

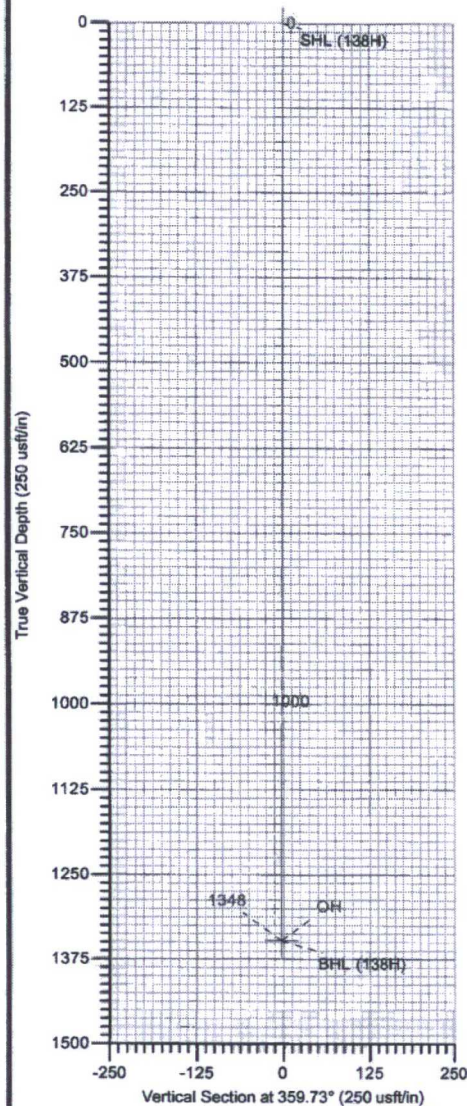


Project: Lea County, NM (NAD-83)
 Site: Thistle Unit
 Well: 138H
 Wellbore: OH
 Design: Plan #1



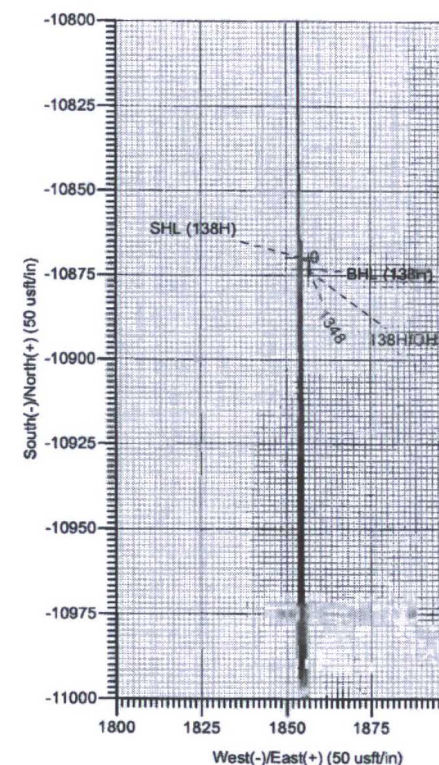
Azimuths to Grid North
 True North: -0.41°
 Magnetic North: 6.49°

Magnetic Field
 Strength: 48205.2nT
 Dip Angle: 60.05°
 Date: 1/5/2017
 Model: HDGM



DESIGN TARGET DETAILS					
Name	TVD	+N/-S	+E/-W	Northing	Easting
SHL (138H)	0.00	-10869.80	1854.56	457157.10	782577.12
BHL (138H)	1347.99	-10873.24	1856.44	457153.66	782579.00
MP (138H)	10091.00	-7003.80	1835.43	461023.10	782557.99
PBHL (138H)	10145.00	-3137.15	1817.05	464889.75	782539.61

PROJECT DETAILS: Lea County, NM (NAD-83)	
Geodetic System:	US State Plane 1983
Datum:	North American Datum 1983
Ellipsoid:	GRS 1980
Zone:	New Mexico Eastern Zone



Devon Energy

Lea County, NM (NAD-83)

Thistle Unit

138H

OH

Design: OH

Standard Survey Report

31 January, 2017

LEAM Drilling Systems LLC
Survey Report

Company:	Devon Energy	Local Co-ordinate Reference:	Site Thistle Unit
Project:	Lea County, NM (NAD-83)	TVD Reference:	3640.3' GE + 23.5' KB @ 3663.80usft (Original Well Elev)
Site:	Thistle Unit	MD Reference:	3640.3' GE + 23.5' KB @ 3663.80usft (Original Well Elev)
Well:	138H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Multi User Db

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	Thistle Unit		
Site Position:		Northing:	468,026.90 usft
From:	Map	Easting:	780,722.56 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 17' 3.494 N
		Longitude:	103° 33' 31.335 W
		Grid Convergence:	0.41 °

Well	138H		
Well Position	+N/-S	-10,869.80 usft	Northing:
	+E/-W	1,854.56 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	3,663.80 usft
		Latitude:	32° 15' 15.804 N
		Longitude:	103° 33' 10.653 W
		Ground Level:	3,640.30 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	1/5/2017	6.90
			Dip Angle (°)
			60.05
			Field Strength (nT)
			48,205

Design	OH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	-10,869.80	1,854.56
			Direction (°)
			359.73

Survey Program	Date 1/31/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
137.00	1,203.00	Survey #1 (OH)	LEAM MWD+HDGM
1,348.00	1,348.00	Survey #2 (OH)	Project
			Description
			MWD+HDGM Projection

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	-10,869.80	1,854.56	0.00	0.00	0.00	0.00
SHL (138H)									
137.00	0.20	158.50	137.00	-10,870.02	1,854.65	-0.22	0.15	0.15	0.00
265.00	0.30	103.20	265.00	-10,870.31	1,855.06	-0.51	0.19	0.08	-43.20
445.00	0.40	99.80	445.00	-10,870.52	1,856.13	-0.73	0.06	0.06	-1.89
544.00	0.30	114.60	543.99	-10,870.69	1,856.71	-0.90	0.14	-0.10	14.95
636.00	0.10	205.30	635.99	-10,870.86	1,856.89	-1.07	0.34	-0.22	98.59
728.00	0.20	164.70	727.99	-10,871.09	1,856.90	-1.30	0.15	0.11	-44.13

LEAM Drilling Systems LLC

Survey Report

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Site:	Thistle Unit	MD Reference:	3640.3' GE + 23.5' KB @ 3663.80usft (Original Well Elev)
Well:	138H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Multi User 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)	
823.00	0.30	184.20	822.99	-10,871.50	1,856.93	-1.71	0.14	0.11	20.53	
918.00	0.30	183.30	917.99	-10,871.99	1,856.90	-2.20	0.00	0.00	-0.95	
1,013.00	0.30	190.30	1,012.99	-10,872.49	1,856.84	-2.70	0.04	0.00	7.37	
1,108.00	0.20	192.60	1,107.99	-10,872.89	1,856.76	-3.10	0.11	-0.11	2.42	
1,203.00	0.10	235.50	1,202.99	-10,873.10	1,856.65	-3.31	0.15	-0.11	45.16	
1,348.00	0.10	235.50	1,347.99	-10,873.24	1,856.44	-3.45	0.00	0.00	0.00	
PBHL (138H) - MP (138H) - BHL (138H)										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
BHL (138H)	0.00	0.00	1,347.99	-10,873.24	1,856.44	457,153.66	782,579.00	32° 15' 15.769 N	103° 33' 10.631 W	
- actual wellpath hits target center										
- Point										

Checked By: _____ Approved By: _____ Date: _____