



HOBBS OCD

AUG 21 2017

RECEIVED



Lea Unit No. 45H

Lea County, NM

May 03, 2017

Job No. LNM5136417

Survey Completion Report



PRODIRECTIONAL

Survey Certification Letter

May 03, 2017



Operator Name: Legacy Reserves
Well Name: Lea Unit No. 45H
County/Parish: Lea County,
State: NM
Rig Name: McVay 4
Job Number: LNM5136417

This is to certify the surveys performed on the referenced well by Professional Directional Ent., Inc. are true and correct MWD Surveys, data provided as follows:

<u>Surveyor</u>	<u>Surveyed Depths</u>	<u>Projection to Bit</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
ProDirectional	200' MD – 15,577' MD	15,762' MD	03/25/17 – 04/11/17	MWD-OWSG

Sincerely,

Mike Coats
Well Planning
Professional Directional

850 Conroe Park West Drive | Conroe, TX 77303 | Phone: 936.441.7266

prodirectional.com



Legacy Reserves

Lea County, NM

Lea Unit

45H

OH

HOBBS OCD

AUG 21 2017

RECEIVED

Survey: ProDirectional

Survey Report

11 April, 2017





ProDirectional
Survey Report



Company:	Legacy Reserves	Local Co-ordinate Reference:	Well 45H
Project:	Lea County, NM (NAD27)	TVD Reference:	GL 3673'+KB 18' @ 3691.00usft (McVay 4)
Site:	Lea Unit	MD Reference:	GL 3673'+KB 18' @ 3691.00usft (McVay 4)
Well:	45H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	MWD	Database:	WellPlanner1

Project	Lea County, NM (NAD27)		
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 Unit		
Site Position:		Northing:	567,540.50 usft
From:	Map	Easting:	757,874.60 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 33' 26.964 N
		Longitude:	103° 29' 46.949 W
		Grid Convergence:	0.45 °

Well	45H					
Well Position	+N/-S	0.00 usft	Northing:	581,668.20 usft	Latitude:	32° 35' 47.311 N
	+E/-W	0.00 usft	Easting:	750,631.30 usft	Longitude:	103° 31' 10.311 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,673.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	3/24/2017	6.73	60.62	48,343.40

Design	MWD			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	180.08

Survey Program	Date 4/11/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
200.00	15,762.00	Survey #1 (OH)	MWD - OWSG	MWD - OWSG

Company: Legacy Reserves
Project: Lea County, NM (NAD27)
Site: Lea Unit
Well: 45H
Wellbore: OH
Design: MWD

Local Co-ordinate Reference: Well 45H
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MD Reference: GL 3673'+KB 18' @ 3691.00usft (McVay 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	581,668.20	750,631.30
200.00	0.30	191.10	200.00	0.51	-0.51	-0.10	0.52	191.10	581,667.69	750,631.20
Pro MWD First Survey: 200' MD										
291.00	0.50	176.30	291.00	1.14	-1.14	-0.12	1.15	186.04	581,667.06	750,631.18
383.00	0.50	187.80	382.99	1.94	-1.94	-0.15	1.95	184.41	581,666.26	750,631.15
565.00	0.70	174.00	564.98	3.83	-3.83	-0.14	3.84	182.11	581,664.37	750,631.16
656.00	0.60	189.50	655.98	4.86	-4.86	-0.16	4.86	181.91	581,663.34	750,631.14
839.00	0.40	198.40	838.97	6.41	-6.41	-0.52	6.43	184.65	581,661.79	750,630.78
1,021.00	0.60	194.80	1,020.96	7.93	-7.93	-0.97	7.99	186.94	581,660.27	750,630.33
1,203.00	0.60	192.30	1,202.95	9.79	-9.78	-1.41	9.89	188.21	581,658.42	750,629.89
1,294.00	0.90	190.40	1,293.95	10.96	-10.95	-1.64	11.08	188.53	581,657.25	750,629.66
1,385.00	1.30	196.90	1,384.93	12.65	-12.64	-2.07	12.81	189.30	581,655.56	750,629.23
1,480.00	1.50	199.40	1,479.90	14.85	-14.85	-2.80	15.11	190.67	581,653.35	750,628.50
1,574.00	1.50	204.90	1,573.87	17.13	-17.12	-3.72	17.52	192.27	581,651.08	750,627.58
1,667.00	1.60	201.10	1,666.83	19.45	-19.44	-4.70	20.00	193.60	581,648.76	750,626.60
1,723.00	1.30	203.30	1,722.82	20.76	-20.75	-5.24	21.40	194.16	581,647.45	750,626.06
1,858.00	0.90	209.90	1,857.79	23.09	-23.08	-6.37	23.94	195.43	581,645.12	750,624.93
1,952.00	0.90	187.50	1,951.78	24.46	-24.45	-6.84	25.39	195.62	581,643.75	750,624.46
2,141.00	0.90	200.30	2,140.76	27.32	-27.31	-7.54	28.34	195.44	581,640.89	750,623.76
2,330.00	0.80	174.40	2,329.74	30.03	-30.02	-7.93	31.05	194.80	581,638.18	750,623.37
2,424.00	0.70	185.30	2,423.73	31.26	-31.24	-7.92	32.23	194.22	581,636.96	750,623.38
2,519.00	0.80	153.20	2,518.72	32.42	-32.41	-7.67	33.31	193.32	581,635.79	750,623.63
2,613.00	0.40	143.20	2,612.72	33.27	-33.26	-7.18	34.03	192.18	581,634.94	750,624.12
2,707.00	0.30	126.90	2,706.71	33.68	-33.67	-6.79	34.35	191.40	581,634.53	750,624.51
2,802.00	0.40	129.60	2,801.71	34.04	-34.03	-6.33	34.62	190.54	581,634.17	750,624.97
2,896.00	0.40	173.50	2,895.71	34.58	-34.57	-6.04	35.09	189.92	581,633.63	750,625.26
2,991.00	0.80	88.90	2,990.71	34.89	-34.89	-5.34	35.29	188.71	581,633.31	750,625.96

Company: Legacy Reserves
Project: Lea County, NM (NAD27)
Site: Lea Unit
Well: 45H
Wellbore: OH
Design: MWD

Local Co-ordinate Reference: Well 45H
TVD Reference: GL 3673'+KB 18' @ 3691.00usft (McVay 4)
MD Reference: GL 3673'+KB 18' @ 3691.00usft (McVay 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
3,085.00	1.20	75.70	3,084.69	34.63	-34.63	-3.73	34.83	186.15	581,633.57	750,627.57
3,180.00	0.90	69.90	3,179.68	34.13	-34.13	-2.07	34.19	183.47	581,634.07	750,629.23
3,274.00	1.00	59.60	3,273.66	33.46	-33.46	-0.67	33.47	181.14	581,634.74	750,630.63
3,368.00	0.70	63.20	3,367.65	32.78	-32.78	0.55	32.79	179.04	581,635.42	750,631.85
3,463.00	0.60	55.30	3,462.65	32.24	-32.24	1.48	32.27	177.37	581,635.96	750,632.78
3,552.00	0.30	52.80	3,551.64	31.83	-31.83	2.05	31.90	176.32	581,636.37	750,633.35
3,651.00	0.40	39.30	3,650.64	31.41	-31.41	2.47	31.51	175.50	581,636.79	750,633.77
3,746.00	0.30	34.80	3,745.64	30.94	-30.95	2.82	31.08	174.78	581,637.25	750,634.12
3,840.00	0.30	27.80	3,839.64	30.52	-30.53	3.08	30.68	174.24	581,637.67	750,634.38
3,934.00	0.30	27.00	3,933.64	30.09	-30.09	3.31	30.27	173.73	581,638.11	750,634.61
4,029.00	0.30	30.20	4,028.64	29.65	-29.66	3.54	29.87	173.18	581,638.54	750,634.84
4,123.00	0.20	83.80	4,122.63	29.42	-29.43	3.83	29.67	172.58	581,638.77	750,635.13
4,218.00	0.30	131.40	4,217.63	29.57	-29.57	4.18	29.87	171.95	581,638.63	750,635.48
4,312.00	0.40	124.50	4,311.63	29.91	-29.92	4.64	30.28	171.19	581,638.28	750,635.94
4,406.00	0.30	121.10	4,405.63	30.23	-30.23	5.12	30.66	170.39	581,637.97	750,636.42
4,500.00	0.30	139.90	4,499.63	30.54	-30.55	5.49	31.04	169.82	581,637.65	750,636.79
4,595.00	0.40	137.60	4,594.63	30.98	-30.98	5.87	31.54	169.27	581,637.22	750,637.17
4,689.00	0.50	136.40	4,688.62	31.51	-31.52	6.38	32.16	168.57	581,636.68	750,637.68
4,784.00	0.50	150.80	4,783.62	32.18	-32.19	6.86	32.91	167.96	581,636.01	750,638.16
4,878.00	0.80	164.50	4,877.61	33.17	-33.18	7.24	33.96	167.69	581,635.02	750,638.54
4,973.00	0.70	162.40	4,972.61	34.36	-34.37	7.59	35.20	167.54	581,633.83	750,638.89
5,067.00	0.60	155.70	5,066.60	35.35	-35.36	7.97	36.25	167.30	581,632.84	750,639.27
5,162.00	0.50	158.30	5,161.60	36.19	-36.20	8.33	37.15	167.05	581,632.00	750,639.63
5,256.00	0.40	145.70	5,255.59	36.84	-36.85	8.66	37.86	166.77	581,631.35	750,639.96
5,351.00	0.30	141.50	5,350.59	37.31	-37.32	9.00	38.39	166.44	581,630.88	750,640.30
5,471.00	0.30	85.70	5,470.59	37.53	-37.55	9.51	38.73	165.78	581,630.65	750,640.81
5,565.00	0.30	92.20	5,564.59	37.52	-37.54	10.00	38.85	165.08	581,630.66	750,641.30

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Design: MWD

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Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)	
5,659.00	0.40	103.00	5,658.59	37.60	-37.62	10.57	39.08	164.31	581,630.58	750,641.87	
5,754.00	0.40	132.10	5,753.58	37.90	-37.92	11.14	39.52	163.63	581,630.28	750,642.44	
5,848.00	0.60	123.30	5,847.58	38.39	-38.41	11.79	40.18	162.93	581,629.79	750,643.09	
5,943.00	0.60	126.40	5,942.58	38.96	-38.97	12.61	40.96	162.07	581,629.23	750,643.91	
6,037.00	0.50	144.40	6,036.57	39.58	-39.60	13.25	41.76	161.51	581,628.60	750,644.55	
6,132.00	0.60	126.90	6,131.57	40.22	-40.24	13.88	42.56	160.96	581,627.96	750,645.18	
6,226.00	0.60	129.20	6,225.56	40.82	-40.84	14.66	43.39	160.26	581,627.36	750,645.96	
6,321.00	0.60	126.50	6,320.56	41.43	-41.45	15.44	44.24	159.57	581,626.75	750,646.74	
6,415.00	0.70	127.90	6,414.55	42.08	-42.10	16.29	45.14	158.84	581,626.10	750,647.59	
6,509.00	0.60	144.00	6,508.55	42.83	-42.85	17.04	46.11	158.32	581,625.35	750,648.34	
6,604.00	0.70	133.90	6,603.54	43.63	-43.65	17.75	47.12	157.88	581,624.55	750,649.05	
6,698.00	0.70	137.80	6,697.53	44.45	-44.48	18.55	48.19	157.37	581,623.72	750,649.85	
6,792.00	0.60	156.00	6,791.53	45.33	-45.35	19.13	49.22	157.13	581,622.85	750,650.43	
6,887.00	0.70	284.50	6,886.52	45.64	-45.66	18.77	49.37	157.65	581,622.54	750,650.07	
6,981.00	0.90	280.80	6,980.51	45.36	-45.38	17.49	48.63	158.92	581,622.82	750,648.79	
7,076.00	1.00	280.50	7,075.50	45.07	-45.09	15.94	47.82	160.53	581,623.11	750,647.24	
7,170.00	1.00	286.50	7,169.49	44.69	-44.71	14.35	46.95	162.20	581,623.49	750,645.65	
7,265.00	1.20	283.90	7,264.47	44.21	-44.23	12.59	45.99	164.11	581,623.97	750,643.89	
7,359.00	1.10	281.00	7,358.45	43.81	-43.82	10.75	45.12	166.22	581,624.38	750,642.05	
7,453.00	1.00	285.10	7,452.43	43.42	-43.44	9.07	44.37	168.20	581,624.76	750,640.37	
7,547.00	1.00	280.80	7,546.42	43.06	-43.07	7.47	43.71	170.16	581,625.13	750,638.77	
7,642.00	1.20	275.60	7,641.40	42.81	-42.82	5.67	43.19	172.46	581,625.38	750,636.97	
7,736.00	1.30	274.50	7,735.38	42.63	-42.64	3.63	42.79	175.14	581,625.56	750,634.93	
7,831.00	1.40	275.70	7,830.35	42.44	-42.44	1.40	42.46	178.11	581,625.76	750,632.70	
7,925.00	1.50	272.40	7,924.32	42.27	-42.27	-0.97	42.28	181.32	581,625.93	750,630.33	
8,019.00	1.50	278.70	8,018.29	42.04	-42.03	-3.42	42.17	184.65	581,626.17	750,627.88	
8,113.00	1.50	272.80	8,112.26	41.80	-41.79	-5.87	42.20	187.99	581,626.41	750,625.43	

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8,207.00	1.50	278.00	8,206.23	41.57	-41.56	-8.31	42.38	191.31	581,626.64	750,622.99	
8,302.00	1.20	303.20	8,301.20	40.85	-40.84	-10.38	42.14	194.26	581,627.36	750,620.92	
8,396.00	1.30	304.00	8,395.18	39.72	-39.70	-12.08	41.50	196.93	581,628.50	750,619.22	
8,491.00	1.40	304.90	8,490.15	38.46	-38.44	-13.93	40.88	199.92	581,629.76	750,617.37	
8,585.00	1.80	7.20	8,584.12	36.34	-36.32	-14.69	39.17	202.02	581,631.88	750,616.61	
8,679.00	1.80	7.50	8,678.08	33.41	-33.39	-14.31	36.32	203.20	581,634.81	750,616.99	
8,774.00	2.80	25.50	8,773.00	29.83	-29.81	-13.11	32.57	203.74	581,638.39	750,618.19	
8,868.00	2.10	24.50	8,866.91	26.19	-26.17	-11.41	28.55	203.56	581,642.03	750,619.89	
8,963.00	0.60	17.50	8,961.88	24.13	-24.12	-10.54	26.32	203.61	581,644.08	750,620.76	
9,057.00	0.30	267.00	9,055.88	23.67	-23.66	-10.64	25.94	204.21	581,644.54	750,620.66	
9,151.00	0.80	244.60	9,149.88	23.97	-23.95	-11.48	26.56	205.60	581,644.25	750,619.82	
9,245.00	1.10	242.20	9,243.86	24.67	-24.66	-12.87	27.81	207.56	581,643.54	750,618.43	
9,340.00	1.10	221.30	9,338.85	25.79	-25.77	-14.28	29.46	208.99	581,642.43	750,617.02	
9,434.00	1.00	223.80	9,432.83	27.06	-27.04	-15.44	31.13	209.73	581,641.16	750,615.86	
9,528.00	0.90	225.50	9,526.82	28.17	-28.15	-16.53	32.64	210.43	581,640.05	750,614.77	
9,623.00	1.10	227.10	9,621.80	29.31	-29.29	-17.73	34.24	211.19	581,638.91	750,613.57	
9,717.00	1.40	238.20	9,715.78	30.54	-30.51	-19.37	36.14	212.41	581,637.69	750,611.93	
9,796.00	1.20	249.90	9,794.76	31.33	-31.30	-20.97	37.68	213.82	581,636.90	750,610.33	
9,858.00	1.80	218.20	9,856.74	32.32	-32.29	-22.18	39.17	214.48	581,635.91	750,609.12	
9,905.00	5.30	194.60	9,903.65	35.00	-34.97	-23.18	41.96	213.54	581,633.23	750,608.12	
9,952.00	9.20	186.40	9,950.26	40.84	-40.81	-24.15	47.42	210.62	581,627.39	750,607.15	
9,999.00	12.70	185.10	9,996.40	49.73	-49.69	-25.03	55.64	206.73	581,618.51	750,606.27	
10,046.00	16.20	186.90	10,041.91	61.39	-61.35	-26.28	66.74	203.19	581,606.85	750,605.02	
10,093.00	19.90	187.70	10,086.58	75.83	-75.79	-28.14	80.84	200.37	581,592.41	750,603.16	
10,140.00	24.50	186.60	10,130.09	93.45	-93.41	-30.33	98.21	197.99	581,574.79	750,600.97	
10,187.00	28.90	184.70	10,172.07	114.46	-114.42	-32.38	118.91	195.80	581,553.78	750,598.92	
10,234.00	33.60	183.50	10,212.24	138.78	-138.73	-34.11	142.86	193.81	581,529.47	750,597.19	



ProDirectional Survey Report



Company: Legacy Reserves
Project: Lea County, NM (NAD27)
Site: Lea Unit
Well: 45H
Wellbore: OH
Design: MWD

Local Co-ordinate Reference: Well 45H
TVD Reference: GL 3673'+KB 18' @ 3691.00usft (McVay 4)
MD Reference: GL 3673'+KB 18' @ 3691.00usft (McVay 4)
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Database: WellPlanner1

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
10,281.00	38.10	183.60	10,250.32	166.25	-166.20	-35.81	170.01	192.16	581,502.00	750,595.49
10,328.00	41.70	184.00	10,286.38	196.33	-196.27	-37.81	199.88	190.90	581,471.93	750,593.49
10,375.00	44.80	182.70	10,320.61	228.47	-228.42	-39.68	231.84	189.86	581,439.78	750,591.62
10,422.00	48.60	182.40	10,352.83	262.64	-262.58	-41.20	265.80	188.92	581,405.62	750,590.10
10,469.00	52.60	182.30	10,382.66	298.92	-298.86	-42.69	301.90	188.13	581,369.34	750,588.61
10,516.00	57.80	182.00	10,409.47	337.48	-337.42	-44.13	340.29	187.45	581,330.78	750,587.17
10,564.00	66.20	180.40	10,431.99	379.81	-379.75	-45.00	382.41	186.76	581,288.45	750,586.30
10,611.00	75.70	179.40	10,447.31	424.19	-424.12	-44.91	426.50	186.04	581,244.08	750,586.39
10,680.00	87.80	178.60	10,457.19	492.33	-492.27	-43.71	494.21	185.07	581,175.93	750,587.59
10,774.00	90.40	178.10	10,458.67	586.27	-586.21	-41.01	587.65	184.00	581,081.99	750,590.29
10,868.00	91.60	177.70	10,457.03	680.19	-680.13	-37.56	681.17	183.16	580,988.07	750,593.74
10,963.00	92.40	177.60	10,453.72	775.04	-775.00	-33.67	775.73	182.49	580,893.20	750,597.63
11,057.00	89.60	178.10	10,452.08	868.95	-868.91	-30.14	869.43	181.99	580,799.29	750,601.16
11,151.00	90.10	178.30	10,452.32	962.90	-962.86	-27.19	963.24	181.62	580,705.34	750,604.11
11,246.00	90.70	178.10	10,451.66	1,057.84	-1,057.81	-24.21	1,058.09	181.31	580,610.39	750,607.09
11,340.00	91.40	178.30	10,449.94	1,151.77	-1,151.75	-21.26	1,151.94	181.06	580,516.45	750,610.04
11,434.00	91.50	179.10	10,447.56	1,245.72	-1,245.69	-19.12	1,245.84	180.88	580,422.51	750,612.18
11,528.00	90.50	179.40	10,445.92	1,339.69	-1,339.67	-17.89	1,339.79	180.77	580,328.53	750,613.41
11,622.00	90.60	179.40	10,445.01	1,433.68	-1,433.66	-16.91	1,433.76	180.68	580,234.54	750,614.39
11,717.00	90.70	179.40	10,443.94	1,528.67	-1,528.65	-15.91	1,528.73	180.60	580,139.55	750,615.39
11,811.00	91.70	179.90	10,441.97	1,622.64	-1,622.62	-15.34	1,622.69	180.54	580,045.58	750,615.96
11,905.00	95.30	180.10	10,436.23	1,716.45	-1,716.43	-15.34	1,716.50	180.51	579,951.77	750,615.96
11,999.00	95.20	180.10	10,427.63	1,810.06	-1,810.04	-15.50	1,810.10	180.49	579,858.16	750,615.80
12,093.00	92.80	177.80	10,421.07	1,903.80	-1,903.78	-13.78	1,903.83	180.41	579,764.42	750,617.52
12,188.00	90.60	176.80	10,418.25	1,998.64	-1,998.62	-9.31	1,998.65	180.27	579,669.58	750,621.99
12,282.00	87.70	177.20	10,419.65	2,092.48	-2,092.48	-4.39	2,092.48	180.12	579,575.72	750,626.91
12,376.00	88.30	177.60	10,422.93	2,186.32	-2,186.32	-0.13	2,186.32	180.00	579,481.88	750,631.17



ProDirectional Survey Report



Company: Legacy Reserves
Project: Lea County, NM (NAD27)
Site: Lea Unit
Well: 45H
Wellbore: OH
Design: MWD

Local Co-ordinate Reference: Well 45H
TVD Reference: GL 3673'+KB 18' @ 3691.00usft (McVay 4)
MD Reference: GL 3673'+KB 18' @ 3691.00usft (McVay 4)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)	
12,470.00	89.20	178.10	10,424.98	2,280.22	-2,280.23	3.40	2,280.23	179.91	579,387.97	750,634.70	
12,564.00	90.70	178.10	10,425.06	2,374.17	-2,374.18	6.51	2,374.19	179.84	579,294.02	750,637.81	
12,658.00	91.30	178.60	10,423.42	2,468.11	-2,468.12	9.22	2,468.14	179.79	579,200.08	750,640.52	
12,752.00	90.10	178.20	10,422.27	2,562.06	-2,562.08	11.84	2,562.10	179.74	579,106.12	750,643.14	
12,846.00	90.30	178.60	10,421.94	2,656.02	-2,656.04	14.47	2,656.08	179.69	579,012.16	750,645.77	
12,940.00	90.80	179.10	10,421.04	2,749.99	-2,750.02	16.35	2,750.06	179.66	578,918.18	750,647.65	
13,035.00	91.80	178.60	10,418.89	2,844.94	-2,844.97	18.26	2,845.03	179.63	578,823.23	750,649.56	
13,129.00	91.40	178.30	10,416.26	2,938.87	-2,938.90	20.80	2,938.97	179.59	578,729.30	750,652.10	
13,223.00	90.40	179.00	10,414.78	3,032.82	-3,032.86	23.02	3,032.95	179.57	578,635.34	750,654.32	
13,317.00	90.60	179.40	10,413.96	3,126.81	-3,126.85	24.33	3,126.94	179.55	578,541.35	750,655.63	
13,412.00	89.70	179.70	10,413.72	3,221.80	-3,221.84	25.07	3,221.94	179.55	578,446.36	750,656.37	
13,506.00	89.80	179.20	10,414.13	3,315.80	-3,315.84	25.98	3,315.94	179.55	578,352.36	750,657.28	
13,600.00	89.80	178.10	10,414.45	3,409.77	-3,409.81	28.19	3,409.93	179.53	578,258.39	750,659.49	
13,694.00	89.80	177.10	10,414.78	3,503.68	-3,503.72	32.13	3,503.87	179.47	578,164.48	750,663.43	
13,788.00	90.50	176.80	10,414.54	3,597.54	-3,597.59	37.13	3,597.78	179.41	578,070.61	750,668.43	
13,882.00	90.70	177.20	10,413.55	3,691.39	-3,691.46	42.05	3,691.70	179.35	577,976.74	750,673.35	
13,976.00	89.30	178.80	10,413.55	3,785.33	-3,785.39	45.33	3,785.66	179.31	577,882.81	750,676.63	
14,070.00	88.90	180.70	10,415.03	3,879.31	-3,879.38	45.74	3,879.65	179.32	577,788.82	750,677.04	
14,164.00	87.70	180.70	10,417.82	3,973.26	-3,973.33	44.59	3,973.58	179.36	577,694.87	750,675.89	
14,259.00	88.60	181.20	10,420.88	4,068.20	-4,068.26	43.02	4,068.49	179.39	577,599.94	750,674.32	
14,353.00	88.20	181.00	10,423.51	4,162.15	-4,162.21	41.21	4,162.41	179.43	577,505.99	750,672.51	
14,447.00	89.90	180.80	10,425.07	4,256.12	-4,256.18	39.74	4,256.37	179.47	577,412.02	750,671.04	
14,541.00	90.20	180.60	10,424.98	4,350.12	-4,350.17	38.59	4,350.34	179.49	577,318.03	750,669.89	
14,635.00	90.20	181.50	10,424.66	4,444.10	-4,444.16	36.87	4,444.31	179.52	577,224.04	750,668.17	
14,729.00	90.90	182.90	10,423.75	4,538.03	-4,538.08	33.26	4,538.20	179.58	577,130.12	750,664.56	
14,824.00	90.60	182.60	10,422.51	4,632.92	-4,632.96	28.70	4,633.05	179.65	577,035.24	750,660.00	
14,918.00	90.10	183.20	10,421.94	4,726.80	-4,726.84	23.94	4,726.90	179.71	576,941.36	750,655.24	

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Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)	
15,012.00	89.40	183.30	10,422.35	4,820.66	-4,820.69	18.62	4,820.72	179.78	576,847.51	750,649.92	
15,106.00	89.10	183.00	10,423.58	4,914.51	-4,914.54	13.45	4,914.55	179.84	576,753.66	750,644.75	
15,200.00	90.30	182.70	10,424.07	5,008.40	-5,008.42	8.78	5,008.42	179.90	576,659.78	750,640.08	
15,295.00	90.30	182.60	10,423.57	5,103.30	-5,103.31	4.38	5,103.32	179.95	576,564.89	750,635.68	
15,389.00	91.50	182.90	10,422.10	5,197.19	-5,197.19	-0.12	5,197.19	180.00	576,471.01	750,631.18	
15,483.00	91.90	183.10	10,419.31	5,291.02	-5,291.02	-5.04	5,291.02	180.05	576,377.18	750,626.26	
15,577.00	91.90	183.20	10,416.19	5,384.84	-5,384.83	-10.20	5,384.84	180.11	576,283.37	750,621.10	
Last Survey: 15577' MD, 10416.19' TVD											
15,762.00	91.90	183.20	10,410.06	5,569.46	-5,569.44	-20.53	5,569.48	180.21	576,098.76	750,610.77	
PTB: 15762' MD, 10410.06' TVD											

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
200.00	200.00	-0.51	-0.10	Pro MWD First Survey: 200' MD
15,577.00	10,416.19	-5,384.83	-10.20	Last Survey: 15577' MD, 10416.19' TVD
15,762.00	10,410.06	-5,569.44	-20.53	PTB: 15762' MD, 10410.06' TVD