



PHOENIX
TECHNOLOGY SERVICES

NM OIL CONSERVATION
ARTESIA DISTRICT

MAR 27 2017

RECEIVED

March 23, 2017

Oil Conservation Division
State of New Mexico
811 S. First St.
Artesia, New Mexico 88210

Dear District 2 - Artesia

Attention: Regulatory Department

Accepted for record

NMOCD RE

3/29/17

Re: BC Operating
Black River 15 State SWD No.1
Eddy County, NM
API #30-015-43096
Job No. 60964

Enclosed please find the Survey Data Certification, and the original Plat and one copy of the Survey Report performed on the above referenced Well by Phoenix Technology Services, Inc. (P-5 No. 664171). Other information required by your office is as follows:

Name & Title of Surveyor	Drain Hole Number	Surveyed Depths		Dates Performed		Type of Survey
		From	To	Start	End	
Larry Seebeck	1	697	4,181	03/4/17	03/7/17	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the letterhead address and phone number.

Best Regards,

Brittany Carley

Brittany Carley
Operations Administrator

Provide spud and drilling information
for this well.

Phoenix Technology Services
SURVEY DATA CERTIFICATION



PHOENIX JOB NUMBER 60964

ENERGY COMPANY BC Operating

WELL NAME Black River 15 State SWD No. 1

COUNTY & STATE

Eddy, New Mexico

API WELL NUMBER 30-015-43096

PROPOSED DIRECTION 0.00

TIE-IN DATA						
MEASURED	VERTICAL			N-S	E-W	DATA
DEPTH	DEPTH	INCLIN	AZIMUTH	COORD	COORD	SOURCE
611.00 ft	610.68 ft	2.18	6.00	16.40 ft	3.24 ft	Gyro

FIRST	FIRST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
4-Mar-17	697.00 ft	2.62	14.84

SURVEY INSTRUMENT
TYPE
Phoenix MWD

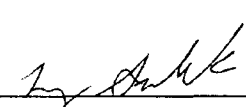
LAST	LAST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
7-Mar-17	4,181.00 ft	0.54	212.62

TO THE BEST OF MY KNOWLEDGE I
CERTIFY THIS SURVEY DATA TO BE
TRUE AND CORRECT.

PROJECTED	PROJECTED		
TD SURVEY	TD SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
7-Mar-17	4,235.00 ft	0.54	212.62

Larry Seebeck

PRINT YOUR NAME ABOVE


SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	7.37
DECLINATION OR GRID	GRID

3/4/2017

TODAY'S DATE

MWD SUPERVISOR 1 Larry Seebeck

DIRECTIONAL DRILLER 1

Ruben Cano

MWD SUPERVISOR 2 PRISM

DIRECTIONAL DRILLER 2



NM OIL CONSERVATION
ARTESIA DISTRICT

MAR 27 2017

RECEIVED

BC Operating, Inc.

Eddy County, New Mexico (NAD27)

Black River 15 State

SWD #001

OH / Job #60964

Survey: Phoenix MWD surveys

Standard Survey Report

08 March, 2017





Phoenix Technology Services LP

Survey Report



Company: BC Operating, Inc.
Project: Eddy County, New Mexico (NAD27)
Site: Black River 15 State
Well: SWD #001
Wellbore: OH / Job #60964
Design: OH / Job #60964

Local Co-ordinate Reference: Well SWD #001
TVD Reference: GL + KB @ 3247.50usft (Patterson 244)
MD Reference: GL + KB @ 3247.50usft (Patterson 244)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass 5000 GCR

Project	Eddy County, New Mexico (NAD27)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site Black River 15 State

Site Position: Northing: 442,504.65 usft Latitude: 32° 12' 59.29432 N
From: Lat/Long Easting: 547,101.57 usft Longitude: 104° 10' 51.71297 W
Position Uncertainty: 0.00 usft Slot Radius: 13-3/16 " Grid Convergence: 0.08 °

Well SWD #001

Well Position +N/-S 0.00 usft Northing: 442,504.65 usft Latitude: 32° 12' 59.29432 N
+E/-W 0.00 usft Easting: 547,101.57 usft Longitude: 104° 10' 51.71297 W
Position Uncertainty 0.00 usft **Wellhead Elevation:** 0.00 usft **Ground Level:** 3,219.00 usft

Wellbore OH / Job #60964

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	3/3/2017	7.45	60.02	48,107

Design OH / Job #60964

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	187.51

Survey Program Date 3/8/2017

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
697.00	4,235.00	Phoenix MWD surveys (OH / Job #60964)	MWD+HDGM	OWSG Rev.2 MWD + HDGM

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
611.00	2.18	6.00	610.68	16.40	3.24	-16.68	0.00	0.00	0.00
697.00	2.62	14.84	696.60	19.93	3.91	-20.27	0.67	0.51	10.28
First Phoenix MWD Survey									
790.00	0.59	356.21	789.56	22.46	4.43	-22.85	2.23	-2.18	-20.03
881.00	0.62	213.44	880.56	22.52	4.12	-22.86	1.26	0.03	-156.89
973.00	0.89	195.15	972.55	21.41	3.66	-21.71	0.39	0.29	-19.88
1,066.00	1.02	189.17	1,065.54	19.90	3.34	-20.16	0.18	0.14	-6.43
1,157.00	1.13	189.34	1,156.52	18.21	3.07	-18.46	0.12	0.12	0.19
1,248.00	1.24	192.14	1,247.51	16.36	2.72	-16.58	0.14	0.12	3.08
1,339.00	1.43	192.29	1,338.48	14.29	2.27	-14.47	0.21	0.21	0.16
1,430.00	1.39	179.24	1,429.45	12.08	2.04	-12.24	0.35	-0.04	-14.34

Company: BC Operating, Inc.
Project: Eddy County, New Mexico (NAD27)
Site: Black River 15 State
Well: SWD #001
Wellbore: OH / Job #60964
Design: OH / Job #60964

Local Co-ordinate Reference: Well SWD #001
TVD Reference: GL + KB @ 3247.50usft (Patterson 244)
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass 5000 GCR

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,521.00	1.58	145.12	1,520.42	9.95	2.77	-10.22	0.98	0.21	-37.49
1,613.00	2.34	131.21	1,612.37	7.67	4.91	-8.24	0.97	0.83	-15.12
1,707.00	1.52	158.63	1,706.32	5.24	6.81	-6.09	1.29	-0.87	29.17
1,801.00	1.48	147.50	1,800.29	3.06	7.91	-4.07	0.31	-0.04	-11.84
1,896.00	2.55	123.37	1,895.23	0.86	10.34	-2.20	1.41	1.13	-25.40
1,990.00	2.32	143.34	1,989.14	-1.82	13.22	0.07	0.93	-0.24	21.24
2,084.00	2.25	164.12	2,083.07	-5.12	14.86	3.13	0.88	-0.07	22.11
2,179.00	0.65	193.00	2,178.04	-7.44	15.25	5.38	1.80	-1.68	30.40
2,273.00	0.45	269.17	2,272.04	-7.96	14.76	5.96	0.74	-0.21	81.03
2,368.00	0.46	289.67	2,367.03	-7.84	14.03	5.94	0.17	0.01	21.58
2,462.00	0.50	281.31	2,461.03	-7.63	13.27	5.83	0.09	0.04	-8.89
2,557.00	0.52	274.65	2,556.03	-7.51	12.44	5.82	0.07	0.02	-7.01
2,651.00	0.45	287.45	2,650.02	-7.37	11.66	5.78	0.14	-0.07	13.62
2,745.00	0.55	289.19	2,744.02	-7.11	10.88	5.63	0.11	0.11	1.85
2,838.00	0.58	284.99	2,837.01	-6.84	10.00	5.48	0.05	0.03	-4.52
2,931.00	0.60	279.48	2,930.01	-6.64	9.07	5.40	0.06	0.02	-5.92
3,025.00	0.62	278.66	3,024.00	-6.48	8.08	5.37	0.02	0.02	-0.87
3,120.00	0.63	269.97	3,119.00	-6.40	7.05	5.43	0.10	0.01	-9.15
3,214.00	0.55	271.35	3,212.99	-6.39	6.08	5.54	0.09	-0.09	1.47
3,308.00	0.63	270.45	3,306.99	-6.38	5.12	5.66	0.09	0.09	-0.96
3,402.00	0.61	265.40	3,400.98	-6.42	4.10	5.82	0.06	-0.02	-5.37
3,496.00	0.56	265.06	3,494.98	-6.50	3.14	6.03	0.05	-0.05	-0.36
3,591.00	0.52	259.91	3,589.97	-6.61	2.26	6.26	0.07	-0.04	-5.42
3,685.00	0.48	264.41	3,683.97	-6.72	1.44	6.48	0.06	-0.04	4.79
3,779.00	0.42	239.84	3,777.97	-6.94	0.76	6.78	0.21	-0.06	-26.14
3,873.00	0.28	271.10	3,871.97	-7.10	0.23	7.01	0.25	-0.15	33.26
3,967.00	0.64	226.12	3,965.96	-7.46	-0.38	7.45	0.52	0.38	-47.85
4,061.00	0.54	222.43	4,059.96	-8.15	-1.06	8.22	0.11	-0.11	-3.93
4,155.00	0.54	214.00	4,153.95	-8.85	-1.60	8.98	0.08	0.00	-8.97
4,181.00	0.54	212.62	4,179.95	-9.05	-1.74	9.20	0.05	0.00	-5.31

Final Phoenix MWD Survey

4,235.00	0.54	212.62	4,233.95	-9.48	-2.01	9.66	0.00	0.00	0.00
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Projection to TD

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
697.00	696.60	19.93	3.91	First Phoenix MWD Survey
4,181.00	4,179.95	-9.05	-1.74	Final Phoenix MWD Survey
4,235.00	4,233.95	-9.48	-2.01	Projection to TD