



US ROCKIES REGION PLANNING

**COLORADO NORTHERN ZONE - 83
WELD_BERNHARDT 8 PAD 4N67W1
P_BERNHARDT 21-1**

P_BERNHARDT 21-1

Plan: PLAN #1 1-13-10 RHS

Standard Planning Report

13 January, 2010





Azimuths to True North
Magnetic North: 9.08°
Magnetic Field
Strength: 53283.2snT
Dip Angle: 67.06°
Date: 11/4/2009
Model: IGRF200510

WELL DETAILS: P_BERNHARDT 21-1

+N/-S	+E/-W	Northing	Ground Level:	4825.00	Longitude	Slot
0.00	0.00	1369227.90	Easting	3183596.18	40° 20' 42.216 N	104° 50' 28.752 W

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2627.00	2649.58	PARKMAN TOP
4355.00	4406.97	SUSSEX TOP
4738.00	4796.48	SHANNON TOP
6949.00	7022.13	NIO A TOP
7272.00	7345.13	CODELL TOP
7722.00	7795.13	JSAND TOP

SECTION DETAILS

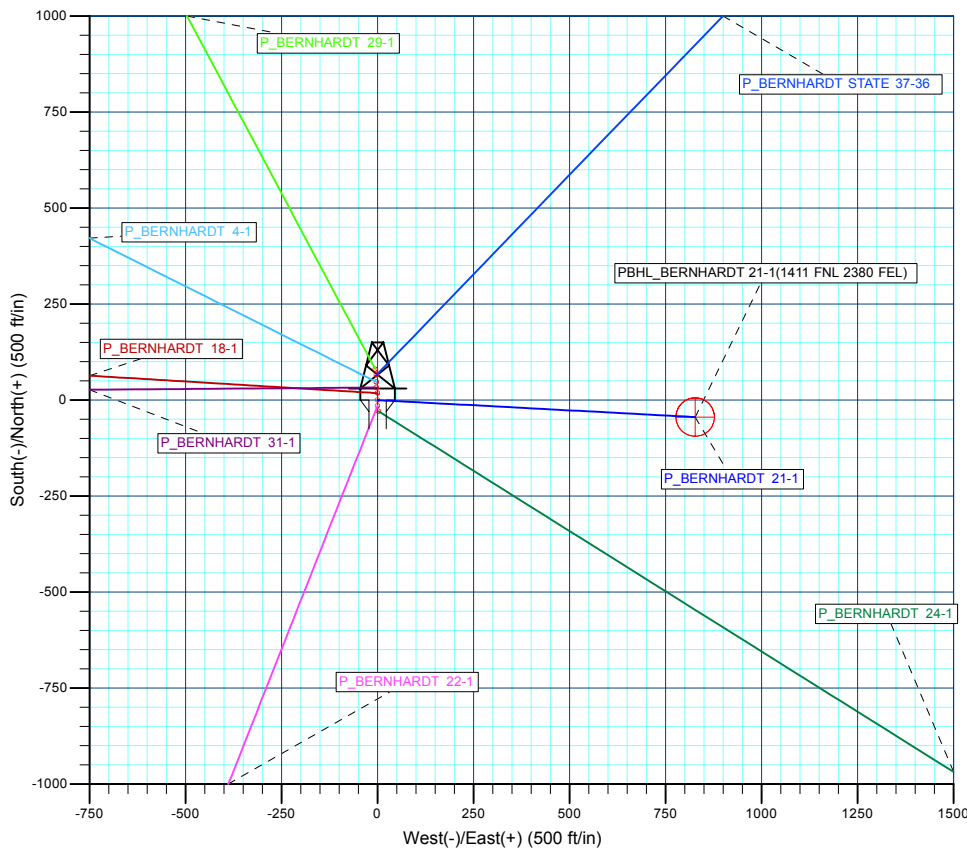
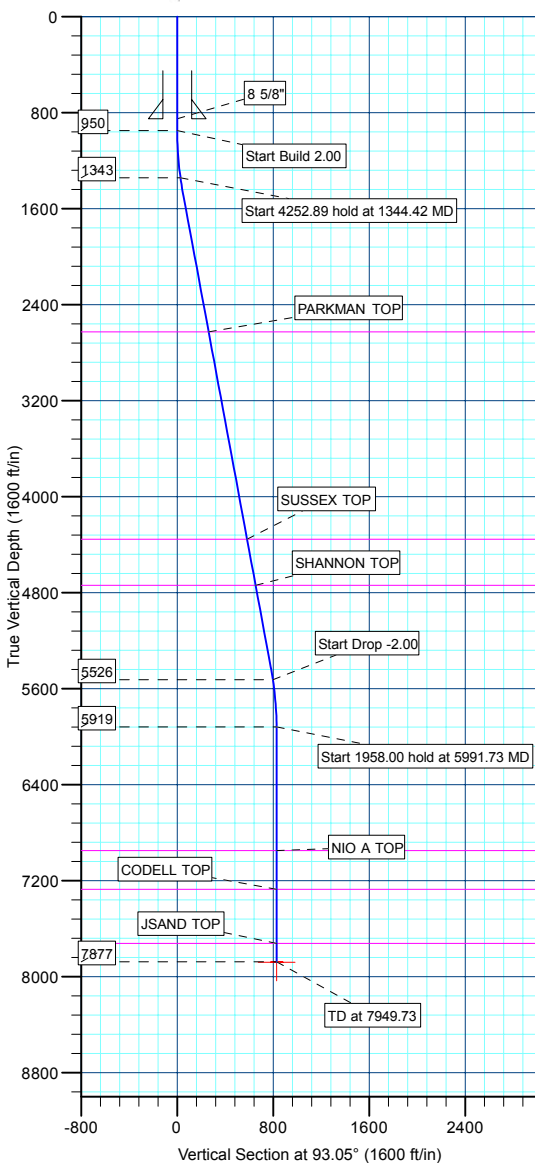
MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
950.00	0.00	0.00	950.00	0.00	0.00	0.00	0.00	0.00	
1474.67	10.49	93.05	1471.74	-2.55	47.84	2.00	93.05	47.91	
5497.46	10.49	93.05	5427.26	-41.50	779.45	0.00	0.00	780.55	
6022.13	0.00	0.00	5949.00	-44.05	827.29	2.00	180.00	828.46	
7953.13	0.00	0.00	7880.00	-44.05	827.29	0.00	0.00	828.46	PBHL_BERNHARDT 21-1(1411 FNL 2380 FEL)

CASING DETAILS

TVD	MD	Name	Size
850.00	850.00	8 5/8"	8.62



KB ELEV: WELL @ 4840.00ft (Original Well Elev)
iRD ELEV: 4825.00



WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PBHL	7880.00	-44.05	827.29	1369190.00	3184423.7840	40° 20' 41.780 N	104° 50' 18.067 W	Circle (Radius: 50.00)

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site:	WELD_BERNHARDT 8 PAD 4N67W1	North Reference:	True
Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_BERNHARDT 21-1		
Design:	PLAN #1 1-13-10 RHS		

Project	COLORADO NORTHERN ZONE - 83, KERR MCGEE OIL & GAS ONSHORE LP		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	WELD_BERNHARDT 8 PAD 4N67W1, SECTION 1 T4N R67W			
Site Position:		Northing:	1,369,246.13 ft	Latitude: 40° 20' 42.396 N
From:	Lat/Long	Easting:	3,183,596.05 ft	Longitude: 104° 50' 28.752 W
Position Uncertainty:	0.00 ft	Slot Radius:	in	Grid Convergence: 0.43 °

Well	P_BERNHARDT 21-1			
Well Position	+N/-S	-18.23 ft	Northing:	1,369,227.90 ft
	+E/-W	0.00 ft	Easting:	3,183,596.18 ft
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft
			Ground Level:	4,825.00 ft

Wellbore	P_BERNHARDT 21-1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	11/4/2009	9.08	67.06	53,283

Design	PLAN #1 1-13-10 RHS			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	93.05

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
950.00	0.00	0.00	950.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,474.67	10.49	93.05	1,471.74	-2.55	47.84	2.00	2.00	0.00	93.05	
5,497.46	10.49	93.05	5,427.26	-41.50	779.45	0.00	0.00	0.00	0.00	
6,022.13	0.00	0.00	5,949.00	-44.05	827.29	2.00	-2.00	0.00	180.00	
7,953.13	0.00	0.00	7,880.00	-44.05	827.29	0.00	0.00	0.00	0.00	PBHL_BERNHARD

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site:	WELD_BERNHARDT 8 PAD 4N67W1	North Reference:	True
Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_BERNHARDT 21-1		
Design:	PLAN #1 1-13-10 RHS		

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)	Turn Rate (°/100ft)
Start Build 2.00									
950.00	0.00	0.00	950.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	1.00	93.05	1,000.00	-0.02	0.44	0.44	2.00	2.00	0.00
1,100.00	3.00	93.05	1,099.93	-0.21	3.92	3.93	2.00	2.00	0.00
1,200.00	5.00	93.05	1,199.68	-0.58	10.89	10.90	2.00	2.00	0.00
1,300.00	7.00	93.05	1,299.13	-1.14	21.32	21.35	2.00	2.00	0.00
Start 4252.89 hold at 1344.42 MD									
1,344.42	7.89	93.05	1,343.17	-1.44	27.07	27.11	2.00	2.00	0.00
1,400.00	9.00	93.05	1,398.15	-1.88	35.22	35.27	2.00	2.00	0.00
1,474.67	10.49	93.05	1,471.74	-2.55	47.84	47.91	2.00	2.00	0.00
1,500.00	10.49	93.05	1,496.65	-2.79	52.45	52.52	0.00	0.00	0.00
1,600.00	10.49	93.05	1,594.98	-3.76	70.64	70.74	0.00	0.00	0.00
1,700.00	10.49	93.05	1,693.30	-4.73	88.82	88.95	0.00	0.00	0.00
1,800.00	10.49	93.05	1,791.63	-5.70	107.01	107.16	0.00	0.00	0.00
1,900.00	10.49	93.05	1,889.96	-6.67	125.20	125.37	0.00	0.00	0.00
2,000.00	10.49	93.05	1,988.29	-7.63	143.38	143.59	0.00	0.00	0.00
2,100.00	10.49	93.05	2,086.61	-8.60	161.57	161.80	0.00	0.00	0.00
2,200.00	10.49	93.05	2,184.94	-9.57	179.76	180.01	0.00	0.00	0.00
2,300.00	10.49	93.05	2,283.27	-10.54	197.94	198.22	0.00	0.00	0.00
2,400.00	10.49	93.05	2,381.60	-11.51	216.13	216.43	0.00	0.00	0.00
2,500.00	10.49	93.05	2,479.92	-12.48	234.31	234.65	0.00	0.00	0.00
2,600.00	10.49	93.05	2,578.25	-13.44	252.50	252.86	0.00	0.00	0.00
PARKMAN TOP									
2,649.58	10.49	93.05	2,627.00	-13.92	261.52	261.89	0.00	0.00	0.00
2,700.00	10.49	93.05	2,676.58	-14.41	270.69	271.07	0.00	0.00	0.00
2,800.00	10.49	93.05	2,774.91	-15.38	288.87	289.28	0.00	0.00	0.00
2,900.00	10.49	93.05	2,873.23	-16.35	307.06	307.50	0.00	0.00	0.00
3,000.00	10.49	93.05	2,971.56	-17.32	325.25	325.71	0.00	0.00	0.00
3,100.00	10.49	93.05	3,069.89	-18.29	343.43	343.92	0.00	0.00	0.00
3,200.00	10.49	93.05	3,168.22	-19.25	361.62	362.13	0.00	0.00	0.00
3,300.00	10.49	93.05	3,266.54	-20.22	379.81	380.34	0.00	0.00	0.00
3,400.00	10.49	93.05	3,364.87	-21.19	397.99	398.56	0.00	0.00	0.00
3,500.00	10.49	93.05	3,463.20	-22.16	416.18	416.77	0.00	0.00	0.00
3,600.00	10.49	93.05	3,561.53	-23.13	434.37	434.98	0.00	0.00	0.00
3,700.00	10.49	93.05	3,659.86	-24.10	452.55	453.19	0.00	0.00	0.00
3,800.00	10.49	93.05	3,758.18	-25.06	470.74	471.41	0.00	0.00	0.00
3,900.00	10.49	93.05	3,856.51	-26.03	488.93	489.62	0.00	0.00	0.00
4,000.00	10.49	93.05	3,954.84	-27.00	507.11	507.83	0.00	0.00	0.00
4,100.00	10.49	93.05	4,053.17	-27.97	525.30	526.04	0.00	0.00	0.00
4,200.00	10.49	93.05	4,151.49	-28.94	543.49	544.26	0.00	0.00	0.00
4,300.00	10.49	93.05	4,249.82	-29.91	561.67	562.47	0.00	0.00	0.00
4,400.00	10.49	93.05	4,348.15	-30.87	579.86	580.68	0.00	0.00	0.00
SUSSEX TOP									
4,406.97	10.49	93.05	4,355.00	-30.94	581.13	581.95	0.00	0.00	0.00
4,500.00	10.49	93.05	4,446.48	-31.84	598.04	598.89	0.00	0.00	0.00
4,600.00	10.49	93.05	4,544.80	-32.81	616.23	617.10	0.00	0.00	0.00
4,700.00	10.49	93.05	4,643.13	-33.78	634.42	635.32	0.00	0.00	0.00
SHANNON TOP									
4,796.48	10.49	93.05	4,738.00	-34.71	651.96	652.89	0.00	0.00	0.00
4,800.00	10.49	93.05	4,741.46	-34.75	652.60	653.53	0.00	0.00	0.00
4,900.00	10.49	93.05	4,839.79	-35.72	670.79	671.74	0.00	0.00	0.00
5,000.00	10.49	93.05	4,938.11	-36.68	688.98	689.95	0.00	0.00	0.00
5,100.00	10.49	93.05	5,036.44	-37.65	707.16	708.17	0.00	0.00	0.00
5,200.00	10.49	93.05	5,134.77	-38.62	725.35	726.38	0.00	0.00	0.00

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site:	WELD_BERNHARDT 8 PAD 4N67W1	North Reference:	True
Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_BERNHARDT 21-1		
Design:	PLAN #1 1-13-10 RHS		

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)	Turn Rate (°/100ft)
5,300.00	10.49	93.05	5,233.10	-39.59	743.54	744.59	0.00	0.00	0.00
5,400.00	10.49	93.05	5,331.42	-40.56	761.72	762.80	0.00	0.00	0.00
5,497.46	10.49	93.05	5,427.26	-41.50	779.45	780.55	0.00	0.00	0.00
5,500.00	10.44	93.05	5,429.75	-41.53	779.91	781.01	2.00	-2.00	0.00
Start Drop -2.00									
5,597.31	8.50	93.05	5,525.74	-42.38	795.90	797.02	2.00	-2.00	0.00
5,600.00	8.44	93.05	5,528.39	-42.40	796.29	797.42	2.00	-2.00	0.00
5,700.00	6.44	93.05	5,627.54	-43.09	809.23	810.37	2.00	-2.00	0.00
5,800.00	4.44	93.05	5,727.09	-43.59	818.70	819.86	2.00	-2.00	0.00
5,900.00	2.44	93.05	5,826.90	-43.91	824.69	825.86	2.00	-2.00	0.00
Start 1958.00 hold at 5991.73 MD									
5,991.73	0.61	93.05	5,918.60	-44.04	827.13	828.30	2.00	-2.00	0.00
6,000.00	0.44	93.05	5,926.87	-44.04	827.21	828.38	2.00	-2.00	0.00
6,022.13	0.00	0.00	5,949.00	-44.05	827.29	828.46	2.00	-2.00	0.00
6,100.00	0.00	0.00	6,026.87	-44.05	827.29	828.46	0.00	0.00	0.00
6,200.00	0.00	0.00	6,126.87	-44.05	827.29	828.46	0.00	0.00	0.00
6,300.00	0.00	0.00	6,226.87	-44.05	827.29	828.46	0.00	0.00	0.00
6,400.00	0.00	0.00	6,326.87	-44.05	827.29	828.46	0.00	0.00	0.00
6,500.00	0.00	0.00	6,426.87	-44.05	827.29	828.46	0.00	0.00	0.00
6,600.00	0.00	0.00	6,526.87	-44.05	827.29	828.46	0.00	0.00	0.00
6,700.00	0.00	0.00	6,626.87	-44.05	827.29	828.46	0.00	0.00	0.00
6,800.00	0.00	0.00	6,726.87	-44.05	827.29	828.46	0.00	0.00	0.00
6,900.00	0.00	0.00	6,826.87	-44.05	827.29	828.46	0.00	0.00	0.00
7,000.00	0.00	0.00	6,926.87	-44.05	827.29	828.46	0.00	0.00	0.00
NIO A TOP									
7,022.13	0.00	0.00	6,949.00	-44.05	827.29	828.46	0.00	0.00	0.00
7,100.00	0.00	0.00	7,026.87	-44.05	827.29	828.46	0.00	0.00	0.00
7,200.00	0.00	0.00	7,126.87	-44.05	827.29	828.46	0.00	0.00	0.00
7,300.00	0.00	0.00	7,226.87	-44.05	827.29	828.46	0.00	0.00	0.00
CODELL TOP									
7,345.13	0.00	0.00	7,272.00	-44.05	827.29	828.46	0.00	0.00	0.00
7,400.00	0.00	0.00	7,326.87	-44.05	827.29	828.46	0.00	0.00	0.00
7,500.00	0.00	0.00	7,426.87	-44.05	827.29	828.46	0.00	0.00	0.00
7,600.00	0.00	0.00	7,526.87	-44.05	827.29	828.46	0.00	0.00	0.00
7,700.00	0.00	0.00	7,626.87	-44.05	827.29	828.46	0.00	0.00	0.00
JSAND TOP									
7,795.13	0.00	0.00	7,722.00	-44.05	827.29	828.46	0.00	0.00	0.00
7,800.00	0.00	0.00	7,726.87	-44.05	827.29	828.46	0.00	0.00	0.00
7,900.00	0.00	0.00	7,826.87	-44.05	827.29	828.46	0.00	0.00	0.00
TD at 7949.73									
7,949.73	0.00	0.00	7,876.60	-44.05	827.29	828.46	0.00	0.00	0.00
PBHL_BERNHARDT 21-1(1411 FNL 2380 FEL)									
7,953.13	0.00	0.00	7,880.00	-44.05	827.29	828.46	0.00	0.00	0.00

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site:	WELD_BERNHARDT 8 PAD 4N67W1	North Reference:	True
Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_BERNHARDT 21-1		
Design:	PLAN #1 1-13-10 RHS		

Design Targets									
Target Name									
- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- Shape									
PBHL_BERNHARDT	0.00	0.00	7,880.00	-44.05	827.29	1,369,190.00	3,184,423.78	40° 20' 41.780 N	104° 50' 18.067 W
- plan hits target center									
- Circle (radius 50.00)									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
850.00	850.00	8 5/8"	8.62	11.00	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,649.58	2,627.00	PARKMAN TOP				
4,406.97	4,355.00	SUSSEX TOP				
4,796.48	4,738.00	SHANNON TOP				
7,022.13	6,949.00	NIO A TOP				
7,345.13	7,272.00	CODELL TOP				
7,795.13	7,722.00	JSAND TOP				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
950.00	950.00	0.00	0.00	Start Build 2.00	
1,344.42	1,343.17	4.96	26.65	Start 4252.89 hold at 1344.42 MD	
5,597.31	5,555.83	111.64	600.50	Start Drop -2.00	
5,991.73	5,949.00	116.60	627.15	Start 1958.00 hold at 5991.73 MD	
7,949.73				TD at 7949.73	



US ROCKIES REGION PLANNING

**COLORADO NORTHERN ZONE - 83
WELD_BERNHARDT 8 PAD 4N67W1
P_BERNHARDT 21-1**

**P_BERNHARDT 21-1
PLAN #1 1-13-10 RHS**

Anticollision Report

13 January, 2010



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

Reference	PLAN #1 1-13-10 RHS		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	0.00 to 20,000.00ft	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.00ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date	1/13/2010		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	7,953.13	PLAN #1 1-13-10 RHS (P_BERNHARDT 21-1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
WELD_BERNHARDT 8 PAD 4N67W1						
P_BERNHARDT 18-1 - P_BERNHARDT 18-1 - PLAN #1	950.00	950.00	18.23	14.22	4.544	CC
P_BERNHARDT 18-1 - P_BERNHARDT 18-1 - PLAN #1	1,000.00	999.97	18.30	14.08	4.334	ES, SF
P_BERNHARDT 22-1 - P_BERNHARDT 22-1 - PLAN #1	950.00	950.00	14.57	10.56	3.631	CC, ES
P_BERNHARDT 22-1 - P_BERNHARDT 22-1 - PLAN #1	1,000.00	999.75	14.96	10.75	3.549	SF
P_BERNHARDT 24-1 - P_BERNHARDT 24-1 - PLAN #1	200.00	200.00	29.27	28.63	45.696	CC, ES
P_BERNHARDT 24-1 - P_BERNHARDT 24-1 - PLAN #1	600.00	595.00	51.04	48.56	20.543	SF
P_BERNHARDT 29-1 - P_BERNHARDT 29-1 - PLAN #1	950.00	950.00	80.34	76.33	20.025	CC, ES
P_BERNHARDT 29-1 - P_BERNHARDT 29-1 - PLAN #1	1,100.00	1,095.96	84.49	79.84	18.198	SF
P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1	200.00	200.00	32.91	32.27	51.373	CC
P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1	300.00	299.87	33.09	32.01	30.696	ES
P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1	600.00	597.08	44.66	42.21	18.185	SF
P_BERNHARDT 4-1 - P_BERNHARDT 4-1 - PLAN #1 1'	950.00	950.00	47.44	43.43	11.825	CC, ES
P_BERNHARDT 4-1 - P_BERNHARDT 4-1 - PLAN #1 1'	1,100.00	1,098.38	50.35	45.71	10.862	SF
P_BERNHARDT STATE 37-36 - P_BERNHARDT STATI	200.00	200.00	65.64	65.00	102.463	CC, ES
P_BERNHARDT STATE 37-36 - P_BERNHARDT STATI	900.00	876.27	136.78	132.59	32.579	SF

Offset Design	WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 18-1 - P_BERNHARDT 18-1 - PLAN #1 11-04												Offset Site Error:	0.00 ft
Survey Program:	0-MWD												Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis			Distance									Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.23	0.00	18.23					
100.00	100.00	100.00	100.00	0.10	0.10	0.00	18.23	0.00	18.23	18.04	0.19	95.425		
200.00	200.00	200.00	200.00	0.32	0.32	0.00	18.23	0.00	18.23	17.59	0.64	28.460		
300.00	300.00	300.00	300.00	0.55	0.55	0.00	18.23	0.00	18.23	17.14	1.09	16.724		
400.00	400.00	400.00	400.00	0.77	0.77	0.00	18.23	0.00	18.23	16.69	1.54	11.841		
500.00	500.00	500.00	500.00	0.99	0.99	0.00	18.23	0.00	18.23	16.24	1.99	9.165		
600.00	600.00	600.00	600.00	1.22	1.22	0.00	18.23	0.00	18.23	15.79	2.44	7.476		
700.00	700.00	700.00	700.00	1.44	1.44	0.00	18.23	0.00	18.23	15.34	2.89	6.312		
800.00	800.00	800.00	800.00	1.67	1.67	0.00	18.23	0.00	18.23	14.89	3.34	5.462		
900.00	900.00	900.00	900.00	1.89	1.89	0.00	18.23	0.00	18.23	14.44	3.79	4.814		
950.00	950.00	950.00	950.00	2.01	2.01	0.00	18.23	0.00	18.23	14.22	4.01	4.544	CC	
1,000.00	1,000.00	999.97	999.96	2.11	2.11	-95.77	18.26	-0.43	18.30	14.08	4.22	4.334	ES, SF	
1,100.00	1,099.93	1,099.53	1,099.46	2.31	2.31	-115.66	18.47	-3.89	20.25	15.63	4.62	4.379		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 18-1 - P_BERNHARDT 18-1 - PLAN #1 11-04												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Tooface (")	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
1,200.00	1,199.68	1,198.02	1,197.71	2.52	2.53	-140.70	18.88	-10.71	29.14	24.11	5.02	5.800	
1,300.00	1,299.13	1,294.74	1,293.91	2.76	2.75	-156.43	19.49	-20.68	47.08	41.67	5.41	8.700	
1,400.00	1,398.15	1,389.06	1,387.35	3.01	3.00	-164.66	20.27	-33.52	73.02	67.23	5.79	12.605	
1,474.67	1,471.74	1,457.59	1,454.94	3.23	3.20	-168.25	20.95	-44.77	97.01	90.94	6.07	15.974	
1,500.00	1,496.65	1,480.46	1,477.43	3.31	3.26	-169.19	21.20	-48.88	105.89	99.71	6.18	17.144	
1,600.00	1,594.98	1,571.48	1,566.69	3.63	3.56	-171.88	22.28	-66.68	142.60	136.01	6.59	21.631	
1,700.00	1,693.30	1,664.18	1,657.52	3.97	3.89	-173.52	23.40	-85.18	179.86	172.84	7.02	25.616	
1,800.00	1,791.63	1,756.88	1,748.35	4.32	4.23	-174.59	24.53	-103.68	217.20	209.74	7.46	29.124	
1,900.00	1,889.96	1,849.58	1,839.18	4.68	4.58	-175.36	25.65	-122.18	254.59	246.69	7.90	32.225	
2,000.00	1,988.29	1,942.28	1,930.01	5.05	4.95	-175.92	26.77	-140.68	292.01	283.66	8.35	34.979	
2,100.00	2,086.61	2,034.98	2,020.83	5.43	5.32	-176.36	27.90	-159.18	329.45	320.65	8.80	37.436	
2,200.00	2,184.94	2,127.69	2,111.66	5.81	5.69	-176.71	29.02	-177.68	366.90	357.65	9.26	39.638	
2,300.00	2,283.27	2,220.39	2,202.49	6.19	6.07	-176.99	30.14	-196.18	404.36	394.65	9.72	41.620	
2,400.00	2,381.60	2,313.09	2,293.32	6.58	6.46	-177.23	31.26	-214.68	441.83	431.65	10.18	43.413	
2,500.00	2,479.92	2,405.79	2,384.15	6.97	6.85	-177.43	32.39	-233.18	479.30	468.66	10.64	45.041	
2,600.00	2,578.25	2,498.49	2,474.98	7.37	7.24	-177.60	33.51	-251.68	516.78	505.67	11.11	46.524	
2,700.00	2,676.58	2,591.19	2,565.81	7.76	7.63	-177.74	34.63	-270.18	554.26	542.69	11.58	47.880	
2,800.00	2,774.91	2,683.89	2,656.64	8.16	8.03	-177.87	35.76	-288.68	591.75	579.70	12.05	49.124	
2,900.00	2,873.23	2,776.60	2,747.47	8.56	8.43	-177.99	36.88	-307.17	629.23	616.72	12.52	50.269	
3,000.00	2,971.56	2,869.30	2,838.30	8.96	8.83	-178.09	38.00	-325.67	666.72	653.73	12.99	51.326	
3,100.00	3,069.89	2,962.00	2,929.13	9.37	9.23	-178.18	39.13	-344.17	704.21	690.75	13.46	52.305	
3,200.00	3,168.22	3,054.70	3,019.96	9.77	9.63	-178.26	40.25	-362.67	741.70	727.76	13.94	53.213	
3,300.00	3,266.54	3,147.40	3,110.79	10.17	10.03	-178.33	41.37	-381.17	779.19	764.78	14.41	54.058	
3,400.00	3,364.87	3,240.10	3,201.62	10.58	10.43	-178.40	42.50	-399.67	816.69	801.80	14.89	54.846	
3,500.00	3,463.20	3,332.80	3,292.45	10.98	10.84	-178.46	43.62	-418.17	854.18	838.81	15.37	55.583	
3,600.00	3,561.53	3,425.50	3,383.28	11.39	11.24	-178.51	44.74	-436.67	891.68	875.83	15.85	56.273	
3,700.00	3,659.86	3,518.21	3,474.11	11.80	11.65	-178.56	45.87	-455.17	929.17	912.85	16.32	56.920	
3,800.00	3,758.18	3,610.91	3,564.94	12.20	12.06	-178.61	46.99	-473.67	966.67	949.86	16.80	57.528	
3,900.00	3,856.51	3,703.61	3,655.77	12.61	12.46	-178.65	48.11	-492.17	1,004.16	986.88	17.28	58.101	
4,000.00	3,954.84	3,796.31	3,746.60	13.02	12.87	-178.69	49.24	-510.67	1,041.66	1,023.90	17.76	58.642	
4,100.00	4,053.17	3,889.01	3,837.43	13.43	13.28	-178.73	50.36	-529.17	1,079.16	1,060.91	18.24	59.152	
4,200.00	4,151.49	3,981.71	3,928.26	13.84	13.69	-178.77	51.48	-547.67	1,116.65	1,097.93	18.72	59.635	
4,300.00	4,249.82	4,074.41	4,019.09	14.25	14.09	-178.80	52.60	-566.17	1,154.15	1,134.95	19.21	60.093	
4,400.00	4,348.15	4,167.12	4,109.92	14.66	14.50	-178.83	53.73	-584.67	1,191.65	1,171.96	19.69	60.527	
4,500.00	4,446.48	4,259.82	4,200.75	15.07	14.91	-178.86	54.85	-603.17	1,229.15	1,208.98	20.17	60.939	
4,600.00	4,544.80	4,352.52	4,291.58	15.48	15.32	-178.89	55.97	-621.67	1,266.65	1,246.00	20.65	61.332	
4,700.00	4,643.13	4,445.22	4,382.41	15.89	15.73	-178.91	57.10	-640.17	1,304.15	1,283.01	21.14	61.705	
4,800.00	4,741.46	4,537.92	4,473.24	16.30	16.14	-178.94	58.22	-658.67	1,341.65	1,320.03	21.62	62.061	
4,900.00	4,839.79	4,630.62	4,564.07	16.71	16.55	-178.96	59.34	-677.17	1,379.15	1,357.04	22.10	62.401	
5,000.00	4,938.11	4,723.32	4,654.90	17.12	16.96	-178.98	60.47	-695.67	1,416.65	1,394.06	22.58	62.726	
5,100.00	5,036.44	4,816.02	4,745.73	17.53	17.37	-179.00	61.59	-714.16	1,454.14	1,431.08	23.07	63.036	
5,200.00	5,134.77	4,908.73	4,836.56	17.94	17.78	-179.02	62.71	-732.66	1,491.64	1,468.09	23.55	63.334	
5,300.00	5,233.10	5,001.43	4,927.39	18.35	18.19	-179.04	63.84	-751.16	1,529.14	1,505.11	24.04	63.618	
5,400.00	5,331.42	5,094.13	5,018.22	18.76	18.60	-179.06	64.96	-769.66	1,566.65	1,542.12	24.52	63.891	
5,497.46	5,427.26	5,184.48	5,106.74	19.16	19.00	-179.07	66.05	-787.69	1,603.19	1,578.20	24.99	64.147	
5,500.00	5,429.75	5,186.83	5,109.05	19.17	19.01	-179.07	66.08	-788.16	1,604.14	1,579.14	25.01	64.144	
5,600.00	5,528.39	5,280.20	5,200.53	19.46	19.43	-179.10	67.21	-806.80	1,639.94	1,614.35	25.59	64.082	
5,700.00	5,627.54	5,374.76	5,293.18	19.72	19.85	-179.12	68.36	-825.67	1,672.45	1,646.31	26.14	63.971	
5,800.00	5,727.09	5,466.29	5,402.48	19.93	20.32	-179.14	69.70	-847.80	1,701.59	1,674.89	26.70	63.733	
5,900.00	5,826.90	5,729.41	5,642.82	20.11	20.99	-179.17	71.90	-883.94	1,722.42	1,694.98	27.43	62.790	
6,000.00	5,926.87	5,980.23	5,893.06	20.25	21.44	-179.18	72.86	-899.77	1,731.26	1,703.18	28.08	61.647	
6,022.13	5,949.00	6,036.17	5,949.00	20.28	21.50	-86.13	72.89	-900.32	1,731.56	1,703.34	28.22	61.361	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 18-1 - P_BERNHARDT 18-1 - PLAN #1 11-04												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,100.00	6,026.87	6,114.04	6,026.87	20.38	21.60	-86.13	72.89	-900.32	1,731.56	1,703.06	28.50	60.753	
6,200.00	6,126.87	6,214.04	6,126.87	20.52	21.73	-86.13	72.89	-900.32	1,731.56	1,702.69	28.87	59.969	
6,300.00	6,226.87	6,314.04	6,226.87	20.66	21.86	-86.13	72.89	-900.32	1,731.56	1,702.31	29.25	59.201	
6,400.00	6,326.87	6,414.04	6,326.87	20.80	22.00	-86.13	72.89	-900.32	1,731.56	1,701.94	29.63	58.449	
6,500.00	6,426.87	6,514.04	6,426.87	20.94	22.13	-86.13	72.89	-900.32	1,731.56	1,701.56	30.00	57.711	
6,600.00	6,526.87	6,614.04	6,526.87	21.08	22.27	-86.13	72.89	-900.32	1,731.56	1,701.18	30.38	56.988	
6,700.00	6,626.87	6,714.04	6,626.87	21.22	22.41	-86.13	72.89	-900.32	1,731.56	1,700.79	30.77	56.280	
6,800.00	6,726.87	6,814.04	6,726.87	21.37	22.55	-86.13	72.89	-900.32	1,731.56	1,700.41	31.15	55.586	
6,900.00	6,826.87	6,914.04	6,826.87	21.52	22.69	-86.13	72.89	-900.32	1,731.56	1,700.02	31.54	54.906	
7,000.00	6,926.87	7,014.04	6,926.87	21.67	22.83	-86.13	72.89	-900.32	1,731.56	1,699.64	31.92	54.239	
7,100.00	7,026.87	7,114.04	7,026.87	21.82	22.98	-86.13	72.89	-900.32	1,731.56	1,699.25	32.31	53.586	
7,200.00	7,126.87	7,214.04	7,126.87	21.97	23.12	-86.13	72.89	-900.32	1,731.56	1,698.86	32.70	52.946	
7,300.00	7,226.87	7,314.04	7,226.87	22.12	23.27	-86.13	72.89	-900.32	1,731.56	1,698.46	33.10	52.318	
7,400.00	7,326.87	7,414.04	7,326.87	22.27	23.42	-86.13	72.89	-900.32	1,731.56	1,698.07	33.49	51.703	
7,500.00	7,426.87	7,514.04	7,426.87	22.43	23.57	-86.13	72.89	-900.32	1,731.56	1,697.68	33.89	51.100	
7,600.00	7,526.87	7,614.04	7,526.87	22.58	23.72	-86.13	72.89	-900.32	1,731.56	1,697.28	34.28	50.509	
7,700.00	7,626.87	7,714.04	7,626.87	22.74	23.87	-86.13	72.89	-900.32	1,731.56	1,696.88	34.68	49.930	
7,800.00	7,726.87	7,814.04	7,726.87	22.90	24.02	-86.13	72.89	-900.32	1,731.56	1,696.48	35.08	49.362	
7,900.00	7,826.87	7,914.04	7,826.87	23.06	24.17	-86.13	72.89	-900.32	1,731.56	1,696.08	35.48	48.806	
7,932.28	7,859.15	7,946.32	7,859.15	23.11	24.22	-86.13	72.89	-900.32	1,731.56	1,695.95	35.61	48.628	
7,953.13	7,880.00	7,959.17	7,872.00	23.14	24.24	-86.13	72.89	-900.32	1,731.58	1,695.90	35.68	48.537	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 22-1 - P_BERNHARDT 22-1 - PLAN #1 11-04												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	180.00	-14.57	0.00	14.57				
100.00	100.00	100.00	100.00	0.10	0.10	180.00	-14.57	0.00	14.57	14.38	0.19	76.250	
200.00	200.00	200.00	200.00	0.32	0.32	180.00	-14.57	0.00	14.57	13.93	0.64	22.741	
300.00	300.00	300.00	300.00	0.55	0.55	180.00	-14.57	0.00	14.57	13.48	1.09	13.363	
400.00	400.00	400.00	400.00	0.77	0.77	180.00	-14.57	0.00	14.57	13.03	1.54	9.462	
500.00	500.00	500.00	500.00	0.99	0.99	180.00	-14.57	0.00	14.57	12.58	1.99	7.323	
600.00	600.00	600.00	600.00	1.22	1.22	180.00	-14.57	0.00	14.57	12.13	2.44	5.973	
700.00	700.00	700.00	700.00	1.44	1.44	180.00	-14.57	0.00	14.57	11.68	2.89	5.044	
800.00	800.00	800.00	800.00	1.67	1.67	180.00	-14.57	0.00	14.57	11.23	3.34	4.364	
900.00	900.00	900.00	900.00	1.89	1.89	180.00	-14.57	0.00	14.57	10.78	3.79	3.846	
950.00	950.00	950.00	950.00	2.01	2.01	180.00	-14.57	0.00	14.57	10.56	4.01	3.631 CC, ES	
1,000.00	1,000.00	999.75	999.75	2.11	2.10	89.21	-14.97	-0.16	14.96	10.75	4.22	3.549 SF	
1,100.00	1,099.93	1,099.03	1,098.96	2.31	2.28	103.34	-18.17	-1.42	18.77	14.18	4.59	4.089	
1,200.00	1,199.68	1,197.59	1,197.28	2.52	2.46	118.22	-24.52	-3.92	28.25	23.27	4.98	5.677	
1,300.00	1,299.13	1,294.99	1,294.16	2.76	2.67	127.58	-33.87	-7.61	43.97	38.60	5.37	8.182	
1,400.00	1,398.15	1,390.81	1,389.07	3.01	2.89	132.82	-46.06	-12.41	65.60	59.81	5.79	11.333	
1,474.67	1,471.74	1,461.07	1,458.37	3.23	3.08	135.19	-56.87	-16.67	85.39	79.28	6.12	13.964	
1,500.00	1,496.65	1,484.65	1,481.56	3.31	3.15	135.86	-60.85	-18.24	92.71	86.48	6.23	14.876	
1,600.00	1,594.98	1,576.79	1,571.80	3.63	3.44	137.26	-78.11	-25.04	123.36	116.64	6.72	18.364	
1,700.00	1,693.30	1,667.26	1,659.79	3.97	3.77	137.52	-97.67	-32.75	156.65	149.43	7.23	21.672	
1,800.00	1,791.63	1,755.95	1,745.36	4.32	4.15	137.24	-119.35	-41.29	192.48	184.72	7.76	24.800	
1,900.00	1,889.96	1,842.74	1,828.36	4.68	4.56	136.69	-142.94	-50.59	230.79	222.48	8.31	27.762	
2,000.00	1,988.29	1,927.53	1,908.67	5.05	5.00	136.01	-168.23	-60.55	271.52	262.64	8.88	30.585	
2,100.00	2,086.61	2,017.85	1,993.74	5.43	5.52	135.33	-196.47	-71.68	313.57	304.09	9.48	33.078	
2,200.00	2,184.94	2,108.52	2,079.14	5.81	6.06	134.80	-224.82	-82.85	355.65	345.56	10.09	35.239	
2,300.00	2,283.27	2,199.19	2,164.54	6.19	6.61	134.39	-253.17	-94.02	397.75	387.04	10.71	37.122	
2,400.00	2,381.60	2,289.86	2,249.93	6.58	7.17	134.06	-281.51	-105.19	439.87	428.53	11.35	38.771	
2,500.00	2,479.92	2,380.53	2,335.33	6.97	7.74	133.78	-309.86	-116.37	482.00	470.02	11.98	40.227	
2,600.00	2,578.25	2,471.21	2,420.73	7.37	8.32	133.55	-338.21	-127.54	524.13	511.51	12.62	41.519	
2,700.00	2,676.58	2,561.88	2,506.13	7.76	8.90	133.35	-366.56	-138.71	566.27	553.00	13.27	42.660	
2,800.00	2,774.91	2,652.55	2,591.53	8.16	9.49	133.18	-394.91	-149.88	608.42	594.49	13.93	43.676	
2,900.00	2,873.23	2,743.22	2,676.92	8.56	10.08	133.03	-423.26	-161.05	650.57	635.98	14.59	44.589	
3,000.00	2,971.56	2,833.89	2,762.32	8.96	10.67	132.90	-451.60	-172.22	692.72	677.47	15.25	45.413	
3,100.00	3,069.89	2,924.56	2,847.72	9.37	11.27	132.79	-479.95	-183.39	734.87	718.95	15.92	46.160	
3,200.00	3,168.22	3,015.23	2,933.12	9.77	11.87	132.69	-508.30	-194.56	777.03	760.44	16.59	46.840	
3,300.00	3,266.54	3,105.91	3,018.52	10.17	12.47	132.60	-536.65	-205.73	819.19	801.93	17.26	47.461	
3,400.00	3,364.87	3,196.58	3,103.92	10.58	13.07	132.51	-565.00	-216.91	861.35	843.42	17.93	48.030	
3,500.00	3,463.20	3,287.25	3,189.31	10.98	13.67	132.44	-593.35	-228.08	903.51	884.90	18.61	48.552	
3,600.00	3,561.53	3,377.92	3,274.71	11.39	14.28	132.37	-621.70	-239.25	945.68	926.39	19.29	49.034	
3,700.00	3,659.86	3,468.59	3,360.11	11.80	14.88	132.31	-650.04	-250.42	987.84	967.87	19.96	49.480	
3,800.00	3,758.18	3,559.26	3,445.51	12.20	15.49	132.25	-678.39	-261.59	1,030.00	1,009.36	20.64	49.893	
3,900.00	3,856.51	3,649.93	3,530.91	12.61	16.09	132.20	-706.74	-272.76	1,072.17	1,050.84	21.33	50.277	
4,000.00	3,954.84	3,740.60	3,616.31	13.02	16.70	132.15	-735.09	-283.93	1,114.34	1,092.33	22.01	50.635	
4,100.00	4,053.17	3,831.28	3,701.70	13.43	17.31	132.10	-763.44	-295.10	1,156.50	1,133.81	22.69	50.969	
4,200.00	4,151.49	3,921.95	3,787.10	13.84	17.92	132.06	-791.79	-306.27	1,198.67	1,175.30	23.37	51.282	
4,300.00	4,249.82	4,012.62	3,872.50	14.25	18.53	132.02	-820.13	-317.45	1,240.84	1,216.78	24.06	51.575	
4,400.00	4,348.15	4,103.29	3,957.90	14.66	19.14	131.98	-848.48	-328.62	1,283.01	1,258.26	24.74	51.851	
4,500.00	4,446.48	4,193.96	4,043.30	15.07	19.75	131.95	-876.83	-339.79	1,325.18	1,299.75	25.43	52.110	
4,600.00	4,544.80	4,284.63	4,128.69	15.48	20.36	131.92	-905.18	-350.96	1,367.34	1,341.23	26.12	52.354	
4,700.00	4,643.13	4,375.30	4,214.09	15.89	20.97	131.89	-933.53	-362.13	1,409.51	1,382.71	26.80	52.585	
4,800.00	4,741.46	4,465.98	4,299.49	16.30	21.58	131.86	-961.88	-373.30	1,451.68	1,424.19	27.49	52.803	
4,900.00	4,839.79	4,556.65	4,384.89	16.71	22.19	131.83	-990.23	-384.47	1,493.85	1,465.67	28.18	53.009	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 22-1 - P_BERNHARDT 22-1 - PLAN #1 11-04												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.00	4,938.11	4,647.32	4,470.29	17.12	22.81	131.81	-1,018.57	-395.64	1,536.02	1,507.15	28.87	53.205	
5,100.00	5,036.44	4,737.99	4,555.69	17.53	23.42	131.78	-1,046.92	-406.82	1,578.20	1,548.64	29.56	53.391	
5,200.00	5,134.77	4,828.66	4,641.08	17.94	24.03	131.76	-1,075.27	-417.99	1,620.37	1,590.12	30.25	53.567	
5,300.00	5,233.10	4,919.33	4,726.48	18.35	24.64	131.74	-1,103.62	-429.16	1,662.54	1,631.60	30.94	53.735	
5,400.00	5,331.42	5,010.00	4,811.88	18.76	25.26	131.72	-1,131.97	-440.33	1,704.71	1,673.08	31.63	53.896	
5,497.46	5,427.26	5,098.37	4,895.11	19.16	25.85	131.70	-1,159.60	-451.22	1,745.81	1,713.51	32.30	54.045	
5,500.00	5,429.75	5,100.67	4,897.28	19.17	25.87	131.72	-1,160.32	-451.50	1,746.88	1,714.55	32.32	54.041	
5,600.00	5,528.39	5,191.83	4,983.14	19.46	26.49	132.32	-1,188.82	-462.73	1,787.94	1,754.82	33.12	53.991	
5,700.00	5,627.54	5,376.54	5,158.53	19.72	27.45	132.66	-1,242.62	-483.93	1,825.13	1,791.03	34.10	53.524	
5,800.00	5,727.09	5,606.58	5,381.54	19.93	28.32	132.85	-1,294.87	-504.52	1,853.64	1,818.60	35.04	52.894	
5,900.00	5,826.90	5,846.87	5,618.51	20.11	29.00	132.95	-1,331.48	-518.95	1,872.60	1,836.75	35.85	52.230	
6,000.00	5,926.87	6,093.50	5,864.29	20.25	29.44	132.97	-1,349.72	-526.14	1,881.56	1,845.06	36.50	51.552	
6,022.13	5,949.00	6,148.50	5,919.27	20.28	29.50	-133.99	-1,351.10	-526.68	1,882.16	1,845.54	36.62	51.398	
6,100.00	6,026.87	6,256.10	6,026.87	20.38	29.60	-134.00	-1,351.51	-526.84	1,882.32	1,845.44	36.87	51.046	
6,200.00	6,126.87	6,356.10	6,126.87	20.52	29.68	-134.00	-1,351.51	-526.84	1,882.32	1,845.17	37.15	50.665	
6,300.00	6,226.87	6,456.10	6,226.87	20.66	29.76	-134.00	-1,351.51	-526.84	1,882.32	1,844.89	37.43	50.286	
6,400.00	6,326.87	6,556.10	6,326.87	20.80	29.84	-134.00	-1,351.51	-526.84	1,882.32	1,844.60	37.72	49.908	
6,500.00	6,426.87	6,656.10	6,426.87	20.94	29.93	-134.00	-1,351.51	-526.84	1,882.32	1,844.31	38.00	49.532	
6,600.00	6,526.87	6,756.10	6,526.87	21.08	30.01	-134.00	-1,351.51	-526.84	1,882.32	1,844.03	38.29	49.157	
6,700.00	6,626.87	6,856.10	6,626.87	21.22	30.10	-134.00	-1,351.51	-526.84	1,882.32	1,843.73	38.59	48.784	
6,800.00	6,726.87	6,956.10	6,726.87	21.37	30.19	-134.00	-1,351.51	-526.84	1,882.32	1,843.44	38.88	48.412	
6,900.00	6,826.87	7,056.10	6,826.87	21.52	30.28	-134.00	-1,351.51	-526.84	1,882.32	1,843.14	39.18	48.043	
7,000.00	6,926.87	7,156.10	6,926.87	21.67	30.37	-134.00	-1,351.51	-526.84	1,882.32	1,842.84	39.48	47.676	
7,100.00	7,026.87	7,256.10	7,026.87	21.82	30.46	-134.00	-1,351.51	-526.84	1,882.32	1,842.53	39.79	47.312	
7,200.00	7,126.87	7,356.10	7,126.87	21.97	30.56	-134.00	-1,351.51	-526.84	1,882.32	1,842.22	40.09	46.949	
7,300.00	7,226.87	7,456.10	7,226.87	22.12	30.65	-134.00	-1,351.51	-526.84	1,882.32	1,841.92	40.40	46.590	
7,400.00	7,326.87	7,556.10	7,326.87	22.27	30.75	-134.00	-1,351.51	-526.84	1,882.32	1,841.60	40.71	46.232	
7,500.00	7,426.87	7,656.10	7,426.87	22.43	30.85	-134.00	-1,351.51	-526.84	1,882.32	1,841.29	41.03	45.878	
7,600.00	7,526.87	7,756.10	7,526.87	22.58	30.95	-134.00	-1,351.51	-526.84	1,882.32	1,840.97	41.35	45.526	
7,700.00	7,626.87	7,856.10	7,626.87	22.74	31.05	-134.00	-1,351.51	-526.84	1,882.32	1,840.65	41.67	45.176	
7,800.00	7,726.87	7,956.10	7,726.87	22.90	31.15	-134.00	-1,351.51	-526.84	1,882.32	1,840.33	41.99	44.830	
7,900.00	7,826.87	8,056.10	7,826.87	23.06	31.25	-134.00	-1,351.51	-526.84	1,882.32	1,840.00	42.31	44.486	
7,953.13	7,880.00	8,109.23	7,880.00	23.14	31.31	-134.00	-1,351.51	-526.84	1,882.32	1,839.83	42.49	44.305	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 24-1 - P_BERNHARDT 24-1 - PLAN #1 11-04													Offset Site Error: 0.00 ft
Survey Program: 0-MWD													Offset Well Error: 0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	174.54	-29.14	2.79	29.27				
100.00	100.00	100.00	100.00	0.10	0.10	174.54	-29.14	2.79	29.27	29.08	0.19	153.217	
200.00	200.00	200.00	200.00	0.32	0.32	174.54	-29.14	2.79	29.27	28.63	0.64	45.696 CC, ES	
300.00	300.00	299.34	299.32	0.55	0.53	171.96	-30.05	4.25	30.36	29.29	1.07	28.345	
400.00	400.00	398.44	398.29	0.77	0.74	165.29	-32.79	8.61	33.94	32.44	1.51	22.527	
500.00	500.00	497.07	496.54	0.99	0.99	157.02	-37.31	15.83	40.68	38.70	1.97	20.604	
600.00	600.00	595.00	593.75	1.22	1.27	149.35	-43.58	25.82	51.04	48.56	2.48	20.543 SF	
700.00	700.00	692.01	689.60	1.44	1.59	143.24	-51.53	38.50	65.16	62.11	3.05	21.392	
800.00	800.00	787.89	783.78	1.67	1.97	138.67	-61.07	53.72	82.93	79.27	3.66	22.651	
900.00	900.00	882.46	876.02	1.89	2.38	135.31	-72.12	71.33	104.23	99.90	4.33	24.058	
950.00	950.00	929.19	921.34	2.01	2.61	133.98	-78.17	80.99	116.15	111.46	4.69	24.764	
1,000.00	1,000.00	975.63	966.19	2.11	2.85	39.75	-84.57	91.21	128.57	124.34	4.24	30.360	
1,100.00	1,099.93	1,067.87	1,054.65	2.31	3.37	38.34	-98.44	113.32	153.84	149.15	4.69	32.813	
1,200.00	1,199.68	1,159.26	1,141.43	2.52	3.94	37.75	-113.66	137.59	179.54	174.38	5.16	34.797	
1,300.00	1,299.13	1,249.79	1,226.45	2.76	4.56	37.68	-130.17	163.94	205.60	199.95	5.65	36.377	
1,400.00	1,398.15	1,339.46	1,309.65	3.01	5.23	37.94	-147.93	192.26	232.01	225.84	6.17	37.598	
1,474.67	1,471.74	1,405.86	1,370.56	3.23	5.76	38.27	-161.97	214.65	251.95	245.37	6.58	38.304	
1,500.00	1,496.65	1,428.25	1,390.96	3.31	5.94	38.48	-166.87	222.47	258.84	252.12	6.72	38.501	
1,600.00	1,594.98	1,522.19	1,476.14	3.63	6.75	39.21	-187.92	256.04	287.07	279.74	7.33	39.151	
1,700.00	1,693.30	1,618.03	1,563.01	3.97	7.58	39.82	-209.43	290.35	315.43	307.46	7.97	39.581	
1,800.00	1,791.63	1,713.88	1,649.88	4.32	8.42	40.33	-230.94	324.66	343.81	335.18	8.62	39.872	
1,900.00	1,889.96	1,809.73	1,736.75	4.68	9.26	40.76	-252.46	358.98	372.21	362.92	9.29	40.065	
2,000.00	1,988.29	1,905.58	1,823.62	5.05	10.11	41.13	-273.97	393.29	400.63	390.66	9.97	40.189	
2,100.00	2,086.61	2,001.42	1,910.49	5.43	10.96	41.46	-295.48	427.60	429.06	418.40	10.66	40.262	
2,200.00	2,184.94	2,097.27	1,997.36	5.81	11.81	41.74	-316.99	461.91	457.50	446.15	11.35	40.300	
2,300.00	2,283.27	2,193.12	2,084.23	6.19	12.66	41.99	-338.51	496.23	485.95	473.90	12.05	40.312	
2,400.00	2,381.60	2,288.96	2,171.10	6.58	13.51	42.21	-360.02	530.54	514.41	501.65	12.76	40.307	
2,500.00	2,479.92	2,384.81	2,257.97	6.97	14.36	42.41	-381.53	564.85	542.88	529.41	13.48	40.288	
2,600.00	2,578.25	2,480.66	2,344.84	7.37	15.22	42.58	-403.05	599.16	571.35	557.16	14.19	40.260	
2,700.00	2,676.58	2,576.50	2,431.71	7.76	16.07	42.75	-424.56	633.48	599.83	584.92	14.91	40.225	
2,800.00	2,774.91	2,672.35	2,518.59	8.16	16.93	42.89	-446.07	667.79	628.31	612.67	15.63	40.187	
2,900.00	2,873.23	2,768.20	2,605.46	8.56	17.79	43.03	-467.58	702.10	656.79	640.43	16.36	40.145	
3,000.00	2,971.56	2,864.04	2,692.33	8.96	18.64	43.15	-489.10	736.41	685.28	668.19	17.09	40.102	
3,100.00	3,069.89	2,959.89	2,779.20	9.37	19.50	43.26	-510.61	770.73	713.77	695.95	17.82	40.058	
3,200.00	3,168.22	3,055.74	2,866.07	9.77	20.36	43.37	-532.12	805.04	742.26	723.71	18.55	40.013	
3,300.00	3,266.54	3,151.58	2,952.94	10.17	21.22	43.46	-553.63	839.35	770.75	751.47	19.28	39.968	
3,400.00	3,364.87	3,247.43	3,039.81	10.58	22.07	43.55	-575.15	873.66	799.25	779.23	20.02	39.924	
3,500.00	3,463.20	3,343.28	3,126.68	10.98	22.93	43.64	-596.66	907.98	827.74	806.99	20.76	39.881	
3,600.00	3,561.53	3,439.13	3,213.55	11.39	23.79	43.72	-618.17	942.29	856.24	834.75	21.49	39.839	
3,700.00	3,659.86	3,534.97	3,300.42	11.80	24.65	43.79	-639.68	976.60	884.74	862.51	22.23	39.797	
3,800.00	3,758.18	3,630.82	3,387.29	12.20	25.51	43.86	-661.20	1,010.91	913.24	890.27	22.97	39.757	
3,900.00	3,856.51	3,726.67	3,474.16	12.61	26.37	43.92	-682.71	1,045.23	941.75	918.04	23.71	39.717	
4,000.00	3,954.84	3,822.51	3,561.03	13.02	27.23	43.98	-704.22	1,079.54	970.25	945.80	24.45	39.679	
4,100.00	4,053.17	3,918.36	3,647.90	13.43	28.08	44.04	-725.74	1,113.85	998.75	973.56	25.19	39.642	
4,200.00	4,151.49	4,014.21	3,734.77	13.84	28.94	44.09	-747.25	1,148.16	1,027.26	1,001.32	25.94	39.606	
4,300.00	4,249.82	4,110.05	3,821.64	14.25	29.80	44.14	-768.76	1,182.48	1,055.77	1,029.09	26.68	39.571	
4,400.00	4,348.15	4,205.90	3,908.51	14.66	30.66	44.19	-790.27	1,216.79	1,084.27	1,056.85	27.42	39.537	
4,500.00	4,446.48	4,301.75	3,995.38	15.07	31.52	44.24	-811.79	1,251.10	1,112.78	1,084.61	28.17	39.505	
4,600.00	4,544.80	4,397.59	4,082.25	15.48	32.38	44.28	-833.30	1,285.41	1,141.29	1,112.37	28.91	39.473	
4,700.00	4,643.13	4,493.44	4,169.12	15.89	33.24	44.32	-854.81	1,319.73	1,169.80	1,140.14	29.66	39.442	
4,800.00	4,741.46	4,589.29	4,255.99	16.30	34.10	44.36	-876.32	1,354.04	1,198.31	1,167.90	30.40	39.413	
4,900.00	4,839.79	4,685.13	4,342.86	16.71	34.96	44.40	-897.84	1,388.35	1,226.81	1,195.66	31.15	39.384	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 ft
WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 24-1 - P_BERNHARDT 24-1 - PLAN #1 11-04												Offset Well Error:	0.00 ft
Survey Program: 0-MWD													
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.00	4,938.11	4,780.98	4,429.74	17.12	35.82	44.44	-919.35	1,422.66	1,255.33	1,223.43	31.90	39.356	
5,100.00	5,036.44	4,876.83	4,516.61	17.53	36.68	44.47	-940.86	1,456.98	1,283.84	1,251.19	32.64	39.329	
5,200.00	5,134.77	4,972.67	4,603.48	17.94	37.54	44.50	-962.37	1,491.29	1,312.35	1,278.96	33.39	39.303	
5,300.00	5,233.10	5,068.52	4,690.35	18.35	38.40	44.54	-983.89	1,525.60	1,340.86	1,306.72	34.14	39.278	
5,400.00	5,331.42	5,164.37	4,777.22	18.76	39.26	44.57	-1,005.40	1,559.91	1,369.37	1,334.48	34.89	39.253	
5,497.46	5,427.26	5,257.78	4,861.88	19.16	40.10	44.59	-1,026.37	1,593.36	1,397.16	1,361.54	35.61	39.230	
5,500.00	5,429.75	5,260.21	4,864.09	19.17	40.12	44.61	-1,026.91	1,594.23	1,397.88	1,362.25	35.63	39.229	
5,600.00	5,528.39	5,355.68	4,950.61	19.46	40.98	45.02	-1,048.34	1,628.40	1,427.64	1,391.31	36.33	39.295	
5,700.00	5,627.54	5,450.33	5,036.40	19.72	41.83	45.37	-1,069.58	1,662.29	1,459.75	1,422.78	36.97	39.483	
5,800.00	5,727.09	5,544.05	5,121.34	19.93	42.67	45.67	-1,090.62	1,695.84	1,494.18	1,456.62	37.55	39.787	
5,900.00	5,826.90	5,636.74	5,205.35	20.11	43.50	45.93	-1,111.42	1,729.02	1,530.92	1,492.84	38.08	40.201	
6,000.00	5,926.87	5,728.27	5,288.31	20.25	44.32	46.15	-1,131.97	1,761.79	1,569.96	1,531.40	38.56	40.719	
6,022.13	5,949.00	5,748.36	5,306.52	20.28	44.50	139.24	-1,136.48	1,768.98	1,578.91	1,540.26	38.65	40.847	
6,100.00	6,026.87	5,885.46	5,431.86	20.38	45.49	138.61	-1,165.97	1,816.03	1,609.46	1,570.48	38.97	41.297	
6,200.00	6,126.87	6,092.75	5,626.02	20.52	46.70	137.86	-1,204.47	1,877.43	1,643.23	1,603.79	39.44	41.663	
6,300.00	6,226.87	6,310.50	5,835.05	20.66	47.71	137.27	-1,236.76	1,928.93	1,670.24	1,630.30	39.93	41.825	
6,400.00	6,326.87	6,536.84	6,056.57	20.80	48.49	136.86	-1,261.29	1,968.06	1,690.00	1,649.57	40.43	41.804	
6,500.00	6,426.87	6,769.32	6,287.16	20.94	49.02	136.61	-1,276.74	1,992.70	1,702.12	1,661.22	40.90	41.616	
6,600.00	6,526.87	7,005.05	6,522.59	21.08	49.28	136.52	-1,282.21	2,001.42	1,706.36	1,665.01	41.34	41.276	
6,700.00	6,626.87	7,109.32	6,626.87	21.22	49.34	136.52	-1,282.22	2,001.43	1,706.36	1,664.73	41.62	40.994	
6,800.00	6,726.87	7,209.32	6,726.87	21.37	49.40	136.52	-1,282.22	2,001.43	1,706.36	1,664.46	41.90	40.721	
6,900.00	6,826.87	7,309.32	6,826.87	21.52	49.46	136.52	-1,282.22	2,001.43	1,706.36	1,664.17	42.19	40.448	
7,000.00	6,926.87	7,409.32	6,926.87	21.67	49.52	136.52	-1,282.22	2,001.43	1,706.36	1,663.89	42.47	40.176	
7,100.00	7,026.87	7,509.32	7,026.87	21.82	49.58	136.52	-1,282.22	2,001.43	1,706.36	1,663.60	42.76	39.905	
7,200.00	7,126.87	7,609.32	7,126.87	21.97	49.65	136.52	-1,282.22	2,001.43	1,706.36	1,663.31	43.05	39.635	
7,300.00	7,226.87	7,709.32	7,226.87	22.12	49.71	136.52	-1,282.22	2,001.43	1,706.36	1,663.01	43.34	39.367	
7,400.00	7,326.87	7,809.32	7,326.87	22.27	49.77	136.52	-1,282.22	2,001.43	1,706.36	1,662.72	43.64	39.100	
7,500.00	7,426.87	7,909.32	7,426.87	22.43	49.84	136.52	-1,282.22	2,001.43	1,706.36	1,662.42	43.94	38.834	
7,600.00	7,526.87	8,009.32	7,526.87	22.58	49.91	136.52	-1,282.22	2,001.43	1,706.36	1,662.12	44.24	38.570	
7,700.00	7,626.87	8,109.32	7,626.87	22.74	49.97	136.52	-1,282.22	2,001.43	1,706.36	1,661.82	44.54	38.307	
7,800.00	7,726.87	8,209.32	7,726.87	22.90	50.04	136.52	-1,282.22	2,001.43	1,706.36	1,661.51	44.85	38.046	
7,900.00	7,826.87	8,309.32	7,826.87	23.06	50.11	136.52	-1,282.22	2,001.43	1,706.36	1,661.20	45.16	37.787	
7,953.13	7,880.00	8,362.45	7,880.00	23.14	50.15	136.52	-1,282.22	2,001.43	1,706.36	1,661.04	45.32	37.649	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 29-1 - P_BERNHARDT 29-1 - PLAN #1 11-04													Offset Site Error: 0.00 ft
Survey Program: 0-MWD													Offset Well Error: 0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-3.98	80.15	-5.57	80.34				
100.00	100.00	100.00	100.00	0.10	0.10	-3.98	80.15	-5.57	80.34	80.15	0.19	420.527	
200.00	200.00	200.00	200.00	0.32	0.32	-3.98	80.15	-5.57	80.34	79.70	0.64	125.421	
300.00	300.00	300.00	300.00	0.55	0.55	-3.98	80.15	-5.57	80.34	79.25	1.09	73.701	
400.00	400.00	400.00	400.00	0.77	0.77	-3.98	80.15	-5.57	80.34	78.80	1.54	52.182	
500.00	500.00	500.00	500.00	0.99	0.99	-3.98	80.15	-5.57	80.34	78.35	1.99	40.390	
600.00	600.00	600.00	600.00	1.22	1.22	-3.98	80.15	-5.57	80.34	77.90	2.44	32.945	
700.00	700.00	700.00	700.00	1.44	1.44	-3.98	80.15	-5.57	80.34	77.45	2.89	27.817	
800.00	800.00	800.00	800.00	1.67	1.67	-3.98	80.15	-5.57	80.34	77.00	3.34	24.071	
900.00	900.00	900.00	900.00	1.89	1.89	-3.98	80.15	-5.57	80.34	76.55	3.79	21.214	
950.00	950.00	950.00	950.00	2.01	2.01	-3.98	80.15	-5.57	80.34	76.33	4.01	20.025 CC, ES	
1,000.00	1,000.00	998.74	998.74	2.11	2.11	-97.44	80.51	-5.77	80.79	76.56	4.23	19.117	
1,100.00	1,099.93	1,095.96	1,095.90	2.31	2.33	-100.55	83.43	-7.32	84.49	79.84	4.64	18.198 SF	
1,200.00	1,199.68	1,192.40	1,192.11	2.52	2.55	-105.93	89.19	-10.40	92.57	87.50	5.07	18.266	
1,300.00	1,299.13	1,287.57	1,286.79	2.76	2.78	-112.28	97.68	-14.92	105.97	100.47	5.50	19.263	
1,400.00	1,398.15	1,380.99	1,379.37	3.01	3.02	-118.41	108.70	-20.80	125.37	119.43	5.94	21.101	
1,474.67	1,471.74	1,449.35	1,446.82	3.23	3.21	-122.43	118.46	-25.99	143.93	137.65	6.28	22.935	
1,500.00	1,496.65	1,472.26	1,469.37	3.31	3.28	-123.76	122.04	-27.91	150.95	144.55	6.39	23.616	
1,600.00	1,594.98	1,561.68	1,557.04	3.63	3.56	-127.88	137.56	-36.18	181.16	174.30	6.86	26.417	
1,700.00	1,693.30	1,649.35	1,642.43	3.97	3.88	-130.67	155.11	-45.53	214.91	207.58	7.33	29.307	
1,800.00	1,791.63	1,735.17	1,725.38	4.32	4.23	-132.56	174.51	-55.87	251.78	243.96	7.82	32.205	
1,900.00	1,889.96	1,819.05	1,805.78	4.68	4.60	-133.83	195.58	-67.10	291.49	283.18	8.31	35.072	
2,000.00	1,988.29	1,903.61	1,886.13	5.05	5.03	-134.70	218.81	-79.49	333.74	324.92	8.82	37.839	
2,100.00	2,086.61	1,993.84	1,971.69	5.43	5.51	-135.40	244.13	-92.98	376.67	367.31	9.36	40.257	
2,200.00	2,184.94	2,084.08	2,057.24	5.81	6.02	-135.96	269.44	-106.48	419.62	409.72	9.90	42.369	
2,300.00	2,283.27	2,174.31	2,142.80	6.19	6.53	-136.41	294.76	-119.97	462.61	452.15	10.46	44.224	
2,400.00	2,381.60	2,264.55	2,228.35	6.58	7.06	-136.79	320.07	-133.46	505.61	494.58	11.02	45.862	
2,500.00	2,479.92	2,354.79	2,313.91	6.97	7.59	-137.11	345.38	-146.95	548.63	537.03	11.60	47.315	
2,600.00	2,578.25	2,445.02	2,399.46	7.37	8.13	-137.38	370.70	-160.45	591.66	579.48	12.17	48.608	
2,700.00	2,676.58	2,535.26	2,485.02	7.76	8.68	-137.61	396.01	-173.94	634.70	621.94	12.75	49.766	
2,800.00	2,774.91	2,625.49	2,570.57	8.16	9.23	-137.82	421.33	-187.43	677.74	664.40	13.34	50.807	
2,900.00	2,873.23	2,715.73	2,656.13	8.56	9.78	-138.00	446.64	-200.93	720.80	706.87	13.93	51.746	
3,000.00	2,971.56	2,805.97	2,741.68	8.96	10.34	-138.16	471.95	-214.42	763.85	749.33	14.52	52.596	
3,100.00	3,069.89	2,896.20	2,827.24	9.37	10.90	-138.30	497.27	-227.91	806.92	791.80	15.12	53.369	
3,200.00	3,168.22	2,986.44	2,912.79	9.77	11.46	-138.43	522.58	-241.41	849.98	834.26	15.72	54.074	
3,300.00	3,266.54	3,076.67	2,998.35	10.17	12.03	-138.55	547.90	-254.90	893.05	876.73	16.32	54.719	
3,400.00	3,364.87	3,166.91	3,083.90	10.58	12.59	-138.65	573.21	-268.39	936.12	919.20	16.92	55.312	
3,500.00	3,463.20	3,257.14	3,169.46	10.98	13.16	-138.75	598.52	-281.89	979.20	961.67	17.53	55.858	
3,600.00	3,561.53	3,347.38	3,255.01	11.39	13.73	-138.84	623.84	-295.38	1,022.27	1,004.14	18.14	56.363	
3,700.00	3,659.86	3,437.62	3,340.57	11.80	14.30	-138.92	649.15	-308.87	1,065.35	1,046.61	18.75	56.830	
3,800.00	3,758.18	3,527.85	3,426.12	12.20	14.87	-138.99	674.47	-322.37	1,108.43	1,089.08	19.36	57.264	
3,900.00	3,856.51	3,618.09	3,511.68	12.61	15.44	-139.06	699.78	-335.86	1,151.51	1,131.55	19.97	57.667	
4,000.00	3,954.84	3,708.32	3,597.23	13.02	16.01	-139.12	725.09	-349.35	1,194.60	1,174.02	20.58	58.044	
4,100.00	4,053.17	3,798.56	3,682.79	13.43	16.58	-139.18	750.41	-362.85	1,237.68	1,216.48	21.19	58.396	
4,200.00	4,151.49	3,888.79	3,768.34	13.84	17.16	-139.24	775.72	-376.34	1,280.76	1,258.95	21.81	58.725	
4,300.00	4,249.82	3,979.03	3,853.90	14.25	17.73	-139.29	801.03	-389.83	1,323.85	1,301.42	22.43	59.034	
4,400.00	4,348.15	4,069.27	3,939.45	14.66	18.30	-139.34	826.35	-403.33	1,366.94	1,343.89	23.04	59.324	
4,500.00	4,446.48	4,159.50	4,025.01	15.07	18.88	-139.39	851.66	-416.82	1,410.02	1,386.36	23.66	59.597	
4,600.00	4,544.80	4,249.74	4,110.56	15.48	19.46	-139.43	876.98	-430.31	1,453.11	1,428.83	24.28	59.855	
4,700.00	4,643.13	4,339.97	4,196.12	15.89	20.03	-139.47	902.29	-443.81	1,496.20	1,471.30	24.90	60.099	
4,800.00	4,741.46	4,430.21	4,281.67	16.30	20.61	-139.51	927.60	-457.30	1,539.29	1,513.77	25.51	60.329	
4,900.00	4,839.79	4,520.45	4,367.23	16.71	21.18	-139.54	952.92	-470.79	1,582.38	1,556.24	26.13	60.547	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 29-1 - P_BERNHARDT 29-1 - PLAN #1 11-04												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
5,000.00	4,938.11	4,610.68	4,452.78	17.12	21.76	-139.58	978.23	-484.28	1,625.47	1,598.71	26.76	60.754	
5,100.00	5,036.44	4,700.92	4,538.34	17.53	22.34	-139.61	1,003.55	-497.78	1,668.56	1,641.18	27.38	60.950	
5,200.00	5,134.77	4,791.15	4,623.89	17.94	22.92	-139.64	1,028.86	-511.27	1,711.65	1,683.65	28.00	61.137	
5,300.00	5,233.10	4,881.39	4,709.45	18.35	23.49	-139.67	1,054.17	-524.76	1,754.74	1,726.12	28.62	61.315	
5,400.00	5,331.42	4,971.62	4,795.00	18.76	24.07	-139.70	1,079.49	-538.26	1,797.83	1,768.59	29.24	61.484	
5,497.46	5,427.26	5,059.57	4,878.39	19.16	24.63	-139.72	1,104.16	-551.41	1,839.83	1,809.98	29.85	61.641	
5,500.00	5,429.75	5,061.86	4,880.56	19.17	24.65	-139.74	1,104.80	-551.75	1,840.92	1,811.06	29.87	61.637	
5,600.00	5,528.39	5,152.69	4,966.67	19.46	25.23	-140.32	1,130.28	-565.33	1,882.74	1,852.14	30.60	61.524	
5,700.00	5,627.54	5,244.57	5,053.79	19.72	25.82	-140.78	1,156.06	-579.07	1,922.11	1,890.81	31.30	61.405	
5,800.00	5,727.09	5,465.12	5,264.94	19.93	26.89	-140.95	1,212.11	-608.95	1,956.66	1,924.39	32.27	60.625	
5,900.00	5,826.90	5,739.36	5,533.27	20.11	27.86	-140.99	1,261.64	-635.35	1,980.51	1,947.28	33.22	59.609	
6,000.00	5,926.87	6,024.75	5,816.86	20.25	28.51	-140.97	1,288.91	-649.89	1,992.65	1,958.65	34.01	58.598	
6,022.13	5,949.00	6,088.72	5,880.76	20.28	28.61	-47.91	1,291.59	-651.32	1,993.71	1,959.56	34.15	58.377	
6,100.00	6,026.87	6,234.85	6,026.87	20.38	28.77	-47.89	1,293.27	-652.21	1,994.33	1,959.84	34.48	57.833	
6,200.00	6,126.87	6,334.85	6,126.87	20.52	28.87	-47.89	1,293.27	-652.21	1,994.33	1,959.53	34.80	57.308	
6,300.00	6,226.87	6,434.85	6,226.87	20.66	28.96	-47.89	1,293.27	-652.21	1,994.33	1,959.21	35.12	56.788	
6,400.00	6,326.87	6,534.85	6,326.87	20.80	29.07	-47.89	1,293.27	-652.21	1,994.33	1,958.89	35.44	56.272	
6,500.00	6,426.87	6,634.85	6,426.87	20.94	29.17	-47.89	1,293.27	-652.21	1,994.33	1,958.56	35.77	55.762	
6,600.00	6,526.87	6,734.85	6,526.87	21.08	29.27	-47.89	1,293.27	-652.21	1,994.33	1,958.23	36.09	55.256	
6,700.00	6,626.87	6,834.85	6,626.87	21.22	29.38	-47.89	1,293.27	-652.21	1,994.33	1,957.90	36.42	54.756	
6,800.00	6,726.87	6,934.85	6,726.87	21.37	29.48	-47.89	1,293.27	-652.21	1,994.33	1,957.57	36.75	54.261	
6,900.00	6,826.87	7,034.85	6,826.87	21.52	29.59	-47.89	1,293.27	-652.21	1,994.33	1,957.24	37.09	53.771	
7,000.00	6,926.87	7,134.85	6,926.87	21.67	29.70	-47.89	1,293.27	-652.21	1,994.33	1,956.90	37.43	53.286	
7,100.00	7,026.87	7,234.85	7,026.87	21.82	29.81	-47.89	1,293.27	-652.21	1,994.33	1,956.56	37.77	52.807	
7,200.00	7,126.87	7,334.85	7,126.87	21.97	29.92	-47.89	1,293.27	-652.21	1,994.33	1,956.22	38.11	52.334	
7,300.00	7,226.87	7,434.85	7,226.87	22.12	30.03	-47.89	1,293.27	-652.21	1,994.33	1,955.87	38.45	51.865	
7,400.00	7,326.87	7,534.85	7,326.87	22.27	30.15	-47.89	1,293.27	-652.21	1,994.33	1,955.53	38.80	51.403	
7,500.00	7,426.87	7,634.85	7,426.87	22.43	30.26	-47.89	1,293.27	-652.21	1,994.33	1,955.18	39.15	50.945	
7,600.00	7,526.87	7,734.85	7,526.87	22.58	30.38	-47.89	1,293.27	-652.21	1,994.33	1,954.83	39.50	50.493	
7,700.00	7,626.87	7,834.85	7,626.87	22.74	30.50	-47.89	1,293.27	-652.21	1,994.33	1,954.48	39.85	50.047	
7,800.00	7,726.87	7,934.85	7,726.87	22.90	30.61	-47.89	1,293.27	-652.21	1,994.33	1,954.12	40.20	49.606	
7,900.00	7,826.87	8,034.85	7,826.87	23.06	30.74	-47.89	1,293.27	-652.21	1,994.33	1,953.77	40.56	49.171	
7,953.13	7,880.00	8,087.99	7,880.00	23.14	30.80	-47.89	1,293.27	-652.21	1,994.33	1,953.58	40.75	48.941	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1 11-04												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-4.86	32.79	-2.79	32.91				
100.00	100.00	100.00	100.00	0.10	0.10	-4.86	32.79	-2.79	32.91	32.72	0.19	172.251	
200.00	200.00	200.00	200.00	0.32	0.32	-4.86	32.79	-2.79	32.91	32.27	0.64	51.373 CC	
300.00	300.00	299.87	299.85	0.55	0.53	-7.87	32.78	-4.53	33.09	32.01	1.08	30.696 ES	
400.00	400.00	399.50	399.34	0.77	0.76	-16.55	32.74	-9.73	34.16	32.64	1.51	22.548	
500.00	500.00	498.65	498.11	0.99	1.01	-29.31	32.67	-18.34	37.52	35.55	1.97	19.062	
600.00	600.00	597.08	595.81	1.22	1.29	-42.89	32.58	-30.26	44.66	42.21	2.46	18.185 SF	
700.00	700.00	694.58	692.13	1.44	1.62	-54.41	32.47	-45.37	56.35	53.35	3.00	18.795	
800.00	800.00	790.94	786.76	1.67	1.99	-63.02	32.33	-63.52	72.49	68.90	3.60	20.155	
900.00	900.00	885.96	879.43	1.89	2.41	-69.16	32.17	-84.52	92.75	88.50	4.25	21.826	
950.00	950.00	932.92	924.95	2.01	2.64	-71.52	32.08	-96.03	104.30	99.70	4.60	22.690	
1,000.00	1,000.00	979.35	969.78	2.11	2.88	-166.55	31.99	-108.14	117.16	112.83	4.34	27.015	
1,100.00	1,099.93	1,070.12	1,056.81	2.31	3.39	-169.80	31.80	-133.91	147.93	143.17	4.75	31.123	
1,200.00	1,199.68	1,157.68	1,139.94	2.52	3.93	-172.21	31.59	-161.37	185.14	179.98	5.16	35.895	
1,300.00	1,299.13	1,241.59	1,218.79	2.76	4.50	-173.99	31.37	-190.06	228.46	222.90	5.55	41.130	
1,400.00	1,398.15	1,322.48	1,293.98	3.01	5.09	-175.32	31.15	-219.89	277.53	271.59	5.94	46.707	
1,474.67	1,471.74	1,384.63	1,351.42	3.23	5.57	-176.14	30.97	-243.62	317.10	310.86	6.23	50.865	
1,500.00	1,496.65	1,405.89	1,371.07	3.31	5.74	-176.40	30.90	-251.74	330.81	324.46	6.35	52.118	
1,600.00	1,594.98	1,489.83	1,448.64	3.63	6.39	-177.25	30.66	-283.79	384.99	378.19	6.80	56.606	
1,700.00	1,693.30	1,573.76	1,526.22	3.97	7.05	-177.89	30.42	-315.84	439.21	431.95	7.26	60.473	
1,800.00	1,791.63	1,657.70	1,603.79	4.32	7.71	-178.39	30.18	-347.89	493.46	485.73	7.73	63.829	
1,900.00	1,889.96	1,741.63	1,681.36	4.68	8.38	-178.79	29.93	-379.94	547.74	539.53	8.20	66.763	
2,000.00	1,988.29	1,825.56	1,758.94	5.05	9.05	-179.12	29.69	-411.99	602.03	593.35	8.68	69.345	
2,100.00	2,086.61	1,909.50	1,836.51	5.43	9.72	-179.40	29.45	-444.05	656.33	647.17	9.16	71.630	
2,200.00	2,184.94	1,993.43	1,914.08	5.81	10.39	-179.63	29.20	-476.10	710.64	700.99	9.65	73.665	
2,300.00	2,283.27	2,077.37	1,991.66	6.19	11.06	-179.83	28.96	-508.15	764.96	754.82	10.13	75.487	
2,400.00	2,381.60	2,161.30	2,069.23	6.58	11.73	-180.00	28.72	-540.20	819.28	808.66	10.62	77.125	
2,500.00	2,479.92	2,245.23	2,146.80	6.97	12.41	-179.84	28.48	-572.25	873.61	862.50	11.11	78.607	
2,600.00	2,578.25	2,329.17	2,224.38	7.37	13.08	-179.71	28.23	-604.30	927.94	916.33	11.61	79.952	
2,700.00	2,676.58	2,413.10	2,301.95	7.76	13.75	-179.59	27.99	-636.35	982.28	970.18	12.10	81.179	
2,800.00	2,774.91	2,497.04	2,379.52	8.16	14.43	-179.48	27.75	-668.40	1,036.61	1,024.02	12.60	82.300	
2,900.00	2,873.23	2,580.97	2,457.10	8.56	15.10	-179.39	27.51	-700.45	1,090.95	1,077.86	13.09	83.330	
3,000.00	2,971.56	2,664.90	2,534.67	8.96	15.78	-179.30	27.26	-732.50	1,145.30	1,131.71	13.59	84.278	
3,100.00	3,069.89	2,748.84	2,612.24	9.37	16.46	-179.22	27.02	-764.56	1,199.64	1,185.55	14.09	85.154	
3,200.00	3,168.22	2,832.77	2,689.81	9.77	17.13	-179.15	26.78	-796.61	1,253.98	1,239.40	14.59	85.965	
3,300.00	3,266.54	2,916.71	2,767.39	10.17	17.81	-179.08	26.53	-828.66	1,308.33	1,293.24	15.09	86.719	
3,400.00	3,364.87	3,000.64	2,844.96	10.58	18.49	-179.02	26.29	-860.71	1,362.68	1,347.09	15.59	87.420	
3,500.00	3,463.20	3,084.57	2,922.53	10.98	19.17	-178.97	26.05	-892.76	1,417.03	1,400.94	16.09	88.075	
3,600.00	3,561.53	3,168.51	3,000.11	11.39	19.84	-178.91	25.81	-924.81	1,471.38	1,454.79	16.59	88.687	
3,700.00	3,659.86	3,252.44	3,077.68	11.80	20.52	-178.87	25.56	-956.86	1,525.73	1,508.63	17.09	89.261	
3,800.00	3,758.18	3,336.38	3,155.25	12.20	21.20	-178.82	25.32	-988.91	1,580.08	1,562.48	17.60	89.800	
3,900.00	3,856.51	3,420.31	3,232.83	12.61	21.88	-178.78	25.08	-1,020.96	1,634.43	1,616.33	18.10	90.307	
4,000.00	3,954.84	3,504.24	3,310.40	13.02	22.55	-178.74	24.83	-1,053.01	1,688.78	1,670.18	18.60	90.784	
4,100.00	4,053.17	3,588.18	3,387.97	13.43	23.23	-178.70	24.59	-1,085.07	1,743.13	1,724.03	19.11	91.235	
4,200.00	4,151.49	3,672.11	3,465.55	13.84	23.91	-178.67	24.35	-1,117.12	1,797.49	1,777.88	19.61	91.661	
4,300.00	4,249.82	3,756.05	3,543.12	14.25	24.59	-178.63	24.11	-1,149.17	1,851.84	1,831.73	20.11	92.064	
4,400.00	4,348.15	3,839.98	3,620.69	14.66	25.27	-178.60	23.86	-1,181.22	1,906.20	1,885.58	20.62	92.447	
4,500.00	4,446.48	3,923.91	3,698.27	15.07	25.95	-178.58	23.62	-1,213.27	1,960.55	1,939.43	21.12	92.810	
4,600.00	4,544.80	4,007.85	3,775.84	15.48	26.62	-178.55	23.38	-1,245.32	2,014.90	1,993.28	21.63	93.155	
4,700.00	4,643.13	4,091.78	3,853.41	15.89	27.30	-178.52	23.13	-1,277.37	2,069.26	2,047.12	22.14	93.484	
4,800.00	4,741.46	4,175.72	3,930.98	16.30	27.98	-178.50	22.89	-1,309.42	2,123.62	2,100.97	22.64	93.796	
4,900.00	4,839.79	4,259.65	4,008.56	16.71	28.66	-178.47	22.65	-1,341.47	2,177.97	2,154.82	23.15	94.095	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 31-1 - P_BERNHARDT 31-1 - PLAN #1 11-04												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.00	4,938.11	4,343.58	4,086.13	17.12	29.34	178.45	22.41	-1,373.53	2,232.33	2,208.67	23.65	94.380	
5,100.00	5,036.44	4,427.52	4,163.70	17.53	30.02	178.43	22.16	-1,405.58	2,286.68	2,262.52	24.16	94.652	
5,200.00	5,134.77	4,511.45	4,241.28	17.94	30.70	178.41	21.92	-1,437.63	2,341.04	2,316.37	24.67	94.913	
5,300.00	5,233.10	4,595.39	4,318.85	18.35	31.38	178.39	21.68	-1,469.68	2,395.40	2,370.22	25.17	95.163	
5,400.00	5,331.42	4,679.32	4,396.42	18.76	32.05	178.37	21.44	-1,501.73	2,449.75	2,424.07	25.68	95.402	
5,497.46	5,427.26	4,761.13	4,472.03	19.16	32.72	178.35	21.20	-1,532.97	2,502.73	2,476.56	26.17	95.626	
5,500.00	5,429.75	4,763.26	4,474.00	19.17	32.73	178.35	21.19	-1,533.78	2,504.11	2,477.92	26.19	95.608	
5,600.00	5,528.39	4,848.17	4,552.47	19.46	33.42	178.37	20.95	-1,566.20	2,556.91	2,530.00	26.92	94.989	
5,700.00	5,627.54	4,934.87	4,632.60	19.72	34.12	178.38	20.70	-1,599.31	2,606.73	2,579.11	27.62	94.379	
5,800.00	5,727.09	5,023.25	4,714.29	19.93	34.84	178.39	20.44	-1,633.06	2,653.48	2,625.19	28.29	93.780	
5,900.00	5,826.90	5,113.21	4,797.43	20.11	35.57	178.40	20.18	-1,667.42	2,697.13	2,668.19	28.94	93.192	
6,000.00	5,926.87	5,455.47	5,118.01	20.25	37.70	178.34	19.28	-1,786.85	2,737.07	2,706.82	30.25	90.494	
6,022.13	5,949.00	5,945.12	5,595.84	20.28	39.48	-88.68	18.49	-1,891.03	2,741.89	2,710.46	31.42	87.263	
6,100.00	6,026.87	6,377.18	6,026.87	20.38	40.06	-88.70	18.31	-1,914.92	2,742.92	2,710.69	32.23	85.112	
6,200.00	6,126.87	6,477.18	6,126.87	20.52	40.13	-88.70	18.31	-1,914.92	2,742.92	2,710.37	32.55	84.263	
6,300.00	6,226.87	6,577.18	6,226.87	20.66	40.21	-88.70	18.31	-1,914.92	2,742.92	2,710.04	32.88	83.423	
6,400.00	6,326.87	6,677.18	6,326.87	20.80	40.28	-88.70	18.31	-1,914.92	2,742.92	2,709.71	33.21	82.593	
6,500.00	6,426.87	6,777.18	6,426.87	20.94	40.35	-88.70	18.31	-1,914.92	2,742.92	2,709.38	33.54	81.774	
6,600.00	6,526.87	6,877.18	6,526.87	21.08	40.43	-88.70	18.31	-1,914.92	2,742.92	2,709.04	33.88	80.964	
6,700.00	6,626.87	6,977.18	6,626.87	21.22	40.51	-88.70	18.31	-1,914.92	2,742.92	2,708.70	34.22	80.164	
6,800.00	6,726.87	7,077.18	6,726.87	21.37	40.58	-88.70	18.31	-1,914.92	2,742.92	2,708.36	34.56	79.374	
6,900.00	6,826.87	7,177.18	6,826.87	21.52	40.66	-88.70	18.31	-1,914.92	2,742.92	2,708.02	34.90	78.594	
7,000.00	6,926.87	7,277.18	6,926.87	21.67	40.74	-88.70	18.31	-1,914.92	2,742.92	2,707.67	35.24	77.825	
7,100.00	7,026.87	7,377.18	7,026.87	21.82	40.83	-88.70	18.31	-1,914.92	2,742.92	2,707.33	35.59	77.065	
7,200.00	7,126.87	7,477.18	7,126.87	21.97	40.91	-88.70	18.31	-1,914.92	2,742.92	2,706.98	35.94	76.316	
7,300.00	7,226.87	7,577.18	7,226.87	22.12	40.99	-88.70	18.31	-1,914.92	2,742.92	2,706.63	36.29	75.577	
7,400.00	7,326.87	7,677.18	7,326.87	22.27	41.08	-88.70	18.31	-1,914.92	2,742.92	2,706.27	36.65	74.848	
7,500.00	7,426.87	7,777.18	7,426.87	22.43	41.16	-88.70	18.31	-1,914.92	2,742.92	2,705.92	37.00	74.128	
7,600.00	7,526.87	7,877.18	7,526.87	22.58	41.25	-88.70	18.31	-1,914.92	2,742.92	2,705.56	37.36	73.419	
7,700.00	7,626.87	7,977.18	7,626.87	22.74	41.34	-88.70	18.31	-1,914.92	2,742.92	2,705.20	37.72	72.720	
7,800.00	7,726.87	8,077.18	7,726.87	22.90	41.42	-88.70	18.31	-1,914.92	2,742.92	2,704.84	38.08	72.030	
7,900.00	7,826.87	8,177.18	7,826.87	23.06	41.51	-88.70	18.31	-1,914.92	2,742.92	2,704.48	38.44	71.350	
7,953.13	7,880.00	8,230.31	7,880.00	23.14	41.56	-88.70	18.31	-1,914.92	2,742.92	2,704.28	38.64	70.992	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 4-1 - P_BERNHARDT 4-1 - PLAN #1 11-04-01													Offset Site Error: 0.00 ft
Survey Program: 0-MWD													Offset Well Error: 0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Tooface (")	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-3.37	47.36	-2.79	47.44				
100.00	100.00	100.00	100.00	0.10	0.10	-3.37	47.36	-2.79	47.44	47.25	0.19	248.332	
200.00	200.00	200.00	200.00	0.32	0.32	-3.37	47.36	-2.79	47.44	46.80	0.64	74.064	
300.00	300.00	300.00	300.00	0.55	0.55	-3.37	47.36	-2.79	47.44	46.35	1.09	43.522	
400.00	400.00	400.00	400.00	0.77	0.77	-3.37	47.36	-2.79	47.44	45.90	1.54	30.815	
500.00	500.00	500.00	500.00	0.99	0.99	-3.37	47.36	-2.79	47.44	45.46	1.99	23.851	
600.00	600.00	600.00	600.00	1.22	1.22	-3.37	47.36	-2.79	47.44	45.01	2.44	19.455	
700.00	700.00	700.00	700.00	1.44	1.44	-3.37	47.36	-2.79	47.44	44.56	2.89	16.427	
800.00	800.00	800.00	800.00	1.67	1.67	-3.37	47.36	-2.79	47.44	44.11	3.34	14.214	
900.00	900.00	900.00	900.00	1.89	1.89	-3.37	47.36	-2.79	47.44	43.66	3.79	12.527	
950.00	950.00	950.00	950.00	2.01	2.01	-3.37	47.36	-2.79	47.44	43.43	4.01	11.825 CC, ES	
1,000.00	1,000.00	999.58	999.57	2.11	2.11	-97.37	47.55	-3.17	47.72	43.49	4.22	11.294	
1,100.00	1,099.93	1,098.38	1,098.32	2.31	2.32	-104.56	49.08	-6.22	50.35	45.71	4.64	10.862 SF	
1,200.00	1,199.68	1,196.17	1,195.87	2.52	2.54	-116.37	52.10	-12.24	57.65	52.60	5.05	11.406	
1,300.00	1,299.13	1,292.30	1,291.48	2.76	2.77	-128.57	56.51	-21.05	71.95	66.48	5.47	13.149	
1,400.00	1,398.15	1,386.15	1,384.47	3.01	3.01	-138.36	62.20	-32.42	94.17	88.29	5.88	16.021	
1,474.67	1,471.74	1,454.43	1,451.83	3.23	3.21	-143.81	67.20	-42.39	115.77	109.60	6.17	18.751	
1,500.00	1,496.65	1,477.24	1,474.27	3.31	3.28	-145.41	69.03	-46.05	123.94	117.66	6.28	19.738	
1,600.00	1,594.98	1,565.97	1,561.23	3.63	3.57	-150.15	76.90	-61.77	158.67	151.97	6.70	23.691	
1,700.00	1,693.30	1,652.54	1,645.51	3.97	3.89	-153.21	85.74	-79.42	196.92	189.80	7.12	27.654	
1,800.00	1,791.63	1,736.87	1,727.01	4.32	4.25	-155.28	95.45	-98.81	238.26	230.71	7.55	31.569	
1,900.00	1,889.96	1,818.91	1,805.65	4.68	4.63	-156.72	105.92	-119.71	282.42	274.45	7.98	35.410	
2,000.00	1,988.29	1,900.00	1,882.68	5.05	5.06	-157.76	117.25	-142.34	329.22	320.81	8.41	39.150	
2,100.00	2,086.61	1,977.90	1,956.00	5.43	5.51	-158.51	129.04	-165.87	378.45	369.60	8.84	42.791	
2,200.00	2,184.94	2,064.39	2,037.15	5.81	6.04	-159.16	142.43	-192.61	428.49	419.18	9.31	46.040	
2,300.00	2,283.27	2,150.87	2,118.31	6.19	6.59	-159.67	155.82	-219.35	478.57	468.79	9.77	48.960	
2,400.00	2,381.60	2,237.36	2,199.46	6.58	7.15	-160.08	169.22	-246.10	528.67	518.42	10.25	51.586	
2,500.00	2,479.92	2,323.85	2,280.61	6.97	7.72	-160.42	182.61	-272.84	578.78	568.05	10.73	53.957	
2,600.00	2,578.25	2,410.34	2,361.76	7.37	8.30	-160.71	196.00	-299.58	628.91	617.70	11.21	56.105	
2,700.00	2,676.58	2,496.83	2,442.92	7.76	8.88	-160.95	209.39	-326.32	679.05	667.35	11.70	58.055	
2,800.00	2,774.91	2,583.32	2,524.07	8.16	9.47	-161.16	222.79	-353.06	729.20	717.01	12.19	59.830	
2,900.00	2,873.23	2,669.81	2,605.22	8.56	10.06	-161.35	236.18	-379.80	779.35	766.67	12.68	61.455	
3,000.00	2,971.56	2,756.29	2,686.38	8.96	10.66	-161.51	249.57	-406.55	829.51	816.33	13.18	62.946	
3,100.00	3,069.89	2,842.78	2,767.53	9.37	11.26	-161.65	262.96	-433.29	879.67	865.99	13.68	64.317	
3,200.00	3,168.22	2,929.27	2,848.68	9.77	11.86	-161.78	276.36	-460.03	929.84	915.66	14.18	65.583	
3,300.00	3,266.54	3,015.76	2,929.83	10.17	12.47	-161.89	289.75	-486.77	980.01	965.33	14.68	66.754	
3,400.00	3,364.87	3,102.25	3,010.99	10.58	13.08	-162.00	303.14	-513.51	1,030.18	1,014.99	15.19	67.840	
3,500.00	3,463.20	3,188.74	3,092.14	10.98	13.68	-162.09	316.53	-540.25	1,080.35	1,064.66	15.69	68.848	
3,600.00	3,561.53	3,275.22	3,173.29	11.39	14.29	-162.18	329.93	-567.00	1,130.53	1,114.33	16.20	69.787	
3,700.00	3,659.86	3,361.71	3,254.44	11.80	14.91	-162.26	343.32	-593.74	1,180.71	1,164.00	16.71	70.663	
3,800.00	3,758.18	3,448.20	3,335.60	12.20	15.52	-162.33	356.71	-620.48	1,230.89	1,213.67	17.22	71.483	
3,900.00	3,856.51	3,534.69	3,416.75	12.61	16.13	-162.39	370.11	-647.22	1,281.07	1,263.34	17.73	72.252	
4,000.00	3,954.84	3,621.18	3,497.90	13.02	16.74	-162.46	383.50	-673.96	1,331.25	1,313.01	18.24	72.974	
4,100.00	4,053.17	3,707.67	3,579.06	13.43	17.36	-162.51	396.89	-700.70	1,381.44	1,362.68	18.76	73.653	
4,200.00	4,151.49	3,794.16	3,660.21	13.84	17.97	-162.56	410.28	-727.45	1,431.62	1,412.35	19.27	74.292	
4,300.00	4,249.82	3,880.64	3,741.36	14.25	18.59	-162.61	423.68	-754.19	1,481.81	1,462.02	19.79	74.895	
4,400.00	4,348.15	3,967.13	3,822.51	14.66	19.21	-162.66	437.07	-780.93	1,531.99	1,511.69	20.30	75.465	
4,500.00	4,446.48	4,053.62	3,903.67	15.07	19.82	-162.70	450.46	-807.67	1,582.18	1,561.36	20.82	76.004	
4,600.00	4,544.80	4,140.11	3,984.82	15.48	20.44	-162.74	463.85	-834.41	1,632.37	1,611.03	21.33	76.516	
4,700.00	4,643.13	4,226.60	4,065.97	15.89	21.06	-162.78	477.25	-861.15	1,682.56	1,660.70	21.85	77.001	
4,800.00	4,741.46	4,313.09	4,147.13	16.30	21.68	-162.82	490.64	-887.90	1,732.74	1,710.38	22.37	77.462	
4,900.00	4,839.79	4,399.57	4,228.28	16.71	22.30	-162.85	504.03	-914.64	1,782.93	1,760.05	22.89	77.900	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT 4-1 - P_BERNHARDT 4-1 - PLAN #1 11-04-01												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.00	4,938.11	4,486.06	4,309.43	17.12	22.92	-162.88	517.42	-941.38	1,833.12	1,809.72	23.41	78.317	
5,100.00	5,036.44	4,572.55	4,390.58	17.53	23.54	-162.91	530.82	-968.12	1,883.31	1,859.39	23.93	78.715	
5,200.00	5,134.77	4,659.04	4,471.74	17.94	24.16	-162.94	544.21	-994.86	1,933.50	1,909.06	24.45	79.094	
5,300.00	5,233.10	4,745.53	4,552.89	18.35	24.78	-162.97	557.60	-1,021.60	1,983.69	1,958.73	24.97	79.457	
5,400.00	5,331.42	4,832.02	4,634.04	18.76	25.40	-163.00	571.00	-1,048.35	2,033.88	2,008.40	25.49	79.804	
5,497.46	5,427.26	4,916.31	4,713.14	19.16	26.00	-163.02	584.05	-1,074.41	2,082.80	2,056.81	25.99	80.128	
5,500.00	5,429.75	4,918.51	4,715.20	19.17	26.02	-163.03	584.39	-1,075.09	2,084.08	2,058.06	26.01	80.121	
5,600.00	5,528.39	5,005.86	4,797.16	19.46	26.64	-163.36	597.91	-1,102.10	2,132.74	2,106.05	26.69	79.907	
5,700.00	5,627.54	5,094.79	4,880.60	19.72	27.28	-163.63	611.69	-1,129.59	2,178.45	2,151.11	27.34	79.669	
5,800.00	5,727.09	5,185.19	4,965.42	19.93	27.93	-163.84	625.68	-1,157.54	2,221.17	2,193.20	27.97	79.414	
5,900.00	5,826.90	5,276.52	5,042.39	20.11	28.52	-163.86	639.97	-1,185.99	2,268.37	2,239.29	28.58	79.166	
6,000.00	5,926.87	5,373.05	5,140.71	20.25	31.01	-163.78	703.40	-1,312.73	2,278.99	2,248.63	30.36	75.067	
6,022.13	5,949.00	6,037.73	5,795.00	20.28	31.20	-70.72	707.45	-1,320.81	2,280.96	2,250.36	30.60	74.533	
6,100.00	6,026.87	6,269.75	6,026.87	20.38	31.47	-70.70	710.42	-1,326.75	2,282.35	2,251.25	31.10	73.379	
6,200.00	6,126.87	6,369.75	6,126.87	20.52	31.56	-70.70	710.42	-1,326.75	2,282.35	2,250.91	31.44	72.584	
6,300.00	6,226.87	6,469.75	6,226.87	20.66	31.66	-70.70	710.42	-1,326.75	2,282.35	2,250.56	31.79	71.794	
6,400.00	6,326.87	6,569.75	6,326.87	20.80	31.75	-70.70	710.42	-1,326.75	2,282.35	2,250.21	32.14	71.016	
6,500.00	6,426.87	6,669.75	6,426.87	20.94	31.85	-70.70	710.42	-1,326.75	2,282.35	2,249.86	32.49	70.250	
6,600.00	6,526.87	6,769.75	6,526.87	21.08	31.95	-70.70	710.42	-1,326.75	2,282.35	2,249.51	32.84	69.494	
6,700.00	6,626.87	6,869.75	6,626.87	21.22	32.05	-70.70	710.42	-1,326.75	2,282.35	2,249.15	33.20	68.750	
6,800.00	6,726.87	6,969.75	6,726.87	21.37	32.15	-70.70	710.42	-1,326.75	2,282.35	2,248.79	33.56	68.017	
6,900.00	6,826.87	7,069.75	6,826.87	21.52	32.25	-70.70	710.42	-1,326.75	2,282.35	2,248.43	33.92	67.296	
7,000.00	6,926.87	7,169.75	6,926.87	21.67	32.35	-70.70	710.42	-1,326.75	2,282.35	2,248.07	34.28	66.585	
7,100.00	7,026.87	7,269.75	7,026.87	21.82	32.46	-70.70	710.42	-1,326.75	2,282.35	2,247.71	34.64	65.885	
7,200.00	7,126.87	7,369.75	7,126.87	21.97	32.56	-70.70	710.42	-1,326.75	2,282.35	2,247.34	35.01	65.197	
7,300.00	7,226.87	7,469.75	7,226.87	22.12	32.67	-70.70	710.42	-1,326.75	2,282.35	2,246.97	35.37	64.519	
7,400.00	7,326.87	7,569.75	7,326.87	22.27	32.77	-70.70	710.42	-1,326.75	2,282.35	2,246.60	35.74	63.851	
7,500.00	7,426.87	7,669.75	7,426.87	22.43	32.88	-70.70	710.42	-1,326.75	2,282.35	2,246.23	36.12	63.195	
7,600.00	7,526.87	7,769.75	7,526.87	22.58	32.99	-70.70	710.42	-1,326.75	2,282.35	2,245.86	36.49	62.548	
7,700.00	7,626.87	7,869.75	7,626.87	22.74	33.10	-70.70	710.42	-1,326.75	2,282.35	2,245.48	36.86	61.912	
7,800.00	7,726.87	7,969.75	7,726.87	22.90	33.22	-70.70	710.42	-1,326.75	2,282.35	2,245.11	37.24	61.286	
7,900.00	7,826.87	8,069.75	7,826.87	23.06	33.33	-70.70	710.42	-1,326.75	2,282.35	2,244.73	37.62	60.670	
7,953.13	7,880.00	8,122.88	7,880.00	23.14	33.39	-70.70	710.42	-1,326.75	2,282.35	2,244.53	37.82	60.347	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	-2.43	65.58	-2.79	65.64				
100.00	100.00	100.00	100.00	0.10	0.10	-2.43	65.58	-2.79	65.64	65.45	0.19	343.552	
200.00	200.00	200.00	200.00	0.32	0.32	-2.43	65.58	-2.79	65.64	65.00	0.64	102.463 CC, ES	
300.00	300.00	298.41	298.39	0.55	0.54	-1.38	66.79	-1.61	66.83	65.75	1.08	61.698	
400.00	400.00	396.58	396.43	0.77	0.76	1.54	70.43	1.89	70.54	69.01	1.53	46.135	
500.00	500.00	494.30	493.78	0.99	1.01	5.75	76.44	7.70	77.08	75.09	1.99	38.747	
600.00	600.00	591.33	590.11	1.22	1.28	10.52	84.78	15.75	86.79	84.32	2.48	35.056	
700.00	700.00	687.47	685.12	1.44	1.59	15.22	95.34	25.95	99.93	96.93	3.00	33.299	
800.00	800.00	782.51	778.50	1.67	1.94	19.47	108.04	38.20	116.59	113.02	3.57	32.625	
900.00	900.00	876.27	870.00	1.89	2.34	23.11	122.74	52.39	136.78	132.59	4.20	32.579 SF	
950.00	950.00	922.61	914.97	2.01	2.55	24.70	130.80	60.17	148.18	143.65	4.53	32.711	
1,000.00	1,000.00	968.64	959.46	2.11	2.78	-66.81	139.32	68.40	160.25	155.92	4.33	37.032	
1,100.00	1,099.93	1,059.93	1,047.07	2.31	3.26	-64.76	157.74	86.18	185.76	180.98	4.79	38.818	
1,200.00	1,199.68	1,150.12	1,132.80	2.52	3.79	-63.69	177.90	105.64	212.85	207.59	5.27	40.409	
1,300.00	1,299.13	1,239.16	1,216.52	2.76	4.37	-63.25	199.70	126.68	241.37	235.59	5.78	41.758	
1,400.00	1,398.15	1,326.99	1,298.14	3.01	4.98	-63.25	223.02	149.19	271.24	264.91	6.33	42.846	
1,474.67	1,471.74	1,396.44	1,362.15	3.23	5.49	-63.52	242.42	167.91	294.00	287.21	6.79	43.284	
1,500.00	1,496.65	1,420.56	1,384.37	3.31	5.67	-63.79	249.17	174.43	301.61	294.65	6.96	43.330	
1,600.00	1,594.98	1,515.79	1,472.10	3.63	6.38	-64.75	275.82	200.15	331.71	324.07	7.64	43.403	
1,700.00	1,693.30	1,611.02	1,559.84	3.97	7.10	-65.55	302.46	225.87	361.88	353.53	8.35	43.336	
1,800.00	1,791.63	1,706.25	1,647.57	4.32	7.83	-66.22	329.10	251.58	392.11	383.03	9.08	43.185	
1,900.00	1,889.96	1,801.47	1,735.30	4.68	8.55	-66.80	355.75	277.30	422.37	412.55	9.83	42.988	
2,000.00	1,988.29	1,896.70	1,823.04	5.05	9.28	-67.30	382.39	303.02	452.67	442.09	10.58	42.767	
2,100.00	2,086.61	1,991.93	1,910.77	5.43	10.01	-67.74	409.04	328.74	483.00	471.65	11.35	42.538	
2,200.00	2,184.94	2,087.16	1,998.50	5.81	10.75	-68.13	435.68	354.46	513.35	501.22	12.13	42.309	
2,300.00	2,283.27	2,182.39	2,086.24	6.19	11.48	-68.47	462.33	380.18	543.72	530.80	12.92	42.085	
2,400.00	2,381.60	2,277.62	2,173.97	6.58	12.22	-68.78	488.97	405.90	574.11	560.40	13.71	41.870	
2,500.00	2,479.92	2,372.85	2,261.70	6.97	12.95	-69.06	515.62	431.62	604.51	590.00	14.51	41.663	
2,600.00	2,578.25	2,468.08	2,349.44	7.37	13.69	-69.31	542.26	457.34	634.92	619.61	15.31	41.468	
2,700.00	2,676.58	2,563.31	2,437.17	7.76	14.43	-69.53	568.91	483.05	665.34	649.22	16.12	41.282	
2,800.00	2,774.91	2,658.54	2,524.90	8.16	15.16	-69.74	595.55	508.77	695.77	678.84	16.93	41.107	
2,900.00	2,873.23	2,753.76	2,612.64	8.56	15.90	-69.93	622.20	534.49	726.21	708.47	17.74	40.942	
3,000.00	2,971.56	2,848.99	2,700.37	8.96	16.64	-70.10	648.84	560.21	756.65	738.10	18.55	40.786	
3,100.00	3,069.89	2,944.22	2,788.10	9.37	17.38	-70.27	675.48	585.93	787.10	767.73	19.37	40.639	
3,200.00	3,168.22	3,039.45	2,875.84	9.77	18.12	-70.41	702.13	611.65	817.55	797.37	20.19	40.501	
3,300.00	3,266.54	3,134.68	2,963.57	10.17	18.86	-70.55	728.77	637.37	848.01	827.01	21.01	40.370	
3,400.00	3,364.87	3,229.91	3,051.30	10.58	19.60	-70.68	755.42	663.09	878.48	856.65	21.83	40.246	
3,500.00	3,463.20	3,325.14	3,139.04	10.98	20.34	-70.80	782.06	688.81	908.94	886.29	22.65	40.129	
3,600.00	3,561.53	3,420.37	3,226.77	11.39	21.08	-70.91	808.71	714.52	939.41	915.94	23.47	40.019	
3,700.00	3,659.86	3,515.60	3,314.51	11.80	21.82	-71.02	835.35	740.24	969.89	945.59	24.30	39.914	
3,800.00	3,758.18	3,610.82	3,402.24	12.20	22.56	-71.12	862.00	765.96	1,000.37	975.24	25.13	39.815	
3,900.00	3,856.51	3,706.05	3,489.97	12.61	23.30	-71.21	888.64	791.68	1,030.84	1,004.89	25.95	39.720	
4,000.00	3,954.84	3,801.28	3,577.71	13.02	24.04	-71.30	915.29	817.40	1,061.33	1,034.55	26.78	39.631	
4,100.00	4,053.17	3,896.51	3,665.44	13.43	24.78	-71.38	941.93	843.12	1,091.81	1,064.20	27.61	39.546	
4,200.00	4,151.49	3,991.74	3,753.17	13.84	25.52	-71.46	968.57	868.84	1,122.29	1,093.86	28.44	39.465	
4,300.00	4,249.82	4,086.97	3,840.91	14.25	26.26	-71.53	995.22	894.56	1,152.78	1,123.51	29.27	39.387	
4,400.00	4,348.15	4,182.20	3,928.64	14.66	27.00	-71.61	1,021.86	920.28	1,183.27	1,153.17	30.10	39.314	
4,500.00	4,446.48	4,277.43	4,016.37	15.07	27.74	-71.67	1,048.51	945.99	1,213.76	1,182.83	30.93	39.243	
4,600.00	4,544.80	4,372.66	4,104.11	15.48	28.48	-71.74	1,075.15	971.71	1,244.25	1,212.49	31.76	39.176	
4,700.00	4,643.13	4,467.89	4,191.84	15.89	29.22	-71.80	1,101.80	997.43	1,274.75	1,242.15	32.59	39.112	
4,800.00	4,741.46	4,563.11	4,279.57	16.30	29.96	-71.85	1,128.44	1,023.15	1,305.24	1,271.82	33.42	39.050	
4,900.00	4,839.79	4,658.34	4,367.31	16.71	30.70	-71.91	1,155.09	1,048.87	1,335.74	1,301.48	34.26	38.991	

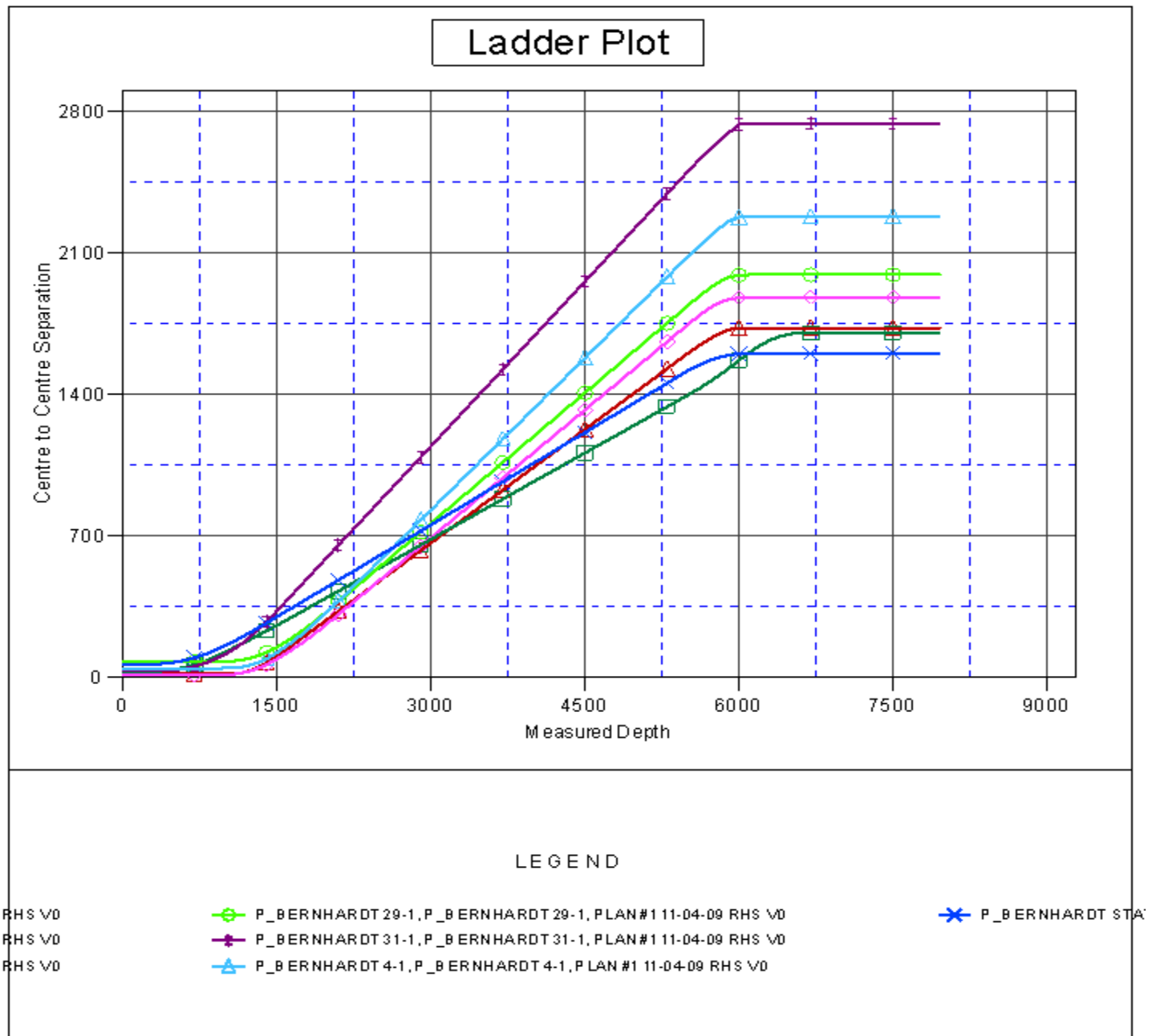
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_BERNHARDT 8 PAD 4N67W1 - P_BERNHARDT STATE 37-36 - P_BERNHARDT STATE 37-36												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.00	4,938.11	4,753.57	4,455.04	17.12	31.44	-71.96	1,181.73	1,074.59	1,366.23	1,331.14	35.09	38.935	
5,100.00	5,036.44	4,848.80	4,542.77	17.53	32.18	-72.01	1,208.38	1,100.31	1,396.73	1,360.81	35.92	38.881	
5,200.00	5,134.77	4,944.03	4,630.51	17.94	32.93	-72.06	1,235.02	1,126.03	1,427.23	1,390.47	36.76	38.829	
5,300.00	5,233.10	5,039.26	4,718.24	18.35	33.67	-72.11	1,261.67	1,151.75	1,457.73	1,420.14	37.59	38.778	
5,400.00	5,331.42	5,134.49	4,805.97	18.76	34.41	-72.15	1,288.31	1,177.46	1,488.23	1,449.81	38.43	38.730	
5,497.46	5,427.26	5,242.92	4,905.94	19.16	35.22	-72.20	1,318.53	1,206.63	1,517.87	1,478.58	39.30	38.628	
5,500.00	5,429.75	5,247.59	4,910.27	19.17	35.25	-72.22	1,319.80	1,207.86	1,518.62	1,479.29	39.33	38.616	
5,600.00	5,528.39	5,434.65	5,085.71	19.46	36.32	-72.84	1,366.42	1,252.86	1,545.70	1,505.29	40.41	38.251	
5,700.00	5,627.54	5,626.98	5,270.10	19.72	37.21	-73.31	1,405.66	1,290.74	1,567.95	1,526.62	41.34	37.931	
5,800.00	5,727.09	5,823.73	5,462.09	19.93	37.93	-73.64	1,436.50	1,320.51	1,585.15	1,543.04	42.11	37.643	
5,900.00	5,826.90	6,023.89	5,659.95	20.11	38.48	-73.83	1,458.07	1,341.33	1,597.11	1,554.39	42.71	37.392	
6,000.00	5,926.87	6,226.29	5,861.66	20.25	38.84	-73.89	1,469.73	1,352.58	1,603.68	1,560.54	43.13	37.178	
6,022.13	5,949.00	6,271.27	5,906.61	20.28	38.89	19.16	1,470.93	1,353.74	1,604.40	1,561.19	43.20	37.135	
6,100.00	6,026.87	6,391.54	6,026.87	20.38	38.99	19.18	1,471.80	1,354.58	1,604.94	1,561.51	43.43	36.956	
6,200.00	6,126.87	6,491.54	6,126.87	20.52	39.06	19.18	1,471.80	1,354.58	1,604.94	1,561.25	43.68	36.739	
6,300.00	6,226.87	6,591.54	6,226.87	20.66	39.13	19.18	1,471.80	1,354.58	1,604.94	1,560.99	43.94	36.522	
6,400.00	6,326.87	6,691.54	6,326.87	20.80	39.20	19.18	1,471.80	1,354.58	1,604.94	1,560.73	44.21	36.305	
6,500.00	6,426.87	6,791.54	6,426.87	20.94	39.28	19.18	1,471.80	1,354.58	1,604.94	1,560.47	44.47	36.088	
6,600.00	6,526.87	6,891.54	6,526.87	21.08	39.35	19.18	1,471.80	1,354.58	1,604.94	1,560.20	44.74	35.871	
6,700.00	6,626.87	6,991.54	6,626.87	21.22	39.43	19.18	1,471.80	1,354.58	1,604.94	1,559.93	45.01	35.654	
6,800.00	6,726.87	7,091.54	6,726.87	21.37	39.51	19.18	1,471.80	1,354.58	1,604.94	1,559.65	45.29	35.438	
6,900.00	6,826.87	7,191.54	6,826.87	21.52	39.59	19.18	1,471.80	1,354.58	1,604.94	1,559.37	45.57	35.222	
7,000.00	6,926.87	7,291.54	6,926.87	21.67	39.67	19.18	1,471.80	1,354.58	1,604.94	1,559.09	45.85	35.007	
7,100.00	7,026.87	7,391.54	7,026.87	21.82	39.75	19.18	1,471.80	1,354.58	1,604.94	1,558.81	46.13	34.793	
7,200.00	7,126.87	7,491.54	7,126.87	21.97	39.83	19.18	1,471.80	1,354.58	1,604.94	1,558.52	46.41	34.579	
7,300.00	7,226.87	7,591.54	7,226.87	22.12	39.92	19.18	1,471.80	1,354.58	1,604.94	1,558.24	46.70	34.365	
7,400.00	7,326.87	7,691.54	7,326.87	22.27	40.00	19.18	1,471.80	1,354.58	1,604.94	1,557.95	46.99	34.153	
7,500.00	7,426.87	7,791.54	7,426.87	22.43	40.09	19.18	1,471.80	1,354.58	1,604.94	1,557.65	47.29	33.941	
7,600.00	7,526.87	7,891.54	7,526.87	22.58	40.17	19.18	1,471.80	1,354.58	1,604.94	1,557.36	47.58	33.731	
7,700.00	7,626.87	7,991.54	7,626.87	22.74	40.26	19.18	1,471.80	1,354.58	1,604.94	1,557.06	47.88	33.521	
7,800.00	7,726.87	8,091.54	7,726.87	22.90	40.35	19.18	1,471.80	1,354.58	1,604.94	1,556.76	48.18	33.312	
7,900.00	7,826.87	8,191.54	7,826.87	23.06	40.44	19.18	1,471.80	1,354.58	1,604.94	1,556.46	48.48	33.104	
7,953.13	7,880.00	8,244.67	7,880.00	23.14	40.49	19.18	1,471.80	1,354.58	1,604.94	1,556.30	48.64	32.994	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

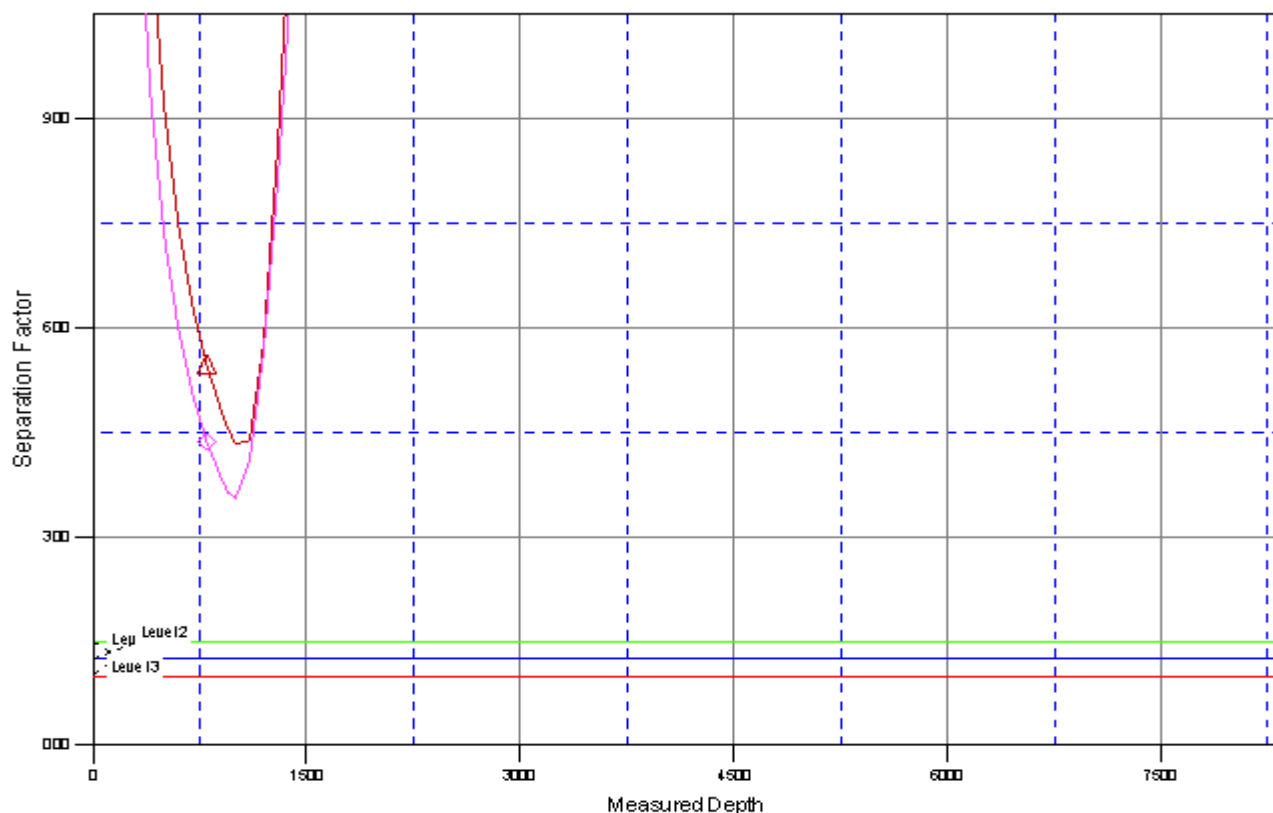
Reference Depths are relative to WELL @ 4840.00ft (Original Well Elev) Coordinates are relative to: P_BERNHARDT 21-1
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is 105° 30' 0.000 W ° Grid Convergence at Surface is: 0.43°







Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_BERNHARDT 21-1
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4840.00ft (Original Well Elev)
Reference Site:	WELD_BERNHARDT 8 PAD 4N67W1	MD Reference:	WELL @ 4840.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_BERNHARDT 21-1	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_BERNHARDT 21-1	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 1-13-10 RHS	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4840.00ft (Original Well Elev) Coordinates are relative to: P_BERNHARDT 21-1
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is 105° 30' 0.000 W ° Grid Convergence at Surface is: 0.43°

Separation Factor Plot



LEGEND

9 RHS V0	 P_BERNHARDT 29-1, P_BERNHARDT 29-1, PLAN #1 11-04-09 RHS V0	 P_BERNHARDT STA
9 RHS V0	 P_BERNHARDT 31-1, P_BERNHARDT 31-1, PLAN #1 11-04-09 RHS V0	
9 RHS V0	 P_BERNHARDT 4-1, P_BERNHARDT 4-1, PLAN #1 11-04-09 RHS V0	