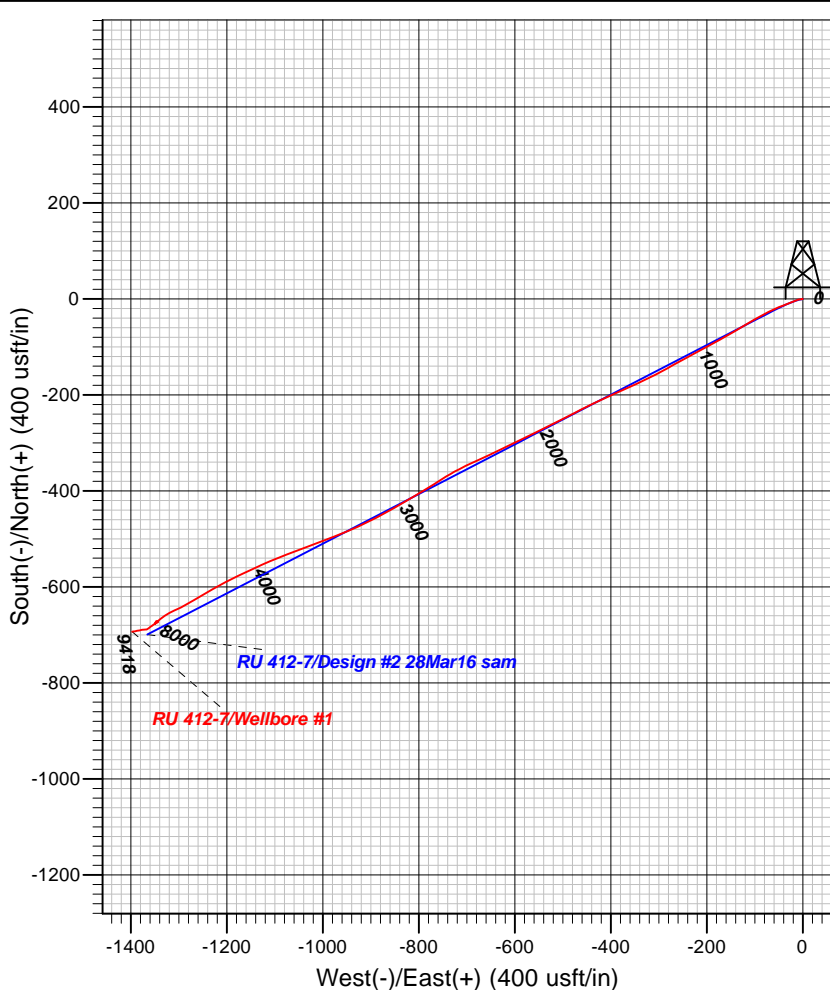
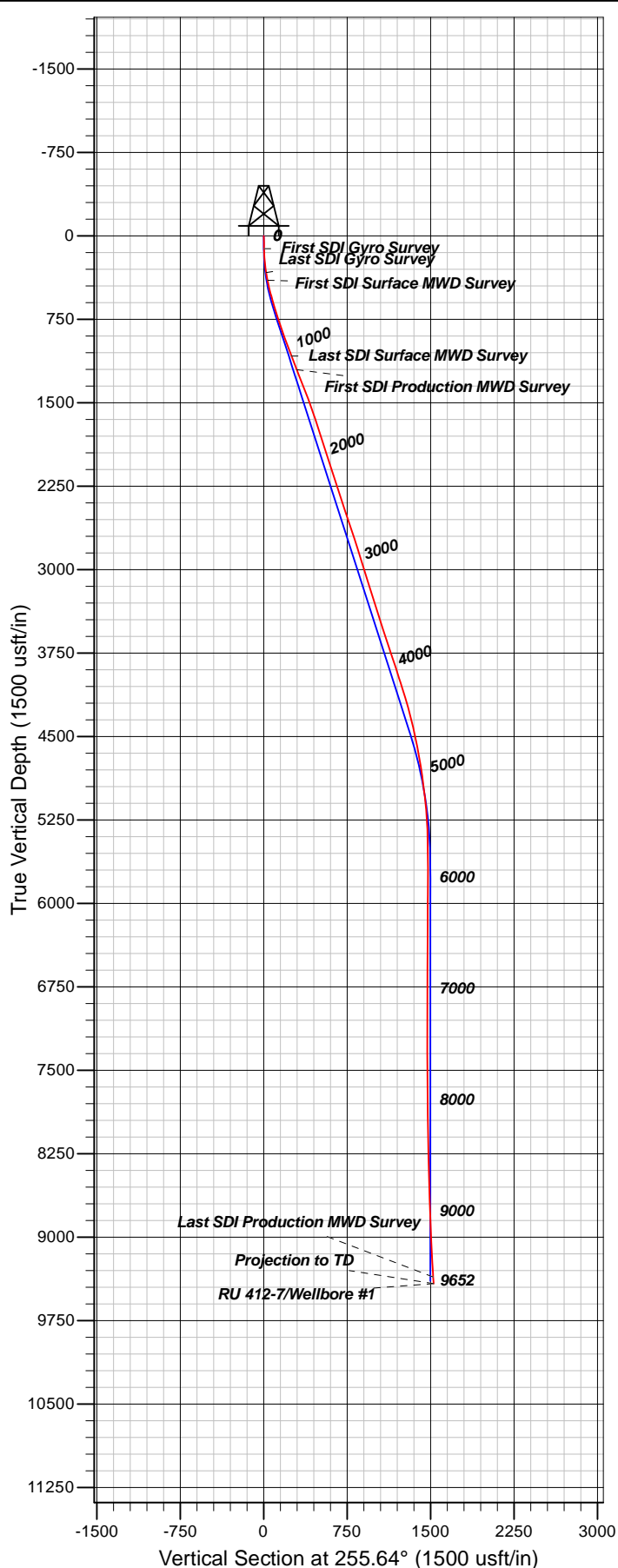


Signature

6-Sep-16

Date

Janie Collins
Colorado District Well Planner
Scientific Drilling International



Well Details: RU 412-7

TVD Reference: GL 7339' & RKB 24' @ 7363.00usft (H&B 318) Level: 7339.00
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.00 0.00 1599691.07 2345081.41 39.4569657 -107.8197223 RU 412-7 (B4)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well RU 412-7 - Slot RU 412-7 (B4), True North
 Vertical (TVD) Reference: GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
 Section (VS) Reference: Slot - RU 412-7 (B4)(0.00N, 0.00E)
 Measured Depth Reference: GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
 Calculation Method: Minimum Curvature

PROJECT DETAILS: Garfield County, CO NAD83

Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Colorado Central Zone

System Datum: Mean Sea Level

Plan: Wellbore #1

11:57, September 06 2016
 Created By: Janie Collins

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well RU 412-7 - Slot RU 412-7 (B4)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
Site:	RU 22-7 Pad	MD Reference:	GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
Well:	RU 412-7	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Grand Junction District

Project	Garfield County, CO NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		RU 22-7 Pad			
Site Position:		Northing:	1,599,673.59 usft	Latitude:	39.4569181
From:	Map	Easting:	2,345,086.00 usft	Longitude:	-107.8197045
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.46 °

Well	RU 412-7 - Slot RU 412-7 (B4)					
Well Position	+N/-S	0.00 usft	Northing:	1,599,691.06 usft	Latitude:	39.4569657
	+E/-W	0.00 usft	Easting:	2,345,081.41 usft	Longitude:	-107.8197223
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	7,339.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/21/2016	9.35	65.68	51,789

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	255.64	

Survey Program	Date	9/6/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
115.00	331.00	Survey #1 - Gyro MWD Survey (Wellbore)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
400.00	1,117.00	Survey #2 - Surface MWD Survey (Wellbo)	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,250.00	9,652.00	Survey #3 - Production MWD Survey (Wel)	SDI MWD	SDI MWD - Standard ver 1.0.1	

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115.00	1.50	270.18	114.99	0.00	-1.51	1.46	1.30	1.30	0.00
First SDI Gyro Survey									
150.00	2.64	264.90	149.96	-0.07	-2.77	2.70	3.30	3.26	-15.09
240.00	5.28	257.08	239.74	-1.18	-8.87	8.88	2.99	2.93	-8.69
331.00	9.06	246.27	330.02	-5.00	-19.51	20.14	4.39	4.15	-11.88
Last SDI Gyro Survey									
400.00	11.44	249.55	397.91	-9.57	-30.90	32.31	3.55	3.45	4.75

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well RU 412-7 - Slot RU 412-7 (B4)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
Site:	RU 22-7 Pad	MD Reference:	GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
Well:	RU 412-7	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Grand Junction District

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)
First SDI Surface MWD Survey									
491.00	14.07	248.38	486.66	-16.80	-49.64	52.26	2.90	2.89	-1.29
583.00	16.25	243.21	575.46	-26.73	-71.53	75.93	2.79	2.37	-5.62
673.00	17.84	240.62	661.50	-39.17	-94.79	101.54	1.96	1.77	-2.88
764.00	19.22	239.04	747.78	-53.71	-119.78	129.36	1.61	1.52	-1.74
855.00	19.60	239.84	833.61	-69.09	-145.82	158.40	0.51	0.42	0.88
946.00	19.64	241.16	919.33	-84.13	-172.41	187.90	0.49	0.04	1.45
1,036.00	20.56	241.51	1,003.84	-98.97	-199.55	217.87	1.03	1.02	0.39
1,117.00	21.90	241.03	1,079.35	-113.07	-225.27	246.28	1.67	1.65	-0.59
Last SDI Surface MWD Survey									
1,250.00	22.77	242.42	1,202.37	-137.00	-269.79	295.34	0.77	0.65	1.05
First SDI Production MWD Survey									
1,345.00	22.25	241.03	1,290.13	-154.22	-301.82	330.64	0.78	-0.55	-1.46
1,439.00	21.17	244.92	1,377.47	-170.04	-332.76	364.54	1.91	-1.15	4.14
1,534.00	20.38	245.82	1,466.29	-184.09	-363.39	397.70	0.90	-0.83	0.95
1,628.00	20.03	245.76	1,554.50	-197.40	-393.00	429.68	0.37	-0.37	-0.06
1,723.00	18.99	244.95	1,644.05	-210.62	-421.84	460.90	1.13	-1.09	-0.85
1,817.00	18.66	243.08	1,733.02	-223.91	-449.10	490.61	0.73	-0.35	-1.99
1,912.00	18.03	243.80	1,823.19	-237.28	-475.84	519.83	0.70	-0.66	0.76
2,006.00	17.44	242.44	1,912.72	-250.22	-501.39	547.79	0.77	-0.63	-1.45
2,100.00	18.65	244.22	2,002.10	-263.27	-527.41	576.23	1.41	1.29	1.89
2,195.00	18.81	243.62	2,092.07	-276.69	-554.81	606.10	0.26	0.17	-0.63
2,289.00	18.33	242.56	2,181.18	-290.23	-581.50	635.32	0.62	-0.51	-1.13
2,383.00	17.72	244.44	2,270.56	-303.21	-607.53	663.76	0.90	-0.65	2.00
2,478.00	18.87	244.75	2,360.76	-316.01	-634.46	693.02	1.21	1.21	0.33
2,572.00	18.73	245.71	2,449.74	-328.70	-661.97	722.82	0.36	-0.15	1.02
2,667.00	17.89	244.82	2,539.93	-341.18	-689.08	752.18	0.93	-0.88	-0.94
2,761.00	19.82	243.24	2,628.89	-354.50	-716.37	781.92	2.12	2.05	-1.68
2,855.00	19.02	236.96	2,717.55	-370.03	-743.45	812.00	2.38	-0.85	-6.68
2,950.00	18.51	239.16	2,807.50	-386.20	-769.37	841.13	0.92	-0.54	2.32
3,044.00	17.83	237.61	2,896.81	-401.56	-794.34	869.12	0.89	-0.72	-1.65
3,138.00	18.22	240.55	2,986.20	-416.49	-819.29	897.00	1.05	0.41	3.13
3,233.00	18.10	239.79	3,076.47	-431.22	-844.97	925.53	0.28	-0.13	-0.80
3,327.00	17.49	240.20	3,165.97	-445.59	-869.85	953.20	0.66	-0.65	0.44
3,422.00	18.47	244.37	3,256.33	-459.19	-895.80	981.72	1.70	1.03	4.39
3,516.00	17.15	244.98	3,345.83	-471.50	-921.79	1,009.94	1.42	-1.40	0.65
3,611.00	18.51	247.19	3,436.26	-483.27	-948.38	1,038.63	1.60	1.43	2.33
3,705.00	17.58	248.10	3,525.64	-494.35	-975.31	1,067.46	1.03	-0.99	0.97
3,799.00	18.78	249.91	3,614.94	-504.84	-1,002.69	1,096.59	1.41	1.28	1.93
3,893.00	17.63	248.88	3,704.24	-515.16	-1,030.18	1,125.78	1.27	-1.22	-1.10
3,988.00	18.90	248.45	3,794.45	-526.00	-1,057.91	1,155.33	1.34	1.34	-0.45
4,082.00	18.55	250.28	3,883.48	-536.64	-1,086.15	1,185.33	0.73	-0.37	1.95
4,176.00	18.55	245.74	3,972.60	-547.83	-1,113.86	1,214.94	1.54	0.00	-4.83
4,270.00	17.37	244.42	4,062.01	-560.03	-1,140.15	1,243.44	1.33	-1.26	-1.40

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well RU 412-7 - Slot RU 412-7 (B4)
Project:	Garfield County, CO NAD83	TVD Reference:	GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
Site:	RU 22-7 Pad	MD Reference:	GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
Well:	RU 412-7	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Grand Junction District

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)	
4,365.00	16.60	246.56	4,152.87	-571.55	-1,165.39	1,270.75	1.04	-0.81	2.25	
4,459.00	16.47	242.34	4,242.99	-583.08	-1,189.51	1,296.98	1.28	-0.14	-4.49	
4,554.00	14.13	242.47	4,334.61	-594.69	-1,211.73	1,321.38	2.46	-2.46	0.14	
4,648.00	13.49	240.00	4,425.90	-605.48	-1,231.40	1,343.11	0.93	-0.68	-2.63	
4,742.00	12.01	239.25	4,517.58	-615.96	-1,249.30	1,363.05	1.58	-1.57	-0.80	
4,836.00	11.82	240.83	4,609.55	-625.65	-1,266.11	1,381.74	0.40	-0.20	1.68	
4,931.00	9.62	239.22	4,702.89	-634.46	-1,281.42	1,398.76	2.34	-2.32	-1.69	
5,025.00	9.77	243.22	4,795.55	-642.07	-1,295.29	1,414.09	0.73	0.16	4.26	
5,120.00	7.51	246.53	4,889.46	-648.18	-1,308.19	1,428.09	2.43	-2.38	3.48	
5,214.00	7.43	242.01	4,982.67	-653.48	-1,319.19	1,440.06	0.63	-0.09	-4.81	
5,308.00	6.24	235.21	5,076.00	-659.24	-1,328.75	1,450.76	1.53	-1.27	-7.23	
5,402.00	4.31	232.68	5,169.60	-664.30	-1,335.75	1,458.80	2.07	-2.05	-2.69	
5,497.00	4.46	229.03	5,264.32	-668.89	-1,341.38	1,465.39	0.33	0.16	-3.84	
5,591.00	2.38	235.40	5,358.14	-672.39	-1,345.75	1,470.49	2.25	-2.21	6.78	
5,685.00	1.88	227.98	5,452.08	-674.53	-1,348.50	1,473.68	0.61	-0.53	-7.89	
5,779.00	1.17	204.39	5,546.05	-676.44	-1,350.04	1,475.65	0.99	-0.76	-25.10	
5,873.00	0.84	41.80	5,640.04	-676.80	-1,349.98	1,475.68	2.11	-0.35	-172.97	
5,968.00	0.55	74.95	5,735.03	-676.16	-1,349.08	1,474.65	0.51	-0.31	34.89	
6,063.00	0.76	20.48	5,830.03	-675.45	-1,348.42	1,473.83	0.66	0.22	-57.34	
6,158.00	0.55	15.72	5,925.02	-674.42	-1,348.07	1,473.24	0.23	-0.22	-5.01	
6,252.00	0.44	11.15	6,019.02	-673.63	-1,347.88	1,472.86	0.12	-0.12	-4.86	
6,346.00	0.40	329.08	6,113.02	-673.00	-1,347.98	1,472.80	0.32	-0.04	-44.76	
6,440.00	0.62	357.69	6,207.01	-672.21	-1,348.17	1,472.78	0.35	0.23	30.44	
6,535.00	0.26	143.67	6,302.01	-671.87	-1,348.06	1,472.60	0.89	-0.38	153.66	
6,629.00	0.72	179.52	6,396.01	-672.63	-1,347.93	1,472.66	0.57	0.49	38.14	
6,723.00	1.05	180.29	6,490.00	-674.08	-1,347.93	1,473.02	0.35	0.35	0.82	
6,818.00	0.95	69.80	6,584.99	-674.68	-1,347.19	1,472.46	1.73	-0.11	-116.31	
6,912.00	0.76	62.96	6,678.98	-674.13	-1,345.91	1,471.07	0.23	-0.20	-7.28	
7,007.00	1.23	66.07	6,773.96	-673.43	-1,344.41	1,469.45	0.50	0.49	3.27	
7,102.00	0.07	32.26	6,868.96	-672.97	-1,343.45	1,468.40	1.23	-1.22	-35.59	
7,196.00	0.50	344.18	6,962.96	-672.52	-1,343.53	1,468.37	0.49	0.46	-51.15	
7,291.00	0.44	326.18	7,057.95	-671.82	-1,343.85	1,468.50	0.17	-0.06	-18.95	
7,385.00	0.24	343.45	7,151.95	-671.33	-1,344.10	1,468.63	0.24	-0.21	18.37	
7,480.00	0.21	216.11	7,246.95	-671.28	-1,344.26	1,468.77	0.42	-0.03	-134.04	
7,574.00	0.45	310.55	7,340.95	-671.18	-1,344.65	1,469.12	0.54	0.26	100.47	
7,669.00	0.56	250.54	7,435.95	-671.09	-1,345.37	1,469.80	0.54	0.12	-63.17	
7,763.00	0.44	240.06	7,529.94	-671.43	-1,346.11	1,470.60	0.16	-0.13	-11.15	
7,857.00	0.62	235.05	7,623.94	-671.90	-1,346.84	1,471.43	0.20	0.19	-5.33	
7,952.00	0.42	204.97	7,718.93	-672.51	-1,347.41	1,472.13	0.35	-0.21	-31.66	
8,046.00	0.83	232.75	7,812.93	-673.23	-1,348.10	1,472.97	0.53	0.44	29.55	
8,140.00	0.79	197.03	7,906.92	-674.27	-1,348.83	1,473.94	0.53	-0.04	-38.00	
8,235.00	0.91	206.03	8,001.91	-675.57	-1,349.35	1,474.77	0.19	0.13	9.47	
8,329.00	0.90	239.73	8,095.90	-676.61	-1,350.32	1,475.96	0.56	-0.01	35.85	

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Site:	RU 22-7 Pad	MD Reference:	GL 7339' & RKB 24' @ 7363.00usft (H&P 318)
Well:	RU 412-7	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Grand Junction District

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)	
8,424.00	1.18	236.36	8,190.88	-677.53	-1,351.78	1,477.60	0.30	0.29	-3.55	
8,518.00	1.39	238.62	8,284.86	-678.66	-1,353.56	1,479.61	0.23	0.22	2.40	
8,612.00	1.73	227.50	8,378.82	-680.21	-1,355.58	1,481.95	0.48	0.36	-11.83	
8,707.00	1.88	239.60	8,473.78	-681.97	-1,357.98	1,484.71	0.43	0.16	12.74	
8,801.00	1.64	231.92	8,567.73	-683.58	-1,360.37	1,487.42	0.36	-0.26	-8.17	
8,896.00	1.92	235.48	8,662.69	-685.32	-1,362.75	1,490.16	0.32	0.29	3.75	
8,990.00	2.20	235.12	8,756.63	-687.24	-1,365.52	1,493.33	0.30	0.30	-0.38	
9,084.00	2.18	268.02	8,850.56	-688.34	-1,368.79	1,496.77	1.32	-0.02	35.00	
9,179.00	2.49	265.02	8,945.48	-688.58	-1,372.65	1,500.57	0.35	0.33	-3.16	
9,273.00	3.04	261.11	9,039.37	-689.14	-1,377.15	1,505.06	0.62	0.59	-4.16	
9,367.00	3.07	257.99	9,133.24	-690.05	-1,382.07	1,510.06	0.18	0.03	-3.32	
9,462.00	3.02	258.00	9,228.11	-691.10	-1,387.01	1,515.10	0.05	-0.05	0.01	
9,556.00	3.40	261.20	9,321.96	-692.04	-1,392.19	1,520.35	0.45	0.40	3.40	
9,592.00	3.25	259.75	9,357.90	-692.39	-1,394.25	1,522.43	0.48	-0.42	-4.03	
Last SDI Production MWD Survey										
9,652.00	3.25	259.75	9,417.80	-692.99	-1,397.59	1,525.82	0.00	0.00	0.00	
Projection to TD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
115.00	114.99	0.00	-1.51	First SDI Gyro Survey	
331.00	330.02	-5.00	-19.51	Last SDI Gyro Survey	
400.00	397.91	-9.57	-30.90	First SDI Surface MWD Survey	
1,117.00	1,079.35	-113.07	-225.27	Last SDI Surface MWD Survey	
1,250.00	1,202.37	-137.00	-269.79	First SDI Production MWD Survey	
9,592.00	9,357.90	-692.39	-1,394.25	Last SDI Production MWD Survey	
9,652.00	9,417.80	-692.99	-1,397.59	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____