

Edge Energy LLC

Weld County, Co (NAD 83)

Sec. 10 Twn 4N Rng 63W

70 Ranch-10-11-3 - Slot A3

Hz

UWI:

WL:

Plan: #1

Standard Planning Report

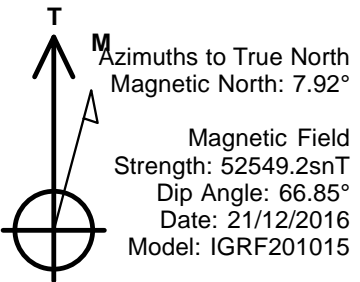
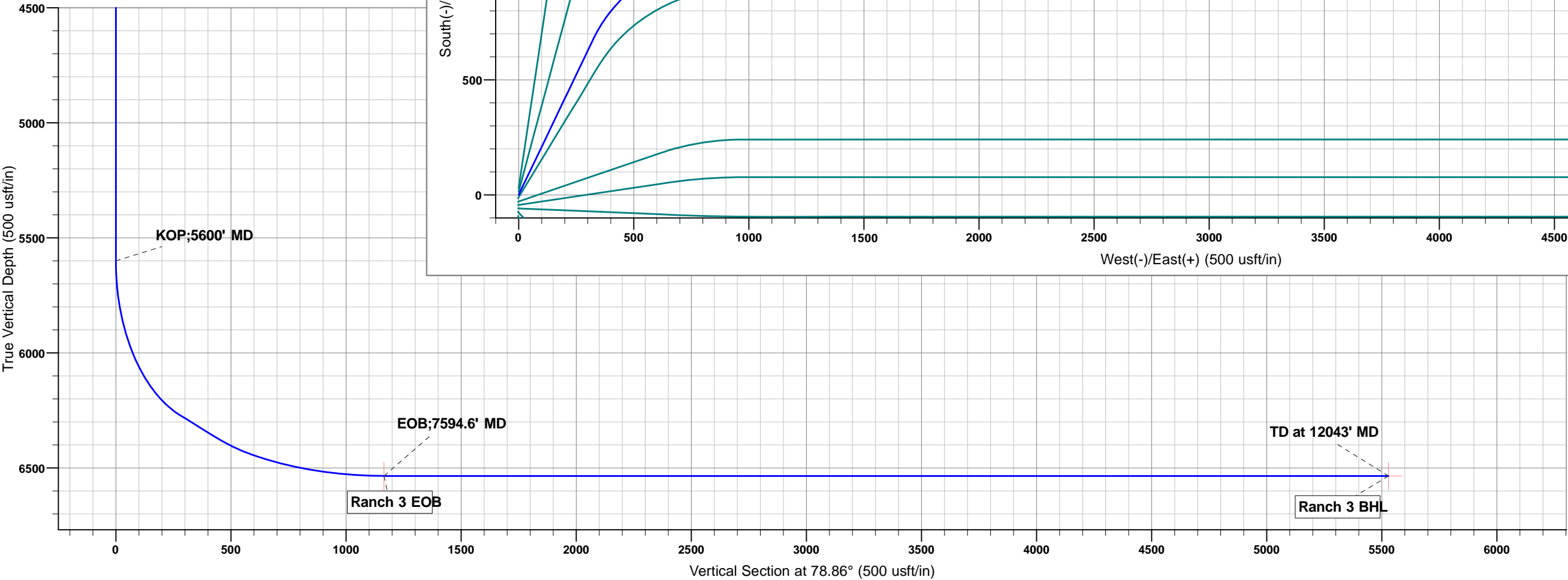
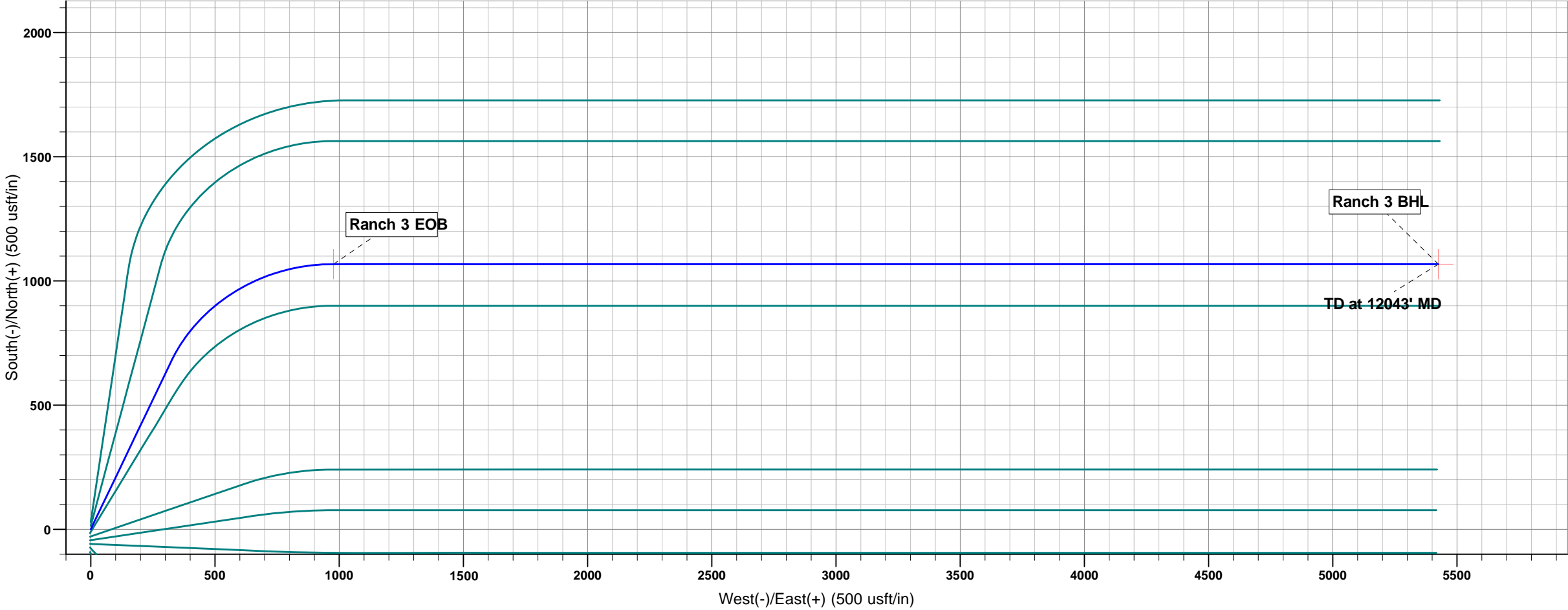
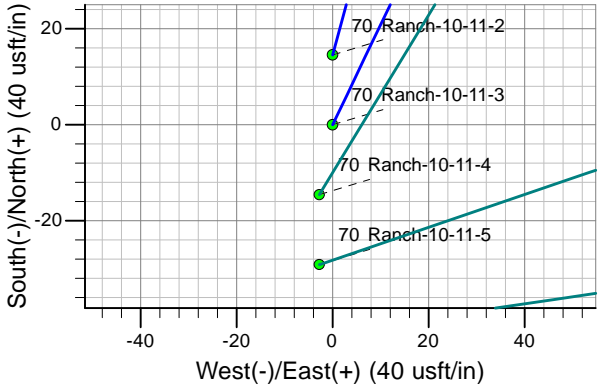
28 December, 2016

Project: Weld County, Co (NAD 83)
Site: Sec. 10 TwN 4N Rng 63W
Well: 70 Ranch-10-11-3
Wellbore: Hz
Plan: #1

Reference Details - WELL CENTRE
Geodetic System: US State Plane 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone
Northing: 1363993.18
Easting: 3301964.08
Latitude: 40° 19' 38.99980 N
Longitude: 104° 25' 0.91200 W
Grid Convergence: 0.70° West
Ground Elevation: 4605.0
KB Elevation: RKB @ 4625.0usft (kb;20')

PLAN DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	5600.0	0.00	0.00	5600.0	0.0	0.0	0.00	0.00	0.0	
3	6472.7	69.82	25.57	6272.2	423.1	202.5	8.00	25.57	280.4	
4	6768.3	69.82	25.57	6374.2	673.4	322.2	0.00	0.00	446.2	
5	7594.6	90.00	90.00	6535.0	1068.0	977.0	8.00	80.63	1164.9	Ranch 3 EOB
6	12043.0	90.00	90.00	6535.0	1068.0	5425.4	0.00	0.00	5529.5	Ranch 3 BHL



Planning Report

Database:	WellPlan Services	Local Co-ordinate Reference:	Well 70 Ranch-10-11-3 - Slot A3
Company:	Edge Energy LLC	TVD Reference:	RKB @ 4625.0usft (kb;20')
Project:	Weld County, Co (NAD 83)	MD Reference:	RKB @ 4625.0usft (kb;20')
Site:	Sec. 10 Twn 4N Rng 63W	North Reference:	True
Well:	70 Ranch-10-11-3	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	#1		

Project	Weld County, Co (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		Sec. 10 Twn 4N Rng 63W			
Site Position:		Northing:	1,364,022.34 usft	Latitude:	40° 19' 39.28800 N
From:	Lat/Long	Easting:	3,301,963.73 usft	Longitude:	104° 25' 0.91200 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.70 °

Well	70 Ranch-10-11-3 - Slot A3					
Well Position	+N/-S	-29.2 usft	Northing:	1,363,993.18 usft	Latitude:	40° 19' 38.99980 N
	+E/-W	0.0 usft	Easting:	3,301,964.08 usft	Longitude:	104° 25' 0.91200 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	4,605.0 usft

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF201015	21/12/2016	7.92	66.85	52,549

Design	#1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	78.86

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.00	0.00	0.00	0.00	
6,472.7	69.82	25.57	6,272.2	423.1	202.5	8.00	8.00	0.00	25.57	
6,768.3	69.82	25.57	6,374.2	673.4	322.2	0.00	0.00	0.00	0.00	
7,594.6	90.00	90.00	6,535.0	1,068.0	977.0	8.00	2.44	7.80	80.63	Ranch 3 EOB
12,043.0	90.00	90.00	6,535.0	1,068.0	5,425.4	0.00	0.00	0.00	0.00	Ranch 3 BHL

Planning Report

Database:	WellPlan Services	Local Co-ordinate Reference:	Well 70 Ranch-10-11-3 - Slot A3
Company:	Edge Energy LLC	TVD Reference:	RKB @ 4625.0usft (kb;20')
Project:	Weld County, Co (NAD 83)	MD Reference:	RKB @ 4625.0usft (kb;20')
Site:	Sec. 10 Twn 4N Rng 63W	North Reference:	True
Well:	70 Ranch-10-11-3	Survey Calculation Method:	Minimum Curvature
Wellbore:	H2		
Design:	#1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	-4,625.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP;5600' MD										
5,600.0	0.00	0.00	5,600.0	975.0	0.0	0.0	0.0	0.00	0.00	0.00
5,700.0	8.00	25.57	5,699.7	1,074.7	6.3	3.0	4.2	8.00	8.00	0.00
5,800.0	16.00	25.57	5,797.4	1,172.4	25.0	12.0	16.6	8.00	8.00	0.00
5,900.0	24.00	25.57	5,891.3	1,266.3	55.9	26.7	37.0	8.00	8.00	0.00
6,000.0	32.00	25.57	5,979.5	1,354.5	98.2	47.0	65.0	8.00	8.00	0.00
6,100.0	40.00	25.57	6,060.4	1,435.4	151.1	72.3	100.1	8.00	8.00	0.00
6,200.0	48.00	25.57	6,132.2	1,507.2	213.8	102.3	141.6	8.00	8.00	0.00
6,300.0	56.00	25.57	6,193.8	1,568.8	284.8	136.3	188.7	8.00	8.00	0.00
6,400.0	64.00	25.57	6,243.7	1,618.7	362.8	173.6	240.4	8.00	8.00	0.00
6,472.7	69.82	25.57	6,272.2	1,647.2	423.1	202.5	280.4	8.00	8.00	0.00
6,500.0	69.82	25.57	6,281.6	1,656.6	446.3	213.5	295.7	0.00	0.00	0.00
6,600.0	69.82	25.57	6,316.1	1,691.1	530.9	254.0	351.8	0.00	0.00	0.00
6,700.0	69.82	25.57	6,350.6	1,725.6	615.6	294.5	407.9	0.00	0.00	0.00
6,768.3	69.82	25.57	6,374.2	1,749.2	673.4	322.2	446.2	0.00	0.00	0.00
6,800.0	70.25	28.23	6,385.0	1,760.0	700.0	335.7	464.6	8.00	1.37	8.39
6,900.0	71.86	36.51	6,417.5	1,792.5	779.8	386.3	529.6	8.00	1.62	8.28
7,000.0	73.83	44.63	6,447.1	1,822.1	852.3	448.4	604.6	8.00	1.96	8.12
7,100.0	76.09	52.58	6,473.1	1,848.1	916.0	520.8	687.9	8.00	2.26	7.95
7,200.0	78.61	60.36	6,495.0	1,870.0	969.8	602.1	778.1	8.00	2.52	7.78
7,300.0	81.32	68.00	6,512.5	1,887.5	1,012.7	690.6	873.2	8.00	2.72	7.64
7,400.0	84.19	75.53	6,525.1	1,900.1	1,043.7	784.8	971.6	8.00	2.87	7.53
7,500.0	87.15	82.99	6,532.6	1,907.6	1,062.2	882.7	1,071.2	8.00	2.96	7.45
EOB;7594.6' MD										
7,594.6	90.00	90.00	6,535.0	1,910.0	1,068.0	977.0	1,164.9	8.00	3.01	7.41
7,600.0	90.00	90.00	6,535.0	1,910.0	1,068.0	982.4	1,170.2	0.00	0.00	0.00
7,700.0	90.00	90.00	6,535.0	1,910.0	1,068.0	1,082.4	1,268.3	0.00	0.00	0.00
7,800.0	90.00	90.00	6,535.0	1,910.0	1,068.0	1,182.4	1,366.4	0.00	0.00	0.00
7,900.0	90.00	90.00	6,535.0	1,910.0	1,068.0	1,282.4	1,464.5	0.00	0.00	0.00
8,000.0	90.00	90.00	6,535.0	1,910.0	1,068.0	1,382.4	1,562.7	0.00	0.00	0.00
8,100.0	90.00	90.00	6,535.0	1,910.0	1,068.0	1,482.4	1,660.8	0.00	0.00	0.00
8,200.0	90.00	90.00	6,535.0	1,910.0	1,068.0	1,582.4	1,758.9	0.00	0.00	0.00
8,300.0	90.00	90.00	6,535.0	1,910.0	1,068.0	1,682.4	1,857.0	0.00	0.00	0.00
8,400.0	90.00	90.00	6,535.0	1,910.0	1,068.0	1,782.4	1,955.1	0.00	0.00	0.00
8,500.0	90.00	90.00	6,535.0	1,910.0	1,068.0	1,882.4	2,053.2	0.00	0.00	0.00
8,600.0	90.00	90.00	6,535.0	1,910.0	1,068.0	1,982.4	2,151.4	0.00	0.00	0.00
8,700.0	90.00	90.00	6,535.0	1,910.0	1,068.0	2,082.4	2,249.5	0.00	0.00	0.00
8,800.0	90.00	90.00	6,535.0	1,910.0	1,068.0	2,182.4	2,347.6	0.00	0.00	0.00
8,900.0	90.00	90.00	6,535.0	1,910.0	1,068.0	2,282.4	2,445.7	0.00	0.00	0.00
9,000.0	90.00	90.00	6,535.0	1,910.0	1,068.0	2,382.4	2,543.8	0.00	0.00	0.00
9,100.0	90.00	90.00	6,535.0	1,910.0	1,068.0	2,482.4	2,641.9	0.00	0.00	0.00
9,200.0	90.00	90.00	6,535.0	1,910.0	1,068.0	2,582.4	2,740.1	0.00	0.00	0.00
9,300.0	90.00	90.00	6,535.0	1,910.0	1,068.0	2,682.4	2,838.2	0.00	0.00	0.00
9,400.0	90.00	90.00	6,535.0	1,910.0	1,068.0	2,782.4	2,936.3	0.00	0.00	0.00
9,500.0	90.00	90.00	6,535.0	1,910.0	1,068.0	2,882.4	3,034.4	0.00	0.00	0.00

Planning Report

Database:	WellPlan Services	Local Co-ordinate Reference:	Well 70 Ranch-10-11-3 - Slot A3
Company:	Edge Energy LLC	TVD Reference:	RKB @ 4625.0usft (kb;20')
Project:	Weld County, Co (NAD 83)	MD Reference:	RKB @ 4625.0usft (kb;20')
Site:	Sec. 10 Twn 4N Rng 63W	North Reference:	True
Well:	70 Ranch-10-11-3	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	#1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,600.0	90.00	90.00	6,535.0	1,910.0	1,068.0	2,982.4	3,132.5	0.00	0.00	0.00
9,700.0	90.00	90.00	6,535.0	1,910.0	1,068.0	3,082.4	3,230.6	0.00	0.00	0.00
9,800.0	90.00	90.00	6,535.0	1,910.0	1,068.0	3,182.4	3,328.8	0.00	0.00	0.00
9,900.0	90.00	90.00	6,535.0	1,910.0	1,068.0	3,282.4	3,426.9	0.00	0.00	0.00
10,000.0	90.00	90.00	6,535.0	1,910.0	1,068.0	3,382.4	3,525.0	0.00	0.00	0.00
10,100.0	90.00	90.00	6,535.0	1,910.0	1,068.0	3,482.4	3,623.1	0.00	0.00	0.00
10,200.0	90.00	90.00	6,535.0	1,910.0	1,068.0	3,582.4	3,721.2	0.00	0.00	0.00
10,300.0	90.00	90.00	6,535.0	1,910.0	1,068.0	3,682.4	3,819.3	0.00	0.00	0.00
10,400.0	90.00	90.00	6,535.0	1,910.0	1,068.0	3,782.4	3,917.5	0.00	0.00	0.00
10,500.0	90.00	90.00	6,535.0	1,910.0	1,068.0	3,882.4	4,015.6	0.00	0.00	0.00
10,600.0	90.00	90.00	6,535.0	1,910.0	1,068.0	3,982.4	4,113.7	0.00	0.00	0.00
10,700.0	90.00	90.00	6,535.0	1,910.0	1,068.0	4,082.4	4,211.8	0.00	0.00	0.00
10,800.0	90.00	90.00	6,535.0	1,910.0	1,068.0	4,182.4	4,309.9	0.00	0.00	0.00
10,900.0	90.00	90.00	6,535.0	1,910.0	1,068.0	4,282.4	4,408.1	0.00	0.00	0.00
11,000.0	90.00	90.00	6,535.0	1,910.0	1,068.0	4,382.4	4,506.2	0.00	0.00	0.00
11,100.0	90.00	90.00	6,535.0	1,910.0	1,068.0	4,482.4	4,604.3	0.00	0.00	0.00
11,200.0	90.00	90.00	6,535.0	1,910.0	1,068.0	4,582.4	4,702.4	0.00	0.00	0.00
11,300.0	90.00	90.00	6,535.0	1,910.0	1,068.0	4,682.4	4,800.5	0.00	0.00	0.00
11,400.0	90.00	90.00	6,535.0	1,910.0	1,068.0	4,782.4	4,898.6	0.00	0.00	0.00
11,500.0	90.00	90.00	6,535.0	1,910.0	1,068.0	4,882.4	4,996.8	0.00	0.00	0.00
11,600.0	90.00	90.00	6,535.0	1,910.0	1,068.0	4,982.4	5,094.9	0.00	0.00	0.00
11,700.0	90.00	90.00	6,535.0	1,910.0	1,068.0	5,082.4	5,193.0	0.00	0.00	0.00
11,800.0	90.00	90.00	6,535.0	1,910.0	1,068.0	5,182.4	5,291.1	0.00	0.00	0.00
11,900.0	90.00	90.00	6,535.0	1,910.0	1,068.0	5,282.4	5,389.2	0.00	0.00	0.00
12,000.0	90.00	90.00	6,535.0	1,910.0	1,068.0	5,382.4	5,487.3	0.00	0.00	0.00
TD at 12043' MD										
12,043.0	90.00	90.00	6,535.0	1,910.0	1,068.0	5,425.4	5,529.5	0.00	0.00	0.00

Design 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		
Ranch 3 EOB - plan hits target center - Point	0.00	0.00	6,535.0	1,068.0	977.0	1,365,073.02	3,302,927.97	40° 19' 49.55365 N	104° 24' 48.29633 W	
Ranch 3 BHL - plan hits target center - Point	0.00	0.00	6,535.0	1,068.0	5,425.4	1,365,127.35	3,307,376.01	40° 19' 49.54796 N	104° 23' 50.85600 W	

Planning Report

Database:	WellPlan Services	Local Co-ordinate Reference:	Well 70 Ranch-10-11-3 - Slot A3
Company:	Edge Energy LLC	TVD Reference:	RKB @ 4625.0usft (kb;20')
Project:	Weld County, Co (NAD 83)	MD Reference:	RKB @ 4625.0usft (kb;20')
Site:	Sec. 10 Twn 4N Rng 63W	North Reference:	True
Well:	70 Ranch-10-11-3	Survey Calculation Method:	Minimum Curvature
Wellbore:	Hz		
Design:	#1		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,600.0	5,600.0	0.0	0.0	KOP;5600' MD
7,594.6	6,535.0	1,068.0	977.0	EOB;7594.6' MD
12,043.0	6,535.0	1,068.0	5,425.4	TD at 12043' MD

Anticollision Report

Company:	Edge Energy LLC	Local Co-ordinate Reference:	Well 70 Ranch-10-11-3 - Slot A3
Project:	Weld County, Co (NAD 83)	TVD Reference:	RKB @ 4625.0usft (kb;20')
Reference Site:	Sec. 10 Twn 4N Rng 63W	MD Reference:	RKB @ 4625.0usft (kb;20')
Site Error:	0.0 usft	North Reference:	True
Reference Well:	70 Ranch-10-11-3	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Hz	Database:	WellPlan Services
Reference Design:	#1	Offset TVD Reference:	Offset Datum

Reference	#1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 50.0usft	Error Model:	ISCWSA
Depth Range:	5,000.0 to 99,999.0usft	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 50.0 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	28/12/2016		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	12,043.0	#1 (Hz)	MWD	MWD - Standard	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec. 10 Twn 4N Rng 63W						
70 Ranch-10-11-1 - Hz - #1	5,000.0	4,999.0	29.1	6.9	1.313	Level 3, CC, ES, SF
70 Ranch-10-11-10 - Hz - #1						Out of range
70 Ranch-10-11-11 - Hz - #1						Out of range
70 Ranch-10-11-12 - Hz - #1						Out of range
70 Ranch-10-11-2 - Hz - #1	5,200.0	5,200.0	14.6	-8.5	0.631	Level 1, CC, ES, SF
70 Ranch-10-11-4 - Hz - #1	5,590.4	5,591.3	5.2	-19.7	0.209	Level 1, CC, ES, SF
70 Ranch-10-11-5 - Hz - #1	5,622.8	5,623.8	27.8	2.8	1.112	Level 2, CC, ES, SF
70 Ranch-10-11-6 - Hz - #1	5,522.3	5,522.7	42.8	18.3	1.746	CC, ES, SF
70 Ranch-10-11-7 - Hz - #1						Out of range
70 Ranch-10-11-8 - Hz - #1						Out of range
70 Ranch-10-11-9 - Hz - #1						Out of range

Offset Design		Sec. 10 Twn 4N Rng 63W - 70 Ranch-10-11-1 - Hz - #1											Offset Site Error:		0.0 usft
Survey Program:		0-MWD											Offset Well Error:		0.0 usft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
5,000.0	5,000.0	4,999.0	4,999.0	11.1	11.1	0.00	29.1	0.0	29.1	6.9	22.20	1.313	Level 3, CC, ES, SF		
5,022.9	5,022.9	5,021.2	5,021.2	11.2	11.2	0.07	29.4	0.0	29.4	7.1	22.31	1.318	Level 3		
5,050.0	5,050.0	5,047.4	5,047.4	11.2	11.2	0.35	30.4	0.2	30.5	8.0	22.43	1.358	Level 3		
5,100.0	5,100.0	5,095.5	5,095.3	11.3	11.3	1.27	34.3	0.8	34.5	11.8	22.65	1.522			
5,150.0	5,150.0	5,143.0	5,142.4	11.4	11.4	2.41	40.6	1.7	41.2	18.3	22.87	1.800			

Anticollision Report

Company:	Edge Energy LLC	Local Co-ordinate Reference:	Well 70 Ranch-10-11-3 - Slot A3
Project:	Weld County, Co (NAD 83)	TVD Reference:	RKB @ 4625.0usft (kb;20')
Reference Site:	Sec. 10 Twn 4N Rng 63W	MD Reference:	RKB @ 4625.0usft (kb;20')
Site Error:	0.0 usft	North Reference:	True
Reference Well:	70 Ranch-10-11-3	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Hz	Database:	WellPlan Services
Reference Design:	#1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 10 Twn 4N Rng 63W - 70 Ranch-10-11-2 - Hz - #1												Offset Site Error:	0.0 usft
Survey Program: 0-MWD												Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
5,000.0	5,000.0	5,000.0	5,000.0	11.1	11.1	0.00	14.6	0.0	14.6	-7.6	22.21	0.656	Level 1
5,050.0	5,050.0	5,050.0	5,050.0	11.2	11.2	0.00	14.6	0.0	14.6	-7.9	22.43	0.650	Level 1
5,100.0	5,100.0	5,100.0	5,100.0	11.3	11.3	0.00	14.6	0.0	14.6	-8.1	22.66	0.643	Level 1
5,150.0	5,150.0	5,150.0	5,150.0	11.4	11.4	0.00	14.6	0.0	14.6	-8.3	22.88	0.637	Level 1
5,183.3	5,183.3	5,183.3	5,183.3	11.5	11.5	0.00	14.6	0.0	14.6	-8.5	23.03	0.633	Level 1
5,200.0	5,200.0	5,200.0	5,200.0	11.6	11.6	0.00	14.6	0.0	14.6	-8.5	23.11	0.631	Level 1, CC, ES, SF
5,250.0	5,250.0	5,249.0	5,248.9	11.7	11.7	1.53	16.2	0.4	16.2	-7.1	23.33	0.696	Level 1
5,300.0	5,300.0	5,297.5	5,297.2	11.8	11.8	4.68	21.0	1.7	21.2	-2.3	23.55	0.902	Level 1
5,350.0	5,350.0	5,345.1	5,344.1	11.9	11.9	7.53	28.7	3.8	29.6	5.8	23.77	1.244	Level 2
5,400.0	5,400.0	5,391.5	5,389.2	12.0	12.0	9.56	39.1	6.6	41.1	17.2	23.99	1.715	

Anticollision Report

Company:	Edge Energy LLC	Local Co-ordinate Reference:	Well 70 Ranch-10-11-3 - Slot A3
Project:	Weld County, Co (NAD 83)	TVD Reference:	RKB @ 4625.0usft (kb;20')
Reference Site:	Sec. 10 Twn 4N Rng 63W	MD Reference:	RKB @ 4625.0usft (kb;20')
Site Error:	0.0 usft	North Reference:	True
Reference Well:	70 Ranch-10-11-3	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Hz	Database:	WellPlan Services
Reference Design:	#1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 10 Twn 4N Rng 63W - 70 Ranch-10-11-4 - Hz - #1												Offset Site Error:	0.0 usft
Survey Program: 0-MWD												Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,000.0	5,000.0	5,000.0	5,000.0	11.1	11.1	-169.17	-14.6	-2.8	14.8	-7.4	22.21	0.668	Level 1
5,050.0	5,050.0	5,050.0	5,050.0	11.2	11.2	-169.17	-14.6	-2.8	14.8	-7.6	22.43	0.661	Level 1
5,100.0	5,100.0	5,100.0	5,100.0	11.3	11.3	-169.17	-14.6	-2.8	14.8	-7.8	22.66	0.655	Level 1
5,150.0	5,150.0	5,150.0	5,150.0	11.4	11.4	-169.17	-14.6	-2.8	14.8	-8.0	22.88	0.648	Level 1
5,200.0	5,200.0	5,200.0	5,200.0	11.6	11.6	-169.17	-14.6	-2.8	14.8	-8.3	23.11	0.642	Level 1
5,250.0	5,250.0	5,250.0	5,250.0	11.7	11.7	-169.17	-14.6	-2.8	14.8	-8.5	23.33	0.636	Level 1
5,300.0	5,300.0	5,300.0	5,300.0	11.8	11.8	-169.17	-14.6	-2.8	14.8	-8.7	23.56	0.630	Level 1
5,350.0	5,350.0	5,350.0	5,350.0	11.9	11.9	-169.17	-14.6	-2.8	14.8	-8.9	23.78	0.624	Level 1
5,400.0	5,400.0	5,400.0	5,400.0	12.0	12.0	-169.17	-14.6	-2.8	14.8	-9.2	24.01	0.618	Level 1
5,450.0	5,450.0	5,450.0	5,450.0	12.1	12.1	-169.17	-14.6	-2.8	14.8	-9.4	24.23	0.612	Level 1
5,500.0	5,500.0	5,500.9	5,500.9	12.2	12.2	-171.92	-13.0	-1.8	13.2	-11.3	24.46	0.539	Level 1
5,550.0	5,550.0	5,551.3	5,551.0	12.3	12.3	173.74	-8.5	0.9	8.6	-16.1	24.68	0.347	Level 1
5,590.4	5,590.4	5,591.3	5,590.4	12.4	12.4	121.30	-2.7	4.4	5.2	-19.7	24.85	0.209	Level 1, CC, ES, SF
5,600.0	5,600.0	5,600.7	5,599.6	12.5	12.5	101.17	-1.1	5.4	5.5	-19.4	24.90	0.223	Level 1
5,650.0	5,650.0	5,649.1	5,646.6	12.6	12.6	29.59	8.9	11.5	13.5	-11.6	25.08	0.537	Level 1
5,700.0	5,699.7	5,696.9	5,692.0	12.7	12.7	20.40	21.4	19.1	23.4	-1.8	25.15	0.930	Level 1
5,750.0	5,748.9	5,744.0	5,735.8	12.8	12.8	17.26	36.3	28.1	33.5	8.3	25.12	1.332	Level 3
5,800.0	5,797.4	5,790.6	5,777.9	12.9	12.9	15.98	53.3	38.5	43.4	18.4	25.00	1.737	

Anticollision Report

Company:	Edge Energy LLC	Local Co-ordinate Reference:	Well 70 Ranch-10-11-3 - Slot A3
Project:	Weld County, Co (NAD 83)	TVD Reference:	RKB @ 4625.0usft (kb;20')
Reference Site:	Sec. 10 Twn 4N Rng 63W	MD Reference:	RKB @ 4625.0usft (kb;20')
Site Error:	0.0 usft	North Reference:	True
Reference Well:	70 Ranch-10-11-3	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	WellPlan Services
Reference Design:	#1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 10 Twn 4N Rng 63W - 70 Ranch-10-11-5 - HZ - #1													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
5,000.0	5,000.0	5,000.0	5,000.0	11.1	11.1	-174.53	-29.1	-2.8	29.3	7.1	22.21	1.318	Level 3	
5,050.0	5,050.0	5,050.0	5,050.0	11.2	11.2	-174.53	-29.1	-2.8	29.3	6.8	22.43	1.305	Level 3	
5,100.0	5,100.0	5,100.0	5,100.0	11.3	11.3	-174.53	-29.1	-2.8	29.3	6.6	22.66	1.292	Level 3	
5,150.0	5,150.0	5,150.0	5,150.0	11.4	11.4	-174.53	-29.1	-2.8	29.3	6.4	22.88	1.279	Level 3	
5,200.0	5,200.0	5,200.0	5,200.0	11.6	11.6	-174.53	-29.1	-2.8	29.3	6.2	23.11	1.267	Level 3	
5,250.0	5,250.0	5,250.0	5,250.0	11.7	11.7	-174.53	-29.1	-2.8	29.3	5.9	23.33	1.255	Level 3	
5,300.0	5,300.0	5,300.0	5,300.0	11.8	11.8	-174.53	-29.1	-2.8	29.3	5.7	23.56	1.243	Level 2	
5,350.0	5,350.0	5,350.0	5,350.0	11.9	11.9	-174.53	-29.1	-2.8	29.3	5.5	23.78	1.231	Level 2	
5,400.0	5,400.0	5,400.0	5,400.0	12.0	12.0	-174.53	-29.1	-2.8	29.3	5.3	24.01	1.219	Level 2	
5,450.0	5,450.0	5,450.0	5,450.0	12.1	12.1	-174.53	-29.1	-2.8	29.3	5.0	24.23	1.208	Level 2	
5,500.0	5,500.0	5,500.0	5,500.0	12.2	12.2	-174.53	-29.1	-2.8	29.3	4.8	24.45	1.197	Level 2	
5,550.0	5,550.0	5,550.3	5,550.3	12.3	12.3	-175.19	-29.0	-2.4	29.1	4.4	24.68	1.180	Level 2	
5,600.0	5,600.0	5,600.9	5,600.8	12.5	12.4	179.39	-28.1	0.3	28.1	3.2	24.89	1.129	Level 2	
5,622.8	5,622.8	5,623.8	5,623.5	12.5	12.5	149.73	-27.4	2.4	27.8	2.8	24.99	1.112	Level 2, CC, ES, SF	
5,650.0	5,650.0	5,651.0	5,650.6	12.6	12.6	144.29	-26.2	5.7	28.3	3.2	25.08	1.127	Level 2	
5,700.0	5,699.7	5,700.7	5,699.6	12.7	12.7	134.34	-23.5	13.7	31.7	6.4	25.23	1.254	Level 3	
5,750.0	5,748.9	5,750.0	5,747.6	12.8	12.8	126.30	-19.9	24.2	38.3	12.9	25.39	1.507		
5,800.0	5,797.4	5,798.4	5,794.0	12.9	12.9	120.77	-15.5	37.0	47.8	22.2	25.57	1.869		

Anticollision Report

Company:	Edge Energy LLC	Local Co-ordinate Reference:	Well 70 Ranch-10-11-3 - Slot A3
Project:	Weld County, Co (NAD 83)	TVD Reference:	RKB @ 4625.0usft (kb;20')
Reference Site:	Sec. 10 Twn 4N Rng 63W	MD Reference:	RKB @ 4625.0usft (kb;20')
Site Error:	0.0 usft	North Reference:	True
Reference Well:	70 Ranch-10-11-3	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Hz	Database:	WellPlan Services
Reference Design:	#1	Offset TVD Reference:	Offset Datum

Offset Design Sec. 10 Twn 4N Rng 63W - 70 Ranch-10-11-6 - Hz - #1												Offset Site Error:	0.0 usft
Survey Program: 0-MWD												Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
5,000.0	5,000.0	5,000.0	5,000.0	11.1	11.1	-176.35	-43.7	-2.8	43.8	21.6	22.21	1.972	
5,050.0	5,050.0	5,050.0	5,050.0	11.2	11.2	-176.35	-43.7	-2.8	43.8	21.4	22.43	1.953	
5,100.0	5,100.0	5,100.0	5,100.0	11.3	11.3	-176.35	-43.7	-2.8	43.8	21.1	22.66	1.933	
5,150.0	5,150.0	5,150.0	5,150.0	11.4	11.4	-176.35	-43.7	-2.8	43.8	20.9	22.88	1.914	
5,200.0	5,200.0	5,200.0	5,200.0	11.6	11.6	-176.35	-43.7	-2.8	43.8	20.7	23.11	1.896	
5,250.0	5,250.0	5,250.0	5,250.0	11.7	11.7	-176.35	-43.7	-2.8	43.8	20.5	23.33	1.877	
5,300.0	5,300.0	5,300.0	5,300.0	11.8	11.8	-176.35	-43.7	-2.8	43.8	20.2	23.56	1.859	
5,350.0	5,350.0	5,350.0	5,350.0	11.9	11.9	-176.35	-43.7	-2.8	43.8	20.0	23.78	1.842	
5,400.0	5,400.0	5,400.1	5,400.1	12.0	12.0	-176.42	-43.7	-2.7	43.8	19.8	24.00	1.824	
5,450.0	5,450.0	5,450.5	5,450.5	12.1	12.1	-178.82	-43.4	-0.9	43.4	19.2	24.22	1.794	
5,500.0	5,500.0	5,500.6	5,500.3	12.2	12.2	175.27	-42.8	3.5	42.9	18.5	24.43	1.756	
5,522.3	5,522.3	5,522.7	5,522.3	12.3	12.3	171.52	-42.4	6.3	42.8	18.3	24.53	1.746 CC, ES, SF	
5,550.0	5,550.0	5,550.0	5,549.3	12.3	12.3	165.96	-41.7	10.4	43.0	18.4	24.65	1.746	
5,600.0	5,600.0	5,598.7	5,597.0	12.5	12.4	154.02	-40.4	19.7	45.0	20.1	24.86	1.810	

Anticollision Report

Company:	Edge Energy LLC	Local Co-ordinate Reference:	Well 70 Ranch-10-11-3 - Slot A3
Project:	Weld County, Co (NAD 83)	TVD Reference:	RKB @ 4625.0usft (kb;20')
Reference Site:	Sec. 10 Twn 4N Rng 63W	MD Reference:	RKB @ 4625.0usft (kb;20')
Site Error:	0.0 usft	North Reference:	True
Reference Well:	70 Ranch-10-11-3	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Hz	Database:	WellPlan Services
Reference Design:	#1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to RKB @ 4625.0usft (kb;20')
 Offset Depths are relative to Offset Datum
 Central Meridian is 105° 30' 0.00000 W

Coordinates are relative to: 70 Ranch-10-11-3 - Slot A3
 Coordinate System is US State Plane 1983, Colorado Northern Zone
 Grid Convergence at Surface is: 0.70°

