

API number:	30-005-29204		
OGRID:		Operator:	CHEVRON U S A INC
		Property:	PERSEUS 10 FEDERAL COM # 4H

surface	ULSTR:	A	10	T 15S	R 31E
				660 FNL	200 FEL

BH Loc	ULSTR:	D	10	T 15S	R 31E
13327	MD	8718.3	TVD	701 FNL	215 FWL
				5065 FEL	

Top Perf/OH	ULSTR:	A	10	T 15S	R 31E
9635	MD	8752.6	TVD	678 FNL	1375 FEL

Bot Perf/OH	ULSTR:	D	10	T 15S	R 31E
13227	MD	8722.0	TVD	700 FNL	315 FWL
				4965 FEL	

	MD	N/S	E/W	VD
	9605	-16.31	-1145.04	8754.24
TOP PERFS/OH	9635	-18.35	-1174.93	8752.59
	9695	-22.42	-1234.70	8749.29
	13182	-39.91	-4719.82	8723.89
BOT PERFS/OH	13227	-40.34	-4764.77	8722.00
	13260	-40.66	-4797.74	8720.62

NEXT TO LAST	13260	-40.66	-4797.74	8720.62
LAST READING	13327	-41.48	-4864.70	8718.28
TD	13327	-41.48	-4864.70	8718.28

Surface Location	660	FN	200	FE
Projected BHL	701	FN	5065	FE
Location of				
Top Perfs/OH	678	FN	1375	FE
Bottom Perfs/OH	700	FN	4965	FE

SUMMARY of Subsurface Locations

Surface Location	A-10-15S-31E	660	FN	200	FE	Vert. Depth
Top Perfs/OH	A-10-15S-31E	678	FN	1375	FE	8752.59
Bottom Perfs/OH	D-10-15S-31E	700	FN	4965	FE	8722.00
Projected TD	D-10-15S-31E	701	FN	5065	FE	8718.28

MAR 03 2014



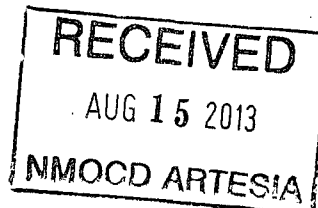
PHOENIX
TECHNOLOGY SERVICES

HOBBS OCD

SEP 04 2013

RECEIVED

March 20, 2012



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

Dear District ¹/₂ - Artesia *Hobbs*

Re: Chevron North America Exploration and Production Mid-Continent Business Unit
Perseus 10 Federal Com #4H
Chavez County, NM
API #30-005-29204
Job No. 1310545

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. 606018). Other information required by your office is as follows:

Name & Title of Surveyor	Drainhole Number	Surveyed Depths		Dates Performed		Type of Survey
		From	To	Start	End	
Derek Webster	4H	537	13,260	07/09/13	07/27/13	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,

Dolly Aguirre

Dolly Aguirre
Operations Administrator

Certified mail receipt number: 7011 1570 0001 4364 8578

RECEIVED

AUG 15 2013

WOOD ARTESIA

Phoenix Technology Services
SURVEY DATA CERTIFICATIONPHOENIX
TECHNOLOGY SERVICES

PHOENIX JOB NUMBER 1310545

OPERATOR Chevron

WELL NAME Perseus 10 Federal com#4H

COUNTY & STATE

Chavez Co. NM

API WELL NUMBER 30-005-29204

PROPOSED DIRECTION 269.51

TIE-IN DATA						
MEASURED	VERTICAL			N-S	E-W	DATA
DEPTH	DEPTH	INCLIN	AZIMUTH	COORD	COORD	SOURCE
ft	.00 ft	.0 ft	.0 ft	.00 ft	.00 ft	Surface

FIRST SURVEY DATE	FIRST SURVEY DEPTH	INCLIN	AZIMUTH
9-Jul-13	537 ft	0.5	335.7

SURVEY INSTRUMENT

TYPE

Phoenix MWD

LAST SURVEY DATE	LAST SURVEY DEPTH	INCLIN	AZIMUTH
27-Jul-13	13,260 ft	92	269.3

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

PROJECTED TD SURVEY DATE	PROJECTED TD SURVEY DEPTH	INCLIN	AZIMUTH
27-Jul-13	13,327 ft	92	269.3

Derek Webster

PRINT YOUR NAME ABOVE

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	7.23
DECLINATION OR GRID	GRID

27-Jul-13

TODAY'S DATE

MWD SUPERVISOR 1 Derek Webster

DIRECTIONAL DRILLER 1

Kieth Scheppler

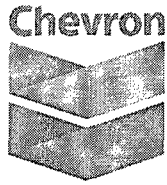
MWD SUPERVISOR 2 Zak Dawson

DIRECTIONAL DRILLER 2

Craig Cannon

1805 Brittmore Road Houston, Texas 77043

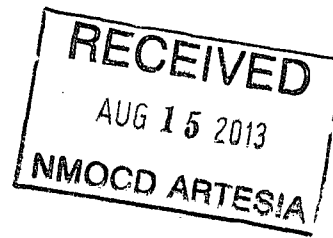
(713)3370609 (Voice), (713)337-0599 (Fax)



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SEP 04 2013

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Chevron

Chaves County NM (NAD27 NME)
Perseus 10 Federal Com
#4H

OH / Job #1310545

HOBBS OCD

SEP 04 2013

RECEIVED

Survey: Phoenix MWD Survey

Standard Survey Report

28 July, 2013



PHOENIX
TECHNOLOGY SERVICES



Survey Report



Company:	Chevron	Local Co-ordinate Reference:	Well #4H
Project:	Chaves County NM (NAD27 NME)	TVD Reference:	KB @ 4429.50usft (Ensign 153)
Site:	Perseus 10 Federal Com	MD Reference:	KB @ 4429.50usft (Ensign 153)
Well:	#4H	North Reference:	Grid
Wellbore:	OH / Job #1310545	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 153)	Database:	Compass 5000 GCR DB

Project	Chaves County NM (NAD27 NME)		
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	Perseus 10 Federal Com		
Site Position:		Northing:	740,937.50 usft
From:	Map	Easting:	663,077.60 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	33° 2' 8.753896 N
		Longitude:	103° 48' 4.328056 W
		Grid Convergence:	0.29 °

Well	#4H		
Well Position	+N/-S	0.00 usft	Northing: 740,937.50 usft
	+E/-W	0.00 usft	Easting: 663,077.60 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Ground Level:	4,405.00 usft
		Latitude:	33° 2' 8.753896 N
		Longitude:	103° 48' 4.328056 W

Wellbore	OH / Job #1310545		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010_14	05/20/13	(°)
			7.52
			Dip Angle (°)
			60.85
			Field Strength (nT)
			48,878

Design	Surveys (Ensign 153)		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction (°)
			269.51

Survey Program	Date 07/27/13		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
537.00	12,735.00	Phoenix MWD Survey (OH / Job #1310545)	MWD
			Description
			MWD - Standard

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)
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	537.00	0.50	335.70	536.99	2.14	-0.96	0.95	0.09	0.09	0.00
First Phoenix MWD Survey										
	716.00	0.70	337.40	715.98	3.86	-1.71	1.67	0.11	0.11	0.95
	895.00	0.60	336.70	894.97	5.73	-2.50	2.45	0.06	-0.06	-0.39
	1,074.00	0.50	333.10	1,073.96	7.28	-3.22	3.16	0.06	-0.06	-2.01
	1,253.00	0.40	322.10	1,252.96	8.47	-3.96	3.89	0.07	-0.06	-6.15
	1,432.00	0.40	308.40	1,431.95	9.36	-4.83	4.75	0.05	0.00	-7.65
	1,611.00	0.40	309.90	1,610.95	10.14	-5.80	5.71	0.01	0.00	0.84
	1,790.00	0.70	310.50	1,789.94	11.25	-7.11	7.01	0.17	0.17	0.34
	1,969.00	1.00	316.40	1,968.92	13.10	-9.02	8.91	0.17	0.17	3.30



Survey Report



Company: Chevron
Project: Chaves County NM (NAD27 NME)
Site: Perseus 10 Federal Com
Well: #4H
Wellbore: OH / Job #1310545
Design: Surveys (Ensign 153)

Local Co-ordinate Reference: Well #4H
TVD Reference: KB @ 4429.50usft (Ensign 153)
MD Reference: KB @ 4429.50usft (Ensign 153)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass 5000 GCR.DB

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)
2,148.00	1.10	336.30	2,147.89	15.80	-10.79	10.65	0.21	0.06	11.12
2,327.00	1.30	334.00	2,326.85	19.20	-12.37	12.20	0.11	0.11	-1.28
2,506.00	1.20	334.00	2,505.81	22.71	-14.08	13.89	0.06	-0.06	0.00
2,685.00	1.20	341.90	2,684.77	26.17	-15.48	15.26	0.09	0.00	4.41
2,863.00	1.00	344.60	2,862.74	29.44	-16.48	16.22	0.12	-0.11	1.52
3,042.00	0.90	340.70	3,041.71	32.28	-17.36	17.08	0.07	-0.06	-2.18
3,221.00	0.70	323.90	3,220.70	34.49	-18.46	18.17	0.17	-0.11	-9.39
3,400.00	0.40	317.20	3,399.69	35.83	-19.53	19.23	0.17	-0.17	-3.74
3,579.00	0.20	334.40	3,578.68	36.57	-20.09	19.78	0.12	-0.11	9.61
3,758.00	0.20	3.80	3,757.68	37.16	-20.21	19.89	0.06	0.00	16.42
3,807.00	0.10	321.90	3,806.68	37.28	-20.23	19.91	0.29	-0.20	-85.51
3,910.00	0.20	22.30	3,909.68	37.52	-20.21	19.89	0.17	0.10	58.64
4,089.00	0.40	11.60	4,088.68	38.42	-19.97	19.64	0.12	0.11	-5.98
4,268.00	0.40	25.30	4,267.68	39.60	-19.58	19.24	0.05	0.00	7.65
4,447.00	0.50	39.90	4,446.67	40.76	-18.81	18.46	0.08	0.06	8.16
4,626.00	0.60	4.90	4,625.66	42.29	-18.23	17.87	0.19	0.06	-19.55
4,805.00	0.30	74.90	4,804.66	43.35	-17.70	17.32	0.32	-0.17	39.11
4,984.00	0.30	82.60	4,983.66	43.53	-16.78	16.41	0.02	0.00	4.30
5,163.00	0.50	77.70	5,162.65	43.76	-15.55	15.18	0.11	0.11	-2.74
5,341.00	0.80	100.80	5,340.64	43.69	-13.57	13.20	0.22	0.17	12.98
5,520.00	0.30	155.90	5,519.63	43.03	-12.15	11.78	0.38	-0.28	30.78
5,699.00	0.30	59.10	5,698.63	42.84	-11.56	11.19	0.25	0.00	-54.08
5,878.00	0.70	290.00	5,877.63	43.46	-12.18	11.81	0.51	0.22	-72.12
6,056.00	0.90	131.90	6,055.62	42.90	-12.17	11.80	0.88	0.11	-88.82
6,235.00	0.20	142.10	6,234.61	41.71	-10.93	10.57	0.39	-0.39	5.70
6,414.00	0.40	230.70	6,413.61	41.07	-11.22	10.87	0.25	0.11	49.50
6,593.00	0.40	246.10	6,592.60	40.42	-12.27	11.93	0.06	0.00	8.60
6,771.00	0.70	26.70	6,770.60	41.14	-12.35	12.00	0.58	0.17	78.99
6,950.00	0.40	1.90	6,949.59	42.74	-11.84	11.48	0.21	-0.17	-13.85
7,129.00	0.70	343.30	7,128.58	44.41	-12.14	11.75	0.19	0.17	-10.39
7,308.00	0.60	348.10	7,307.57	46.38	-12.64	12.25	0.06	-0.06	2.68
7,487.00	1.90	98.00	7,486.54	46.88	-9.90	9.50	1.22	0.73	61.40
7,665.00	2.10	101.70	7,664.43	45.81	-3.78	3.39	0.13	0.11	2.08
7,844.00	1.90	93.20	7,843.32	44.98	2.39	-2.78	0.20	-0.11	-4.75
8,023.00	2.00	103.60	8,022.22	44.08	8.39	-8.77	0.21	0.06	5.81
8,202.00	2.00	96.40	8,201.11	42.99	14.53	-14.90	0.14	0.00	-4.02
8,291.00	1.40	172.50	8,290.08	41.74	16.22	-16.57	2.41	-0.67	85.51
8,336.00	3.40	262.80	8,335.05	41.03	14.96	-15.31	8.19	4.44	200.67
8,380.00	7.20	273.00	8,378.86	41.01	10.91	-11.27	8.86	8.64	23.18
8,425.00	12.60	265.00	8,423.17	40.73	3.20	-3.55	12.35	12.00	-17.78
8,470.00	17.90	264.70	8,466.57	39.66	-8.58	8.24	11.78	11.78	-0.67
8,515.00	23.70	266.90	8,508.62	38.53	-24.51	24.18	13.00	12.89	4.89
8,559.00	29.10	268.50	8,548.02	37.78	-44.05	43.73	12.38	12.27	3.64



Survey Report



Company: Chevron
Project: Chaves County NM (NAD27 NME)
Site: Perseus 10 Federal Com
Well: #4H
Wellbore: OH / Job #1310545
Design: Surveys (Ensign 153)

Local Co-ordinate Reference: Well #4H
TVD Reference: KB @ 4429.50usft (Ensign 153)
MD Reference: KB @ 4429.50usft (Ensign 153)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass 5000 GCR DB

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)
8,604.00	35.40	269.60	8,586.06	37.40	-68.05	67.73	14.06	14.00	2.44
8,649.00	41.50	268.90	8,621.28	37.02	-96.01	95.69	13.59	13.56	-1.56
8,694.00	48.60	268.40	8,653.05	36.26	-127.83	127.52	15.80	15.78	-1.11
8,738.00	54.50	267.60	8,680.40	35.05	-162.25	161.95	13.48	13.41	-1.82
8,783.00	60.40	267.60	8,704.60	33.46	-200.14	199.84	13.11	13.11	0.00
8,828.00	64.80	267.80	8,725.31	31.86	-240.05	239.76	9.79	9.78	0.44
8,872.00	67.60	267.60	8,743.06	30.24	-280.27	280.00	6.38	6.36	-0.45
8,917.00	71.50	268.40	8,758.78	28.78	-322.40	322.14	8.83	8.67	1.78
8,962.00	73.70	267.90	8,772.24	27.39	-365.31	365.06	5.00	4.89	-1.11
9,007.00	73.60	267.20	8,784.91	25.54	-408.45	408.22	1.51	-0.22	-1.56
9,051.00	76.70	267.40	8,796.18	23.54	-450.93	450.71	7.06	7.05	0.45
9,096.00	80.60	267.50	8,805.03	21.58	-495.00	494.80	8.67	8.67	0.22
9,158.00	86.70	267.50	8,811.89	18.89	-556.53	556.35	9.84	9.84	0.00
9,203.00	89.90	267.10	8,813.22	16.77	-601.45	601.29	7.17	7.11	-0.89
9,248.00	90.90	267.30	8,812.91	14.58	-646.40	646.25	2.27	2.22	0.44
9,337.00	91.60	266.70	8,810.97	9.92	-735.26	735.14	1.04	0.79	-0.67
9,427.00	91.80	265.80	8,808.30	4.04	-825.02	824.96	1.02	0.22	-1.00
9,516.00	92.20	266.80	8,805.19	-1.70	-913.78	913.76	1.21	0.45	1.12
9,605.00	92.90	266.50	8,801.23	-6.90	-1,002.54	1,002.56	0.86	0.79	-0.34
9,695.00	93.40	265.70	8,796.29	-13.01	-1,092.20	1,092.27	1.05	0.56	-0.89
9,785.00	92.40	267.00	8,791.73	-18.73	-1,181.89	1,182.01	1.82	-1.11	1.44
9,874.00	91.80	269.50	8,788.47	-21.45	-1,270.79	1,270.92	2.89	-0.67	2.81
9,964.00	92.00	268.90	8,785.49	-22.70	-1,360.73	1,360.87	0.70	0.22	-0.67
10,053.00	90.00	268.90	8,783.93	-24.41	-1,449.69	1,449.85	2.25	-2.25	0.00
10,142.00	90.10	268.40	8,783.86	-26.51	-1,538.67	1,538.84	0.57	0.11	-0.56
10,232.00	90.90	267.80	8,783.07	-29.49	-1,628.61	1,628.81	1.11	0.89	-0.67
10,321.00	90.30	269.00	8,782.14	-31.98	-1,717.57	1,717.78	1.51	-0.67	1.35
10,410.00	90.90	269.00	8,781.21	-33.53	-1,806.55	1,806.77	0.67	0.67	0.00
10,500.00	91.00	269.10	8,779.72	-35.02	-1,896.53	1,896.76	0.16	0.11	0.11
10,589.00	92.20	269.10	8,777.23	-36.42	-1,985.48	1,985.72	1.35	1.35	0.00
10,679.00	92.00	270.70	8,773.93	-36.58	-2,075.42	2,075.65	1.79	-0.22	1.78
10,768.00	92.30	270.40	8,770.59	-35.72	-2,164.35	2,164.58	0.48	0.34	-0.34
10,857.00	93.30	269.80	8,766.25	-35.57	-2,253.24	2,253.46	1.31	1.12	-0.67
10,947.00	92.00	270.20	8,762.08	-35.57	-2,343.14	2,343.36	1.51	-1.44	0.44
11,036.00	90.90	271.60	8,759.83	-34.17	-2,432.10	2,432.30	2.00	-1.24	1.57
11,125.00	89.80	272.00	8,759.29	-31.38	-2,521.05	2,521.23	1.32	-1.24	0.45
11,215.00	90.20	271.70	8,759.29	-28.47	-2,611.01	2,611.16	0.56	0.44	-0.33
11,304.00	90.40	271.90	8,758.82	-25.67	-2,699.96	2,700.08	0.32	0.22	0.22
11,394.00	90.40	271.20	8,758.19	-23.24	-2,789.93	2,790.02	0.78	0.00	-0.78
11,483.00	90.70	270.60	8,757.34	-21.84	-2,878.91	2,878.99	0.75	0.34	-0.67
11,573.00	91.20	270.10	8,755.85	-21.29	-2,968.90	2,968.97	0.79	0.56	-0.56
11,662.00	89.10	270.60	8,755.61	-20.75	-3,057.89	3,057.95	2.43	-2.36	0.56
11,752.00	87.40	271.00	8,758.36	-19.49	-3,147.83	3,147.89	1.94	-1.89	0.44



Survey Report



Company:	Chevron	Local Co-ordinate Reference:	Well #4H
Project:	Chaves County NM (NAD27 NME)	TVD Reference:	KB @ 4429.50usft (Ensign 153)
Site:	Perseus 10 Federal Com	MD Reference:	KB @ 4429.50usft (Ensign 153)
Well:	#4H	North Reference:	Grid
Wellbore:	OH / Job #1310545	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Ensign 153)	Database:	Compass 5000 GCR DB

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)
11,841.00	87.90	271.10	8,762.01	-17.86	-3,236.74	3,236.78	0.57	0.56	0.11
11,930.00	88.20	270.30	8,765.04	-16.78	-3,325.69	3,325.71	0.96	0.34	-0.90
12,020.00	89.00	269.60	8,767.24	-16.86	-3,415.66	3,415.68	1.18	0.89	-0.78
12,109.00	88.40	269.70	8,769.26	-17.40	-3,504.63	3,504.65	0.68	-0.67	0.11
12,199.00	88.80	269.50	8,771.46	-18.03	-3,594.60	3,594.63	0.50	0.44	-0.22
12,288.00	89.10	269.20	8,773.09	-19.04	-3,683.58	3,683.61	0.48	0.34	-0.34
12,377.00	89.70	268.90	8,774.02	-20.51	-3,772.56	3,772.60	0.75	0.67	-0.34
12,467.00	88.70	269.40	8,775.28	-21.85	-3,862.54	3,862.59	1.24	-1.11	0.56
12,556.00	89.10	269.40	8,776.99	-22.78	-3,951.52	3,951.57	0.45	0.45	0.00
12,645.00	89.90	269.40	8,777.76	-23.71	-4,040.51	4,040.57	0.90	0.90	0.00
12,735.00	90.40	268.90	8,777.53	-25.05	-4,130.50	4,130.57	0.79	0.56	-0.56
12,824.00	89.20	269.80	8,777.84	-26.06	-4,219.49	4,219.56	1.69	-1.35	1.01
12,913.00	89.90	269.60	8,778.54	-26.52	-4,308.49	4,308.56	0.82	0.79	-0.22
13,003.00	91.10	269.10	8,777.75	-27.54	-4,398.48	4,398.55	1.44	1.33	-0.56
13,092.00	92.20	269.10	8,775.19	-28.94	-4,487.43	4,487.51	1.24	1.24	0.00
13,182.00	92.80	269.60	8,771.26	-29.96	-4,577.34	4,577.43	0.87	0.67	0.56
13,260.00	92.00	269.30	8,768.00	-30.71	-4,655.26	4,655.36	1.10	-1.03	-0.38
Last Phoenix MWD Survey									
13,327.00	92.00	269.30	8,765.66	-31.53	-4,722.22	4,722.32	0.00	0.00	0.00
Projection to TD									

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
537.00	536.99	2.14	-0.96	First Phoenix MWD Survey
13,260.00	8,768.00	-30.71	-4,655.26	Last Phoenix MWD Survey
13,327.00	8,765.66	-31.53	-4,722.22	Projection to TD

Checked By: _____ Approved By: _____ Date: _____



Directional Survey

HOBBS OCD

JAN 31 2014

Well Name PERSEUS 10 FEDERAL COM 4H		Lease Wolffbone		Field Name Wolffbone		Business Unit Mid-Continent	
Ground Elevation (ft) 4,405.00	Original RKB (ft) 4,430.00	Current RKB Elevation 4,430.00, 6/13/2013		Mud Line Elevation (ft)	Water Depth (ft)	RECEIVED	

Wellbore Name Original Hole		Parent Wellbore Original Hole		Kick Off Depth (ftKB) 8.195		Vertical Section Direction (°) 269.51	
UTM Northing (Y) (ft)			UTM Easting (X) (ft)			UTM Grid Zone	
Date		Definitive? Y		Description MWD		Planned? N	
MD Tie In (ftKB)		TVD Tie In (ftKB)		Inclination Tie In (°)		Azimuth Tie In (°)	
				NSTie In (ft)		EWTie In (ft)	

Survey Data													
MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Method	Survey Company	Build (°/100ft)	Depart (ft)	Turn (°/100ft)	Unuse d data
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Magn MWD		0.00	0.00	0.00	N
537	0.50	335.70	536.99	2.14	-0.96	0.95	0.09	Magn MWD		0.09	2.34	62.51	N
716	0.70	337.40	715.98	3.86	-1.71	1.67	0.11	Magn MWD		0.11	4.22	0.95	N
895	0.60	336.40	894.97	5.73	-2.50	2.45	0.06	Magn MWD		-0.06	6.25	-0.56	N
1,074	0.50	333.10	1,073.96	7.28	-3.23	3.17	0.06	Magn MWD		-0.06	7.96	-1.84	N
1,253	0.40	322.10	1,252.96	8.47	-3.97	3.89	0.07	Magn MWD		-0.06	9.35	-6.15	N
1,432	0.40	308.40	1,431.95	9.35	-4.84	4.76	0.05	Magn MWD		0.00	10.53	-7.65	N
1,611	0.40	309.90	1,610.95	10.14	-5.81	5.72	0.01	Magn MWD		0.00	11.69	0.84	N
1,790	0.70	310.50	1,789.94	11.25	-7.12	7.02	0.17	Magn MWD		0.17	13.31	0.34	N
1,969	1.00	316.40	1,968.92	13.09	-9.03	8.92	0.17	Magn MWD		0.17	15.90	3.30	N
2,148	1.10	336.30	2,147.89	15.80	-10.80	10.66	0.21	Magn MWD		0.06	19.13	11.12	N
2,327	1.30	334.00	2,326.85	19.19	-12.38	12.21	0.11	Magn MWD		0.11	22.84	-1.28	N
2,506	1.20	334.00	2,505.81	22.70	-14.09	13.89	0.06	Magn MWD		-0.06	26.72	0.00	N
2,685	1.20	341.90	2,684.77	26.17	-15.49	15.27	0.09	Magn MWD		0.00	30.41	4.41	N
2,863	1.00	344.60	2,862.74	29.44	-16.48	16.23	0.12	Magn MWD		-0.11	33.74	1.52	N
3,042	0.90	340.70	3,041.71	32.27	-17.36	17.09	0.07	Magn MWD		-0.06	36.65	-2.18	N
3,221	0.70	323.90	3,220.70	34.48	-18.47	18.18	0.17	Magn MWD		-0.11	39.12	-9.39	N
3,400	0.40	317.20	3,399.69	35.82	-19.54	19.23	0.17	Magn MWD		-0.17	40.81	-3.74	N
3,579	0.20	334.40	3,578.68	36.57	-20.10	19.79	0.12	Magn MWD		-0.11	41.73	9.61	N
3,758	0.20	3.80	3,757.68	37.16	-20.22	19.90	0.06	Magn MWD		0.00	42.30	-	N
3,807	0.10	321.90	3,806.68	37.28	-20.24	19.92	0.29	Magn MWD		-0.20	42.42	649.18	N
3,910	0.20	22.30	3,909.68	37.51	-20.22	19.90	0.17	Magn MWD		0.10	42.62	-	N
4,089	0.40	11.60	4,088.68	38.42	-19.98	19.65	0.12	Magn MWD		0.11	43.30	-5.98	N
4,268	0.40	25.30	4,267.68	39.59	-19.59	19.25	0.05	Magn MWD		0.00	44.17	7.65	N
4,447	0.50	39.90	4,446.67	40.76	-18.82	18.47	0.08	Magn MWD		0.06	44.89	8.16	N
4,626	0.60	4.90	4,625.66	42.29	-18.24	17.88	0.19	Magn MWD		0.06	46.05	-19.55	N



Directional Survey

Well Name PERSEUS 10 FEDERAL COM 4H		Lease Wolfbone		Field Name Wolfbone		Business Unit Mid-Continent	
Ground Elevation (ft) 4,405.00	Original RKB (ft) 4,430.00	Current RKB Elevation 4,430.00, 6/13/2013				Mud Line Elevation (ft)	Water Depth (ft)

Survey Data													
MD (RKB)	Incl (°)	Azm (°)	TVD (RKB)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Method	Survey Company	Build (°/100ft)	Depart (ft)	Turn (°/100ft)	Unuse d data
4,805	0.30	74.90	4,804.66	43.35	-17.71	17.33	0.32	Magn MWD		-0.17	46.82	39.11	N
4,984	0.30	82.60	4,983.66	43.53	-16.79	16.42	0.02	Magn MWD		0.00	46.65	4.30	N
5,163	0.50	77.70	5,162.65	43.75	-15.56	15.19	0.11	Magn MWD		0.11	46.44	-2.74	N
5,341	0.80	100.80	5,340.64	43.69	-13.58	13.21	0.22	Magn MWD		0.17	45.75	12.98	N
5,520	0.30	155.90	5,519.63	43.03	-12.16	11.79	0.38	Magn MWD		-0.28	44.71	30.78	N
5,699	0.30	59.10	5,698.63	42.84	-11.57	11.20	0.25	Magn MWD		0.00	44.37	-54.08	N
5,878	0.70	290.00	5,877.63	43.45	-12.19	11.82	0.51	Magn MWD		0.22	45.13	128.99	N
6,056	0.90	131.90	6,055.62	42.89	-12.18	11.81	0.88	Magn MWD		0.11	44.59	-88.82	N
6,235	0.20	142.10	6,234.61	41.71	-10.94	10.58	0.39	Magn MWD		-0.39	43.12	5.70	N
6,414	0.40	230.70	6,413.61	41.06	-11.23	10.88	0.25	Magn MWD		0.11	42.57	49.50	N
6,593	0.40	246.10	6,592.60	40.41	-12.28	11.94	0.06	Magn MWD		0.00	42.24	8.60	N
6,771	0.70	26.70	6,770.60	41.13	-12.36	12.01	0.58	Magn MWD		0.17	42.95	-	N
6,950	0.40	1.90	6,949.59	42.74	-11.85	11.48	0.21	Magn MWD		-0.17	44.35	-13.85	N
7,129	0.70	343.30	7,128.58	44.41	-12.14	11.76	0.19	Magn MWD		0.17	46.04	190.73	N
7,308	0.60	348.10	7,307.57	46.37	-12.65	12.25	0.06	Magn MWD		-0.06	48.07	2.68	N
7,487	1.90	98.00	7,486.54	46.88	-9.91	9.50	1.22	Magn MWD		0.73	47.91	-	N
7,665	2.10	101.70	7,664.43	45.80	-3.79	3.40	0.13	Magn MWD		0.11	45.96	2.08	N
7,844	1.90	93.20	7,843.32	44.97	2.38	-2.77	0.20	Magn MWD		-0.11	45.04	-4.75	N
8,023	2.00	103.60	8,022.22	44.07	8.38	-8.76	0.21	Magn MWD		0.06	44.86	5.81	N
8,783	60.40	267.60	8,653.16	25.22	-344.33	344.10	8.20	Magn MWD		7.68	345.25	21.58	N
9,117	82.00	267.40	8,760.16	11.48	-658.34	658.22	6.47	Magn MWD		6.47	658.44	-0.06	N
9,203	89.90	267.10	8,766.23	7.36	-743.96	743.87	9.19	Magn MWD		9.19	744.00	-0.35	N
9,248	90.90	267.30	8,765.92	5.16	-788.90	788.83	2.27	Magn MWD		2.22	788.92	0.44	N
9,337	91.60	266.70	8,763.97	0.51	-877.76	877.72	1.04	Magn MWD		0.79	877.76	-0.67	N
9,427	91.80	265.80	8,761.30	-5.38	-967.53	967.54	1.02	Magn MWD		0.22	967.54	-1.00	N
9,516	92.20	266.80	8,758.20	-11.12	-1,056.29	1,056.34	1.21	Magn MWD		0.45	1,056. 34	1.12	N
9,605	92.90	266.50	8,754.24	-16.31	-1,145.04	1,145.14	0.86	Magn MWD		0.79	1,145. 16	-0.34	N
9,695	93.40	265.70	8,749.29	-22.42	-1,234.70	1,234.85	1.05	Magn MWD		0.56	1,234. 90	-0.89	N
9,785	92.40	267.00	8,744.74	-28.14	-1,324.40	1,324.59	1.82	Magn MWD		-1.11	1,324. 70	1.44	N



Directional Survey

Well Name PERSEUS 10 FEDERAL COM 4H		Lease Wolfbone		Field Name Wolfbone		Business Unit Mid-Continent	
Ground Elevation (ft) 4,405.00	Original RKB (ft) 4,430.00	Current RKB Elevation 4,430.00, 6/13/2013				Mud Line Elevation (ft)	Water Depth (ft)

Survey Data

MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Method	Survey Company	Build (°/100ft)	Depart (ft)	Turn (°/100ft)	Unuse d data
9,874	91.80	269.50	8,741.48	-30.86	-1,413.29	1,413.50	2.89	Magn MWD		-0.67	1,413.63	2.81	N
9,964	92.00	268.90	8,738.49	-32.12	-1,503.23	1,503.45	0.70	Magn MWD		0.22	1,503.57	-0.67	N
10,053	90.00	268.90	8,736.94	-33.82	-1,592.20	1,592.43	2.25	Magn MWD		-2.25	1,592.56	0.00	N
10,142	90.10	268.40	8,736.86	-35.92	-1,681.17	1,681.42	0.57	Magn MWD		0.11	1,681.56	-0.56	N
10,232	90.90	267.80	8,736.08	-38.90	-1,771.12	1,771.39	1.11	Magn MWD		0.89	1,771.55	-0.67	N
10,321	90.30	269.00	8,735.15	-41.39	-1,860.08	1,860.36	1.51	Magn MWD		-0.67	1,860.54	1.35	N
10,410	90.90	269.00	8,734.21	-42.94	-1,949.06	1,949.35	0.67	Magn MWD		0.67	1,949.53	0.00	N
10,500	91.00	269.10	8,732.72	-44.43	-2,039.03	2,039.34	0.16	Magn MWD		0.11	2,039.52	0.11	N
10,589	92.20	269.10	8,730.24	-45.83	-2,127.99	2,128.30	1.35	Magn MWD		1.35	2,128.48	0.00	N
10,679	92.00	270.70	8,726.94	-45.99	-2,217.92	2,218.23	1.79	Magn MWD		-0.22	2,218.40	1.78	N
10,768	92.30	270.40	8,723.60	-45.13	-2,306.85	2,307.16	0.48	Magn MWD		0.34	2,307.30	-0.34	N
10,813	93.30	269.80	8,721.40	-45.06	-2,351.80	2,352.10	2.59	Magn MWD		2.22	2,352.23	-1.33	N
10,857	93.30	269.80	8,718.87	-45.21	-2,395.73	2,396.03	0.00	Magn MWD		0.00	2,396.15	0.00	N
10,947	92.00	270.20	8,714.71	-45.21	-2,485.63	2,485.92	1.51	Magn MWD		-1.44	2,486.04	0.44	N
11,036	90.90	271.60	8,712.45	-43.81	-2,574.59	2,574.87	2.00	Magn MWD		-1.24	2,574.96	1.57	N
11,125	89.80	272.00	8,711.91	-41.02	-2,663.54	2,663.79	1.32	Magn MWD		-1.24	2,663.85	0.45	N
11,215	90.20	271.70	8,711.91	-38.11	-2,753.49	2,753.72	0.56	Magn MWD		0.44	2,753.75	-0.33	N
11,304	90.40	271.90	8,711.45	-35.32	-2,842.45	2,842.64	0.32	Magn MWD		0.22	2,842.67	0.22	N
11,394	90.40	271.20	8,710.82	-32.88	-2,932.41	2,932.58	0.78	Magn MWD		0.00	2,932.59	-0.78	N
11,483	90.70	270.60	8,709.96	-31.48	-3,021.39	3,021.55	0.75	Magn MWD		0.34	3,021.56	-0.67	N
11,573	91.20	270.10	8,708.47	-30.93	-3,111.38	3,111.53	0.79	Magn MWD		0.56	3,111.53	-0.56	N
11,662	89.10	270.60	8,708.24	-30.39	-3,200.37	3,200.52	2.43	Magn MWD		-2.36	3,200.52	0.56	N
11,752	87.40	271.00	8,710.99	-29.13	-3,290.32	3,290.45	1.94	Magn MWD		-1.89	3,290.45	0.44	N
11,841	87.90	271.10	8,714.64	-27.50	-3,379.23	3,379.34	0.57	Magn MWD		0.56	3,379.34	0.11	N
11,930	88.20	270.30	8,717.66	-26.42	-3,468.17	3,468.27	0.96	Magn MWD		0.34	3,468.27	-0.90	N
12,020	89.00	269.60	8,719.86	-26.50	-3,558.14	3,558.24	1.18	Magn MWD		0.89	3,558.24	-0.78	N
12,109	88.40	269.70	8,721.88	-27.04	-3,647.12	3,647.21	0.68	Magn MWD		-0.67	3,647.22	0.11	N
12,199	88.80	269.50	8,724.08	-27.67	-3,737.09	3,737.19	0.50	Magn MWD		0.44	3,737.19	-0.22	N
12,288	89.10	269.20	8,725.71	-28.68	-3,826.07	3,826.17	0.48	Magn MWD		0.34	3,826.17	-0.34	N



Directional Survey

Well Name PERSEUS 10 FEDERAL COM 4H		Lease Wolfbone	Field Name Wolfbone	Business Unit Mid-Continent	
Ground Elevation (ft) 4,405.00	Original RKB (ft) 4,430.00	Current RKB Elevation 4,430.00, 6/13/2013		Mud Line Elevation (ft)	Water Depth (ft)

Survey Data													
MD (RKB)	Incl (°)	Azm (°)	TVD (ft)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Method	Survey Company	Build (°/100ft)	Depth (ft)	Turn (°/100ft)	Use of data
12,377	89.70	268.90	8,726.64	-30.15	-3,915.05	3,915.16	0.75	Magn MWD		0.67	3,915.16	-0.34	N
12,467	88.70	269.40	8,727.90	-31.49	-4,005.03	4,005.15	1.24	Magn MWD		-1.11	4,005.15	0.56	N
12,556	89.10	269.40	8,729.61	-32.42	-4,094.01	4,094.13	0.45	Magn MWD		0.45	4,094.14	0.00	N
12,645	89.90	269.20	8,730.39	-33.51	-4,183.00	4,183.13	0.93	Magn MWD		0.90	4,183.13	-0.22	N
12,735	90.40	268.90	8,730.15	-35.00	-4,272.98	4,273.13	0.65	Magn MWD		0.56	4,273.13	-0.33	N
12,824	89.20	269.80	8,730.46	-36.01	-4,361.97	4,362.12	1.69	Magn MWD		-1.35	4,362.12	1.01	N
12,913	89.90	269.60	8,731.16	-36.48	-4,450.97	4,451.12	0.82	Magn MWD		0.79	4,451.12	-0.22	N
13,003	91.10	269.10	8,730.37	-37.50	-4,540.96	4,541.11	1.44	Magn MWD		1.33	4,541.11	-0.56	N
13,092	92.20	269.10	8,727.81	-38.89	-4,629.91	4,630.07	1.24	Magn MWD		1.24	4,630.07	0.00	N
13,182	92.80	269.60	8,723.89	-39.91	-4,719.82	4,719.99	0.87	Magn MWD		0.67	4,719.99	0.56	N
13,260	92.00	269.30	8,720.62	-40.66	-4,797.74	4,797.92	1.10	Magn MWD		-1.03	4,797.92	-0.38	N
13,327	92.00	269.30	8,718.28	-41.48	-4,864.70	4,864.88	0.00	Extrap.		0.00	4,864.88	0.00	N