



EPW_RMP

SWEPI EXPLORATION - COLORADO

Herring Draw 1-9

Herring Draw 1-9

Herring Draw 1-9

Plan: Herring Draw 1-9 Horizontal

Standard Survey Report

14 April, 2011





Shell EP Survey Report



Company:	EPW_RMP	Local Co-ordinate Reference:	Well Herring Draw 1-9
Project:	SWEPI EXPLORATION - COLORADO	TVD Reference:	WELLHEAD @ 6923.00ft
Site:	Herring Draw 1-9	MD Reference:	WELLHEAD @ 6923.00ft
Well:	Herring Draw 1-9	North Reference:	Grid
Wellbore:	Herring Draw 1-9	Survey Calculation Method:	Minimum Curvature
Design:	Herring Draw 1-9 Horizontal	Database:	EDM_UA_Production

Project	SWEPI EXPLORATION - COLORADO		
Map System:	EPW NAD83	System Datum:	Mean Sea Level
Geo Datum:	NAD83 [1188_4269]		
Map Zone:	NAD83 / UTM 13N [1188_26913]		

Site		Herring Draw 1-9					
Site Position:		Northing:	14,656,022.44	usft	Latitude:	40° 19' 40.152 N	
From:	Lat/Long	Easting:	941,083.20	usft	Longitude:	107° 30' 32.665 W	
Position Uncertainty:	1.00	ft	Slot Radius:	13.200	in	Grid Convergence:	-1.62 °

Well		Herring Draw 1-9				
Well Position	+N/-S	0.00 ft	Northing:	14,656,063.11 usft	Latitude:	40° 19' 40.650 N
	+E/-W	0.00 ft	Easting:	941,427.26 usft	Longitude:	107° 30' 28.240 W
Position Uncertainty		1.00 ft	Wellhead Elevation:	6,912.00 ft	Ground Level:	6,912.00 ft

Wellbore	Herring Draw 1-9				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2009	2/1/2011	10.26	66.55	52,825

Design	Herring Draw 1-9 Horizontal				
Audit Notes:					
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	222.12	

Survey Tool Program	Date	4/8/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	6,460.94	Herring Draw 1-9 Horizontal (Herring Draw	EPW UNKNOWN	Survey tool used to measure well is unknown	

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	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	



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Wellbore:	Herring Draw 1-9	Survey Calculation Method:	Minimum Curvature
Design:	Herring Draw 1-9 Horizontal	Database:	EDM_UA_Production

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)
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,041.60	0.00	0.00	2,041.60	0.00	0.00	0.00	0.00	0.00	0.00
2,050.00	0.50	229.37	2,050.00	-0.02	-0.03	0.04	6.00	6.00	0.00
2,100.00	3.50	229.37	2,099.96	-1.16	-1.35	1.77	6.00	6.00	0.00
2,150.00	6.50	229.37	2,149.77	-4.00	-4.66	6.10	6.00	6.00	0.00
2,200.00	9.50	229.37	2,199.27	-8.54	-9.95	13.00	6.00	6.00	0.00
2,250.00	12.50	229.37	2,248.35	-14.75	-17.19	22.47	6.00	6.00	0.00
2,300.00	15.50	229.37	2,296.86	-22.63	-26.37	34.47	6.00	6.00	0.00
2,350.00	18.50	229.37	2,344.67	-32.15	-37.47	48.97	6.00	6.00	0.00
2,400.00	21.50	229.37	2,391.65	-43.28	-50.45	65.94	6.00	6.00	0.00
2,450.00	24.50	229.37	2,437.66	-56.01	-65.27	85.32	6.00	6.00	0.00
2,500.00	27.50	229.37	2,482.60	-70.28	-81.91	107.06	6.00	6.00	0.00
2,550.00	30.50	229.37	2,526.32	-86.06	-100.31	131.11	6.00	6.00	0.00
2,600.00	33.50	229.37	2,568.72	-103.32	-120.41	157.39	6.00	6.00	0.00
2,650.00	36.50	229.37	2,609.67	-121.99	-142.18	185.84	6.00	6.00	0.00
2,700.00	39.50	229.37	2,649.06	-142.04	-165.54	216.38	6.00	6.00	0.00
2,750.00	42.50	229.37	2,686.79	-163.40	-190.43	248.92	6.00	6.00	0.00
2,800.00	45.50	229.37	2,722.75	-186.01	-216.79	283.37	6.00	6.00	0.00
2,850.00	48.50	229.37	2,756.84	-209.82	-244.54	319.64	6.00	6.00	0.00
2,900.00	51.50	229.37	2,788.98	-234.76	-273.61	357.64	6.00	6.00	0.00
2,950.00	54.50	229.37	2,819.06	-260.76	-303.91	397.25	6.00	6.00	0.00
3,000.00	57.50	229.37	2,847.02	-287.76	-335.37	438.37	6.00	6.00	0.00
3,050.00	60.50	229.37	2,872.76	-315.66	-367.90	480.88	6.00	6.00	0.00
3,100.00	63.50	229.37	2,896.23	-344.41	-401.40	524.67	6.00	6.00	0.00
3,150.00	66.50	229.37	2,917.36	-373.91	-435.79	569.62	6.00	6.00	0.00
3,200.00	69.50	229.37	2,936.08	-404.10	-470.97	615.60	6.00	6.00	0.00
3,250.00	72.50	229.37	2,952.35	-434.88	-506.84	662.50	6.00	6.00	0.00
3,291.60	75.00	229.37	2,963.99	-460.89	-537.15	702.11	6.00	6.00	0.00
3,300.00	75.00	229.37	2,966.17	-466.17	-543.31	710.16	0.00	0.00	0.00
3,391.60	75.00	229.37	2,989.87	-523.78	-610.46	797.93	0.00	0.00	0.00
3,400.00	75.26	229.37	2,992.03	-529.07	-616.62	805.98	3.09	3.09	0.00
3,500.00	78.35	229.37	3,014.85	-592.46	-690.50	902.55	3.09	3.09	0.00
3,600.00	81.45	229.37	3,032.39	-656.56	-765.21	1,000.20	3.09	3.09	0.00
3,700.00	84.54	229.37	3,044.59	-721.19	-840.52	1,098.65	3.09	3.09	0.00



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Site:	Herring Draw 1-9	MD Reference:	WELLHEAD @ 6923.00ft
Well:	Herring Draw 1-9	North Reference:	Grid
Wellbore:	Herring Draw 1-9	Survey Calculation Method:	Minimum Curvature
Design:	Herring Draw 1-9 Horizontal	Database:	EDM_UA_Production

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)
3,800.00	87.63	229.37	3,051.42	-786.14	-916.23	1,197.61	3.09	3.09	0.00
3,876.61	90.00	229.37	3,053.00	-836.02	-974.35	1,273.58	3.09	3.09	0.00
3,900.00	90.23	228.90	3,052.95	-851.32	-992.04	1,296.80	2.24	1.00	-2.00
4,000.00	91.23	226.90	3,051.67	-918.35	-1,066.23	1,396.27	2.24	1.00	-2.00
4,100.00	92.23	224.90	3,048.65	-987.90	-1,138.01	1,496.00	2.24	1.00	-2.00
4,200.00	93.23	222.90	3,043.88	-1,059.87	-1,207.27	1,595.84	2.23	1.00	-2.00
4,300.00	94.23	220.90	3,037.36	-1,134.13	-1,273.91	1,695.62	2.23	1.00	-2.00
4,334.38	94.58	220.21	3,034.72	-1,160.18	-1,296.20	1,729.88	2.23	1.00	-2.00
4,400.00	94.58	218.90	3,029.49	-1,210.61	-1,337.85	1,795.23	1.99	0.00	-2.00
4,493.40	94.58	217.03	3,022.03	-1,284.00	-1,395.13	1,888.08	1.99	0.00	-2.00
4,500.00	94.58	217.03	3,021.50	-1,289.25	-1,399.09	1,894.63	0.00	0.00	0.00
4,600.00	94.58	217.03	3,013.52	-1,368.82	-1,459.13	1,993.92	0.00	0.00	0.00
4,700.00	94.58	217.03	3,005.54	-1,448.40	-1,519.16	2,093.21	0.00	0.00	0.00
4,800.00	94.58	217.03	2,997.56	-1,527.97	-1,579.20	2,192.50	0.00	0.00	0.00
4,900.00	94.58	217.03	2,989.58	-1,607.54	-1,639.24	2,291.79	0.00	0.00	0.00
5,000.00	94.58	217.03	2,981.60	-1,687.12	-1,699.27	2,391.08	0.00	0.00	0.00
5,100.00	94.58	217.03	2,973.62	-1,766.69	-1,759.31	2,490.37	0.00	0.00	0.00
5,200.00	94.58	217.03	2,965.64	-1,846.26	-1,819.35	2,589.66	0.00	0.00	0.00
5,300.00	94.58	217.03	2,957.66	-1,925.84	-1,879.38	2,688.94	0.00	0.00	0.00
5,400.00	94.58	217.03	2,949.67	-2,005.41	-1,939.42	2,788.23	0.00	0.00	0.00
5,500.00	94.58	217.03	2,941.69	-2,084.98	-1,999.46	2,887.52	0.00	0.00	0.00
5,600.00	94.58	217.03	2,933.71	-2,164.56	-2,059.49	2,986.81	0.00	0.00	0.00
5,700.00	94.58	217.03	2,925.73	-2,244.13	-2,119.53	3,086.10	0.00	0.00	0.00
5,800.00	94.58	217.03	2,917.75	-2,323.70	-2,179.57	3,185.39	0.00	0.00	0.00
5,900.00	94.58	217.03	2,909.77	-2,403.28	-2,239.60	3,284.68	0.00	0.00	0.00
6,000.00	94.58	217.03	2,901.79	-2,482.85	-2,299.64	3,383.97	0.00	0.00	0.00
6,100.00	94.58	217.03	2,893.81	-2,562.42	-2,359.68	3,483.26	0.00	0.00	0.00
6,200.00	94.58	217.03	2,885.83	-2,642.00	-2,419.71	3,582.55	0.00	0.00	0.00
6,300.00	94.58	217.03	2,877.85	-2,721.57	-2,479.75	3,681.83	0.00	0.00	0.00
6,400.00	94.58	217.03	2,869.86	-2,801.14	-2,539.79	3,781.12	0.00	0.00	0.00
6,460.94	94.58	217.03	2,865.00	-2,849.63	-2,576.37	3,841.63	0.00	0.00	0.00

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Toe Target HD1-9 - plan hits target center - Point	0.00	360.00	2,865.00	-2,849.63	-2,576.37	14,653,213.48	938,850.89	40° 19' 11.784 N	107° 31' 0.440 W
Heel Target HD1-9 - plan hits target center - Point	0.00	360.00	3,053.00	-836.02	-974.35	14,655,227.09	940,452.90	40° 19' 32.120 N	107° 30' 40.507 W



Shell EP
Survey Report



Company:	EPW_RMP	Local Co-ordinate Reference:	Well Herring Draw 1-9
Project:	SWEPI EXPLORATION - COLORADO	TVD Reference:	WELLHEAD @ 6923.00ft
Site:	Herring Draw 1-9	MD Reference:	WELLHEAD @ 6923.00ft
Well:	Herring Draw 1-9	North Reference:	Grid
Wellbore:	Herring Draw 1-9	Survey Calculation Method:	Minimum Curvature
Design:	Herring Draw 1-9 Horizontal	Database:	EDM_UA_Production

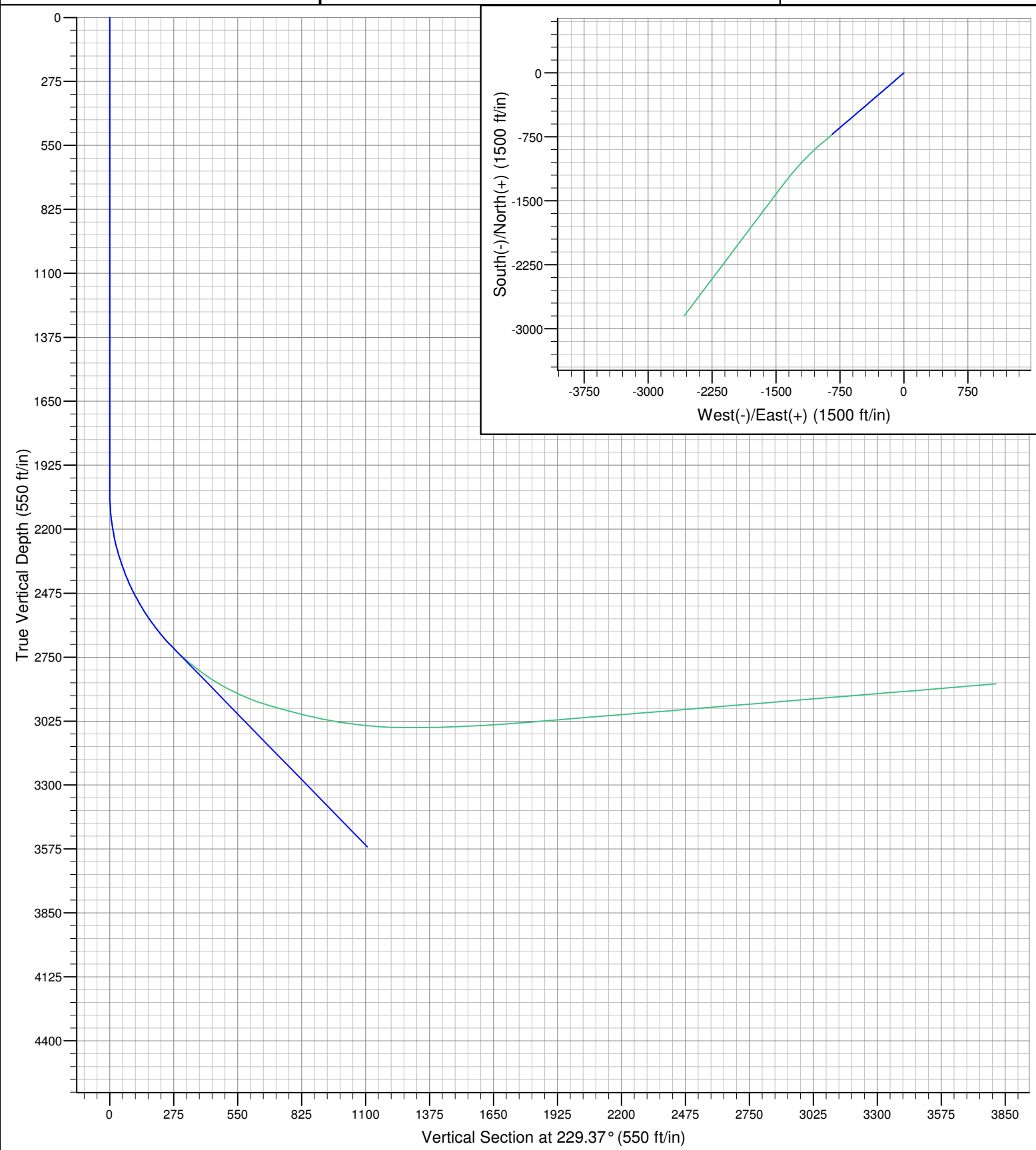
Checked By: _____	Approved By: _____	Date: _____
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Project: SWEPI EXPLORATION - COLORADO
Site: Herring Draw 1-9
Well: Herring Draw 1-9
Wellbore: Herring Draw 19 Pilot
Design: Herring Draw 1-9 Pilot

SITE DETAILS: Herring Draw 1-9

Site Centre Latitude: 40° 19' 40.152 N
Longitude: 107° 30' 32.665 W

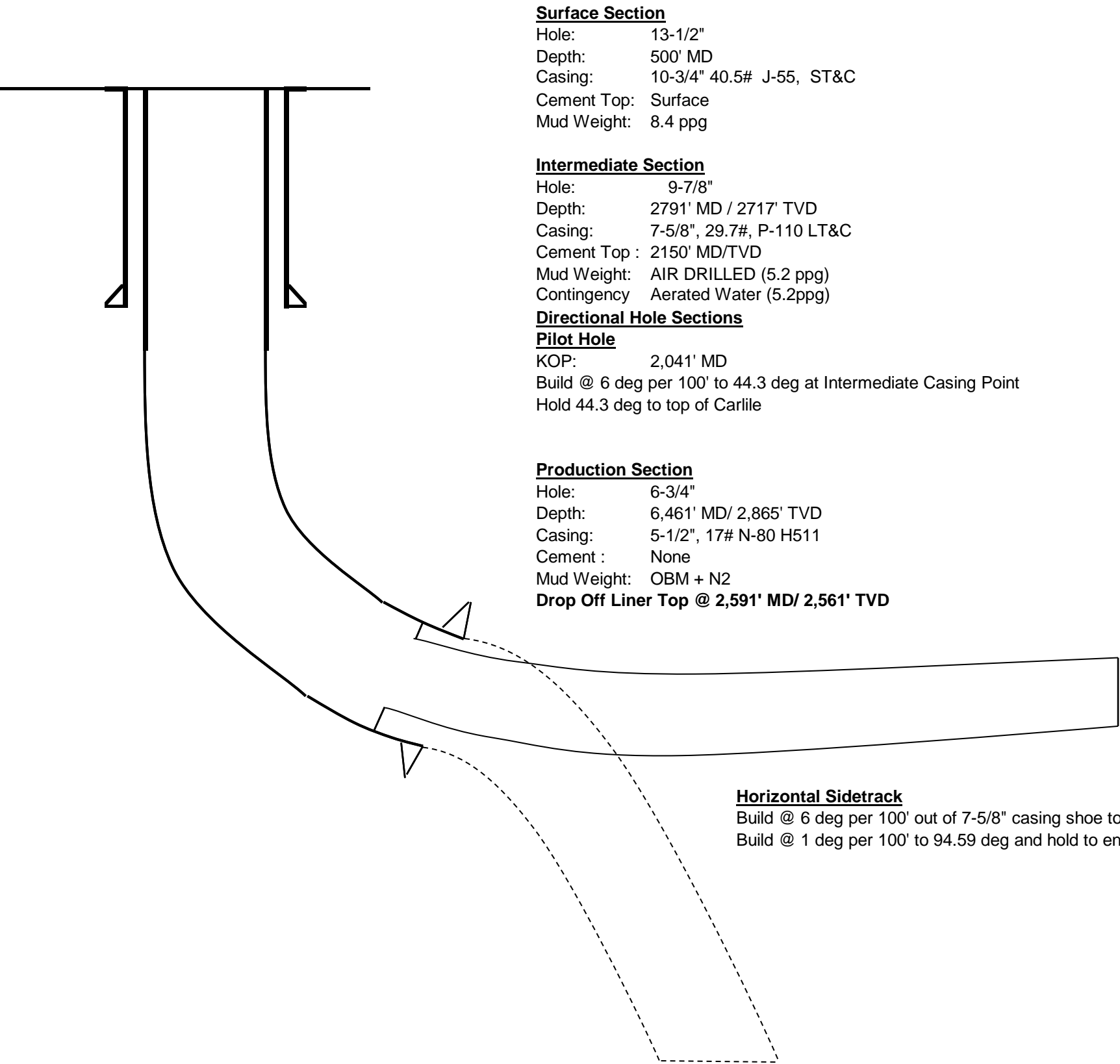
Positional Uncertainty: 1.00
Convergence: -1.62
Local North: Grid



WFU Herring Draw 1-9

T4N, R90W, SEC9
Wellbore Diagram

Updated: 3/25/2011
Location: Section 9 Township 4N Range 90W Moffat County, Colorado
Unit Williams Fork Unit
API Number: Pending Elevation: 6926 GL
Target Zone: Niobrara Shale 6937 KB



Surface Section

Hole: 13-1/2"
Depth: 500' MD
Casing: 10-3/4" 40.5# J-55, ST&C
Cement Top: Surface
Mud Weight: 8.4 ppg

Intermediate Section

Hole: 9-7/8"
Depth: 2791' MD / 2717' TVD
Casing: 7-5/8", 29.7#, P-110 LT&C
Cement Top : 2150' MD/TVD
Mud Weight: AIR DRILLED (5.2 ppg)
Contingency Aerated Water (5.2ppg)

Directional Hole Sections

Pilot Hole

KOP: 2,041' MD
Build @ 6 deg per 100' to 44.3 deg at Intermediate Casing Point
Hold 44.3 deg to top of Carlile

Production Section

Hole: 6-3/4"
Depth: 6,461' MD/ 2,865' TVD
Casing: 5-1/2", 17# N-80 H511
Cement : None
Mud Weight: OBM + N2
Drop Off Liner Top @ 2,591' MD/ 2,561' TVD

Horizontal Sidetrack

Build @ 6 deg per 100' out of 7-5/8" casing shoe to land horizontal
Build @ 1 deg per 100' to 94.59 deg and hold to end of section