

EXTRACTION OIL & GAS

Broomfield County

Sec 9-T1S-R68W

UNITED B S16-20-11N

OWB

Design: FINAL SURVEY

Standard Survey Report

12 January, 2022



Project: Broomfield County
Site: Sec 9-T1S-R68W
Well: UNITED B S16-20-11N
Wellbore: OWB
Design: FINAL SURVEY

PROJECT DETAILS: Broomfield County
 Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Colorado Northern Zone
 System Datum: Mean Sea Level



Azimuths to True North
 Magnetic North: 7.97°
 Magnetic Field
 Strength: 51745.8snT
 Dip Angle: 66.30°
 Date: 2/4/2021
 Model: IGRF2020

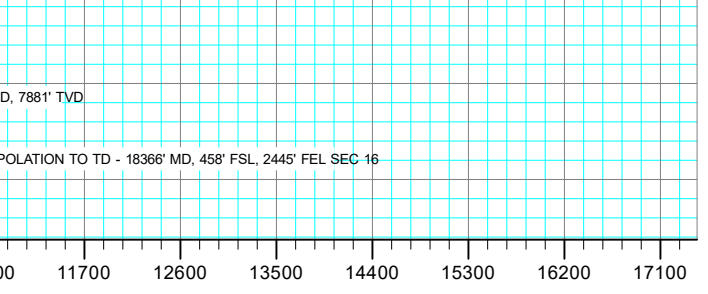
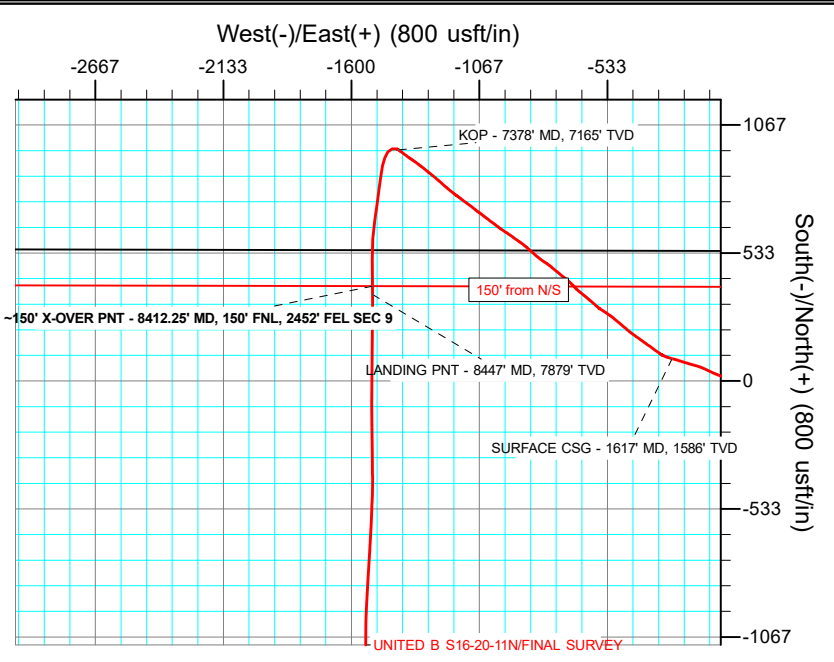
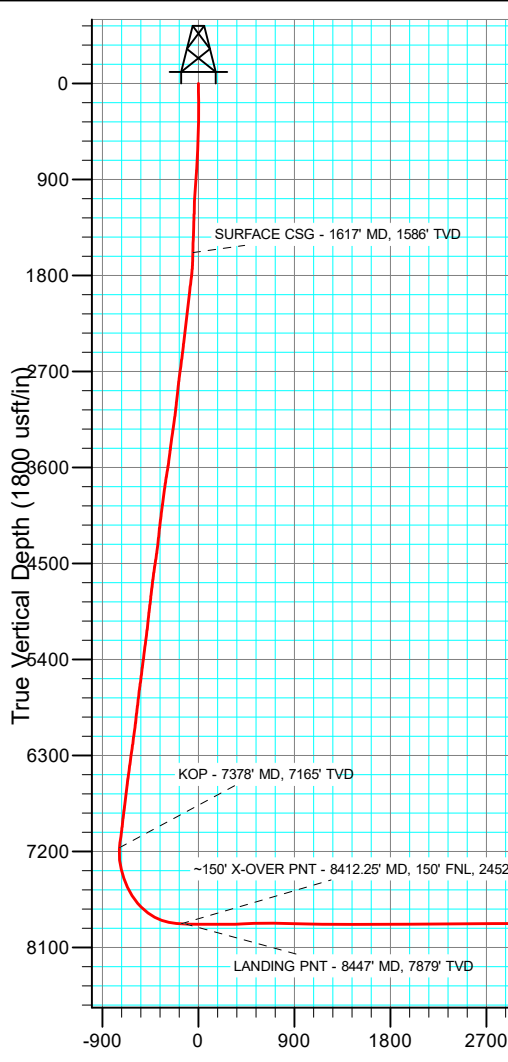
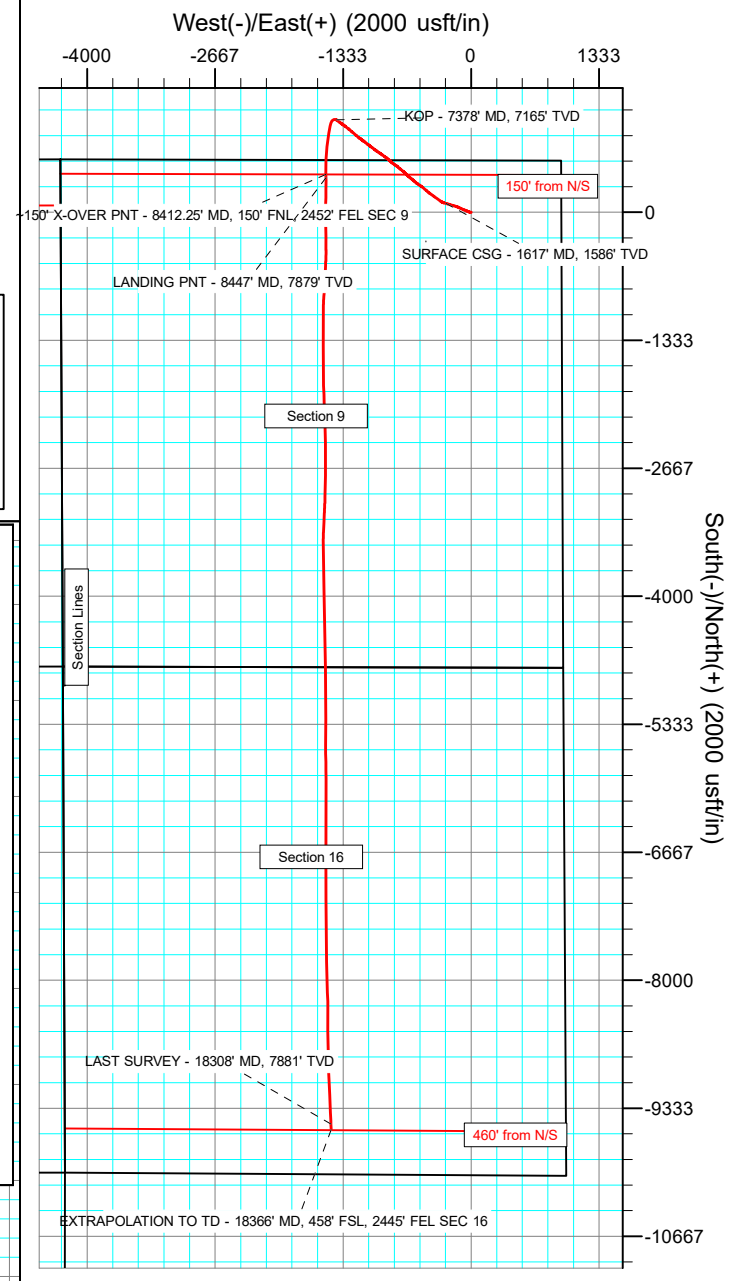
WELL DETAILS: UNITED B S16-20-11N

		5254.00					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot	
0.00	0.00	1237845.65	3139947.32	39.985189°N	105.000568°W		

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation
1617.00	13.15	285.57	1586.33	93.19	-263.85	-52.34	282.43	SURFACE CSG - 1617' MD, 1586' TVD
7378.00	14.19	299.94	7164.89	962.55	-1402.71	-740.03	1719.31	KOP - 7378' MD, 7165' TVD
8412.25	88.08	179.63	7878.28	394.91	-1512.23	-162.37	2339.33	~150' X-OVER PNT - 8412.25' MD, 150' FNL, 2452' FEL SEC 9
8447.00	88.30	179.51	7879.38	360.18	-1511.97	-128.07	2374.07	LANDING PNT - 8447' MD, 7879' TVD
18308.00	88.45	177.43	7880.83	-9496.94	-1460.05	9608.51	12234.06	LAST SURVEY - 18308' MD, 7881' TVD
18366.00	88.45	177.43	7882.39	-9554.86	-1457.45	9665.38	12292.04	EXTRAPOLATION TO TD - 18366' MD, 458' FSL, 2445' FEL SEC 16

SHL:
 542' FNL, 939' FEL
 Sec 9-T1S-R68W
150' SETBACK X-OVER:
 150' FNL, 2452' FEL
 Sec 9-T1S-R68W
BHL:
 458' FSL, 2445' FEL
 Sec 16-T1S-R68W



Survey Report

Company: EXTRACTION OIL & GAS	Local Co-ordinate Reference: Well UNITED B S16-20-11N
Project: Broomfield County	TVD Reference: KB 28' @ 5282.00usft
Site: Sec 9-T1S-R68W	MD Reference: KB 28' @ 5282.00usft
Well: UNITED B S16-20-11N	North Reference: True
Wellbore: OWB	Survey Calculation Method: Minimum Curvature
Design: FINAL SURVEY	Database: EDT_32Bit_ODBC

Project Broomfield County	
Map System: US State Plane 1983	System Datum: Mean Sea Level
Geo Datum: North American Datum 1983	
Map Zone: Colorado Northern Zone	

Site Sec 9-T1S-R68W		
Site Position:	Northing: 1,238,372.37 usft	Latitude: 39.986700°N
From: Lat/Long	Easting: 3,135,664.83 usft	Longitude: 105.015841°W
Position Uncertainty: 0.00 usft	Slot Radius: 13.200 in	Grid Convergence: 0.31 °

Well UNITED B S16-20-11N		
Well Position +N/-S 0.00 usft	Northing: 1,237,845.65 usft	Latitude: 39.985189°N
+E/-W 0.00 usft	Easting: 3,139,947.32 usft	Longitude: 105.000568°W
Position Uncertainty 0.00 usft	Wellhead Elevation: usft	Ground Level: 5,254.00 usft

Wellbore OWB					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	2/4/2021	7.97	66.30	51,745.78151274

Design FINAL SURVEY				
Audit Notes:				
Version: 1.0	Phase: ACTUAL	Tie On Depth: 0.00		
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	188.67

Survey Program		Date 1/12/2022		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
135.00	1,565.00	SURFACE (OWB)	MWD OWSG	OWSG MWD - Standard
1,678.00	18,366.00	FINAL SURVEY (OWB)	MWD OWSG	OWSG MWD - Standard

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	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	
135.00	0.83	196.33	135.00	-0.94	-0.27	0.97	0.61	0.61	0.00	
227.00	2.41	268.92	226.96	-1.61	-2.40	1.96	2.50	1.72	78.90	
318.00	4.48	287.11	317.80	-0.60	-7.71	1.76	2.54	2.27	19.99	
407.00	6.50	286.67	406.38	1.86	-15.86	0.55	2.27	2.27	-0.49	
496.00	9.36	293.18	494.52	6.16	-27.34	-1.97	3.36	3.21	7.31	
586.00	10.15	294.50	583.22	12.33	-41.28	-5.96	0.91	0.88	1.47	
675.00	11.64	292.30	670.62	18.99	-56.73	-10.22	1.74	1.67	-2.47	
764.00	12.56	290.98	757.64	25.86	-74.07	-14.39	1.08	1.03	-1.48	
854.00	13.75	294.06	845.28	33.72	-92.97	-19.32	1.53	1.32	3.42	

Survey Report

Company:	EXTRACTION OIL & GAS	Local Co-ordinate Reference:	Well UNITED B S16-20-11N
Project:	Broomfield County	TVD Reference:	KB 28' @ 5282.00usft
Site:	Sec 9-T1S-R68W	MD Reference:	KB 28' @ 5282.00usft
Well:	UNITED B S16-20-11N	North Reference:	True
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEY	Database:	EDT_32Bit_ODBC

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
943.00	14.92	296.52	931.50	43.15	-112.88	-25.64	1.48	1.31	2.76
1,033.00	15.02	293.44	1,018.45	52.96	-133.95	-32.16	0.89	0.11	-3.42
1,121.00	14.58	286.94	1,103.54	60.73	-155.01	-36.66	1.95	-0.50	-7.39
1,211.00	14.01	285.44	1,190.75	66.93	-176.35	-39.57	0.76	-0.63	-1.67
1,300.00	12.70	287.29	1,277.34	72.71	-196.07	-42.31	1.55	-1.47	2.08
1,390.00	13.18	287.11	1,365.06	78.66	-215.33	-45.30	0.54	0.53	-0.20
1,480.00	12.52	287.90	1,452.80	84.68	-234.42	-48.37	0.76	-0.73	0.88
1,565.00	13.09	285.27	1,535.69	90.05	-252.47	-50.95	0.96	0.67	-3.09
1,617.00	13.15	285.57	1,586.33	93.19	-263.85	-52.34	0.17	0.11	0.58
SURFACE CSG - 1617' MD, 1586' TVD									
1,678.00	13.21	285.92	1,645.73	96.96	-277.23	-54.05	0.17	0.11	0.57
1,767.00	14.22	293.36	1,732.19	104.08	-297.05	-58.10	2.28	1.13	8.36
1,856.00	15.10	306.69	1,818.32	115.35	-316.38	-66.32	3.91	0.99	14.98
1,945.00	14.81	305.94	1,904.31	128.95	-334.89	-76.98	0.39	-0.33	-0.84
2,034.00	14.36	305.22	1,990.44	141.99	-353.11	-87.12	0.55	-0.51	-0.81
2,123.00	13.89	304.67	2,076.75	154.43	-370.92	-96.74	0.55	-0.53	-0.62
2,212.00	14.71	307.09	2,162.99	167.33	-388.72	-106.80	1.14	0.92	2.72
2,301.00	14.18	305.32	2,249.17	180.44	-406.62	-117.06	0.78	-0.60	-1.99
2,390.00	13.71	304.63	2,335.55	192.74	-424.20	-126.57	0.56	-0.53	-0.78
2,479.00	13.57	310.20	2,422.05	205.47	-440.85	-136.65	1.48	-0.16	6.26
2,568.00	12.95	309.69	2,508.67	218.58	-456.50	-147.25	0.71	-0.70	-0.57
2,657.00	14.65	310.50	2,595.10	232.26	-472.73	-158.32	1.92	1.91	0.91
2,747.00	14.08	310.26	2,682.29	246.73	-489.74	-170.06	0.64	-0.63	-0.27
2,836.00	13.33	310.27	2,768.75	260.35	-505.83	-181.10	0.84	-0.84	0.01
2,925.00	14.24	304.04	2,855.19	273.11	-522.73	-191.17	1.95	1.02	-7.00
3,014.00	15.04	303.75	2,941.30	285.66	-541.40	-200.75	0.90	0.90	-0.33
3,103.00	13.90	302.38	3,027.48	297.80	-560.03	-209.95	1.34	-1.28	-1.54
3,192.00	14.71	311.74	3,113.73	311.05	-577.50	-220.41	2.75	0.91	10.52
3,281.00	13.94	311.13	3,199.96	325.62	-594.00	-232.33	0.88	-0.87	-0.69
3,370.00	15.88	310.55	3,285.96	340.59	-611.33	-244.51	2.19	2.18	-0.65
3,459.00	14.58	309.14	3,371.83	355.58	-629.27	-256.62	1.52	-1.46	-1.58
3,548.00	13.28	308.28	3,458.21	368.98	-645.99	-267.36	1.48	-1.46	-0.97
3,637.00	13.28	314.40	3,544.84	382.47	-661.32	-278.38	1.58	0.00	6.88
3,726.00	15.59	317.18	3,631.02	398.40	-676.75	-291.79	2.71	2.60	3.12
3,815.00	16.22	310.28	3,716.62	415.21	-694.36	-305.75	2.24	0.71	-7.75
3,904.00	14.60	308.60	3,802.42	430.24	-712.61	-317.87	1.89	-1.82	-1.89
3,993.00	15.27	309.92	3,888.41	444.76	-730.37	-329.54	0.84	0.75	1.48
4,082.00	13.38	309.33	3,974.64	458.81	-747.32	-340.87	2.13	-2.12	-0.66
4,172.00	13.72	310.48	4,062.14	472.34	-763.50	-351.81	0.48	0.38	1.28
4,261.00	15.00	304.72	4,148.36	485.75	-780.99	-362.43	2.15	1.44	-6.47
4,350.00	13.04	303.64	4,234.71	497.87	-798.82	-371.73	2.22	-2.20	-1.21
4,438.00	13.48	307.42	4,320.36	509.61	-815.23	-380.85	1.10	0.50	4.30
4,528.00	14.71	311.60	4,407.65	523.57	-832.11	-392.11	1.77	1.37	4.64

Survey Report

Company:	EXTRACTION OIL & GAS	Local Co-ordinate Reference:	Well UNITED B S16-20-11N
Project:	Broomfield County	TVD Reference:	KB 28' @ 5282.00usft
Site:	Sec 9-T1S-R68W	MD Reference:	KB 28' @ 5282.00usft
Well:	UNITED B S16-20-11N	North Reference:	True
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEY	Database:	EDT_32Bit_ODBC

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
4,617.00	15.92	311.76	4,493.49	539.20	-849.67	-404.91	1.36	1.36	0.18	
4,706.00	14.12	311.50	4,579.45	554.52	-866.90	-417.46	2.02	-2.02	-0.29	
4,796.00	15.45	306.47	4,666.47	568.93	-884.77	-429.01	2.05	1.48	-5.59	
4,885.00	13.86	304.92	4,752.57	582.07	-903.04	-439.25	1.84	-1.79	-1.74	
4,974.00	14.14	306.69	4,838.93	594.67	-920.50	-449.07	0.57	0.31	1.99	
5,063.00	15.45	305.04	4,924.97	607.97	-938.92	-459.44	1.55	1.47	-1.85	
5,152.00	13.96	302.35	5,011.06	620.53	-957.70	-469.02	1.84	-1.67	-3.02	
5,241.00	14.14	304.87	5,097.40	632.49	-975.69	-478.13	0.72	0.20	2.83	
5,330.00	15.99	307.67	5,183.33	646.19	-994.31	-488.87	2.23	2.08	3.15	
5,419.00	14.35	306.18	5,269.23	660.20	-1,012.92	-499.91	1.89	-1.84	-1.67	
5,508.00	14.78	307.84	5,355.37	673.67	-1,030.79	-510.54	0.67	0.48	1.87	
5,598.00	16.28	308.04	5,442.08	688.49	-1,049.79	-522.32	1.67	1.67	0.22	
5,687.00	14.24	304.38	5,527.94	702.36	-1,068.65	-533.18	2.53	-2.29	-4.11	
5,776.00	15.45	309.62	5,613.97	716.10	-1,086.82	-544.03	2.03	1.36	5.89	
5,865.00	14.89	306.94	5,699.87	730.53	-1,105.09	-555.54	1.01	-0.63	-3.01	
5,954.00	13.63	305.12	5,786.13	743.44	-1,122.81	-565.63	1.50	-1.42	-2.04	
6,043.00	14.66	309.11	5,872.43	756.58	-1,140.12	-576.00	1.59	1.16	4.48	
6,132.00	13.23	303.76	5,958.81	769.34	-1,157.33	-586.03	2.16	-1.61	-6.01	
6,221.00	15.08	309.67	6,045.11	782.39	-1,174.71	-596.31	2.64	2.08	6.64	
6,310.00	14.50	308.87	6,131.16	796.78	-1,192.30	-607.88	0.69	-0.65	-0.90	
6,399.00	15.33	311.25	6,217.16	811.53	-1,209.82	-619.82	1.16	0.93	2.67	
6,519.00	13.74	311.24	6,333.32	831.38	-1,232.46	-636.03	1.32	-1.32	-0.01	
6,608.00	14.89	309.77	6,419.55	845.66	-1,249.20	-647.63	1.36	1.29	-1.65	
6,697.00	15.25	309.03	6,505.49	860.35	-1,267.08	-659.45	0.46	0.40	-0.83	
6,786.00	13.24	308.64	6,591.75	874.09	-1,284.14	-670.45	2.26	-2.26	-0.44	
6,875.00	13.35	309.76	6,678.36	887.02	-1,300.00	-680.85	0.31	0.12	1.26	
6,964.00	14.33	306.03	6,764.78	900.07	-1,316.80	-691.22	1.49	1.10	-4.19	
7,053.00	16.04	305.89	6,850.67	913.76	-1,335.67	-701.90	1.92	1.92	-0.16	
7,142.00	14.06	303.70	6,936.61	926.97	-1,354.63	-712.10	2.31	-2.22	-2.46	
7,231.00	14.89	307.97	7,022.79	940.00	-1,372.64	-722.27	1.52	0.93	4.80	
7,320.00	15.07	308.78	7,108.77	954.28	-1,390.67	-733.67	0.31	0.20	0.91	
7,378.00	14.19	299.94	7,164.89	962.55	-1,402.71	-740.03	4.13	-1.52	-15.24	
KOP - 7378' MD, 7165' TVD										
7,409.00	13.86	294.83	7,194.97	966.01	-1,409.37	-742.44	4.13	-1.06	-16.50	
7,498.00	14.59	252.63	7,281.47	967.14	-1,429.80	-740.48	11.43	0.82	-47.42	
7,587.00	16.78	217.94	7,367.33	953.63	-1,448.44	-724.32	10.65	2.46	-38.98	
7,676.00	19.27	197.83	7,452.04	929.49	-1,460.85	-698.58	7.49	2.80	-22.60	
7,765.00	25.01	193.52	7,534.45	897.19	-1,469.75	-665.31	6.70	6.45	-4.84	
7,855.00	31.95	187.75	7,613.52	855.04	-1,477.42	-622.48	8.29	7.71	-6.41	
7,944.00	40.06	187.64	7,685.46	803.23	-1,484.42	-570.21	9.11	9.11	-0.12	
8,033.00	48.80	187.47	7,748.96	741.53	-1,492.59	-507.98	9.82	9.82	-0.19	
8,122.00	58.72	188.10	7,801.51	670.50	-1,502.33	-436.30	11.16	11.15	0.71	
8,211.00	68.33	184.72	7,841.14	591.43	-1,511.11	-356.81	11.32	10.80	-3.80	
8,300.00	78.21	178.73	7,866.75	506.38	-1,513.56	-272.36	12.83	11.10	-6.73	

Survey Report

Company:	EXTRACTION OIL & GAS	Local Co-ordinate Reference:	Well UNITED B S16-20-11N
Project:	Broomfield County	TVD Reference:	KB 28' @ 5282.00usft
Site:	Sec 9-T1S-R68W	MD Reference:	KB 28' @ 5282.00usft
Well:	UNITED B S16-20-11N	North Reference:	True
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEY	Database:	EDT_32Bit_ODBC

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
8,389.00	87.94	179.71	7,877.47	418.15	-1,512.37	-185.32	10.99	10.93	1.10
8,412.25	88.08	179.63	7,878.28	394.91	-1,512.23	-162.37	0.71	0.62	-0.35
~150' X-OVER PNT - 8412.25' MD, 150' FNL, 2452' FEL SEC 9									
8,447.00	88.30	179.51	7,879.38	360.18	-1,511.97	-128.07	0.71	0.62	-0.35
LANDING PNT - 8447' MD, 7879' TVD									
8,478.00	88.49	179.40	7,880.24	329.20	-1,511.68	-97.48	0.71	0.62	-0.35
8,567.00	89.14	181.30	7,882.09	240.22	-1,512.22	-9.45	2.26	0.73	2.13
8,656.00	90.28	180.42	7,882.54	151.23	-1,513.55	78.73	1.62	1.28	-0.99
8,745.00	89.73	180.56	7,882.53	62.24	-1,514.32	166.82	0.64	-0.62	0.16
8,834.00	89.98	180.25	7,882.75	-26.76	-1,514.95	254.89	0.45	0.28	-0.35
8,923.00	91.36	179.45	7,881.71	-115.75	-1,514.71	342.83	1.79	1.55	-0.90
9,012.00	91.36	179.56	7,879.60	-204.72	-1,513.94	430.67	0.12	0.00	0.12
9,101.00	91.09	179.73	7,877.70	-293.70	-1,513.39	518.55	0.36	-0.30	0.19
9,190.00	90.84	178.73	7,876.20	-382.68	-1,512.20	606.33	1.16	-0.28	-1.12
9,279.00	91.62	181.80	7,874.29	-471.64	-1,512.61	694.34	3.56	0.88	3.45
9,368.00	89.13	182.71	7,873.71	-560.57	-1,516.11	782.77	2.98	-2.80	1.02
9,457.00	88.49	182.93	7,875.55	-649.44	-1,520.49	871.29	0.76	-0.72	0.25
9,546.00	87.90	183.24	7,878.36	-738.26	-1,525.27	959.82	0.75	-0.66	0.35
9,635.00	88.68	183.77	7,881.01	-827.06	-1,530.71	1,048.42	1.06	0.88	0.60
9,724.00	89.45	183.12	7,882.46	-915.88	-1,536.06	1,137.04	1.13	0.87	-0.73
9,813.00	89.58	180.94	7,883.22	-1,004.82	-1,539.21	1,225.43	2.45	0.15	-2.45
9,902.00	89.17	180.85	7,884.19	-1,093.80	-1,540.60	1,313.61	0.47	-0.46	-0.10
9,991.00	89.89	179.53	7,884.92	-1,182.80	-1,540.90	1,401.63	1.69	0.81	-1.48
10,080.00	89.56	179.29	7,885.35	-1,271.79	-1,539.98	1,489.46	0.46	-0.37	-0.27
10,170.00	91.02	179.91	7,884.89	-1,361.79	-1,539.35	1,578.33	1.76	1.62	0.69
10,259.00	91.11	179.71	7,883.24	-1,450.77	-1,539.06	1,666.26	0.25	0.10	-0.22
10,348.00	90.46	180.06	7,882.02	-1,539.76	-1,538.88	1,754.20	0.83	-0.73	0.39
10,437.00	90.46	179.54	7,881.30	-1,628.76	-1,538.57	1,842.13	0.58	0.00	-0.58
10,526.00	90.15	179.45	7,880.83	-1,717.75	-1,537.78	1,929.99	0.36	-0.35	-0.10
10,615.00	89.72	178.56	7,880.93	-1,806.74	-1,536.24	2,017.73	1.11	-0.48	-1.00
10,704.00	90.08	178.06	7,881.09	-1,895.70	-1,533.61	2,105.28	0.69	0.40	-0.56
10,793.00	89.85	177.97	7,881.14	-1,984.64	-1,530.53	2,192.74	0.28	-0.26	-0.10
10,882.00	90.39	177.60	7,880.95	-2,073.58	-1,527.09	2,280.14	0.74	0.61	-0.42
10,972.00	90.70	177.24	7,880.10	-2,163.48	-1,523.04	2,368.40	0.53	0.34	-0.40
11,061.00	90.98	177.24	7,878.79	-2,252.37	-1,518.76	2,455.63	0.31	0.31	0.00
11,150.00	91.06	179.36	7,877.21	-2,341.31	-1,516.12	2,543.16	2.38	0.09	2.38
11,239.00	89.98	180.43	7,876.40	-2,430.30	-1,515.95	2,631.11	1.71	-1.21	1.20
11,328.00	89.81	180.56	7,876.56	-2,519.30	-1,516.72	2,719.20	0.24	-0.19	0.15
11,417.00	89.46	180.09	7,877.13	-2,608.30	-1,517.23	2,807.26	0.66	-0.39	-0.53
11,506.00	89.95	179.33	7,877.59	-2,697.29	-1,516.78	2,895.17	1.02	0.55	-0.85
11,595.00	90.25	181.63	7,877.43	-2,786.28	-1,517.52	2,983.25	2.61	0.34	2.58
11,684.00	90.28	181.59	7,877.02	-2,875.25	-1,520.02	3,071.58	0.06	0.03	-0.04
11,773.00	91.00	181.19	7,876.03	-2,964.22	-1,522.18	3,159.85	0.93	0.81	-0.45

Survey Report

Company:	EXTRACTION OIL & GAS	Local Co-ordinate Reference:	Well UNITED B S16-20-11N
Project:	Broomfield County	TVD Reference:	KB 28' @ 5282.00usft
Site:	Sec 9-T1S-R68W	MD Reference:	KB 28' @ 5282.00usft
Well:	UNITED B S16-20-11N	North Reference:	True
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEY	Database:	EDT_32Bit_ODBC

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
11,862.00	90.65	182.18	7,874.75	-3,053.17	-1,524.80	3,248.18	1.18	-0.39	1.11	
11,951.00	88.48	182.94	7,875.42	-3,142.07	-1,528.77	3,336.67	2.58	-2.44	0.85	
12,040.00	88.21	182.69	7,877.99	-3,230.92	-1,533.14	3,425.16	0.41	-0.30	-0.28	
12,130.00	88.02	182.59	7,880.95	-3,320.78	-1,537.28	3,514.62	0.24	-0.21	-0.11	
12,218.00	88.36	181.14	7,883.73	-3,408.69	-1,540.15	3,601.95	1.69	0.39	-1.65	
12,308.00	90.08	180.00	7,884.96	-3,498.67	-1,541.04	3,691.04	2.29	1.91	-1.27	
12,397.00	89.88	179.35	7,884.99	-3,587.67	-1,540.54	3,778.94	0.76	-0.22	-0.73	
12,486.00	89.74	178.97	7,885.28	-3,676.66	-1,539.23	3,866.72	0.46	-0.16	-0.43	
12,575.00	89.65	178.56	7,885.76	-3,765.64	-1,537.31	3,954.39	0.47	-0.10	-0.46	
12,664.00	89.92	178.98	7,886.09	-3,854.61	-1,535.40	4,042.06	0.56	0.30	0.47	
12,753.00	91.02	178.80	7,885.36	-3,943.59	-1,533.68	4,129.77	1.25	1.24	-0.20	
12,843.00	90.77	178.71	7,883.96	-4,033.56	-1,531.72	4,218.41	0.30	-0.28	-0.10	
12,932.00	90.62	178.35	7,882.88	-4,122.52	-1,529.44	4,306.01	0.44	-0.17	-0.40	
13,021.00	90.26	178.15	7,882.19	-4,211.48	-1,526.72	4,393.54	0.46	-0.40	-0.22	
13,110.00	89.95	177.89	7,882.03	-4,300.43	-1,523.65	4,481.01	0.45	-0.35	-0.29	
13,199.00	89.50	178.15	7,882.46	-4,389.37	-1,520.57	4,568.47	0.58	-0.51	0.29	
13,289.00	90.65	178.96	7,882.34	-4,479.34	-1,518.30	4,657.07	1.56	1.28	0.90	
13,378.00	90.62	179.46	7,881.35	-4,568.33	-1,517.08	4,744.85	0.56	-0.03	0.56	
13,467.00	90.08	179.40	7,880.81	-4,657.32	-1,516.19	4,832.70	0.61	-0.61	-0.07	
13,556.00	89.95	179.27	7,880.79	-4,746.31	-1,515.16	4,920.52	0.21	-0.15	-0.15	
13,645.00	90.46	179.83	7,880.47	-4,835.31	-1,514.46	5,008.39	0.85	0.57	0.63	
13,734.00	90.98	179.91	7,879.35	-4,924.30	-1,514.26	5,096.33	0.59	0.58	0.09	
13,823.00	90.73	179.94	7,878.02	-5,013.29	-1,514.14	5,184.29	0.28	-0.28	0.03	
13,912.00	90.45	180.06	7,877.10	-5,102.29	-1,514.14	5,272.27	0.34	-0.31	0.13	
14,001.00	90.26	180.02	7,876.55	-5,191.29	-1,514.20	5,360.26	0.22	-0.21	-0.04	
14,090.00	89.98	180.12	7,876.37	-5,280.29	-1,514.31	5,448.25	0.33	-0.31	0.11	
14,179.00	89.55	180.23	7,876.73	-5,369.28	-1,514.58	5,536.28	0.50	-0.48	0.12	
14,269.00	91.29	180.24	7,876.07	-5,459.28	-1,514.95	5,625.30	1.93	1.93	0.01	
14,357.00	91.57	179.87	7,873.88	-5,547.25	-1,515.04	5,712.28	0.53	0.32	-0.42	
14,446.00	91.40	179.53	7,871.57	-5,636.22	-1,514.57	5,800.16	0.43	-0.19	-0.38	
14,535.00	91.30	179.24	7,869.47	-5,725.19	-1,513.62	5,887.97	0.34	-0.11	-0.33	
14,625.00	90.95	179.12	7,867.71	-5,815.16	-1,512.33	5,976.72	0.41	-0.39	-0.13	
14,713.00	90.77	178.98	7,866.38	-5,903.14	-1,510.87	6,063.47	0.26	-0.20	-0.16	
14,803.00	90.14	180.11	7,865.67	-5,993.13	-1,510.16	6,152.32	1.44	-0.70	1.26	
14,892.00	89.81	180.23	7,865.71	-6,082.13	-1,510.42	6,240.34	0.39	-0.37	0.13	
14,981.00	89.11	180.53	7,866.55	-6,171.13	-1,511.01	6,328.41	0.86	-0.79	0.34	
15,070.00	88.45	180.42	7,868.44	-6,260.10	-1,511.75	6,416.48	0.75	-0.74	-0.12	
15,159.00	89.88	179.98	7,869.74	-6,349.09	-1,512.06	6,504.50	1.68	1.61	-0.49	
15,248.00	89.43	180.11	7,870.27	-6,438.09	-1,512.13	6,592.49	0.53	-0.51	0.15	
15,337.00	89.11	179.91	7,871.41	-6,527.08	-1,512.14	6,680.47	0.42	-0.36	-0.22	
15,426.00	90.64	179.92	7,871.60	-6,616.08	-1,512.01	6,768.42	1.72	1.72	0.01	
15,515.00	90.60	180.39	7,870.64	-6,705.07	-1,512.25	6,856.44	0.53	-0.04	0.53	
15,604.00	90.19	180.35	7,870.03	-6,794.07	-1,512.83	6,944.50	0.46	-0.46	-0.04	
15,693.00	89.70	180.14	7,870.11	-6,883.07	-1,513.21	7,032.54	0.60	-0.55	-0.24	

Survey Report

Company:	EXTRACTION OIL & GAS	Local Co-ordinate Reference:	Well UNITED B S16-20-11N
Project:	Broomfield County	TVD Reference:	KB 28' @ 5282.00usft
Site:	Sec 9-T1S-R68W	MD Reference:	KB 28' @ 5282.00usft
Well:	UNITED B S16-20-11N	North Reference:	True
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEY	Database:	EDT_32Bit_ODBC

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
15,782.00	90.62	179.96	7,869.86	-6,972.06	-1,513.28	7,120.53	1.05	1.03	-0.20
15,871.00	90.17	179.73	7,869.25	-7,061.06	-1,513.04	7,208.48	0.57	-0.51	-0.26
15,960.00	89.81	179.53	7,869.27	-7,150.06	-1,512.47	7,296.37	0.46	-0.40	-0.22
16,049.00	89.48	179.30	7,869.82	-7,239.05	-1,511.56	7,384.21	0.45	-0.37	-0.26
16,138.00	88.92	179.47	7,871.06	-7,328.04	-1,510.61	7,472.03	0.66	-0.63	0.19
16,227.00	88.51	179.58	7,873.06	-7,417.01	-1,509.87	7,559.88	0.48	-0.46	0.12
16,317.00	88.31	179.05	7,875.55	-7,506.97	-1,508.79	7,648.65	0.63	-0.22	-0.59
16,406.00	89.75	179.30	7,877.06	-7,595.95	-1,507.51	7,736.41	1.64	1.62	0.28
16,495.00	90.92	179.24	7,876.54	-7,684.94	-1,506.38	7,824.21	1.32	1.31	-0.07
16,584.00	90.77	179.51	7,875.23	-7,773.92	-1,505.41	7,912.03	0.35	-0.17	0.30
16,673.00	90.49	179.03	7,874.25	-7,862.91	-1,504.27	7,999.83	0.62	-0.31	-0.54
16,762.00	90.34	178.37	7,873.60	-7,951.88	-1,502.25	8,087.49	0.76	-0.17	-0.74
16,851.00	90.81	177.98	7,872.71	-8,040.83	-1,499.42	8,174.99	0.69	0.53	-0.44
16,940.00	91.26	177.97	7,871.10	-8,129.76	-1,496.27	8,262.43	0.51	0.51	-0.01
17,029.00	90.99	179.09	7,869.35	-8,218.72	-1,493.99	8,350.02	1.29	-0.30	1.26
17,118.00	89.98	179.86	7,868.60	-8,307.71	-1,493.18	8,437.87	1.43	-1.13	0.87
17,207.00	89.31	180.39	7,869.15	-8,396.70	-1,493.37	8,525.88	0.96	-0.75	0.60
17,296.00	89.01	180.04	7,870.46	-8,485.69	-1,493.70	8,613.90	0.52	-0.34	-0.39
17,385.00	88.74	179.59	7,872.20	-8,574.68	-1,493.42	8,701.82	0.59	-0.30	-0.51
17,474.00	88.61	179.01	7,874.26	-8,663.64	-1,492.33	8,789.61	0.67	-0.15	-0.65
17,563.00	88.58	178.17	7,876.45	-8,752.59	-1,490.14	8,877.21	0.94	-0.03	-0.94
17,652.00	89.79	177.99	7,877.71	-8,841.53	-1,487.16	8,964.68	1.37	1.36	-0.20
17,741.00	90.24	177.72	7,877.69	-8,930.47	-1,483.83	9,052.10	0.59	0.51	-0.30
17,830.00	89.83	177.48	7,877.63	-9,019.39	-1,480.10	9,139.44	0.53	-0.46	-0.27
17,919.00	89.35	177.21	7,878.27	-9,108.29	-1,475.98	9,226.71	0.62	-0.54	-0.30
18,008.00	90.00	178.27	7,878.78	-9,197.22	-1,472.47	9,314.09	1.40	0.73	1.19
18,097.00	90.15	177.77	7,878.66	-9,286.16	-1,469.39	9,401.55	0.59	0.17	-0.56
18,187.00	89.49	177.51	7,878.94	-9,376.09	-1,465.69	9,489.89	0.79	-0.73	-0.29
18,276.00	89.00	177.17	7,880.11	-9,464.98	-1,461.56	9,577.15	0.67	-0.55	-0.38
18,308.00	88.45	177.43	7,880.83	-9,496.94	-1,460.05	9,608.51	1.90	-1.72	0.81
LAST SURVEY - 18308' MD, 7881' TVD									
18,366.00	88.45	177.43	7,882.40	-9,554.86	-1,457.45	9,665.38	0.00	0.00	0.00
EXTRAPOLATION TO TD - 18366' MD, 458' FSL, 2445' FEL SEC 16									

Survey Report

Company: EXTRACTION OIL & GAS	Local Co-ordinate Reference: Well UNITED B S16-20-11N
Project: Broomfield County	TVD Reference: KB 28' @ 5282.00usft
Site: Sec 9-T1S-R68W	MD Reference: KB 28' @ 5282.00usft
Well: UNITED B S16-20-11N	North Reference: True
Wellbore: OWB	Survey Calculation Method: Minimum Curvature
Design: FINAL SURVEY	Database: EDT_32Bit_ODBC

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
UNITED B S16-11N - PE	0.00	0.00	7,867.00	-9,557.36	-1,436.09	1,228,280.35	3,138,565.08	39.958952°N	105.005691°W
- actual wellpath misses target center by 26.45usft at 18366.00usft MD (7882.39 TVD, -9554.86 N, -1457.45 E)									
- Point									
UNITED B S16-11N - LF	0.00	0.00	7,867.00	394.91	-1,488.22	1,238,232.17	3,138,456.90	39.986273°N	105.005879°W
- actual wellpath misses target center by 26.53usft at 8412.00usft MD (7878.27 TVD, 395.16 N, -1512.23 E)									
- Point									

Design Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(usft)	(usft)	+N/-S	+E/-W		
		(usft)	(usft)		
1,617.00	1,586.33	93.19	-263.85	SURFACE CSG - 1617' MD, 1586' TVD	
7,378.00	7,164.89	962.55	-1,402.71	KOP - 7378' MD, 7165' TVD	
8,412.25	7,878.28	394.91	-1,512.23	~150' X-OVER PNT - 8412.25' MD, 150' FNL, 2452' FEL SEC 9	
8,447.00	7,879.38	360.18	-1,511.97	LANDING PNT - 8447' MD, 7879' TVD	
18,308.00	7,880.83	-9,496.94	-1,460.05	LAST SURVEY - 18308' MD, 7881' TVD	
18,366.00	7,882.40	-9,554.86	-1,457.45	EXTRAPOLATION TO TD - 18366' MD, 458' FSL, 2445' FEL SEC 16	

Checked By: _____	Approved By: _____	Date: _____
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