

Devon Energy

Project: Lea County, NM (NAD-83)
Site: Thistle Unit
Well: 102H
Wellbore: OH
Design: Plan #1



Azimuths to Grid North
True North: -0.42°
Magnetic North: 6.48°

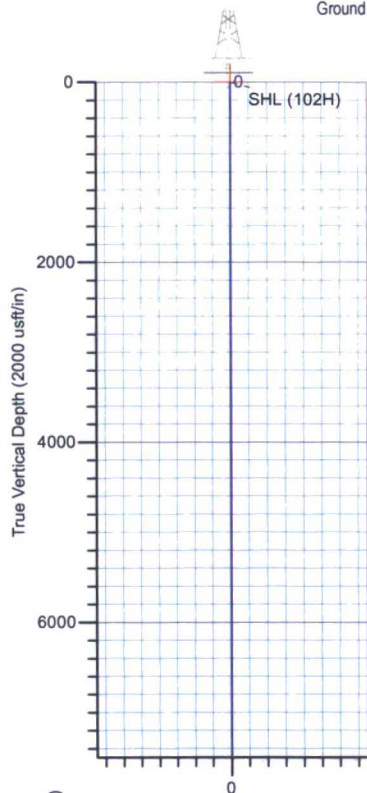
Magnetic Field
Strength: 48205.2snT
Dip Angle: 60.05°
Date: 1/5/2017
Model: HDGM

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



3637.8' GE + 23.5' KB @ 3664.30usft (Original Well Elev)
Ground Level: 3640.80



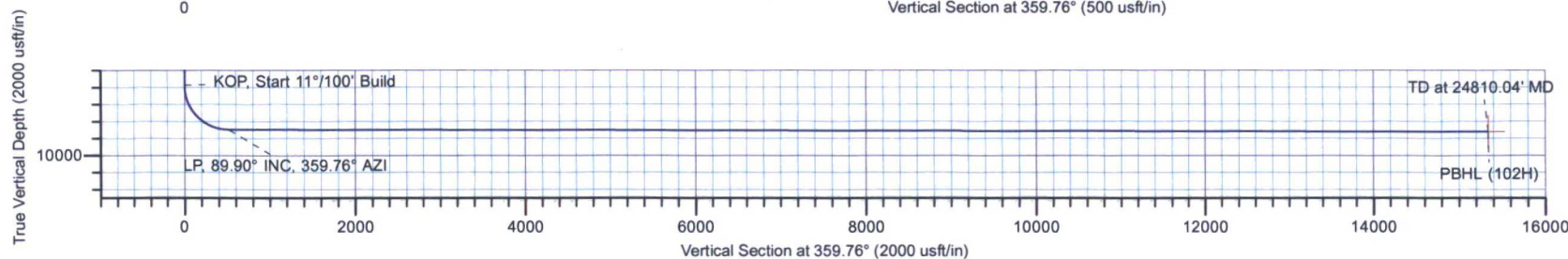
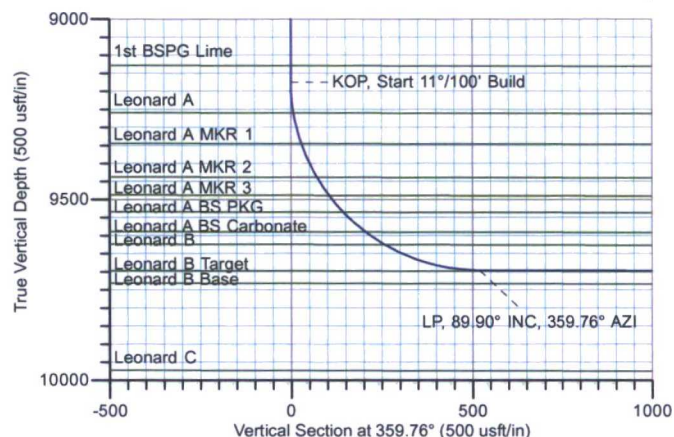
HOBBS OCD
JAN 18 2017
RECEIVED

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	9175.27	0.00	0.00	9175.27	0.00	0.00	0.00	0.00	0.00	KOP, Start 11°/100' Build
3	9992.54	89.90	359.76	9696.14	519.96	-2.19	11.00	359.76	519.96	LP, 89.90° INC, 359.76° AZI
4	24810.04	89.90	359.76	9722.00	15337.30	-64.71	0.00	0.00	15337.44	TD at 24810.04' MD

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
PBHL (102H)	9722.00	15337.30	-64.71	32° 17' 47.572 N	103° 33' 10.456 W
SHL (102H)	0.00	0.00	0.00	32° 15' 15.804 N	103° 33' 11.002 W



LEAM DRILLING SYSTEMS LLC
2010 East Davis, Conroe, Texas 77301
Phone: 936/756-7577, Fax: 936/756-7595

Plan: Plan #1 (102H/OH)
Thistle Unit
Created By: Brady Deaver
Date: _____
Approved: _____
Date: 13:30, January 12 2017

Devon Energy

Project: Lea County, NM (NAD-83)
Site: Thistle Unit
Well: 102H
Wellbore: OH
Design: Plan #1



Azimuths to Grid North
True North: -0.42°
Magnetic North: 6.48°
Magnetic Field
Strength: 48205.2snT
Dip Angle: 60.05°
Date: 1/5/2017
Model: HDGM



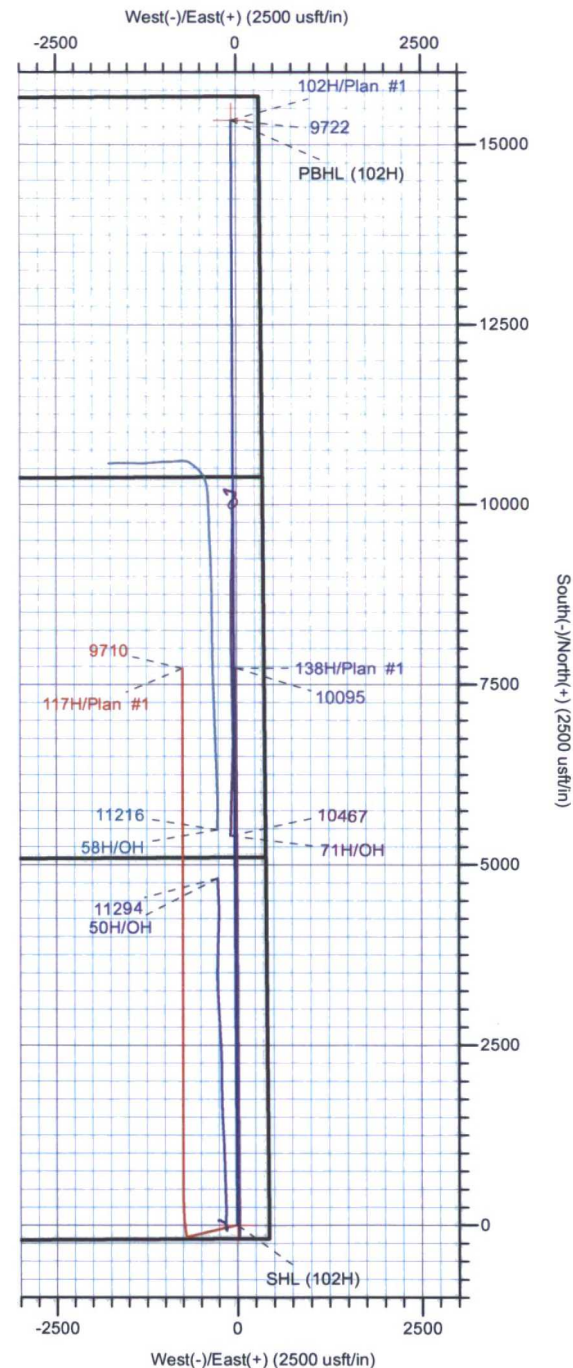
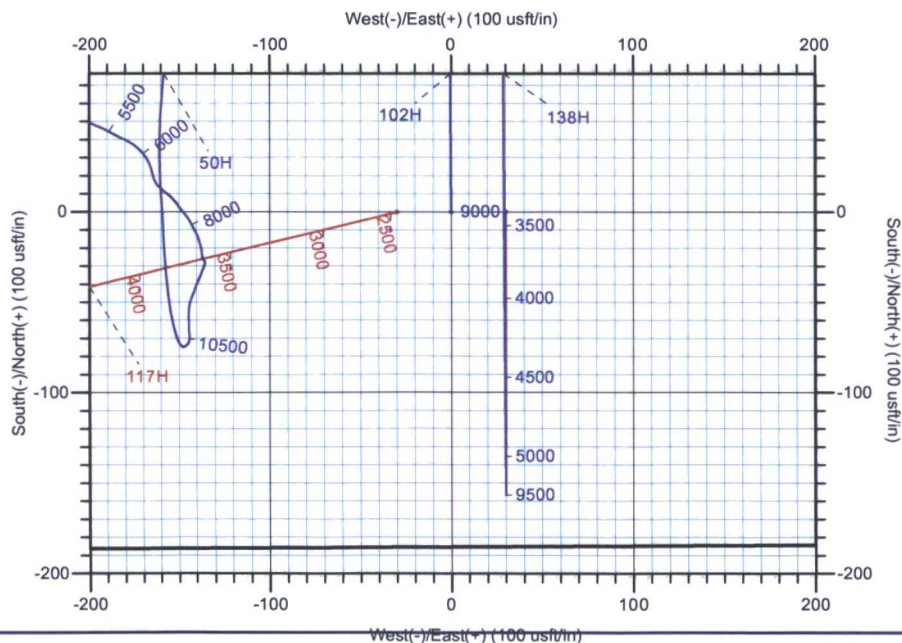
PROJECT DETAILS: Lea County, NM (NAD-83)
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
9175.27	0.00	0.00	9175.27	0.00	0.00	0.00	0.00	0.00	
9992.54	89.90	359.76	9696.14	519.96	-2.19	11.00	359.76	519.96	
24810.04	89.90	359.76	9722.00	15337.30	-64.71	0.00	0.00	15337.44	PBHL (102H)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL (102H)	9722.00	15337.30	-64.71	472494.22	782482.48	32° 17' 47.572 N	103° 33' 10.456 W
SHL (102H)	0.00	0.00	0.00	457156.92	782547.19	32° 15' 15.804 N	103° 33' 11.002 W



LEAM DRILLING SYSTEMS LLC
2010 East Davis, Conroe, Texas 77301
Phone: 936/756-7577, Fax: 936/756-7595

Plan: Plan #1 (102H/OH)
Thistle Unit
Created By: Brady Deaver
Date: _____
Approved: _____
Date: 13:39, January 12 2017

Devon Energy

Lea County, NM (NAD-83)

Thistle Unit

102H

OH

HOBBS OCD

JAN 18 2017

RECEIVED

Plan: Plan #1

Standard Planning Report

12 January, 2017

LEAM Drilling Systems LLC

Planning Report

Database:	EDM 5000.1 Multi User Db	Local Co-ordinate Reference:	Well 102H
Company:	Devon Energy	TVD Reference:	3637.8' GE + 23.5' KB @ 3664.30usft (Original Well Elev)
Project:	Lea County, NM (NAD-83)	MD Reference:	3637.8' GE + 23.5' KB @ 3664.30usft (Original Well Elev)
Site:	Thistle Unit	North Reference:	Grid
Well:	102H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

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

Well	102H					
Well Position	+N/-S	-10,869.98 usft	Northing:	457,156.92 usft	Latitude:	32° 15' 15.804 N
	+E/-W	1,824.63 usft	Easting:	782,547.19 usft	Longitude:	103° 33' 11.002 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	3,664.30 usft	Ground Level:	3,640.80 usft

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

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	359.76

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
9,175.27	0.00	0.00	9,175.27	0.00	0.00	0.00	0.00	0.00	0.00	
9,992.54	89.90	359.76	9,696.14	519.96	-2.19	11.00	11.00	0.00	359.76	
24,810.04	89.90	359.76	9,722.00	15,337.30	-64.71	0.00	0.00	0.00	0.00	PBHL (102H)

LEAM Drilling Systems LLC

Planning Report

Database:	EDM 5000.1 Multi User Db	Local Co-ordinate Reference:	Well 102H
Company:	Devon Energy	TVD Reference:	3637.8' GE + 23.5' KB @ 3664.30usft (Original Well Elev)
Project:	Lea County, NM (NAD-83)	MD Reference:	3637.8' GE + 23.5' KB @ 3664.30usft (Original Well Elev)
Site:	Thistle Unit	North Reference:	Grid
Well:	102H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned 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	
SHL (102H)										
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,324.30	0.00	0.00	1,324.30	0.00	0.00	0.00	0.00	0.00	0.00	
Rustler										
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,824.30	0.00	0.00	1,824.30	0.00	0.00	0.00	0.00	0.00	0.00	
Top of Salt										
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00	

LEAM Drilling Systems LLC

Planning Report

Database: EDM 5000.1 Multi User Db
 Company: Devon Energy
 Project: Lea County, NM (NAD-83)
 Site: Thistle Unit
 Well: 102H
 Wellbore: OH
 Design: Plan #1

Local Co-ordinate Reference: Well 102H
 TVD Reference: 3637.8' GE + 23.5' KB @ 3664.30usft
 (Original Well Elev)
 MD Reference: 3637.8' GE + 23.5' KB @ 3664.30usft
 (Original Well Elev)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned 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)
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,969.30	0.00	0.00	4,969.30	0.00	0.00	0.00	0.00	0.00	0.00
Base of Salt									
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,236.30	0.00	0.00	5,236.30	0.00	0.00	0.00	0.00	0.00	0.00
Delaware									
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	0.00	0.00
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	0.00	0.00
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	0.00	0.00
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	0.00	0.00
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	0.00	0.00
8,000.00	0.00	0.00	8,000.00	0.00	0.00	0.00	0.00	0.00	0.00
8,100.00	0.00	0.00	8,100.00	0.00	0.00	0.00	0.00	0.00	0.00
8,200.00	0.00	0.00	8,200.00	0.00	0.00	0.00	0.00	0.00	0.00
8,300.00	0.00	0.00	8,300.00	0.00	0.00	0.00	0.00	0.00	0.00
8,400.00	0.00	0.00	8,400.00	0.00	0.00	0.00	0.00	0.00	0.00
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	0.00	0.00
8,600.00	0.00	0.00	8,600.00	0.00	0.00	0.00	0.00	0.00	0.00
8,700.00	0.00	0.00	8,700.00	0.00	0.00	0.00	0.00	0.00	0.00
8,800.00	0.00	0.00	8,800.00	0.00	0.00	0.00	0.00	0.00	0.00
8,900.00	0.00	0.00	8,900.00	0.00	0.00	0.00	0.00	0.00	0.00
8,936.30	0.00	0.00	8,936.30	0.00	0.00	0.00	0.00	0.00	0.00
Lower Brushy									
9,000.00	0.00	0.00	9,000.00	0.00	0.00	0.00	0.00	0.00	0.00
9,100.00	0.00	0.00	9,100.00	0.00	0.00	0.00	0.00	0.00	0.00

LEAM Drilling Systems LLC

Planning Report

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Company: Devon Energy
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Well: 102H
Wellbore: OH
Design: Plan #1

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(Original Well Elev)
MD Reference: 3637.8' GE + 23.5' KB @ 3664.30usft
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Survey Calculation Method: Minimum Curvature

Planned 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)
9,129.30	0.00	0.00	9,129.30	0.00	0.00	0.00	0.00	0.00	0.00
1st BSPG Lime									
9,175.27	0.00	0.00	9,175.27	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Start 11°/100' Build									
9,200.00	2.72	359.76	9,199.99	0.59	0.00	0.59	11.00	11.00	0.00
9,250.00	8.22	359.76	9,249.74	5.35	-0.02	5.35	11.00	11.00	0.00
9,260.69	9.40	359.76	9,260.31	6.99	-0.03	6.99	11.00	11.00	0.00
Leonard A									
9,300.00	13.72	359.76	9,298.81	14.86	-0.06	14.86	11.00	11.00	0.00
9,348.53	19.06	359.76	9,345.35	28.55	-0.12	28.55	11.00	11.00	0.00
Leonard A MKR 1									
9,350.00	19.22	359.76	9,346.74	29.03	-0.12	29.03	11.00	11.00	0.00
9,400.00	24.72	359.76	9,393.09	47.73	-0.20	47.73	11.00	11.00	0.00
9,450.00	30.22	359.76	9,437.44	70.79	-0.30	70.79	11.00	11.00	0.00
9,451.14	30.35	359.76	9,438.42	71.36	-0.30	71.37	11.00	11.00	0.00
Leonard A MKR 2									
9,500.00	35.72	359.76	9,479.37	97.99	-0.41	97.99	11.00	11.00	0.00
9,511.31	36.97	359.76	9,488.48	104.69	-0.44	104.69	11.00	11.00	0.00
Leonard A MKR 3									
9,550.00	41.22	359.76	9,518.50	129.08	-0.54	129.08	11.00	11.00	0.00
9,571.74	43.61	359.76	9,534.55	143.75	-0.61	143.75	11.00	11.00	0.00
Leonard A BS PKG									
9,600.00	46.72	359.76	9,554.47	163.78	-0.69	163.78	11.00	11.00	0.00
9,650.00	52.22	359.76	9,586.95	201.77	-0.85	201.77	11.00	11.00	0.00
9,654.44	52.71	359.76	9,589.66	205.29	-0.87	205.30	11.00	11.00	0.00
Leonard A BS Carbonate									
9,700.00	57.72	359.76	9,615.64	242.70	-1.02	242.70	11.00	11.00	0.00
9,717.53	59.65	359.76	9,624.75	257.67	-1.09	257.67	11.00	11.00	0.00
Leonard B									
9,750.00	63.22	359.76	9,640.27	286.19	-1.21	286.19	11.00	11.00	0.00
9,800.00	68.72	359.76	9,660.63	331.83	-1.40	331.84	11.00	11.00	0.00
9,850.00	74.22	359.76	9,676.51	379.22	-1.60	379.23	11.00	11.00	0.00
9,900.00	79.72	359.76	9,687.78	427.92	-1.81	427.92	11.00	11.00	0.00
9,950.00	85.22	359.76	9,694.33	477.47	-2.01	477.47	11.00	11.00	0.00
9,992.54	89.90	359.76	9,696.14	519.96	-2.19	519.96	11.00	11.00	0.00
LP, 89.90° INC, 359.76° AZI									
10,000.00	89.90	359.76	9,696.15	527.42	-2.23	527.42	0.00	0.00	0.00
10,100.00	89.90	359.76	9,696.33	627.41	-2.65	627.42	0.00	0.00	0.00
10,200.00	89.90	359.76	9,696.50	727.41	-3.07	727.42	0.00	0.00	0.00
10,300.00	89.90	359.76	9,696.68	827.41	-3.49	827.42	0.00	0.00	0.00
10,400.00	89.90	359.76	9,696.85	927.41	-3.91	927.42	0.00	0.00	0.00
10,500.00	89.90	359.76	9,697.02	1,027.41	-4.33	1,027.42	0.00	0.00	0.00
10,600.00	89.90	359.76	9,697.20	1,127.41	-4.76	1,127.42	0.00	0.00	0.00
10,700.00	89.90	359.76	9,697.37	1,227.41	-5.18	1,227.42	0.00	0.00	0.00
10,800.00	89.90	359.76	9,697.55	1,327.41	-5.60	1,327.42	0.00	0.00	0.00
10,900.00	89.90	359.76	9,697.72	1,427.41	-6.02	1,427.42	0.00	0.00	0.00
11,000.00	89.90	359.76	9,697.90	1,527.41	-6.44	1,527.42	0.00	0.00	0.00
11,100.00	89.90	359.76	9,698.07	1,627.40	-6.87	1,627.42	0.00	0.00	0.00
11,200.00	89.90	359.76	9,698.25	1,727.40	-7.29	1,727.42	0.00	0.00	0.00
11,300.00	89.90	359.76	9,698.42	1,827.40	-7.71	1,827.42	0.00	0.00	0.00
11,400.00	89.90	359.76	9,698.60	1,927.40	-8.13	1,927.42	0.00	0.00	0.00

LEAM Drilling Systems LLC

Planning Report

Database: EDM 5000.1 Multi User Db
Company: Devon Energy
Project: Lea County, NM (NAD-83)
Site: Thistle Unit
Well: 102H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well 102H
TVD Reference: 3637.8' GE + 23.5' KB @ 3664.30usft
(Original Well Elev)
MD Reference: 3637.8' GE + 23.5' KB @ 3664.30usft
(Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned 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)
11,500.00	89.90	359.76	9,698.77	2,027.40	-8.55	2,027.42	0.00	0.00	0.00
11,600.00	89.90	359.76	9,698.94	2,127.40	-8.98	2,127.42	0.00	0.00	0.00
11,700.00	89.90	359.76	9,699.12	2,227.40	-9.40	2,227.42	0.00	0.00	0.00
11,800.00	89.90	359.76	9,699.29	2,327.40	-9.82	2,327.42	0.00	0.00	0.00
11,900.00	89.90	359.76	9,699.47	2,427.40	-10.24	2,427.42	0.00	0.00	0.00
12,000.00	89.90	359.76	9,699.64	2,527.39	-10.66	2,527.42	0.00	0.00	0.00
12,100.00	89.90	359.76	9,699.82	2,627.39	-11.09	2,627.42	0.00	0.00	0.00
12,200.00	89.90	359.76	9,699.99	2,727.39	-11.51	2,727.42	0.00	0.00	0.00
12,300.00	89.90	359.76	9,700.17	2,827.39	-11.93	2,827.42	0.00	0.00	0.00
12,400.00	89.90	359.76	9,700.34	2,927.39	-12.35	2,927.42	0.00	0.00	0.00
12,500.00	89.90	359.76	9,700.52	3,027.39	-12.77	3,027.42	0.00	0.00	0.00
12,600.00	89.90	359.76	9,700.69	3,127.39	-13.19	3,127.42	0.00	0.00	0.00
12,700.00	89.90	359.76	9,700.86	3,227.39	-13.62	3,227.42	0.00	0.00	0.00
12,800.00	89.90	359.76	9,701.04	3,327.39	-14.04	3,327.42	0.00	0.00	0.00
12,900.00	89.90	359.76	9,701.21	3,427.39	-14.46	3,427.42	0.00	0.00	0.00
13,000.00	89.90	359.76	9,701.39	3,527.38	-14.88	3,527.42	0.00	0.00	0.00
13,100.00	89.90	359.76	9,701.56	3,627.38	-15.30	3,627.42	0.00	0.00	0.00
13,200.00	89.90	359.76	9,701.74	3,727.38	-15.73	3,727.42	0.00	0.00	0.00
13,300.00	89.90	359.76	9,701.91	3,827.38	-16.15	3,827.42	0.00	0.00	0.00
13,400.00	89.90	359.76	9,702.09	3,927.38	-16.57	3,927.42	0.00	0.00	0.00
13,500.00	89.90	359.76	9,702.26	4,027.38	-16.99	4,027.41	0.00	0.00	0.00
13,600.00	89.90	359.76	9,702.44	4,127.38	-17.41	4,127.41	0.00	0.00	0.00
13,700.00	89.90	359.76	9,702.61	4,227.38	-17.84	4,227.41	0.00	0.00	0.00
13,800.00	89.90	359.76	9,702.78	4,327.38	-18.26	4,327.41	0.00	0.00	0.00
13,900.00	89.90	359.76	9,702.96	4,427.37	-18.68	4,427.41	0.00	0.00	0.00
14,000.00	89.90	359.76	9,703.13	4,527.37	-19.10	4,527.41	0.00	0.00	0.00
14,100.00	89.90	359.76	9,703.31	4,627.37	-19.52	4,627.41	0.00	0.00	0.00
14,200.00	89.90	359.76	9,703.48	4,727.37	-19.95	4,727.41	0.00	0.00	0.00
14,300.00	89.90	359.76	9,703.66	4,827.37	-20.37	4,827.41	0.00	0.00	0.00
14,400.00	89.90	359.76	9,703.83	4,927.37	-20.79	4,927.41	0.00	0.00	0.00
14,500.00	89.90	359.76	9,704.01	5,027.37	-21.21	5,027.41	0.00	0.00	0.00
14,600.00	89.90	359.76	9,704.18	5,127.37	-21.63	5,127.41	0.00	0.00	0.00
14,700.00	89.90	359.76	9,704.35	5,227.37	-22.05	5,227.41	0.00	0.00	0.00
14,800.00	89.90	359.76	9,704.53	5,327.37	-22.48	5,327.41	0.00	0.00	0.00
14,900.00	89.90	359.76	9,704.70	5,427.36	-22.90	5,427.41	0.00	0.00	0.00
15,000.00	89.90	359.76	9,704.88	5,527.36	-23.32	5,527.41	0.00	0.00	0.00
15,100.00	89.90	359.76	9,705.05	5,627.36	-23.74	5,627.41	0.00	0.00	0.00
15,200.00	89.90	359.76	9,705.23	5,727.36	-24.16	5,727.41	0.00	0.00	0.00
15,300.00	89.90	359.76	9,705.40	5,827.36	-24.59	5,827.41	0.00	0.00	0.00
15,400.00	89.90	359.76	9,705.58	5,927.36	-25.01	5,927.41	0.00	0.00	0.00
15,500.00	89.90	359.76	9,705.75	6,027.36	-25.43	6,027.41	0.00	0.00	0.00
15,600.00	89.90	359.76	9,705.93	6,127.36	-25.85	6,127.41	0.00	0.00	0.00
15,700.00	89.90	359.76	9,706.10	6,227.36	-26.27	6,227.41	0.00	0.00	0.00
15,800.00	89.90	359.76	9,706.27	6,327.36	-26.70	6,327.41	0.00	0.00	0.00
15,900.00	89.90	359.76	9,706.45	6,427.35	-27.12	6,427.41	0.00	0.00	0.00
16,000.00	89.90	359.76	9,706.62	6,527.35	-27.54	6,527.41	0.00	0.00	0.00
16,100.00	89.90	359.76	9,706.80	6,627.35	-27.96	6,627.41	0.00	0.00	0.00
16,200.00	89.90	359.76	9,706.97	6,727.35	-28.38	6,727.41	0.00	0.00	0.00
16,300.00	89.90	359.76	9,707.15	6,827.35	-28.81	6,827.41	0.00	0.00	0.00
16,400.00	89.90	359.76	9,707.32	6,927.35	-29.23	6,927.41	0.00	0.00	0.00
16,500.00	89.90	359.76	9,707.50	7,027.35	-29.65	7,027.41	0.00	0.00	0.00
16,600.00	89.90	359.76	9,707.67	7,127.35	-30.07	7,127.41	0.00	0.00	0.00

LEAM Drilling Systems LLC

Planning Report

Database: EDM 5000.1 Multi User Db
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Project: Lea County, NM (NAD-83)
Site: Thistle Unit
Well: 102H
Wellbore: OH
Design: Plan #1

Local Co-ordinate Reference: Well 102H
TVD Reference: 3637.8' GE + 23.5' KB @ 3664.30usft
(Original Well Elev)
MD Reference: 3637.8' GE + 23.5' KB @ 3664.30usft
(Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned 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)
16,700.00	89.90	359.76	9,707.85	7,227.35	-30.49	7,227.41	0.00	0.00	0.00
16,800.00	89.90	359.76	9,708.02	7,327.34	-30.91	7,327.41	0.00	0.00	0.00
16,900.00	89.90	359.76	9,708.19	7,427.34	-31.34	7,427.41	0.00	0.00	0.00
17,000.00	89.90	359.76	9,708.37	7,527.34	-31.76	7,527.41	0.00	0.00	0.00
17,100.00	89.90	359.76	9,708.54	7,627.34	-32.18	7,627.41	0.00	0.00	0.00
17,200.00	89.90	359.76	9,708.72	7,727.34	-32.60	7,727.41	0.00	0.00	0.00
17,300.00	89.90	359.76	9,708.89	7,827.34	-33.02	7,827.41	0.00	0.00	0.00
17,400.00	89.90	359.76	9,709.07	7,927.34	-33.45	7,927.41	0.00	0.00	0.00
17,500.00	89.90	359.76	9,709.24	8,027.34	-33.87	8,027.41	0.00	0.00	0.00
17,600.00	89.90	359.76	9,709.42	8,127.34	-34.29	8,127.41	0.00	0.00	0.00
17,700.00	89.90	359.76	9,709.59	8,227.34	-34.71	8,227.41	0.00	0.00	0.00
17,800.00	89.90	359.76	9,709.77	8,327.33	-35.13	8,327.41	0.00	0.00	0.00
17,900.00	89.90	359.76	9,709.94	8,427.33	-35.56	8,427.41	0.00	0.00	0.00
18,000.00	89.90	359.76	9,710.11	8,527.33	-35.98	8,527.41	0.00	0.00	0.00
18,100.00	89.90	359.76	9,710.29	8,627.33	-36.40	8,627.41	0.00	0.00	0.00
18,200.00	89.90	359.76	9,710.46	8,727.33	-36.82	8,727.41	0.00	0.00	0.00
18,300.00	89.90	359.76	9,710.64	8,827.33	-37.24	8,827.41	0.00	0.00	0.00
18,400.00	89.90	359.76	9,710.81	8,927.33	-37.67	8,927.41	0.00	0.00	0.00
18,500.00	89.90	359.76	9,710.99	9,027.33	-38.09	9,027.41	0.00	0.00	0.00
18,600.00	89.90	359.76	9,711.16	9,127.33	-38.51	9,127.41	0.00	0.00	0.00
18,700.00	89.90	359.76	9,711.34	9,227.33	-38.93	9,227.41	0.00	0.00	0.00
18,800.00	89.90	359.76	9,711.51	9,327.32	-39.35	9,327.41	0.00	0.00	0.00
18,900.00	89.90	359.76	9,711.69	9,427.32	-39.78	9,427.41	0.00	0.00	0.00
19,000.00	89.90	359.76	9,711.86	9,527.32	-40.20	9,527.41	0.00	0.00	0.00
19,100.00	89.90	359.76	9,712.03	9,627.32	-40.62	9,627.41	0.00	0.00	0.00
19,200.00	89.90	359.76	9,712.21	9,727.32	-41.04	9,727.41	0.00	0.00	0.00
19,300.00	89.90	359.76	9,712.38	9,827.32	-41.46	9,827.41	0.00	0.00	0.00
19,400.00	89.90	359.76	9,712.56	9,927.32	-41.88	9,927.41	0.00	0.00	0.00
19,500.00	89.90	359.76	9,712.73	10,027.32	-42.31	10,027.41	0.00	0.00	0.00
19,600.00	89.90	359.76	9,712.91	10,127.32	-42.73	10,127.41	0.00	0.00	0.00
19,700.00	89.90	359.76	9,713.08	10,227.31	-43.15	10,227.41	0.00	0.00	0.00
19,800.00	89.90	359.76	9,713.26	10,327.31	-43.57	10,327.41	0.00	0.00	0.00
19,900.00	89.90	359.76	9,713.43	10,427.31	-43.99	10,427.41	0.00	0.00	0.00
20,000.00	89.90	359.76	9,713.61	10,527.31	-44.42	10,527.41	0.00	0.00	0.00
20,100.00	89.90	359.76	9,713.78	10,627.31	-44.84	10,627.41	0.00	0.00	0.00
20,200.00	89.90	359.76	9,713.95	10,727.31	-45.26	10,727.40	0.00	0.00	0.00
20,300.00	89.90	359.76	9,714.13	10,827.31	-45.68	10,827.40	0.00	0.00	0.00
20,400.00	89.90	359.76	9,714.30	10,927.31	-46.10	10,927.40	0.00	0.00	0.00
20,500.00	89.90	359.76	9,714.48	11,027.31	-46.53	11,027.40	0.00	0.00	0.00
20,600.00	89.90	359.76	9,714.65	11,127.31	-46.95	11,127.40	0.00	0.00	0.00
20,700.00	89.90	359.76	9,714.83	11,227.30	-47.37	11,227.40	0.00	0.00	0.00
20,800.00	89.90	359.76	9,715.00	11,327.30	-47.79	11,327.40	0.00	0.00	0.00
20,900.00	89.90	359.76	9,715.18	11,427.30	-48.21	11,427.40	0.00	0.00	0.00
21,000.00	89.90	359.76	9,715.35	11,527.30	-48.64	11,527.40	0.00	0.00	0.00
21,100.00	89.90	359.76	9,715.52	11,627.30	-49.06	11,627.40	0.00	0.00	0.00
21,200.00	89.90	359.76	9,715.70	11,727.30	-49.48	11,727.40	0.00	0.00	0.00
21,300.00	89.90	359.76	9,715.87	11,827.30	-49.90	11,827.40	0.00	0.00	0.00
21,400.00	89.90	359.76	9,716.05	11,927.30	-50.32	11,927.40	0.00	0.00	0.00
21,500.00	89.90	359.76	9,716.22	12,027.30	-50.74	12,027.40	0.00	0.00	0.00
21,600.00	89.90	359.76	9,716.40	12,127.29	-51.17	12,127.40	0.00	0.00	0.00
21,700.00	89.90	359.76	9,716.57	12,227.29	-51.59	12,227.40	0.00	0.00	0.00
21,800.00	89.90	359.76	9,716.75	12,327.29	-52.01	12,327.40	0.00	0.00	0.00

LEAM Drilling Systems LLC

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Planned 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)
21,900.00	89.90	359.76	9,716.92	12,427.29	-52.43	12,427.40	0.00	0.00	0.00
22,000.00	89.90	359.76	9,717.10	12,527.29	-52.85	12,527.40	0.00	0.00	0.00
22,100.00	89.90	359.76	9,717.27	12,627.29	-53.28	12,627.40	0.00	0.00	0.00
22,200.00	89.90	359.76	9,717.44	12,727.29	-53.70	12,727.40	0.00	0.00	0.00
22,300.00	89.90	359.76	9,717.62	12,827.29	-54.12	12,827.40	0.00	0.00	0.00
22,400.00	89.90	359.76	9,717.79	12,927.29	-54.54	12,927.40	0.00	0.00	0.00
22,500.00	89.90	359.76	9,717.97	13,027.29	-54.96	13,027.40	0.00	0.00	0.00
22,600.00	89.90	359.76	9,718.14	13,127.28	-55.39	13,127.40	0.00	0.00	0.00
22,700.00	89.90	359.76	9,718.32	13,227.28	-55.81	13,227.40	0.00	0.00	0.00
22,800.00	89.90	359.76	9,718.49	13,327.28	-56.23	13,327.40	0.00	0.00	0.00
22,900.00	89.90	359.76	9,718.67	13,427.28	-56.65	13,427.40	0.00	0.00	0.00
23,000.00	89.90	359.76	9,718.84	13,527.28	-57.07	13,527.40	0.00	0.00	0.00
23,100.00	89.90	359.76	9,719.02	13,627.28	-57.50	13,627.40	0.00	0.00	0.00
23,200.00	89.90	359.76	9,719.19	13,727.28	-57.92	13,727.40	0.00	0.00	0.00
23,300.00	89.90	359.76	9,719.36	13,827.28	-58.34	13,827.40	0.00	0.00	0.00
23,400.00	89.90	359.76	9,719.54	13,927.28	-58.76	13,927.40	0.00	0.00	0.00
23,500.00	89.90	359.76	9,719.71	14,027.28	-59.18	14,027.40	0.00	0.00	0.00
23,600.00	89.90	359.76	9,719.89	14,127.27	-59.60	14,127.40	0.00	0.00	0.00
23,700.00	89.90	359.76	9,720.06	14,227.27	-60.03	14,227.40	0.00	0.00	0.00
23,800.00	89.90	359.76	9,720.24	14,327.27	-60.45	14,327.40	0.00	0.00	0.00
23,900.00	89.90	359.76	9,720.41	14,427.27	-60.87	14,427.40	0.00	0.00	0.00
24,000.00	89.90	359.76	9,720.59	14,527.27	-61.29	14,527.40	0.00	0.00	0.00
24,100.00	89.90	359.76	9,720.76	14,627.27	-61.71	14,627.40	0.00	0.00	0.00
24,200.00	89.90	359.76	9,720.94	14,727.27	-62.14	14,727.40	0.00	0.00	0.00
24,300.00	89.90	359.76	9,721.11	14,827.27	-62.56	14,827.40	0.00	0.00	0.00
24,400.00	89.90	359.76	9,721.28	14,927.27	-62.98	14,927.40	0.00	0.00	0.00
24,500.00	89.90	359.76	9,721.46	15,027.26	-63.40	15,027.40	0.00	0.00	0.00
24,600.00	89.90	359.76	9,721.63	15,127.26	-63.82	15,127.40	0.00	0.00	0.00
24,700.00	89.90	359.76	9,721.81	15,227.26	-64.25	15,227.40	0.00	0.00	0.00
24,800.00	89.90	359.76	9,721.98	15,327.26	-64.67	15,327.40	0.00	0.00	0.00
24,810.04	89.90	359.76	9,722.00	15,337.30	-64.71	15,337.44	0.00	0.00	0.00

TD at 24810.04' MD - PBHL (102H)

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL (102H) - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	457,156.92	782,547.19	32° 15' 15.804 N	103° 33' 11.002 W
PBHL (102H) - plan hits target center - Point	0.00	0.00	9,722.00	15,337.30	-64.71	472,494.22	782,482.48	32° 17' 47.572 N	103° 33' 10.456 W

LEAM Drilling Systems LLC

Planning Report

Database:	EDM 5000.1 Multi User Db	Local Co-ordinate Reference:	Well 102H
Company:	Devon Energy	TVD Reference:	3637.8' GE + 23.5' KB @ 3664.30usft (Original Well Elev)
Project:	Lea County, NM (NAD-83)	MD Reference:	3637.8' GE + 23.5' KB @ 3664.30usft (Original Well Elev)
Site:	Thistle Unit	North Reference:	Grid
Well:	102H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,324.30	-2,340.00	Rustler		0.10	359.76	
1,824.30	-1,840.00	Top of Salt		0.10	359.76	
2,665.30	0.00	Leonard B Target		0.10	359.76	
2,665.30	0.00	Leonard B Base		0.10	359.76	
2,665.30	0.00	Leonard C		0.10	359.76	
4,969.30	1,305.00	Base of Salt		0.10	359.76	
5,236.30	1,572.00	Delaware		0.10	359.76	
8,936.30	5,272.00	Lower Brushy		0.10	359.76	
9,129.30	5,465.00	1st BSPG Lime		0.10	359.76	
9,260.69	5,596.01	Leonard A		0.10	359.76	
9,348.53	5,681.05	Leonard A MKR 1		0.10	359.76	
9,451.14	5,774.12	Leonard A MKR 2		0.10	359.76	
9,511.31	5,824.18	Leonard A MKR 3		0.10	359.76	
9,571.74	5,870.25	Leonard A BS PKG		0.10	359.76	
9,654.44	5,925.36	Leonard A BS Carbonate		0.10	359.76	
9,717.53	5,960.45	Leonard B		0.10	359.76	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
9,175.27	9,175.27	0.00	0.00	KOP, Start 11°/100' Build	
9,992.54	9,696.14	519.96	-2.19	LP, 89.90° INC, 359.76° AZI	
24,810.04	9,722.00	15,337.30	-64.71	TD at 24810.04' MD	