

BISON OIL & GAS II

WELD COUNTY

SEC 11-T5N-61W

GROTHER 5-61 11B-14-23-5

OWB

Design: FINAL SURVEY

Standard Survey Report

15 September, 2022

Project: WELD COUNTY
Site: SEC 11-T5N-61W
Well: GROTHEER 5-61 11B-14-23-5
Wellbore: OWB
Design: FINAL SURVEY

PROJECT DETAILS: WELD 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: 7.43°
Magnetic Field
Strength: 51912.6snT
Dip Angle: 66.70°
Date: 6/23/2022
Model: IGRF2020

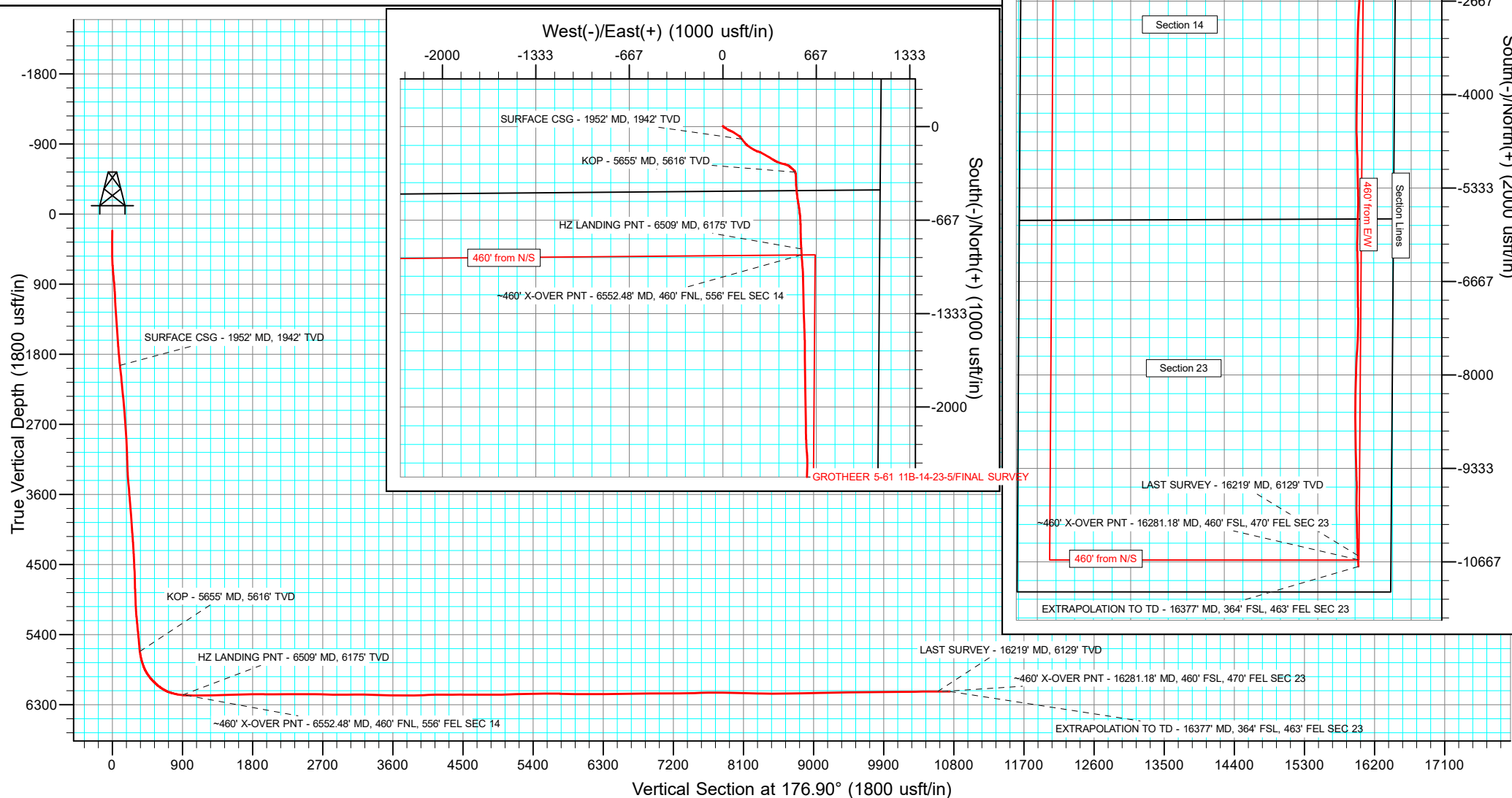
WELL DETAILS: GROTHEER 5-61 11B-14-23-5

+N/-S	+E/-W	Northing	Ground Level:	4685.50	Longitude	Slot
0.00	0.00	1394924.21	Easting	3370344.13	Latitude	
				40.409845°N	104.170025°W	

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
1952.00	7.53	142.83	1941.71	-88.86	136.49	96.11	171.98	SURFACE CSG - 1952' MD, 1942' TVD
5655.00	7.95	160.67	5615.99	-324.28	516.25	351.71	628.88	KOP - 5655' MD, 5616' TVD
6509.00	85.27	176.99	6175.38	-871.16	559.42	900.13	1177.81	HZ LANDING PNT - 6509' MD, 6175' TVD
6552.48	88.04	176.49	6177.65	-914.50	561.87	943.54	1221.08	~460' X-OVER PNT - 6552.48' MD, 460' FNL, 556' FEL SEC 14
16219.00	89.67	176.21	6129.46	-10575.54	570.66	10590.93	10885.97	LAST SURVEY - 16219' MD, 6129' TVD
16281.18	89.67	176.21	6129.81	-10637.59	574.77	10653.10	10948.15	~460' X-OVER PNT - 16281.18' MD, 460' FSL, 470' FEL SEC 23
16377.00	89.67	176.21	6130.37	-10733.19	581.11	10748.91	11043.97	EXTRAPOLATION TO TD - 16377' MD, 364' FSL, 463' FEL SEC 23

SHL:
460' FSL, 1126' FEL
Sec 11-T5N-R61W
~460' X-OVER PNT:
460' FNL, 556' FEL
Sec 14-T5N-R61W
~460' X-OVER PNT:
460' FSL, 470' FEL
Sec 23-T5N-R61W
BHL:
364' FSL, 463' FEL
Sec 23-T5N-R61W



Survey Report

Company:	BISON OIL & GAS II	Local Co-ordinate Reference:	Well GROTHEER 5-61 11B-14-23-5
Project:	WELD COUNTY	TVD Reference:	KBE 24' @ 4709.50usft
Site:	SEC 11-T5N-61W	MD Reference:	KBE 24' @ 4709.50usft
Well:	GROTHEER 5-61 11B-14-23-5	North Reference:	True
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEY	Database:	EDT_32Bit_ODBC

Project	WELD COUNTY		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site		SEC 11-T5N-61W			
Site Position:		Northing:	1,395,071.08 usft	Latitude:	40.410254°N
From:	Lat/Long	Easting:	3,370,200.45 usft	Longitude:	104.170533°W
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence:	0.86 °

Well		GROTHEER 5-61 11B-14-23-5				
Well Position	+N/-S	0.00 usft	Northing:	1,394,924.21 usft	Latitude:	40.409845°N
	+E/-W	0.00 usft	Easting:	3,370,344.13 usft	Longitude:	104.170025°W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,685.50 usft

Wellbore	OWB				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	6/23/2022	7.43	66.70	51,912.57973907

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	176.90	

Survey Program	Date	9/15/2022			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
303.00	1,905.00	SURFACE SURVEY (OWB)	MWD	OWSG MWD - Standard	
1,960.00	16,377.00	FINAL SURVEY (OWB)	MWD	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)	
211.00	1.50	38.30	210.98	2.07	1.64	-1.98	0.00	0.00	0.00	
303.00	0.70	331.30	302.96	3.51	2.12	-3.39	1.51	-0.87	-72.83	
377.00	1.00	306.40	376.95	4.29	1.38	-4.21	0.63	0.41	-33.65	
464.00	0.40	289.10	463.95	4.84	0.48	-4.80	0.72	-0.69	-19.89	
551.00	2.20	148.80	550.93	3.51	1.06	-3.45	2.90	2.07	-161.26	
638.00	4.70	133.80	637.76	-0.39	4.50	0.63	3.03	2.87	-17.24	
725.00	7.70	122.50	724.25	-5.99	11.99	6.63	3.71	3.45	-12.99	
812.00	9.60	121.20	810.26	-12.88	23.11	14.11	2.20	2.18	-1.49	
900.00	9.20	121.10	897.07	-20.31	35.41	22.20	0.45	-0.45	-0.11	
987.00	7.30	115.10	983.17	-26.25	46.37	28.72	2.39	-2.18	-6.90	

Survey Report

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Site:	SEC 11-T5N-61W	MD Reference:	KBE 24' @ 4709.50usft
Well:	GROTHEER 5-61 11B-14-23-5	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)
1,074.00	5.80	111.30	1,069.60	-30.19	55.47	33.15	1.79	-1.72	-4.37
1,161.00	6.50	111.00	1,156.10	-33.55	64.17	36.97	0.81	0.80	-0.34
1,249.00	7.00	121.90	1,243.49	-38.17	73.37	42.08	1.56	0.57	12.39
1,336.00	7.10	124.60	1,329.84	-44.03	82.30	48.41	0.40	0.11	3.10
1,510.00	6.50	123.10	1,502.61	-55.51	99.40	60.80	0.36	-0.34	-0.86
1,597.00	6.50	121.10	1,589.05	-60.74	107.74	66.48	0.26	0.00	-2.30
1,685.00	6.90	123.80	1,676.45	-66.26	116.40	72.45	0.58	0.45	3.07
1,772.00	6.10	139.20	1,762.90	-72.67	123.76	79.25	2.20	-0.92	17.70
1,859.00	6.60	142.30	1,849.36	-80.12	129.84	87.02	0.70	0.57	3.56
1,905.00	6.50	142.90	1,895.06	-84.29	133.03	91.36	0.26	-0.22	1.30
1,952.00	7.53	142.83	1,941.71	-88.86	136.49	96.11	2.18	2.18	-0.15
SURFACE CSG - 1952' MD, 1942' TVD									
1,960.00	7.70	142.82	1,949.64	-89.71	137.13	96.99	2.18	2.18	-0.13
2,055.00	7.39	141.94	2,043.82	-99.59	144.74	107.27	0.35	-0.33	-0.93
2,150.00	7.11	141.84	2,138.06	-109.02	152.14	117.09	0.30	-0.29	-0.11
2,245.00	6.69	140.04	2,232.37	-117.89	159.33	126.33	0.50	-0.44	-1.89
2,340.00	6.77	137.72	2,326.72	-126.27	166.65	135.10	0.30	0.08	-2.44
2,434.00	8.36	125.63	2,419.90	-134.35	175.93	143.67	2.38	1.69	-12.86
2,529.00	7.69	124.95	2,513.97	-142.02	186.76	151.91	0.71	-0.71	-0.72
2,624.00	7.56	123.58	2,608.13	-149.11	197.17	159.56	0.24	-0.14	-1.44
2,719.00	7.03	122.53	2,702.36	-155.70	207.28	166.68	0.58	-0.56	-1.11
2,814.00	6.64	119.15	2,796.69	-161.50	216.98	172.99	0.59	-0.41	-3.56
2,910.00	5.67	116.83	2,892.13	-166.34	226.06	178.32	1.04	-1.01	-2.42
3,005.00	5.31	119.50	2,986.70	-170.63	234.07	183.03	0.46	-0.38	2.81
3,124.00	4.29	107.41	3,105.28	-174.67	243.11	187.56	1.20	-0.86	-10.16
3,220.00	6.38	107.05	3,200.86	-177.31	251.64	190.65	2.18	2.18	-0.37
3,314.00	6.30	104.61	3,294.28	-180.14	261.62	194.02	0.30	-0.09	-2.60
3,409.00	8.54	119.98	3,388.49	-184.98	272.78	199.46	3.13	2.36	16.18
3,504.00	8.85	119.67	3,482.40	-192.12	285.24	207.26	0.33	0.33	-0.33
3,600.00	8.99	119.43	3,577.24	-199.46	298.19	215.29	0.15	0.15	-0.25
3,695.00	8.74	119.11	3,671.10	-206.62	310.96	223.13	0.27	-0.26	-0.34
3,790.00	8.26	118.69	3,765.06	-213.41	323.25	230.57	0.51	-0.51	-0.44
3,884.00	7.57	121.93	3,858.16	-219.93	334.43	237.68	0.87	-0.73	3.45
3,979.00	7.17	124.09	3,952.38	-226.56	344.65	244.86	0.51	-0.42	2.27
4,074.00	6.45	120.25	4,046.71	-232.57	354.17	251.38	0.90	-0.76	-4.04
4,169.00	8.16	121.49	4,140.93	-238.78	364.53	258.14	1.81	1.80	1.31
4,264.00	7.00	117.63	4,235.10	-244.99	375.41	264.92	1.33	-1.22	-4.06
4,359.00	6.40	115.66	4,329.45	-249.96	385.31	270.43	0.68	-0.63	-2.07
4,453.00	7.85	109.95	4,422.73	-254.42	396.06	275.46	1.71	1.54	-6.07
4,548.00	6.94	109.95	4,516.94	-258.59	407.56	280.25	0.96	-0.96	0.00
4,643.00	6.46	108.13	4,611.29	-262.22	418.03	284.43	0.55	-0.51	-1.92
4,738.00	6.37	102.21	4,705.69	-264.99	428.26	287.76	0.70	-0.09	-6.23
4,833.00	5.90	96.69	4,800.15	-266.68	438.26	289.98	0.79	-0.49	-5.81

Survey Report

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Project:	WELD COUNTY	TVD Reference:	KBE 24' @ 4709.50usft
Site:	SEC 11-T5N-61W	MD Reference:	KBE 24' @ 4709.50usft
Well:	GROTHEER 5-61 11B-14-23-5	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)
4,928.00	6.98	113.80	4,894.56	-269.58	448.39	293.42	2.31	1.14	18.01
5,024.00	5.43	107.81	4,989.99	-273.32	458.06	297.68	1.75	-1.61	-6.24
5,119.00	6.58	116.88	5,084.47	-277.15	467.19	302.01	1.57	1.21	9.55
5,214.00	8.90	130.53	5,178.61	-284.39	477.63	309.80	3.10	2.44	14.37
5,309.00	6.53	131.67	5,272.74	-292.76	487.26	318.67	2.50	-2.49	1.20
5,404.00	8.81	132.45	5,366.89	-301.26	496.66	327.67	2.40	2.40	0.82
5,498.00	7.08	135.50	5,459.98	-310.25	506.03	337.16	1.89	-1.84	3.24
5,592.00	5.45	140.80	5,553.42	-317.85	512.92	345.11	1.84	-1.73	5.64
5,655.00	7.95	160.67	5,615.99	-324.28	516.25	351.71	5.36	3.97	31.53
KOP - 5655' MD, 5616' TVD									
5,688.00	9.48	166.56	5,648.61	-329.08	517.64	356.58	5.36	4.63	17.86
5,782.00	16.08	174.80	5,740.24	-349.59	520.62	377.23	7.27	7.02	8.77
5,878.00	22.74	179.63	5,830.73	-381.43	521.95	409.09	7.13	6.94	5.03
5,972.00	34.73	176.41	5,913.01	-426.48	523.75	454.18	12.86	12.76	-3.43
6,067.00	42.55	173.12	5,987.17	-485.48	529.30	513.39	8.51	8.23	-3.46
6,161.00	51.03	170.13	6,051.47	-553.17	539.39	581.52	9.31	9.02	-3.18
6,256.00	59.20	174.10	6,105.78	-630.29	549.93	659.10	9.26	8.60	4.18
6,351.00	72.50	179.74	6,144.58	-716.62	554.36	745.54	15.00	14.00	5.94
6,446.00	79.88	177.64	6,167.25	-808.78	556.49	837.68	8.06	7.77	-2.21
6,509.00	85.27	176.99	6,175.38	-871.16	559.42	900.13	8.62	8.56	-1.03
HZ LANDING PNT - 6509' MD, 6175' TVD									
6,541.00	88.01	176.67	6,177.26	-903.05	561.18	932.07	8.62	8.56	-1.01
6,552.48	88.04	176.49	6,177.65	-914.50	561.87	943.54	1.64	0.29	-1.61
~460' X-OVER PNT - 6552.48' MD, 460' FNL, 556' FEL SEC 14									
6,636.00	88.29	175.14	6,180.33	-997.76	567.96	1,027.00	1.64	0.29	-1.61
6,730.00	90.79	179.26	6,181.08	-1,091.61	572.55	1,120.97	5.13	2.66	4.38
6,826.00	91.46	178.79	6,179.20	-1,187.58	574.19	1,216.88	0.85	0.70	-0.49
6,921.00	91.46	178.79	6,176.78	-1,282.53	576.19	1,311.80	0.00	0.00	0.00
7,015.00	91.39	178.03	6,174.44	-1,376.46	578.80	1,405.74	0.81	-0.07	-0.81
7,111.00	92.19	177.56	6,171.44	-1,472.34	582.49	1,501.68	0.97	0.83	-0.49
7,205.00	91.23	180.13	6,168.63	-1,566.27	584.38	1,595.57	2.92	-1.02	2.73
7,300.00	90.58	178.99	6,167.13	-1,661.26	585.11	1,690.46	1.38	-0.68	-1.20
7,395.00	91.20	179.20	6,165.66	-1,756.23	586.61	1,785.38	0.69	0.65	0.22
7,490.00	89.78	179.95	6,164.85	-1,851.22	587.32	1,880.27	1.69	-1.49	0.79
7,585.00	89.58	177.73	6,165.38	-1,946.20	589.24	1,975.21	2.35	-0.21	-2.34
7,679.00	90.53	179.79	6,165.29	-2,040.17	591.27	2,069.15	2.41	1.01	2.19
7,869.00	90.42	178.58	6,163.71	-2,230.14	593.98	2,258.99	0.64	-0.06	-0.64
7,964.00	89.73	174.93	6,163.59	-2,324.97	599.35	2,353.97	3.91	-0.73	-3.84
8,059.00	89.69	181.38	6,164.07	-2,419.87	602.41	2,448.90	6.79	-0.04	6.79
8,155.00	90.60	182.41	6,163.82	-2,515.81	599.24	2,544.53	1.43	0.95	1.07
8,250.00	88.54	182.62	6,164.54	-2,610.71	595.07	2,639.07	2.18	-2.17	0.22
8,344.00	88.25	182.95	6,167.17	-2,704.57	590.50	2,732.53	0.47	-0.31	0.35
8,438.00	89.23	182.84	6,169.24	-2,798.42	585.76	2,826.00	1.05	1.04	-0.12
8,532.00	89.84	182.88	6,170.00	-2,892.30	581.07	2,919.49	0.65	0.65	0.04

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Site:	SEC 11-T5N-61W	MD Reference:	KBE 24' @ 4709.50usft
Well:	GROTHEER 5-61 11B-14-23-5	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)
8,626.00	90.67	182.33	6,169.58	-2,986.20	576.79	3,013.02	1.06	0.88	-0.59
8,722.00	91.35	182.16	6,167.89	-3,082.11	573.03	3,108.59	0.73	0.71	-0.18
8,816.00	88.65	181.49	6,167.89	-3,176.06	570.04	3,202.23	2.96	-2.87	-0.71
8,910.00	88.25	180.85	6,170.43	-3,270.00	568.12	3,295.93	0.80	-0.43	-0.68
9,003.00	88.11	180.63	6,173.39	-3,362.95	566.92	3,388.68	0.28	-0.15	-0.24
9,099.00	88.04	180.14	6,176.61	-3,458.89	566.28	3,484.45	0.52	-0.07	-0.51
9,193.00	89.58	181.62	6,178.56	-3,552.85	564.83	3,578.19	2.27	1.64	1.57
9,287.00	89.36	181.04	6,179.43	-3,646.82	562.65	3,671.91	0.66	-0.23	-0.62
9,382.00	89.29	180.77	6,180.55	-3,741.81	561.15	3,766.67	0.29	-0.07	-0.28
9,478.00	91.65	181.25	6,179.76	-3,837.78	559.46	3,862.41	2.51	2.46	0.50
9,573.00	92.22	180.55	6,176.56	-3,932.71	557.97	3,957.13	0.95	0.60	-0.74
9,668.00	92.72	180.30	6,172.46	-4,027.62	557.26	4,051.86	0.59	0.53	-0.26
9,763.00	90.31	180.78	6,169.95	-4,122.58	556.37	4,146.63	2.59	-2.54	0.51
9,858.00	90.31	180.84	6,169.44	-4,217.57	555.03	4,241.40	0.06	0.00	0.06
9,952.00	90.00	181.17	6,169.18	-4,311.55	553.38	4,335.16	0.48	-0.33	0.35
10,047.00	90.36	180.31	6,168.88	-4,406.54	552.15	4,429.95	0.98	0.38	-0.91
10,143.00	89.41	178.59	6,169.08	-4,502.53	553.07	4,525.85	2.05	-0.99	-1.79
10,237.00	89.93	178.82	6,169.62	-4,596.51	555.20	4,619.80	0.60	0.55	0.24
10,333.00	89.97	178.67	6,169.70	-4,692.48	557.30	4,715.75	0.16	0.04	-0.16
10,427.00	89.61	177.67	6,170.05	-4,786.43	560.30	4,809.72	1.13	-0.38	-1.06
10,521.00	89.90	177.10	6,170.45	-4,880.33	564.59	4,903.72	0.68	0.31	-0.61
10,616.00	91.32	179.94	6,169.44	-4,975.28	567.04	4,998.66	3.34	1.49	2.99
10,711.00	91.72	179.38	6,166.92	-5,070.25	567.61	5,093.52	0.72	0.42	-0.59
10,806.00	91.61	178.50	6,164.16	-5,165.19	569.36	5,188.42	0.93	-0.12	-0.93
10,901.00	92.37	178.31	6,160.86	-5,260.10	572.01	5,283.33	0.82	0.80	-0.20
10,996.00	90.44	179.17	6,158.53	-5,355.04	574.09	5,378.25	2.22	-2.03	0.91
11,092.00	90.72	178.73	6,157.56	-5,451.02	575.85	5,474.18	0.54	0.29	-0.46
11,186.00	89.25	180.82	6,157.58	-5,545.01	576.22	5,568.05	2.72	-1.56	2.22
11,281.00	90.87	181.10	6,157.48	-5,639.99	574.63	5,662.81	1.73	1.71	0.29
11,376.00	88.12	181.99	6,158.32	-5,734.95	572.07	5,757.49	3.04	-2.89	0.94
11,470.00	88.34	181.72	6,161.22	-5,828.85	569.03	5,851.09	0.37	0.23	-0.29
11,565.00	89.75	181.87	6,162.81	-5,923.79	566.05	5,945.73	1.49	1.48	0.16
11,661.00	89.44	180.32	6,163.48	-6,019.77	564.22	6,041.47	1.65	-0.32	-1.61
11,756.00	90.27	180.26	6,163.72	-6,114.76	563.74	6,136.30	0.88	0.87	-0.06
11,850.00	90.77	179.71	6,162.87	-6,208.76	563.76	6,230.16	0.79	0.53	-0.59
11,946.00	90.05	177.76	6,162.18	-6,304.73	565.88	6,326.10	2.17	-0.75	-2.03
12,041.00	89.73	177.70	6,162.37	-6,399.65	569.64	6,421.09	0.34	-0.34	-0.06
12,136.00	91.55	180.45	6,161.31	-6,494.62	571.18	6,516.00	3.47	1.92	2.89
12,231.00	91.35	179.34	6,158.90	-6,589.59	571.35	6,610.84	1.19	-0.21	-1.17
12,326.00	90.61	180.48	6,157.28	-6,684.57	571.50	6,705.69	1.43	-0.78	1.20
12,420.00	90.55	179.15	6,156.32	-6,778.57	571.80	6,799.57	1.42	-0.06	-1.41
12,516.00	90.60	178.75	6,155.36	-6,874.54	573.56	6,895.50	0.42	0.05	-0.42
12,611.00	90.76	180.83	6,154.23	-6,969.53	573.91	6,990.37	2.20	0.17	2.19

Survey Report

Company:	BISON OIL & GAS II	Local Co-ordinate Reference:	Well GROTHEER 5-61 11B-14-23-5
Project:	WELD COUNTY	TVD Reference:	KBE 24' @ 4709.50usft
Site:	SEC 11-T5N-61W	MD Reference:	KBE 24' @ 4709.50usft
Well:	GROTHEER 5-61 11B-14-23-5	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)
12,705.00	90.68	178.40	6,153.05	-7,063.52	574.54	7,084.25	2.59	-0.09	-2.59
12,800.00	89.62	180.52	6,152.80	-7,158.50	575.44	7,179.14	2.49	-1.12	2.23
12,896.00	90.04	180.50	6,153.09	-7,254.50	574.58	7,274.95	0.44	0.44	-0.02
12,991.00	91.46	179.77	6,151.85	-7,349.49	574.36	7,369.79	1.68	1.49	-0.77
13,086.00	90.92	182.61	6,149.87	-7,444.44	572.39	7,464.49	3.04	-0.57	2.99
13,180.00	92.53	182.54	6,147.04	-7,538.30	568.17	7,557.99	1.71	1.71	-0.07
13,274.00	90.16	184.09	6,144.84	-7,632.10	562.73	7,651.37	3.01	-2.52	1.65
13,369.00	90.85	184.05	6,144.00	-7,726.86	555.99	7,745.62	0.73	0.73	-0.04
13,464.00	89.05	182.12	6,144.08	-7,821.71	550.88	7,840.06	2.78	-1.89	-2.03
13,558.00	88.35	181.68	6,146.21	-7,915.64	547.76	7,933.67	0.88	-0.74	-0.47
13,654.00	88.55	181.35	6,148.81	-8,011.57	545.22	8,029.33	0.40	0.21	-0.34
13,749.00	88.45	181.42	6,151.30	-8,106.51	542.93	8,124.00	0.13	-0.11	0.07
13,843.00	88.45	181.42	6,153.84	-8,200.45	540.60	8,217.68	0.00	0.00	0.00
13,938.00	89.15	181.10	6,155.83	-8,295.40	538.51	8,312.38	0.81	0.74	-0.34
14,033.00	89.72	180.87	6,156.77	-8,390.38	536.88	8,407.14	0.65	0.60	-0.24
14,223.00	90.20	179.70	6,156.90	-8,580.38	535.93	8,596.80	0.67	0.25	-0.62
14,318.00	90.89	180.11	6,156.00	-8,675.37	536.09	8,691.67	0.84	0.73	0.43
14,413.00	91.11	179.89	6,154.34	-8,770.36	536.09	8,786.51	0.33	0.23	-0.23
14,508.00	91.69	179.30	6,152.02	-8,865.32	536.76	8,881.38	0.87	0.61	-0.62
14,699.00	90.65	177.96	6,148.12	-9,056.22	541.33	9,072.24	0.89	-0.54	-0.70
14,794.00	91.11	178.03	6,146.66	-9,151.15	544.65	9,167.21	0.49	0.48	0.07
14,890.00	90.79	179.11	6,145.07	-9,247.11	547.05	9,263.16	1.17	-0.33	1.12
14,984.00	90.91	178.60	6,143.67	-9,341.08	548.93	9,357.09	0.56	0.13	-0.54
15,079.00	91.59	178.29	6,141.60	-9,436.02	551.50	9,452.04	0.79	0.72	-0.33
15,174.00	92.26	177.97	6,138.41	-9,530.92	554.60	9,546.96	0.78	0.71	-0.34
15,269.00	90.16	180.04	6,136.40	-9,625.87	556.25	9,641.86	3.10	-2.21	2.18
15,365.00	90.23	181.27	6,136.07	-9,721.86	555.15	9,737.66	1.28	0.07	1.28
15,460.00	90.35	180.60	6,135.59	-9,816.85	553.60	9,832.42	0.72	0.13	-0.71
15,554.00	90.02	179.14	6,135.29	-9,910.84	553.81	9,926.29	1.59	-0.35	-1.55
15,649.00	90.08	178.58	6,135.21	-10,005.82	555.70	10,021.23	0.59	0.06	-0.59
15,743.00	90.42	178.61	6,134.80	-10,099.79	558.01	10,115.19	0.36	0.36	0.03
15,839.00	90.71	178.67	6,133.85	-10,195.76	560.29	10,211.14	0.31	0.30	0.06
15,934.00	91.23	178.19	6,132.24	-10,290.71	562.89	10,306.09	0.74	0.55	-0.51
16,029.00	90.71	179.88	6,130.63	-10,385.68	564.49	10,401.01	1.86	-0.55	1.78
16,124.00	90.52	178.23	6,129.61	-10,480.66	566.06	10,495.94	1.75	-0.20	-1.74
16,219.00	89.67	176.21	6,129.46	-10,575.54	570.66	10,590.93	2.31	-0.89	-2.13
LAST SURVEY - 16219' MD, 6129' TVD									
16,281.18	89.67	176.21	6,129.81	-10,637.59	574.77	10,653.10	0.00	0.00	0.00
~460' X-OVER PNT - 16281.18' MD, 460' FSL, 470' FEL SEC 23									
16,377.00	89.67	176.21	6,130.37	-10,733.19	581.11	10,748.91	0.00	0.00	0.00
EXTRAPOLATION TO TD - 16377' MD, 364' FSL, 463' FEL SEC 23									

Survey Report

Company:	BISON OIL & GAS II	Local Co-ordinate Reference:	Well GROTHEER 5-61 11B-14-23-5
Project:	WELD COUNTY	TVD Reference:	KBE 24' @ 4709.50usft
Site:	SEC 11-T5N-61W	MD Reference:	KBE 24' @ 4709.50usft
Well:	GROTHEER 5-61 11B-14-23-5	North Reference:	True
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEY	Database:	EDT_32Bit_ODBC

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
PBHL- GROTHEER 5-6 - actual wellpath misses target center by 36.83usft at 16377.00usft MD (6130.37 TVD, -10733.19 N, 581.11 E) - Point	0.00	0.00	6,160.00	-10,737.31	559.62	1,384,196.92	3,371,064.69	40.380372°N	104.168017°W
EPI- GROTHEER 5-61 1 - actual wellpath misses target center by 33.52usft at 16280.29usft MD (6129.81 TVD, -10636.70 N, 574.72 E) - Point	0.00	0.00	6,160.00	-10,637.49	560.18	1,384,296.74	3,371,063.76	40.380646°N	104.168015°W
LP- GROTHEER 5-61 1' - actual wellpath misses target center by 26.68usft at 6554.24usft MD (6177.71 TVD, -916.25 N, 561.98 E) - Point	0.00	0.00	6,175.00	-914.40	588.45	1,394,018.77	3,370,946.21	40.407335°N	104.167912°W

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,952.00	1,941.71	-88.86	136.49	SURFACE CSG - 1952' MD, 1942' TVD	
5,655.00	5,615.99	-324.28	516.25	KOP - 5655' MD, 5616' TVD	
6,509.00	6,175.38	-871.16	559.42	HZ LANDING PNT - 6509' MD, 6175' TVD	
6,552.48	6,177.65	-914.50	561.87	~460' X-OVER PNT - 6552.48' MD, 460' FNL, 556' FEL SEC 14	
16,219.00	6,129.46	-10,575.54	570.66	LAST SURVEY - 16219' MD, 6129' TVD	
16,281.18	6,129.81	-10,637.59	574.77	~460' X-OVER PNT - 16281.18' MD, 460' FSL, 470' FEL SEC 23	
16,377.00	6,130.37	-10,733.19	581.11	EXTRAPOLATION TO TD - 16377' MD, 364' FSL, 463' FEL SEC 23	

Checked By: _____	Approved By: _____	Date: _____
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