



Well: Wethington 7-7
Wellbore: Original Hole
Design: Plan #1

Reference Details - WELL CENTRE
Geodetic System: US State Plane 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone
Northing: 1268615.92
Easting: 3190187.99
Latitude: 40° 4' 7.4399 N
Longitude: 104° 49' 13.6590 W
Grid Convergence: 0.44° West
Ground Elevation: 4902.00
KB Elevation: WELL @ 4917.00ft (Original Well Elev)

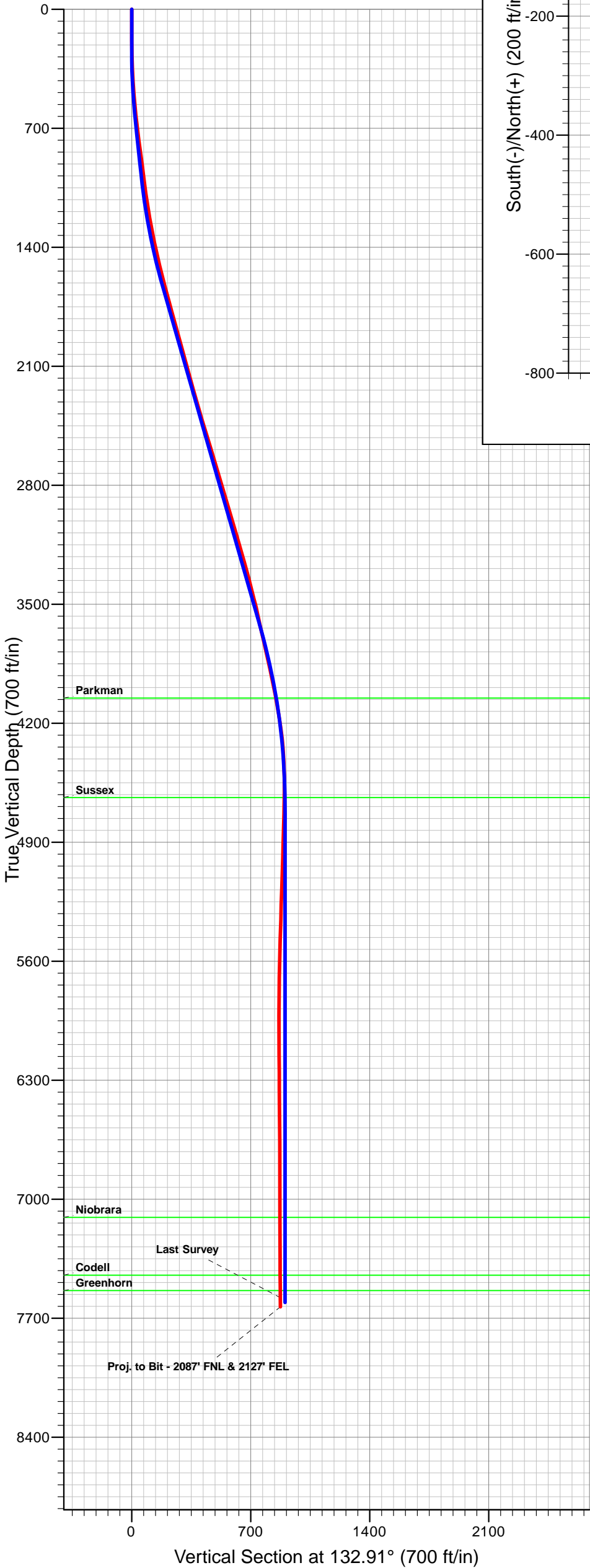
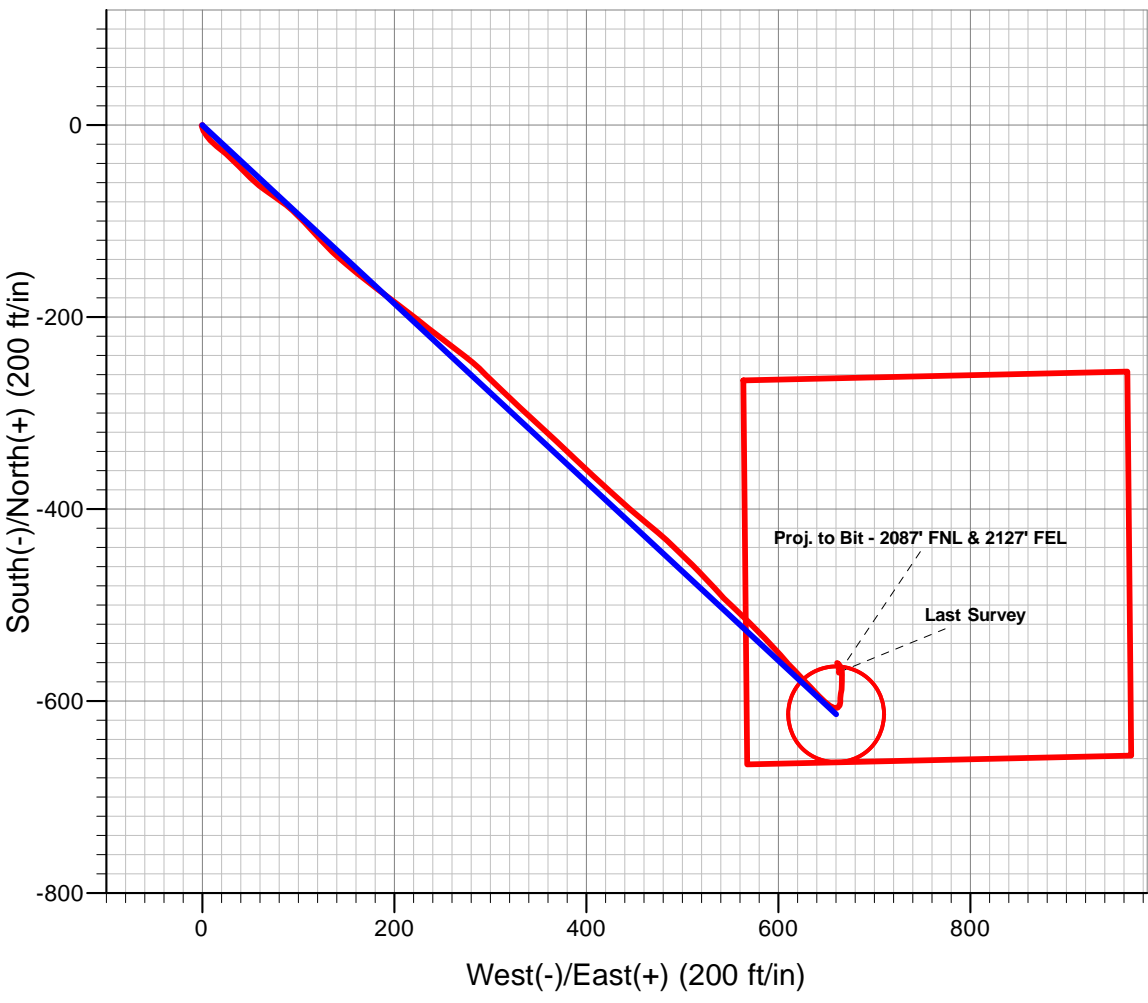


Departure
Energy Services (US) L.P.
Denver, Colorado
Phone: 303.542.2000

Casper, Wyoming
Phone: 307.265.2231
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ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Closure	Annotation
250.00	250.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP - Build at 1.50°/100'
649.27	650.00	6.00	132.91	-14.25	15.33	20.92	20.92	End of Build - Hold
980.15	982.70	6.00	132.91	-37.92	40.80	55.70	55.70	Build at 1.50°/100'
1633.73	1649.37	16.00	132.91	-124.42	133.85	182.75	182.75	End of Build - Hold
3624.31	3720.16	16.00	132.91	-513.04	551.91	753.53	753.53	Drop at 1.50°/100'
4677.17	4786.83	0.00	0.00	-613.79	660.28	901.50	901.50	End of Drop - Hold
7607.00	7716.66	0.00	132.91	-613.79	660.28	901.50	901.50	PBHL - 2130' FNL & 2130' FEL



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
4052.00	4158.84	Parkman
4637.00	4746.66	Sussex
7107.00	7216.66	Niobrara
7447.00	7556.66	Codell
7537.00	7646.66	Greenhorn

CASING DETAILS

TVD	MD	Name	Size
880.00	882.00	8 5/8"	8.62

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
Wethington 7-7 TD	7607.00	-613.79	660.20	1268007.20	3190852.87



Azimuths to True North
Magnetic North: 8.84°

Magnetic Field
Strength: 52928.0snT
Dip Angle: 66.77°
Date: 8/31/2011
Model: IGRF2010



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Anadarko Petroleum Corporation

Weld County, Colorado

Section 7 - Township 1 North - Range 66 West

Wethington 7-7

S-Well

Final Surveys

Job Number: 311028

Surface location

NAD 83

Lat: 40.068733°N

Long: 104.820461°W

Final Surveys Report

September 8, 2011

Company:	Anadarko Petroleum Corporation	Local Co-ordinate Reference:	Well Wethington 7-7
Project:	Weld County, Colorado (Northern Zone)	TVD Reference:	WELL @ 4917.00ft (Original Well Elev)
Site:	Wethington 21-7 Pad	MD Reference:	WELL @ 4917.00ft (Original Well Elev)
Well:	Wethington 7-7	North Reference:	True
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Project	Weld County, Colorado (Northern Zone)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	Wethington 21-7 Pad, Sec 7-T1N-R66W		
Site Position:		Northing:	1,268,685.79 ft
From:	Lat/Long	Easting:	3,190,193.28 ft
Position Uncertainty:	0.00 ft	Slot Radius:	13.20 in
		Latitude:	40° 4' 8.1300 N
		Longitude:	104° 49' 13.5840 W
		Grid Convergence:	0.44 °

Well	Wethington 7-7		
Well Position	+N/-S	0.00 ft	Northing:
	+E/-W	0.00 ft	Easting:
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft
		Latitude:	40° 4' 7.4399 N
		Longitude:	104° 49' 13.6590 W
		Ground Level:	4,902.00 ft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/31/2011	8.84	66.77	52,928

Design	Surveys				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	132.91	

Survey Program	Date	9/8/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
79.00	7,742.00	Final Surveys (Original Hole)	MWD	MWD - Standard	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
79.00	0.70	231.47	79.00	-0.30	-0.38	-0.07	0.89	0.89	0.00	
140.00	0.13	202.99	140.00	-0.60	-0.70	-0.10	0.97	-0.93	-46.69	
230.00	1.58	163.70	229.98	-1.88	-0.39	1.00	1.65	1.61	-43.66	
320.00	1.80	159.04	319.94	-4.39	0.47	3.33	0.29	0.24	-5.18	
426.00	3.20	146.00	425.84	-8.40	2.72	7.71	1.42	1.32	-12.30	
517.00	5.10	142.60	516.60	-13.72	6.59	14.17	2.10	2.09	-3.74	
608.00	5.80	129.80	607.19	-19.88	12.58	22.75	1.54	0.77	-14.07	
699.00	6.90	129.10	697.63	-26.27	20.36	32.79	1.21	1.21	-0.77	
789.00	7.80	133.70	786.89	-33.90	28.97	44.30	1.19	1.00	5.11	

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Well:	Wethington 7-7	North Reference:	True
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
857.00	7.30	134.30	854.30	-40.10	35.40	53.23	0.74	-0.74	0.88
927.00	7.60	136.50	923.71	-46.56	41.77	62.29	0.59	0.43	3.14
1,017.00	7.20	133.50	1,012.96	-54.76	49.95	73.87	0.62	-0.44	-3.33
1,108.00	8.10	128.20	1,103.15	-62.65	59.13	85.97	1.26	0.99	-5.82
1,199.00	9.24	126.00	1,193.11	-70.91	70.08	99.61	1.30	1.25	-2.42
1,289.00	10.90	124.90	1,281.72	-80.03	82.90	115.21	1.86	1.84	-1.22
1,380.00	11.80	135.10	1,370.95	-91.55	96.53	133.03	2.41	0.99	11.21
1,471.00	13.50	135.70	1,459.74	-105.74	110.52	152.94	1.87	1.87	0.66
1,561.00	13.60	138.40	1,547.23	-121.17	124.88	173.96	0.71	0.11	3.00
1,652.00	15.60	131.40	1,635.30	-137.27	141.16	196.85	2.93	2.20	-7.69
1,743.00	14.80	129.00	1,723.11	-152.67	159.38	220.68	1.12	-0.88	-2.64
1,834.00	16.00	127.60	1,810.85	-167.64	178.35	244.76	1.38	1.32	-1.54
1,924.00	15.30	126.20	1,897.51	-182.22	197.75	268.91	0.88	-0.78	-1.56
2,015.00	15.10	129.70	1,985.33	-196.88	216.56	292.66	1.03	-0.22	3.85
2,106.00	15.00	127.10	2,073.21	-211.56	235.08	316.21	0.75	-0.11	-2.86
2,197.00	15.60	127.10	2,160.98	-226.04	254.23	340.10	0.66	0.66	0.00
2,287.00	16.70	127.80	2,247.43	-241.27	274.10	365.02	1.24	1.22	0.78
2,387.00	16.10	135.70	2,343.37	-260.00	295.14	393.19	2.31	-0.60	7.90
2,469.00	16.30	132.70	2,422.12	-275.94	311.54	416.05	1.05	0.24	-3.66
2,560.00	17.10	134.20	2,509.28	-293.93	330.51	442.20	1.00	0.88	1.65
2,650.00	16.60	131.30	2,595.42	-311.64	349.66	468.28	1.09	-0.56	-3.22
2,741.00	17.10	134.20	2,682.51	-329.55	369.01	494.65	1.07	0.55	3.19
2,832.00	16.10	132.80	2,769.72	-347.45	387.87	520.64	1.18	-1.10	-1.54
2,923.00	16.60	133.60	2,857.04	-364.99	406.54	546.26	0.60	0.55	0.88
3,014.00	16.70	131.20	2,944.22	-382.56	425.79	572.32	0.76	0.11	-2.64
3,105.00	16.60	131.60	3,031.41	-399.80	445.35	598.39	0.17	-0.11	0.44
3,195.00	16.50	129.20	3,117.68	-416.42	464.86	624.00	0.77	-0.11	-2.67
3,286.00	15.10	132.20	3,205.24	-432.55	483.66	648.75	1.78	-1.54	3.30
3,377.00	15.90	134.30	3,292.93	-449.22	501.36	673.06	1.07	0.88	2.31
3,468.00	14.20	135.70	3,380.81	-465.91	518.08	696.67	1.91	-1.87	1.54
3,559.00	14.50	138.00	3,468.97	-482.37	533.50	719.17	0.71	0.33	2.53
3,649.00	12.50	133.70	3,556.48	-497.47	548.08	740.13	2.48	-2.22	-4.78
3,740.00	12.50	133.10	3,645.32	-511.00	562.39	759.83	0.14	0.00	-0.66
3,831.00	12.90	136.30	3,734.10	-525.08	576.60	779.81	0.89	0.44	3.52
3,922.00	12.60	135.80	3,822.85	-539.54	590.54	799.87	0.35	-0.33	-0.55
4,013.00	12.40	139.00	3,911.70	-554.03	603.87	819.50	0.79	-0.22	3.52
4,103.00	11.00	135.50	3,999.83	-567.44	616.23	837.68	1.74	-1.56	-3.89
4,194.00	10.40	137.30	4,089.24	-579.67	627.88	854.55	0.75	-0.66	1.98
4,285.00	8.40	136.50	4,179.02	-590.53	638.03	869.37	2.20	-2.20	-0.88
4,376.00	7.50	132.90	4,269.14	-599.40	646.96	881.94	1.13	-0.99	-3.96
4,466.00	3.60	121.30	4,358.70	-604.86	653.68	890.59	4.49	-4.33	-12.89
4,557.00	2.90	109.90	4,449.56	-607.13	658.28	895.51	1.04	-0.77	-12.53
4,648.00	2.00	48.80	4,540.49	-606.87	661.64	897.79	2.87	-0.99	-67.14
4,739.00	2.10	38.00	4,631.43	-604.51	663.86	897.81	0.44	0.11	-11.87

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Well:	Wethington 7-7	North Reference:	True
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,829.00	2.40	350.50	4,721.37	-601.35	664.57	896.17	2.04	0.33	-52.78
4,920.00	3.20	5.10	4,812.26	-596.94	664.48	893.11	1.17	0.88	16.04
5,011.00	2.60	11.60	4,903.14	-592.39	665.12	890.48	0.75	-0.66	7.14
5,102.00	2.90	9.60	4,994.04	-588.10	665.92	888.14	0.35	0.33	-2.20
5,193.00	2.50	356.60	5,084.94	-583.85	666.18	885.44	0.80	-0.44	-14.29
5,283.00	3.30	5.10	5,174.82	-579.31	666.30	882.43	1.01	0.89	9.44
5,374.00	2.20	352.80	5,265.72	-574.97	666.31	879.49	1.37	-1.21	-13.52
5,465.00	2.50	7.90	5,356.64	-571.27	666.37	877.01	0.75	0.33	16.59
5,556.00	1.80	340.50	5,447.58	-567.95	666.16	874.60	1.35	-0.77	-30.11
5,640.00	1.90	336.80	5,531.54	-565.43	665.17	872.16	0.19	0.12	-4.40
5,731.00	1.60	327.00	5,622.49	-562.98	663.89	869.55	0.46	-0.33	-10.77
5,822.00	0.90	309.00	5,713.47	-561.46	662.64	867.60	0.87	-0.77	-19.78
5,913.00	0.40	308.70	5,804.47	-560.82	661.84	866.57	0.55	-0.55	-0.33
6,004.00	0.50	311.80	5,895.46	-560.35	661.29	865.86	0.11	0.11	3.41
6,094.00	0.50	109.00	5,985.46	-560.22	661.37	865.83	1.09	0.00	174.67
6,185.00	0.50	142.00	6,076.46	-560.66	661.99	866.58	0.31	0.00	36.26
6,276.00	0.50	172.60	6,167.45	-561.37	662.29	867.28	0.29	0.00	33.63
6,367.00	0.50	174.70	6,258.45	-562.16	662.37	867.88	0.02	0.00	2.31
6,457.00	0.40	205.30	6,348.45	-562.83	662.28	868.27	0.28	-0.11	34.00
6,548.00	0.50	170.50	6,439.45	-563.51	662.21	868.68	0.31	0.11	-38.24
6,639.00	0.50	158.60	6,530.44	-564.27	662.42	869.35	0.11	0.00	-13.08
6,730.00	0.40	161.70	6,621.44	-564.94	662.66	869.99	0.11	-0.11	3.41
6,821.00	0.50	114.30	6,712.44	-565.41	663.12	870.64	0.41	0.11	-52.09
6,911.00	0.20	130.40	6,802.44	-565.67	663.60	871.17	0.35	-0.33	17.89
7,002.00	0.20	169.80	6,893.43	-565.93	663.75	871.46	0.15	0.00	43.30
7,093.00	0.20	298.50	6,984.43	-566.01	663.64	871.43	0.40	0.00	141.43
7,184.00	0.20	194.40	7,075.43	-566.09	663.46	871.35	0.35	0.00	-114.40
7,275.00	0.50	165.90	7,166.43	-566.63	663.51	871.76	0.37	0.33	-31.32
7,365.00	0.50	180.40	7,256.43	-567.40	663.61	872.36	0.14	0.00	16.11
7,456.00	0.50	208.10	7,347.43	-568.15	663.42	872.73	0.26	0.00	30.44
7,547.00	0.40	197.90	7,438.42	-568.80	663.13	872.96	0.14	-0.11	-11.21
7,638.00	0.50	176.10	7,529.42	-569.50	663.06	873.39	0.22	0.11	-23.96
7,687.00	0.50	175.40	7,578.42	-569.93	663.09	873.70	0.01	0.00	-1.43
Last Survey									
7,742.00	0.50	175.40	7,633.42	-570.40	663.13	874.05	0.00	0.00	0.00
Proj. to Bit - 2087' FNL & 2127' FEL									

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,687.00	7,578.42	-569.93	663.09	Last Survey
7,742.00	7,633.42	-570.40	663.13	Proj. to Bit - 2087' FNL & 2127' FEL

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Design:	Surveys	Database:	EDM 5000.1 Single User Db

Checked By: _____	Approved By: _____	Date: _____
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