

Anadarko Petroleum Corp.

Kiowa County, CO

Sec. 11-T17S-R48W

LINCOLN 1748-11-11-H

Plan F

Plan: Rev F1

Sperry Drilling Services

Proposal Report

16 December, 2013

Well Coordinates: 1,710,647.23 N, 3,781,616.59 E (38° 35' 12.61" N, 102° 45' 55.29" W)

Ground Level: 4,233.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Centered on Well LINCOLN 1748-11-11-H

RKB = 19' @ 4252.00usft (Pioneer 54)

N

True

Dec-Deg - API - US Survey Feet - Custom

Version: 5000.1 Build: 70

HALLIBURTON

Project: Kiowa County, CO
Site: Sec. 11-T17S-R48W
Well: LINCOLN 1748-11-11-H
Wellbore: Plan F
Design: Rev F1

Anadarko Petroleum Corp.

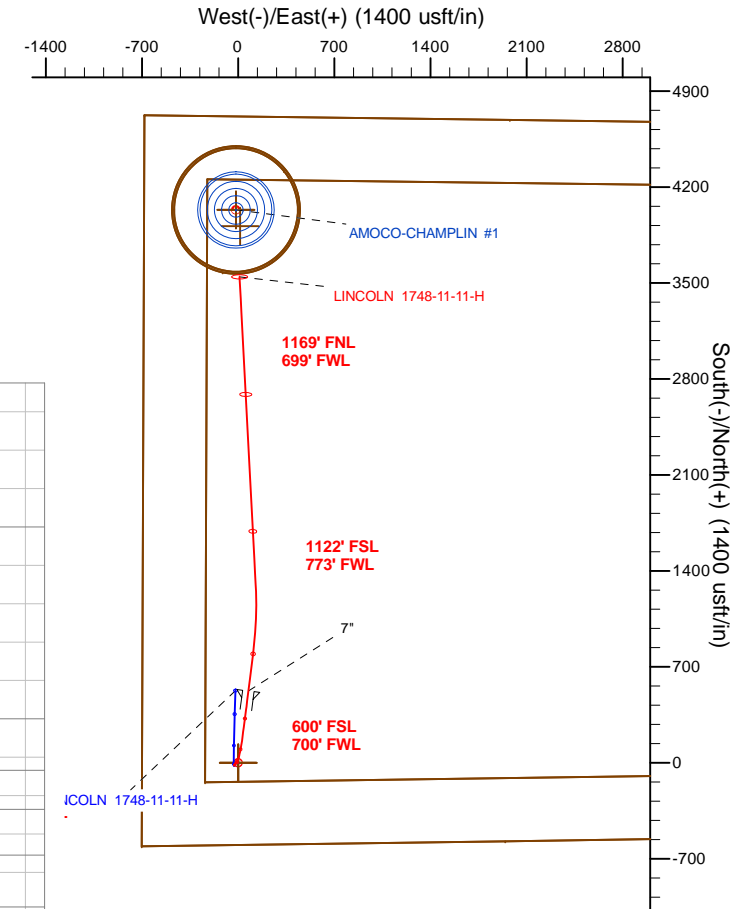
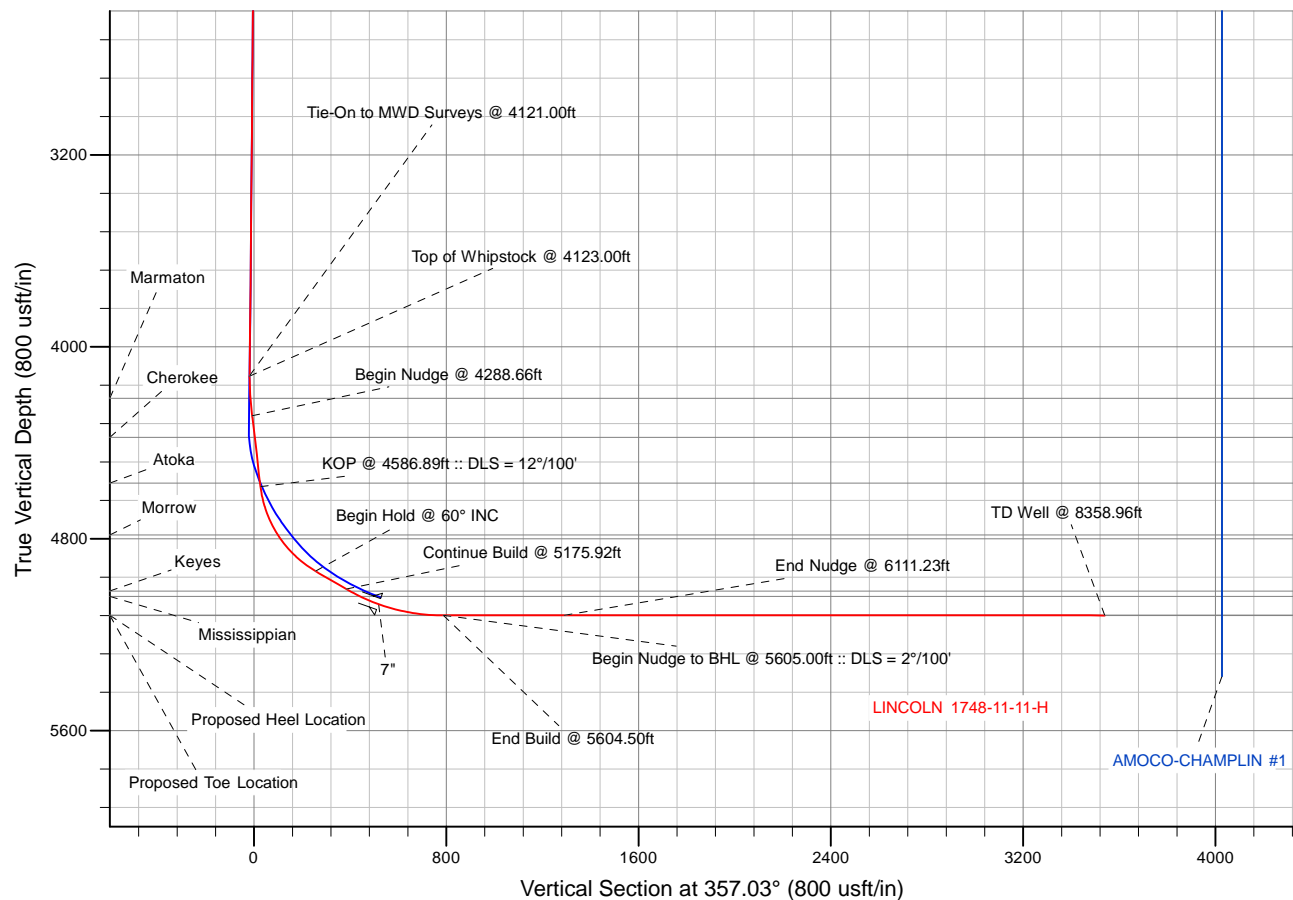
HALLIBURTON
Sperry Drilling

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	4121.00	1.17	215.20	4120.67	-19.87	-28.23	0.00	0.00	-18.38	
2	4123.00	1.17	215.36	4122.67	-19.90	-28.25	0.16	90.08	-18.41	
3	4134.50	1.83	29.99	4134.17	-19.84	-28.23	26.09	176.72	-18.35	
4	4288.66	8.00	30.00	4287.69	-8.40	-21.62	4.00	0.01	-7.27	
5	4586.89	8.00	30.00	4583.02	27.55	-0.87	0.00	0.00	27.55	
6	5025.92	60.00	7.16	4935.34	259.18	41.11	12.00	335.00	256.70	
7	5175.92	60.00	7.16	5010.34	388.07	57.31	0.00	0.00	384.58	
8	5604.50	90.00	7.16	5120.00	794.13	108.34	7.00	0.00	787.45	
9	6111.23	90.00	357.03	5120.00	1299.87	126.85	2.00	-90.00	1291.55	
10	8358.96	90.00	357.03	5120.00	3544.58	10.34	0.00	0.00	3539.28	

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
LINCOLN 1748-11-11-H_SB	0.00	0.00	0.00	38.586836	-102.765358	Polygon
LINCOLN 1748-11-11-H_SEC	0.00	0.00	0.00	38.586836	-102.765358	Polygon
LINCOLN 1748-11-11-H_SHL	0.00	0.00	0.00	38.586836	-102.765358	Point
5° @ 5149' TVD	5149.00	4032.55	-16.29	38.597908	-102.765415	Circle (Radius: 450.48)
LINCOLN 1748-11-11-H_BHL	5149.00	3913.83	13.43	38.597582	-102.765311	Point
5° @ 5321' TVD	5321.00	4032.55	-16.29	38.597908	-102.765415	Circle (Radius: 465.53)



WELL DETAILS: LINCOLN 1748-11-11-H

Ground Level: 4233.00

RKB = 19' @ 4252.00usft (Pioneer 54)

Plan: Rev F1 (LINCOLN 1748-11-11-H /Plan F)

Created By: Clint Eshelman Date: 12/16/2013
Reviewed: _____ Date: _____

Plan Report for LINCOLN 1748-11-11-H - Rev F1

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)	Toolface Azimuth (°)
4,121.00	1.17	215.20	4,120.67	-19.87	-28.23	-18.38	0.00	0.00	0.00	0.00
Tie-On to MWD Surveys @ 4121.00ft - LINCOLN 1748-11-11-H_SB - LINCOLN 1748-11-11-H_SHL - LINCOLN 1748-11-11-H_SEC										
4,123.00	1.17	215.36	4,122.67	-19.90	-28.25	-18.41	0.16	0.00	8.00	90.08
Top of Whipstock @ 4123.00ft										
4,134.50	1.83	29.99	4,134.17	-19.84	-28.23	-18.35	26.09	5.77	1,518.51	176.72
4,200.00	4.45	30.00	4,199.57	-16.73	-26.43	-15.33	4.00	4.00	0.01	0.01
4,215.49	5.07	30.00	4,215.00	-15.61	-25.79	-14.26	4.00	4.00	0.00	0.01
Marmaton										
4,288.66	8.00	30.00	4,287.69	-8.40	-21.62	-7.27	4.00	4.00	0.00	0.01
Begin Nudge @ 4288.66ft										
4,300.00	8.00	30.00	4,298.92	-7.03	-20.83	-5.94	0.00	0.00	0.00	0.00
4,379.86	8.00	30.00	4,378.00	2.59	-15.28	3.38	0.00	0.00	0.00	0.00
Cherokee										
4,400.00	8.00	30.00	4,397.95	5.02	-13.87	5.73	0.00	0.00	0.00	0.00
4,500.00	8.00	30.00	4,496.97	17.07	-6.92	17.41	0.00	0.00	0.00	0.00
4,571.72	8.00	30.00	4,568.00	25.72	-1.93	25.78	0.00	0.00	0.00	0.00
Atoka										
4,586.89	8.00	30.00	4,583.02	27.55	-0.87	27.55	0.00	0.00	0.00	0.00
KOP @ 4586.89ft :: DLS = 12°/100'										
4,600.00	9.45	25.95	4,595.98	29.30	0.06	29.26	12.00	11.05	-30.91	-25.00
4,700.00	21.09	14.00	4,692.30	54.23	8.03	53.74	12.00	11.64	-11.95	-20.99
4,800.00	32.99	10.42	4,781.22	98.63	17.34	97.59	12.00	11.89	-3.58	-9.41
4,803.32	33.38	10.34	4,784.00	100.42	17.67	99.36	12.00	11.93	-2.36	-6.20
Morrow										
4,900.00	44.93	8.60	4,858.84	160.54	27.58	158.89	12.00	11.95	-1.80	-6.14
5,000.00	56.90	7.42	4,921.78	237.27	38.31	234.97	12.00	11.97	-1.18	-4.78
5,025.92	60.00	7.16	4,935.34	259.18	41.11	256.70	12.00	11.97	-0.97	-4.03
Begin Hold @ 60° INC										
5,100.00	60.00	7.16	4,972.38	322.83	49.11	319.85	0.00	0.00	0.00	-3.89
5,175.92	60.00	7.16	5,010.34	388.07	57.31	384.58	0.00	0.00	0.00	0.00
Continue Build @ 5175.92ft										
5,193.58	61.24	7.16	5,019.00	403.33	59.23	399.72	7.00	7.00	0.00	0.00
Keyes										
5,200.00	61.69	7.16	5,022.07	408.93	59.93	405.28	7.00	7.00	0.00	0.00
5,239.60	64.46	7.16	5,040.00	443.96	64.33	440.03	7.00	7.00	0.00	0.00
Mississippian										
5,300.00	68.69	7.16	5,064.01	498.93	71.24	494.57	7.00	7.00	0.00	0.00
5,325.92	70.50	7.16	5,073.05	523.04	74.27	518.49	7.00	7.00	0.00	0.00
7"										
5,400.00	75.69	7.16	5,094.59	593.34	83.11	588.23	7.00	7.00	0.00	0.00
5,500.00	82.69	7.16	5,113.34	690.73	95.35	684.87	7.00	7.00	0.00	0.00
5,600.00	89.69	7.16	5,119.99	789.67	107.78	783.03	7.00	7.00	0.00	0.00
5,604.50	90.00	7.16	5,120.00	794.14	108.34	787.46	6.99	6.99	0.00	0.00
End Build @ 5604.50ft - Proposed Heel Location										
5,605.00	90.00	7.15	5,120.00	794.63	108.41	787.95	2.02	0.00	-2.02	-90.00
Begin Nudge to BHL @ 5605.00ft :: DLS = 2°/100'										
5,700.00	90.00	5.25	5,120.00	889.07	118.67	881.73	2.00	0.00	-2.00	-90.00
5,800.00	90.00	3.25	5,120.00	988.79	126.09	980.93	2.00	0.00	-2.00	-90.00
5,900.00	90.00	1.25	5,120.00	1,088.71	130.02	1,080.51	2.00	0.00	-2.00	-90.00
6,000.00	90.00	359.25	5,120.00	1,188.70	130.46	1,180.35	2.00	0.00	-2.00	-90.00
6,100.00	90.00	357.25	5,120.00	1,288.65	127.41	1,280.32	2.00	0.00	-2.00	-90.00
6,111.23	90.00	357.03	5,120.00	1,299.87	126.85	1,291.55	2.00	0.00	-2.00	-90.00
End Nudge @ 6111.23ft										
6,200.00	90.00	357.03	5,120.00	1,388.52	122.25	1,380.32	0.00	0.00	0.00	0.00
6,300.00	90.00	357.03	5,120.00	1,488.38	117.07	1,480.32	0.00	0.00	0.00	0.00
6,400.00	90.00	357.03	5,120.00	1,588.25	111.88	1,580.32	0.00	0.00	0.00	0.00

Plan Report for LINCOLN 1748-11-11-H - Rev F1

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)	Toolface Azimuth (°)
6,500.00	90.00	357.03	5,120.00	1,688.11	106.70	1,680.32	0.00	0.00	0.00	0.00
6,600.00	90.00	357.03	5,120.00	1,787.98	101.52	1,780.32	0.00	0.00	0.00	0.00
6,700.00	90.00	357.03	5,120.00	1,887.85	96.33	1,880.32	0.00	0.00	0.00	0.00
6,800.00	90.00	357.03	5,120.00	1,987.71	91.15	1,980.32	0.00	0.00	0.00	0.00
6,900.00	90.00	357.03	5,120.00	2,087.58	85.97	2,080.32	0.00	0.00	0.00	0.00
7,000.00	90.00	357.03	5,120.00	2,187.44	80.78	2,180.32	0.00	0.00	0.00	0.00
7,100.00	90.00	357.03	5,120.00	2,287.31	75.60	2,280.32	0.00	0.00	0.00	0.00
7,200.00	90.00	357.03	5,120.00	2,387.17	70.42	2,380.32	0.00	0.00	0.00	0.00
7,300.00	90.00	357.03	5,120.00	2,487.04	65.23	2,480.32	0.00	0.00	0.00	0.00
7,400.00	90.00	357.03	5,120.00	2,586.90	60.05	2,580.32	0.00	0.00	0.00	0.00
7,500.00	90.00	357.03	5,120.00	2,686.77	54.87	2,680.32	0.00	0.00	0.00	0.00
7,600.00	90.00	357.03	5,120.00	2,786.64	49.68	2,780.32	0.00	0.00	0.00	0.00
7,700.00	90.00	357.03	5,120.00	2,886.50	44.50	2,880.32	0.00	0.00	0.00	0.00
7,800.00	90.00	357.03	5,120.00	2,986.37	39.31	2,980.32	0.00	0.00	0.00	0.00
7,900.00	90.00	357.03	5,120.00	3,086.23	34.13	3,080.32	0.00	0.00	0.00	0.00
8,000.00	90.00	357.03	5,120.00	3,186.10	28.95	3,180.32	0.00	0.00	0.00	0.00
8,100.00	90.00	357.03	5,120.00	3,285.96	23.76	3,280.32	0.00	0.00	0.00	0.00
8,200.00	90.00	357.03	5,120.00	3,385.83	18.58	3,380.32	0.00	0.00	0.00	0.00
8,300.00	90.00	357.03	5,120.00	3,485.69	13.40	3,480.32	0.00	0.00	0.00	0.00
8,358.96	90.00	357.03	5,120.00	3,544.58	10.34	3,539.28	0.00	0.00	0.00	0.00

TD Well @ 8358.96ft - Proposed Toe Location - 5° @ 5321' TVD - 5° @ 5149' TVD - LINCOLN 1748-11-11-H_BHL

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,121.00	4,120.67	-19.87	-28.23	Tie-On to MWD Surveys @ 4121.00ft
4,123.00	4,122.67	-19.90	-28.25	Top of Whipstock @ 4123.00ft
4,288.66	4,287.69	-8.40	-21.62	Begin Nudge @ 4288.66ft
4,586.89	4,583.02	27.55	-0.87	KOP @ 4586.89ft :: DLS = 12°/100'
5,025.92	4,935.34	259.18	41.11	Begin Hold @ 60° INC
5,175.92	5,010.34	388.07	57.31	Continue Build @ 5175.92ft
5,604.50	5,120.00	794.14	108.34	End Build @ 5604.50ft
5,605.00	5,120.00	794.63	108.41	Begin Nudge to BHL @ 5605.00ft :: DLS = 2°/100'
6,111.23	5,120.00	1,299.87	126.85	End Nudge @ 6111.23ft
8,358.96	5,120.00	3,544.58	10.34	TD Well @ 8358.96ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	357.03	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
174.00	4,121.00	MWD Field Surveys	MWD+SC
4,121.00	5,325.92	Rev F1	MWD+SC
5,325.92	8,358.96	Rev F1	MWD+SC

Plan Report for LINCOLN 1748-11-11-H - Rev F1**Casing Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
5,325.92	5,073.05	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,215.49	4,215.00	Marmaton		0.00	
4,379.86	4,378.00	Cherokee		0.00	
4,571.72	4,568.00	Atoka		0.00	
4,803.32	4,784.00	Morrow		0.00	
5,193.58	5,019.00	Keyes		0.00	
5,239.60	5,040.00	Mississippian		0.00	
5,604.50	5,120.00	Proposed Heel Location		0.00	
8,358.96	5,120.00	Proposed Toe Location		0.00	

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
LINCOLN 1748-11-11-H_SB	0.00	0.00	0.00	Polygon
LINCOLN 1748-11-11-H_SHL	0.00	0.00	0.00	Point
LINCOLN 1748-11-11-H_SEC	0.00	0.00	0.00	Polygon
5° @ 5149' TVD	5,149.00	4,032.55	-16.29	Circle
LINCOLN 1748-11-11-H_BHL	5,149.00	3,913.83	13.43	Point
5° @ 5321' TVD	5,321.00	4,032.55	-16.29	Circle

Directional Difficulty Index

Average Dogleg over Survey:	2.41 °/100usft	Maximum Dogleg over Survey:	26.09 °/100usft at 4,134.50 usft
Net Tortousity applicable to Plans:	2.41 °/100usft	Directional Difficulty Index:	5.884

Audit Info

North Reference Sheet for Sec. 11-T17S-R48W - LINCOLN 1748-11-11-H - Plan F

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB = 19' @ 4252.00usft (Pioneer 54). Northing and Easting are relative to LINCOLN 1748- 11-11-H

Coordinate System is US State Plane 1983, Colorado Southern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.50°, Longitude Origin:0.000000°, Latitude Origin:38.433333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 1.00003162

Grid Coordinates of Well: 1,710,647.23 usft N, 3,781,616.59 usft E

Geographical Coordinates of Well: 38° 35' 12.61" N, 102° 45' 55.29" W

Grid Convergence at Surface is: 1.68°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,358.96usft

the Bottom Hole Displacement is 3,544.59usft in the Direction of 0.17° (True).

Magnetic Convergence at surface is: -5.73° (30 October 2013, , BGGM2013)

