

API# 30-039-29937

RCVD DEC 4 '12

OIL CONS. DIV.

DIST. 3

EnerVest Operating LLC

Rio Arriba County, NM

Jicarilla

Jicarilla 155 #19M

OH

Design: OH

Standard Survey Report

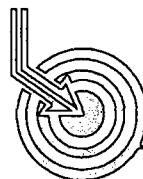
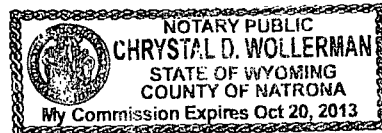
10 September, 2012

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

Notarized this date 10th of September 2012.

Crystal D. Wollerman

Notary Signature
County of Natrona
State of Wyoming



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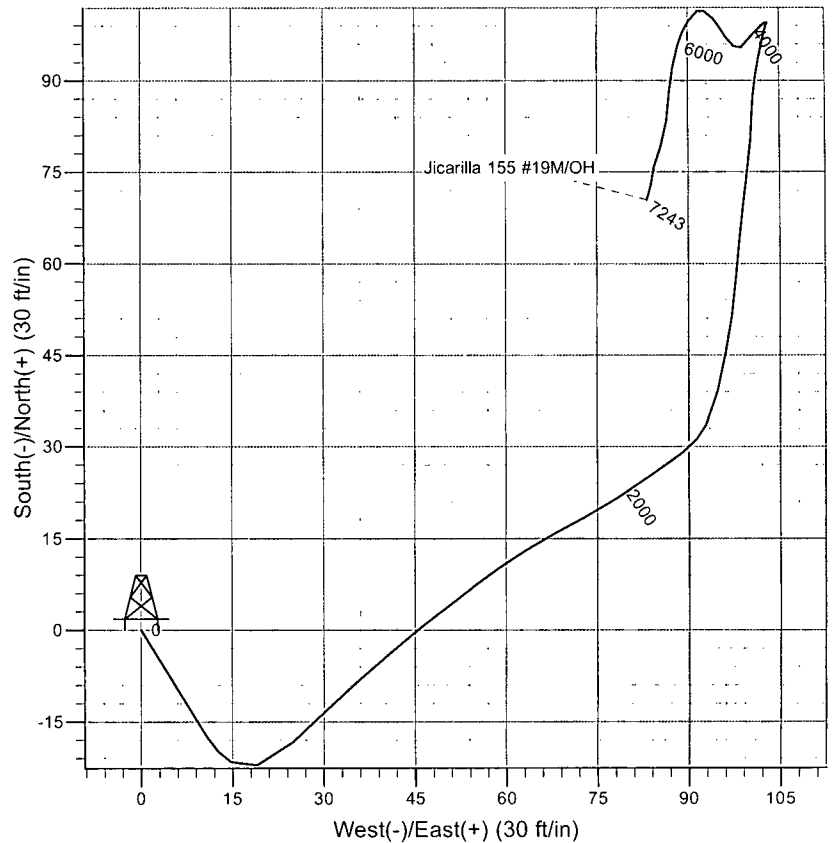
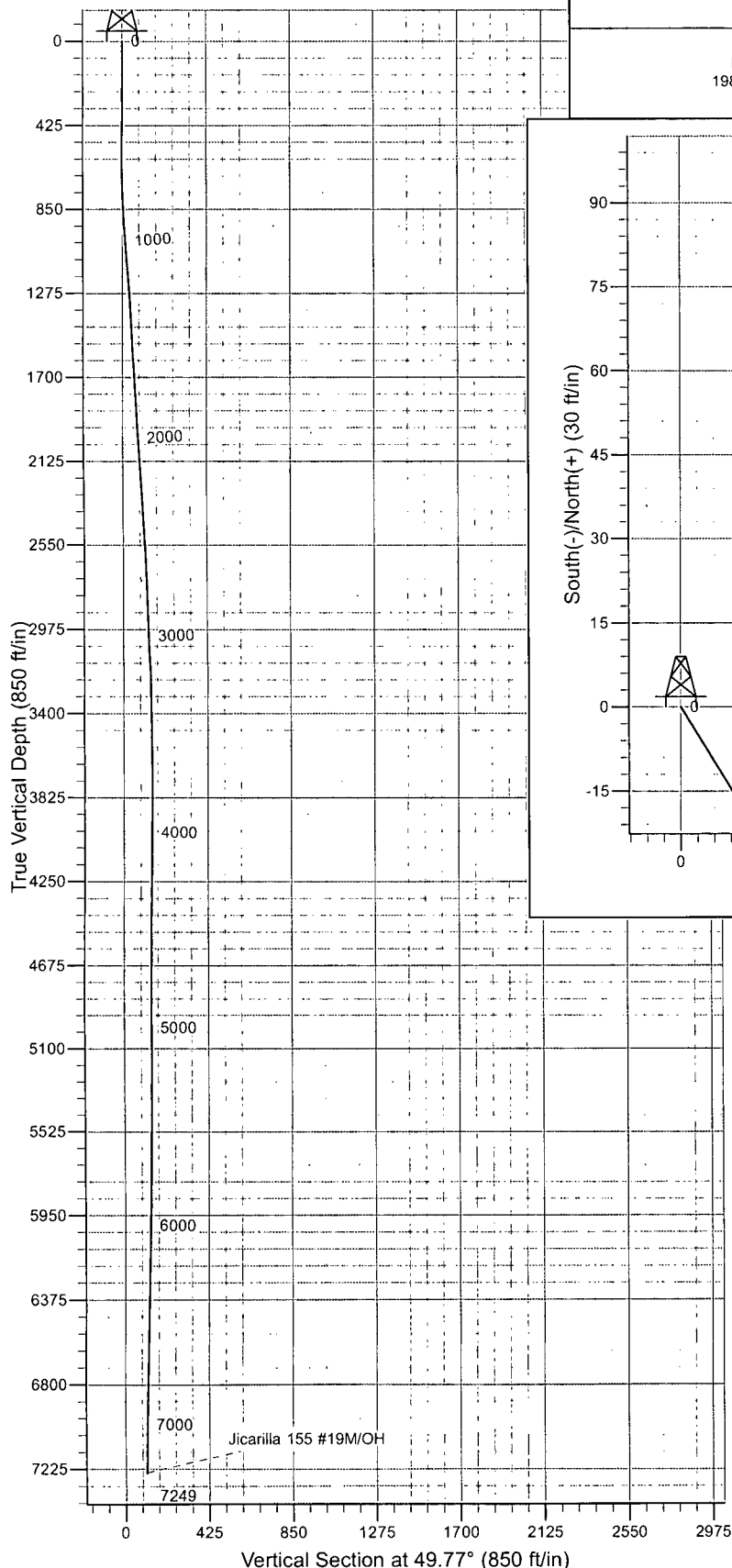
EnerVest Operating LLC

Project: Rio Arriba County, NM
Site: Jicarilla
Well: Jicarilla 155 #19M
Wellbore: OH
Design: OH



WELL DETAILS: Jicarilla 155 #19M

Ground Level: GL 6458' & KB 13' @ 6471.00ft (D&J 2)
Northing 1986589.06 Easting 2855754.56 Latitude 36° 27' 31.392 N Longitude 107° 22' 55.920 W



REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Jicarilla 155 #19M, True North
Vertical (TVD) Reference: GL 6458' & KB 13' @ 6471.00ft (D&J 2)
Section (VS) Reference: Slot - (0.00N, 0.00E)
Measured Depth Reference: GL 6458' & KB 13' @ 6471.00ft (D&J 2)
Calculation Method: Minimum Curvature
Local North: True
Location:

PROJECT DETAILS: Rio Arriba County, NM

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Western Zone

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Survey Report



Company:	EnerVest Operating LLC	Local Co-ordinate Reference:	Well Jicarilla 155 #19M
Project:	Rio Arriba County, NM	TVD Reference:	GL 6458' & KB 13' @ 6471.00ft (D&J 2)
Site:	Jicarilla	MD Reference:	GL 6458' & KB 13' @ 6471.00ft (D&J 2)
Well:	Jicarilla 155 #19M	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies Compass Server

Project	Rio Arriba County, NM		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site	Jicarilla		
Site Position:		Northing:	1,995,697.30 usft
From:	Lat/Long	Easting:	2,855,703.11 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	36° 29' 1.464 N
		Longitude:	107° 22' 56.028 W
		Grid Convergence:	0.27 °

Well	Jicarilla 155 #19M, 2380' FNL 2440' FEL Sec 29 T26N R5W		
Well Position	+N/-S	0.00 ft	Northing: 1,986,589.07 usft
	+E/-W	0.00 ft	Easting: 2,855,754.56 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft
		Latitude:	36° 27' 31.392 N
		Longitude:	107° 22' 55.920 W
		Ground Level:	6,458.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010	2012/07/10	9.57	63.27	50,518

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	49.77	

Survey Program	Date	2012/09/10			
From	To	Survey (Wellbore)	Tool Name	Description	
(ft)	(ft)				
605.00	2,925.00	Survey #1 (OH)	MWD SDI	MWD - Standard ver 1.0.1	
3,061.00	7,249.00	Survey #2 (OH)	MWD SDI	MWD - Standard ver 1.0.1	

Survey										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn	
Depth	(°)	(°)	Depth	(ft)	(ft)	Section	Rate	Rate	Rate	
(ft)			(ft)			(ft)	(°/100ft)	(°/100ft)	(°/100ft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
605.00	3.89	148.24	604.54	-17.46	10.81	-3.02	0.64	0.64	0.00	
First SDI MWD Survey										
701.00	3.14	121.49	700.36	-21.60	14.76	-2.68	1.86	-0.78	-27.86	
793.00	2.80	69.08	792.25	-22.11	19.01	0.23	2.87	-0.37	-56.97	
918.00	3.70	47.91	917.05	-18.32	24.86	7.15	1.19	0.72	-16.94	
1,013.00	4.23	45.72	1,011.83	-13.82	29.64	13.70	0.58	0.56	-2.31	
1,107.00	4.50	48.71	1,105.55	-8.96	34.89	20.85	0.38	0.29	3.18	
1,200.00	4.84	49.60	1,198.25	-4.01	40.62	28.42	0.37	0.37	0.96	
1,295.00	3.98	51.63	1,292.96	0.63	46.26	35.72	0.92	-0.91	2.14	

Scientific Drilling

Survey Report



Company:	EnerVest Operating LLC	Local Co-ordinate Reference:	Well Jicarilla 155 #19M
Project:	Rio Arriba County, NM	TVD Reference:	GL 6458' & KB 13' @ 6471.00ft (D&J 2)
Site:	Jicarilla	MD Reference:	GL 6458' & KB 13' @ 6471.00ft (D&J 2)
Well:	Jicarilla 155 #19M	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies Compass Server

Survey

Measured Depth. (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Bulld Rate (°/100ft)	Turn Rate (°/100ft)
1,391.00	2.93	52.82	1,388.79	4.18	50.83	41.50	1.10	-1.09	1.24
1,485.00	3.26	51.98	1,482.65	7.28	54.84	46.57	0.35	0.35	-0.89
1,577.00	2.99	56.38	1,574.51	10.22	58.90	51.57	0.39	-0.29	4.78
1,671.00	3.32	57.25	1,668.37	13.05	63.23	56.71	0.35	0.35	0.93
1,765.00	3.41	61.97	1,762.21	15.84	67.99	62.14	0.31	0.10	5.02
1,861.00	3.50	62.56	1,858.03	18.53	73.11	67.78	0.10	0.09	0.61
1,955.00	3.78	56.02	1,951.85	21.58	78.23	73.66	0.53	0.30	-6.96
2,050.00	3.96	56.79	2,046.63	25.13	83.57	80.03	0.20	0.19	0.81
2,144.00	4.16	52.63	2,140.39	28.98	88.99	86.66	0.38	0.21	-4.43
2,237.00	3.44	26.00	2,233.20	33.53	92.90	92.58	2.03	-0.77	-28.63
2,333.00	3.68	11.69	2,329.01	39.14	94.79	97.64	0.96	0.25	-14.91
2,428.00	3.97	12.25	2,423.80	45.34	96.10	102.65	0.31	0.31	0.59
2,520.00	3.67	7.04	2,515.60	51.37	97.14	107.34	0.50	-0.33	-5.66
2,614.00	3.99	4.77	2,609.39	57.62	97.78	111.86	0.38	0.34	-2.41
2,709.00	3.73	5.68	2,704.17	63.98	98.36	116.42	0.28	-0.27	0.96
2,802.00	3.42	7.33	2,796.99	69.75	99.01	120.64	0.35	-0.33	1.77
2,925.00	3.26	6.96	2,919.78	76.86	99.90	125.91	0.13	-0.13	-0.30
Last Survey in 8 3/4" Hole									
3,061.00	2.27	1.72	3,055.62	83.39	100.45	130.55	0.75	-0.73	-3.85
First Survey in 6 1/4" Hole									
3,155.00	2.55	5.26	3,149.54	87.33	100.70	133.28	0.34	0.30	3.77
3,247.00	1.77	9.05	3,241.47	90.77	101.11	135.82	0.86	-0.85	4.12
3,341.00	1.90	12.31	3,335.42	93.73	101.67	138.16	0.18	0.14	3.47
3,434.00	1.29	11.46	3,428.39	96.26	102.21	140.20	0.66	-0.66	-0.91
3,528.00	1.53	14.68	3,522.36	98.51	102.74	142.06	0.27	0.26	3.43
3,621.00	0.22	166.77	3,615.35	99.54	103.09	142.99	1.86	-1.41	163.54
3,712.00	0.13	282.33	3,706.35	99.39	103.03	142.85	0.33	-0.10	126.99
3,806.00	0.20	290.79	3,800.35	99.47	102.78	142.71	0.08	0.07	9.00
3,897.00	0.24	207.64	3,891.35	99.36	102.54	142.45	0.32	0.04	-91.37
3,990.00	0.41	241.32	3,984.35	99.03	102.16	141.95	0.27	0.18	36.22
4,144.00	0.67	216.41	4,138.34	98.04	101.14	140.53	0.22	0.17	-16.18
4,300.00	0.71	227.41	4,294.33	96.65	99.89	138.68	0.09	0.03	7.05
4,455.00	0.48	207.82	4,449.32	95.42	98.88	137.12	0.20	-0.15	-12.64
4,609.00	0.89	310.09	4,603.31	95.62	97.66	136.32	0.71	0.27	66.41
4,763.00	0.62	329.41	4,757.30	97.11	96.32	136.26	0.24	-0.18	12.55
4,915.00	0.71	326.77	4,909.29	98.61	95.39	136.51	0.06	0.06	-1.74
5,070.00	0.79	318.31	5,064.28	100.21	94.15	136.60	0.09	0.05	-5.46
5,225.00	0.55	300.25	5,219.26	101.38	92.80	136.32	0.20	-0.15	-11.65
5,413.00	0.35	220.90	5,407.26	101.40	91.64	135.45	0.32	-0.11	-42.21
5,569.00	0.29	222.97	5,563.26	100.75	91.06	134.59	0.04	-0.04	1.33
5,724.00	0.69	220.34	5,718.25	99.75	90.19	133.28	0.26	0.26	-1.70
5,879.00	0.80	199.92	5,873.24	98.03	89.21	131.42	0.18	0.07	-13.17
6,034.00	1.02	198.15	6,028.22	95.70	88.42	129.31	0.14	0.14	-1.14

Scientific Drilling

Survey Report



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Site:	Jicarilla	MD Reference:	GL 6458' & KB 13' @ 6471.00ft (D&J 2)
Well:	Jicarilla 155 #19M	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Rockies Compass Server

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,221.00	1.21	191.04	6,215.18	92.18	87.52	126.35	0.13	0.10	-3.80
6,408.00	1.44	185.45	6,402.13	87.90	86.92	123.13	0.14	0.12	-2.99
6,593.00	1.35	183.94	6,587.08	83.41	86.55	119.95	0.05	-0.05	-0.82
6,780.00	1.39	202.72	6,774.03	79.12	85.52	116.39	0.24	0.02	10.04
6,936.00	1.15	195.20	6,929.99	75.87	84.38	113.42	0.19	-0.15	-4.82
7,092.00	1.12	183.60	7,085.96	72.83	83.87	111.07	0.15	-0.02	-7.44
7,249.00	0.78	211.71	7,242.94	70.39	83.21	109.00	0.36	-0.22	17.90
Last SDI MWD Survey									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
605.00	604.54	-17.46	10.81	First SDI MWD Survey
2,925.00	2,919.78	76.86	99.90	Last Survey in 8 3/4" Hole
3,061.00	3,055.62	83.39	100.45	First Survey in 6 1/4" Hole
7,249.00	7,242.94	70.39	83.21	Last SDI MWD Survey

Checked By: _____	Approved By: _____	Date: _____
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