

Conoco Phillips Company

Arapahoe County, Colorado

Sec. 14-T4S-R65W

Prosper Farms 4-65 13-14 1H

Plan C (Pilot)

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

14 November, 2014

Well Coordinates: 1,682,895.51 N, 3,242,064.33 E (39° 42' 18.73" N, 104° 38' 22.76" W)

Ground Level: 5,691.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well Prosper Farms 4-65 13-14 1H

KB 24 ft @ 5715.00usft (H&P 280)

N

True

API - US Survey Feet - Custom





HALLIBURTON

OPERATOR:	ConocoPhillips
WELL:	Prosper Farms 4-65 13-14 1H
FIELD:	Niobrara
RIG:	H&P 280
LEGALS:	Sec. 14-T4S-R65W
COUNTY:	Arapahoe
STATE:	CO.
CAL. METHOD:	Min Curvature
MAG. DECL. APPLIED:	8.3894
VERTICAL SEC. DIR. :	89.290

SSDS Job Number :	901753107
Start Date of Job :	10/19/2014
End Date of Job :	11/1/2014
Lead Directional Driller:	Roland Hall
Other SSDS DD's :	Lual Qubain
SSDS MWD Engineers :	Ryan Rogge
	Kyle Wass

	Main Hole =====>		1st Side Track =====>		2nd Side Track =====>		3rd Side Track =====>		4th Side Track =====>	
	2218.00	Tie On	7223.00	Tie On		Tie On		Tie On		Tie On
First Survey Depth	2310.00									
Last Survey Depth	8138.00									
KOP Depth/Sidetrack MD		KOP	7240.00	KOP-ST1		KOP-ST2		KOP-ST3		KOP-ST4
First Survey Depth		MWD	7314.00	MWD		MWD		MWD		MWD
Last Survey Depth		MWD	14658.00	MWD		MWD		MWD		MWD
Bit Extrapolation to TD	8195.00	T.D.	14719.00	T.D.		T.D.		T.D.		T.D.

The following Sperry Sun Drilling Services personnel listed below, do certify the above survey information to be accurate :

Print Name :	Roland Hall	Print Name :	Ryan Rogge	Print Name :
Sign Name :		Sign Name :		Sign Name :
Print Name :	Lual Oubain	Print Name :	Kyle Wass	Print Name :
Sign Name :		Sign Name :		Sign Name :

Examples of Survey Types:

Tie On	Tie On to Surface Casing (Assumed Vertical), Tie On to existing MWD Survey (prior drilled hole)
MWD	Sperry Sun Drilling Services (SSDS) Measurement While Drilling (MWD) Survey's
ESS	Sperry Sun Drilling Services (SSDS) Electronic Survey System (ESS) Survey's
Gyro	Gyro Survey's ; Provided by third party vendor, or by Sperry Sun Drilling Services (SSDS)
SS	Single Shot (SS) Survey's ; Provided by Sperry Sun Drilling Services (SSDS) or third party vendor.

Design Report for Prosper Farms 4-65 13-14 1H - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
2,218.00	0.28	157.74	2,217.98	-4.11	0.77	-4.11	0.02
Tie-On to Gyro Surveys @ 2218.00 ft							
2,310.00	0.44	158.20	2,309.98	-4.65	0.98	-4.65	0.17
First Sperry MWD Survey @ 2310.00 ft							
2,405.00	1.29	16.85	2,404.97	-3.96	1.43	-3.96	1.74
2,500.00	2.69	8.77	2,499.91	-0.73	2.08	-0.73	1.50
2,594.00	3.00	9.23	2,593.80	3.87	2.81	3.87	0.33
2,688.00	3.22	353.97	2,687.66	8.93	2.93	8.93	0.91
2,783.00	3.36	348.62	2,782.50	14.31	2.10	14.31	0.36
2,877.00	3.47	346.10	2,876.34	19.77	0.87	19.77	0.20
2,972.00	3.34	347.95	2,971.17	25.27	-0.40	25.27	0.18
3,066.00	3.40	347.83	3,065.01	30.67	-1.56	30.67	0.06
3,161.00	3.41	349.89	3,159.84	36.21	-2.65	36.21	0.13
3,255.00	2.65	11.10	3,253.71	41.09	-2.72	41.09	1.43
3,350.00	2.50	14.81	3,348.61	45.25	-1.77	45.25	0.24
3,444.00	2.23	17.96	3,442.53	48.97	-0.68	48.97	0.32
3,539.00	2.35	3.93	3,537.46	52.67	0.02	52.67	0.60
3,634.00	2.28	2.65	3,632.38	56.50	0.24	56.50	0.09
3,728.00	1.93	6.90	3,726.32	59.94	0.52	59.94	0.41
3,822.00	1.92	6.13	3,820.26	63.08	0.88	63.08	0.03
3,917.00	2.01	10.65	3,915.21	66.30	1.36	66.30	0.19
4,011.00	2.43	357.47	4,009.14	69.91	1.57	69.91	0.70
4,106.00	2.19	357.61	4,104.06	73.74	1.41	73.74	0.25
4,200.00	1.81	359.51	4,198.00	77.01	1.32	77.01	0.41
4,294.00	2.46	359.69	4,291.94	80.52	1.30	80.52	0.69
4,389.00	2.23	4.00	4,386.86	84.40	1.41	84.40	0.30
4,484.00	1.62	9.27	4,481.80	87.57	1.76	87.57	0.67
4,578.00	2.49	2.89	4,575.74	90.92	2.08	90.92	0.96
4,673.00	2.51	1.58	4,670.65	95.06	2.24	95.06	0.06
4,767.00	2.59	356.99	4,764.56	99.24	2.18	99.24	0.23
4,862.00	2.24	359.24	4,859.47	103.24	2.05	103.24	0.38
4,956.00	1.88	2.26	4,953.41	106.61	2.08	106.61	0.40
5,051.00	1.36	7.68	5,048.38	109.29	2.30	109.29	0.57
5,145.00	2.03	359.88	5,142.33	112.06	2.44	112.06	0.75
5,240.00	1.26	351.96	5,237.29	114.78	2.29	114.78	0.84
5,334.00	1.66	348.83	5,331.26	117.14	1.88	117.14	0.43
5,428.00	2.25	347.09	5,425.21	120.27	1.21	120.27	0.63
5,523.00	4.00	0.97	5,520.06	125.40	0.85	125.40	1.99
5,617.00	4.94	5.48	5,613.78	132.71	1.29	132.71	1.07
5,712.00	5.26	4.89	5,708.40	141.12	2.05	141.12	0.34
5,806.00	4.23	355.95	5,802.08	148.87	2.17	148.87	1.35
5,901.00	3.45	345.55	5,896.87	155.13	1.21	155.13	1.10
5,995.00	2.14	334.73	5,990.75	159.46	-0.24	159.46	1.50
6,090.00	0.70	283.48	6,085.72	161.20	-1.57	161.20	1.88
6,184.00	0.56	261.81	6,179.72	161.27	-2.58	161.27	0.29
6,279.00	0.53	250.15	6,274.71	161.05	-3.45	161.05	0.12
6,373.00	0.12	75.88	6,368.71	160.93	-3.76	160.93	0.69
6,467.00	0.55	48.32	6,462.71	161.25	-3.33	161.25	0.48
6,562.00	1.00	61.35	6,557.70	161.95	-2.26	161.95	0.51

Design Report for Prosper Farms 4-65 13-14 1H - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
6,656.00	0.51	159.04	6,651.70	161.96	-1.39	161.96	1.26
6,751.00	0.45	62.73	6,746.70	161.73	-0.91	161.73	0.75
6,845.00	1.32	32.74	6,840.68	162.81	0.00	162.81	1.02
6,940.00	0.39	37.72	6,935.67	163.99	0.79	163.99	0.98
7,034.00	0.43	77.82	7,029.67	164.32	1.33	164.32	0.30
7,129.00	0.52	91.49	7,124.67	164.38	2.11	164.38	0.15
7,223.00	0.74	94.72	7,218.66	164.32	3.14	164.32	0.24
7,318.00	0.75	87.70	7,313.65	164.29	4.38	164.29	0.10
7,413.00	0.83	85.83	7,408.64	164.37	5.68	164.37	0.09
7,507.00	0.12	82.41	7,502.64	164.43	6.46	164.43	0.76
7,601.00	0.17	92.26	7,596.64	164.44	6.70	164.44	0.06
7,696.00	0.28	70.05	7,691.64	164.51	7.06	164.51	0.15
7,790.00	0.25	64.28	7,785.64	164.68	7.46	164.68	0.04
7,885.00	0.25	102.60	7,880.64	164.72	7.85	164.72	0.17
7,979.00	0.28	80.29	7,974.64	164.72	8.27	164.72	0.11
8,074.00	0.06	26.06	8,069.64	164.80	8.52	164.80	0.26
8,138.00	0.20	179.64	8,133.64	164.72	8.54	164.72	0.40
Final Sperry MWD Survey @ 8138.00 ft							
8,195.00	0.20	179.64	8,190.64	164.52	8.54	164.52	0.00
Straight Line Projection to TD @ 8195.00 ft							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
2,218.00	2,217.98	-4.11	0.77	Tie-On to Gyro Surveys @ 2218.00 ft
2,310.00	2,309.98	-4.65	0.98	First Sperry MWD Survey @ 2310.00 ft
8,138.00	8,133.64	164.72	8.54	Final Sperry MWD Survey @ 8138.00 ft
8,195.00	8,190.64	164.52	8.54	Straight Line Projection to TD @ 8195.00 ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (usft)	+E/-W (usft)	Start TVD (usft)
Target	Prosper Farms 4-65 13-14 1H_Rev C0_(Pilot)_BHL Tgt	0.00	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
84.00	2,218.00	Surface_Gyro	NS-GYRO-MS
2,310.00	8,138.00	Vertical_Sperry MWD Surveys	MWD
8,195.00	8,195.00	Projection to Bit_BLIND	Blind

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,245.00	2,244.98	9 5/8"	9-5/8	13-1/2

Design Report for Prosper Farms 4-65 13-14 1H - Actual Field Surveys

Wellbore Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Prosper Farms 4-65 13-14 1H	0.00	0.00	0.00	0.01	0.00	1,682,895.52	3,242,064.33	39° 42' 18.730 N	104° 38' 22.760 W
- actual wellpath misses target center by 2217.98usft at 2218.00usft MD (2217.98 TVD, -4.11 N, 0.77 E)									
- Polygon									
Point 1				0.00	2,103.12	4,972.01	1,685,045.61	3,247,016.15	
Point 2				0.00	-3,190.78	4,956.44	1,679,751.85	3,247,050.72	
Point 3				0.00	-3,259.16	10,213.29	1,679,733.25	3,252,307.94	
Point 4				0.00	2,019.81	10,234.53	1,685,012.14	3,252,279.18	
Point 5				0.00	2,103.12	4,972.01	1,685,045.61	3,247,016.15	
Point 6				0.00	2,169.30	-352.36	1,685,061.37	3,241,691.44	
Point 7				0.00	-483.66	-349.30	1,682,408.58	3,241,719.63	
Point 8				0.00	-3,137.71	-345.40	1,679,754.71	3,241,748.66	
Point 9				0.00	-3,190.78	4,956.44	1,679,751.85	3,247,050.72	
Prosper Farms 4-65 13-14 1H	0.00	0.00	0.00	0.01	0.00	1,682,895.52	3,242,064.33	39° 42' 18.730 N	104° 38' 22.760 W
- actual wellpath misses target center by 2217.98usft at 2218.00usft MD (2217.98 TVD, -4.11 N, 0.77 E)									
- Polygon									
Point 1				0.00	-2,799.16	9,753.29	1,680,188.87	3,251,843.60	
Point 2				0.00	1,559.81	9,774.53	1,684,547.81	3,251,823.56	
Point 3				0.00	1,643.12	4,972.01	1,684,585.64	3,247,020.51	
Point 4				0.00	1,709.30	107.64	1,684,605.75	3,242,155.77	
Point 5				0.00	-483.66	110.70	1,682,412.93	3,242,179.60	
Point 6				0.00	-2,677.71	114.60	1,680,219.04	3,242,204.28	
Point 7				0.00	-2,730.78	4,956.44	1,680,211.82	3,247,046.36	
Prosper Farms 4-65 13-14 1H	0.00	0.00	8,150.00	184.75	0.00	1,683,080.25	3,242,062.58	39° 42' 20.556 N	104° 38' 22.760 W
- actual wellpath misses target center by 27.24usft at 8138.00usft MD (8133.64 TVD, 164.72 N, 8.54 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	0.43 °/100usft	Maximum Dogleg over Survey:	1.99 °/100usft at 5,523.00 usft
Net Tortousity applicable to Plans:	0.38 °/100usft	Directional Difficulty Index:	3.842

Audit Info

North Reference Sheet for Sec. 14-T4S-R65W - Prosper Farms 4-65 13-14 1H - Plan C (Pilot)

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

Vertical Depths are relative to KB 24 ft @ 5715.00usft (H&P 280). Northing and Easting are relative to Prosper Farms 4-65 13-14 1H

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

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 105° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:39° 45' 0.000 N°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99999145

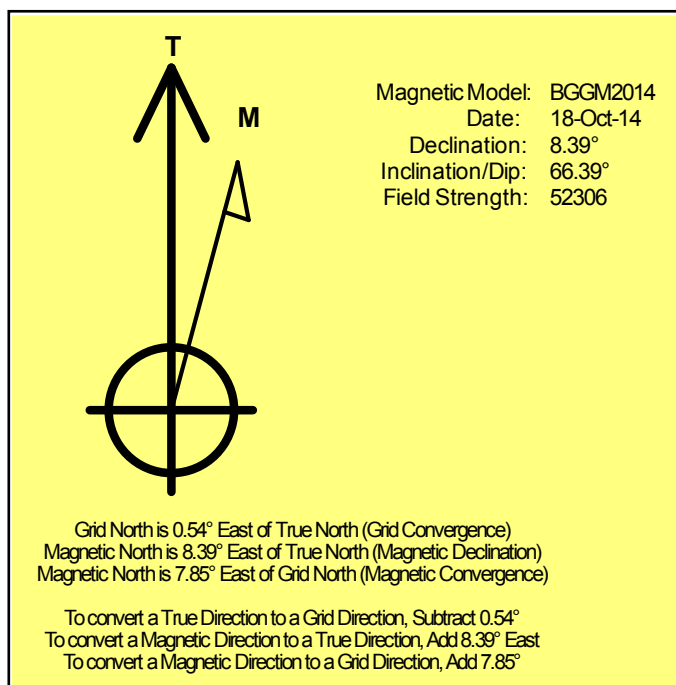
Grid Coordinates of Well: 1,682,895.51 usft N, 3,242,064.33 usft E

Geographical Coordinates of Well: 39° 42' 18.73" N, 104° 38' 22.76" W

Grid Convergence at Surface is: 0.54°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,195.00usft
the Bottom Hole Displacement is 164.74usft in the Direction of 2.97° (True).

Magnetic Convergence at surface is: -7.85° (18 October 2014, , BGGM2014)



Project: Arapahoe County, Colorado
Site: Sec. 14-T4S-R65W
Well: Prosper Farms 4-65 13-14 1H

Conoco Phillips Company

HALLIBURTON
Sperry Drilling

