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Mewbourne Oil Company

Eddy County, New Mexico (Nad 83)

Sec 11, T19S, R29E

Sapphire 11/12 B2KK State Com #1H

Wellbore #1

30-015-45020

Design: Wellbore #1

QES Survey Certification Report

27 October, 2018



Quintana Energy Services

11390 FM 830
Willis, TX 77318
Phone: (936) 856-4332
Fax: (936) 856-8678



Survey Certification Sheet

Company	Job Number	Date
Mewbourne Oil Company	WT-181152	10/29/2018

Lease	Well Name	County & State
SEC 11, T-19S, R29E	Sapphire 11/12 B2KK State Com #1H	Eddy County, NM

API No.	Survey Depth Range	Survey Type
30-015-45020	432.1 feet to 14510 feet MD	MWD

Sidetrack Information	Directional Supervisor/Surveyor
Click here to enter text.	Jeff Newton

Certification Statement

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by Quintana Energy Services (QES). This report represents a true and correct directional survey of this well based on the original data obtained at the well site. Wellbore coordinates are calculated using minimum curvature.

Christopher Hughes

Digitally signed by Christopher Hughes
DN: cn=Christopher Hughes, o=QES Directional Drilling,
ou=MWD Compliance, email=Chrish@qesinc.com, c=US
Date: 2018.11.29 14:25:55 -06'00'

A large, stylized handwritten signature in black ink, appearing to read 'Christopher Hughes', is written over the printed name and title.

Christopher Hughes
MWD Compliance Manager

Quintana Energy Services

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Christopher Hughes
MWD Compliance Manager



QES Survey Certification Report



Company: Mewbourne Oil Company
Project: Eddy County, New Mexico (Nad 83)
Site: Sec 11, T19S, R29E
Well: Sapphire 11/12 B2KK State Com #1H
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Sapphire 11/12 B2KK State Com #1H
TVD Reference: WELL @ 3404.0usft (Patterson #230)
MD Reference: WELL @ 3404.0usft (Patterson #230)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project Eddy County, New Mexico (Nad 83)

Map System: US State Plane 1983 System Datum: Mean Sea Level
Geo Datum: North American Datum 1983
Map Zone: New Mexico Eastern Zone

Site Sec 11, T19S, R29E

Site Position: Northing: 607,339.86 usft Latitude: 32° 40' 9.484 N
From: Map Easting: 628,765.02 usft Longitude: 104° 2' 57.176 W
Position Uncertainty: 0.0 usft Slot Radius: 13-3/16" Grid Convergence: 0.15 °

Well Sapphire 11/12 B2KK State Com #1H

Well Position: +N/-S 0.0 usft Northing: 607,339.90 usft Latitude: 32° 40' 9.486 N
+E/-W 0.0 usft Easting: 628,734.70 usft Longitude: 104° 2' 57.530 W
Position Uncertainty: 0.0 usft Wellhead Elevation: usft Ground Level: 3,377.0 usft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/5/2018	7.07	60.38	48,017.07280592

Design Wellbore #1

Audit Notes:

Version: 1.0 Phase: ACTUAL Tie On Depth: 0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	80.18

Survey Program Date 10/27/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
109.0	432.0	Trueshot Surveys (Wellbore #1)	GYRO-NS	OWSG Gyrocompass Gyro
531.0	14,510.0	QES MWD Surveys (Wellbore #1)	OWSG (Rev2) MWD	OWSG MWD - Standard

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)
432.0	0.70	30.00	432.0	3.9	1.1	4.1	15.99
432.1	0.70	30.00	432.1	3.9	1.1	4.1	15.99
Gyro Tie-in @ 432.0' MD / 432.0' TVD							
531.0	1.80	12.40	531.0	6.0	1.8	6.2	16.44
562.0	2.30	2.50	561.9	7.1	1.9	7.3	15.00
623.0	4.10	352.00	622.8	10.5	1.6	10.6	8.95
684.0	5.90	347.80	683.6	15.7	0.7	15.7	2.49
744.0	6.60	347.20	743.2	22.1	-0.7	22.1	358.10
807.0	7.00	348.10	805.8	29.4	-2.3	29.4	355.47
871.0	7.60	350.80	869.3	37.4	-3.8	37.5	354.18
934.0	6.90	352.90	931.8	45.2	-4.9	45.5	353.76



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Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)
998.0	6.00	357.10	995.4	52.4	-5.6	52.7	353.91
1,061.0	5.50	349.30	1,058.1	58.6	-6.3	59.0	353.85
1,124.0	5.90	345.00	1,120.7	64.7	-7.7	65.2	353.21
1,188.0	6.20	344.60	1,184.4	71.2	-9.5	71.9	352.42
1,251.0	5.70	345.50	1,247.0	77.5	-11.2	78.3	351.80
1,315.0	5.80	347.10	1,310.7	83.8	-12.7	84.7	351.39
1,364.0	6.20	344.80	1,359.5	88.7	-13.9	89.8	351.08
1,444.0	6.20	347.60	1,439.0	97.1	-16.0	98.4	350.65
1,540.0	6.50	344.20	1,534.4	107.4	-18.6	109.0	350.18
1,603.0	6.80	343.50	1,597.0	114.4	-20.6	116.3	349.79
1,666.0	6.60	335.10	1,659.6	121.3	-23.2	123.5	349.17
1,701.0	6.50	326.10	1,694.3	124.8	-25.2	127.3	348.60
1,795.0	5.60	313.00	1,787.8	132.3	-31.5	136.0	346.62
1,890.0	5.70	308.00	1,882.3	138.4	-38.6	143.6	344.42
1,985.0	6.60	307.00	1,976.8	144.6	-46.7	151.9	342.11
2,079.0	6.30	318.80	2,070.2	151.7	-54.4	161.1	340.28
2,173.0	5.80	335.30	2,163.7	159.9	-59.8	170.7	339.51
2,267.0	6.20	343.40	2,257.2	169.1	-63.2	180.5	339.51
2,361.0	6.20	342.80	2,350.6	178.8	-66.1	190.6	339.70
2,455.0	6.20	343.90	2,444.1	188.5	-69.0	200.7	339.88
2,549.0	6.10	344.10	2,537.5	198.2	-71.8	210.8	340.08
2,644.0	6.20	344.10	2,632.0	208.0	-74.6	220.9	340.26
2,739.0	6.20	344.10	2,726.4	217.8	-77.4	231.2	340.43
2,833.0	5.40	333.00	2,820.0	226.7	-80.8	240.6	340.38
2,927.0	5.60	328.30	2,913.5	234.5	-85.2	249.5	340.02
3,022.0	5.90	328.60	3,008.0	242.6	-90.2	258.8	339.60
3,117.0	6.00	330.70	3,102.5	251.1	-95.2	268.6	339.24
3,212.0	6.30	333.20	3,197.0	260.1	-100.0	278.6	338.97
3,306.0	5.40	323.00	3,290.5	268.2	-105.0	288.0	338.63
3,401.0	4.90	316.10	3,385.1	274.7	-110.5	296.1	338.10
3,496.0	5.10	317.90	3,479.7	280.8	-116.1	303.8	337.53
3,590.0	3.90	314.20	3,573.5	286.1	-121.2	310.7	337.04
3,685.0	3.30	310.30	3,668.3	290.1	-125.6	316.2	336.59
3,780.0	3.20	338.30	3,763.1	294.4	-128.7	321.3	336.39
3,875.0	3.50	347.40	3,858.0	299.7	-130.3	326.8	336.50
3,969.0	3.50	354.30	3,951.8	305.3	-131.2	332.3	336.75
4,064.0	4.00	341.30	4,046.6	311.3	-132.5	338.4	336.94
4,158.0	4.50	336.70	4,140.3	317.8	-135.1	345.3	336.98
4,253.0	4.70	338.60	4,235.0	324.9	-137.9	352.9	336.99
4,348.0	5.10	338.80	4,329.7	332.4	-140.9	361.1	337.03
4,442.0	5.10	338.80	4,423.3	340.2	-143.9	369.4	337.07
4,537.0	4.70	339.50	4,518.0	347.8	-146.8	377.5	337.12
4,632.0	4.10	345.80	4,612.7	354.7	-149.0	384.8	337.22
4,726.0	4.00	343.20	4,706.4	361.1	-150.8	391.4	337.34



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Wellbore: Wellbore #1
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MD Reference:
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WELL @ 3404.0usft (Patterson #230)
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Survey

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4,821.0	3.50	336.20	4,801.2	367.0	-152.9	397.5	337.38
4,915.0	3.20	329.60	4,895.1	371.9	-155.4	403.0	337.32
5,009.0	3.00	329.30	4,988.9	376.2	-158.0	408.1	337.22
5,104.0	3.20	329.80	5,083.8	380.7	-160.6	413.1	337.13
5,199.0	3.20	324.90	5,178.7	385.1	-163.4	418.4	337.01
5,293.0	3.30	327.20	5,272.5	389.5	-166.4	423.6	336.87
5,388.0	3.50	326.10	5,367.3	394.3	-169.5	429.1	336.74
5,483.0	3.80	329.00	5,462.1	399.4	-172.7	435.1	336.61
5,577.0	4.10	334.90	5,555.9	405.1	-175.8	441.6	336.54
5,672.0	4.20	339.70	5,650.7	411.4	-178.4	448.4	336.55
5,767.0	4.70	339.00	5,745.4	418.3	-181.0	455.8	336.60
5,861.0	4.80	337.70	5,839.1	425.5	-183.9	463.6	336.63
5,956.0	5.10	337.70	5,933.7	433.1	-187.0	471.8	336.65
6,051.0	5.10	337.40	6,028.3	440.9	-190.2	480.2	336.66
6,145.0	5.30	330.90	6,121.9	448.6	-193.9	488.7	336.62
6,240.0	5.30	323.30	6,216.5	455.9	-198.7	497.3	336.45
6,334.0	5.30	322.50	6,310.1	462.9	-203.9	505.8	336.22
6,429.0	4.70	319.50	6,404.8	469.3	-209.1	513.8	335.98
6,524.0	3.80	321.60	6,499.5	474.7	-213.6	520.6	335.77
6,619.0	3.10	346.20	6,594.3	479.7	-216.2	526.2	335.74
6,713.0	3.20	359.70	6,688.2	484.8	-216.8	531.1	335.90
6,808.0	3.10	0.40	6,783.1	490.0	-216.8	535.8	336.13
6,902.0	2.00	356.40	6,877.0	494.2	-216.9	539.7	336.30
6,997.0	1.30	357.10	6,971.9	496.9	-217.1	542.2	336.40
7,092.0	0.90	18.00	7,066.9	498.7	-216.9	543.8	336.50
7,186.0	0.70	43.10	7,160.9	499.8	-216.3	544.6	336.60
7,281.0	0.80	50.70	7,255.9	500.7	-215.3	545.0	336.73
7,375.0	1.10	65.50	7,349.9	501.4	-214.0	545.2	336.89
7,470.0	1.10	68.10	7,444.9	502.2	-212.3	545.2	337.08
7,543.0	1.20	61.40	7,517.8	502.8	-211.0	545.3	337.23
7,589.0	1.30	66.70	7,563.8	503.2	-210.1	545.3	337.34
7,621.0	5.40	50.50	7,595.8	504.3	-208.6	545.8	337.53
7,653.0	12.10	51.60	7,627.4	507.4	-204.8	547.2	338.02
7,684.0	18.00	52.80	7,657.3	512.3	-198.5	549.4	338.82
7,716.0	22.80	53.00	7,687.3	519.0	-189.6	552.6	339.94
7,747.0	26.50	56.00	7,715.5	526.5	-179.0	556.1	341.22
7,779.0	30.50	58.30	7,743.6	534.8	-166.2	560.0	342.74
7,810.0	34.60	60.40	7,769.7	543.3	-151.8	564.1	344.38
7,841.0	37.90	60.00	7,794.7	552.4	-135.9	568.8	346.17
7,873.0	40.90	59.70	7,819.4	562.6	-118.4	574.9	348.12
7,905.0	43.30	59.10	7,843.2	573.5	-99.9	582.1	350.12
7,936.0	47.50	59.10	7,864.9	584.8	-81.0	590.4	352.12
7,968.0	51.40	59.30	7,885.7	597.3	-60.1	600.3	354.25
8,000.0	55.30	60.00	7,904.8	610.2	-37.9	611.4	356.44



QES Survey Certification Report



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Wellbore: Wellbore #1
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Well Sapphire 11/12 B2KK State Com #1H
WELL @ 3404.0usft (Patterson #230)
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8,031.0	58.50	59.50	7,921.8	623.3	-15.5	623.5	358.57
8,063.0	60.80	59.70	7,937.9	637.3	8.3	637.3	0.75
8,094.0	62.80	59.30	7,952.6	651.2	31.8	651.9	2.80
8,125.0	66.00	58.60	7,966.0	665.6	55.8	667.9	4.79
8,156.0	69.00	58.10	7,977.8	680.6	80.2	685.3	6.72
8,188.0	71.00	57.70	7,988.8	696.6	105.6	704.5	8.62
8,219.0	71.80	57.20	7,998.7	712.4	130.4	724.2	10.37
8,251.0	73.60	58.40	8,008.2	728.7	156.3	745.2	12.10
8,282.0	75.80	59.50	8,016.4	744.1	181.9	766.0	13.73
8,314.0	78.60	60.20	8,023.4	759.8	208.8	787.9	15.37
8,346.0	81.50	61.20	8,029.0	775.2	236.3	810.4	16.96
8,364.0	83.50	62.30	8,031.3	783.6	252.1	823.2	17.83
8,453.0	85.70	60.20	8,039.7	826.2	329.7	889.6	21.76
8,516.0	85.10	61.40	8,044.7	856.9	384.5	939.2	24.17
8,612.0	83.70	65.10	8,054.1	899.9	469.8	1,015.1	27.57
8,706.0	84.40	70.20	8,063.9	935.4	556.3	1,088.3	30.74
8,801.0	86.40	71.30	8,071.5	966.6	645.7	1,162.4	33.74
8,895.0	87.30	74.20	8,076.7	994.5	735.3	1,236.8	36.48
8,990.0	88.60	75.10	8,080.1	1,019.6	826.8	1,312.7	39.04
9,084.0	91.30	77.90	8,080.1	1,041.5	918.2	1,388.5	41.40
9,179.0	92.20	80.80	8,077.2	1,059.1	1,011.5	1,464.5	43.68
9,273.0	92.80	82.70	8,073.1	1,072.5	1,104.5	1,539.6	45.84
9,367.0	91.20	83.90	8,069.9	1,083.5	1,197.8	1,615.1	47.87
9,461.0	89.70	86.70	8,069.1	1,091.2	1,291.4	1,690.7	49.80
9,555.0	88.60	89.20	8,070.5	1,094.6	1,385.4	1,765.6	51.69
9,649.0	87.40	87.40	8,073.8	1,097.4	1,479.3	1,841.8	53.43
9,744.0	88.30	87.80	8,077.4	1,101.3	1,574.1	1,921.1	55.02
9,838.0	87.10	88.00	8,081.1	1,104.8	1,668.0	2,000.7	56.48
9,933.0	88.60	89.40	8,084.7	1,106.9	1,762.9	2,081.6	57.87
10,028.0	88.20	90.60	8,087.3	1,106.9	1,857.8	2,162.6	59.21
10,122.0	91.00	92.50	8,088.0	1,104.4	1,951.8	2,242.6	60.50
10,217.0	90.60	91.70	8,086.7	1,100.9	2,046.7	2,324.0	61.72
10,312.0	89.50	91.80	8,086.6	1,098.0	2,141.7	2,406.7	62.86
10,406.0	91.00	91.30	8,086.2	1,095.5	2,235.6	2,489.6	63.90
10,501.0	90.90	89.40	8,084.6	1,094.9	2,330.6	2,575.0	64.84
10,595.0	90.80	89.90	8,083.2	1,095.5	2,424.6	2,660.6	65.69
10,689.0	90.00	90.40	8,082.6	1,095.2	2,518.6	2,746.4	66.50
10,784.0	88.00	89.70	8,084.2	1,095.1	2,613.6	2,833.7	67.27
10,878.0	86.90	89.20	8,088.4	1,096.0	2,707.5	2,920.9	67.96
10,973.0	86.40	89.20	8,093.9	1,097.4	2,802.3	3,009.5	68.62
11,068.0	87.50	89.50	8,099.0	1,098.4	2,897.2	3,098.4	69.24
11,162.0	90.20	90.40	8,100.9	1,098.5	2,991.1	3,186.5	69.83
11,256.0	90.80	89.90	8,100.1	1,098.3	3,085.1	3,274.8	70.40
11,351.0	90.30	89.40	8,099.2	1,098.8	3,180.1	3,364.6	70.94



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EDM 5000.1 Single User Db

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)
11,446.0	89.10	88.80	8,099.7	1,100.3	3,275.1	3,455.0	71.43
11,540.0	88.30	88.70	8,101.8	1,102.4	3,369.1	3,544.8	71.88
11,635.0	88.50	88.80	8,104.4	1,104.5	3,464.0	3,635.8	72.32
11,730.0	89.30	90.90	8,106.3	1,104.7	3,559.0	3,726.5	72.76
11,824.0	88.50	90.80	8,108.1	1,103.3	3,652.9	3,815.9	73.19
11,918.0	87.80	91.10	8,111.1	1,101.8	3,746.9	3,905.5	73.61
12,013.0	88.80	90.90	8,113.9	1,100.1	3,841.8	3,996.2	74.02
12,107.0	90.60	90.90	8,114.4	1,098.6	3,935.8	4,086.3	74.40
12,202.0	90.80	90.40	8,113.2	1,097.5	4,030.8	4,177.5	74.77
12,296.0	91.60	89.90	8,111.3	1,097.3	4,124.8	4,268.2	75.10
12,391.0	90.40	90.10	8,109.6	1,097.3	4,219.8	4,360.1	75.42
12,485.0	88.90	90.60	8,110.2	1,096.7	4,313.7	4,451.0	75.74
12,580.0	88.50	90.40	8,112.4	1,095.9	4,408.7	4,542.9	76.04
12,675.0	88.50	90.10	8,114.8	1,095.5	4,503.7	4,635.0	76.33
12,769.0	88.40	89.00	8,117.4	1,096.2	4,597.6	4,726.5	76.59
12,863.0	88.60	88.70	8,119.8	1,098.1	4,691.6	4,818.4	76.83
12,958.0	89.10	88.00	8,121.7	1,100.8	4,786.5	4,911.5	77.05
13,052.0	88.80	87.10	8,123.5	1,104.9	4,880.4	5,003.9	77.24
13,147.0	89.30	86.60	8,125.0	1,110.1	4,975.3	5,097.6	77.42
13,242.0	88.10	85.50	8,127.2	1,116.6	5,070.0	5,191.5	77.58
13,336.0	88.90	86.20	8,129.7	1,123.4	5,163.7	5,284.5	77.73
13,430.0	89.30	89.40	8,131.1	1,127.0	5,257.6	5,377.1	77.90
13,524.0	89.60	91.30	8,132.0	1,126.4	5,351.6	5,468.9	78.11
13,619.0	89.70	90.80	8,132.6	1,124.7	5,446.6	5,561.5	78.33
13,713.0	90.10	92.70	8,132.8	1,121.8	5,540.6	5,653.0	78.55
13,808.0	90.50	93.20	8,132.3	1,116.9	5,635.4	5,745.1	78.79
13,903.0	89.10	93.80	8,132.6	1,111.1	5,730.3	5,837.0	79.03
13,997.0	87.70	93.20	8,135.2	1,105.4	5,824.0	5,928.0	79.25
14,092.0	87.80	92.90	8,139.0	1,100.4	5,918.8	6,020.3	79.47
14,186.0	88.20	92.20	8,142.3	1,096.2	6,012.7	6,111.8	79.67
14,281.0	88.60	91.10	8,144.9	1,093.4	6,107.6	6,204.7	79.85
14,375.0	88.80	90.60	8,147.0	1,092.1	6,201.6	6,297.0	80.01
14,439.0	89.00	89.90	8,148.3	1,091.8	6,265.6	6,360.0	80.12
14,510.0	89.00	89.90	8,149.5	1,091.9	6,336.6	6,429.9	80.22

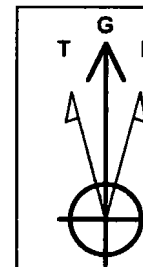
TD @ 14510.0' MD / 8149.5' TVD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
432.1	432.1	3.9	1.1	Gyro Tie-in @ 432.0' MD / 432.0' TVD
14,510.0	8,149.5	1,091.9	6,336.6	TD @ 14510.0' MD / 8149.5' TVD

Company Name: Mewbourne Oil Company
Sapphire 11/12 B2KK State Com #1H
Eddy County, New Mexico (Nad 83)
Rig: Patterson #230
Created By: Shane Robbins
Date: 10/27/2018

Sapphire 11/12 B2KK State Com #1H
Eddy County, New Mexico (Nad 83)
Q181371 & WT-181152
Design #2



Azimuths to Grid North

Correction: 6.92°

Magnetic Field

Strength: 48017.1snT

Dip Angle: 60.38°

Date: 10/5/2018

Model: IGRF2015

PROJECT DETAILS: Eddy County, New Mexico (Nad 83)

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level

ANNOTATIONS

MD	Inc	Azi	TVD	+N-S	+E-W	VSeciDeparture	Annotation
432.1	0.70	30.00	432.1	3.9	1.1	1.8	4.1
14510.0	89.00	89.90	8149.5	1091.9	6336.6	6429.9	7249.9
Gyro Tie-In @ 432.0' MD / 432.0' TVD							
TD @ 14510.0' MD / 8149.5' TVD							

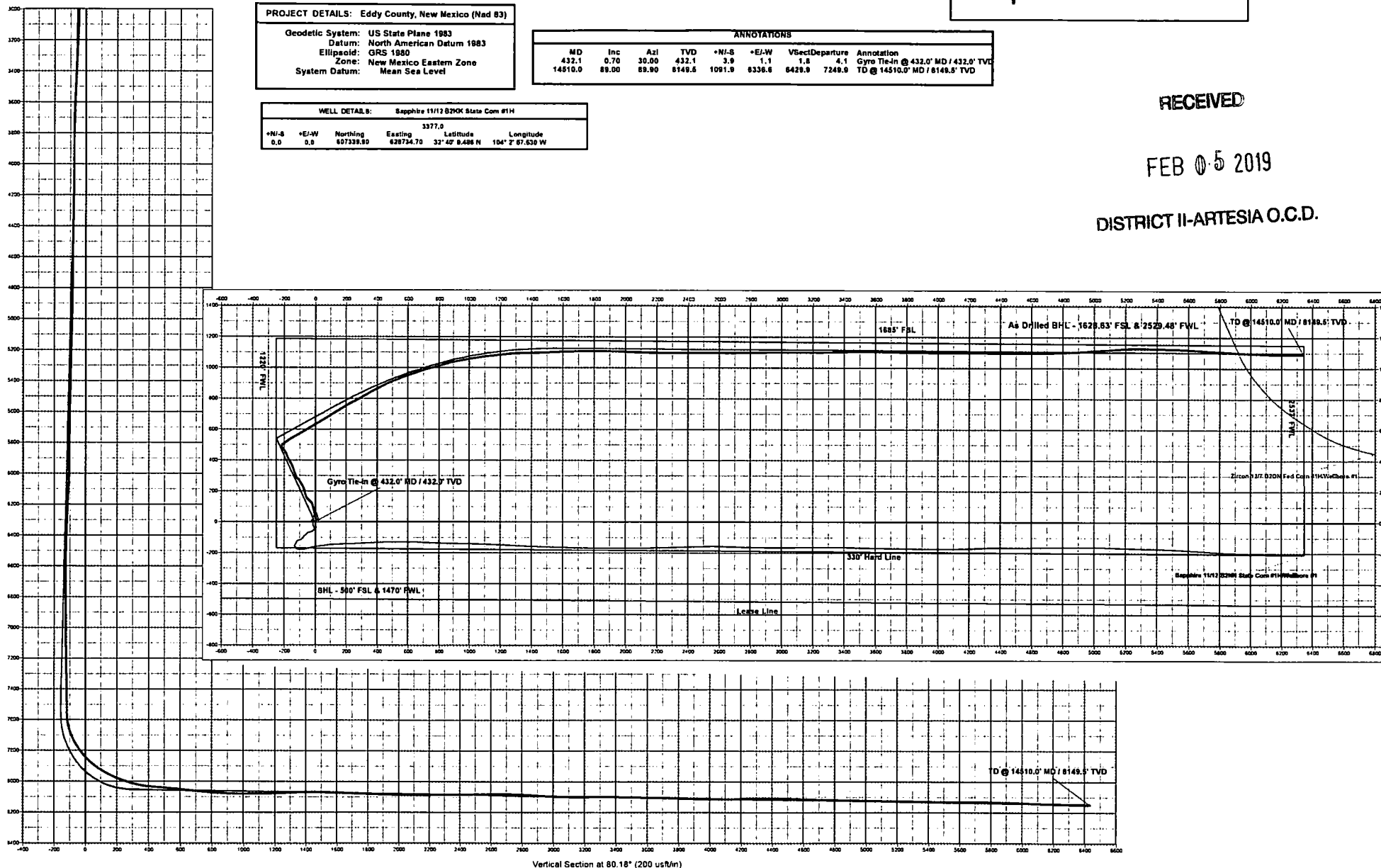
WELL DETAILS: Sapphire 11/12 B2KK State Com #1H

+N-S	+E-W	North	East	Latitude	Longitude
0.0	0.0	607339.90	628734.70	33° 40' 9.488 N	104° 2' 87.630 W

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FEB 05 2019

DISTRICT II-ARTESIA O.C.D.



Vertical Section at 80.18° (200 usf/m)