

# **Occidental Petroleum**

**Weld County, CO (UTM-NAD83)**

**RAINBOW 24-9HZ PAD**

**RAINBOW 9-2HZ**

**OH**

**Design: OH**

## **Standard Survey Report**

**02 June, 2023**



Project: Weld County, CO (UTM-NAD83)  
 Site: RAINBOW 24-9HZ PAD  
 Well: RAINBOW 9-2HZ  
 Wellbore: OH  
 Design: OH  
 Lat: 40.415130  
 Long: -104.895948  
 GL: 4949.00  
 KB: PD 461 @ 4969.00usft



Azimuths to True North  
 Magnetic North: 7.88°  
 Magnetic Field  
 Strength: 51800.1nT  
 Dip Angle: 66.58°  
 Date: 3/19/2023  
 Model: HRGM

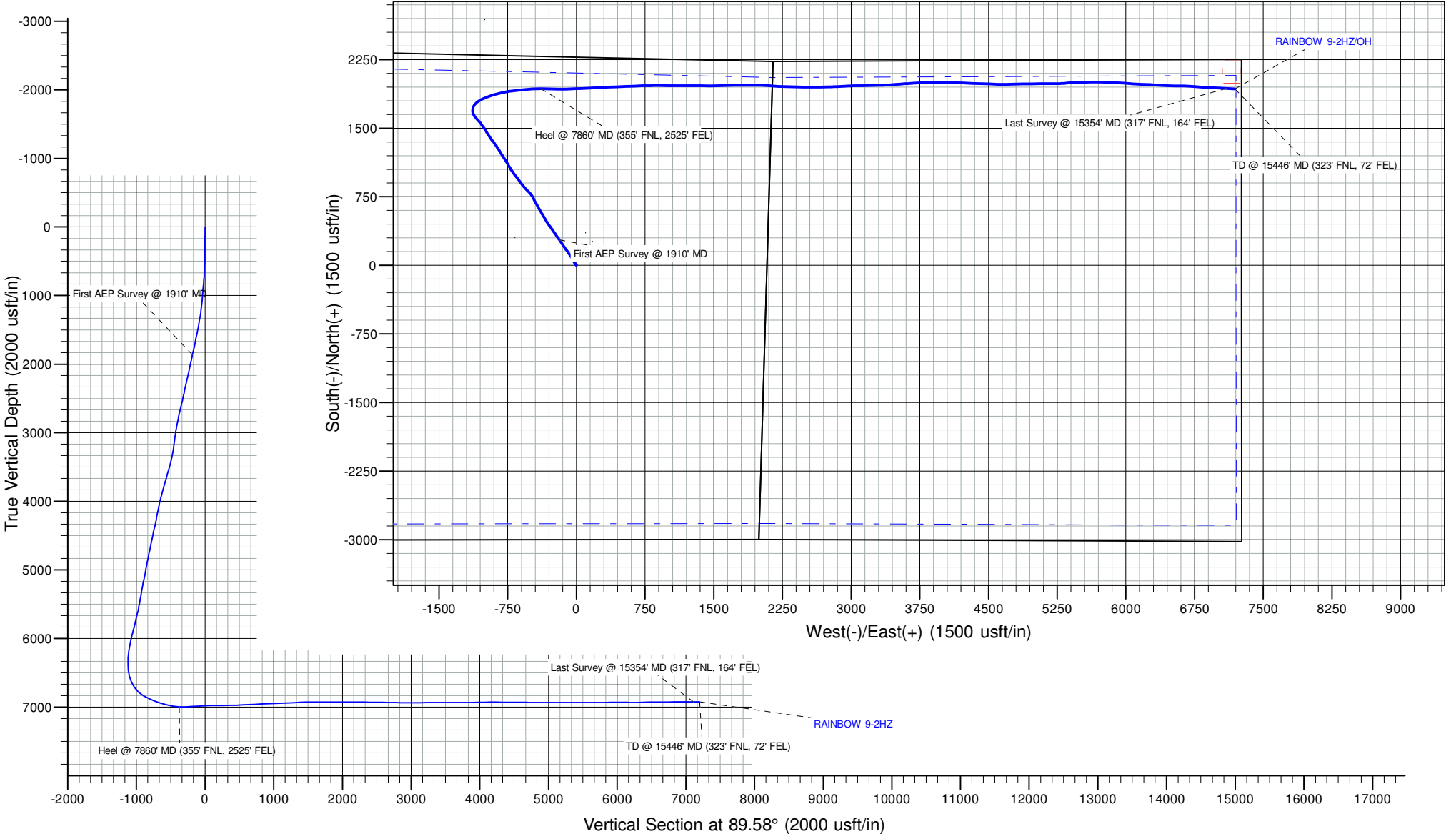
WELL DETAILS: RAINBOW 9-2HZ

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	14677921.67	1669379.30	40.415130	-104.895948

SHL: 2278' FNL, 2544' FEL - Sec 9-T5N-R67W  
 Heel: 355' FNL, 2525' FEL - Sec 9-T5N-R67W  
 BHL: 323' FNL, 72' FEL - Sec 10-T5N-R67W

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
1910.00	21.75	324.36	1863.49	277.19	-184.52	-182.48	334.30	First AEP Survey @ 1910' MD
7860.00	90.15	91.48	6999.38	1931.22	-388.00	-373.84	2876.19	Heel @ 7860' MD (355' FNL, 2525' FEL)
15354.00	90.10	93.08	6925.19	1934.21	7097.91	7111.90	10368.07	Last Survey @ 15354' MD (317' FNL, 164' FEL)
15446.00	90.10	93.08	6925.03	1929.27	7189.78	7203.73	10460.07	TD @ 15446' MD (323' FNL, 72' FEL)



## Survey Report

<b>Company:</b> Occidental Petroleum	<b>Local Co-ordinate Reference:</b> Well RAINBOW 9-2HZ
<b>Project:</b> Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b> PD 461 @ 4969.00usft
<b>Site:</b> RAINBOW 24-9HZ PAD	<b>MD Reference:</b> PD 461 @ 4969.00usft
<b>Well:</b> RAINBOW 9-2HZ	<b>North Reference:</b> True
<b>Wellbore:</b> OH	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> OH	<b>Database:</b> Fhartmann

<b>Project</b> Weld County, CO (UTM-NAD83)	
<b>Map System:</b> Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b> Ground Level
<b>Geo Datum:</b> North American Datum 1983	
<b>Map Zone:</b> Zone 13N (108 W to 102 W)	

<b>Site</b> RAINBOW 24-9HZ PAD		
<b>Site Position:</b>	<b>Northing:</b> 14,677,926.65 usft	<b>Latitude:</b> 40.415144
<b>From:</b> Lat/Long	<b>Easting:</b> 1,669,365.10 usft	<b>Longitude:</b> -104.895999
<b>Position Uncertainty:</b> 0.00 usft	<b>Slot Radius:</b> 13-3/16 "	

<b>Well</b> RAINBOW 9-2HZ			
<b>Well Position</b>	<b>+N/-S</b> 0.00 usft	<b>Northing:</b> 14,677,921.67 usft	<b>Latitude:</b> 40.415130
	<b>+E/-W</b> 0.00 usft	<b>Easting:</b> 1,669,379.30 usft	<b>Longitude:</b> -104.895948
<b>Position Uncertainty</b>	3.28 usft	<b>Wellhead Elevation:</b> usft	<b>Ground Level:</b> 4,949.00 usft
<b>Grid Convergence:</b>	0.07 °		

<b>Wellbore</b> OH					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HRGM	3/19/2023	7.88	66.58	51,800.08413075

<b>Design</b> OH					
<b>Audit Notes:</b>					
<b>Version:</b> 1.0	<b>Phase:</b> ACTUAL	<b>Tie On Depth:</b> 0.00			
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	89.58	

<b>Survey Program</b>		<b>Date</b> 6/2/2023		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
15.00	1,855.00	Surface (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:crustal field declination
1,910.00	15,446.00	MWD (OH)	APC_ISCWSA REV 2 MWD+	Fixed:v2:Rockies, crustal dec + 3-axis correction

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
15.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00
91.00	0.03	20.82	91.00	0.02	0.01	0.01	0.04	0.04	0.00
179.00	0.30	186.61	179.00	-0.19	-0.01	-0.01	0.37	0.31	188.40
268.00	0.07	267.42	268.00	-0.42	-0.09	-0.10	0.33	-0.26	90.80
360.00	1.56	318.42	359.99	0.51	-0.98	-0.98	1.65	1.62	55.43
451.00	2.25	318.78	450.94	2.78	-2.98	-2.96	0.76	0.76	0.40
541.00	2.75	319.70	540.85	5.76	-5.54	-5.50	0.56	0.56	1.02
630.00	4.27	326.29	629.68	10.14	-8.76	-8.68	1.76	1.71	7.40

## Survey Report

<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well RAINBOW 9-2HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	PD 461 @ 4969.00usft
<b>Site:</b>	RAINBOW 24-9HZ PAD	<b>MD Reference:</b>	PD 461 @ 4969.00usft
<b>Well:</b>	RAINBOW 9-2HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Fhartmann

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)	
721.00	6.07	324.02	720.31	16.85	-13.47	-13.34	1.99	1.98	-2.49	
811.00	8.42	330.08	809.58	26.42	-19.55	-19.36	2.74	2.61	6.73	
901.00	10.75	331.21	898.32	39.49	-26.88	-26.59	2.60	2.59	1.26	
991.00	11.75	332.14	986.59	54.94	-35.20	-34.80	1.13	1.11	1.03	
1,081.00	11.50	331.95	1,074.75	70.96	-43.71	-43.18	0.28	-0.28	-0.21	
1,170.00	12.11	327.47	1,161.86	86.67	-52.90	-52.26	1.24	0.69	-5.03	
1,261.00	13.80	325.36	1,250.55	103.64	-64.20	-63.44	1.93	1.86	-2.32	
1,351.00	15.44	323.99	1,337.63	122.17	-77.35	-76.45	1.86	1.82	-1.52	
1,441.00	17.10	324.50	1,424.02	142.63	-92.08	-91.03	1.85	1.84	0.57	
1,530.00	18.61	324.33	1,508.73	164.82	-107.96	-106.74	1.70	1.70	-0.19	
1,620.00	19.94	325.79	1,593.69	189.18	-124.96	-123.57	1.57	1.48	1.62	
1,710.00	21.30	326.37	1,677.92	215.49	-142.64	-141.06	1.53	1.51	0.64	
1,800.00	22.05	326.23	1,761.55	243.14	-161.08	-159.30	0.84	0.83	-0.16	
1,855.00	22.25	325.63	1,812.49	260.32	-172.70	-170.79	0.55	0.36	-1.09	
1,910.00	21.75	324.36	1,863.49	277.19	-184.52	-182.48	1.25	-0.91	-2.31	
<b>First AEP Survey @ 1910' MD</b>										
2,003.00	19.43	322.70	1,950.54	303.50	-203.94	-201.71	2.57	-2.49	-1.78	
2,095.00	21.76	327.01	2,036.66	329.99	-222.50	-220.07	3.02	2.53	4.68	
2,188.00	22.71	326.55	2,122.75	359.42	-241.78	-239.14	1.04	1.02	-0.49	
2,280.00	20.16	323.94	2,208.38	387.06	-260.90	-258.06	2.96	-2.77	-2.84	
2,372.00	22.17	324.82	2,294.17	414.07	-280.24	-277.20	2.21	2.18	0.96	
2,465.00	19.70	322.95	2,381.02	440.93	-299.80	-296.56	2.75	-2.66	-2.01	
2,557.00	22.87	327.74	2,466.74	468.43	-318.69	-315.24	3.93	3.45	5.21	
2,650.00	25.98	331.13	2,551.41	501.56	-338.17	-334.49	3.67	3.34	3.65	
2,742.00	25.64	329.65	2,634.24	536.38	-357.96	-354.02	0.79	-0.37	-1.61	
2,835.00	23.12	328.69	2,718.94	569.35	-377.62	-373.44	2.74	-2.71	-1.03	
2,927.00	21.24	327.05	2,804.13	598.77	-396.07	-391.67	2.15	-2.04	-1.78	
3,042.00	20.92	332.23	2,911.44	634.42	-416.97	-412.31	1.64	-0.28	4.50	
3,135.00	18.22	330.62	2,999.06	661.79	-431.84	-426.98	2.96	-2.90	-1.73	
3,227.00	15.10	328.36	3,087.19	684.53	-445.19	-440.16	3.46	-3.39	-2.46	
3,319.00	17.16	333.41	3,175.57	706.87	-457.55	-452.36	2.71	2.24	5.49	
3,411.00	20.09	336.22	3,262.74	733.47	-470.00	-464.61	3.33	3.18	3.05	
3,504.00	20.53	325.35	3,349.99	761.51	-485.72	-480.12	4.08	0.47	-11.69	
3,597.00	21.50	319.46	3,436.81	787.88	-506.07	-500.28	2.50	1.04	-6.33	
3,689.00	21.81	312.80	3,522.33	812.31	-529.57	-523.60	2.69	0.34	-7.24	
3,784.00	22.49	317.07	3,610.33	837.61	-554.90	-548.74	1.84	0.72	4.49	
3,877.00	24.91	321.86	3,695.49	866.04	-579.11	-572.75	3.32	2.60	5.15	
3,970.00	25.26	322.94	3,779.71	897.28	-603.17	-596.57	0.62	0.38	1.16	
4,062.00	25.61	323.48	3,862.80	928.92	-626.83	-620.00	0.46	0.38	0.59	
4,154.00	23.06	323.01	3,946.62	959.30	-649.51	-642.46	2.78	-2.77	-0.51	
4,247.00	19.25	320.46	4,033.33	985.68	-670.23	-662.99	4.21	-4.10	-2.74	
4,339.00	19.74	325.95	4,120.07	1,010.25	-688.59	-681.17	2.06	0.53	5.97	
4,432.00	19.45	326.49	4,207.68	1,036.17	-705.93	-698.32	0.37	-0.31	0.58	

## Survey Report

<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well RAINBOW 9-2HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	PD 461 @ 4969.00usft
<b>Site:</b>	RAINBOW 24-9HZ PAD	<b>MD Reference:</b>	PD 461 @ 4969.00usft
<b>Well:</b>	RAINBOW 9-2HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Fhartmann

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)	
4,524.00	23.08	328.76	4,293.40	1,064.37	-723.75	-715.92	4.05	3.95	2.47	
4,617.00	24.55	330.07	4,378.48	1,096.71	-742.84	-734.78	1.68	1.58	1.41	
4,710.00	20.65	327.87	4,464.33	1,127.35	-761.21	-752.93	4.29	-4.19	-2.37	
4,802.00	20.61	326.81	4,550.43	1,154.64	-778.70	-770.22	0.41	-0.04	-1.15	
4,894.00	21.21	326.45	4,636.37	1,182.06	-796.76	-788.08	0.67	0.65	-0.39	
4,987.00	23.01	327.71	4,722.53	1,211.45	-815.77	-806.87	2.00	1.94	1.35	
5,079.00	20.96	327.90	4,807.83	1,240.59	-834.12	-825.01	2.23	-2.23	0.21	
5,172.00	20.84	329.07	4,894.71	1,268.87	-851.47	-842.14	0.47	-0.13	1.26	
5,265.00	18.66	326.64	4,982.24	1,295.49	-868.15	-858.63	2.50	-2.34	-2.61	
5,357.00	19.60	325.11	5,069.16	1,320.44	-885.07	-875.37	1.16	1.02	-1.66	
5,452.00	20.03	323.65	5,158.53	1,346.61	-903.83	-893.93	0.69	0.45	-1.54	
5,545.00	16.97	322.41	5,246.72	1,370.20	-921.55	-911.48	3.32	-3.29	-1.33	
5,639.00	15.81	323.82	5,336.90	1,391.41	-937.48	-927.26	1.30	-1.23	1.50	
5,731.00	17.35	324.98	5,425.07	1,412.76	-952.75	-942.37	1.71	1.67	1.26	
5,823.00	20.19	328.68	5,512.17	1,437.56	-968.88	-958.32	3.35	3.09	4.02	
5,915.00	21.70	326.52	5,598.09	1,465.31	-986.52	-975.75	1.84	1.64	-2.35	
6,007.00	24.11	327.26	5,682.83	1,495.31	-1,006.07	-995.08	2.64	2.62	0.80	
6,101.00	24.30	326.46	5,768.57	1,527.58	-1,027.14	-1,015.91	0.40	0.20	-0.85	
6,194.00	21.63	319.21	5,854.21	1,556.52	-1,048.91	-1,037.48	4.18	-2.87	-7.80	
6,286.00	19.26	319.89	5,940.40	1,580.96	-1,069.77	-1,058.15	2.59	-2.58	0.74	
6,378.00	19.30	317.28	6,027.25	1,603.74	-1,089.86	-1,078.07	0.94	0.04	-2.84	
6,470.00	18.64	323.07	6,114.26	1,626.66	-1,109.01	-1,097.06	2.17	-0.72	6.29	
6,563.00	17.29	335.83	6,202.76	1,651.16	-1,123.60	-1,111.47	4.46	-1.45	13.72	
6,657.00	15.90	349.05	6,292.87	1,676.56	-1,131.77	-1,119.45	4.27	-1.48	14.06	
6,749.00	16.44	344.00	6,381.27	1,701.94	-1,133.39	-1,120.88	4.38	0.59	15.64	
6,841.00	18.77	18.33	6,469.00	1,729.00	-1,127.95	-1,115.24	5.49	2.53	16.18	
6,933.00	22.80	36.84	6,555.08	1,757.36	-1,112.58	-1,099.67	8.33	4.38	20.12	
7,027.00	29.96	53.12	6,639.35	1,786.10	-1,082.81	-1,069.69	10.77	7.62	17.32	
7,120.00	39.16	62.98	6,715.92	1,813.45	-1,037.94	-1,024.62	11.55	9.89	10.60	
7,212.00	48.87	68.61	6,782.02	1,839.36	-979.64	-966.13	11.37	10.55	6.12	
7,305.00	59.49	72.95	6,836.39	1,863.96	-908.50	-894.82	12.03	11.42	4.67	
7,397.00	65.91	77.74	6,878.58	1,884.53	-829.46	-815.62	8.37	6.98	5.21	
7,489.00	70.11	80.98	6,913.03	1,900.24	-745.65	-731.70	5.61	4.57	3.52	
7,581.00	73.04	83.70	6,942.11	1,911.85	-659.16	-645.12	4.24	3.18	2.96	
7,674.00	75.05	83.76	6,967.68	1,921.61	-570.28	-556.18	2.16	2.16	0.06	
7,766.00	77.64	86.23	6,989.40	1,929.40	-481.23	-467.08	3.84	2.82	2.68	
7,860.00	90.15	91.48	6,999.38	1,931.22	-388.00	-373.84	14.42	13.31	5.59	
<b>Heel @ 7860' MD (355' FNL, 2525' FEL)</b>										
7,953.00	93.95	91.80	6,996.05	1,928.56	-295.12	-280.97	4.10	4.09	0.34	
8,045.00	92.61	89.62	6,990.79	1,927.42	-203.28	-189.15	2.78	-1.46	-2.37	
8,138.00	93.17	90.00	6,986.10	1,927.73	-110.40	-96.27	0.73	0.60	0.41	
8,231.00	91.89	86.95	6,981.99	1,930.20	-17.54	-3.39	3.55	-1.38	-3.28	
8,323.00	92.21	87.08	6,978.70	1,934.99	74.28	88.46	0.38	0.35	0.14	
8,416.00	90.26	87.00	6,976.70	1,939.79	167.13	181.34	2.10	-2.10	-0.09	

## Survey Report

<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well RAINBOW 9-2HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	PD 461 @ 4969.00usft
<b>Site:</b>	RAINBOW 24-9HZ PAD	<b>MD Reference:</b>	PD 461 @ 4969.00usft
<b>Well:</b>	RAINBOW 9-2HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Fhartmann

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)	
8,508.00	89.47	87.01	6,976.92	1,944.60	259.00	273.25	0.86	-0.86	0.01	
8,601.00	91.79	87.79	6,975.89	1,948.81	351.89	366.17	2.63	2.49	0.84	
8,694.00	91.90	87.98	6,972.90	1,952.25	444.78	459.08	0.24	0.12	0.20	
8,787.00	92.33	87.72	6,969.47	1,955.73	537.65	551.97	0.54	0.46	-0.28	
8,879.00	93.23	87.24	6,965.01	1,959.77	629.45	643.80	1.11	0.98	-0.52	
8,971.00	92.91	88.58	6,960.08	1,963.12	721.26	735.63	1.50	-0.35	1.46	
9,063.00	93.41	88.16	6,955.01	1,965.74	813.08	827.47	0.71	0.54	-0.46	
9,155.00	92.57	90.67	6,950.21	1,966.67	904.94	919.33	2.87	-0.91	2.73	
9,248.00	91.46	90.26	6,946.94	1,965.92	997.88	1,012.26	1.27	-1.19	-0.44	
9,340.00	92.42	90.32	6,943.82	1,965.45	1,089.82	1,104.20	1.05	1.04	0.07	
9,432.00	91.75	90.09	6,940.48	1,965.12	1,181.76	1,196.13	0.77	-0.73	-0.25	
9,524.00	93.10	90.31	6,936.58	1,964.80	1,273.68	1,288.04	1.49	1.47	0.24	
9,616.00	92.96	91.36	6,931.72	1,963.46	1,365.54	1,379.89	1.15	-0.15	1.14	
9,708.00	90.93	89.25	6,928.60	1,962.98	1,457.47	1,471.82	3.18	-2.21	-2.29	
9,802.00	91.49	88.51	6,926.61	1,964.81	1,551.43	1,565.79	0.99	0.60	-0.79	
9,894.00	88.67	88.93	6,926.48	1,966.87	1,643.40	1,657.77	3.10	-3.07	0.46	
9,986.00	88.41	88.76	6,928.83	1,968.72	1,735.35	1,749.74	0.34	-0.28	-0.18	
10,079.00	90.29	89.64	6,929.88	1,970.02	1,828.33	1,842.72	2.23	2.02	0.95	
10,171.00	91.12	90.84	6,928.75	1,969.63	1,920.32	1,934.71	1.59	0.90	1.30	
10,264.00	88.70	91.59	6,928.90	1,967.66	2,013.29	2,027.66	2.72	-2.60	0.81	
10,357.00	90.29	93.72	6,929.72	1,963.35	2,106.18	2,120.52	2.86	1.71	2.29	
10,450.00	90.26	93.51	6,929.27	1,957.49	2,198.99	2,213.28	0.23	-0.03	-0.23	
10,542.00	89.50	91.15	6,929.46	1,953.75	2,290.91	2,305.17	2.69	-0.83	-2.57	
10,635.00	89.78	92.06	6,930.05	1,951.15	2,383.87	2,398.11	1.02	0.30	0.98	
10,727.00	89.36	90.40	6,930.74	1,949.17	2,475.84	2,490.07	1.86	-0.46	-1.80	
10,820.00	89.09	90.39	6,932.00	1,948.53	2,568.83	2,583.05	0.29	-0.29	-0.01	
10,912.00	88.97	88.70	6,933.55	1,949.26	2,660.81	2,675.03	1.84	-0.13	-1.84	
11,005.00	89.46	88.83	6,934.83	1,951.27	2,753.78	2,768.01	0.55	0.53	0.14	
11,097.00	88.54	86.77	6,936.43	1,954.80	2,845.70	2,859.95	2.45	-1.00	-2.24	
11,189.00	88.79	86.82	6,938.58	1,959.94	2,937.53	2,951.81	0.28	0.27	0.05	
11,282.00	90.71	89.01	6,938.98	1,963.32	3,030.45	3,044.76	3.13	2.06	2.35	
11,374.00	91.61	88.43	6,937.12	1,965.38	3,122.41	3,136.73	1.16	0.98	-0.63	
11,467.00	90.89	88.99	6,935.09	1,967.47	3,215.36	3,229.70	0.98	-0.77	0.60	
11,559.00	89.70	89.22	6,934.62	1,968.91	3,307.35	3,321.69	1.32	-1.29	0.25	
11,652.00	89.21	86.08	6,935.50	1,972.72	3,400.26	3,414.63	3.42	-0.53	-3.38	
11,746.00	90.46	86.50	6,935.77	1,978.80	3,494.06	3,508.47	1.40	1.33	0.45	
11,837.00	90.15	84.96	6,935.29	1,985.58	3,584.80	3,599.26	1.73	-0.34	-1.69	
11,929.00	90.28	87.06	6,934.94	1,991.98	3,676.57	3,691.07	2.29	0.14	2.28	
12,022.00	91.00	86.11	6,933.90	1,997.52	3,769.40	3,783.94	1.28	0.77	-1.02	
12,114.00	91.16	88.94	6,932.17	2,001.49	3,861.29	3,875.85	3.08	0.17	3.08	
12,207.00	89.43	89.74	6,931.69	2,002.56	3,954.28	3,968.85	2.05	-1.86	0.86	
12,299.00	91.81	92.50	6,930.70	2,000.76	4,046.24	4,060.79	3.96	2.59	3.00	
12,391.00	90.82	92.63	6,928.58	1,996.65	4,138.12	4,152.64	1.09	-1.08	0.14	

## Survey Report

<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well RAINBOW 9-2HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	PD 461 @ 4969.00usft
<b>Site:</b>	RAINBOW 24-9HZ PAD	<b>MD Reference:</b>	PD 461 @ 4969.00usft
<b>Well:</b>	RAINBOW 9-2HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Fhartmann

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)	
12,483.00	88.37	91.66	6,929.23	1,993.20	4,230.04	4,244.54	2.86	-2.66	-1.05	
12,575.00	89.31	91.71	6,931.10	1,990.50	4,321.98	4,336.46	1.02	1.02	0.05	
12,668.00	90.55	93.47	6,931.21	1,986.30	4,414.88	4,429.33	2.31	1.33	1.89	
12,761.00	89.38	90.57	6,931.27	1,983.02	4,507.81	4,522.23	3.36	-1.26	-3.12	
12,855.00	90.28	92.32	6,931.55	1,980.65	4,601.78	4,616.18	2.09	0.96	1.86	
12,948.00	89.08	88.81	6,932.07	1,979.73	4,694.76	4,709.14	3.99	-1.29	-3.77	
13,040.00	89.51	88.95	6,933.20	1,981.53	4,786.73	4,801.13	0.49	0.47	0.15	
13,133.00	89.32	88.92	6,934.15	1,983.26	4,879.71	4,894.12	0.21	-0.20	-0.03	
13,225.00	89.53	89.29	6,935.07	1,984.69	4,971.70	4,986.11	0.46	0.23	0.40	
13,318.00	89.96	89.50	6,935.48	1,985.68	5,064.69	5,079.11	0.51	0.46	0.23	
13,410.00	90.86	89.05	6,934.83	1,986.84	5,156.68	5,171.10	1.09	0.98	-0.49	
13,502.00	89.46	89.84	6,934.57	1,987.73	5,248.67	5,263.10	1.75	-1.52	0.86	
13,595.00	89.27	84.00	6,935.60	1,992.73	5,341.49	5,355.95	6.28	-0.20	-6.28	
13,687.00	90.77	86.92	6,935.57	2,000.01	5,433.19	5,447.70	3.57	1.63	3.17	
13,780.00	89.40	89.27	6,935.43	2,003.10	5,526.13	5,540.66	2.92	-1.47	2.53	
13,873.00	90.55	89.79	6,935.47	2,003.86	5,619.12	5,633.66	1.36	1.24	0.56	
13,965.00	91.68	89.74	6,933.68	2,004.24	5,711.10	5,725.64	1.23	1.23	-0.05	
14,058.00	90.22	91.67	6,932.14	2,003.09	5,804.08	5,818.61	2.60	-1.57	2.08	
14,150.00	91.20	94.59	6,931.00	1,998.07	5,895.92	5,910.41	3.35	1.07	3.17	
14,243.00	88.94	93.36	6,930.89	1,991.63	5,988.69	6,003.13	2.77	-2.43	-1.32	
14,334.00	90.21	94.53	6,931.56	1,985.37	6,079.47	6,093.86	1.90	1.40	1.29	
14,427.00	88.81	92.24	6,932.36	1,979.87	6,172.30	6,186.64	2.89	-1.51	-2.46	
14,520.00	90.22	93.02	6,933.14	1,975.61	6,265.19	6,279.50	1.73	1.52	0.84	
14,612.00	92.05	94.42	6,931.32	1,969.64	6,356.97	6,371.24	2.50	1.99	1.52	
14,705.00	90.59	92.29	6,929.18	1,964.20	6,449.78	6,464.01	2.78	-1.57	-2.29	
14,797.00	90.17	91.02	6,928.57	1,961.54	6,541.74	6,555.94	1.45	-0.46	-1.38	
14,890.00	90.87	90.54	6,927.72	1,960.28	6,634.73	6,648.92	0.91	0.75	-0.52	
14,982.00	89.88	93.67	6,927.12	1,956.90	6,726.65	6,740.81	3.57	-1.08	3.40	
15,076.00	91.77	94.57	6,925.77	1,950.15	6,820.39	6,834.50	2.23	2.01	0.96	
15,169.00	89.57	93.04	6,924.68	1,943.98	6,913.17	6,927.24	2.88	-2.37	-1.65	
15,261.00	89.85	92.99	6,925.15	1,939.14	7,005.04	7,019.07	0.31	0.30	-0.05	
15,354.00	90.10	93.08	6,925.19	1,934.21	7,097.91	7,111.90	0.29	0.27	0.10	
<b>Last Survey @ 15354' MD (317' FNL, 164' FEL)</b>										
15,446.00	90.10	93.08	6,925.03	1,929.27	7,189.78	7,203.73	0.00	0.00	0.00	
<b>TD @ 15446' MD (323' FNL, 72' FEL)</b>										

## Survey Report

<b>Company:</b>	Occidental Petroleum	<b>Local Co-ordinate Reference:</b>	Well RAINBOW 9-2HZ
<b>Project:</b>	Weld County, CO (UTM-NAD83)	<b>TVD Reference:</b>	PD 461 @ 4969.00usft
<b>Site:</b>	RAINBOW 24-9HZ PAD	<b>MD Reference:</b>	PD 461 @ 4969.00usft
<b>Well:</b>	RAINBOW 9-2HZ	<b>North Reference:</b>	True
<b>Wellbore:</b>	OH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	OH	<b>Database:</b>	Fhartmann

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,910.00	1,863.49	277.19	-184.52	First AEP Survey @ 1910' MD
7,860.00	6,999.38	1,931.22	-388.00	Heel @ 7860' MD (355' FNL, 2525' FEL)
15,354.00	6,925.19	1,934.21	7,097.91	Last Survey @ 15354' MD (317' FNL, 164' FEL)
15,446.00	6,925.03	1,929.27	7,189.78	TD @ 15446' MD (323' FNL, 72' FEL)

Checked By: _____	Approved By: _____	Date: _____
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