

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Bernhardt 6G-323**

Surface Location: Bernhardt 4N66W6G Pad Sec.6-T4N-R66W
 North American Datum 1983, US State Plane 1983, Colorado Northern Zone

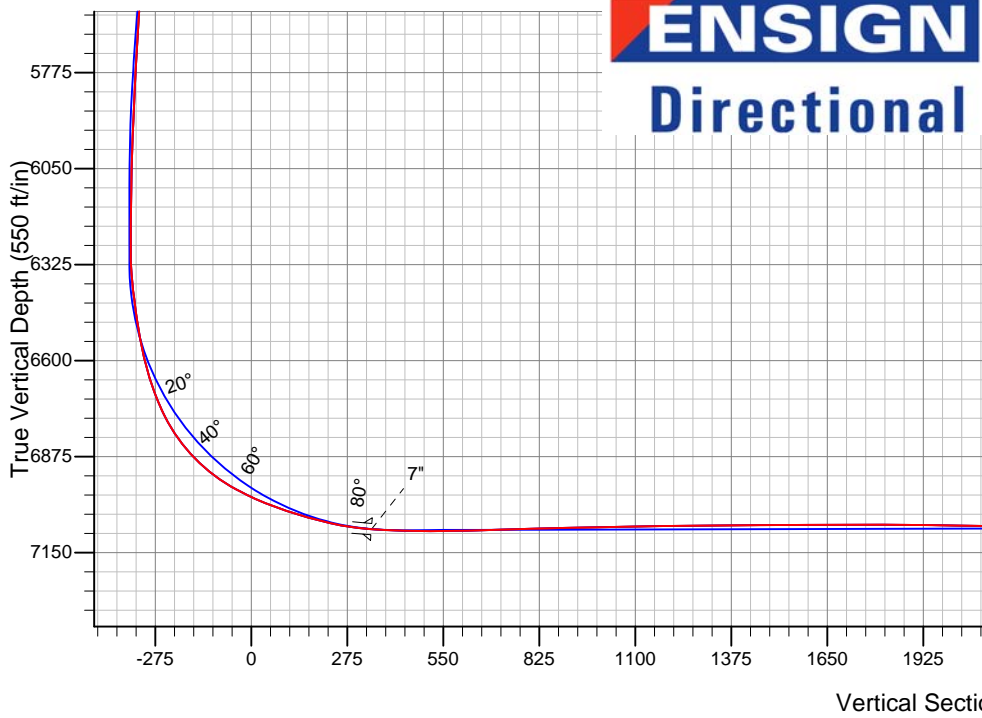
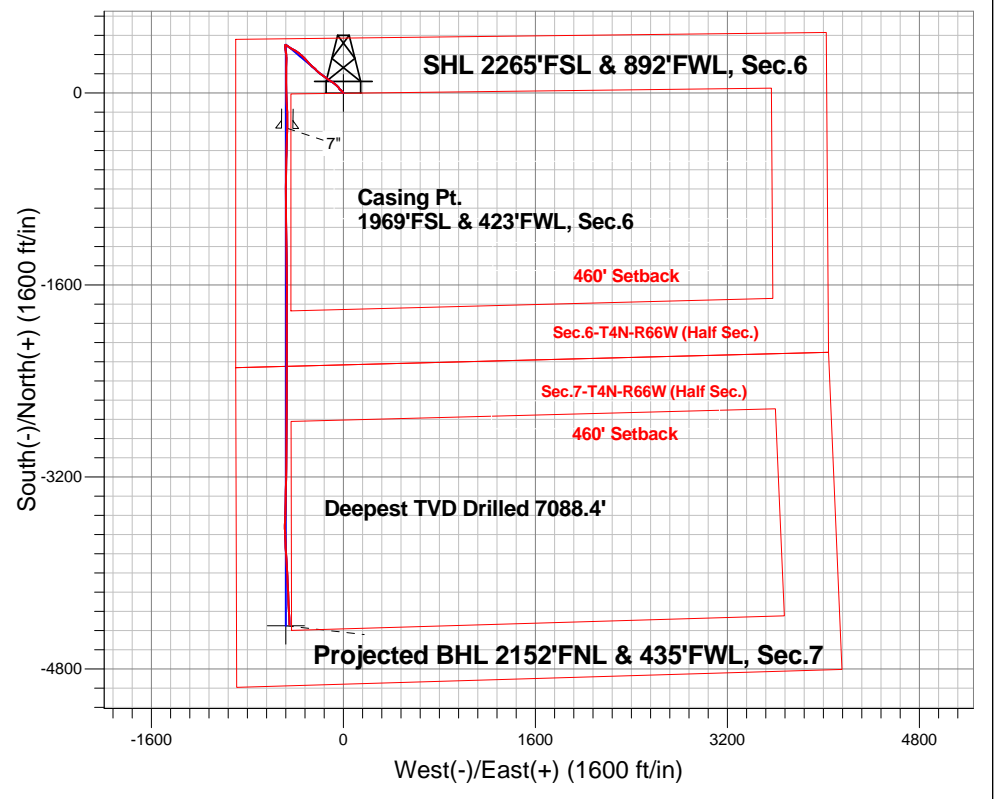
Ground Elevation: 4722.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1367451.90	3187718.36	40.340100	-104.826580	

Ensign Rig #124 RKB - 13.5' WELL @ 4735.5ft (Ensign Rig #124 RKB - 13.5')

FINAL SURVEY

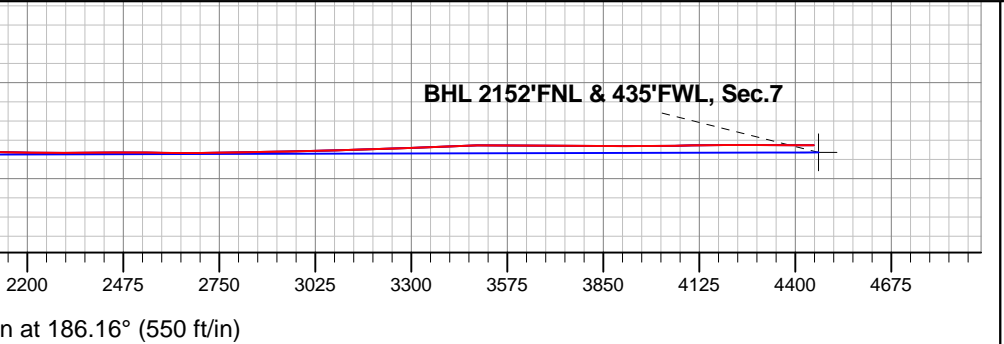
Projected Bottom Hole Location
 11655'MD 7055'TVD 4431'S & 449'W of SHL
 89.6 degree Incl @ 177.1 degree AZM



Bernhardt 4N66W6G Pad Sec.6-T4N-R66W
 Bernhardt 6G-323
 Wellbore #1

ANNOTATIONS		
TVD	MD	Annotation
7088.4	7681.0	Deepest TVD Drilled 7088.4'

LEGEND	
	Bernhardt 6G-323, Wellbore #1, Plan #4 (3-13-15) V0
	Bernhardt 6G-323, Wellbore #1, Survey #1
	Wellbore #1





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.6-T4N-R66W

Bernhardt 4N66W6G Pad Sec.6-T4N-R66W

Bernhardt 6G-323

Wellbore #1

Survey: Survey #1

Standard Survey Report

23 March, 2015

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Bernhardt 6G-323
Project:	SEC.6-T4N-R66W	TVD Reference:	WELL @ 4735.5ft (Ensign Rig #124 RKB - 13.5')
Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4735.5ft (Ensign Rig #124 RKB - 13.5')
Well:	Bernhardt 6G-323	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.6-T4N-R66W, Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W				
Site Position:		Northing:	1,367,654.84 ft	Latitude:	40.340660
From:	Lat/Long	Easting:	3,187,571.86 ft	Longitude:	-104.827100
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.43 °

Well	Bernhardt 6G-323					
Well Position	+N/-S	0.0 ft	Northing:	1,367,451.90 ft	Latitude:	40.340100
	+E/-W	0.0 ft	Easting:	3,187,718.36 ft	Longitude:	-104.826580
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,722.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/13/2015	8.39	66.86	52,700

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	186.16	

Survey Program	Date	3/23/2015			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
159.0	11,655.0	Survey #1 (Wellbore #1)	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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
1.0	0.01	317.10	1.0	0.0	0.0	0.0	0.94	0.94	0.00	
SHL 2265'FSL & 892'FWL, Sec.6										
159.0	1.50	317.10	159.0	1.5	-1.4	-1.4	0.94	0.94	0.00	
444.0	1.10	321.10	443.9	6.4	-5.7	-5.7	0.14	-0.14	1.40	
722.0	1.70	317.60	721.8	11.5	-10.1	-10.4	0.22	0.22	-1.26	
891.0	2.00	319.20	890.7	15.6	-13.7	-14.0	0.18	0.18	0.95	
1,024.0	2.30	310.70	1,023.6	19.1	-17.3	-17.1	0.33	0.23	-6.39	
1,117.0	3.50	302.20	1,116.5	21.8	-21.1	-19.4	1.37	1.29	-9.14	
1,209.0	4.20	314.60	1,208.3	25.7	-25.9	-22.8	1.18	0.76	13.48	
1,302.0	6.10	320.60	1,300.9	31.9	-31.4	-28.3	2.12	2.04	6.45	
1,393.0	7.90	321.40	1,391.3	40.5	-38.4	-36.2	1.98	1.98	0.88	

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Site:	Bernhardt 4N66W6G Pad Sec.6-T4N-R66W	MD Reference:	WELL @ 4735.5ft (Ensign Rig #124 RKB - 13.5')
Well:	Bernhardt 6G-323	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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)
1,485.0	7.80	318.10	1,482.4	50.1	-46.5	-44.8	0.50	-0.11	-3.59
1,577.0	8.00	316.20	1,573.5	59.4	-55.1	-53.1	0.36	0.22	-2.07
1,669.0	8.00	312.70	1,664.6	68.3	-64.3	-61.0	0.53	0.00	-3.80
1,761.0	7.80	309.20	1,755.8	76.6	-73.8	-68.3	0.57	-0.22	-3.80
1,853.0	7.80	304.60	1,846.9	84.1	-83.8	-74.6	0.68	0.00	-5.00
1,945.0	7.60	300.50	1,938.1	90.7	-94.2	-80.1	0.64	-0.22	-4.46
2,041.0	7.70	299.30	2,033.2	97.1	-105.2	-85.3	0.20	0.10	-1.25
2,136.0	7.60	306.20	2,127.4	103.9	-115.9	-90.9	0.97	-0.11	7.26
2,231.0	7.30	300.50	2,221.6	110.7	-126.1	-96.5	0.84	-0.32	-6.00
2,325.0	6.80	308.40	2,314.9	117.2	-135.6	-102.0	1.16	-0.53	8.40
2,421.0	7.00	308.40	2,410.2	124.4	-144.7	-108.1	0.21	0.21	0.00
2,516.0	7.10	307.00	2,504.5	131.5	-153.9	-114.2	0.21	0.11	-1.47
2,611.0	7.20	307.00	2,598.7	138.6	-163.3	-120.3	0.11	0.11	0.00
2,706.0	7.50	304.80	2,692.9	145.7	-173.2	-126.3	0.43	0.32	-2.32
2,802.0	6.90	300.50	2,788.2	152.2	-183.3	-131.7	0.84	-0.63	-4.48
2,897.0	6.60	306.10	2,882.5	158.3	-192.6	-136.7	0.76	-0.32	5.89
2,993.0	6.60	307.80	2,977.9	165.0	-201.5	-142.4	0.20	0.00	1.77
3,184.0	6.10	318.60	3,167.7	179.3	-216.8	-155.0	0.68	-0.26	5.65
3,279.0	6.00	316.20	3,262.2	186.7	-223.6	-161.6	0.29	-0.11	-2.53
3,375.0	5.50	315.00	3,357.7	193.6	-230.3	-167.7	0.54	-0.52	-1.25
3,470.0	6.50	312.70	3,452.2	200.4	-237.5	-173.8	1.08	1.05	-2.42
3,565.0	6.90	313.20	3,546.5	208.0	-245.6	-180.4	0.43	0.42	0.53
3,660.0	6.90	310.10	3,640.8	215.6	-254.1	-187.0	0.39	0.00	-3.26
3,755.0	6.70	311.40	3,735.2	222.9	-262.7	-193.4	0.27	-0.21	1.37
3,851.0	8.40	314.00	3,830.3	231.5	-271.9	-200.9	1.81	1.77	2.71
3,946.0	8.20	315.60	3,924.3	241.1	-281.6	-209.5	0.32	-0.21	1.68
4,041.0	7.50	317.80	4,018.5	250.6	-290.5	-217.9	0.80	-0.74	2.32
4,137.0	6.20	318.80	4,113.8	259.1	-298.2	-225.6	1.36	-1.35	1.04
4,232.0	7.10	316.70	4,208.1	267.2	-305.6	-232.9	0.98	0.95	-2.21
4,327.0	7.30	318.10	4,302.4	276.0	-313.6	-240.7	0.28	0.21	1.47
4,423.0	7.60	319.80	4,397.6	285.4	-321.8	-249.2	0.39	0.31	1.77
4,518.0	7.20	315.70	4,491.8	294.5	-330.0	-257.3	0.70	-0.42	-4.32
4,614.0	6.40	308.70	4,587.1	302.1	-338.4	-264.0	1.20	-0.83	-7.29
4,709.0	6.70	311.40	4,681.5	309.1	-346.7	-270.1	0.45	0.32	2.84
4,804.0	7.70	309.70	4,775.7	316.8	-355.7	-276.8	1.08	1.05	-1.79
4,899.0	7.70	310.50	4,869.9	325.0	-365.5	-283.9	0.11	0.00	0.84
4,995.0	6.80	309.20	4,965.1	332.8	-374.8	-290.6	0.95	-0.94	-1.35
5,090.0	7.30	306.30	5,059.4	339.9	-384.0	-296.7	0.65	0.53	-3.05
5,185.0	6.40	306.20	5,153.7	346.6	-393.1	-302.4	0.95	-0.95	-0.11
5,376.0	5.90	298.30	5,343.6	357.6	-410.4	-311.4	0.51	-0.26	-4.14
5,472.0	6.70	291.80	5,439.0	362.0	-419.9	-314.8	1.12	0.83	-6.77
5,567.0	6.80	296.00	5,533.4	366.5	-430.1	-318.2	0.53	0.11	4.42
5,663.0	7.10	303.50	5,628.7	372.3	-440.2	-322.9	0.99	0.31	7.81
5,758.0	7.00	305.30	5,723.0	378.8	-449.8	-328.4	0.26	-0.11	1.89
5,853.0	6.00	300.90	5,817.3	384.7	-458.8	-333.3	1.18	-1.05	-4.63
5,949.0	5.40	306.60	5,912.9	390.0	-466.7	-337.7	0.86	-0.63	5.94
6,044.0	4.50	298.10	6,007.5	394.4	-473.6	-341.3	1.22	-0.95	-8.95
6,140.0	2.30	304.10	6,103.3	397.3	-478.5	-343.6	2.32	-2.29	6.25
6,240.0	1.70	289.60	6,203.3	398.9	-481.6	-344.9	0.78	-0.60	-14.50
6,336.0	1.00	244.50	6,299.3	399.0	-483.7	-344.8	1.27	-0.73	-46.98
6,431.0	6.70	188.90	6,394.0	393.2	-485.3	-338.8	6.52	6.00	-58.53
6,526.0	8.40	177.90	6,488.2	380.8	-485.9	-326.4	2.34	1.79	-11.58
6,622.0	13.30	169.50	6,582.5	362.9	-483.6	-308.9	5.35	5.10	-8.75
6,717.0	19.00	172.80	6,673.7	336.8	-479.7	-283.3	6.07	6.00	3.47

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Well:	Bernhardt 6G-323	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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)
6,811.0	27.20	176.40	6,760.1	300.1	-476.4	-247.2	8.85	8.72	3.83
6,907.0	38.20	182.90	6,840.8	248.4	-476.5	-195.8	12.01	11.46	6.77
7,002.0	49.60	179.90	6,909.1	182.7	-477.9	-130.3	12.20	12.00	-3.16
7,097.0	60.60	180.10	6,963.4	104.9	-477.9	-52.9	11.58	11.58	0.21
7,193.0	67.80	177.80	7,005.1	18.5	-476.3	32.7	7.80	7.50	-2.40
7,288.0	72.90	178.10	7,037.1	-70.9	-473.1	121.3	5.38	5.37	0.32
7,383.0	76.50	177.70	7,062.1	-162.4	-469.8	211.9	3.81	3.79	-0.42
7,430.0	79.60	179.30	7,071.9	-208.4	-468.6	257.5	7.39	6.60	3.40
7,480.0	83.20	180.80	7,079.3	-257.8	-468.6	306.6	7.79	7.20	3.00
7,518.0	85.71	181.06	7,083.0	-295.6	-469.2	344.3	6.64	6.61	0.68
7"									
7,539.0	87.10	181.20	7,084.3	-316.6	-469.6	365.2	6.64	6.61	0.68
7,587.0	87.50	181.00	7,086.6	-364.5	-470.6	412.9	0.93	0.83	-0.42
7,634.0	89.20	181.40	7,087.9	-411.5	-471.5	459.7	3.72	3.62	0.85
7,681.0	89.60	183.10	7,088.4	-458.4	-473.4	506.6	3.72	0.85	3.62
Deepest TVD Drilled 7088.4'									
7,776.0	91.50	181.40	7,087.5	-553.4	-477.1	601.4	2.68	2.00	-1.79
7,872.0	91.50	180.80	7,085.0	-649.3	-479.0	697.0	0.62	0.00	-0.63
7,967.0	91.50	180.70	7,082.5	-744.3	-480.2	791.5	0.11	0.00	-0.11
8,062.0	91.60	179.80	7,079.9	-839.2	-480.6	886.0	0.95	0.11	-0.95
8,157.0	91.10	179.80	7,077.7	-934.2	-480.3	980.4	0.53	-0.53	0.00
8,253.0	91.00	178.90	7,075.9	-1,030.2	-479.2	1,075.7	0.94	-0.10	-0.94
8,348.0	91.10	178.70	7,074.2	-1,125.1	-477.2	1,169.9	0.24	0.11	-0.21
8,443.0	90.40	179.40	7,073.0	-1,220.1	-475.6	1,264.1	1.04	-0.74	0.74
8,539.0	90.60	179.10	7,072.1	-1,316.1	-474.4	1,359.4	0.38	0.21	-0.31
8,634.0	90.10	179.80	7,071.5	-1,411.1	-473.5	1,453.8	0.91	-0.53	0.74
8,729.0	90.20	179.60	7,071.3	-1,506.1	-473.0	1,548.2	0.24	0.11	-0.21
8,825.0	90.70	179.80	7,070.5	-1,602.1	-472.5	1,643.6	0.56	0.52	0.21
8,920.0	89.80	180.30	7,070.1	-1,697.1	-472.5	1,738.0	1.08	-0.95	0.53
9,015.0	89.60	180.10	7,070.6	-1,792.1	-472.9	1,832.5	0.30	-0.21	-0.21
9,110.0	89.30	180.00	7,071.5	-1,887.1	-473.0	1,927.0	0.33	-0.32	-0.11
9,205.0	89.30	179.20	7,072.7	-1,982.1	-472.3	2,021.3	0.84	0.00	-0.84
9,300.0	89.10	180.10	7,074.0	-2,077.1	-471.7	2,115.7	0.97	-0.21	0.95
9,396.0	88.80	180.30	7,075.8	-2,173.0	-472.0	2,211.2	0.38	-0.31	0.21
9,491.0	90.50	180.70	7,076.4	-2,268.0	-472.9	2,305.7	1.84	1.79	0.42
9,586.0	90.50	180.30	7,075.5	-2,363.0	-473.7	2,400.2	0.42	0.00	-0.42
9,682.0	89.40	179.10	7,075.6	-2,459.0	-473.2	2,495.6	1.70	-1.15	-1.25
9,777.0	89.30	179.60	7,076.7	-2,554.0	-472.1	2,589.9	0.54	-0.11	0.53
9,872.0	90.50	180.70	7,076.9	-2,649.0	-472.4	2,684.4	1.71	1.26	1.16
9,967.0	91.00	181.00	7,075.6	-2,744.0	-473.8	2,779.0	0.61	0.53	0.32
10,062.0	91.00	180.70	7,074.0	-2,839.0	-475.2	2,873.6	0.32	0.00	-0.32
10,157.0	91.60	180.50	7,071.8	-2,933.9	-476.2	2,968.1	0.67	0.63	-0.21
10,253.0	91.60	180.10	7,069.1	-3,029.9	-476.7	3,063.6	0.42	0.00	-0.42
10,348.0	91.70	180.70	7,066.4	-3,124.9	-477.3	3,158.0	0.64	0.11	0.63
10,443.0	91.60	180.70	7,063.7	-3,219.8	-478.5	3,252.6	0.11	-0.11	0.00
10,538.0	92.20	181.20	7,060.5	-3,314.7	-480.1	3,347.1	0.82	0.63	0.53
10,633.0	92.60	181.70	7,056.5	-3,409.6	-482.5	3,441.7	0.67	0.42	0.53
10,729.0	89.50	182.10	7,054.8	-3,505.5	-485.7	3,537.4	3.26	-3.23	0.42
10,824.0	89.50	180.50	7,055.6	-3,600.5	-487.8	3,632.1	1.68	0.00	-1.68
10,919.0	89.60	177.70	7,056.3	-3,695.5	-486.3	3,726.3	2.95	0.11	-2.95
11,014.0	89.80	176.40	7,056.8	-3,790.4	-481.4	3,820.1	1.38	0.21	-1.37
11,110.0	90.10	176.60	7,056.9	-3,886.2	-475.6	3,914.8	0.38	0.31	0.21
11,252.0	90.70	177.30	7,055.9	-4,028.0	-468.0	4,054.9	0.65	0.42	0.49

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Well:	Bernhardt 6G-323	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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)
11,301.0	90.90	177.30	7,055.2	-4,076.9	-465.7	4,103.4	0.41	0.41	0.00
11,396.0	90.40	177.70	7,054.2	-4,171.8	-461.6	4,197.3	0.67	-0.53	0.42
11,491.0	90.00	177.30	7,053.8	-4,266.7	-457.4	4,291.2	0.60	-0.42	-0.42
11,598.0	89.60	177.10	7,054.2	-4,373.6	-452.2	4,396.9	0.42	-0.37	-0.19
11,655.0	89.60	177.10	7,054.6	-4,430.5	-449.3	4,453.2	0.00	0.00	0.00
BHL 2162'FNL & 405'FWL, Sec.7									

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,518.0	7,083.0	7"	7	7-1/2

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,681.0	7,088.4	-458.4	-473.4	Deepest TVD Drilled 7088.4'

Checked By: _____ Approved By: _____ Date: _____