

US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_HOWARD 20-29 PAD

Howard 10-29

Howard 10-29

Plan: Howard 10-29 (wp02)

Standard Planning Report

18 May, 2011



Weatherford®

Project: COLORADO NORTHERN ZONE - 83
 Site: WELD_HOWARD 20-29 PAD
 Well: Howard 10-29
 Wellbore: Howard 10-29
 Section:
 SHL:
 Design: Howard 10-29 (wp02)
 Latitude: 40.017863
 Longitude: -104.909612
 GL: 5023.00
 KB: 15' RKB + 5023' GL @ 5038.00ft

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
3888.00	4003.97	PK Depth
4838.00	4967.75	SX Depth
7356.00	7485.75	NIO Depth
7775.00	7904.75	CD Depth
7854.00	7983.75	GH Depth
8208.00	8337.75	J Depth



Azimuths to True North
 Magnetic North: 8.92°

Magnetic Field
 Strength: 52924.0snT
 Dip Angle: 66.72°
 Date: 5/6/2011
 Model: IGRF2010

WELL DETAILS: Howard 10-29

+N/-S	+E/-W	Northing	Ground Level: Easting	5023.00 Latitude	Longitude	Slot
0.00	0.00	1249904.30	3165354.77	40.017863	-104.909612	

CASING DETAILS

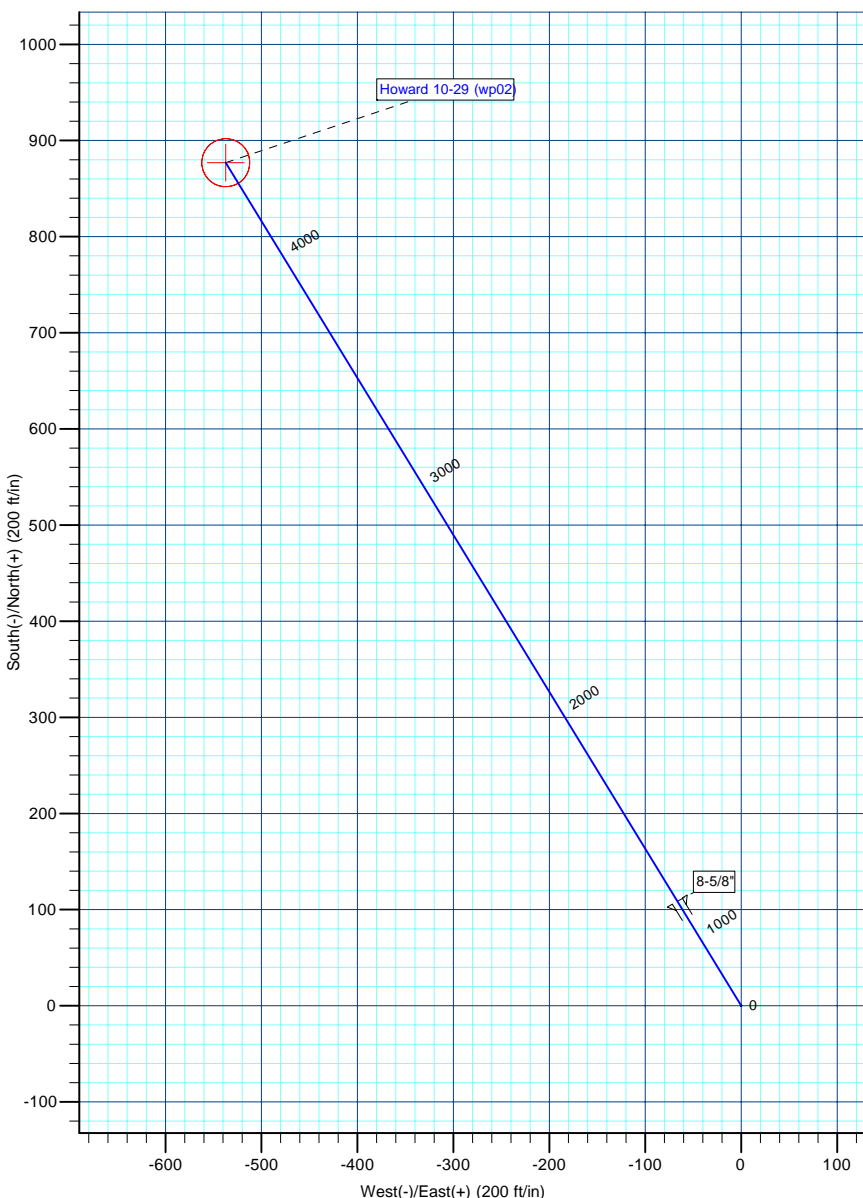
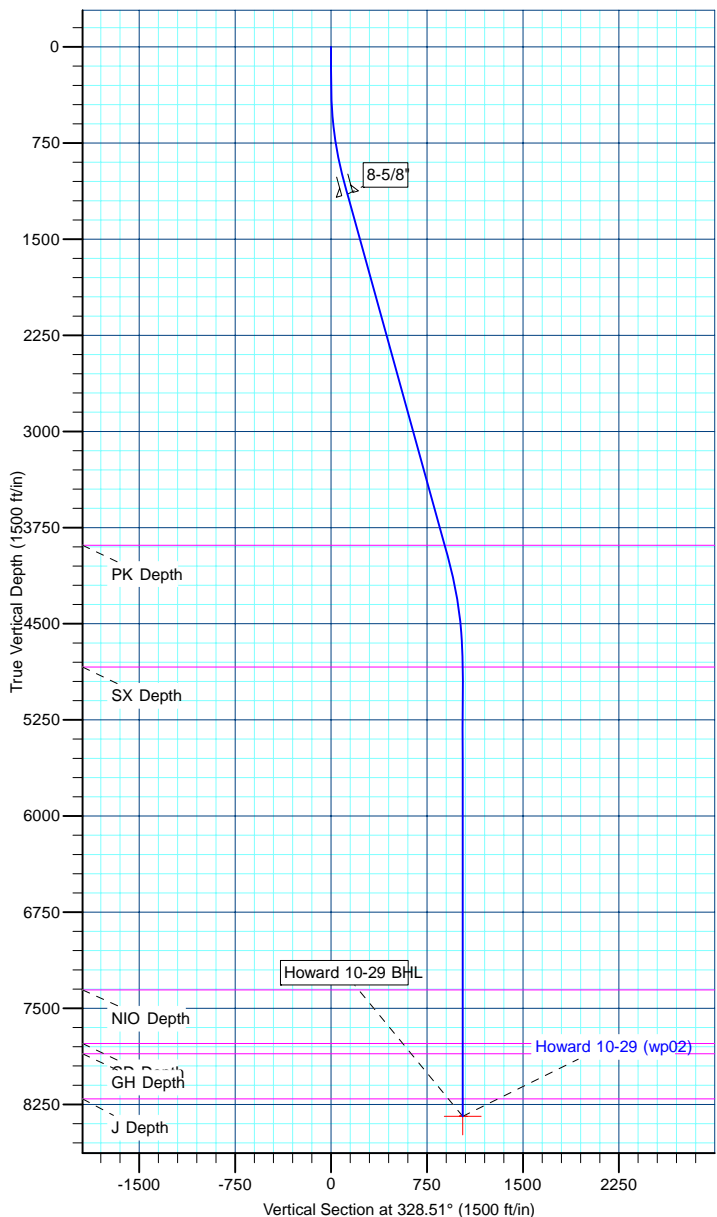
TVD	MD	Name	Size
1150.00	1162.61	8-5/8"	8-5/8

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Howard 10-29 BHL	8343.00	876.83	-537.17	1250777.54	3164811.77	40.020270	-104.911530	Circle (Radius: 25.00)

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
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00
1075.09	15.50	328.51	1065.67	88.86	-54.44	2.00	328.51	104.22
4086.94	15.50	328.51	3967.95	775.27	-474.96	0.00	0.00	909.19
4972.75	0.00	0.00	4843.00	876.83	-537.17	1.75	180.00	1028.29
8472.75	0.00	0.00	8343.00	876.83	-537.17	0.00	0.00	1028.29



Database:	edm5000p	Local Co-ordinate Reference:	Well Howard 10-29
Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' RKB + 5023' GL @ 5038.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' RKB + 5023' GL @ 5038.00ft
Site:	WELD_HOWARD 20-29 PAD	North Reference:	True
Well:	Howard 10-29	Survey Calculation Method:	Minimum Curvature
Wellbore:	Howard 10-29		
Design:	Howard 10-29 (wp02)		

Project	COLORADO NORTHERN ZONE - 83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site						WELD_HOWARD 20-29 PAD											
Site Position:			Northing:			1,249,878.45 ft			Latitude:			40.017791					
From:			Lat/Long			Easting:			3,165,409.00 ft			Longitude:			-104.909419		
Position Uncertainty:			0.00 ft			Slot Radius:			0 "			Grid Convergence:			0.38		

Well	Howard 10-29					
Well Position	+N-S	26.21 ft	Northing:	1,249,904.30 ft	Latitude:	40.017863
	+E-W	-54.06 ft	Easting:	3,165,354.77 ft	Longitude:	-104.909612
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	5,023.00 ft

Wellbore	Howard 10-29				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/6/2011	8.92	66.72	52,924

Design	Howard 10-29 (wp02)			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	328.51

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,075.09	15.50	328.51	1,065.67	88.86	-54.44	2.00	2.00	0.00	328.51	
4,086.94	15.50	328.51	3,967.95	775.27	-474.96	0.00	0.00	0.00	0.00	
4,972.75	0.00	0.00	4,843.00	876.83	-537.17	1.75	-1.75	0.00	180.00	
8,472.75	0.00	0.00	8,343.00	876.83	-537.17	0.00	0.00	0.00	0.00	Howard 10-29 BHL

Database:	edm5000p	Local Co-ordinate Reference:	Well Howard 10-29
Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' RKB + 5023' GL @ 5038.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' RKB + 5023' GL @ 5038.00ft
Site:	WELD_HOWARD 20-29 PAD	North Reference:	True
Well:	Howard 10-29	Survey Calculation Method:	Minimum Curvature
Wellbore:	Howard 10-29		
Design:	Howard 10-29 (wp02)		

Planned 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
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	2.00	328.51	399.98	1.49	-0.91	1.75	2.00	2.00	0.00
500.00	4.00	328.51	499.84	5.95	-3.65	6.98	2.00	2.00	0.00
600.00	6.00	328.51	599.45	13.38	-8.20	15.69	2.00	2.00	0.00
700.00	8.00	328.51	698.70	23.77	-14.56	27.88	2.00	2.00	0.00
800.00	10.00	328.51	797.47	37.11	-22.74	43.52	2.00	2.00	0.00
900.00	12.00	328.51	895.62	53.38	-32.70	62.60	2.00	2.00	0.00
1,000.00	14.00	328.51	993.06	72.56	-44.45	85.10	2.00	2.00	0.00
1,075.09	15.50	328.51	1,065.67	88.86	-54.44	104.22	2.00	2.00	0.00
1,100.00	15.50	328.51	1,089.67	94.54	-57.92	110.87	0.00	0.00	0.00
1,162.61	15.50	328.51	1,150.00	108.81	-66.66	127.61	0.00	0.00	0.00
8-5/8"									
1,200.00	15.50	328.51	1,186.03	117.33	-71.88	137.60	0.00	0.00	0.00
1,300.00	15.50	328.51	1,282.40	140.12	-85.84	164.33	0.00	0.00	0.00
1,400.00	15.50	328.51	1,378.76	162.91	-99.81	191.05	0.00	0.00	0.00
1,500.00	15.50	328.51	1,475.12	185.70	-113.77	217.78	0.00	0.00	0.00
1,600.00	15.50	328.51	1,571.48	208.49	-127.73	244.51	0.00	0.00	0.00
1,700.00	15.50	328.51	1,667.85	231.28	-141.69	271.23	0.00	0.00	0.00
1,800.00	15.50	328.51	1,764.21	254.07	-155.65	297.96	0.00	0.00	0.00
1,900.00	15.50	328.51	1,860.57	276.86	-169.62	324.69	0.00	0.00	0.00
2,000.00	15.50	328.51	1,956.93	299.65	-183.58	351.41	0.00	0.00	0.00
2,100.00	15.50	328.51	2,053.29	322.44	-197.54	378.14	0.00	0.00	0.00
2,200.00	15.50	328.51	2,149.66	345.23	-211.50	404.87	0.00	0.00	0.00
2,300.00	15.50	328.51	2,246.02	368.02	-225.46	431.60	0.00	0.00	0.00
2,400.00	15.50	328.51	2,342.38	390.81	-239.43	458.32	0.00	0.00	0.00
2,500.00	15.50	328.51	2,438.74	413.60	-253.39	485.05	0.00	0.00	0.00
2,600.00	15.50	328.51	2,535.11	436.39	-267.35	511.78	0.00	0.00	0.00
2,700.00	15.50	328.51	2,631.47	459.18	-281.31	538.50	0.00	0.00	0.00
2,800.00	15.50	328.51	2,727.83	481.97	-295.27	565.23	0.00	0.00	0.00
2,900.00	15.50	328.51	2,824.19	504.76	-309.24	591.96	0.00	0.00	0.00
3,000.00	15.50	328.51	2,920.55	527.55	-323.20	618.68	0.00	0.00	0.00
3,100.00	15.50	328.51	3,016.92	550.34	-337.16	645.41	0.00	0.00	0.00
3,200.00	15.50	328.51	3,113.28	573.13	-351.12	672.14	0.00	0.00	0.00
3,300.00	15.50	328.51	3,209.64	595.92	-365.08	698.86	0.00	0.00	0.00
3,400.00	15.50	328.51	3,306.00	618.71	-379.05	725.59	0.00	0.00	0.00
3,500.00	15.50	328.51	3,402.36	641.50	-393.01	752.32	0.00	0.00	0.00
3,600.00	15.50	328.51	3,498.73	664.29	-406.97	779.05	0.00	0.00	0.00
3,700.00	15.50	328.51	3,595.09	687.08	-420.93	805.77	0.00	0.00	0.00
3,800.00	15.50	328.51	3,691.45	709.87	-434.89	832.50	0.00	0.00	0.00
3,900.00	15.50	328.51	3,787.81	732.66	-448.86	859.23	0.00	0.00	0.00
4,000.00	15.50	328.51	3,884.18	755.45	-462.82	885.95	0.00	0.00	0.00
4,003.97	15.50	328.51	3,888.00	756.36	-463.37	887.01	0.00	0.00	0.00
PK Depth									
4,086.94	15.50	328.51	3,967.95	775.27	-474.96	909.19	0.00	0.00	0.00
4,100.00	15.27	328.51	3,980.55	778.22	-476.77	912.65	1.75	-1.75	0.00
4,200.00	13.52	328.51	4,077.40	799.43	-489.76	937.52	1.75	-1.75	0.00
4,300.00	11.77	328.51	4,174.97	818.10	-501.19	959.42	1.75	-1.75	0.00
4,400.00	10.02	328.51	4,273.16	834.22	-511.07	978.32	1.75	-1.75	0.00
4,500.00	8.27	328.51	4,371.89	847.77	-519.38	994.22	1.75	-1.75	0.00
4,600.00	6.52	328.51	4,471.05	858.75	-526.10	1,007.09	1.75	-1.75	0.00
4,700.00	4.77	328.51	4,570.56	867.15	-531.24	1,016.94	1.75	-1.75	0.00

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Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' RKB + 5023' GL @ 5038.00ft
Site:	WELD_HOWARD 20-29 PAD	North Reference:	True
Well:	Howard 10-29	Survey Calculation Method:	Minimum Curvature
Wellbore:	Howard 10-29		
Design:	Howard 10-29 (wp02)		

Planned 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)
4,800.00	3.02	328.51	4,670.33	872.94	-534.79	1,023.73	1.75	-1.75	0.00
4,900.00	1.27	328.51	4,770.25	876.14	-536.75	1,027.48	1.75	-1.75	0.00
4,967.75	0.09	328.51	4,838.00	876.82	-537.17	1,028.29	1.75	-1.75	0.00
SX Depth									
4,972.75	0.00	0.00	4,843.00	876.83	-537.17	1,028.29	1.75	-1.75	0.00
5,000.00	0.00	0.00	4,870.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
5,100.00	0.00	0.00	4,970.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
5,200.00	0.00	0.00	5,070.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
5,300.00	0.00	0.00	5,170.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
5,400.00	0.00	0.00	5,270.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
5,500.00	0.00	0.00	5,370.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
5,600.00	0.00	0.00	5,470.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
5,700.00	0.00	0.00	5,570.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
5,800.00	0.00	0.00	5,670.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
5,900.00	0.00	0.00	5,770.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
6,000.00	0.00	0.00	5,870.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
6,100.00	0.00	0.00	5,970.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
6,200.00	0.00	0.00	6,070.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
6,300.00	0.00	0.00	6,170.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
6,400.00	0.00	0.00	6,270.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
6,500.00	0.00	0.00	6,370.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
6,600.00	0.00	0.00	6,470.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
6,700.00	0.00	0.00	6,570.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
6,800.00	0.00	0.00	6,670.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
6,900.00	0.00	0.00	6,770.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
7,000.00	0.00	0.00	6,870.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
7,100.00	0.00	0.00	6,970.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
7,200.00	0.00	0.00	7,070.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
7,300.00	0.00	0.00	7,170.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
7,400.00	0.00	0.00	7,270.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
7,485.75	0.00	0.00	7,356.00	876.83	-537.17	1,028.29	0.00	0.00	0.00
NIO Depth									
7,500.00	0.00	0.00	7,370.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
7,600.00	0.00	0.00	7,470.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
7,700.00	0.00	0.00	7,570.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
7,800.00	0.00	0.00	7,670.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
7,900.00	0.00	0.00	7,770.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
7,904.75	0.00	0.00	7,775.00	876.83	-537.17	1,028.29	0.00	0.00	0.00
CD Depth									
7,983.75	0.00	0.00	7,854.00	876.83	-537.17	1,028.29	0.00	0.00	0.00
GH Depth									
8,000.00	0.00	0.00	7,870.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
8,100.00	0.00	0.00	7,970.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
8,200.00	0.00	0.00	8,070.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
8,300.00	0.00	0.00	8,170.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
8,337.75	0.00	0.00	8,208.00	876.83	-537.17	1,028.29	0.00	0.00	0.00
J Depth									
8,400.00	0.00	0.00	8,270.25	876.83	-537.17	1,028.29	0.00	0.00	0.00
8,472.75	0.00	0.00	8,343.00	876.83	-537.17	1,028.29	0.00	0.00	0.00
Howard 10-29 BHL									

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Company:	US ROCKIES REGION PLANNING	TVD Reference:	15' RKB + 5023' GL @ 5038.00ft
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	15' RKB + 5023' GL @ 5038.00ft
Site:	WELD_HOWARD 20-29 PAD	North Reference:	True
Well:	Howard 10-29	Survey Calculation Method:	Minimum Curvature
Wellbore:	Howard 10-29		
Design:	Howard 10-29 (wp02)		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
Howard 10-29 BHL	0.00	0.00	8,343.00	876.83	-537.17	1,250,777.53	3,164,811.77	40.020270	-104.911530
- plan hits target center									
- Circle (radius 25.00)									

Casing Points					
Measured Depth	Vertical Depth			Casing Diameter	Hole Diameter
(ft)	(ft)		Name	(")	(")
1,162.61	1,150.00	8-5/8"		8-5/8	11

Formations						
Measured Depth	Vertical Depth				Dip	Dip Direction
(ft)	(ft)	Name	Lithology		(°)	(°)
4,003.97	3,888.00	PK Depth			0.00	
4,967.75	4,838.00	SX Depth			0.00	
7,485.75	7,356.00	NIO Depth			0.00	
7,904.75	7,775.00	CD Depth			0.00	
7,983.75	7,854.00	GH Depth			0.00	
8,337.75	8,208.00	J Depth			0.00	