



Company: B.P.
Project: La Plata County, CO NAD83
Site: Harper Pad
Well: Harper 01-18 2
Wellbore: Lateral 1
Design: Plan #2

PROJECT DETAILS: La Plata County, CO NAD83

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Southern Zone
System Datum: Mean Sea Level
Local North: Grid



Azimuths to Grid North
True North: 1.25°
Magnetic North: 10.45°

Magnetic Field
Strength: 50109.5snT
Dip Angle: 63.65°
Date: 1/19/2018
Model: HDGM

WELL DETAILS: Harper 01-18 2

GL 6919' & RKB 11' @ 6930.00usft (Aztec 507)
+N/-S +E/-W Northing Easting Latitude Longitude
0.00 0.00 1196059.56 2404386.66 37.1872087 -107.5447140

Plan: Plan #2 (Harper 01-18 2/Lateral 1)

Created By: Janie Collins Date: 10:08, January 22 2018

DESIGN TARGET DETAILS

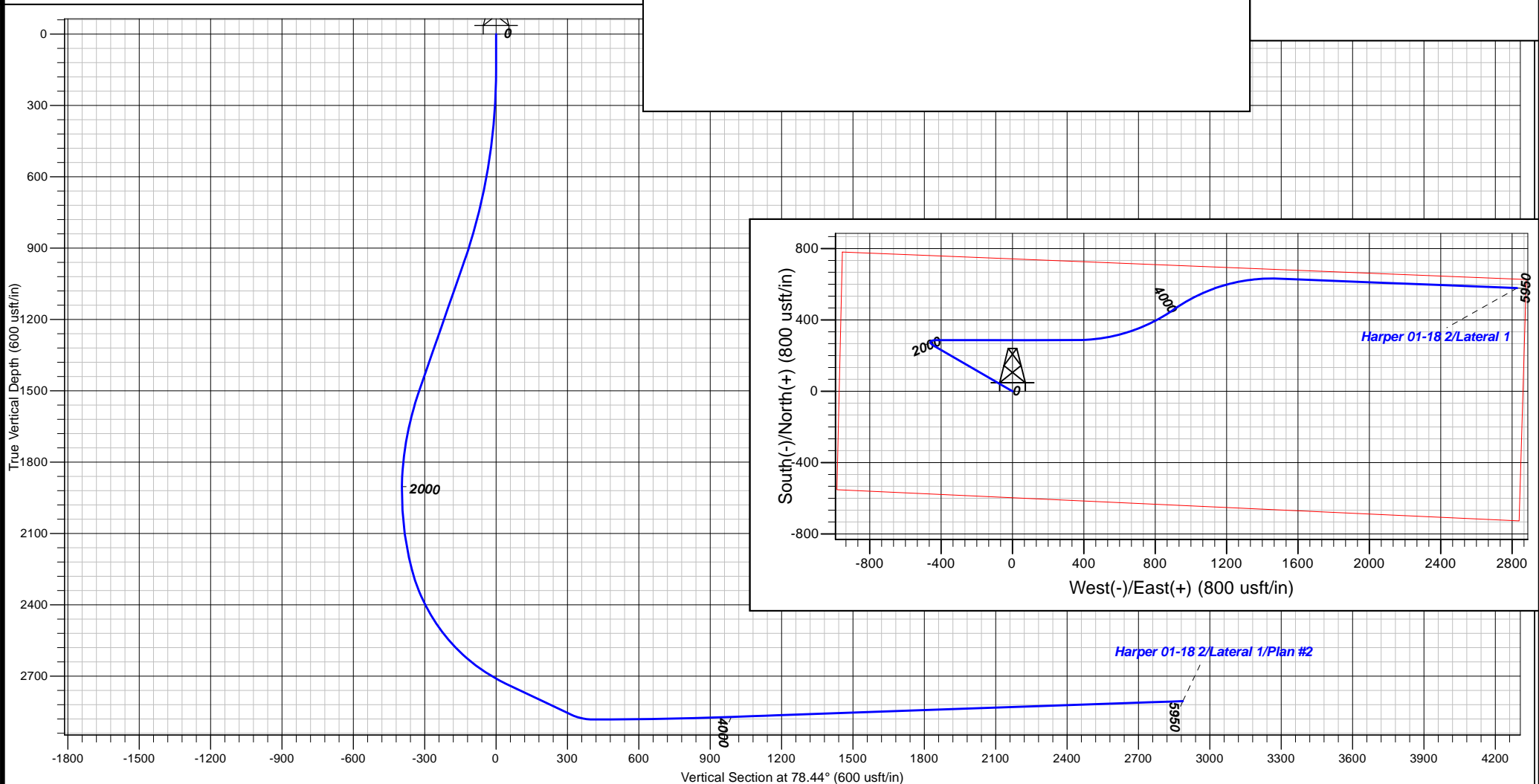
Name TVD +N/-S +E/-W Northing Easting
Harper Lat 1 BHL 2805.00 578.53 2828.17 1196638.09 2407214.83

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
3305.65	65.00	90.00	2860.53	286.59	260.61	0.00	0.00	312.75	
3405.65	90.00	90.00	2882.00	286.59	357.46	25.00	0.00	407.65	
3989.77	91.95	55.00	2871.74	459.43	905.84	6.00	-86.60	979.53	
4610.30	91.92	92.25	2849.99	631.18	1490.41	6.00	89.38	1586.67	
5949.86	91.92	92.25	2805.00	578.53	2828.17	0.00	0.00	2886.74	Harper Lat 1 BHL

CASING DETAILS

No casing data is available





B.P.

La Plata County, CO NAD83

Harper Pad

Harper 01-18 2

Lateral 1

Plan: Plan #2

Standard Planning Report

22 January, 2018





Database:	Grand Junction District	Local Co-ordinate Reference:	Well Harper 01-18 2
Company:	B.P.	TVD Reference:	GL 6919' & RKB 11' @ 6930.00usft (Aztec 507)
Project:	La Plata County, CO NAD83	MD Reference:	GL 6919' & RKB 11' @ 6930.00usft (Aztec 507)
Site:	Harper Pad	North Reference:	Grid
Well:	Harper 01-18 2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral 1		
Design:	Plan #2		

Project	La Plata County, CO NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Southern Zone		

Site		Harper Pad			
Site Position:		Northing:	1,196,059.56 usft	Latitude:	37.1872086
From:	Map	Easting:	2,404,386.66 usft	Longitude:	-107.5447140
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	-1.25 °

Well	Harper 01-18 2					
Well Position	+N/-S	0.00 usft	Northing:	1,196,059.56 usft	Latitude:	37.1872086
	+E/-W	0.00 usft	Easting:	2,404,386.66 usft	Longitude:	-107.5447140
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,919.00 usft

Wellbore	Lateral 1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	1/19/2018	9.20	63.65	50,110

Design	Plan #2				
Audit Notes:					
Version:	Phase:	PLAN		Tie On Depth:	3,305.65
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	78.44	

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
3,305.65	65.00	90.00	2,860.53	286.59	260.61	0.00	0.00	0.00	0.00	
3,405.65	90.00	90.00	2,882.00	286.59	357.46	25.00	25.00	0.00	0.00	
3,989.77	91.95	55.00	2,871.74	459.43	905.84	6.00	0.33	-5.99	-86.60	
4,610.30	91.92	92.25	2,849.99	631.18	1,490.41	6.00	0.00	6.00	89.38	
5,949.86	91.92	92.25	2,805.00	578.53	2,828.17	0.00	0.00	0.00	0.00	Harper Lat 1 BHL



Database:	Grand Junction District	Local Co-ordinate Reference:	Well Harper 01-18 2
Company:	B.P.	TVD Reference:	GL 6919' & RKB 11' @ 6930.00usft (Aztec 507)
Project:	La Plata County, CO NAD83	MD Reference:	GL 6919' & RKB 11' @ 6930.00usft (Aztec 507)
Site:	Harper Pad	North Reference:	Grid
Well:	Harper 01-18 2	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral 1		
Design:	Plan #2		

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)
3,305.65	65.00	90.00	2,860.53	286.59	260.61	312.75	0.00	0.00	0.00
3,400.00	88.59	90.00	2,881.93	286.59	351.81	402.11	25.00	25.00	0.00
3,405.65	90.00	90.00	2,882.00	286.59	357.46	407.65	25.00	25.00	0.00
3,500.00	90.33	84.35	2,881.72	291.24	451.66	500.86	6.00	0.35	-5.99
3,600.00	90.69	78.36	2,880.83	306.26	550.47	600.69	6.00	0.35	-5.99
3,700.00	91.03	72.37	2,879.33	331.52	647.17	700.48	6.00	0.34	-5.99
3,800.00	91.36	66.38	2,877.24	366.72	740.70	799.17	6.00	0.33	-5.99
3,900.00	91.68	60.38	2,874.59	411.50	830.03	895.66	6.00	0.32	-5.99
3,989.77	91.95	55.00	2,871.74	459.43	905.84	979.53	6.00	0.30	-6.00
4,000.00	91.96	55.61	2,871.39	465.25	914.24	988.93	6.00	0.06	6.00
4,100.00	92.01	61.62	2,867.93	517.28	999.52	1,082.91	6.00	0.05	6.00
4,200.00	92.04	67.62	2,864.40	560.09	1,089.77	1,179.91	6.00	0.03	6.00
4,300.00	92.04	73.62	2,860.83	593.23	1,184.00	1,278.87	6.00	0.01	6.00
4,400.00	92.03	79.63	2,857.27	616.34	1,281.18	1,378.71	6.00	-0.02	6.00
4,500.00	91.99	85.63	2,853.76	629.15	1,380.25	1,478.34	6.00	-0.04	6.00
4,600.00	91.93	91.64	2,850.34	631.53	1,480.12	1,576.66	6.00	-0.06	6.00
4,610.30	91.92	92.25	2,849.99	631.18	1,490.41	1,586.67	6.00	-0.07	6.00
4,700.00	91.92	92.25	2,846.98	627.66	1,579.99	1,673.72	0.00	0.00	0.00
4,800.00	91.92	92.25	2,843.62	623.73	1,679.85	1,770.77	0.00	0.00	0.00
4,900.00	91.92	92.25	2,840.26	619.80	1,779.72	1,867.83	0.00	0.00	0.00
5,000.00	91.92	92.25	2,836.90	615.87	1,879.59	1,964.88	0.00	0.00	0.00
5,100.00	91.92	92.25	2,833.54	611.94	1,979.45	2,061.93	0.00	0.00	0.00
5,200.00	91.92	92.25	2,830.18	608.00	2,079.32	2,158.98	0.00	0.00	0.00
5,300.00	91.92	92.25	2,826.83	604.07	2,179.18	2,256.04	0.00	0.00	0.00
5,400.00	91.92	92.25	2,823.47	600.14	2,279.05	2,353.09	0.00	0.00	0.00
5,500.00	91.92	92.25	2,820.11	596.21	2,378.92	2,450.14	0.00	0.00	0.00
5,600.00	91.92	92.25	2,816.75	592.28	2,478.78	2,547.19	0.00	0.00	0.00
5,700.00	91.92	92.25	2,813.39	588.35	2,578.65	2,644.24	0.00	0.00	0.00
5,800.00	91.92	92.25	2,810.03	584.42	2,678.52	2,741.30	0.00	0.00	0.00
5,900.00	91.92	92.25	2,806.67	580.49	2,778.38	2,838.35	0.00	0.00	0.00
5,949.86	91.92	92.25	2,805.00	578.53	2,828.17	2,886.74	0.00	0.00	0.00
Harper Lat 1 BHL									

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
Harper Lat 1 BHL - plan hits target center - Point	0.00	360.00	2,805.00	578.53	2,828.17	1,196,638.09	2,407,214.83	37.1889667	-107.5350514