



# Weatherford®

Weatherford International Ltd.

2000 Oil Drive

Casper, WY 82604

## Survey Certification

<b>Operating Company:</b>	Anadarko Petroleum Corp.
<b>Well Name:</b>	Palyo 35N-W11HZ
<b>State:</b>	Colorado
<b>County:</b>	Weld
<b>API Number:</b>	512335453
<b>Datum:</b>	NAD 83
<b>Survey Calculation Method:</b>	Minimum Curvature
<b>North Reference:</b>	True North

I, John R. Morgan, hereby certify the attached directional survey run from the measure depth of 894.00 feet to the measured depth of 11,564.00 feet as accurate and true to the best of my knowledge.

Signature

20-Sep-12

Date

**John Morgan**

Directional Planning

Weatherford International - Rockies District

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_PALYO 29-11HZ Pad**

**Palyo 35N-E11HZ**

**Palyo 35N-E11HZ**

**Design: Palyo 35N-E11HZ**

## **Standard Survey Report**

**20 September, 2012**

# Andarko Petroleum Corporation

## Survey Report

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well Palyo 35N-E11HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Site:</b>	WELD_PALYO 29-11HZ Pad	<b>MD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Well:</b>	Palyo 35N-E11HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Palyo 35N-E11HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Palyo 35N-E11HZ	<b>Database:</b>	edmp

<b>Project</b>	COLORADO NORTHERN ZONE - 83		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site	WELD_PALYO 29-11HZ Pad				
Site Position:		Northing:	1,301,787.54 usft	Latitude:	40.158582
From:	Lat/Long	Easting:	3,241,120.73 usft	Longitude:	-104.637307
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.56 °

Well	Palyo 35N-E11HZ					
Well Position	+N/-S	0.00 ft	Northing:	1,301,787.59 usft	Latitude:	40.158583
	+E/-W	0.00 ft	Easting:	3,241,090.55 usft	Longitude:	-104.637415
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,855.00 ft

<b>Wellbore</b>	Palyo 35N-E11HZ				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	2/16/2012	8.68	66.85	52,947

<b>Design</b>	Palyo 35N-E11HZ				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	17.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	17.00	0.00	0.00	172.30	

<b>Survey Program</b>	<b>Date</b>	9/19/2012			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
117.00	841.00	Survey #1 (Palyo 35N-E11HZ)	NS-GYRO-MS	NORTH SENSING GYROCOMPASSING M/S	
911.00	11,581.00	Survey #2 (Palyo 35N-E11HZ)	MWD	MWD - STANDARD	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
17.00	0.00	0.00	17.00	0.00	0.00	0.00	0.00	0.00	0.00	
117.00	0.21	76.07	117.00	0.04	0.18	-0.02	0.21	0.21	0.00	
217.00	0.26	64.90	217.00	0.18	0.56	-0.11	0.07	0.05	-11.17	
317.00	0.27	99.72	317.00	0.24	1.00	-0.10	0.16	0.01	34.82	
417.00	0.39	92.54	417.00	0.19	1.57	0.03	0.13	0.12	-7.18	
517.00	0.30	100.48	516.99	0.12	2.17	0.17	0.10	-0.09	7.94	
617.00	0.18	156.36	616.99	-0.07	2.49	0.40	0.25	-0.12	55.88	
717.00	0.20	157.38	716.99	-0.37	2.62	0.72	0.02	0.02	1.02	
817.00	0.11	156.91	816.99	-0.62	2.72	0.98	0.09	-0.09	-0.47	
841.00	0.07	24.54	840.99	-0.63	2.74	0.99	0.69	-0.17	-551.54	

# Andarko Petroleum Corporation

## Survey Report

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well Palyo 35N-E11HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Site:</b>	WELD_PALYO 29-11HZ Pad	<b>MD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Well:</b>	Palyo 35N-E11HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Palyo 35N-E11HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Palyo 35N-E11HZ	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
TIE ON									
911.00	0.16	181.31	910.99	-0.69	2.75	1.05	0.32	0.13	223.96
FIRST MWD SURVEY									
973.00	1.09	65.07	972.99	-0.53	3.29	0.96	1.89	1.50	-187.48
1,066.00	3.58	52.55	1,065.91	1.61	6.40	-0.74	2.72	2.68	-13.46
1,160.00	4.99	46.54	1,159.64	6.21	11.69	-4.59	1.57	1.50	-6.39
1,253.00	6.74	39.80	1,252.15	13.18	18.12	-10.64	2.02	1.88	-7.25
1,347.00	7.00	41.88	1,345.48	21.69	25.48	-18.08	0.38	0.28	2.21
1,440.00	8.84	44.75	1,437.59	30.98	34.29	-26.11	2.02	1.98	3.09
1,526.00	10.40	42.25	1,522.37	41.42	44.16	-35.13	1.88	1.81	-2.91
1,611.00	12.55	42.67	1,605.67	53.89	55.58	-45.96	2.53	2.53	0.49
1,696.00	14.55	44.86	1,688.30	68.25	69.37	-58.34	2.43	2.35	2.58
1,782.00	14.65	38.52	1,771.53	84.42	83.77	-72.43	1.86	0.12	-7.37
1,867.00	13.61	36.50	1,853.96	100.87	96.41	-87.04	1.35	-1.22	-2.38
1,953.00	13.77	44.04	1,937.52	116.36	109.55	-100.63	2.08	0.19	8.77
2,038.00	15.34	43.05	2,019.79	131.85	124.25	-114.01	1.87	1.85	-1.16
2,124.00	16.71	42.69	2,102.45	149.25	140.40	-129.09	1.60	1.59	-0.42
2,209.00	15.95	40.02	2,184.02	167.18	156.20	-144.74	1.26	-0.89	-3.14
2,295.00	15.69	44.35	2,266.76	184.54	171.93	-159.84	1.41	-0.30	5.03
2,380.00	14.48	42.84	2,348.83	200.55	187.19	-173.66	1.50	-1.42	-1.78
2,465.00	13.93	43.05	2,431.23	215.82	201.40	-186.89	0.65	-0.65	0.25
2,551.00	11.95	41.85	2,515.05	230.02	214.41	-199.21	2.32	-2.30	-1.40
2,636.00	12.38	42.68	2,598.14	243.28	226.46	-210.73	0.55	0.51	0.98
2,721.00	13.58	43.95	2,680.96	257.16	239.56	-222.73	1.45	1.41	1.49
2,807.00	15.35	42.06	2,764.23	272.88	254.19	-236.35	2.13	2.06	-2.20
2,892.00	16.10	44.75	2,846.05	289.60	270.03	-250.80	1.23	0.88	3.16
2,978.00	16.41	43.51	2,928.62	306.88	286.79	-265.68	0.54	0.36	-1.44
3,063.00	15.88	37.99	3,010.27	324.76	302.21	-281.33	1.91	-0.62	-6.49
3,148.00	14.56	41.98	3,092.29	341.87	316.52	-296.36	1.98	-1.55	4.69
3,233.00	14.79	45.64	3,174.52	357.39	331.42	-309.75	1.12	0.27	4.31
3,319.00	14.64	44.70	3,257.70	372.79	346.91	-322.94	0.33	-0.17	-1.09
3,404.00	13.96	39.67	3,340.06	388.32	361.01	-336.44	1.67	-0.80	-5.92
3,490.00	13.79	40.38	3,423.56	404.11	374.28	-350.31	0.28	-0.20	0.83
3,575.00	13.89	42.91	3,506.09	419.30	387.79	-363.55	0.72	0.12	2.98
3,660.00	14.41	44.46	3,588.51	434.32	402.14	-376.51	0.76	0.61	1.82
3,745.00	14.51	44.09	3,670.82	449.52	416.96	-389.59	0.16	0.12	-0.44
3,831.00	14.27	44.08	3,754.12	464.87	431.83	-402.81	0.28	-0.28	-0.01
3,916.00	14.47	43.98	3,836.46	480.04	446.49	-415.87	0.24	0.24	-0.12
4,002.00	16.36	43.27	3,919.36	496.59	462.25	-430.16	2.21	2.20	-0.83
4,087.00	16.34	42.94	4,000.92	514.06	478.60	-445.29	0.11	-0.02	-0.39
4,173.00	14.43	40.86	4,083.84	531.03	493.86	-460.05	2.31	-2.22	-2.42
4,258.00	11.79	38.70	4,166.62	545.82	506.22	-473.05	3.16	-3.11	-2.54
4,344.00	11.97	41.47	4,250.78	559.35	517.62	-484.94	0.70	0.21	3.22

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## Survey Report

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<b>Site:</b>	WELD_PALYO 29-11HZ Pad	<b>MD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Well:</b>	Palyo 35N-E11HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Palyo 35N-E11HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Palyo 35N-E11HZ	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,429.00	11.62	42.33	4,333.98	572.29	529.22	-496.20	0.46	-0.41	1.01
4,514.00	10.82	42.21	4,417.36	584.53	540.34	-506.84	0.94	-0.94	-0.14
4,600.00	10.34	41.92	4,501.89	596.25	550.92	-517.04	0.56	-0.56	-0.34
4,685.00	9.97	41.01	4,585.56	607.48	560.85	-526.83	0.47	-0.44	-1.07
4,771.00	7.78	40.69	4,670.53	617.51	569.53	-535.61	2.55	-2.55	-0.37
4,856.00	5.40	28.38	4,754.96	625.39	575.18	-542.67	3.24	-2.80	-14.48
4,942.00	3.41	17.42	4,840.71	631.39	577.87	-548.25	2.50	-2.31	-12.74
5,028.00	1.27	29.53	4,926.63	634.66	579.11	-551.33	2.54	-2.49	14.08
5,113.00	0.91	44.75	5,011.61	635.96	580.05	-552.49	0.54	-0.42	17.91
5,199.00	0.78	48.75	5,097.61	636.83	580.97	-553.23	0.17	-0.15	4.65
5,284.00	1.06	57.39	5,182.59	637.64	582.06	-553.88	0.37	0.33	10.16
5,369.00	0.60	50.80	5,267.59	638.34	583.07	-554.44	0.55	-0.54	-7.75
5,455.00	0.56	67.95	5,353.58	638.79	583.81	-554.78	0.21	-0.05	19.94
5,540.00	0.40	55.40	5,438.58	639.11	584.44	-555.02	0.22	-0.19	-14.76
5,626.00	0.59	33.87	5,524.57	639.65	584.93	-555.49	0.31	0.22	-25.03
5,711.00	0.41	15.84	5,609.57	640.30	585.26	-556.09	0.28	-0.21	-21.21
5,797.00	0.44	25.37	5,695.57	640.90	585.49	-556.65	0.09	0.03	11.08
5,882.00	0.42	349.40	5,780.57	641.50	585.57	-557.24	0.31	-0.02	-42.32
5,968.00	0.41	330.58	5,866.56	642.08	585.36	-557.84	0.16	-0.01	-21.88
6,053.00	0.35	18.44	5,951.56	642.59	585.29	-558.35	0.37	-0.07	56.31
6,139.00	0.38	326.30	6,037.56	643.07	585.22	-558.85	0.37	0.03	-60.63
6,224.00	0.38	296.19	6,122.56	643.43	584.81	-559.26	0.23	0.00	-35.42
6,310.00	0.41	318.67	6,208.56	643.79	584.35	-559.67	0.18	0.03	26.14
6,395.00	0.58	286.24	6,293.55	644.14	583.73	-560.10	0.38	0.20	-38.15
6,481.00	4.35	189.81	6,379.47	641.05	582.76	-557.16	5.18	4.38	-112.13
6,523.00	9.37	190.73	6,421.16	636.11	581.85	-552.40	11.95	11.95	2.19
6,566.00	13.29	186.98	6,463.31	627.77	580.60	-544.29	9.27	9.12	-8.72
6,609.00	17.25	182.18	6,504.79	616.48	579.76	-533.23	9.66	9.21	-11.16
6,652.00	20.95	182.45	6,545.41	602.43	579.18	-519.37	8.61	8.60	0.63
6,694.00	22.94	182.60	6,584.37	586.75	578.49	-503.93	4.74	4.74	0.36
6,737.00	26.46	182.28	6,623.43	568.80	577.73	-486.24	8.19	8.19	-0.74
6,780.00	29.90	182.38	6,661.33	548.51	576.90	-466.25	8.00	8.00	0.23
6,822.00	33.06	182.24	6,697.14	526.60	576.02	-444.65	7.53	7.52	-0.33
6,865.00	37.10	179.96	6,732.32	501.90	575.57	-420.24	9.88	9.40	-5.30
6,908.00	41.05	177.96	6,765.70	474.81	576.08	-393.32	9.64	9.19	-4.65
6,951.00	44.94	180.40	6,797.15	445.50	576.48	-364.22	9.84	9.05	5.67
6,993.00	49.18	183.81	6,825.76	414.79	575.32	-333.95	11.71	10.10	8.12
7,036.00	53.75	185.21	6,852.54	381.27	572.66	-301.08	10.93	10.63	3.26
7,079.00	57.84	184.35	6,876.71	345.84	569.71	-266.37	9.65	9.51	-2.00
7,122.00	62.98	183.23	6,897.93	308.54	567.25	-229.74	12.17	11.95	-2.60
7,164.00	67.19	183.46	6,915.62	270.52	565.02	-192.36	10.04	10.02	0.55
7,207.00	71.51	183.58	6,930.78	230.37	562.55	-152.90	10.05	10.05	0.28
7,250.00	73.76	181.52	6,943.62	189.38	560.73	-112.52	6.95	5.23	-4.79
7,292.00	77.82	180.26	6,953.93	148.68	560.10	-72.27	10.09	9.67	-3.00

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<b>Well:</b>	Palyo 35N-E11HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Palyo 35N-E11HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Palyo 35N-E11HZ	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,335.00	83.48	179.95	6,960.91	106.26	560.03	-30.25	13.18	13.16	-0.72
7,362.00	84.96	180.79	6,963.63	79.40	559.85	-3.66	6.30	5.48	3.11
7,402.00	87.13	181.01	6,966.39	39.51	559.22	35.80	5.46	5.43	0.56
<b>7" INTERMEDIATE CASING</b>									
7,439.00	89.14	181.22	6,967.59	2.53	558.50	72.34	5.46	5.43	0.56
7,524.00	91.06	179.15	6,967.44	-82.46	558.23	156.52	3.32	2.26	-2.44
7,609.00	90.25	179.02	6,966.47	-167.44	559.59	240.92	0.97	-0.95	-0.15
7,695.00	90.44	178.97	6,965.95	-253.42	561.09	326.33	0.23	0.22	-0.06
7,780.00	89.88	178.76	6,965.71	-338.41	562.78	410.78	0.70	-0.66	-0.25
7,866.00	90.18	178.78	6,965.67	-424.39	564.62	496.23	0.35	0.35	0.02
7,951.00	91.05	178.48	6,964.76	-509.36	566.66	580.70	1.08	1.02	-0.35
8,037.00	91.30	179.20	6,962.99	-595.32	568.40	666.12	0.89	0.29	0.84
8,122.00	91.73	179.03	6,960.75	-680.28	569.71	750.49	0.54	0.51	-0.20
8,207.00	90.74	179.66	6,958.91	-765.25	570.68	834.83	1.38	-1.16	0.74
8,293.00	91.11	179.00	6,957.53	-851.24	571.69	920.17	0.88	0.43	-0.77
8,378.00	90.99	179.28	6,955.97	-936.21	572.96	1,004.55	0.36	-0.14	0.33
8,464.00	89.26	179.11	6,955.78	-1,022.20	574.17	1,089.93	2.02	-2.01	-0.20
8,549.00	88.28	178.89	6,957.60	-1,107.17	575.65	1,174.33	1.18	-1.15	-0.26
8,635.00	88.95	179.05	6,959.68	-1,193.13	577.20	1,259.72	0.80	0.78	0.19
8,720.00	89.82	179.50	6,960.60	-1,278.11	578.27	1,344.08	1.15	1.02	0.53
8,806.00	88.03	179.41	6,962.21	-1,364.09	579.09	1,429.39	2.08	-2.08	-0.10
8,891.00	88.27	178.94	6,964.95	-1,449.04	580.31	1,513.74	0.62	0.28	-0.55
8,976.00	86.92	178.03	6,968.52	-1,533.93	582.56	1,598.17	1.91	-1.59	-1.07
9,062.00	86.79	178.21	6,973.24	-1,619.76	585.38	1,683.59	0.26	-0.15	0.21
9,147.00	87.96	178.44	6,977.13	-1,704.63	587.86	1,768.03	1.40	1.38	0.27
9,233.00	88.64	179.39	6,979.68	-1,790.57	589.49	1,853.42	1.36	0.79	1.10
9,318.00	88.21	179.56	6,982.02	-1,875.54	590.26	1,937.72	0.54	-0.51	0.20
9,404.00	89.26	179.52	6,983.92	-1,961.51	590.95	2,023.02	1.22	1.22	-0.05
9,489.00	91.36	180.86	6,983.46	-2,046.50	590.67	2,107.20	2.93	2.47	1.58
9,575.00	89.51	180.02	6,982.80	-2,132.49	590.01	2,192.33	2.36	-2.15	-0.98
9,660.00	91.11	179.35	6,982.34	-2,217.49	590.48	2,276.62	2.04	1.88	-0.79
9,745.00	92.22	180.96	6,979.87	-2,302.45	590.25	2,360.78	2.30	1.31	1.89
9,831.00	92.64	180.74	6,976.23	-2,388.36	588.98	2,445.75	0.55	0.49	-0.26
9,916.00	90.06	181.39	6,974.23	-2,473.32	587.40	2,529.72	3.13	-3.04	0.76
10,002.00	89.38	181.62	6,974.65	-2,559.28	585.14	2,614.62	0.83	-0.79	0.27
10,088.00	89.75	180.98	6,975.30	-2,645.26	583.19	2,699.55	0.86	0.43	-0.74
10,173.00	90.49	180.59	6,975.12	-2,730.25	582.02	2,783.62	0.98	0.87	-0.46
10,258.00	90.19	180.61	6,974.62	-2,815.24	581.13	2,867.73	0.35	-0.35	0.02
10,344.00	91.11	181.14	6,973.64	-2,901.23	579.82	2,952.76	1.23	1.07	0.62
10,429.00	90.74	181.76	6,972.27	-2,986.19	577.67	3,036.67	0.85	-0.44	0.73
10,515.00	90.00	181.01	6,971.71	-3,072.16	575.59	3,121.59	1.23	-0.86	-0.87
10,600.00	88.64	180.92	6,972.72	-3,157.14	574.16	3,205.61	1.60	-1.60	-0.11
10,686.00	88.95	181.00	6,974.53	-3,243.11	572.72	3,290.61	0.37	0.36	0.09

# Andarko Petroleum Corporation

## Survey Report

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well Palyo 35N-E11HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Site:</b>	WELD_PALYO 29-11HZ Pad	<b>MD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Well:</b>	Palyo 35N-E11HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Palyo 35N-E11HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Palyo 35N-E11HZ	<b>Database:</b>	edmp

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
10,771.00	89.01	180.30	6,976.04	-3,328.09	571.75	3,374.69	0.83	0.07	-0.82	
10,857.00	89.26	180.36	6,977.34	-3,414.08	571.26	3,459.84	0.30	0.29	0.07	
10,942.00	89.38	179.95	6,978.35	-3,499.07	571.03	3,544.03	0.50	0.14	-0.48	
11,028.00	89.08	180.27	6,979.51	-3,585.06	570.86	3,629.23	0.51	-0.35	0.37	
11,113.00	89.08	180.24	6,980.87	-3,670.05	570.48	3,713.40	0.04	0.00	-0.04	
11,198.00	89.38	180.91	6,982.01	-3,755.04	569.63	3,797.51	0.86	0.35	0.79	
11,284.00	89.38	180.68	6,982.94	-3,841.03	568.44	3,882.56	0.27	0.00	-0.27	
11,369.00	90.86	182.09	6,982.77	-3,926.00	566.38	3,966.49	2.40	1.74	1.66	
11,455.00	91.17	181.59	6,981.24	-4,011.94	563.62	4,051.28	0.68	0.36	-0.58	
11,527.00	91.73	181.94	6,979.42	-4,083.88	561.41	4,122.28	0.92	0.78	0.49	
LAST MWD SURVEY										
11,581.00	91.73	181.94	6,977.79	-4,137.83	559.58	4,175.49	0.00	0.00	0.00	
PROJECTION TO TD										

Casing Points						
Measured Depth (ft)	Vertical Depth (ft)	Name			Casing Diameter (")	Hole Diameter (")
850.00	849.99	9 5/8"			9-5/8	12-1/4
7,402.00	6,966.39	7"			7	7-1/2

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
841.00	840.99	-0.63	2.74	TIE ON	
911.00	910.99	-0.69	2.75	FIRST MWD SURVEY	
7,402.00	6,966.39	39.51	559.22	7" INTERMEDIATE CASING	
11,527.00	6,979.42	-4,083.88	561.41	LAST MWD SURVEY	
11,581.00	6,977.79	-4,137.83	559.58	PROJECTION TO TD	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

# **US ROCKIES REGION PLANNING**

**COLORADO NORTHERN ZONE - 83**

**WELD\_PALYO 29-11HZ Pad**

**Palyo 35N-E11HZ**

**Palyo 35N-E11HZ**

**Design: Palyo 35N-E11HZ**

## **Survey Report - Geographic**

**20 September, 2012**



# Andarko Petroleum Corporation

## Survey Report - Geographic

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well Palyo 35N-E11HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Site:</b>	WELD_PALYO 29-11HZ Pad	<b>MD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Well:</b>	Palyo 35N-E11HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Palyo 35N-E11HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Palyo 35N-E11HZ	<b>Database:</b>	edmp

<b>Project</b>	COLORADO NORTHERN ZONE - 83		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

<b>Site</b>	WELD_PALYO 29-11HZ Pad			
<b>Site Position:</b>		<b>Northing:</b>	1,301,787.54 usft	<b>Latitude:</b> 40.158582
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,241,120.73 usft	<b>Longitude:</b> -104.637307
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> 0.56 °

<b>Well</b>	Palyo 35N-E11HZ			
<b>Well Position</b>	<b>+N/-S</b>	0.00 ft	<b>Northing:</b>	1,301,787.59 usft
	<b>+E/-W</b>	0.00 ft	<b>Easting:</b>	3,241,090.55 usft
<b>Position Uncertainty</b>	0.00 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b> 4,855.00 ft

<b>Wellbore</b>	Palyo 35N-E11HZ				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	2/16/2012	8.68	66.85	52,947

<b>Design</b>	Palyo 35N-E11HZ			
<b>Audit Notes:</b>				
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b> 17.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	17.00	0.00	0.00	172.30

<b>Survey Program</b>	<b>Date</b>	9/19/2012		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
117.00	841.00	Survey #1 (Palyo 35N-E11HZ)	NS-GYRO-MS	NORTH SENSING GYROCOMPASSING M/S
911.00	11,581.00	Survey #2 (Palyo 35N-E11HZ)	MWD	MWD - STANDARD

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Map Northing (usft)</b>	<b>Map Easting (usft)</b>	<b>Latitude</b>	<b>Longitude</b>
17.00	0.00	0.00	17.00	0.00	0.00	1,301,787.59	3,241,090.55	40.158583	-104.637415
117.00	0.21	76.07	117.00	0.04	0.18	1,301,787.63	3,241,090.72	40.158583	-104.637415
217.00	0.26	64.90	217.00	0.18	0.56	1,301,787.78	3,241,091.11	40.158584	-104.637413
317.00	0.27	99.72	317.00	0.24	1.00	1,301,787.84	3,241,091.54	40.158584	-104.637412
417.00	0.39	92.54	417.00	0.19	1.57	1,301,787.79	3,241,092.12	40.158584	-104.637410
517.00	0.30	100.48	516.99	0.12	2.17	1,301,787.73	3,241,092.71	40.158583	-104.637408
617.00	0.18	156.36	616.99	-0.07	2.49	1,301,787.54	3,241,093.04	40.158583	-104.637406
717.00	0.20	157.38	716.99	-0.37	2.62	1,301,787.24	3,241,093.17	40.158582	-104.637406
817.00	0.11	156.91	816.99	-0.62	2.72	1,301,786.99	3,241,093.28	40.158581	-104.637406
841.00	0.07	24.54	840.99	-0.63	2.74	1,301,786.98	3,241,093.29	40.158581	-104.637405
<b>TIE ON</b>									

# Andarko Petroleum Corporation

## Survey Report - Geographic

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well Palyo 35N-E11HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Site:</b>	WELD_PALYO 29-11HZ Pad	<b>MD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Well:</b>	Palyo 35N-E11HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Palyo 35N-E11HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Palyo 35N-E11HZ	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
911.00	0.16	181.31	910.99	-0.69	2.75	1,301,786.92	3,241,093.31	40.158581	-104.637405
<b>FIRST MWD SURVEY</b>									
973.00	1.09	65.07	972.99	-0.53	3.29	1,301,787.09	3,241,093.84	40.158582	-104.637404
1,066.00	3.58	52.55	1,065.91	1.61	6.40	1,301,789.26	3,241,096.92	40.158587	-104.637392
1,160.00	4.99	46.54	1,159.64	6.21	11.69	1,301,793.91	3,241,102.18	40.158600	-104.637373
1,253.00	6.74	39.80	1,252.15	13.18	18.12	1,301,800.94	3,241,108.54	40.158619	-104.637350
1,347.00	7.00	41.88	1,345.48	21.69	25.48	1,301,809.52	3,241,115.81	40.158643	-104.637324
1,440.00	8.84	44.75	1,437.59	30.98	34.29	1,301,818.90	3,241,124.53	40.158668	-104.637293
1,526.00	10.40	42.25	1,522.37	41.42	44.16	1,301,829.43	3,241,134.30	40.158697	-104.637257
1,611.00	12.55	42.67	1,605.67	53.89	55.58	1,301,842.01	3,241,145.60	40.158731	-104.637216
1,696.00	14.55	44.86	1,688.30	68.25	69.37	1,301,856.51	3,241,159.25	40.158770	-104.637167
1,782.00	14.65	38.52	1,771.53	84.42	83.77	1,301,872.81	3,241,173.49	40.158815	-104.637116
1,867.00	13.61	36.50	1,853.96	100.87	96.41	1,301,889.39	3,241,185.97	40.158860	-104.637070
1,953.00	13.77	44.04	1,937.52	116.36	109.55	1,301,905.01	3,241,198.96	40.158902	-104.637023
2,038.00	15.34	43.05	2,019.79	131.85	124.25	1,301,920.64	3,241,213.51	40.158945	-104.636971
2,124.00	16.71	42.69	2,102.45	149.25	140.40	1,301,938.19	3,241,229.49	40.158993	-104.636913
2,209.00	15.95	40.02	2,184.02	167.18	156.20	1,301,956.27	3,241,245.11	40.159042	-104.636856
2,295.00	15.69	44.35	2,266.76	184.54	171.93	1,301,973.79	3,241,260.67	40.159090	-104.636800
2,380.00	14.48	42.84	2,348.83	200.55	187.19	1,301,989.95	3,241,275.77	40.159134	-104.636746
2,465.00	13.93	43.05	2,431.23	215.82	201.40	1,302,005.36	3,241,289.84	40.159175	-104.636695
2,551.00	11.95	41.85	2,515.05	230.02	214.41	1,302,019.68	3,241,302.70	40.159214	-104.636648
2,636.00	12.38	42.68	2,598.14	243.28	226.46	1,302,033.05	3,241,314.62	40.159251	-104.636605
2,721.00	13.58	43.95	2,680.96	257.16	239.56	1,302,047.06	3,241,327.59	40.159289	-104.636558
2,807.00	15.35	42.06	2,764.23	272.88	254.19	1,302,062.92	3,241,342.07	40.159332	-104.636506
2,892.00	16.10	44.75	2,846.05	289.60	270.03	1,302,079.80	3,241,357.74	40.159378	-104.636449
2,978.00	16.41	43.51	2,928.62	306.88	286.79	1,302,097.24	3,241,374.33	40.159425	-104.636389
3,063.00	15.88	37.99	3,010.27	324.76	302.21	1,302,115.27	3,241,389.58	40.159475	-104.636334
3,148.00	14.56	41.98	3,092.29	341.87	316.52	1,302,132.51	3,241,403.72	40.159521	-104.636283
3,233.00	14.79	45.64	3,174.52	357.39	331.42	1,302,148.18	3,241,418.47	40.159564	-104.636229
3,319.00	14.64	44.70	3,257.70	372.79	346.91	1,302,163.73	3,241,433.81	40.159606	-104.636174
3,404.00	13.96	39.67	3,340.06	388.32	361.01	1,302,179.40	3,241,447.76	40.159649	-104.636124
3,490.00	13.79	40.38	3,423.56	404.11	374.28	1,302,195.32	3,241,460.87	40.159692	-104.636076
3,575.00	13.89	42.91	3,506.09	419.30	387.79	1,302,210.64	3,241,474.23	40.159734	-104.636028
3,660.00	14.41	44.46	3,588.51	434.32	402.14	1,302,225.80	3,241,488.44	40.159775	-104.635976
3,745.00	14.51	44.09	3,670.82	449.52	416.96	1,302,241.14	3,241,503.11	40.159817	-104.635923
3,831.00	14.27	44.08	3,754.12	464.87	431.83	1,302,256.64	3,241,517.83	40.159859	-104.635870
3,916.00	14.47	43.98	3,836.46	480.04	446.49	1,302,271.95	3,241,532.34	40.159901	-104.635818
4,002.00	16.36	43.27	3,919.36	496.59	462.25	1,302,288.65	3,241,547.95	40.159946	-104.635761
4,087.00	16.34	42.94	4,000.92	514.06	478.60	1,302,306.28	3,241,564.13	40.159994	-104.635703
4,173.00	14.43	40.86	4,083.84	531.03	493.86	1,302,323.39	3,241,579.21	40.160041	-104.635648
4,258.00	11.79	38.70	4,166.62	545.82	506.22	1,302,338.30	3,241,591.43	40.160081	-104.635604
4,344.00	11.97	41.47	4,250.78	559.35	517.62	1,302,351.95	3,241,602.70	40.160119	-104.635563
4,429.00	11.62	42.33	4,333.98	572.29	529.22	1,302,364.99	3,241,614.17	40.160154	-104.635522
4,514.00	10.82	42.21	4,417.36	584.53	540.34	1,302,377.34	3,241,625.18	40.160188	-104.635482
4,600.00	10.34	41.92	4,501.89	596.25	550.92	1,302,389.16	3,241,635.64	40.160220	-104.635444
4,685.00	9.97	41.01	4,585.56	607.48	560.85	1,302,400.49	3,241,645.46	40.160251	-104.635409
4,771.00	7.78	40.69	4,670.53	617.51	569.53	1,302,410.60	3,241,654.04	40.160278	-104.635378
4,856.00	5.40	28.38	4,754.96	625.39	575.18	1,302,418.54	3,241,659.62	40.160300	-104.635357
4,942.00	3.41	17.42	4,840.71	631.39	577.87	1,302,424.57	3,241,662.25	40.160316	-104.635348
5,028.00	1.27	29.53	4,926.63	634.66	579.11	1,302,427.85	3,241,663.45	40.160325	-104.635343
5,113.00	0.91	44.75	5,011.61	635.96	580.05	1,302,429.16	3,241,664.38	40.160329	-104.635340
5,199.00	0.78	48.75	5,097.61	636.83	580.97	1,302,430.04	3,241,665.29	40.160331	-104.635337
5,284.00	1.06	57.39	5,182.59	637.64	582.06	1,302,430.85	3,241,666.38	40.160333	-104.635333
5,369.00	0.60	50.80	5,267.59	638.34	583.07	1,302,431.57	3,241,667.38	40.160335	-104.635329
5,455.00	0.56	67.95	5,353.58	638.79	583.81	1,302,432.02	3,241,668.11	40.160337	-104.635326

# Andarko Petroleum Corporation

## Survey Report - Geographic

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well Palyo 35N-E11HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Site:</b>	WELD_PALYO 29-11HZ Pad	<b>MD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Well:</b>	Palyo 35N-E11HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Palyo 35N-E11HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Palyo 35N-E11HZ	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,540.00	0.40	55.40	5,438.58	639.11	584.44	1,302,432.35	3,241,668.74	40.160337	-104.635324
5,626.00	0.59	33.87	5,524.57	639.65	584.93	1,302,432.89	3,241,669.23	40.160339	-104.635322
5,711.00	0.41	15.84	5,609.57	640.30	585.26	1,302,433.55	3,241,669.55	40.160341	-104.635321
5,797.00	0.44	25.37	5,695.57	640.90	585.49	1,302,434.15	3,241,669.77	40.160342	-104.635320
5,882.00	0.42	349.40	5,780.57	641.50	585.57	1,302,434.75	3,241,669.85	40.160344	-104.635320
5,968.00	0.41	330.58	5,866.56	642.08	585.36	1,302,435.32	3,241,669.63	40.160346	-104.635321
6,053.00	0.35	18.44	5,951.56	642.59	585.29	1,302,435.84	3,241,669.56	40.160347	-104.635321
6,139.00	0.38	326.30	6,037.56	643.07	585.22	1,302,436.32	3,241,669.48	40.160348	-104.635321
6,224.00	0.38	296.19	6,122.56	643.43	584.81	1,302,436.68	3,241,669.07	40.160349	-104.635323
6,310.00	0.41	318.67	6,208.56	643.79	584.35	1,302,437.03	3,241,668.60	40.160350	-104.635325
6,395.00	0.58	286.24	6,293.55	644.14	583.73	1,302,437.37	3,241,667.99	40.160351	-104.635327
6,481.00	4.35	189.81	6,379.47	641.05	582.76	1,302,434.27	3,241,667.04	40.160343	-104.635330
6,523.00	9.37	190.73	6,421.16	636.11	581.85	1,302,429.33	3,241,666.18	40.160329	-104.635333
6,566.00	13.29	186.98	6,463.31	627.77	580.60	1,302,420.97	3,241,665.01	40.160306	-104.635338
6,609.00	17.25	182.18	6,504.79	616.48	579.76	1,302,409.68	3,241,664.28	40.160275	-104.635341
6,652.00	20.95	182.45	6,545.41	602.43	579.18	1,302,395.62	3,241,663.84	40.160237	-104.635343
6,694.00	22.94	182.60	6,584.37	586.75	578.49	1,302,379.93	3,241,663.30	40.160194	-104.635345
6,737.00	26.46	182.28	6,623.43	568.80	577.73	1,302,361.98	3,241,662.71	40.160144	-104.635348
6,780.00	29.90	182.38	6,661.33	548.51	576.90	1,302,341.68	3,241,662.09	40.160089	-104.635351
6,822.00	33.06	182.24	6,697.14	526.60	576.02	1,302,319.76	3,241,661.42	40.160029	-104.635354
6,865.00	37.10	179.96	6,732.32	501.90	575.57	1,302,295.06	3,241,661.21	40.159961	-104.635356
6,908.00	41.05	177.96	6,765.70	474.81	576.08	1,302,267.97	3,241,661.98	40.159886	-104.635354
6,951.00	44.94	180.40	6,797.15	445.50	576.48	1,302,238.67	3,241,662.66	40.159806	-104.635353
6,993.00	49.18	183.81	6,825.76	414.79	575.32	1,302,207.95	3,241,661.80	40.159722	-104.635357
7,036.00	53.75	185.21	6,852.54	381.27	572.66	1,302,174.41	3,241,659.47	40.159630	-104.635366
7,079.00	57.84	184.35	6,876.71	345.84	569.71	1,302,138.95	3,241,656.86	40.159532	-104.635377
7,122.00	62.98	183.23	6,897.93	308.54	567.25	1,302,101.63	3,241,654.76	40.159430	-104.635386
7,164.00	67.19	183.46	6,915.62	270.52	565.02	1,302,063.59	3,241,652.91	40.159326	-104.635394
7,207.00	71.51	183.58	6,930.78	230.37	562.55	1,302,023.42	3,241,650.83	40.159215	-104.635403
7,250.00	73.76	181.52	6,943.62	189.38	560.73	1,301,982.41	3,241,649.41	40.159103	-104.635409
7,292.00	77.82	180.26	6,953.93	148.68	560.10	1,301,941.70	3,241,649.17	40.158991	-104.635411
7,335.00	83.48	179.95	6,960.91	106.26	560.03	1,301,899.29	3,241,649.51	40.158875	-104.635412
7,362.00	84.96	180.79	6,963.63	79.40	559.85	1,301,872.43	3,241,649.60	40.158801	-104.635412
7,402.00	87.13	181.01	6,966.39	39.51	559.22	1,301,832.53	3,241,649.36	40.158691	-104.635414
<b>7" INTERMEDIATE CASING</b>									
7,439.00	89.14	181.22	6,967.59	2.53	558.50	1,301,795.55	3,241,649.00	40.158590	-104.635417
7,524.00	91.06	179.15	6,967.44	-82.46	558.23	1,301,710.56	3,241,649.55	40.158357	-104.635418
7,609.00	90.25	179.02	6,966.47	-167.44	559.59	1,301,625.60	3,241,651.73	40.158123	-104.635413
7,695.00	90.44	178.97	6,965.95	-253.42	561.09	1,301,539.63	3,241,654.08	40.157887	-104.635408
7,780.00	89.88	178.76	6,965.71	-338.41	562.78	1,301,454.67	3,241,656.59	40.157654	-104.635402
7,866.00	90.18	178.78	6,965.67	-424.39	564.62	1,301,368.71	3,241,659.27	40.157418	-104.635395
7,951.00	91.05	178.48	6,964.76	-509.36	566.66	1,301,283.77	3,241,662.13	40.157185	-104.635388
8,037.00	91.30	179.20	6,962.99	-595.32	568.40	1,301,197.82	3,241,664.70	40.156949	-104.635382
8,122.00	91.73	179.03	6,960.75	-680.28	569.71	1,301,112.88	3,241,666.84	40.156716	-104.635377
8,207.00	90.74	179.66	6,958.91	-765.25	570.68	1,301,027.92	3,241,668.64	40.156482	-104.635374
8,293.00	91.11	179.00	6,957.53	-851.24	571.69	1,300,941.95	3,241,670.48	40.156246	-104.635370
8,378.00	90.99	179.28	6,955.97	-936.21	572.96	1,300,856.99	3,241,672.59	40.156013	-104.635365
8,464.00	89.26	179.11	6,955.78	-1,022.20	574.17	1,300,771.02	3,241,674.63	40.155777	-104.635361
8,549.00	88.28	178.89	6,957.60	-1,107.17	575.65	1,300,686.07	3,241,676.94	40.155544	-104.635356
8,635.00	88.95	179.05	6,959.68	-1,193.13	577.20	1,300,600.13	3,241,679.32	40.155308	-104.635350
8,720.00	89.82	179.50	6,960.60	-1,278.11	578.27	1,300,515.16	3,241,681.22	40.155074	-104.635346
8,806.00	88.03	179.41	6,962.21	-1,364.09	579.09	1,300,429.19	3,241,682.88	40.154838	-104.635344
8,891.00	88.27	178.94	6,964.95	-1,449.04	580.31	1,300,344.26	3,241,684.93	40.154605	-104.635339
8,976.00	86.92	178.03	6,968.52	-1,533.93	582.56	1,300,259.40	3,241,688.00	40.154372	-104.635331
9,062.00	86.79	178.21	6,973.24	-1,619.76	585.38	1,300,173.60	3,241,691.65	40.154137	-104.635321

# Andarko Petroleum Corporation

## Survey Report - Geographic

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well Palyo 35N-E11HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Site:</b>	WELD_PALYO 29-11HZ Pad	<b>MD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Well:</b>	Palyo 35N-E11HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Palyo 35N-E11HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Palyo 35N-E11HZ	<b>Database:</b>	edmp

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,147.00	87.96	178.44	6,977.13	-1,704.63	587.86	1,300,088.76	3,241,694.96	40.153904	-104.635312
9,233.00	88.64	179.39	6,979.68	-1,790.57	589.49	1,300,002.83	3,241,697.42	40.153668	-104.635306
9,318.00	88.21	179.56	6,982.02	-1,875.54	590.26	1,299,917.88	3,241,699.02	40.153434	-104.635304
9,404.00	89.26	179.52	6,983.92	-1,961.51	590.95	1,299,831.92	3,241,700.55	40.153198	-104.635301
9,489.00	91.36	180.86	6,983.46	-2,046.50	590.67	1,299,746.93	3,241,701.10	40.152965	-104.635302
9,575.00	89.51	180.02	6,982.80	-2,132.49	590.01	1,299,660.93	3,241,701.27	40.152729	-104.635305
9,660.00	91.11	179.35	6,982.34	-2,217.49	590.48	1,299,575.95	3,241,702.57	40.152496	-104.635303
9,745.00	92.22	180.96	6,979.87	-2,302.45	590.25	1,299,490.99	3,241,703.16	40.152262	-104.635304
9,831.00	92.64	180.74	6,976.23	-2,388.36	588.98	1,299,405.07	3,241,702.72	40.152027	-104.635308
9,916.00	90.06	181.39	6,974.23	-2,473.32	587.40	1,299,320.11	3,241,701.97	40.151793	-104.635314
10,002.00	89.38	181.62	6,974.65	-2,559.28	585.14	1,299,234.12	3,241,700.55	40.151557	-104.635322
10,088.00	89.75	180.98	6,975.30	-2,645.26	583.19	1,299,148.13	3,241,699.43	40.151321	-104.635329
10,173.00	90.49	180.59	6,975.12	-2,730.25	582.02	1,299,063.13	3,241,699.10	40.151088	-104.635333
10,258.00	90.19	180.61	6,974.62	-2,815.24	581.13	1,298,978.13	3,241,699.03	40.150855	-104.635336
10,344.00	91.11	181.14	6,973.64	-2,901.23	579.82	1,298,892.14	3,241,698.56	40.150619	-104.635341
10,429.00	90.74	181.76	6,972.27	-2,986.19	577.67	1,298,807.16	3,241,697.23	40.150386	-104.635349
10,515.00	90.00	181.01	6,971.71	-3,072.16	575.59	1,298,721.18	3,241,695.99	40.150150	-104.635356
10,600.00	88.64	180.92	6,972.72	-3,157.14	574.16	1,298,636.19	3,241,695.39	40.149916	-104.635361
10,686.00	88.95	181.00	6,974.53	-3,243.11	572.72	1,298,550.21	3,241,694.78	40.149680	-104.635366
10,771.00	89.01	180.30	6,976.04	-3,328.09	571.75	1,298,465.22	3,241,694.64	40.149447	-104.635370
10,857.00	89.26	180.36	6,977.34	-3,414.08	571.26	1,298,379.23	3,241,694.99	40.149211	-104.635372
10,942.00	89.38	179.95	6,978.35	-3,499.07	571.03	1,298,294.24	3,241,695.58	40.148978	-104.635373
11,028.00	89.08	180.27	6,979.51	-3,585.06	570.86	1,298,208.25	3,241,696.25	40.148742	-104.635373
11,113.00	89.08	180.24	6,980.87	-3,670.05	570.48	1,298,123.26	3,241,696.70	40.148508	-104.635374
11,198.00	89.38	180.91	6,982.01	-3,755.04	569.63	1,298,038.27	3,241,696.68	40.148275	-104.635378
11,284.00	89.38	180.68	6,982.94	-3,841.03	568.44	1,297,952.28	3,241,696.32	40.148039	-104.635382
11,369.00	90.86	182.09	6,982.77	-3,926.00	566.38	1,297,867.29	3,241,695.09	40.147806	-104.635389
11,455.00	91.17	181.59	6,981.24	-4,011.94	563.62	1,297,781.33	3,241,693.17	40.147570	-104.635399
11,527.00	91.73	181.94	6,979.42	-4,083.88	561.41	1,297,709.37	3,241,691.65	40.147372	-104.635407
LAST MWD SURVEY									
11,581.00	91.73	181.94	6,977.79	-4,137.83	559.58	1,297,655.41	3,241,690.35	40.147224	-104.635414
PROJECTION TO TD									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name		Casing Diameter (")	Hole Diameter (")
850.00	849.99	9 5/8"		9-5/8	12-1/4
7,402.00	6,966.39	7"		7	7-1/2

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
841.00	840.99	-0.63	2.74	TIE ON	
911.00	910.99	-0.69	2.75	FIRST MWD SURVEY	
7,402.00	6,966.39	39.51	559.22	7" INTERMEDIATE CASING	
11,527.00	6,979.42	-4,083.88	561.41	LAST MWD SURVEY	
11,581.00	6,977.79	-4,137.83	559.58	PROJECTION TO TD	

# Andarko Petroleum Corporation

## Survey Report - Geographic

<b>Company:</b>	US ROCKIES REGION PLANNING	<b>Local Co-ordinate Reference:</b>	Well Palyo 35N-E11HZ
<b>Project:</b>	COLORADO NORTHERN ZONE - 83	<b>TVD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Site:</b>	WELD_PALYO 29-11HZ Pad	<b>MD Reference:</b>	17' RKB + 4855' GL @ 4872.00ft
<b>Well:</b>	Palyo 35N-E11HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	Palyo 35N-E11HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Palyo 35N-E11HZ	<b>Database:</b>	edmp

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_