

Unit Petroleum

Reno County, Kansas [NAD 83]

Section 4 T25S-R10W

Black Farms 4 #1H

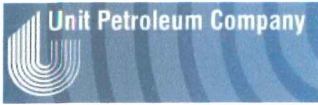
OH

Design: OH

Standard Survey Report

08 May, 2014





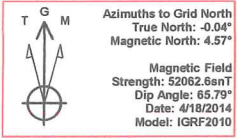
Unit Petroleum
 Project: Reno County, Kansas [NAD 83]
 Site: Section 4 T26S-R10W
 Well: Black Farms 4 #1H
 Wellbore: OH
 Design: Design #1
 Lat: 37° 54' 40.243 N
 Long: 98° 26' 0.077 W
 Pad GL: 1756.00
 KB: 20' KB @ 1776.00usft (UDI 303)



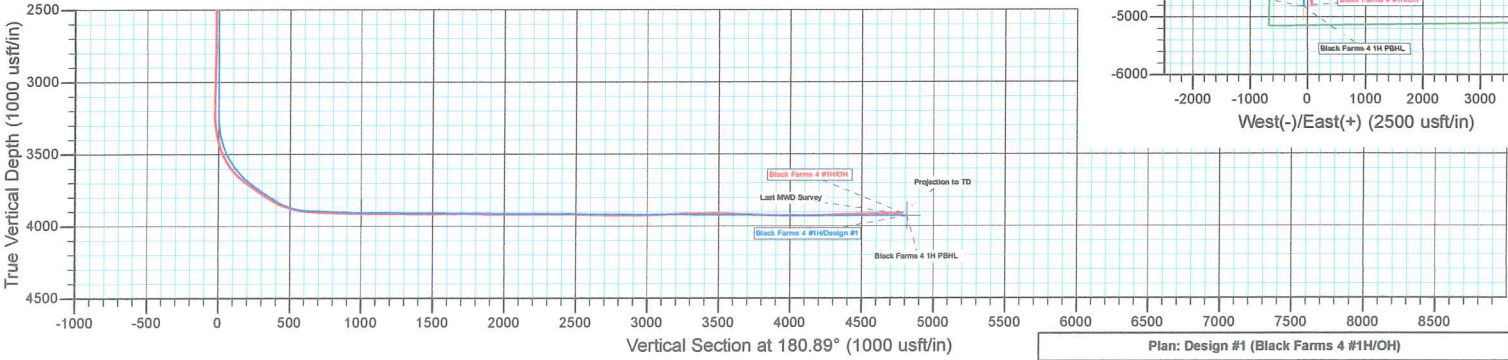
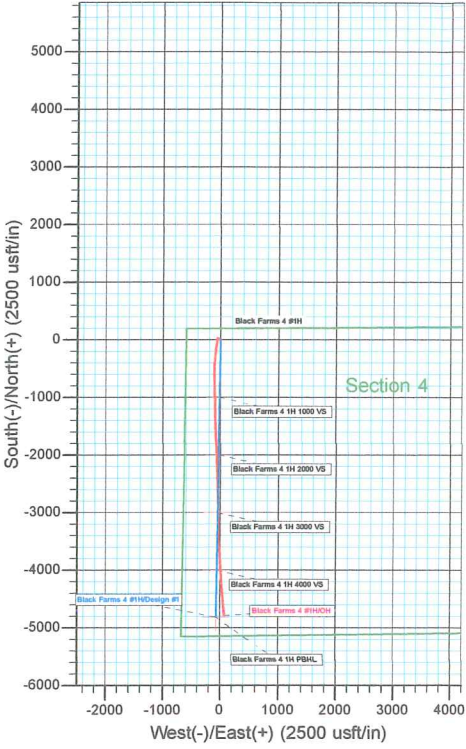
SECTION DETAILS									
MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	Vsect	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3252.50	0.00	0.00	3252.50	0.00	0.00	0.00	0.00	0.00	
3812.50	56.00	180.89	3727.50	-252.53	-3.92	10.00	180.89	252.56	
3962.50	56.00	180.89	3811.38	-376.87	-5.85	0.00	0.00	376.92	
4242.50	89.80	180.89	3893.00	-640.50	-9.95	12.00	0.00	640.58	
4311.42	87.53	180.90	3894.72	-709.39	-11.03	3.00	178.75	709.47	
4533.29	87.53	180.90	3904.28	-831.03	-14.50	0.00	0.00	931.14	
4602.18	89.60	180.89	3906.00	-999.88	-15.58	3.00	-0.18	1000.00	
5602.20	89.80	180.89	3913.00	-1999.76	-31.16	0.00	0.00	2000.00	
5602.20	89.80	180.89	3913.00	-1999.76	-31.16	3.00	0.00	2000.00	
6600.31	89.60	180.89	3919.99	-2997.72	-46.71	0.00	0.00	2998.09	
6602.22	89.66	180.89	3920.00	-2999.64	-46.74	3.00	0.00	3000.00	
7602.24	89.66	180.89	3926.00	-3999.51	-62.32	0.00	0.00	4000.00	
7609.04	89.86	180.89	3926.03	-4006.31	-62.43	3.00	0.00	4006.79	
8416.14	89.66	180.89	3926.00	-4813.31	-75.00	0.00	0.00	4813.69	

WELL DETAILS: Black Farms 4 #1H						
+N-S	+E-W	Northing	Ground Level:	1756.00	Longitude	Slot
0.00	0.00	1765495.00	Easting	1331560.00	37° 54' 40.243 N	98° 26' 0.077 W

PROJECT DETAILS: Reno County, Kansas [NAD 83]
 Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Kansas Southern Zone
 System Datum: Mean Sea Level



NOTE: All Lease lines and Hard lines are estimates only and are subject to the customers' approval.



Plan: Design #1 (Black Farms 4 #1H/OH)
 Created By: Derek Stephens Date: 10:52, May 08 2014

Company:	Unit Petroleum	Local Co-ordinate Reference:	Well Black Farms 4 #1H
Project:	Reno County, Kansas [NAD 83]	TVD Reference:	20' KB @ 1776.00usft (UDI 303)
Site:	Section 4 T25S-R10W	MD Reference:	20' KB @ 1776.00usft (UDI 303)
Well:	Black Farms 4 #1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Project	Reno County, Kansas [NAD 83]		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Kansas Southern Zone		Using geodetic scale factor

Site	Section 4 T25S-R10W				
Site Position:		Northing:	1,765,495.00 usft	Latitude:	37° 54' 40.243 N
From:	Map	Easting:	1,331,560.00 usft	Longitude:	98° 26' 0.077 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.04 °

Well	Black Farms 4 #1H					
Well Position	+N-S	0.00 usft	Northing:	1,765,495.00 usft	Latitude:	37° 54' 40.243 N
	+E-W	0.00 usft	Easting:	1,331,560.00 usft	Longitude:	98° 26' 0.077 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	1,756.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/18/2014	4.61	65.79	52,063

Design	OH				
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	180.89	

Survey Program	Date	5/8/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
79.20	8,425.00	MWD (OH)	MWD	MWD - Standard	

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	
79.20	0.72	294.22	79.20	0.20	-0.45	-0.20	0.91	0.91	0.00	
172.94	1.23	320.71	172.92	1.22	-1.63	-1.20	0.71	0.54	28.26	
266.68	1.39	318.08	266.64	2.85	-3.02	-2.80	0.18	0.17	-2.81	
360.42	0.98	331.64	360.36	4.40	-4.17	-4.34	0.53	-0.44	14.47	
454.16	1.13	304.17	454.08	5.63	-5.31	-5.54	0.56	0.16	-29.30	
547.90	1.07	294.57	547.81	6.51	-6.87	-6.40	0.21	-0.06	-10.24	
641.64	1.14	289.18	641.53	7.18	-8.55	-7.04	0.13	0.07	-5.75	
735.38	1.36	296.32	735.25	7.98	-10.43	-7.81	0.29	0.23	7.62	
829.12	1.38	289.45	828.96	8.85	-12.49	-8.65	0.18	0.02	-7.33	

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Project:	Reno County, Kansas [NAD 83]	TVD Reference:	20' KB @ 1776.00usft (UDI 303)
Site:	Section 4 T25S-R10W	MD Reference:	20' KB @ 1776.00usft (UDI 303)
Well:	Black Farms 4 #1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

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)
922.86	1.59	296.82	922.67	9.81	-14.71	-9.58	0.30	0.22	7.86
1,016.60	1.34	297.98	1,016.38	10.91	-16.84	-10.65	0.27	-0.27	1.24
1,110.34	1.14	293.83	1,110.10	11.80	-18.66	-11.51	0.23	-0.21	-4.43
1,204.08	0.99	279.64	1,203.82	12.31	-20.31	-12.00	0.32	-0.16	-15.14
1,297.82	1.03	255.27	1,297.55	12.24	-21.93	-11.89	0.46	0.04	-26.00
1,391.56	0.93	290.36	1,391.27	12.29	-23.45	-11.92	0.64	-0.11	37.43
1,485.30	0.84	247.46	1,485.00	12.29	-24.80	-11.90	0.70	-0.10	-45.76
1,579.04	0.69	240.57	1,578.74	11.75	-25.93	-11.34	0.19	-0.16	-7.35
1,672.78	0.85	275.19	1,672.47	11.53	-27.11	-11.11	0.52	0.17	36.93
1,766.52	1.00	285.21	1,766.19	11.81	-28.59	-11.36	0.23	0.16	10.69
1,860.26	1.35	300.62	1,859.92	12.59	-30.33	-12.11	0.50	0.37	16.44
1,954.00	1.54	297.96	1,953.63	13.74	-32.40	-13.23	0.21	0.20	-2.84
2,047.74	1.49	303.43	2,047.33	15.00	-34.53	-14.46	0.16	-0.05	5.84
2,141.48	1.60	308.55	2,141.04	16.49	-36.57	-15.92	0.19	0.12	5.46
2,235.22	1.62	311.28	2,234.74	18.18	-38.59	-17.58	0.08	0.02	2.91
2,328.96	1.57	305.49	2,328.45	19.80	-40.63	-19.16	0.18	-0.05	-6.18
2,422.70	1.64	272.94	2,422.15	20.61	-43.01	-19.94	0.96	0.07	-34.72
2,516.44	1.33	260.91	2,515.86	20.51	-45.43	-19.80	0.47	-0.33	-12.83
2,610.18	1.56	279.51	2,609.57	20.55	-47.76	-19.80	0.55	0.25	19.84
2,703.92	1.44	284.47	2,703.28	21.05	-50.16	-20.27	0.19	-0.13	5.29
2,797.66	1.40	321.39	2,796.99	22.24	-52.01	-21.43	0.96	-0.04	39.39
2,891.40	1.29	330.87	2,890.71	24.06	-53.24	-23.23	0.26	-0.12	10.11
2,985.14	1.12	355.20	2,984.43	25.89	-53.83	-25.05	0.57	-0.18	25.95
3,078.88	0.99	346.51	3,078.15	27.59	-54.10	-26.75	0.22	-0.14	-9.27
3,172.62	1.22	349.73	3,171.87	29.36	-54.46	-28.51	0.25	0.25	3.44
3,230.00	0.50	196.20	3,229.25	29.72	-54.64	-28.87	2.93	-1.25	-267.57
3,262.00	3.30	185.90	3,261.23	28.67	-54.78	-27.82	8.78	8.75	-32.19
3,294.00	5.80	185.90	3,293.12	26.15	-55.04	-25.29	7.81	7.81	0.00
3,324.00	8.30	186.50	3,322.89	22.49	-55.44	-21.62	8.34	8.33	2.00
3,356.00	10.60	187.00	3,354.46	17.27	-56.06	-16.40	7.19	7.19	1.56
3,388.00	12.80	187.90	3,385.79	10.84	-56.91	-9.95	6.90	6.88	2.81
3,419.00	14.90	188.50	3,415.89	3.50	-57.97	-2.59	6.79	6.77	1.94
3,451.00	17.80	188.40	3,446.59	-5.41	-59.29	6.34	9.06	9.06	-0.31
3,482.00	21.00	189.00	3,475.83	-15.59	-60.85	16.54	10.34	10.32	1.94
3,514.00	24.70	189.30	3,505.31	-27.86	-62.83	28.83	11.57	11.56	0.94
3,545.00	28.40	190.10	3,533.04	-41.51	-65.17	42.52	11.99	11.94	2.58
3,577.00	32.00	189.70	3,560.69	-57.37	-67.93	58.42	11.27	11.25	-1.25
3,608.00	35.50	189.50	3,586.46	-74.34	-70.80	75.44	11.30	11.29	-0.65
3,638.00	39.00	189.10	3,610.34	-92.26	-73.74	93.40	11.69	11.67	-1.33
3,669.00	43.10	188.60	3,633.71	-112.37	-76.86	113.56	13.27	13.23	-1.61
3,700.00	47.20	187.50	3,655.57	-134.13	-79.93	135.36	13.46	13.23	-3.55
3,731.00	50.60	186.30	3,675.95	-157.32	-82.73	158.59	11.35	10.97	-3.87
3,762.00	52.80	186.30	3,695.16	-181.50	-85.40	182.81	7.10	7.10	0.00
3,794.00	54.20	185.60	3,714.19	-207.08	-88.07	208.43	4.72	4.38	-2.19

Company:	Unit Petroleum	Local Co-ordinate Reference:	Well Black Farms 4 #1H
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Site:	Section 4 T25S-R10W	MD Reference:	20' KB @ 1776.00usft (UDI 303)
Well:	Black Farms 4 #1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

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)
3,825.00	55.40	186.10	3,732.06	-232.28	-90.65	233.67	4.09	3.87	1.61
3,856.00	55.70	186.10	3,749.60	-257.70	-93.37	259.12	0.97	0.97	0.00
3,888.00	55.90	185.50	3,767.58	-284.03	-96.04	285.49	1.67	0.63	-1.88
3,919.00	56.30	185.80	3,784.87	-309.64	-98.57	311.13	1.52	1.29	0.97
3,950.00	56.80	185.90	3,801.96	-335.37	-101.21	336.90	1.64	1.61	0.32
3,982.00	59.00	184.70	3,818.97	-362.36	-103.71	363.93	7.57	6.88	-3.75
4,013.00	62.70	183.30	3,834.06	-389.36	-105.59	390.96	12.57	11.94	-4.52
4,044.00	66.70	182.60	3,847.31	-417.34	-107.03	418.96	13.06	12.90	-2.26
4,075.00	70.20	182.00	3,858.69	-446.15	-108.19	447.78	11.43	11.29	-1.94
4,106.00	73.10	181.20	3,868.45	-475.56	-109.01	477.20	9.67	9.35	-2.58
4,138.00	75.30	179.50	3,877.17	-506.34	-109.19	507.98	8.57	6.88	-5.31
4,169.00	77.70	179.40	3,884.40	-536.48	-108.90	538.12	7.75	7.74	-0.32
4,201.00	79.30	178.70	3,890.78	-567.84	-108.38	569.46	5.44	5.00	-2.19
4,237.00	82.90	178.80	3,896.35	-603.39	-107.61	604.99	10.00	10.00	0.28
4,313.00	87.30	178.90	3,902.84	-679.08	-106.09	680.65	5.79	5.79	0.13
4,346.00	87.10	178.80	3,904.45	-712.03	-105.43	713.59	0.68	-0.61	-0.30
4,441.00	88.60	179.50	3,908.02	-806.95	-104.02	808.47	1.74	1.58	0.74
4,537.00	89.70	179.50	3,909.44	-902.93	-103.18	904.43	1.15	1.15	0.00
4,633.00	89.10	178.60	3,910.45	-998.91	-101.59	1,000.38	1.13	-0.63	-0.94
4,636.01	89.11	178.60	3,910.49	-1,001.92	-101.52	1,003.38	0.31	0.31	0.00
Black Farms 4 1H 1000 VS									
4,729.00	89.40	178.60	3,911.70	-1,094.88	-99.24	1,096.29	0.31	0.31	0.00
4,824.00	89.90	178.80	3,912.28	-1,189.85	-97.09	1,191.22	0.57	0.53	0.21
4,920.00	89.30	178.50	3,912.95	-1,285.82	-94.83	1,287.14	0.70	-0.63	-0.31
5,016.00	88.80	178.60	3,914.54	-1,381.78	-92.40	1,383.05	0.53	-0.52	0.10
5,112.00	90.00	178.40	3,915.55	-1,477.74	-89.89	1,478.96	1.27	1.25	-0.21
5,207.00	90.20	177.30	3,915.38	-1,572.67	-86.32	1,573.82	1.18	0.21	-1.16
5,300.00	90.40	177.20	3,914.90	-1,665.56	-81.86	1,666.63	0.24	0.22	-0.11
5,392.00	89.80	177.40	3,914.74	-1,757.46	-77.53	1,758.45	0.69	-0.65	0.22
5,483.00	89.10	177.10	3,915.61	-1,848.35	-73.16	1,849.26	0.84	-0.77	-0.33
5,575.00	88.90	178.00	3,917.22	-1,940.25	-69.23	1,941.09	1.00	-0.22	0.98
5,635.69	89.57	178.13	3,918.03	-2,000.90	-67.18	2,001.70	1.12	1.10	0.22
Black Farms 4 1H 2000 VS									
5,666.00	89.90	178.20	3,918.17	-2,031.19	-66.21	2,031.98	1.12	1.10	0.22
5,758.00	90.60	178.60	3,917.77	-2,123.16	-63.64	2,123.89	0.88	0.76	0.43
5,850.00	90.40	178.50	3,916.96	-2,215.12	-61.31	2,215.81	0.24	-0.22	-0.11
5,943.00	89.90	177.60	3,916.72	-2,308.07	-58.15	2,308.69	1.11	-0.54	-0.97
6,036.00	89.10	177.20	3,917.53	-2,400.97	-53.93	2,401.52	0.96	-0.86	-0.43
6,128.00	89.40	178.20	3,918.74	-2,492.88	-50.24	2,493.36	1.13	0.33	1.09
6,221.00	88.70	178.40	3,920.28	-2,585.83	-47.48	2,586.25	0.78	-0.75	0.22
6,313.00	89.10	178.90	3,922.04	-2,677.79	-45.31	2,678.17	0.70	0.43	0.54
6,405.00	89.10	178.40	3,923.49	-2,769.75	-43.15	2,770.08	0.54	0.00	-0.54
6,498.00	89.90	179.00	3,924.30	-2,862.72	-41.04	2,863.01	1.08	0.86	0.65



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Site:	Section 4 T25S-R10W	MD Reference:	20' KB @ 1776.00usft (UDI 303)
Well:	Black Farms 4 #1H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

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)	
6,590.00	90.60	179.20	3,923.90	-2,954.71	-39.59	2,954.97	0.79	0.76	0.22	
6,634.85	91.04	178.95	3,923.26	-2,999.55	-38.87	2,999.79	1.13	0.99	-0.55	
Black Farms 4 1H 3000 VS										
6,681.00	91.50	178.70	3,922.23	-3,045.68	-37.92	3,045.90	1.13	0.99	-0.55	
6,772.00	91.90	179.00	3,919.53	-3,136.62	-36.10	3,136.80	0.55	0.44	0.33	
6,865.00	92.00	177.40	3,916.37	-3,229.51	-33.18	3,229.64	1.72	0.11	-1.72	
6,957.00	90.40	177.80	3,914.44	-3,321.41	-29.33	3,321.46	1.79	-1.74	0.43	
7,050.00	91.40	177.50	3,912.98	-3,414.32	-25.52	3,414.30	1.12	1.08	-0.32	
7,142.00	88.50	178.10	3,913.06	-3,506.24	-21.98	3,506.16	3.22	-3.15	0.65	
7,234.00	87.30	176.40	3,916.43	-3,598.07	-17.57	3,597.91	2.26	-1.30	-1.85	
7,328.00	88.90	177.40	3,919.55	-3,691.87	-12.49	3,691.62	2.01	1.70	1.06	
7,423.00	87.70	176.90	3,922.37	-3,786.71	-7.77	3,786.37	1.37	-1.26	-0.53	
7,519.00	89.40	176.50	3,924.80	-3,882.52	-2.25	3,882.08	1.82	1.77	-0.42	
7,614.00	88.80	175.90	3,926.29	-3,977.30	4.05	3,976.75	0.89	-0.63	-0.63	
7,631.53	88.97	175.94	3,926.63	-3,994.78	5.29	3,994.21	0.97	0.95	0.21	
Black Farms 4 1H 4000 VS										
7,709.00	89.70	176.10	3,927.53	-4,072.06	10.67	4,071.40	0.97	0.95	0.21	
7,805.00	91.00	176.70	3,926.95	-4,167.86	16.70	4,167.10	1.49	1.35	0.63	
7,901.00	92.20	177.10	3,924.27	-4,263.68	21.89	4,262.83	1.32	1.25	0.42	
7,996.00	92.20	175.90	3,920.62	-4,358.44	27.69	4,357.48	1.26	0.00	-1.26	
8,092.00	91.90	174.80	3,917.18	-4,454.06	35.46	4,452.96	1.19	-0.31	-1.15	
8,188.00	91.30	174.70	3,914.50	-4,549.62	44.24	4,548.37	0.63	-0.63	-0.10	
8,284.00	90.20	173.60	3,913.25	-4,645.11	54.03	4,643.70	1.62	-1.15	-1.15	
8,379.00	91.70	172.40	3,911.67	-4,739.38	65.60	4,737.78	2.02	1.58	-1.26	
Last MWD Survey										
8,425.00	91.70	172.40	3,910.31	-4,784.96	71.68	4,783.26	0.00	0.00	0.00	
Projection to TD - Black Farms 4 1H PBHL										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
8,379.00	3,911.67	-4,739.38	65.60	Last MWD Survey	
8,425.00	3,910.31	-4,784.96	71.68	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____