



PHOENIX
TECHNOLOGY SERVICES

Oil Conservation Division
State of New Mexico
1625 N. French Drive
Hobbs, New Mexico 88240

HOBBS OCD

July 11, 2012

JUL 20 2012

RECEIVED

Dear District 1 - Hobbs

Re: Cimarex Energy Co.
Hallertau 4 Federal 4H
Lea Co., NM
API #30-025-40475
Job No. 1210467

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. 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	
Daniel Scott	4H	1,245	8,921	06/04/12	06/16/12	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,

Amy Pope
Operations Administrator

Certified mail receipt number: 7011 1570 0001 4364 9957

JUL 10 2012

Phoenix Technology Services
SURVEY DATA CERTIFICATION

HOBBS OCD

JUL 20 2012



PHOENIX JOB NUMBER 1210467

RECEIVED Cimarex

WELL NAME Hallertau 4 Federal 4H

COUNTY & STATE

Lea, New Mexico

API WELL NUMBER 30-025-40475

PROPOSED DIRECTION 183.25

TIE-IN DATA						
MEASURED DEPTH	VERTICAL DEPTH	INCLIN	AZIMUTH	N-S COORD	E-W COORD	DATA SOURCE
1,190 ft	1,189.39 ft	2.7	202.7	-29.71 ft	-13.97 ft	Gyro

FIRST SURVEY DATE	FIRST SURVEY DEPTH	INCLIN	AZIMUTH
4-Jun-12	1,245 ft	2.9	215.1

SURVEY INSTRUMENT TYPE

Phoenix MWD

LAST SURVEY DATE	LAST SURVEY DEPTH	INCLIN	AZIMUTH
16-Jun-12	8,921 ft	13.8	178.4

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
16-Jun-12	8,976 ft	20.9	180

Daniel Scott

PRINT YOUR NAME ABOVE

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	7.16
DECLINATION OR GRID	GRID

TODAY'S DATE

MWD SUPERVISOR 1

Daniel Scott

DIRECTIONAL DRILLER 1

Brinton Donaldson

MWD SUPERVISOR 2

Lance Peak

DIRECTIONAL DRILLER 2

Victor Mata

1805 Brittmore Road

Houston, Texas 77043

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



PHOENIX
TECHNOLOGY SERVICES

Cimarex Energy Company of Colorado

Lea County NM (NAD 83)

Hallertau 4

Hallertau 4 Federal 4H

Job # 1210467/Rig : Cactus 101

Survey: Phoenix MWD Surveys

Cimarex Survey Report

18 June, 2012

RECEIVED

JUL 20 2012

HOBBS OCD



Cimarex Survey Report

Company:	Cimarex Energy Company of Colorado	Local Co-ordinate Reference:	Well Hallertau 4 Federal 4H
Project:	Lea County NM (NAD 83)	TVD Reference:	WELL @ 3330.60usft (Cactus 101)
Site:	Hallertau 4	MD Reference:	WELL @ 3330.60usft (Cactus 101)
Well:	Hallertau 4 Federal 4H	North Reference:	Grid
Wellbore:	Job # 1210467/Rig : Cactus 101	Survey Calculation Method:	Minimum Curvature
Design:	Job # 1210467/Rig : Cactus 101	Database:	Compass5000

Project	Lea County NM (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	Hallertau 4		
Site Position:		Northing:	393,013.58 usft
From:	Map	Easting:	745,819.19 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 4' 43.5144 N
		Longitude:	103° 40' 23.2719 W
		Grid Convergence:	0.35 °

Well	Hallertau 4 Federal 4H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	18.60 usft
		Latitude:	32° 4' 43.5140 N
		Longitude:	103° 40' 25.0121 W
		Ground Level:	3,312.00 usft

Wellbore	Job # 1210467/Rig : Cactus 101		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010_14	05/24/12	7.51
			Dip Angle
			60.01
			Field Strength
			48,424

Design	Job # 1210467/Rig : Cactus 101		
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
			183.25



Cimarex Survey Report

Company:	Cimarex Energy Company of Colorado	Local Co-ordinate Reference:	Well Hallertau 4 Federal 4H
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Site:	Hallertau 4	MD Reference:	WELL @ 3330.60usft (Cactus 101)
Well:	Hallertau 4 Federal 4H	North Reference:	Grid
Wellbore:	Job # 1210467/Rig : Cactus 101	Survey Calculation Method:	Minimum Curvature
Design:	Job # 1210467/Rig : Cactus 101	Database:	Compass5000

Survey Program		Date	06/18/12		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	1,190.00	Gyro Surveys (Job # 1210467/Rig : Cactus	MWD	MWD - Standard	
1,245.00	8,976.00	Phoenix MWD Surveys (Job # 1210467/Ri	MWD	MWD - Standard	

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
1,190.00	2.73	202.68	2,141.21	1,189.39	-29.71	-13.97	30.46	0.00	392,982.91	745,655.50	
1,245.00	2.90	215.10	2,086.27	1,244.33	-32.06	-15.27	32.88	1.15	392,980.56	745,654.19	
First Phoenix MWD Surveys @ 1245' MD											
1,308.00	2.70	220.00	2,023.35	1,307.25	-34.50	-17.14	35.42	0.49	392,978.12	745,652.32	
1,403.00	2.50	225.80	1,928.44	1,402.16	-37.66	-20.07	38.74	0.35	392,974.96	745,649.40	
1,498.00	1.30	238.60	1,833.50	1,497.10	-39.67	-22.47	40.88	1.33	392,972.96	745,646.99	
1,593.00	1.00	251.00	1,738.52	1,592.08	-40.50	-24.18	41.80	0.41	392,972.12	745,645.29	
1,689.00	0.90	252.50	1,642.53	1,688.07	-41.00	-25.69	42.39	0.11	392,971.62	745,643.78	
1,784.00	0.40	61.30	1,547.53	1,783.07	-41.06	-26.11	42.48	1.36	392,971.56	745,643.36	
1,880.00	1.20	26.20	1,451.54	1,879.06	-40.00	-25.37	41.37	0.94	392,972.62	745,644.10	
1,975.00	1.50	20.90	1,356.57	1,974.03	-37.95	-24.49	39.27	0.34	392,974.68	745,644.98	
2,071.00	0.80	23.70	1,260.59	2,070.01	-36.16	-23.77	37.45	0.73	392,976.46	745,645.70	
2,166.00	0.20	4.90	1,165.59	2,165.01	-35.39	-23.49	36.66	0.65	392,977.24	745,645.98	
2,261.00	0.10	64.90	1,070.59	2,260.01	-35.18	-23.40	36.45	0.18	392,977.44	745,646.07	
2,356.00	0.20	81.90	975.59	2,355.01	-35.13	-23.16	36.38	0.11	392,977.50	745,646.31	
2,449.00	0.50	104.50	882.60	2,448.00	-35.21	-22.61	36.43	0.35	392,977.42	745,646.86	
2,543.00	0.30	87.60	788.60	2,542.00	-35.30	-21.96	36.49	0.24	392,977.32	745,647.50	
2,638.00	0.30	89.90	693.60	2,637.00	-35.29	-21.47	36.45	0.01	392,977.34	745,648.00	
2,732.00	0.40	114.80	599.60	2,731.00	-35.42	-20.92	36.55	0.19	392,977.20	745,648.54	
2,827.00	0.50	125.90	504.60	2,826.00	-35.81	-20.29	36.90	0.14	392,976.82	745,649.18	
2,921.00	0.60	124.00	410.61	2,919.99	-36.32	-19.55	37.37	0.11	392,976.30	745,649.92	



Cimarex Survey Report

Company: Cimarex Energy Company of Colorado
Project: Lea County NM (NAD 83)
Site: Hallertau 4
Well: Hallertau 4 Federal 4H
Wellbore: Job # 1210467/Rig : Cactus 101
Design: Job # 1210467/Rig : Cactus 101

Local Co-ordinate Reference: Well Hallertau 4 Federal 4H
TVD Reference: WELL @ 3330.60usft (Cactus 101)
MD Reference: WELL @ 3330.60usft (Cactus 101)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass5000

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
3,016.00	0.50	133.10	315.61	3,014.99	-36.88	-18.83	37.89	0.14	392,975.74	745,650.64
3,110.00	0.50	98.00	221.62	3,108.98	-37.22	-18.12	38.19	0.32	392,975.40	745,651.34
3,205.00	0.70	93.60	126.62	3,203.98	-37.31	-17.14	38.23	0.22	392,975.31	745,652.33
3,299.00	0.90	84.60	32.63	3,297.97	-37.28	-15.83	38.12	0.25	392,975.34	745,653.64
3,393.00	1.00	86.20	-61.36	3,391.96	-37.16	-14.27	37.91	0.11	392,975.46	745,655.19
3,487.00	0.70	87.10	-155.35	3,485.95	-37.07	-12.88	37.74	0.32	392,975.55	745,656.58
3,582.00	0.40	87.30	-250.34	3,580.94	-37.03	-11.97	37.65	0.32	392,975.59	745,657.50
3,676.00	0.30	74.90	-344.34	3,674.94	-36.95	-11.41	37.54	0.13	392,975.67	745,658.06
3,770.00	0.20	88.00	-438.34	3,768.94	-36.88	-11.00	37.44	0.12	392,975.74	745,658.46
3,865.00	0.30	65.70	-533.34	3,863.94	-36.77	-10.61	37.31	0.14	392,975.85	745,658.85
3,959.00	0.50	99.30	-627.34	3,957.94	-36.74	-9.98	37.24	0.32	392,975.89	745,659.48
4,054.00	0.70	103.60	-722.33	4,052.93	-36.94	-9.01	37.39	0.22	392,975.68	745,660.46
4,148.00	1.00	107.30	-816.32	4,146.92	-37.32	-7.67	37.69	0.32	392,975.30	745,661.80
4,242.00	1.00	119.80	-910.31	4,240.91	-37.97	-6.17	38.26	0.23	392,974.65	745,663.29
4,337.00	1.10	134.50	-1,005.29	4,335.89	-39.02	-4.80	39.23	0.30	392,973.60	745,664.66
4,431.00	0.70	140.90	-1,099.28	4,429.88	-40.10	-3.80	40.25	0.44	392,972.52	745,665.67
4,488.00	0.50	116.70	-1,156.28	4,486.88	-40.48	-3.36	40.61	0.56	392,972.14	745,666.11
4,551.00	0.30	165.00	-1,219.27	4,549.87	-40.76	-3.07	40.87	0.59	392,971.86	745,666.40
4,647.00	0.10	164.10	-1,315.27	4,645.87	-41.09	-2.98	41.19	0.21	392,971.53	745,666.49
4,742.00	0.10	129.10	-1,410.27	4,740.87	-41.22	-2.89	41.32	0.06	392,971.40	745,666.57
4,837.00	0.30	173.40	-1,505.27	4,835.87	-41.52	-2.80	41.61	0.25	392,971.10	745,666.67
4,933.00	0.30	176.30	-1,601.27	4,931.87	-42.02	-2.75	42.11	0.02	392,970.60	745,666.71
5,028.00	0.50	165.40	-1,696.27	5,026.87	-42.67	-2.63	42.75	0.22	392,969.95	745,666.83
5,123.00	0.70	195.20	-1,791.26	5,121.86	-43.63	-2.68	43.71	0.38	392,968.99	745,666.78
5,219.00	0.70	187.20	-1,887.26	5,217.86	-44.78	-2.91	44.87	0.10	392,967.84	745,666.56
5,314.00	0.70	204.60	-1,982.25	5,312.85	-45.88	-3.22	45.99	0.22	392,966.74	745,666.24
5,409.00	0.80	209.00	-2,077.24	5,407.84	-46.99	-3.79	47.13	0.12	392,965.63	745,665.68



Cimarex Survey Report

Company: Cimarex Energy Company of Colorado
Project: Lea County NM (NAD 83)
Site: Hallertau 4:
Well: Hallertau 4 Federal 4H
Wellbore: Job # 1210467/Rig : Cactus 101
Design: Job # 1210467/Rig : Cactus 101

Local Co-ordinate Reference: Well Hallertau 4 Federal 4H
TVD Reference: WELL @ 3330.60usft (Cactus 101)
MD Reference: WELL @ 3330.60usft (Cactus 101)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass5000

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
5,505.00	0.90	207.60	-2,173.23	5,503.83	-48.24	-4.46	48.42	0.11	392,964.38	745,665.01	
5,600.00	0.80	215.70	-2,268.22	5,598.82	-49.44	-5.19	49.66	0.16	392,963.18	745,664.27	
5,695.00	1.00	208.80	-2,363.21	5,693.81	-50.71	-5.98	50.97	0.24	392,961.91	745,663.49	
5,789.00	0.90	212.70	-2,457.20	5,787.80	-52.05	-6.77	52.35	0.13	392,960.57	745,662.69	
5,885.00	1.10	216.90	-2,553.18	5,883.78	-53.42	-7.73	53.77	0.22	392,959.20	745,661.73	
5,980.00	0.90	206.00	-2,648.17	5,978.77	-54.82	-8.61	55.22	0.29	392,957.80	745,660.86	
6,076.00	0.80	200.50	-2,744.16	6,074.76	-56.12	-9.17	56.55	0.13	392,956.50	745,660.29	
6,171.00	0.80	201.20	-2,839.15	6,169.75	-57.36	-9.65	57.82	0.01	392,955.26	745,659.82	
6,266.00	1.00	217.10	-2,934.14	6,264.74	-58.64	-10.39	59.14	0.33	392,953.98	745,659.08	
6,361.00	0.70	206.00	-3,029.13	6,359.73	-59.83	-11.14	60.36	0.36	392,952.80	745,658.33	
6,456.00	1.00	218.20	-3,124.11	6,454.71	-61.00	-11.91	61.58	0.37	392,951.62	745,657.56	
6,552.00	0.60	213.30	-3,220.11	6,550.71	-62.08	-12.70	62.70	0.42	392,950.54	745,656.76	
6,647.00	0.70	227.40	-3,315.10	6,645.70	-62.89	-13.40	63.54	0.20	392,949.74	745,656.06	
6,743.00	0.40	238.00	-3,411.09	6,741.69	-63.46	-14.12	64.16	0.33	392,949.16	745,655.35	
6,839.00	0.60	195.30	-3,507.09	6,837.69	-64.12	-14.53	64.84	0.43	392,948.50	745,654.93	
6,933.00	0.50	233.20	-3,601.09	6,931.69	-64.84	-14.99	65.59	0.39	392,947.78	745,654.47	
7,028.00	0.60	218.70	-3,696.08	7,026.68	-65.48	-15.64	66.26	0.18	392,947.14	745,653.83	
7,123.00	0.80	200.00	-3,791.08	7,121.68	-66.49	-16.17	67.30	0.32	392,946.13	745,653.29	
7,219.00	1.00	185.90	-3,887.06	7,217.66	-67.95	-16.49	68.78	0.31	392,944.67	745,652.98	
7,314.00	1.10	213.10	-3,982.05	7,312.65	-69.54	-17.07	70.40	0.53	392,943.08	745,652.39	
7,409.00	0.90	205.50	-4,077.03	7,407.63	-70.98	-17.89	71.88	0.25	392,941.64	745,651.57	
7,505.00	1.20	201.20	-4,173.02	7,503.62	-72.60	-18.58	73.53	0.32	392,940.02	745,650.89	
7,600.00	1.10	198.30	-4,268.00	7,598.60	-74.39	-19.23	75.36	0.12	392,938.23	745,650.24	
7,695.00	1.30	211.40	-4,362.98	7,693.58	-76.18	-20.07	77.19	0.36	392,936.45	745,649.39	
7,791.00	1.20	208.30	-4,458.96	7,789.56	-77.99	-21.12	79.06	0.13	392,934.63	745,648.35	
7,886.00	1.40	204.60	-4,553.93	7,884.53	-79.92	-22.07	81.05	0.23	392,932.70	745,647.39	
7,981.00	1.50	209.00	-4,648.90	7,979.50	-82.07	-23.16	83.25	0.16	392,930.56	745,646.31	



Cimarex Survey Report

Company:	Cimarex Energy Company of Colorado	Local Co-ordinate Reference:	Well Hallertau-4 Federal 4H
Project:	Lea County NM (NAD 83)	TVD Reference:	WELL @ 3330.60usft (Cactus 101)
Site:	Hallertau 4	MD Reference:	WELL @ 3330.60usft (Cactus 101)
Well:	Hallertau 4 Federal 4H	North Reference:	Grid
Wellbore:	Job # 1210467/Rig : Cactus 101	Survey Calculation Method:	Minimum Curvature
Design:	Job # 1210467/Rig : Cactus 101	Database:	Compass5000

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVDSS (usft)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
8,076.00	1.60	209.50	-4,743.87	8,074.47	-84.31	-24.41	85.56	0.11	392,928.31	745,645.05	
8,171.00	1.60	204.70	-4,838.83	8,169.43	-86.67	-25.62	87.98	0.14	392,925.96	745,643.85	
8,266.00	1.90	208.30	-4,933.78	8,264.38	-89.26	-26.92	90.64	0.34	392,923.36	745,642.54	
8,362.00	1.70	207.80	-5,029.74	8,360.34	-91.92	-28.34	93.38	0.21	392,920.70	745,641.13	
8,457.00	1.50	208.80	-5,124.70	8,455.30	-94.25	-29.60	95.78	0.21	392,918.37	745,639.87	
8,552.00	1.50	202.40	-5,219.67	8,550.27	-96.49	-30.67	98.08	0.18	392,916.13	745,638.80	
8,648.00	1.50	214.30	-5,315.63	8,646.23	-98.69	-31.86	100.34	0.32	392,913.93	745,637.61	
8,734.00	1.50	235.10	-5,401.61	8,732.21	-100.27	-33.41	102.00	0.63	392,912.35	745,636.05	
8,794.00	1.50	251.50	-5,461.59	8,792.19	-100.97	-34.80	102.78	0.71	392,911.66	745,634.66	
8,825.00	2.70	197.00	-5,492.57	8,823.17	-101.79	-35.40	103.64	7.09	392,910.83	745,634.07	
8,857.00	6.40	182.20	-5,524.46	8,855.06	-104.30	-35.69	106.15	12.04	392,908.32	745,633.78	
8,889.00	9.80	179.40	-5,556.14	8,886.74	-108.80	-35.73	110.65	10.69	392,903.82	745,633.74	
8,921.00	13.80	178.40	-5,587.46	8,918.06	-115.34	-35.59	117.18	12.52	392,897.28	745,633.87	
8,976.00	20.86	180.00	-5,639.93	8,970.53	-131.72	-35.41	133.51	12.86	392,880.91	745,634.05	

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N-S (usft)	+E-W (usft)	
1,245.00	1,244.33	-32.06	-15.27	First Phoenix MWD Surveys @ 1245' MD

Checked By: _____	Approved By: _____	Date: _____
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