

Plan #2					
Cook Gardner 20-4 (PB-20)					
105XXX, BH					
KBE @ 5665.0ft (Original Well Elev)					
North American Datum 1983					
Well Cook Gardner 20-4 (PB-20), True North					
Target	Azimuth	Origin	Type	N/S	
Cook Gardner 20-4 (PB-20) BHL	268.86	Spot		0.0	
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
Cook Gardner 20-4 (PB-20) TGT	4823.0	-43.6	-2186.4	39.427470	-108.027510
Cook Gardner 20-4 (PB-20) BHL	6536.0	-43.6	-2186.4	39.427470	-108.027510

Cathedral Energy Services

Planning Report

Database: EDM 5000.1 US Multi Users DB
Company: EnCana Oil & Gas (USA) Inc
Project: S. Piceance (Parachute)
Site: NWNE S20-T7S-R95W (PB-20)
Well: Cook Gardner 20-4 (PB-20)
Wellbore: DD
Design: Plan #2

Local Co-ordinate Reference: Well Cook Gardner 20-4 (PB-20)
TVD Reference: KBE @ 5665.0ft (Original Well Elev)
MD Reference: KBE @ 5665.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Project	S. Piceance (Parachute), Garfield County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site	NWNE S20-T7S-R95W (PB-20)			
Site Position:		Northing:	1,590,537.60 ft	Latitude: 39.427690
From:	Lat/Long	Easting:	2,288,393.21 ft	Longitude: -108.019530
Position Uncertainty:	0.0 ft	Slot Radius:	13.200 in	Grid Convergence: -1.59 °

Well	Cook Gardner 20-4 (PB-20)			
Well Position	+N/-S	0.0 ft	Northing:	1,590,503.06 ft
	+E/-W	0.0 ft	Easting:	2,288,324.43 ft
Position Uncertainty	0.0 ft		Wellhead Elevation:	ft
			Ground Level:	5,643.0 ft

Wellbore	DD			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)
	IGRF200510	12/21/2010	10.39	65.70
				Field Strength (nT) 52,293

Design	Plan #2			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.0	0.0	0.0	268.86

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.00	0.00	
983.0	20.49	268.86	968.5	-2.4	-120.8	3.00	3.00	-13.34	268.86	Interp @ 968.5 (Cook
1,183.0	20.49	268.86	1,155.9	-3.8	-190.8	0.00	0.00	0.00	0.00	
1,621.4	33.64	268.86	1,545.4	-7.8	-389.8	3.00	3.00	0.00	0.00	
4,287.4	33.64	268.86	3,764.9	-37.2	-1,866.5	0.00	0.00	0.00	0.00	
5,408.9	0.00	0.00	4,823.0	-43.6	-2,186.4	3.00	-3.00	0.00	180.00	Cook Gardner 20-4 (F
7,121.9	0.00	0.00	6,536.0	-43.6	-2,186.4	0.00	0.00	0.00	0.00	Cook Gardner 20-4 (F
7,221.9	0.00	0.00	6,636.0	-43.6	-2,186.4	0.00	0.00	0.00	0.00	

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TVD Reference: KBE @ 5665.0ft (Original Well Elev)
MD Reference: KBE @ 5665.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	KOP @ 300' MD
400.0	3.00	268.86	400.0	-0.1	-2.6	2.6	3.00	3.00	
500.0	6.00	268.86	499.6	-0.2	-10.5	10.5	3.00	3.00	
600.0	9.00	268.86	598.8	-0.5	-23.5	23.5	3.00	3.00	
700.0	12.00	268.86	697.1	-0.8	-41.7	41.7	3.00	3.00	
800.0	15.00	268.86	794.3	-1.3	-65.1	65.1	3.00	3.00	
900.0	18.00	268.86	890.2	-1.9	-93.5	93.5	3.00	3.00	
983.0	20.49	268.86	968.5	-2.4	-120.8	120.8	3.00	3.00	EOB; Inc=20.49° - Interp @ 968.5 (Cook Gardn
1,000.0	20.49	268.86	984.5	-2.5	-126.8	126.8	0.00	0.00	
1,084.0	20.49	268.86	1,063.1	-3.1	-156.2	156.2	0.00	0.00	Surface Casing
1,100.0	20.49	268.86	1,078.1	-3.2	-161.8	161.8	0.00	0.00	
1,183.0	20.49	268.86	1,155.9	-3.8	-190.8	190.8	0.00	0.00	End of 200' Hold @ 1183' MD
1,200.0	21.00	268.86	1,171.8	-3.9	-196.8	196.9	3.00	3.00	
1,300.0	24.00	268.86	1,264.2	-4.7	-235.1	235.1	3.00	3.00	
1,400.0	27.00	268.86	1,354.4	-5.5	-278.1	278.2	3.00	3.00	
1,500.0	30.00	268.86	1,442.3	-6.5	-325.8	325.9	3.00	3.00	
1,600.0	33.00	268.86	1,527.5	-7.5	-378.1	378.1	3.00	3.00	
1,621.4	33.64	268.86	1,545.4	-7.8	-389.8	389.9	3.00	3.00	EOB; Inc=33.64°
1,700.0	33.64	268.86	1,610.8	-8.6	-433.3	433.4	0.00	0.00	
1,800.0	33.64	268.86	1,694.1	-9.7	-488.7	488.8	0.00	0.00	
1,900.0	33.64	268.86	1,777.3	-10.9	-544.1	544.2	0.00	0.00	
2,000.0	33.64	268.86	1,860.6	-12.0	-599.5	599.6	0.00	0.00	
2,100.0	33.64	268.86	1,943.9	-13.1	-654.9	655.0	0.00	0.00	
2,200.0	33.64	268.86	2,027.1	-14.2	-710.3	710.4	0.00	0.00	
2,300.0	33.64	268.86	2,110.4	-15.3	-765.7	765.8	0.00	0.00	
2,400.0	33.64	268.86	2,193.6	-16.4	-821.1	821.2	0.00	0.00	
2,500.0	33.64	268.86	2,276.9	-17.5	-876.5	876.6	0.00	0.00	
2,600.0	33.64	268.86	2,360.1	-18.6	-931.9	932.0	0.00	0.00	
2,700.0	33.64	268.86	2,443.4	-19.7	-987.2	987.4	0.00	0.00	
2,800.0	33.64	268.86	2,526.6	-20.8	-1,042.6	1,042.8	0.00	0.00	
2,900.0	33.64	268.86	2,609.9	-21.9	-1,098.0	1,098.2	0.00	0.00	
3,000.0	33.64	268.86	2,693.1	-23.0	-1,153.4	1,153.6	0.00	0.00	
3,100.0	33.64	268.86	2,776.4	-24.1	-1,208.8	1,209.0	0.00	0.00	
3,200.0	33.64	268.86	2,859.6	-25.2	-1,264.2	1,264.4	0.00	0.00	
3,300.0	33.64	268.86	2,942.9	-26.3	-1,319.6	1,319.9	0.00	0.00	
3,400.0	33.64	268.86	3,026.1	-27.4	-1,375.0	1,375.3	0.00	0.00	
3,500.0	33.64	268.86	3,109.4	-28.5	-1,430.4	1,430.7	0.00	0.00	
3,600.0	33.64	268.86	3,192.6	-29.6	-1,485.8	1,486.1	0.00	0.00	
3,700.0	33.64	268.86	3,275.9	-30.7	-1,541.2	1,541.5	0.00	0.00	
3,800.0	33.64	268.86	3,359.1	-31.8	-1,596.5	1,596.9	0.00	0.00	
3,900.0	33.64	268.86	3,442.4	-32.9	-1,651.9	1,652.3	0.00	0.00	
3,959.6	33.64	268.86	3,492.0	-33.6	-1,685.0	1,685.3	0.00	0.00	Mesaverde
4,000.0	33.64	268.86	3,525.6	-34.1	-1,707.3	1,707.7	0.00	0.00	
4,100.0	33.64	268.86	3,608.9	-35.2	-1,762.7	1,763.1	0.00	0.00	
4,200.0	33.64	268.86	3,692.1	-36.3	-1,818.1	1,818.5	0.00	0.00	
4,287.4	33.64	268.86	3,764.9	-37.2	-1,866.5	1,866.9	0.00	0.00	Start Drop -3.00
4,300.0	33.27	268.86	3,775.4	-37.4	-1,873.5	1,873.8	3.00	-3.00	
4,400.0	30.27	268.86	3,860.4	-38.4	-1,926.1	1,926.5	3.00	-3.00	
4,500.0	27.27	268.86	3,948.0	-39.4	-1,974.2	1,974.6	3.00	-3.00	

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North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Comments / Formations
4,600.0	24.27	268.86	4,038.1	-40.2	-2,017.7	2,018.1	3.00	-3.00	
4,690.0	21.57	268.86	4,121.0	-40.9	-2,052.7	2,053.1	3.00	-3.00	Williams Fork
4,700.0	21.27	268.86	4,130.3	-41.0	-2,056.3	2,056.7	3.00	-3.00	
4,800.0	18.27	268.86	4,224.4	-41.7	-2,090.1	2,090.6	3.00	-3.00	
4,900.0	15.27	268.86	4,320.1	-42.3	-2,119.0	2,119.4	3.00	-3.00	
5,000.0	12.27	268.86	4,417.2	-42.7	-2,142.8	2,143.2	3.00	-3.00	
5,081.3	9.83	268.86	4,497.0	-43.0	-2,158.3	2,158.8	3.00	-3.00	Top of Gas, Inc=9.83°
5,100.0	9.27	268.86	4,515.5	-43.1	-2,161.4	2,161.9	3.00	-3.00	
5,200.0	6.27	268.86	4,614.5	-43.4	-2,175.0	2,175.4	3.00	-3.00	
5,300.0	3.27	268.86	4,714.2	-43.5	-2,183.3	2,183.7	3.00	-3.00	
5,400.0	0.27	268.86	4,814.1	-43.6	-2,186.3	2,186.8	3.00	-3.00	
5,408.9	0.00	0.00	4,823.0	-43.6	-2,186.4	2,186.8	3.00	-3.00	EOD; Inc=0° - Cook Gardner 20-4 (PB-20) TGT
5,500.0	0.00	0.00	4,914.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
5,600.0	0.00	0.00	5,014.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
5,700.0	0.00	0.00	5,114.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
5,800.0	0.00	0.00	5,214.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
5,900.0	0.00	0.00	5,314.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
6,000.0	0.00	0.00	5,414.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
6,100.0	0.00	0.00	5,514.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
6,200.0	0.00	0.00	5,614.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
6,300.0	0.00	0.00	5,714.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
6,400.0	0.00	0.00	5,814.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
6,500.0	0.00	0.00	5,914.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
6,580.9	0.00	0.00	5,995.0	-43.6	-2,186.4	2,186.8	0.00	0.00	Coal Ridge
6,600.0	0.00	0.00	6,014.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
6,700.0	0.00	0.00	6,114.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
6,800.0	0.00	0.00	6,214.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
6,900.0	0.00	0.00	6,314.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
6,971.9	0.00	0.00	6,386.0	-43.6	-2,186.4	2,186.8	0.00	0.00	Rollins SS
7,000.0	0.00	0.00	6,414.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
7,100.0	0.00	0.00	6,514.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
7,121.9	0.00	0.00	6,536.0	-43.6	-2,186.4	2,186.8	0.00	0.00	TD @ 7121.9' MD - Cook Gardner 20-4 (PB-20)
7,200.0	0.00	0.00	6,614.1	-43.6	-2,186.4	2,186.8	0.00	0.00	
7,221.9	0.00	0.00	6,636.0	-43.6	-2,186.4	2,186.8	0.00	0.00	Permit TD @ 7221.9' MD

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
Cook Gardner 20-4 (PB- - plan hits target center - Circle (radius 25.0)	0.00	0.00	6,536.0	-43.6	-2,186.4	1,590,520.10	2,286,137.70	39.427470	-108.027510
Cook Gardner 20-4 (PB- - plan hits target center - Circle (radius 25.0)	0.00	0.00	4,823.0	-43.6	-2,186.4	1,590,520.10	2,286,137.70	39.427470	-108.027510
Interp @ 968.5 (Cook G; - plan hits target center - Point	0.00	0.00	968.5	-2.4	-120.8	1,590,504.00	2,288,203.60	39.427583	-108.020198

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MD Reference: KBE @ 5665.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
1,084.0	1,063.1	Surface Casing	0.000	0.000

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,959.6	3,492.0	Mesaverde		0.00	
4,690.0	4,121.0	Williams Fork		0.00	
5,081.3	4,497.0	Top of Gas, Inc=9.83°		0.00	
6,580.9	5,995.0	Coal Ridge		0.00	
6,971.9	6,386.0	Rollins SS		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
300.0	300.0	0.0	0.0	KOP @ 300' MD
983.0	968.5	-2.4	-120.8	EOB; Inc=20.49°
1,183.0	1,155.9	-3.8	-190.8	End of 200' Hold @ 1183' MD
1,621.4	1,545.4	-7.8	-389.8	EOB; Inc=33.64°
4,287.4	3,764.9	-37.2	-1,866.5	Start Drop -3.00
5,408.9	4,823.0	-43.6	-2,186.4	EOD; Inc=0°
7,121.9	6,536.0	-43.6	-2,186.4	TD @ 7121.9' MD
7,221.9	6,636.0	-43.6	-2,186.4	Permit TD @ 7221.9' MD