

# **BISON OIL & GAS II**

**WELD COUNTY**

**SEC 11-T5N-61W**

**GROTHER 5-61 11B-14-23-3**

**OWB**

**Design: FINAL SURVEY**

## **Standard Survey Report**

**15 September, 2022**

PROJECT DETAILS: WELD COUNTY

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Geodetic System: US State Plane 1983  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone: Colorado Northern Zone

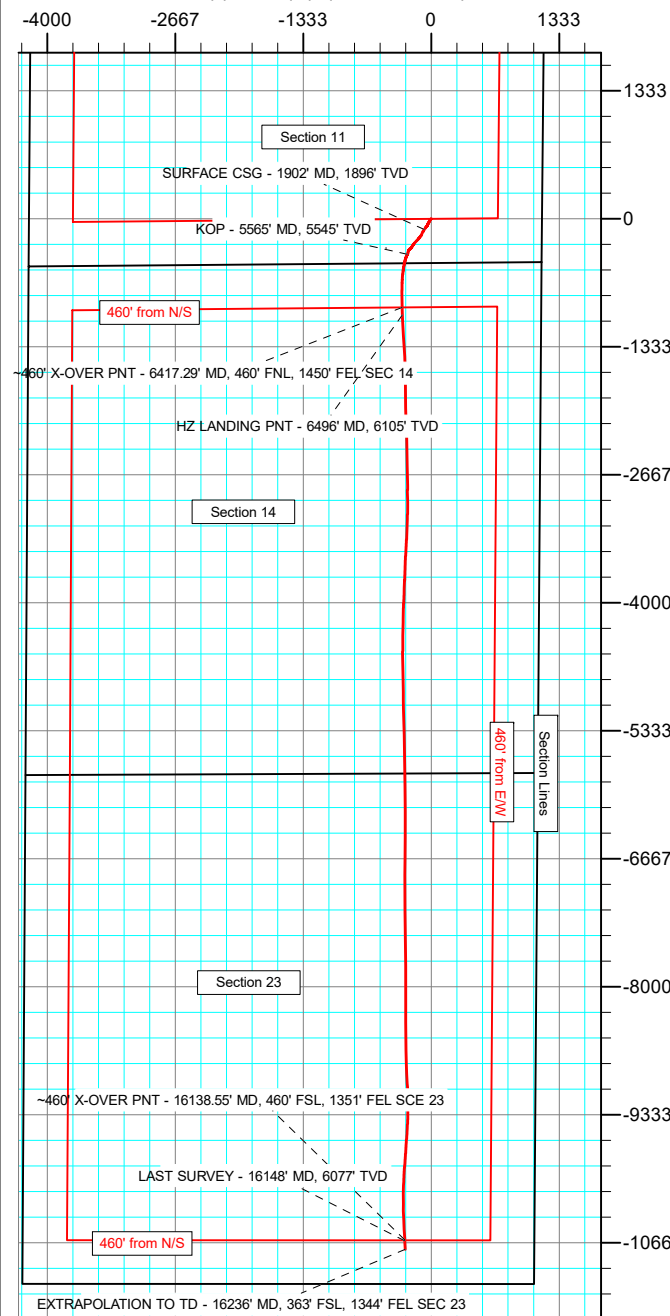
System Datum: Mean Sea Level



Azimuths to True North  
Magnetic North: 7.43°

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

West(-)/East(+) (2000 usft/in)



SHL:  
460' FSL, 1154' FEL  
Sec 11-T5N-R61W

~460' X-OVER PNT:  
460' FNL, 1450' FEL  
Sec 14-T5N-R61W

~460' X-OVER PNT:  
460' FSL, 1351' FEL  
Sec 23-T5N-R61W

BHL:  
363' FSL, 1344' FEL  
Sec 23-T5N-R61W

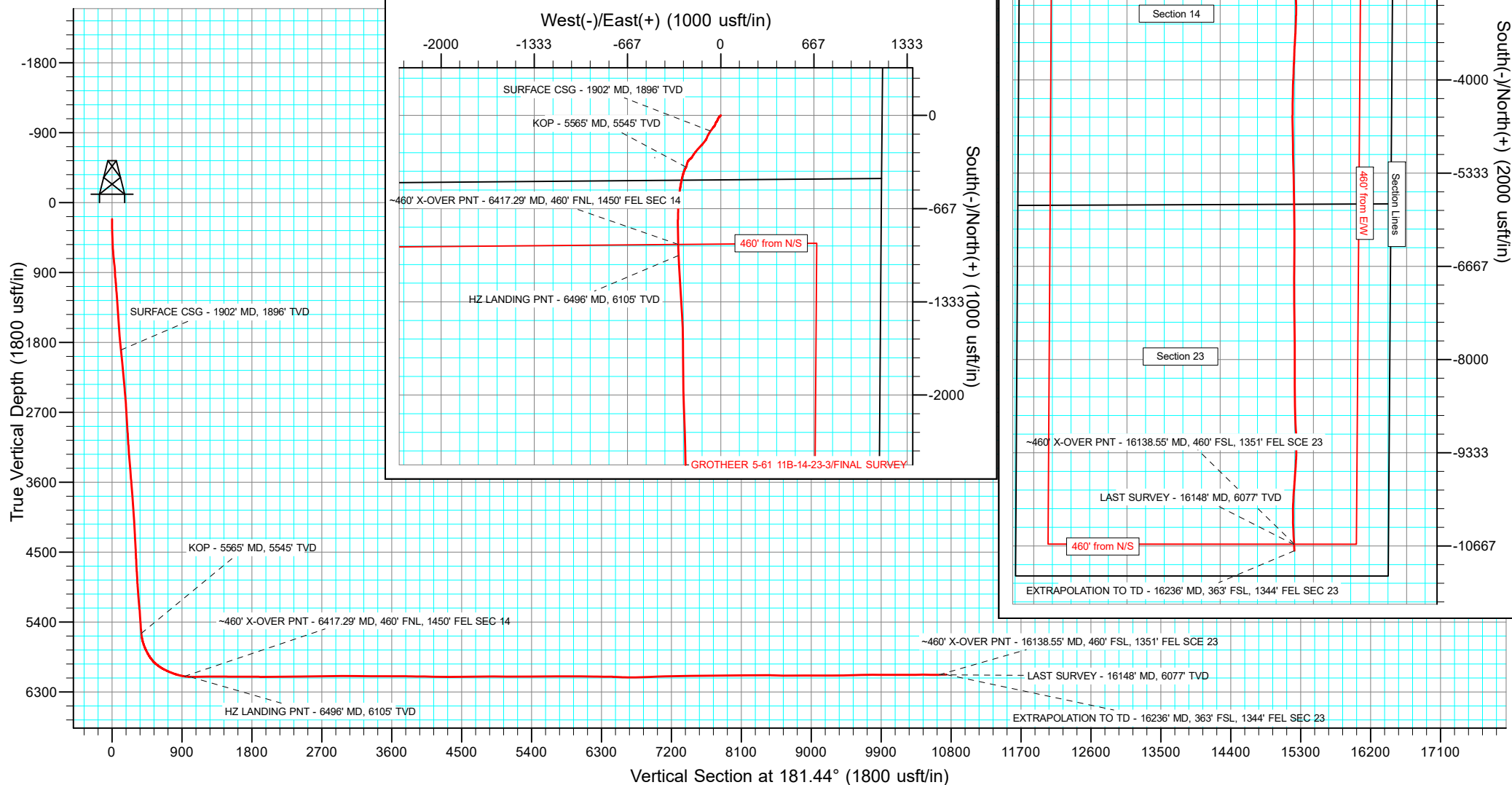
WELL DETAILS: GROTHEER 5-61 11B-14-23-3

+N/-S	+E/-W	Northing	Ground Level: 4686.40	Latitude	Longitude	Slot
0.00	0.00	1394923.79	Easting 3370316.01	40.409845°N	104.170126°W	

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ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
1902.00	6.95	214.82	1895.84	-111.50	-72.76	113.30	136.29	SURFACE CSG - 1902' MD, 1896' TVD
5565.00	6.89	209.86	5544.57	-369.72	-248.62	375.87	454.32	KOP - 5565' MD, 5545' TVD
6417.29	81.39	178.27	6097.67	-922.79	-304.00	930.16	1014.38	460' X-OVER PNT - 6417.29' MD, 460' FNL, 1450' FEL SEC 14
6496.00	87.92	177.70	6104.95	-1001.07	-301.14	1008.34	1092.55	HZ LANDING PNT - 6496' MD, 6105' TVD
16138.55	90.75	176.50	6077.30	-10637.13	-277.06	10640.73	10733.41	460' X-OVER PNT - 16138.55' MD, 460' FSL, 1351' FEL SCE 23
16148.00	90.91	176.27	6077.16	-10646.56	-276.47	10650.14	10742.85	LAST SURVEY - 16148' MD, 6077' TVD
16236.00	90.91	176.27	6075.76	-10734.36	-270.74	10737.77	10830.84	EXTRAPOLATION TO TD - 16236' MD, 363' FSL, 1344' FEL SEC 23



## Survey Report

<b>Company:</b>	BISON OIL & GAS II	<b>Local Co-ordinate Reference:</b>	Well GROTHEER 5-61 11B-14-23-3
<b>Project:</b>	WELD COUNTY	<b>TVD Reference:</b>	KB 24' @ 4710.40usft
<b>Site:</b>	SEC 11-T5N-61W	<b>MD Reference:</b>	KB 24' @ 4710.40usft
<b>Well:</b>	GROTHEER 5-61 11B-14-23-3	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	EDT_32Bit_ODBC

<b>Project</b>	WELD COUNTY		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	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-14-23-3				
Well Position	+N/-S	0.00 usft	Northing:	1,394,923.79 usft	Latitude:	40.409845°N
	+E/-W	0.00 usft	Easting:	3,370,316.01 usft	Longitude:	104.170126°W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	4,686.40 usft

<b>Wellbore</b>	OWB				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2020	6/23/2022	7.43	66.70	51,912.56249812

<b>Design</b>	FINAL SURVEY				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	181.44	

<b>Survey Program</b>	<b>Date</b>	9/15/2022			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
303.00	1,851.00	SURFACE SURVEY (OWB)	MWD	OWSG MWD - Standard	
1,960.00	16,236.00	FINAL SURVEY (OWB)	MWD	OWSG MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
211.00	0.40	13.60	211.00	0.69	0.17	-0.69	0.00	0.00	0.00	
303.00	1.20	224.10	302.99	0.31	-0.42	-0.30	1.69	0.87	-162.50	
377.00	1.50	211.40	376.97	-1.07	-1.47	1.11	0.57	0.41	-17.16	
464.00	2.60	224.80	463.92	-3.45	-3.45	3.53	1.37	1.26	15.40	
551.00	4.40	224.00	550.75	-7.25	-7.16	7.42	2.07	2.07	-0.92	
638.00	5.40	221.10	637.43	-12.73	-12.17	13.03	1.18	1.15	-3.33	
725.00	6.80	209.80	723.94	-20.29	-17.42	20.72	2.11	1.61	-12.99	
812.00	6.70	200.30	810.34	-29.52	-21.74	30.06	1.29	-0.11	-10.92	
900.00	4.40	204.30	897.92	-37.41	-24.91	38.03	2.65	-2.61	4.55	
987.00	4.40	213.50	984.67	-43.23	-28.13	43.93	0.81	0.00	10.57	

## Survey Report

<b>Company:</b>	BISON OIL & GAS II	<b>Local Co-ordinate Reference:</b>	Well GROTHEER 5-61 11B-14-23-3
<b>Project:</b>	WELD COUNTY	<b>TVD Reference:</b>	KB 24' @ 4710.40usft
<b>Site:</b>	SEC 11-T5N-61W	<b>MD Reference:</b>	KB 24' @ 4710.40usft
<b>Well:</b>	GROTHEER 5-61 11B-14-23-3	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	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	5.60	220.10	1,071.33	-49.26	-32.71	50.07	1.53	1.38	7.59
1,161.00	5.30	207.40	1,157.94	-56.08	-37.29	57.00	1.43	-0.34	-14.60
1,249.00	4.40	186.70	1,245.63	-63.04	-39.55	64.02	2.22	-1.02	-23.52
1,336.00	3.90	201.40	1,332.41	-69.11	-41.02	70.12	1.35	-0.57	16.90
1,423.00	4.40	215.60	1,419.18	-74.58	-44.04	75.66	1.31	0.57	16.32
1,510.00	5.40	226.60	1,505.86	-80.10	-48.96	81.31	1.57	1.15	12.64
1,597.00	4.70	218.60	1,592.53	-85.70	-54.16	87.04	1.14	-0.80	-9.20
1,685.00	5.40	215.60	1,680.19	-91.89	-58.82	93.34	0.85	0.80	-3.41
1,772.00	6.20	215.50	1,766.74	-99.04	-63.93	100.62	0.92	0.92	-0.11
1,851.00	7.00	215.40	1,845.22	-106.44	-69.20	108.15	1.01	1.01	-0.13
1,902.00	6.95	214.82	1,895.84	-111.50	-72.76	113.30	0.17	-0.10	-1.13
SURFACE CSG - 1902' MD, 1896' TVD									
1,960.00	6.89	214.16	1,953.42	-117.26	-76.72	119.16	0.17	-0.10	-1.15
2,055.00	6.61	210.73	2,047.76	-126.68	-82.71	128.72	0.52	-0.29	-3.61
2,150.00	5.99	208.84	2,142.18	-135.72	-87.89	137.89	0.69	-0.65	-1.99
2,245.00	5.76	204.58	2,236.68	-144.40	-92.27	146.68	0.52	-0.24	-4.48
2,340.00	5.59	204.25	2,331.22	-152.95	-96.15	155.33	0.18	-0.18	-0.35
2,434.00	5.31	203.42	2,424.79	-161.12	-99.76	163.58	0.31	-0.30	-0.88
2,529.00	5.18	204.28	2,519.40	-169.06	-103.27	171.61	0.16	-0.14	0.91
2,624.00	4.23	218.98	2,614.08	-175.69	-107.24	178.34	1.61	-1.00	15.47
2,719.00	4.12	216.55	2,708.83	-181.16	-111.48	183.91	0.22	-0.12	-2.56
2,910.00	4.77	221.16	2,899.25	-192.65	-120.79	195.63	0.39	0.34	2.41
3,005.00	4.41	218.76	2,993.95	-198.47	-125.67	201.58	0.43	-0.38	-2.53
3,124.00	4.16	214.98	3,112.61	-205.57	-131.01	208.81	0.32	-0.21	-3.18
3,219.00	6.10	223.72	3,207.23	-212.05	-136.48	215.42	2.20	2.04	9.20
3,313.00	5.84	224.02	3,300.72	-219.09	-143.25	222.64	0.28	-0.28	0.32
3,408.00	6.09	221.90	3,395.21	-226.32	-149.98	230.03	0.35	0.26	-2.23
3,504.00	6.24	223.41	3,490.65	-233.90	-156.96	237.78	0.23	0.16	1.57
3,599.00	6.12	221.64	3,585.10	-241.44	-163.88	245.49	0.24	-0.13	-1.86
3,694.00	5.91	219.87	3,679.58	-248.97	-170.38	253.19	0.29	-0.22	-1.86
3,789.00	5.67	220.71	3,774.09	-256.29	-176.57	260.66	0.27	-0.25	0.88
3,883.00	4.86	217.52	3,867.69	-262.96	-182.03	267.47	0.92	-0.86	-3.39
3,979.00	4.68	214.49	3,963.36	-269.42	-186.72	274.04	0.32	-0.19	-3.16
4,074.00	4.50	217.07	4,058.06	-275.59	-191.16	280.32	0.29	-0.19	2.72
4,169.00	3.79	211.71	4,152.81	-281.23	-195.06	286.06	0.85	-0.75	-5.64
4,263.00	3.71	218.83	4,246.61	-286.24	-198.60	291.16	0.50	-0.09	7.57
4,358.00	3.52	201.46	4,341.42	-291.35	-201.59	296.34	1.17	-0.20	-18.28
4,453.00	3.27	209.65	4,436.26	-296.42	-204.00	301.47	0.57	-0.26	8.62
4,547.00	2.76	207.09	4,530.13	-300.76	-206.36	305.87	0.56	-0.54	-2.72
4,642.00	4.30	233.63	4,624.95	-304.91	-210.27	310.12	2.32	1.62	27.94
4,737.00	6.32	235.12	4,719.54	-310.02	-217.42	315.40	2.13	2.13	1.57
4,833.00	4.72	227.88	4,815.09	-315.69	-224.69	321.25	1.81	-1.67	-7.54
4,928.00	3.55	215.63	4,909.84	-320.70	-229.30	326.38	1.54	-1.23	-12.89

# Survey Report

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<b>Project:</b>	WELD COUNTY	<b>TVD Reference:</b>	KB 24' @ 4710.40usft
<b>Site:</b>	SEC 11-T5N-61W	<b>MD Reference:</b>	KB 24' @ 4710.40usft
<b>Well:</b>	GROTHEER 5-61 11B-14-23-3	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	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)
5,023.00	5.52	214.55	5,004.54	-326.85	-233.61	332.64	2.08	2.07	-1.14
5,118.00	5.38	199.10	5,099.11	-334.83	-237.66	340.71	1.55	-0.15	-16.26
5,213.00	4.90	196.60	5,193.73	-342.92	-240.27	348.87	0.56	-0.51	-2.63
5,308.00	4.40	192.45	5,288.42	-350.37	-242.22	356.37	0.63	-0.53	-4.37
5,403.00	3.98	187.44	5,383.17	-357.20	-243.43	363.22	0.59	-0.44	-5.27
5,497.00	4.51	205.46	5,476.91	-363.77	-245.44	369.84	1.52	0.56	19.17
5,565.00	6.89	209.86	5,544.57	-369.72	-248.62	375.87	3.55	3.50	6.47
KOP - 5565' MD, 5545' TVD									
5,592.00	7.84	210.87	5,571.35	-372.71	-250.37	378.90	3.55	3.52	3.73
5,687.00	18.01	202.87	5,663.83	-391.85	-259.43	398.27	10.84	10.71	-8.42
5,782.00	25.44	195.24	5,752.03	-425.12	-270.52	431.81	8.35	7.82	-8.03
5,877.00	32.14	192.15	5,835.25	-469.57	-281.21	476.51	7.22	7.05	-3.25
5,971.00	44.05	188.55	5,909.10	-526.54	-291.37	533.72	12.88	12.67	-3.83
6,067.00	55.38	184.94	5,971.08	-599.14	-299.76	606.51	12.14	11.80	-3.76
6,161.00	64.11	182.00	6,018.41	-680.11	-304.58	687.57	9.67	9.29	-3.13
6,256.00	69.28	180.04	6,055.98	-767.31	-306.10	774.78	5.76	5.44	-2.06
6,351.00	75.73	179.16	6,084.53	-857.86	-305.46	865.29	6.85	6.79	-0.93
6,417.29	81.39	178.27	6,097.67	-922.79	-304.00	930.16	8.64	8.54	-1.34
~460' X-OVER PNT - 6417.29' MD, 460' FNL, 1450' FEL SEC 14									
6,445.00	83.76	177.91	6,101.25	-950.25	-303.08	957.59	8.64	8.54	-1.31
6,496.00	87.92	177.70	6,104.95	-1,001.07	-301.14	1,008.34	8.17	8.16	-0.41
HZ LANDING PNT - 6496' MD, 6105' TVD									
6,540.00	91.51	177.52	6,105.17	-1,045.02	-299.30	1,052.24	8.17	8.16	-0.41
6,635.00	91.05	176.61	6,103.04	-1,139.87	-294.44	1,146.93	1.07	-0.48	-0.96
6,729.00	90.17	176.43	6,102.04	-1,233.69	-288.73	1,240.58	0.96	-0.94	-0.19
6,825.00	91.29	176.04	6,100.82	-1,329.48	-282.43	1,336.17	1.24	1.17	-0.41
6,920.00	88.50	176.23	6,101.00	-1,424.25	-276.03	1,430.76	2.94	-2.94	0.20
7,015.00	88.94	178.83	6,103.12	-1,519.13	-271.93	1,525.50	2.78	0.46	2.74
7,110.00	90.38	179.75	6,103.68	-1,614.12	-270.76	1,620.43	1.80	1.52	0.97
7,204.00	91.22	179.37	6,102.37	-1,708.10	-270.04	1,714.37	0.98	0.89	-0.40
7,299.00	88.81	179.18	6,102.34	-1,803.09	-268.83	1,809.30	2.54	-2.54	-0.20
7,394.00	89.15	179.44	6,104.04	-1,898.07	-267.69	1,904.21	0.45	0.36	0.27
7,489.00	89.82	178.78	6,104.89	-1,993.05	-266.21	1,999.13	0.99	0.71	-0.69
7,584.00	90.58	178.10	6,104.56	-2,088.01	-263.63	2,094.00	1.07	0.80	-0.72
7,678.00	91.81	177.53	6,102.60	-2,181.92	-260.05	2,187.79	1.44	1.31	-0.61
7,774.00	89.54	178.53	6,101.47	-2,277.85	-256.75	2,283.60	2.58	-2.36	1.04
7,868.00	91.06	178.90	6,100.97	-2,371.82	-254.64	2,377.49	1.66	1.62	0.39
7,963.00	92.23	178.77	6,098.25	-2,466.76	-252.71	2,472.35	1.24	1.23	-0.14
8,059.00	89.29	178.96	6,096.97	-2,562.73	-250.81	2,568.24	3.07	-3.06	0.20
8,154.00	90.06	178.81	6,097.51	-2,657.71	-248.96	2,663.14	0.83	0.81	-0.16
8,249.00	91.87	179.79	6,095.91	-2,752.68	-247.80	2,758.05	2.17	1.91	1.03
8,344.00	89.87	180.78	6,094.47	-2,847.66	-248.27	2,853.02	2.35	-2.11	1.04
8,438.00	90.25	178.64	6,094.37	-2,941.66	-247.79	2,946.97	2.31	0.40	-2.28
8,532.00	89.01	180.65	6,094.98	-3,035.65	-247.21	3,040.91	2.51	-1.32	2.14

## Survey Report

<b>Company:</b>	BISON OIL & GAS II	<b>Local Co-ordinate Reference:</b>	Well GROTHEER 5-61 11B-14-23-3
<b>Project:</b>	WELD COUNTY	<b>TVD Reference:</b>	KB 24' @ 4710.40usft
<b>Site:</b>	SEC 11-T5N-61W	<b>MD Reference:</b>	KB 24' @ 4710.40usft
<b>Well:</b>	GROTHEER 5-61 11B-14-23-3	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	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	91.04	182.35	6,094.94	-3,129.60	-249.67	3,134.90	2.82	2.16	1.81	
8,721.00	88.88	182.25	6,095.00	-3,224.52	-253.48	3,229.89	2.28	-2.27	-0.11	
8,815.00	89.48	182.25	6,096.35	-3,318.44	-257.17	3,323.87	0.64	0.64	0.00	
8,909.00	90.99	183.33	6,095.96	-3,412.32	-261.75	3,417.84	1.97	1.61	1.15	
9,003.00	89.20	183.55	6,095.81	-3,506.15	-267.39	3,511.78	1.92	-1.90	0.23	
9,098.00	89.57	181.86	6,096.83	-3,601.04	-271.87	3,606.75	1.82	0.39	-1.78	
9,193.00	90.99	182.35	6,096.36	-3,695.97	-275.36	3,701.74	1.58	1.49	0.52	
9,287.00	88.41	182.00	6,096.86	-3,789.89	-278.93	3,795.72	2.77	-2.74	-0.37	
9,382.00	88.91	182.08	6,099.08	-3,884.80	-282.31	3,890.69	0.53	0.53	0.08	
9,477.00	91.07	183.21	6,099.09	-3,979.70	-286.69	3,985.66	2.57	2.27	1.19	
9,572.00	88.04	181.40	6,099.83	-4,074.60	-290.51	4,080.63	3.72	-3.19	-1.91	
9,668.00	88.48	181.38	6,102.75	-4,170.53	-292.84	4,176.59	0.46	0.46	-0.02	
9,763.00	88.64	180.85	6,105.13	-4,265.48	-294.69	4,271.55	0.58	0.17	-0.56	
9,857.00	89.46	180.84	6,106.69	-4,359.46	-296.08	4,365.53	0.87	0.87	-0.01	
9,951.00	90.85	180.79	6,106.44	-4,453.44	-297.41	4,459.53	1.48	1.48	-0.05	
10,047.00	92.11	180.23	6,103.96	-4,549.41	-298.27	4,555.48	1.44	1.31	-0.58	
10,142.00	90.39	178.64	6,101.89	-4,644.37	-297.33	4,650.39	2.47	-1.81	-1.67	
10,237.00	91.48	178.63	6,100.34	-4,739.33	-295.07	4,745.26	1.15	1.15	-0.01	
10,332.00	90.61	178.89	6,098.60	-4,834.29	-293.01	4,840.14	0.96	-0.92	0.27	
10,426.00	88.27	179.34	6,099.52	-4,928.27	-291.56	4,934.05	2.53	-2.49	0.48	
10,520.00	88.73	179.11	6,101.98	-5,022.23	-290.29	5,027.95	0.55	0.49	-0.24	
10,615.00	90.43	179.17	6,102.68	-5,117.21	-288.86	5,122.87	1.79	1.79	0.06	
10,710.00	92.18	178.51	6,100.52	-5,212.16	-286.94	5,217.74	1.97	1.84	-0.69	
10,805.00	89.25	177.92	6,099.33	-5,307.10	-283.98	5,312.57	3.15	-3.08	-0.62	
10,901.00	90.79	178.57	6,099.30	-5,403.05	-281.04	5,408.42	1.74	1.60	0.68	
10,996.00	90.18	179.63	6,098.49	-5,498.03	-279.55	5,503.33	1.29	-0.64	1.12	
11,091.00	91.29	179.65	6,097.27	-5,593.02	-278.95	5,598.28	1.17	1.17	0.02	
11,186.00	88.54	178.82	6,097.41	-5,688.00	-277.68	5,693.20	3.02	-2.89	-0.87	
11,280.00	89.88	178.99	6,098.71	-5,781.98	-275.89	5,787.09	1.44	1.43	0.18	
11,375.00	91.11	179.34	6,097.89	-5,876.96	-274.50	5,882.01	1.35	1.29	0.37	
11,470.00	88.99	179.39	6,097.81	-5,971.95	-273.45	5,976.94	2.23	-2.23	0.05	
11,565.00	89.15	178.22	6,099.35	-6,066.91	-271.47	6,071.83	1.24	0.17	-1.23	
11,660.00	89.10	180.76	6,100.80	-6,161.89	-270.63	6,166.76	2.67	-0.05	2.67	
11,755.00	89.24	180.19	6,102.18	-6,256.88	-271.41	6,261.73	0.62	0.15	-0.60	
11,850.00	90.36	179.77	6,102.51	-6,351.87	-271.38	6,356.70	1.26	1.18	-0.44	
11,945.00	87.41	180.52	6,104.36	-6,446.85	-271.62	6,451.64	3.20	-3.11	0.79	
12,040.00	87.30	180.71	6,108.74	-6,541.74	-272.64	6,546.53	0.23	-0.12	0.20	
12,135.00	89.15	180.60	6,111.68	-6,636.68	-273.72	6,641.47	1.95	1.95	-0.12	
12,230.00	90.59	180.31	6,111.90	-6,731.68	-274.48	6,736.46	1.55	1.52	-0.31	
12,420.00	93.57	179.82	6,105.00	-6,921.53	-274.69	6,926.26	1.59	1.57	-0.26	
12,515.00	91.19	180.06	6,101.06	-7,016.44	-274.59	7,021.13	2.52	-2.51	0.25	
12,610.00	91.94	179.26	6,098.46	-7,111.40	-274.03	7,116.05	1.15	0.79	-0.84	
12,705.00	90.47	179.89	6,096.47	-7,206.38	-273.33	7,210.98	1.68	-1.55	0.66	

# Survey Report

<b>Company:</b>	BISON OIL & GAS II	<b>Local Co-ordinate Reference:</b>	Well GROTHEER 5-61 11B-14-23-3
<b>Project:</b>	WELD COUNTY	<b>TVD Reference:</b>	KB 24' @ 4710.40usft
<b>Site:</b>	SEC 11-T5N-61W	<b>MD Reference:</b>	KB 24' @ 4710.40usft
<b>Well:</b>	GROTHEER 5-61 11B-14-23-3	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	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)	
12,800.00	92.09	180.27	6,094.34	-7,301.35	-273.46	7,305.92	1.75	1.71	0.40	
12,895.00	89.68	179.42	6,092.88	-7,396.33	-273.20	7,400.87	2.69	-2.54	-0.89	
13,085.00	91.37	178.25	6,091.14	-7,586.27	-269.34	7,590.65	1.08	0.89	-0.62	
13,180.00	90.58	180.22	6,089.52	-7,681.24	-268.07	7,685.56	2.23	-0.83	2.07	
13,273.00	92.01	179.46	6,087.42	-7,774.22	-267.81	7,778.50	1.74	1.54	-0.82	
13,368.00	89.39	180.48	6,086.26	-7,869.20	-267.76	7,873.45	2.96	-2.76	1.07	
13,463.00	90.06	179.65	6,086.71	-7,964.20	-267.87	7,968.42	1.12	0.71	-0.87	
13,558.00	91.51	179.11	6,085.41	-8,059.18	-266.84	8,063.35	1.63	1.53	-0.57	
13,653.00	89.17	180.45	6,084.85	-8,154.17	-266.48	8,158.30	2.84	-2.46	1.41	
13,748.00	90.44	180.21	6,085.17	-8,249.16	-267.03	8,253.27	1.36	1.34	-0.25	
13,843.00	92.00	179.76	6,083.15	-8,344.14	-267.00	8,348.22	1.71	1.64	-0.47	
13,937.00	88.08	179.91	6,083.08	-8,438.12	-266.73	8,442.16	4.17	-4.17	0.16	
14,032.00	88.46	179.20	6,085.95	-8,533.07	-265.99	8,537.07	0.85	0.40	-0.75	
14,127.00	89.15	178.42	6,087.93	-8,628.03	-264.02	8,631.95	1.10	0.73	-0.82	
14,222.00	90.80	178.07	6,087.97	-8,722.98	-261.11	8,726.79	1.78	1.74	-0.37	
14,317.00	90.03	178.84	6,087.29	-8,817.95	-258.55	8,821.66	1.15	-0.81	0.81	
14,412.00	90.37	178.50	6,086.95	-8,912.92	-256.34	8,916.55	0.51	0.36	-0.36	
14,508.00	89.80	175.00	6,086.81	-9,008.75	-250.90	9,012.21	3.69	-0.59	-3.65	
14,603.00	89.92	178.09	6,087.04	-9,103.56	-245.18	9,106.85	3.26	0.13	3.25	
14,698.00	89.99	181.09	6,087.12	-9,198.55	-244.50	9,201.79	3.16	0.07	3.16	
14,793.00	89.38	179.24	6,087.64	-9,293.54	-244.77	9,296.76	2.05	-0.64	-1.95	
14,889.00	92.12	182.39	6,086.38	-9,389.51	-246.14	9,392.73	4.35	2.85	3.28	
14,984.00	92.10	183.34	6,082.89	-9,484.32	-250.88	9,487.63	1.00	-0.02	1.00	
15,079.00	90.54	184.57	6,080.70	-9,579.07	-257.43	9,582.51	2.09	-1.64	1.29	
15,174.00	91.75	183.39	6,078.80	-9,673.81	-264.02	9,677.40	1.78	1.27	-1.24	
15,269.00	89.56	183.74	6,077.71	-9,768.62	-269.93	9,772.32	2.33	-2.31	0.37	
15,364.00	90.99	185.28	6,077.26	-9,863.32	-277.40	9,867.18	2.21	1.51	1.62	
15,459.00	89.01	183.03	6,077.26	-9,958.06	-284.28	9,962.06	3.15	-2.08	-2.37	
15,554.00	89.85	182.18	6,078.20	-10,052.95	-288.60	10,057.03	1.26	0.88	-0.89	
15,648.00	89.87	180.31	6,078.43	-10,146.93	-290.64	10,151.03	1.99	0.02	-1.99	
15,743.00	90.12	179.84	6,078.44	-10,241.93	-290.77	10,246.00	0.56	0.26	-0.49	
15,838.00	91.34	179.51	6,077.23	-10,336.91	-290.23	10,340.95	1.33	1.28	-0.35	
15,933.00	89.49	177.78	6,076.54	-10,431.88	-287.98	10,435.82	2.67	-1.95	-1.82	
16,028.00	89.46	176.63	6,077.41	-10,526.76	-283.35	10,530.56	1.21	-0.03	-1.21	
16,123.00	90.48	176.87	6,077.46	-10,621.60	-277.96	10,625.24	1.10	1.07	0.25	
16,138.55	90.75	176.50	6,077.30	-10,637.13	-277.06	10,640.73	2.95	1.72	-2.40	
~460' X-OVER PNT - 16138.55' MD, 460' FSL, 1351' FEL SCE 23										
16,148.00	90.91	176.27	6,077.16	-10,646.56	-276.47	10,650.14	2.95	1.72	-2.40	
LAST SURVEY - 16148' MD, 6077' TVD										
16,236.00	90.91	176.27	6,075.76	-10,734.36	-270.74	10,737.77	0.00	0.00	0.00	
EXTRAPOLATION TO TD - 16236' MD, 363' FSL, 1344' FEL SEC 23										

## Survey Report

<b>Company:</b>	BISON OIL & GAS II	<b>Local Co-ordinate Reference:</b>	Well GROTHEER 5-61 11B-14-23-3
<b>Project:</b>	WELD COUNTY	<b>TVD Reference:</b>	KB 24' @ 4710.40usft
<b>Site:</b>	SEC 11-T5N-61W	<b>MD Reference:</b>	KB 24' @ 4710.40usft
<b>Well:</b>	GROTHEER 5-61 11B-14-23-3	<b>North Reference:</b>	True
<b>Wellbore:</b>	OWB	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	FINAL SURVEY	<b>Database:</b>	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 5-61 - actual wellpath misses target center by 18.93usft at 16236.00usft MD (6075.76 TVD, -10734.36 N, -270.74 E) - Point	0.00	0.00	6,065.00	-10,736.95	-286.10	1,384,184.18	3,370,190.96	40.380373°N	104.171153°W
EPI- GROTHEER 5-61 1 - actual wellpath misses target center by 14.93usft at 16138.19usft MD (6077.30 TVD, -10636.77 N, -277.09 E) - Point	0.00	0.00	6,065.00	-10,637.13	-285.54	1,384,283.99	3,370,190.03	40.380647°N	104.171151°W
LP- GROTHEER 5-61 1' - actual wellpath misses target center by 31.62usft at 6419.26usft MD (6097.96 TVD, -924.73 N, -303.94 E) - Point	0.00	0.00	6,105.00	-922.79	-273.18	1,393,997.04	3,370,056.71	40.407312°N	104.171107°W

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,902.00	1,895.84	-111.50	-72.76	SURFACE CSG - 1902' MD, 1896' TVD
5,565.00	5,544.57	-369.72	-248.62	KOP - 5565' MD, 5545' TVD
6,417.29	6,097.67	-922.79	-304.00	~460' X-OVER PNT - 6417.29' MD, 460' FNL, 1450' FEL SEC 14
6,496.00	6,104.95	-1,001.07	-301.14	HZ LANDING PNT - 6496' MD, 6105' TVD
16,138.55	6,077.30	-10,637.13	-277.06	~460' X-OVER PNT - 16138.55' MD, 460' FSL, 1351' FEL SCE 23
16,148.00	6,077.16	-10,646.56	-276.47	LAST SURVEY - 16148' MD, 6077' TVD
16,236.00	6,075.76	-10,734.36	-270.74	EXTRAPOLATION TO TD - 16236' MD, 363' FSL, 1344' FEL SEC 23

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_