



PERCUSSION
PETROLEUM
LLC

NM OIL CONSERVATION
ARTESIA DISTRICT

JUN 03 2018

RECEIVED

Percussion Petroleum, LLC

Eddy County, NM

Morris Boyd State Com

4H

30-015-44741

OH

Design: OH

Standard Survey Report

03 April, 2018

WELLBENDERS
DIRECTIONAL SERVICES LLC





Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Site: Morris Boyd State Com
Well: 4H
Wellbore: OH
Rig: Silver Oak 1
Design: Plan #5 / 8:12, April 03 2018

PROJECT DETAILS: Eddy County, NM
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level



TOTAL CORRECTION
Magnetic North is 7.38° East of Grid North (Magnetic Convergence)

WELL DETAILS: 4H

RKB=17' @ 3448.00usft (Silver Oak 1)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	596794.20	502668.80	32.640573	-104.458957

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSec
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1300.00	0.00	360.00	1300.00	0.00	0.00	0.00	0.00
3	1567.61	9.35	217.82	1568.43	-17.21	-13.36	3.49	17.22
4	2132.81	9.35	217.62	2124.12	-69.73	-69.65	0.00	65.60
5	2956.34	89.73	180.06	2621.00	-685.20	-120.10	10.00	655.33
6	5051.93	89.73	180.06	2630.88	-2760.78	-122.29	0.00	2750.89
7	5075.85	90.20	180.06	2630.89	-2774.48	-122.32	2.00	2774.61
8	8175.39	90.20	180.06	2619.83	-5874.20	-125.30	0.00	5874.33

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

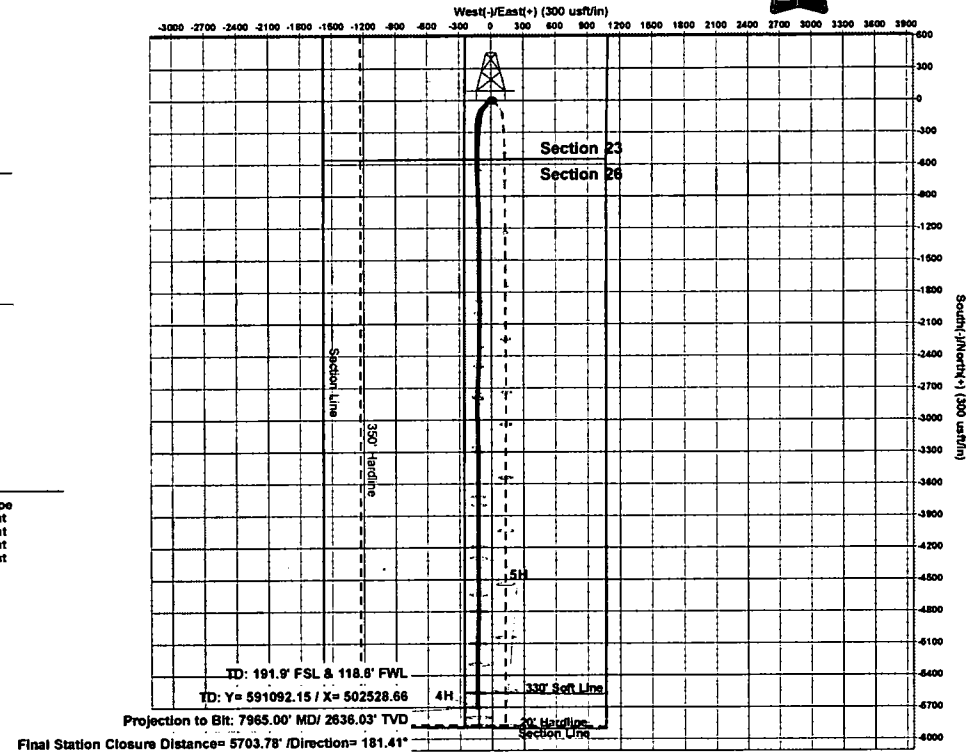
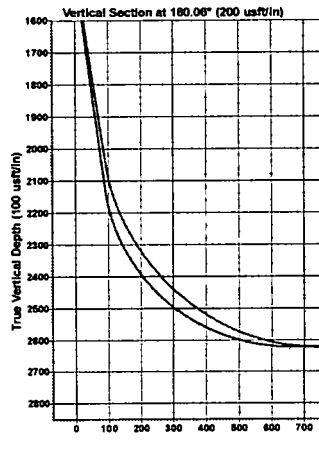
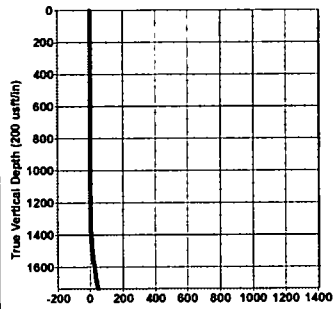
Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
Morris Boyd St Com #4H: BHL	2619.83	-5874.20	-125.30	590020.00	502543.50	Point
Morris Boyd St Com #4H: FTP	2621.00	-655.20	-120.10	596139.00	502548.70	Point
Morris Boyd St Com #4H: LTP	2621.00	-5564.20	-125.00	591230.00	502543.80	Point
Morris Boyd St Com #4H: IP1	2631.00	-2750.76	-122.29	594043.44	502546.51	Point



Azimuths to Grid North
True North: 0.07°
Magnetic North: 7.38°

Magnetic Field
Strength: 48010.2snT
Dip Angle: 60.29°
Date: 3/23/2018
Model: IGRF2015

Disclaimer:
All Plot Details, Boundary Lines and offset well location/ survey data is provided by customer and subject to customer approval.



Projection to Bit: 7965.00' MD/ 2636.03' TVD
Final Station Closure Distance= 5703.78' /Direction= 181.41°

Final Station Closure Distance= 5703.78' /Direction= 181.41°

TD: 191.9' FSL & 118.8' FWL

TD: Y= 591092.15 / X= 502528.66

Projection to Bit: 7965.00' MD/ 2636.03' TVD

Plan: Plan #5 (4H/OH) Silver Oak 1

Created By: Daniel Benn Date: 8:12, April 03 2018



Wellbenders Survey Report



Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Site: Morris Boyd State Com
Well: 4H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well 4H
TVD Reference: RKB=17' @ 3448.00usft (Silver Oak 1)
MD Reference: RKB=17' @ 3448.00usft (Silver Oak 1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WBDS_SQL_2

Project	Eddy County, NM		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Morris Boyd State Com			
Site Position:		Northing:	596,686.20 usft	Latitude: 32.640272
From:	Map	Easting:	501,469.20 usft	Longitude: -104.462854
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in	Grid Convergence: -0.07 °

Well	4H			
Well Position	+N/-S	0.00 usft	Northing:	596,794.20 usft
	+E/-W	0.00 usft	Easting:	502,668.80 usft
Position Uncertainty	0.00 usft		Wellhead Elevation:	usft
			Ground Level:	3,431.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/23/2018	7.31	60.29	48,010.15130857

Design	OH				
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	180.06	

Survey Program	Date 4/3/2018				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
83.00	1,231.00	Survey #1 (OH)	GYRO-NS	OWSG Gyrocompass Gyro	
1,356.00	7,965.00	Survey #2 (OH)	MWD+IGRF	OWSG MWD + IGRF or WMM	

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
83.00	0.05	358.00	83.00	0.04	0.00	-0.04	0.06	0.06	0.00
175.00	0.15	178.12	175.00	-0.04	0.00	0.04	0.22	0.11	-195.52
267.00	0.05	81.96	267.00	-0.16	0.04	0.16	0.18	-0.11	-104.52
358.00	0.28	204.52	358.00	-0.36	-0.01	0.36	0.34	0.25	134.68
450.00	0.46	268.59	450.00	-0.57	-0.47	0.57	0.46	0.20	69.64
541.00	0.53	260.27	540.99	-0.65	-1.25	0.65	0.11	0.08	-9.14
632.00	0.77	259.18	631.99	-0.84	-2.27	0.84	0.26	0.26	-1.20
724.00	0.89	262.49	723.98	-1.04	-3.58	1.05	0.14	0.13	3.60
816.00	0.88	258.88	815.97	-1.27	-4.98	1.28	0.06	-0.01	-3.92



Wellbenders Survey Report



Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Site: Morris Boyd State Com
Well: 4H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well 4H
TVD Reference: RKB=17' @ 3448.00usft (Silver Oak 1)
MD Reference: RKB=17' @ 3448.00usft (Silver Oak 1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WBDS_SQL_2

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)
908.00	0.73	272.56	907.96	-1.38	-6.26	1.39	0.26	-0.16	14.87
999.00	0.96	277.18	998.95	-1.26	-7.60	1.27	0.26	0.25	5.08
1,092.00	1.09	267.90	1,091.93	-1.20	-9.25	1.21	0.23	0.14	-9.98
1,185.00	0.84	267.91	1,184.92	-1.26	-10.82	1.27	0.27	-0.27	0.01
1,231.00	0.87	270.03	1,230.92	-1.27	-11.51	1.28	0.09	0.07	4.61
1,356.00	3.40	243.10	1,355.82	-2.94	-15.76	2.96	2.12	2.02	-21.54
1,450.00	6.70	229.70	1,449.45	-7.75	-22.43	7.78	3.70	3.51	-14.26
1,544.00	10.30	221.60	1,542.40	-17.59	-32.20	17.62	4.03	3.83	-8.62
1,638.00	10.90	220.10	1,634.80	-30.67	-43.50	30.72	0.70	0.64	-1.60
1,731.00	10.70	219.60	1,726.15	-44.05	-54.67	44.11	0.24	-0.22	-0.54
1,826.00	10.80	220.30	1,819.48	-57.63	-66.05	57.70	0.17	0.11	0.74
1,921.00	10.80	219.70	1,912.80	-71.27	-77.49	71.35	0.12	0.00	-0.63
2,016.00	10.60	218.80	2,006.15	-84.93	-88.65	85.02	0.27	-0.21	-0.95
2,110.00	13.90	210.10	2,098.00	-101.44	-99.73	101.54	4.01	3.51	-9.26
2,157.00	19.70	206.00	2,142.98	-113.45	-106.04	113.56	12.59	12.34	-8.72
2,204.00	22.90	203.50	2,186.76	-128.96	-113.16	129.08	7.08	6.81	-5.32
2,250.00	26.40	197.90	2,228.57	-146.91	-119.88	147.04	9.14	7.61	-12.17
2,297.00	29.90	192.30	2,270.01	-168.31	-125.59	168.44	9.32	7.45	-11.91
2,344.00	33.80	187.30	2,309.94	-192.74	-129.75	192.87	10.01	8.30	-10.64
2,392.00	36.60	182.90	2,349.16	-220.28	-132.17	220.42	7.87	5.83	-9.17
2,439.00	40.80	181.60	2,385.83	-249.64	-133.31	249.78	9.10	8.94	-2.77
2,486.00	44.00	179.40	2,420.54	-281.32	-133.56	281.46	7.50	6.81	-4.68
2,532.00	48.00	178.90	2,452.49	-314.40	-133.07	314.54	8.73	8.70	-1.09
2,579.00	51.50	179.50	2,482.85	-350.26	-132.57	350.40	7.51	7.45	1.28
2,625.00	55.50	180.60	2,510.21	-387.23	-132.61	387.37	8.91	8.70	2.39
2,672.00	58.60	181.80	2,535.77	-426.66	-133.45	426.79	6.93	6.60	2.55
2,718.00	63.40	180.80	2,558.06	-466.87	-134.35	467.01	10.61	10.43	-2.17
2,765.00	68.80	179.50	2,577.10	-509.82	-134.45	509.96	11.76	11.49	-2.77
2,812.00	72.40	179.60	2,592.71	-554.14	-134.11	554.28	7.66	7.66	0.21
2,859.00	75.80	179.70	2,605.58	-599.34	-133.83	599.47	7.24	7.23	0.21
2,906.00	82.10	178.80	2,614.59	-645.44	-133.22	645.58	13.54	13.40	-1.91
2,953.00	86.70	178.10	2,619.17	-692.18	-131.96	692.32	9.90	9.79	-1.49
2,999.00	89.20	177.50	2,620.82	-738.11	-130.19	738.25	5.59	5.43	-1.30
3,046.00	89.80	177.70	2,621.23	-785.07	-128.22	785.21	1.35	1.28	0.43
3,138.00	91.20	177.50	2,620.42	-876.98	-124.37	877.11	1.54	1.52	-0.22
3,230.00	88.90	178.50	2,620.34	-968.92	-121.16	969.05	2.73	-2.50	1.09
3,321.00	89.90	179.00	2,621.30	-1,059.89	-119.18	1,060.02	1.23	1.10	0.55
3,413.00	91.30	178.90	2,620.33	-1,151.87	-117.49	1,151.99	1.53	1.52	-0.11
3,504.00	87.70	179.30	2,621.13	-1,242.84	-116.06	1,242.96	3.98	-3.96	0.44
3,595.00	87.70	179.70	2,624.78	-1,333.76	-115.27	1,333.88	0.44	0.00	0.44
3,687.00	88.80	179.80	2,627.59	-1,425.72	-114.87	1,425.84	1.20	1.20	0.11
3,778.00	90.00	180.00	2,628.54	-1,516.71	-114.71	1,516.83	1.34	1.32	0.22
3,871.00	90.80	180.00	2,627.89	-1,609.71	-114.71	1,609.83	0.86	0.86	0.00

Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Site: Morris Boyd State Com
Well: 4H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well 4H
TVD Reference: RKB=17' @ 3448.00usft (Silver Oak 1)
MD Reference: RKB=17' @ 3448.00usft (Silver Oak 1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WBDS_SQL_2

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)
3,963.00	87.90	179.20	2,628.94	-1,701.69	-114.07	1,701.81	3.27	-3.15	-0.87
4,054.00	87.90	179.00	2,632.27	-1,792.62	-112.64	1,792.73	0.22	0.00	-0.22
4,147.00	88.60	179.10	2,635.11	-1,885.56	-111.10	1,885.68	0.76	0.75	0.11
4,200.00	89.50	180.00	2,635.99	-1,938.55	-110.68	1,938.67	2.40	1.70	1.70
4,293.00	90.40	180.30	2,636.07	-2,031.55	-110.92	2,031.66	1.02	0.97	0.32
4,387.00	91.00	180.50	2,634.92	-2,125.54	-111.58	2,125.66	0.67	0.64	0.21
4,482.00	91.50	180.40	2,632.85	-2,220.51	-112.33	2,220.63	0.54	0.53	-0.11
4,576.00	92.30	180.90	2,629.73	-2,314.45	-113.39	2,314.57	1.00	0.85	0.53
4,670.00	89.60	182.30	2,628.17	-2,408.39	-116.02	2,408.51	3.24	-2.87	1.49
4,764.00	89.70	182.60	2,628.75	-2,502.31	-120.03	2,502.43	0.34	0.11	0.32
4,859.00	90.60	182.70	2,628.50	-2,597.20	-124.43	2,597.33	0.95	0.95	0.11
4,953.00	89.50	183.00	2,628.42	-2,691.09	-129.10	2,691.22	1.21	-1.17	0.32
5,047.00	90.00	181.60	2,628.83	-2,785.01	-132.87	2,785.14	1.58	0.53	-1.49
5,142.00	89.30	180.10	2,629.41	-2,879.99	-134.28	2,880.13	1.74	-0.74	-1.58
5,236.00	89.30	178.30	2,630.56	-2,973.97	-132.97	2,974.11	1.91	0.00	-1.91
5,331.00	90.10	178.70	2,631.05	-3,068.94	-130.48	3,069.07	0.94	0.84	0.42
5,425.00	90.20	178.90	2,630.81	-3,162.92	-128.51	3,163.05	0.24	0.11	0.21
5,519.00	90.30	179.20	2,630.40	-3,256.90	-126.96	3,257.03	0.34	0.11	0.32
5,612.00	90.30	179.70	2,629.91	-3,349.90	-126.06	3,350.03	0.54	0.00	0.54
5,706.00	90.40	180.30	2,629.34	-3,443.89	-126.06	3,444.02	0.65	0.11	0.64
5,799.00	91.00	180.30	2,628.20	-3,536.88	-126.55	3,537.02	0.65	0.65	0.00
5,892.00	89.30	179.80	2,627.96	-3,629.88	-126.63	3,630.01	1.91	-1.83	-0.54
5,985.00	89.70	179.70	2,628.77	-3,722.88	-126.22	3,723.01	0.44	0.43	-0.11
6,078.00	89.60	179.30	2,629.34	-3,815.87	-125.41	3,816.00	0.44	-0.11	-0.43
6,172.00	89.50	179.20	2,630.07	-3,909.86	-124.18	3,909.99	0.15	-0.11	-0.11
6,265.00	90.60	180.40	2,629.99	-4,002.86	-123.86	4,002.98	1.75	1.18	1.29
6,358.00	92.30	181.10	2,627.64	-4,095.81	-125.07	4,095.94	1.98	1.83	0.75
6,449.00	91.70	181.30	2,624.46	-4,186.74	-126.98	4,186.87	0.69	-0.66	0.22
6,541.00	90.10	179.40	2,623.02	-4,278.72	-127.54	4,278.85	2.70	-1.74	-2.07
6,633.00	91.00	179.50	2,622.14	-4,370.71	-126.66	4,370.84	0.98	0.98	0.11
6,725.00	90.60	179.30	2,620.85	-4,462.69	-125.69	4,462.82	0.49	-0.43	-0.22
6,816.00	90.50	179.90	2,619.98	-4,553.69	-125.06	4,553.82	0.67	-0.11	0.66
6,907.00	91.10	180.40	2,618.71	-4,644.68	-125.30	4,644.81	0.86	0.66	0.55
6,999.00	90.10	180.00	2,617.74	-4,736.67	-125.62	4,736.80	1.17	-1.09	-0.43
7,090.00	90.30	180.50	2,617.43	-4,827.67	-126.02	4,827.80	0.59	0.22	0.55
7,182.00	90.70	181.00	2,616.62	-4,919.66	-127.22	4,919.79	0.70	0.43	0.54
7,273.00	90.60	181.40	2,615.59	-5,010.63	-129.13	5,010.76	0.45	-0.11	0.44
7,365.00	90.60	182.20	2,614.63	-5,102.58	-132.01	5,102.72	0.87	0.00	0.87
7,458.00	88.50	180.90	2,615.36	-5,195.54	-134.53	5,195.67	2.66	-2.26	-1.40
7,551.00	88.40	180.80	2,617.87	-5,288.49	-135.91	5,288.63	0.15	-0.11	-0.11
7,645.00	87.00	180.20	2,621.65	-5,382.41	-136.73	5,382.55	1.62	-1.49	-0.64
7,738.00	87.10	180.20	2,626.43	-5,475.29	-137.05	5,475.43	0.11	0.11	0.00
7,831.00	87.30	180.70	2,630.98	-5,568.17	-137.78	5,568.31	0.58	0.22	0.54



Wellbenders Survey Report



Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Site: Morris Boyd State Com
Well: 4H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well 4H
TVD Reference: RKB=17' @ 3448.00usft (Silver Oak 1)
MD Reference: RKB=17' @ 3448.00usft (Silver Oak 1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WBDS_SQL_2

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)
7,893.00	88.00	181.10	2,633.52	-5,630.11	-138.76	5,630.25	1.30	1.13	0.65
7,965.00	88.00	181.10	2,636.03	-5,702.05	-140.14	5,702.20	0.00	0.00	0.00

TD: 191.9' FSL & 118.6' FWL - TD: Y= 591092.15 / X= 502528.66 - Projection to Bit: 7965.00' MD/ 2636.03' TVD - Final Stat

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
7,965.00	2,636.03	-5,702.05	-140.14	TD: 191.9' FSL & 118.6' FWL
7,965.00	2,636.03	-5,702.05	-140.14	TD: Y= 591092.15 / X= 502528.66
7,965.00	2,636.03	-5,702.05	-140.14	Projection to Bit: 7965.00' MD/ 2636.03' TVD
7,965.00	2,636.03	-5,702.05	-140.14	Final Station Closure Distance= 5703.78' /Direction= 181.41°

Checked By: _____ Approved By: _____ Date: _____