

Results of Directional Survey

API number:	30-025-40997	DD	
OGRID:		Operator:	CHEVRON U S A INC
		Property:	CENTRAL VACUUM UNIT # 437

surface	ULSTR:	N	25	T	17S	R	34E
				570	FSL	2180	FWL

BH Loc	ULSTR:	N	25	T	17S	R	34E
5160	MD	5086.4	TVD	652	FSL	2608	FWL

Top Perf/OH	ULSTR:	N	25	T	17S	R	34E
4389	MD	4364.4	TVD	573	FSL	2350	FWL

Bot Perf/OH	ULSTR:	N	25	T	17S	R	34E
4781	MD	4733.2	TVD	615	FSL	2476	FWL

	MD	N/S	E/W	VD
	4347	-1.80	156.10	4325
TOP PERFS/OH	4389	3.01	169.87	4364.39
	4437	8.50	185.60	4409.40
	4707	37.50	272.50	4663.40
BOT PERFS/OH	4781	44.90	295.80	4733.20
	4788	45.60	298.00	4739.80

NEXT TO LAST	5111	77.20	410.30	5041.00
LAST READING	5160	82.00	428.10	5086.40
TD	5160	82.00	428.10	5086.40

Surface Location	570	FS	2180	FW
Projected BHL	652	FS	2608	FW
Location of				
Top Perfs/OH	573	FS	2350	FW
Bottom Perfs/OH	615	FS	2476	FW

SUMMARY of Subsurface Locations

Surface Location	N-25-17S-34E	570	FS	2180	FW	Vert. Depth
Top Perfs/OH	N-25-17S-34E	573	FS	2350	FW	4364.39
Bottom Perfs/OH	N-25-17S-34E	615	FS	2476	FW	4733.20
Projected TD	N-25-17S-34E	652	FS	2608	FW	5086.40

FEB 27 2014

Chevron

Lea County, NM (NAD27 NME)

CVU

437

OH

Design: OH - Job #320813-MPD-806

SDI Survey Report

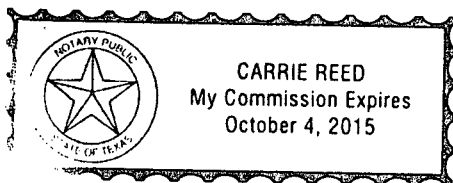
This survey is correct to the best of my knowledge and is supported by actual field data.

Shubarton

Notarized this date 3rd of September, 2013.

Carrie Reed

Notary Signature
County of Midland
State of Texas



SDI

SDI Survey Report

Company:	Chevron	Local Co-ordinate Reference:	Site CVU
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 4022.1usft (H&P #356)
Site:	CVU	MD Reference:	RKB @ 4022.1usft (H&P #356)
Well:	437	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH - Job #320813-MPD-806	Database:	EDM-Regulatory

Project	Lea County, NM (NAD27 NME), Lea County, New Mexico		
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	CVU		
Site Position:		Northing:	655,800.09 usft
From:	Map	Easting:	751,451.30 usft
Position Uncertainty:	0.0 usft	Slot Radius:	0"
		Latitude:	32° 48' 0.755 N
		Longitude:	103° 30' 54.041 W
		Grid Convergence:	0.44 °

Well	437		
Well Position	+N/-S	0.0 usft	Northing: 655,800.09 usft
	+E/-W	0.0 usft	Easting: 751,451.30 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 48' 0.755 N
		Longitude:	103° 30' 54.041 W
		Ground Level:	4,004.1 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF200510	12/12/2012	7.41
			Dip Angle (°)
			60.72
			Field Strength (nT)
			48,856

Design	OH - Job #320813-MPD-806		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction (°)
			0.00

Survey Program	Date 9/19/2013		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
99.5	3,176.4	SDI Gyro #1 (OH)	SDI Gyro
3,264.0	5,160.0	SDI MWD #1 (OH)	SDI-MWD
			Description
			Gyroscopic Survey
			MWD - Scientific Drilling

Survey								
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Azimuth (°)	Closure Distance (usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.0	
99.5	0.40	248.66	99.5	-0.1	-0.3	248.66	0.3	
190.8	0.05	71.95	190.8	-0.2	-0.6	248.45	0.6	
282.1	0.17	110.46	282.1	-0.3	-0.4	237.60	0.5	
375.9	0.25	132.59	375.9	-0.5	-0.1	196.81	0.5	
467.2	0.42	167.69	467.2	-0.9	0.1	174.91	0.9	
560.5	0.75	176.97	560.5	-1.9	0.2	174.26	1.9	
651.8	0.87	177.64	651.8	-3.1	0.2	175.52	3.2	
743.1	1.24	186.31	743.1	-4.8	0.2	178.02	4.8	
839.4	1.86	201.18	839.3	-7.3	-0.5	184.01	7.3	
929.5	2.24	179.74	929.4	-10.4	-1.0	185.65	10.5	

SDI
SDI Survey Report

Company:	Chevron	Local Co-ordinate Reference:	Site CVU
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 4022.1usft (H&P #356)
Site:	CVU	MD Reference:	RKB @ 4022.1usft (H&P #356)
Well:	437	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH - Job #320813-MPD-806	Database:	EDM-Regulatory

Survey							
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Azimuth (°)	Closure Distance (usft)
1,019.7	2.43	181.63	1,019.5	-14.1	-1.1	184.37	14.2
1,109.9	2.73	188.27	1,109.6	-18.2	-1.4	184.54	18.2
1,200.1	3.21	191.21	1,199.7	-22.8	-2.2	185.63	22.9
1,290.3	3.24	193.77	1,289.7	-27.7	-3.3	186.87	27.9
1,380.4	3.35	194.75	1,379.7	-32.7	-4.6	188.03	33.1
1,469.6	3.51	199.44	1,468.8	-37.8	-6.2	189.29	38.3
1,559.8	2.95	201.04	1,558.8	-42.6	-7.9	190.56	43.3
1,650.0	2.90	203.35	1,648.9	-46.9	-9.7	191.67	47.8
1,740.2	2.58	205.17	1,738.9	-50.8	-11.4	192.70	52.1
1,830.3	2.43	206.73	1,829.0	-54.3	-13.2	193.63	55.9
1,920.5	2.15	204.89	1,919.1	-57.6	-14.7	194.36	59.4
2,010.7	2.00	204.69	2,009.3	-60.5	-16.1	194.90	62.6
2,100.9	1.72	197.06	2,099.4	-63.3	-17.2	195.18	65.5
2,191.1	1.50	194.71	2,189.5	-65.7	-17.9	195.21	68.1
2,281.2	1.09	198.15	2,279.7	-67.6	-18.4	195.24	70.1
2,371.4	1.09	200.36	2,369.9	-69.3	-19.0	195.33	71.8
2,461.6	0.85	203.57	2,460.0	-70.7	-19.6	195.47	73.3
2,551.8	0.56	183.21	2,550.2	-71.7	-19.9	195.47	74.4
2,642.0	0.77	119.08	2,640.4	-72.5	-19.3	194.95	75.0
2,732.1	0.96	93.13	2,730.5	-72.8	-18.1	193.93	75.0
2,822.3	1.11	91.81	2,820.7	-72.9	-16.4	192.71	74.7
2,912.5	1.22	86.44	2,910.9	-72.8	-14.6	191.34	74.3
3,002.7	1.21	85.54	3,001.0	-72.7	-12.7	189.91	73.8
3,092.9	1.15	86.73	3,091.2	-72.6	-10.8	188.50	73.4
3,176.4	1.21	90.96	3,174.7	-72.6	-9.1	187.17	73.1
3,264.0	1.23	88.97	3,262.3	-72.6	-7.3	185.71	72.9
3,352.0	1.32	61.46	3,350.3	-72.0	-5.4	184.31	72.3
3,446.0	2.55	61.81	3,444.2	-70.5	-2.6	182.14	70.6
3,533.0	4.31	62.17	3,531.1	-68.1	2.0	178.35	68.1
3,626.0	6.07	57.60	3,623.7	-63.8	9.2	171.79	64.5
3,716.0	7.47	61.02	3,713.0	-58.5	18.3	162.58	61.3
3,806.0	9.76	63.48	3,802.0	-52.2	30.3	149.88	60.4
3,896.0	11.34	66.12	3,890.5	-45.2	45.2	135.01	63.9
3,986.0	12.93	65.33	3,978.5	-37.4	62.4	120.94	72.8
4,076.0	14.07	67.79	4,066.0	-29.1	81.7	109.60	86.8
4,167.0	15.92	70.16	4,153.9	-20.7	103.7	101.28	105.8
4,257.0	18.03	69.81	4,240.0	-11.7	128.4	95.20	128.9
4,347.0	20.14	70.69	4,325.0	-1.8	156.1	90.64	156.1
4,437.0	20.49	70.95	4,409.4	8.5	185.6	87.37	185.8
4,527.0	20.14	71.48	4,493.8	18.6	215.2	85.07	216.0
4,617.0	19.43	71.66	4,578.5	28.2	244.1	83.41	245.7
4,707.0	19.35	72.01	4,663.4	37.5	272.5	82.16	275.1
4,788.0	19.26	72.71	4,739.8	45.6	298.0	81.29	301.5
4,878.0	20.32	75.39	4,824.5	54.0	327.3	80.63	331.7

SDI
SDI Survey Report

Company:	Chevron	Local Co-ordinate Reference:	Site CVU
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 4022.1usft (H&P #356)
Site:	CVU	MD Reference:	RKB @ 4022.1usft (H&P #356)
Well:	437	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH - Job #320813-MPD-806	Database:	EDM-Regulatory

Survey								
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Azimuth (°)	Closure Distance (usft)	
4,968.0	21.90	73.77	4,908.5	62.6	358.5	80.09	364.0	
5,013.0	22.07	74.21	4,950.2	67.3	374.7	79.82	380.7	
5,111.0	22.15	74.67	5,041.0	77.2	410.3	79.35	417.5	
MWD Survey								
5,160.0	22.15	74.67	5,086.4	82.0	428.1	79.15	435.9	
Projection to Bit								
578 7172								

(578) (2172)

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
5,111.0	5,041.0	77.2	410.3	MWD Survey	
5,160.0	5,086.4	82.0	428.1	Projection to Bit	

Checked By: _____	Approved By: _____	Date: _____
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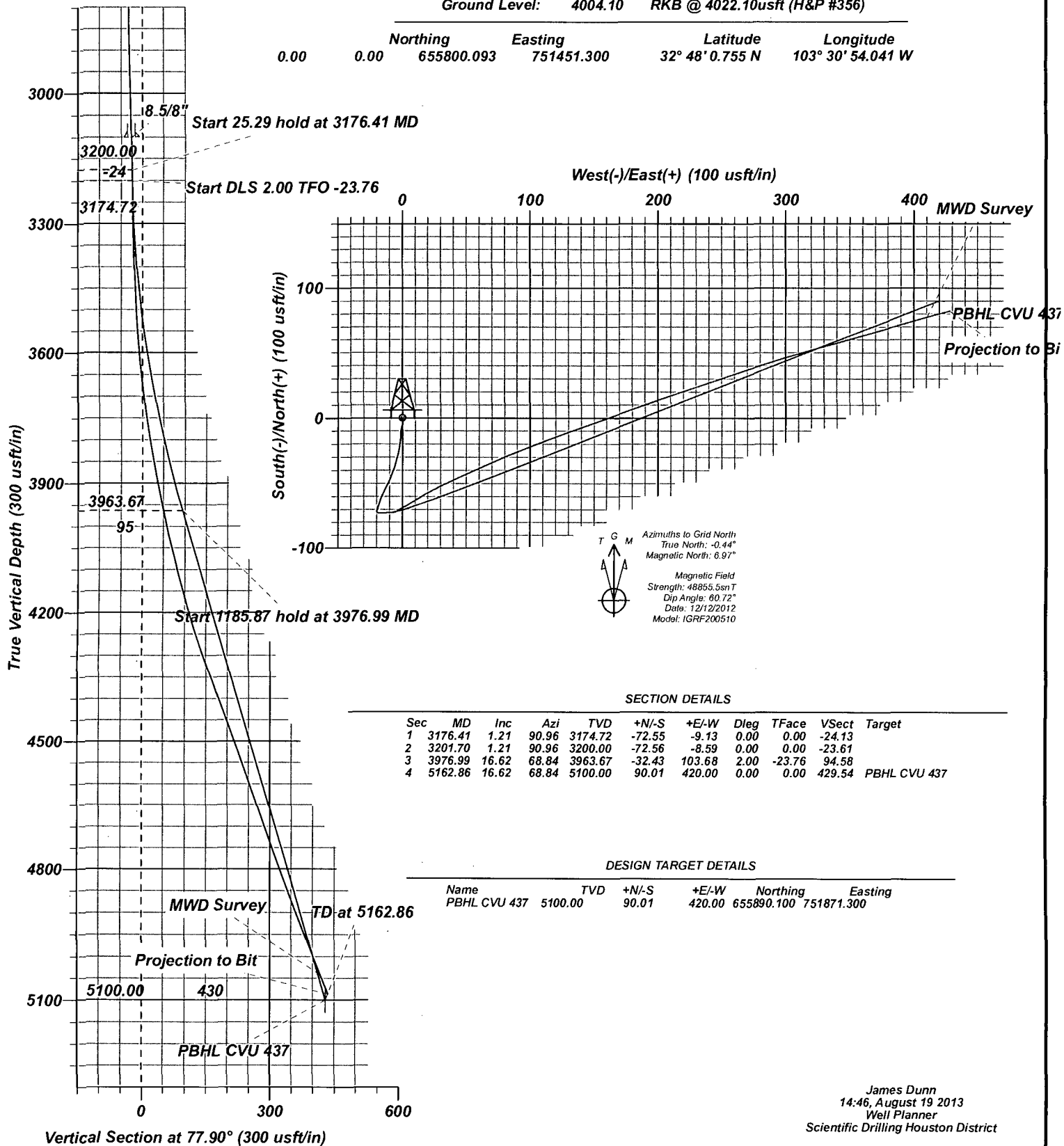


Lea County, NM (NAD27 NME)
CVU 437
Plan #2
H&P #356



Ground Level: 4004.10 RKB @ 4022.10usft (H&P #356)

0.00 0.00 Northing 655800.093 Easting 751451.300 Latitude 32° 48' 0.755 N Longitude 103° 30' 54.041 W



Azimuths to Grid North
True North: -0.44°
Magnetic North: 8.97°
Magnetic Field
Strength: 48855.5nT
Dip Angle: 60.72°
Date: 12/12/2012
Model: IGRF200510

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VFace	Target
1	3176.41	1.21	90.96	3174.72	-72.55	-9.13	0.00	0.00	-24.13	
2	3201.70	1.21	90.96	3200.00	-72.56	-8.59	0.00	0.00	-23.61	
3	3976.99	16.62	68.84	3963.67	-32.43	103.68	2.00	-23.76	94.58	
4	5162.86	16.62	68.84	5100.00	90.01	420.00	0.00	0.00	429.54	PBHL CVU 437

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
PBHL CVU 437	5100.00	90.01	420.00	655890.100	751871.300

James Dunn
14:46, August 19 2013
Well Planner
Scientific Drilling Houston District

HOBBS OCD

DEC 26 2013

RECEIVED

CHEVRON

Vacuum Grayburg San Andres
Lea County, NM
Central Vacuum Unit #437
VH - Job #320813-K-836

Survey: drop Gyro

SDI Survey Report

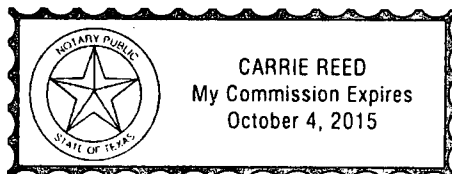
This survey is correct to the best of my knowledge and is supported by actual field data.

[Signature]

Notarized this date 1st of September, 2013.

[Signature]

Notary Signature
County of Midland
State of Texas



SDI
SDI Survey Report

Company:	CHEVRON	Local Co-ordinate Reference:	Well Central Vacuum Unit #437
Project:	Vacuum Grayburg San Andres	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Lea County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Central Vacuum Unit #437	North Reference:	True
Wellbore:	VH - Job #320813-K-836	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #320813-K-836	Database:	EDM-Regulatory

Project	Vacuum Grayburg San Andres		
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	Lea County, NM		
Site Position:		Northing:	656,116.37 usft
From:	Lat/Long	Easting:	755,139.93 usft
Position Uncertainty:	0.0 usft	Slot Radius:	0"
		Latitude:	32° 48' 3.600 N
		Longitude:	103° 30' 10.800 W
		Grid Convergence:	0.45 °

Well	Central Vacuum Unit #437, Directional		
Well Position	+N/-S	0.0 usft	Northing: 655,800.19 usft
	+E/-W	0.0 usft	Easting: 751,451.38 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 48' 0.756 N
		Longitude:	103° 30' 54.040 W
		Ground Level:	0.0 usft

Wellbore	VH - Job #320813-K-836				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	8/12/2013	7.34	60.67	48,778

Design	VH - Job #320813-K-836			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.0	0.0	0.0	77.91

Survey Program	Date	8/22/2013		
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
99.5	3,176.4	drop Gyro (VH - Job #320813-K-836)	Keeper	Keeper Gyro

Survey								
MD	Inc	Azi (azimuth)	TVD	N/S	E/W	Closure Azimuth	Closure Distance	
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(°)	(usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.0	
99.5	0.40	248.66	99.5	-0.1	-0.3	248.66	0.3	
190.8	0.05	71.95	190.8	-0.2	-0.6	248.45	0.6	
282.1	0.17	110.46	282.1	-0.3	-0.4	237.60	0.5	
375.9	0.25	132.59	375.9	-0.5	-0.1	196.81	0.5	
467.2	0.42	167.69	467.2	-0.9	0.1	174.91	0.9	
560.5	0.75	176.97	560.5	-1.9	0.2	174.26	1.9	
651.8	0.87	177.64	651.8	-3.1	0.2	175.52	3.2	
743.1	1.24	186.31	743.1	-4.8	0.2	178.02	4.8	
839.4	1.86	201.18	839.3	-7.3	-0.5	184.01	7.3	
929.5	2.24	179.74	929.4	-10.4	-1.0	185.65	10.5	
1,019.7	2.43	181.63	1,019.5	-14.1	-1.1	184.37	14.2	

SDI
SDI Survey Report

Company:	CHEVRON	Local Co-ordinate Reference:	Well Central Vacuum Unit #437
Project:	Vacuum Grayburg San Andres	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Lea County, NM	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Central Vacuum Unit #437	North Reference:	True
Wellbore:	VH - Job #320813-K-836	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #320813-K-836	Database:	EDM-Regulatory

Survey								
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	Closure Azimuth (°)	Closure Distance (usft)	
1,109.9	2.73	188.27	1,109.6	-18.2	-1.4	184.54	18.2	
1,200.1	3.21	191.21	1,199.7	-22.8	-2.2	185.63	22.9	
1,290.3	3.24	193.77	1,289.7	-27.7	-3.3	186.87	27.9	
1,380.4	3.35	194.75	1,379.7	-32.7	-4.6	188.03	33.1	
1,469.6	3.51	199.44	1,468.8	-37.8	-6.2	189.29	38.3	
1,559.8	2.95	201.04	1,558.8	-42.6	-7.9	190.56	43.3	
1,650.0	2.90	203.35	1,648.9	-46.9	-9.7	191.67	47.8	
1,740.2	2.58	205.17	1,738.9	-50.8	-11.4	192.70	52.1	
1,830.3	2.43	206.73	1,829.0	-54.3	-13.2	193.63	55.9	
1,920.5	2.15	204.89	1,919.1	-57.6	-14.7	194.36	59.4	
2,010.7	2.00	204.69	2,009.3	-60.5	-16.1	194.90	62.6	
2,100.9	1.72	197.06	2,099.4	-63.3	-17.2	195.18	65.5	
2,191.1	1.50	194.71	2,189.5	-65.7	-17.9	195.21	68.1	
2,281.2	1.09	198.15	2,279.7	-67.6	-18.4	195.24	70.1	
2,371.4	1.09	200.36	2,369.9	-69.3	-19.0	195.33	71.8	
2,461.6	0.85	203.57	2,460.0	-70.7	-19.6	195.47	73.3	
2,551.8	0.56	183.21	2,550.2	-71.7	-19.9	195.47	74.4	
2,642.0	0.77	119.08	2,640.4	-72.5	-19.3	194.95	75.0	
2,732.1	0.96	93.13	2,730.5	-72.8	-18.1	193.93	75.0	
2,822.3	1.11	91.81	2,820.7	-72.9	-16.4	192.71	74.7	
2,912.5	1.22	86.44	2,910.9	-72.8	-14.6	191.34	74.3	
3,002.7	1.21	85.54	3,001.0	-72.7	-12.7	189.91	73.8	
3,092.9	1.15	86.73	3,091.2	-72.6	-10.8	188.50	73.4	
3,176.4	1.21	90.96	3,174.7	-72.6	-9.1	187.17	73.1	



Scientific Drilling

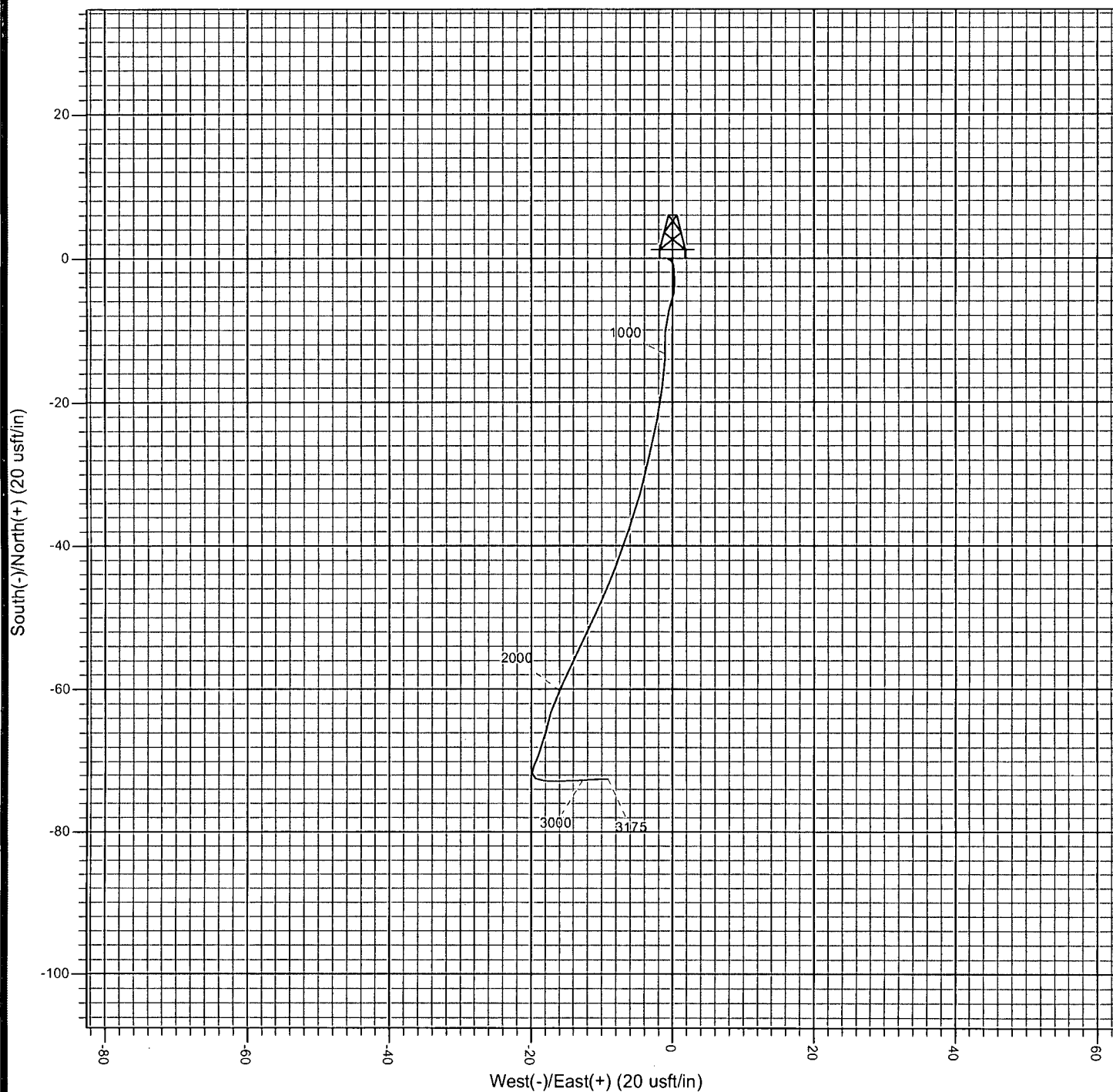
Project: Vacuum Grayburg San Andres
Lea County, NM
Well: Central Vacuum Unit #437
Wellbore: VH - Job #320813-K-836
Design: VH - Job #320813-K-836

WELL DETAILS: Central Vacuum Unit #437

WELL @ 0.0usft (Original Well Elev)

Ground Level: 0.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	655800.19	751451.38	32° 48' 0.756 N	103° 30' 54.040 W	



PROJECT DETAILS: Vacuum Grayburg San Andres	SITE DETAILS: Lea County, NM
Geodetic System: US State Plane 1927 (Exact solution)	Site Centre Latitude: 32° 48' 3.600 N
Datum: NAD 1927 (NADCON CONUS)	Longitude: 103° 30' 10.800 W
Ellipsoid: Clarke 1866	Positional Uncertainty: 0.0
Zone: New Mexico East 3001	Convergence: 0.45
System Datum: Mean Sea Level	Local North: True