



US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_COTTONWOOD 12-33 PAD

P_COTTONWOOD 12-33

P_COTTONWOOD 12-33

Plan: PLAN #1 2-19-10 RHS

Standard Planning Report

19 February, 2010





Project: COLORADO NORTHERN ZONE - 83
 Site: WELD_COTTONWOOD 12-33 PAD
 Well: P_COTTONWOOD 12-33
 Wellbore: P_COTTONWOOD 12-33
 Section: SECTION 33 T2N R66W
 SHL: 1794 FSL 875 FWL
 Design: PLAN #1 2-19-10 RHS
 Latitude: 40° 5' 32.237 N
 Longitude: 104° 47' 18.514 W
 GL: 4949.00
 KB: WELL @ 4964.00ft (Original Well Elev)



Weatherford®



Azimuths to True North
 Magnetic North: 9.03°
 Magnetic Field
 Strength: 53104.6snT
 Dip Angle: 66.84°
 Date: 2/19/2010
 Model: IGRF2010

FORMATION TOP DETAILS			
TVDPath	MDPath	Formation	
4164.00	4174.43	PARKMAN	
4670.00	4681.65	SUSSEX	
7156.00	7167.65	NIO A	
7476.00	7487.65	CODELL	
7566.00	7577.65	GRNHRN	
7940.00	7951.65	JSAND	

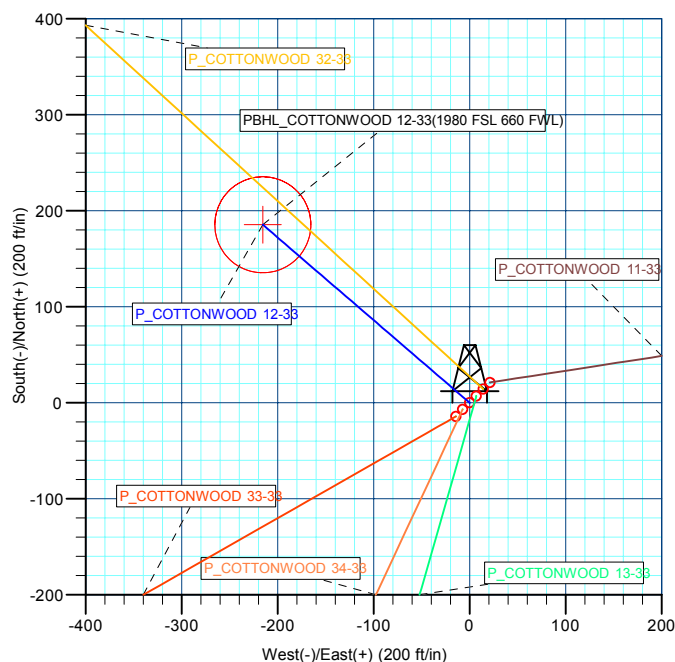
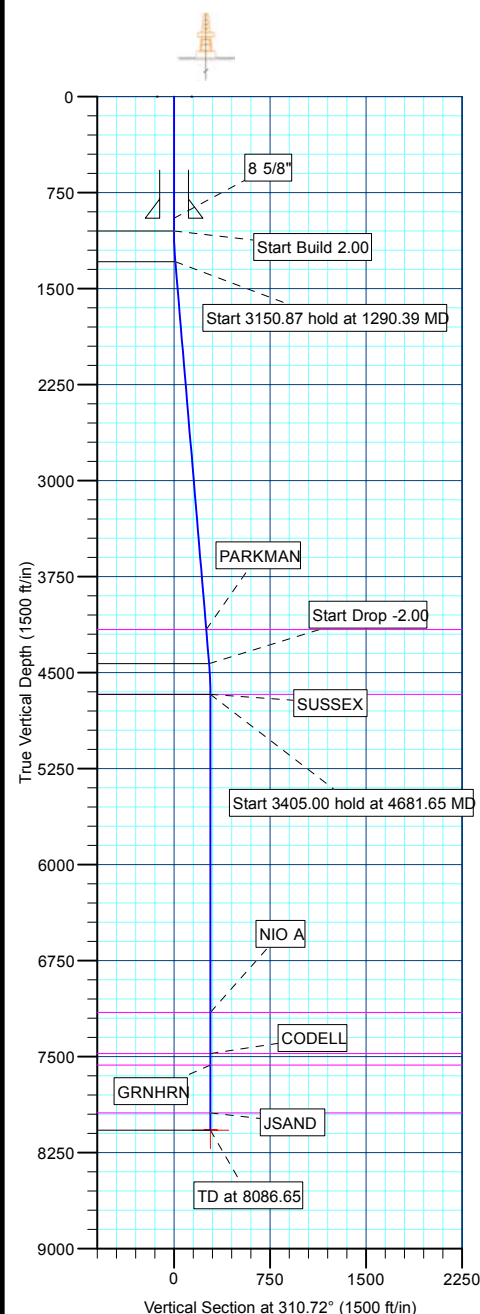
CASING DETAILS			
TVD	MD	Name	Size
950.00	950.00	8 5/8"	8.62

SECTION DETAILS										
MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Annotation	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
1050.00	0.00	0.00	1050.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00	
1290.39	4.81	310.72	1290.11	6.58	-7.64	2.00	310.72	10.08	Start 3150.87 hold at 1290.39 MD	
4441.26	4.81	310.72	4429.89	178.86	-207.79	0.00	0.00	274.16	Start Drop -2.00	
4681.65	0.00	0.00	4670.00	185.44	-215.43	2.00	180.00	284.24	Start 3405.00 hold at 4681.65 MD	
8086.65	0.00	0.00	8075.00	185.44	-215.43	0.00	0.00	284.24	TD at 8086.65	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)							
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape	
PBHL	8075.00	185.44	-215.43	40° 5' 34.069 N	104° 47' 21.286 W	Circle (Radius: 50.00)	

WELL DETAILS: P_COTTONWOOD 12-33						
+N/-S	+E/-W	Northing	Ground Level: Easting	4949.00 Latitude	Longitude	Slot
0.00	0.00	1277263.73	3199064.12	40° 5' 32.237 N	104° 47' 18.514 W	

LEGEND	
P_COTTONWOOD 11-33, P_COTTONWOOD 11-33, PLAN #1 2-19-10 RHS V0	
P_COTTONWOOD 13-33, P_COTTONWOOD 13-33, PLAN #1 2-19-10 RHS V0	
P_COTTONWOOD 32-33, P_COTTONWOOD 32-33, PLAN #1 2-19-10 RHS V0	
P_COTTONWOOD 33-33, P_COTTONWOOD 33-33, PLAN #1 2-19-10 RHS V0	
P_COTTONWOOD 34-33, P_COTTONWOOD 34-33, PLAN #1 2-19-10 RHS V0	
PLAN #1 2-19-10 RHS	



Plan: PLAN #1 2-19-10 RHS (P_COTTONWOOD 12-33 /P_COTTONWOOD 12-33)

Created By: Robert H. Scott Date: 10:12, February 19 2010

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 12-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 12-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 12-33		
Design:	PLAN #1 2-19-10 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_COTTONWOOD 12-33 PAD, SECTION 33 T2N R66W											
Site Position:			Northing:			1,277,285.05 ft			Latitude:			40° 5' 32.446 N					
From:			Lat/Long			Easting:			3,199,085.21 ft			Longitude:			104° 47' 18.240 W		
Position Uncertainty:			0.00 ft			Slot Radius:			in			Grid Convergence:			0.46 °		

Well	P_COTTONWOOD 12-33					
Well Position	+N/-S	-21.14 ft	Northing:	1,277,263.73 ft	Latitude:	40° 5' 32.237 N
	+E/-W	-21.26 ft	Easting:	3,199,064.12 ft	Longitude:	104° 47' 18.514 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,949.00 ft

Wellbore	P_COTTONWOOD 12-33				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/19/2010	9.03	66.84	53,105

Design	PLAN #1 2-19-10 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	310.72

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	
1,050.00	0.00	0.00	1,050.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,290.39	4.81	310.72	1,290.11	6.58	-7.64	2.00	2.00	0.00	310.72	
4,441.26	4.81	310.72	4,429.89	178.86	-207.79	0.00	0.00	0.00	0.00	
4,681.65	0.00	0.00	4,670.00	185.44	-215.43	2.00	-2.00	0.00	180.00	
8,086.65	0.00	0.00	8,075.00	185.44	-215.43	0.00	0.00	0.00	0.00	PBHL_COTTONW

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 12-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 12-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 12-33		
Design:	PLAN #1 2-19-10 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									
1,050.00	0.00	0.00	1,050.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	1.00	310.72	1,100.00	0.28	-0.33	0.44	2.00	2.00	0.00
1,200.00	3.00	310.72	1,199.93	2.56	-2.98	3.93	2.00	2.00	0.00
Start 3150.87 hold at 1290.39 MD									
1,290.39	4.81	310.72	1,290.11	6.58	-7.64	10.08	2.00	2.00	0.00
1,300.00	4.81	310.72	1,299.68	7.10	-8.25	10.89	0.00	0.00	0.00
1,400.00	4.81	310.72	1,399.33	12.57	-14.60	19.27	0.00	0.00	0.00
1,500.00	4.81	310.72	1,498.98	18.04	-20.95	27.65	0.00	0.00	0.00
1,600.00	4.81	310.72	1,598.63	23.50	-27.31	36.03	0.00	0.00	0.00
1,700.00	4.81	310.72	1,698.28	28.97	-33.66	44.41	0.00	0.00	0.00
1,800.00	4.81	310.72	1,797.92	34.44	-40.01	52.79	0.00	0.00	0.00
1,900.00	4.81	310.72	1,897.57	39.91	-46.36	61.17	0.00	0.00	0.00
2,000.00	4.81	310.72	1,997.22	45.38	-52.71	69.55	0.00	0.00	0.00
2,100.00	4.81	310.72	2,096.87	50.84	-59.07	77.94	0.00	0.00	0.00
2,200.00	4.81	310.72	2,196.52	56.31	-65.42	86.32	0.00	0.00	0.00
2,300.00	4.81	310.72	2,296.17	61.78	-71.77	94.70	0.00	0.00	0.00
2,400.00	4.81	310.72	2,395.81	67.25	-78.12	103.08	0.00	0.00	0.00
2,500.00	4.81	310.72	2,495.46	72.72	-84.48	111.46	0.00	0.00	0.00
2,600.00	4.81	310.72	2,595.11	78.18	-90.83	119.84	0.00	0.00	0.00
2,700.00	4.81	310.72	2,694.76	83.65	-97.18	128.22	0.00	0.00	0.00
2,800.00	4.81	310.72	2,794.41	89.12	-103.53	136.60	0.00	0.00	0.00
2,900.00	4.81	310.72	2,894.05	94.59	-109.88	144.99	0.00	0.00	0.00
3,000.00	4.81	310.72	2,993.70	100.05	-116.24	153.37	0.00	0.00	0.00
3,100.00	4.81	310.72	3,093.35	105.52	-122.59	161.75	0.00	0.00	0.00
3,200.00	4.81	310.72	3,193.00	110.99	-128.94	170.13	0.00	0.00	0.00
3,300.00	4.81	310.72	3,292.65	116.46	-135.29	178.51	0.00	0.00	0.00
3,400.00	4.81	310.72	3,392.30	121.93	-141.64	186.89	0.00	0.00	0.00
3,500.00	4.81	310.72	3,491.94	127.39	-148.00	195.27	0.00	0.00	0.00
3,600.00	4.81	310.72	3,591.59	132.86	-154.35	203.65	0.00	0.00	0.00
3,700.00	4.81	310.72	3,691.24	138.33	-160.70	212.04	0.00	0.00	0.00
3,800.00	4.81	310.72	3,790.89	143.80	-167.05	220.42	0.00	0.00	0.00
3,900.00	4.81	310.72	3,890.54	149.26	-173.40	228.80	0.00	0.00	0.00
4,000.00	4.81	310.72	3,990.18	154.73	-179.76	237.18	0.00	0.00	0.00
4,100.00	4.81	310.72	4,089.83	160.20	-186.11	245.56	0.00	0.00	0.00
PARKMAN									
4,174.43	4.81	310.72	4,164.00	164.27	-190.84	251.80	0.00	0.00	0.00
4,200.00	4.81	310.72	4,189.48	165.67	-192.46	253.94	0.00	0.00	0.00
4,300.00	4.81	310.72	4,289.13	171.14	-198.81	262.32	0.00	0.00	0.00
4,400.00	4.81	310.72	4,388.78	176.60	-205.16	270.71	0.00	0.00	0.00
Start Drop -2.00									
4,441.26	4.81	310.72	4,429.89	178.86	-207.79	274.16	0.00	0.00	0.00
4,500.00	3.63	310.72	4,488.47	181.68	-211.06	278.49	2.00	-2.00	0.00
4,600.00	1.63	310.72	4,588.36	184.68	-214.54	283.08	2.00	-2.00	0.00
Start 3405.00 hold at 4681.65 MD - SUSSEX									
4,681.65	0.00	0.00	4,670.00	185.44	-215.43	284.24	2.00	-2.00	0.00
4,700.00	0.00	0.00	4,688.35	185.44	-215.43	284.24	0.00	0.00	0.00
4,800.00	0.00	0.00	4,788.35	185.44	-215.43	284.24	0.00	0.00	0.00
4,900.00	0.00	0.00	4,888.35	185.44	-215.43	284.24	0.00	0.00	0.00
5,000.00	0.00	0.00	4,988.35	185.44	-215.43	284.24	0.00	0.00	0.00
5,100.00	0.00	0.00	5,088.35	185.44	-215.43	284.24	0.00	0.00	0.00
5,200.00	0.00	0.00	5,188.35	185.44	-215.43	284.24	0.00	0.00	0.00
5,300.00	0.00	0.00	5,288.35	185.44	-215.43	284.24	0.00	0.00	0.00

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 12-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 12-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 12-33		
Design:	PLAN #1 2-19-10 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)
5,400.00	0.00	0.00	5,388.35	185.44	-215.43	284.24	0.00	0.00	0.00
5,500.00	0.00	0.00	5,488.35	185.44	-215.43	284.24	0.00	0.00	0.00
5,600.00	0.00	0.00	5,588.35	185.44	-215.43	284.24	0.00	0.00	0.00
5,700.00	0.00	0.00	5,688.35	185.44	-215.43	284.24	0.00	0.00	0.00
5,800.00	0.00	0.00	5,788.35	185.44	-215.43	284.24	0.00	0.00	0.00
5,900.00	0.00	0.00	5,888.35	185.44	-215.43	284.24	0.00	0.00	0.00
6,000.00	0.00	0.00	5,988.35	185.44	-215.43	284.24	0.00	0.00	0.00
6,100.00	0.00	0.00	6,088.35	185.44	-215.43	284.24	0.00	0.00	0.00
6,200.00	0.00	0.00	6,188.35	185.44	-215.43	284.24	0.00	0.00	0.00
6,300.00	0.00	0.00	6,288.35	185.44	-215.43	284.24	0.00	0.00	0.00
6,400.00	0.00	0.00	6,388.35	185.44	-215.43	284.24	0.00	0.00	0.00
6,500.00	0.00	0.00	6,488.35	185.44	-215.43	284.24	0.00	0.00	0.00
6,600.00	0.00	0.00	6,588.35	185.44	-215.43	284.24	0.00	0.00	0.00
6,700.00	0.00	0.00	6,688.35	185.44	-215.43	284.24	0.00	0.00	0.00
6,800.00	0.00	0.00	6,788.35	185.44	-215.43	284.24	0.00	0.00	0.00
6,900.00	0.00	0.00	6,888.35	185.44	-215.43	284.24	0.00	0.00	0.00
7,000.00	0.00	0.00	6,988.35	185.44	-215.43	284.24	0.00	0.00	0.00
7,100.00	0.00	0.00	7,088.35	185.44	-215.43	284.24	0.00	0.00	0.00
NIO A									
7,167.65	0.00	0.00	7,156.00	185.44	-215.43	284.24	0.00	0.00	0.00
7,200.00	0.00	0.00	7,188.35	185.44	-215.43	284.24	0.00	0.00	0.00
7,300.00	0.00	0.00	7,288.35	185.44	-215.43	284.24	0.00	0.00	0.00
7,400.00	0.00	0.00	7,388.35	185.44	-215.43	284.24	0.00	0.00	0.00
CODELL									
7,487.65	0.00	0.00	7,476.00	185.44	-215.43	284.24	0.00	0.00	0.00
7,500.00	0.00	0.00	7,488.35	185.44	-215.43	284.24	0.00	0.00	0.00
GRNHRN									
7,577.65	0.00	0.00	7,566.00	185.44	-215.43	284.24	0.00	0.00	0.00
7,600.00	0.00	0.00	7,588.35	185.44	-215.43	284.24	0.00	0.00	0.00
7,700.00	0.00	0.00	7,688.35	185.44	-215.43	284.24	0.00	0.00	0.00
7,800.00	0.00	0.00	7,788.35	185.44	-215.43	284.24	0.00	0.00	0.00
7,900.00	0.00	0.00	7,888.35	185.44	-215.43	284.24	0.00	0.00	0.00
JSAND									
7,951.65	0.00	0.00	7,940.00	185.44	-215.43	284.24	0.00	0.00	0.00
8,000.00	0.00	0.00	7,988.35	185.44	-215.43	284.24	0.00	0.00	0.00
PBHL_COTTONWOOD 12-33(1980 FSL 660 FWL)									
8,086.65	0.00	0.00	8,075.00	185.44	-215.43	284.24	0.00	0.00	0.00

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL_COTTONWOC	0.00	0.00	8,075.00	185.44	-215.43	1,277,447.43	3,198,847.21	40° 5' 34.069 N	104° 47' 21.286 W
- plan hits target center									
- Circle (radius 50.00)									

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 12-33
Company:	US ROCKIES REGION PLANNING	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Project:	COLORADO NORTHERN ZONE - 83	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site:	WELD_COTTONWOOD 12-33 PAD	North Reference:	True
Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 12-33		
Design:	PLAN #1 2-19-10 RHS		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
950.00	950.00	8 5/8"	8.62	11.00	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,174.43	4,164.00	PARKMAN				
4,681.65	4,670.00	SUSSEX				
7,167.65	7,156.00	NIO A				
7,487.65	7,476.00	CODELL				
7,577.65	7,566.00	GRNHRN				
7,951.65	7,940.00	JSAND				

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,050.00	1,050.00	0.00	0.00	Start Build 2.00	
1,290.39	1,290.11	6.58	-7.64	Start 3150.87 hold at 1290.39 MD	
4,441.26	4,429.89	178.86	-207.79	Start Drop -2.00	
4,681.65	4,670.00	185.44	-215.43	Start 3405.00 hold at 4681.65 MD	
8,086.65	8,075.00	185.44	-215.43	TD at 8086.65	



US ROCKIES REGION PLANNING

**COLORADO NORTHERN ZONE - 83
WELD_COTTONWOOD 12-33 PAD
P_COTTONWOOD 12-33**

**P_COTTONWOOD 12-33
PLAN #1 2-19-10 RHS**

Anticollision Report

19 February, 2010



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 12-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 12-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Reference	PLAN #1 2-19-10 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 2/19/2010			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	8,086.65	PLAN #1 2-19-10 RHS (P_COTTONWOOD)	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
WELD_COTTONWOOD 12-33 PAD						
P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - F	300.00	300.00	29.99	28.90	27.508	CC, ES
P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - F	600.00	596.42	43.52	41.11	18.106	SF
P_COTTONWOOD 13-33 - P_COTTONWOOD 13-33 - F	521.49	521.71	4.83	2.80	2.378	CC, ES, SF
P_COTTONWOOD 32-3 - P_COTTONWOOD 32-33 - PL	1,050.00	1,050.00	20.14	15.68	4.514	CC
P_COTTONWOOD 32-3 - P_COTTONWOOD 32-33 - PL	1,400.00	1,400.06	20.73	14.70	3.434	ES
P_COTTONWOOD 32-3 - P_COTTONWOOD 32-33 - PL	1,500.00	1,499.77	22.01	15.47	3.366	SF
P_COTTONWOOD 33-33 - P_COTTONWOOD 33-33 - F	1,050.00	1,050.00	20.14	15.67	4.513	CC, ES
P_COTTONWOOD 33-33 - P_COTTONWOOD 33-33 - F	1,100.00	1,099.66	20.52	15.85	4.392	SF
P_COTTONWOOD 34-33 - P_COTTONWOOD 34-33 - F	300.00	300.00	10.04	8.95	9.211	CC, ES
P_COTTONWOOD 34-33 - P_COTTONWOOD 34-33 - F	400.00	399.63	11.68	10.16	7.712	SF

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - PLAN #1												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)	Offset Wellbore Centre +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	45.16	21.14	21.26	29.99				
100.00	100.00	100.00	100.00	0.10	0.10	45.16	21.14	21.26	29.99	29.80	0.19	156.958	
200.00	200.00	200.00	200.00	0.32	0.32	45.16	21.14	21.26	29.99	29.35	0.64	46.812	
300.00	300.00	300.00	300.00	0.55	0.55	45.16	21.14	21.26	29.99	28.90	1.09	27.508	CC, ES
400.00	400.00	399.12	399.10	0.77	0.76	47.00	21.41	22.96	31.40	29.88	1.53	20.566	
500.00	500.00	498.01	497.85	0.99	0.98	51.62	22.19	28.02	35.81	33.85	1.96	18.264	
600.00	600.00	596.42	595.89	1.22	1.22	57.17	23.49	36.40	43.52	41.11	2.40	18.106	SF
700.00	700.00	694.14	692.90	1.44	1.49	62.23	25.28	48.01	54.73	51.87	2.86	19.133	
800.00	800.00	790.94	788.54	1.67	1.79	66.28	27.56	62.73	69.47	66.13	3.34	20.811	
900.00	900.00	886.63	882.53	1.89	2.15	69.36	30.30	80.41	87.69	83.84	3.84	22.816	
1,000.00	1,000.00	981.00	974.61	2.12	2.54	71.65	33.46	100.88	109.27	104.89	4.38	24.951	
1,050.00	1,050.00	1,027.64	1,019.84	2.23	2.76	72.57	35.20	112.10	121.30	116.64	4.66	26.026	
1,100.00	1,100.00	1,073.82	1,064.44	2.34	2.99	122.57	37.03	123.92	134.36	129.68	4.68	28.706	
1,200.00	1,199.93	1,164.37	1,151.32	2.56	3.47	124.32	40.93	149.16	164.25	159.13	5.12	32.064	
1,290.39	1,290.11	1,248.28	1,231.31	2.76	3.95	126.08	44.80	174.17	194.87	189.34	5.53	35.244	
1,300.00	1,299.68	1,257.25	1,239.87	2.78	4.01	126.32	45.22	176.85	198.22	192.65	5.57	35.567	
1,400.00	1,399.33	1,350.60	1,328.85	3.02	4.56	128.42	49.53	204.72	233.31	227.27	6.04	38.627	

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_COTTONWOOD 12-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 12-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - PLAN #1												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)	Semi Major Axis Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning
							+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
1,500.00	1,498.98	1,443.95	1,417.84	3.25	5.12	129.97	53.84	232.59	268.61	262.09	6.52	41.216	
1,600.00	1,598.63	1,537.29	1,506.82	3.50	5.69	131.17	58.15	260.46	304.03	297.03	7.00	43.422	
1,700.00	1,698.28	1,630.64	1,595.81	3.75	6.26	132.11	62.46	288.33	339.55	332.06	7.49	45.316	
1,800.00	1,797.92	1,723.99	1,684.80	4.00	6.83	132.88	66.77	316.20	375.14	367.15	7.99	46.956	
1,900.00	1,897.57	1,817.34	1,773.78	4.25	7.41	133.51	71.09	344.07	410.77	402.28	8.49	48.385	
2,000.00	1,997.22	1,910.68	1,862.77	4.51	7.99	134.04	75.40	371.94	446.44	437.45	8.99	49.641	
2,100.00	2,096.87	2,004.03	1,951.75	4.76	8.57	134.50	79.71	399.81	482.14	472.64	9.50	50.752	
2,200.00	2,196.52	2,097.38	2,040.74	5.02	9.15	134.89	84.02	427.68	517.86	507.85	10.01	51.739	
2,300.00	2,296.17	2,190.73	2,129.73	5.28	9.74	135.23	88.33	455.55	553.60	543.08	10.52	52.623	
2,400.00	2,395.81	2,284.08	2,218.71	5.55	10.32	135.53	92.64	483.42	589.35	578.32	11.03	53.417	
2,500.00	2,495.46	2,377.42	2,307.70	5.81	10.90	135.79	96.96	511.29	625.12	613.57	11.55	54.135	
2,600.00	2,595.11	2,470.77	2,396.68	6.07	11.49	136.03	101.27	539.16	660.90	648.84	12.06	54.787	
2,700.00	2,694.76	2,564.12	2,485.67	6.34	12.07	136.24	105.58	567.03	696.68	684.11	12.58	55.380	
2,800.00	2,794.41	2,657.47	2,574.66	6.60	12.66	136.43	109.89	594.90	732.48	719.38	13.10	55.924	
2,900.00	2,894.05	2,750.82	2,663.64	6.87	13.24	136.61	114.20	622.77	768.28	754.66	13.62	56.422	
3,000.00	2,993.70	2,844.16	2,752.63	7.13	13.83	136.76	118.51	650.64	804.08	789.95	14.14	56.882	
3,100.00	3,093.35	2,937.51	2,841.61	7.40	14.42	136.91	122.83	678.51	839.90	825.24	14.66	57.306	
3,200.00	3,193.00	3,030.86	2,930.60	7.67	15.00	137.04	127.14	706.38	875.71	860.53	15.18	57.699	
3,300.00	3,292.65	3,124.21	3,019.59	7.93	15.59	137.16	131.45	734.25	911.53	895.83	15.70	58.064	
3,400.00	3,392.30	3,217.56	3,108.57	8.20	16.18	137.28	135.76	762.12	947.35	931.13	16.22	58.404	
3,500.00	3,491.94	3,310.90	3,197.56	8.47	16.76	137.38	140.07	789.99	983.18	966.43	16.74	58.721	
3,600.00	3,591.59	3,404.25	3,286.54	8.74	17.35	137.48	144.38	817.86	1,019.00	1,001.74	17.27	59.018	
3,700.00	3,691.24	3,497.60	3,375.53	9.01	17.94	137.57	148.70	845.73	1,054.83	1,037.05	17.79	59.296	
3,800.00	3,790.89	3,590.95	3,464.52	9.27	18.53	137.65	153.01	873.60	1,090.67	1,072.35	18.31	59.558	
3,900.00	3,890.54	3,684.30	3,553.50	9.54	19.12	137.73	157.32	901.47	1,126.50	1,107.67	18.84	59.804	
4,000.00	3,990.18	3,777.64	3,642.49	9.81	19.70	137.81	161.63	929.34	1,162.34	1,142.98	19.36	60.035	
4,100.00	4,089.83	3,870.99	3,731.47	10.08	20.29	137.88	165.94	957.21	1,198.18	1,178.29	19.89	60.254	
4,200.00	4,189.48	3,966.25	3,851.17	10.35	21.01	137.97	171.59	993.68	1,233.46	1,212.97	20.49	60.201	
4,300.00	4,289.13	4,163.63	4,013.26	10.62	21.71	138.14	177.95	1,034.85	1,264.15	1,243.00	21.15	59.773	
4,400.00	4,388.78	4,336.76	4,183.18	10.89	22.29	138.37	183.01	1,067.51	1,289.20	1,267.41	21.79	59.164	
4,441.26	4,429.89	4,409.64	4,255.24	11.00	22.49	138.49	184.66	1,078.22	1,297.82	1,275.78	22.05	58.864	
4,500.00	4,488.47	4,514.77	4,359.63	11.14	22.74	138.77	186.56	1,090.46	1,307.90	1,285.44	22.45	58.254	
4,600.00	4,588.36	4,696.68	4,541.10	11.32	23.05	139.06	188.45	1,102.68	1,318.08	1,295.02	23.05	57.176	
4,681.65	4,670.00	4,825.61	4,670.00	11.46	23.18	89.86	188.74	1,104.54	1,319.97	1,296.51	23.46	56.268	
4,700.00	4,688.35	4,843.96	4,688.35	11.49	23.19	89.86	188.74	1,104.54	1,319.97	1,296.45	23.52	56.118	
4,800.00	4,788.35	4,943.96	4,788.35	11.69	23.28	89.86	188.74	1,104.54	1,319.97	1,296.09	23.88	55.266	
4,900.00	4,888.35	5,043.96	4,888.35	11.88	23.38	89.86	188.74	1,104.54	1,319.97	1,295.72	24.25	54.430	
5,000.00	4,988.35	5,143.96	4,988.35	12.08	23.48	89.86	188.74	1,104.54	1,319.97	1,295.35	24.62	53.614	
5,100.00	5,088.35	5,243.96	5,088.35	12.28	23.58	89.86	188.74	1,104.54	1,319.97	1,294.98	24.99	52.816	
5,200.00	5,188.35	5,343.96	5,188.35	12.48	23.68	89.86	188.74	1,104.54	1,319.97	1,294.61	25.37	52.037	
5,300.00	5,288.35	5,443.96	5,288.35	12.68	23.78	89.86	188.74	1,104.54	1,319.97	1,294.23	25.74	51.276	
5,400.00	5,388.35	5,543.96	5,388.35	12.89	23.89	89.86	188.74	1,104.54	1,319.97	1,293.85	26.12	50.533	
5,500.00	5,488.35	5,643.96	5,488.35	13.09	24.00	89.86	188.74	1,104.54	1,319.97	1,293.47	26.50	49.807	
5,600.00	5,588.35	5,743.96	5,588.35	13.29	24.11	89.86	188.74	1,104.54	1,319.97	1,293.09	26.88	49.098	
5,700.00	5,688.35	5,843.96	5,688.35	13.49	24.22	89.86	188.74	1,104.54	1,319.97	1,292.70	27.27	48.406	
5,800.00	5,788.35	5,943.96	5,788.35	13.70	24.33	89.86	188.74	1,104.54	1,319.97	1,292.32	27.66	47.729	
5,900.00	5,888.35	6,043.96	5,888.35	13.90	24.44	89.86	188.74	1,104.54	1,319.97	1,291.93	28.04	47.068	
6,000.00	5,988.35	6,143.96	5,988.35	14.11	24.56	89.86	188.74	1,104.54	1,319.97	1,291.54	28.43	46.423	
6,100.00	6,088.35	6,243.96	6,088.35	14.32	24.67	89.86	188.74	1,104.54	1,319.97	1,291.15	28.83	45.792	
6,200.00	6,188.35	6,343.96	6,188.35	14.52	24.79	89.86	188.74	1,104.54	1,319.97	1,290.75	29.22	45.176	
6,300.00	6,288.35	6,443.96	6,288.35	14.73	24.91	89.86	188.74	1,104.54	1,319.97	1,290.36	29.61	44.574	
6,400.00	6,388.35	6,543.96	6,388.35	14.94	25.03	89.86	188.74	1,104.54	1,319.97	1,289.96	30.01	43.985	

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_COTTONWOOD 12-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 12-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - PLAN #1													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		
6,500.00	6,488.35	6,643.96	6,488.35	15.15	25.15	89.86	188.74	1,104.54	1,319.97	1,289.57	30.41	43.410		
6,600.00	6,588.35	6,743.96	6,588.35	15.36	25.28	89.86	188.74	1,104.54	1,319.97	1,289.17	30.81	42.847		
6,700.00	6,688.35	6,843.96	6,688.35	15.57	25.40	89.86	188.74	1,104.54	1,319.97	1,288.77	31.21	42.298		
6,800.00	6,788.35	6,943.96	6,788.35	15.78	25.53	89.86	188.74	1,104.54	1,319.97	1,288.36	31.61	41.760		
6,900.00	6,888.35	7,043.96	6,888.35	15.99	25.66	89.86	188.74	1,104.54	1,319.97	1,287.96	32.01	41.235		
7,000.00	6,988.35	7,143.96	6,988.35	16.20	25.79	89.86	188.74	1,104.54	1,319.97	1,287.56	32.42	40.721		
7,100.00	7,088.35	7,243.96	7,088.35	16.41	25.92	89.86	188.74	1,104.54	1,319.97	1,287.15	32.82	40.218		
7,200.00	7,188.35	7,343.96	7,188.35	16.62	26.05	89.86	188.74	1,104.54	1,319.97	1,286.75	33.23	39.726		
7,300.00	7,288.35	7,443.96	7,288.35	16.83	26.18	89.86	188.74	1,104.54	1,319.97	1,286.34	33.63	39.245		
7,400.00	7,388.35	7,543.96	7,388.35	17.04	26.31	89.86	188.74	1,104.54	1,319.97	1,285.93	34.04	38.774		
7,500.00	7,488.35	7,643.96	7,488.35	17.25	26.45	89.86	188.74	1,104.54	1,319.97	1,285.52	34.45	38.314		
7,600.00	7,588.35	7,743.96	7,588.35	17.47	26.59	89.86	188.74	1,104.54	1,319.97	1,285.11	34.86	37.863		
7,700.00	7,688.35	7,843.96	7,688.35	17.68	26.72	89.86	188.74	1,104.54	1,319.97	1,284.70	35.27	37.421		
7,800.00	7,788.35	7,943.96	7,788.35	17.89	26.86	89.86	188.74	1,104.54	1,319.97	1,284.29	35.69	36.989		
7,900.00	7,888.35	8,043.96	7,888.35	18.11	27.00	89.86	188.74	1,104.54	1,319.97	1,283.87	36.10	36.566		
8,000.00	7,988.35	8,143.96	7,988.35	18.32	27.15	89.86	188.74	1,104.54	1,319.97	1,283.46	36.51	36.152		
8,046.05	8,034.40	8,190.01	8,034.40	18.42	27.21	89.86	188.74	1,104.54	1,319.97	1,283.27	36.70	35.964		
8,086.65	8,075.00	8,205.61	8,050.00	18.51	27.23	89.86	188.74	1,104.54	1,320.21	1,283.39	36.82	35.854		

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 12-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 12-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 13-33 - P_COTTONWOOD 13-33 - PLAN #1												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)	Semi Major Axis 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	45.30	6.92	6.99	9.84				
100.00	100.00	100.00	100.00	0.10	0.10	45.30	6.92	6.99	9.84	9.65	0.19	51.504	
200.00	200.00	200.00	200.00	0.32	0.32	45.30	6.92	6.99	9.84	9.20	0.64	15.361	
300.00	300.00	300.00	300.00	0.55	0.55	45.30	6.92	6.99	9.84	8.75	1.09	9.027	
400.00	400.00	400.26	400.24	0.77	0.75	51.21	5.23	6.51	8.36	6.84	1.51	5.518	
500.00	500.00	500.27	500.11	0.99	0.94	87.83	0.19	5.07	5.08	3.14	1.94	2.622	
521.49	521.49	521.71	521.49	1.04	0.99	105.93	-1.32	4.64	4.83	2.80	2.03	2.378	CC, ES, SF
600.00	600.00	599.80	599.25	1.22	1.17	161.71	-8.15	2.69	8.62	6.25	2.36	3.646	
700.00	700.00	698.61	697.32	1.44	1.44	-178.24	-19.70	-0.60	19.89	17.06	2.83	7.033	
800.00	800.00	796.47	793.99	1.67	1.76	-172.07	-34.34	-4.78	35.19	31.87	3.33	10.584	
900.00	900.00	893.18	888.95	1.89	2.12	-169.31	-51.92	-9.80	53.98	50.13	3.85	14.009	
1,000.00	1,000.00	988.53	981.92	2.12	2.52	-167.81	-72.26	-15.60	76.11	71.69	4.41	17.239	
1,050.00	1,050.00	1,035.64	1,027.59	2.23	2.75	-167.31	-83.41	-18.79	88.39	83.67	4.71	18.765	
1,100.00	1,100.00	1,082.30	1,072.62	2.34	2.98	-117.60	-95.15	-22.14	101.66	97.04	4.62	22.025	
1,200.00	1,199.93	1,173.95	1,160.46	2.56	3.47	-117.76	-120.28	-29.31	131.68	126.61	5.07	25.982	
1,290.39	1,290.11	1,254.63	1,237.06	2.76	3.95	-118.46	-144.62	-36.26	162.76	157.28	5.48	29.687	
1,300.00	1,299.68	1,263.09	1,245.05	2.78	4.00	-118.61	-147.29	-37.02	166.28	160.75	5.53	30.079	
1,400.00	1,399.33	1,349.85	1,326.51	3.02	4.56	-119.82	-176.00	-45.21	204.45	198.44	6.01	34.034	
1,500.00	1,498.98	1,434.45	1,405.03	3.25	5.15	-120.57	-206.27	-53.85	245.40	238.91	6.49	37.800	
1,600.00	1,598.63	1,524.87	1,488.43	3.50	5.81	-121.11	-239.85	-63.43	287.76	280.75	7.01	41.063	
1,700.00	1,698.28	1,615.43	1,571.96	3.75	6.48	-121.51	-273.48	-73.03	330.13	322.60	7.53	43.836	
1,800.00	1,797.92	1,705.98	1,655.49	4.00	7.15	-121.82	-307.12	-82.63	372.51	364.45	8.06	46.213	
1,900.00	1,897.57	1,796.54	1,739.02	4.25	7.83	-122.07	-340.75	-92.23	414.90	406.31	8.60	48.267	
2,000.00	1,997.22	1,887.10	1,822.55	4.51	8.51	-122.27	-374.39	-101.83	457.30	448.16	9.14	50.056	
2,100.00	2,096.87	1,977.66	1,906.08	4.76	9.19	-122.44	-408.02	-111.43	499.70	490.02	9.68	51.628	
2,200.00	2,196.52	2,068.21	1,989.61	5.02	9.87	-122.58	-441.66	-121.03	542.10	531.88	10.22	53.017	
2,300.00	2,296.17	2,158.77	2,073.14	5.28	10.56	-122.70	-475.29	-130.63	584.51	573.73	10.77	54.254	
2,400.00	2,395.81	2,249.33	2,156.67	5.55	11.24	-122.81	-508.92	-140.23	626.91	615.59	11.32	55.360	
2,500.00	2,495.46	2,339.89	2,240.20	5.81	11.93	-122.90	-542.56	-149.83	669.32	657.44	11.88	56.355	
2,600.00	2,595.11	2,430.44	2,323.73	6.07	12.62	-122.98	-576.19	-159.43	711.73	699.30	12.43	57.254	
2,700.00	2,694.76	2,521.00	2,407.26	6.34	13.31	-123.05	-609.83	-169.03	754.14	741.15	12.99	58.070	
2,800.00	2,794.41	2,611.56	2,490.79	6.60	14.00	-123.11	-643.46	-178.63	796.55	783.01	13.54	58.815	
2,900.00	2,894.05	2,702.12	2,574.32	6.87	14.69	-123.17	-677.10	-188.23	838.96	824.86	14.10	59.495	
3,000.00	2,993.70	2,792.67	2,657.85	7.13	15.38	-123.22	-710.73	-197.83	881.38	866.72	14.66	60.120	
3,100.00	3,093.35	2,883.23	2,741.38	7.40	16.07	-123.27	-744.37	-207.43	923.79	908.57	15.22	60.696	
3,200.00	3,193.00	2,973.79	2,824.91	7.67	16.76	-123.31	-778.00	-217.02	966.20	950.42	15.78	61.228	
3,300.00	3,292.65	3,064.35	2,908.44	7.93	17.45	-123.35	-811.63	-226.62	1,008.62	992.28	16.34	61.721	
3,400.00	3,392.30	3,154.90	2,991.97	8.20	18.14	-123.39	-845.27	-236.22	1,051.03	1,034.13	16.90	62.180	
3,500.00	3,491.94	3,245.46	3,075.50	8.47	18.83	-123.42	-878.90	-245.82	1,093.45	1,075.98	17.47	62.606	
3,600.00	3,591.59	3,336.02	3,159.03	8.74	19.53	-123.45	-912.54	-255.42	1,135.86	1,117.83	18.03	63.005	
3,700.00	3,691.24	3,426.58	3,242.56	9.01	20.22	-123.48	-946.17	-265.02	1,178.28	1,159.69	18.59	63.377	
3,800.00	3,790.89	3,517.13	3,326.09	9.27	20.91	-123.51	-979.81	-274.62	1,220.69	1,201.54	19.16	63.727	
3,900.00	3,890.54	3,607.69	3,409.62	9.54	21.60	-123.53	-1,013.44	-284.22	1,263.11	1,243.39	19.72	64.055	
4,000.00	3,990.18	3,698.25	3,493.15	9.81	22.30	-123.55	-1,047.08	-293.82	1,305.52	1,285.24	20.28	64.364	
4,100.00	4,089.83	3,810.55	3,596.88	10.08	23.08	-123.58	-1,088.44	-305.63	1,347.74	1,326.83	20.91	64.456	
4,200.00	4,189.48	3,985.01	3,760.76	10.35	23.94	-123.68	-1,145.92	-322.03	1,385.95	1,364.28	21.67	63.948	
4,300.00	4,289.13	4,167.70	3,935.92	10.62	24.73	-123.86	-1,195.71	-336.24	1,418.42	1,395.99	22.43	63.242	
4,400.00	4,388.78	4,357.62	4,121.14	10.89	25.40	-124.11	-1,235.98	-347.73	1,444.77	1,421.61	23.16	62.377	
4,441.26	4,429.89	4,437.80	4,200.08	11.00	25.64	-124.24	-1,249.42	-351.57	1,453.78	1,430.33	23.45	61.983	
4,500.00	4,488.47	4,553.62	4,314.75	11.14	25.93	-124.59	-1,265.08	-356.04	1,464.34	1,440.44	23.91	61.252	
4,600.00	4,588.36	4,754.39	4,514.74	11.32	26.30	-124.95	-1,281.61	-360.76	1,475.40	1,450.84	24.56	60.077	
4,681.65	4,670.00	4,909.72	4,670.00	11.46	26.47	-174.32	-1,285.15	-361.77	1,477.85	1,452.85	25.00	59.115	

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_COTTONWOOD 12-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 12-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 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						
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
4,700.00	4,688.35	4,928.07	4,688.35	11.49	26.48	-174.32	-1,285.15	-361.77	1,477.85	1,452.79	25.06	58.976	
4,800.00	4,788.35	5,028.07	4,788.35	11.69	26.56	-174.32	-1,285.15	-361.77	1,477.85	1,452.45	25.40	58.185	
4,900.00	4,888.35	5,128.07	4,888.35	11.88	26.63	-174.32	-1,285.15	-361.77	1,477.85	1,452.12	25.74	57.421	
5,000.00	4,988.35	5,228.07	4,988.35	12.08	26.70	-174.32	-1,285.15	-361.77	1,477.85	1,451.77	26.08	56.669	
5,100.00	5,088.35	5,328.07	5,088.35	12.28	26.77	-174.32	-1,285.15	-361.77	1,477.85	1,451.43	26.42	55.931	
5,200.00	5,188.35	5,428.07	5,188.35	12.48	26.84	-174.32	-1,285.15	-361.77	1,477.85	1,451.08	26.77	55.206	
5,300.00	5,288.35	5,528.07	5,288.35	12.68	26.92	-174.32	-1,285.15	-361.77	1,477.85	1,450.73	27.12	54.494	
5,400.00	5,388.35	5,628.07	5,388.35	12.89	27.00	-174.32	-1,285.15	-361.77	1,477.85	1,450.38	27.47	53.795	
5,500.00	5,488.35	5,728.07	5,488.35	13.09	27.08	-174.32	-1,285.15	-361.77	1,477.85	1,450.03	27.83	53.109	
5,600.00	5,588.35	5,828.07	5,588.35	13.29	27.16	-174.32	-1,285.15	-361.77	1,477.85	1,449.67	28.18	52.435	
5,700.00	5,688.35	5,928.07	5,688.35	13.49	27.24	-174.32	-1,285.15	-361.77	1,477.85	1,449.31	28.54	51.774	
5,800.00	5,788.35	6,028.07	5,788.35	13.70	27.33	-174.32	-1,285.15	-361.77	1,477.85	1,448.95	28.91	51.126	
5,900.00	5,888.35	6,128.07	5,888.35	13.90	27.41	-174.32	-1,285.15	-361.77	1,477.85	1,448.58	29.27	50.489	
6,000.00	5,988.35	6,228.07	5,988.35	14.11	27.50	-174.32	-1,285.15	-361.77	1,477.85	1,448.22	29.64	49.865	
6,100.00	6,088.35	6,328.07	6,088.35	14.32	27.59	-174.32	-1,285.15	-361.77	1,477.85	1,447.85	30.01	49.252	
6,200.00	6,188.35	6,428.07	6,188.35	14.52	27.68	-174.32	-1,285.15	-361.77	1,477.85	1,447.48	30.38	48.651	
6,300.00	6,288.35	6,528.07	6,288.35	14.73	27.77	-174.32	-1,285.15	-361.77	1,477.85	1,447.10	30.75	48.061	
6,400.00	6,388.35	6,628.07	6,388.35	14.94	27.87	-174.32	-1,285.15	-361.77	1,477.85	1,446.73	31.12	47.483	
6,500.00	6,488.35	6,728.07	6,488.35	15.15	27.96	-174.32	-1,285.15	-361.77	1,477.85	1,446.35	31.50	46.916	
6,600.00	6,588.35	6,828.07	6,588.35	15.36	28.06	-174.32	-1,285.15	-361.77	1,477.85	1,445.97	31.88	46.359	
6,700.00	6,688.35	6,928.07	6,688.35	15.57	28.16	-174.32	-1,285.15	-361.77	1,477.85	1,445.59	32.26	45.813	
6,800.00	6,788.35	7,028.07	6,788.35	15.78	28.25	-174.32	-1,285.15	-361.77	1,477.85	1,445.21	32.64	45.278	
6,900.00	6,888.35	7,128.07	6,888.35	15.99	28.36	-174.32	-1,285.15	-361.77	1,477.85	1,444.83	33.02	44.752	
7,000.00	6,988.35	7,228.07	6,988.35	16.20	28.46	-174.32	-1,285.15	-361.77	1,477.85	1,444.45	33.41	44.237	
7,100.00	7,088.35	7,328.07	7,088.35	16.41	28.56	-174.32	-1,285.15	-361.77	1,477.85	1,444.06	33.79	43.732	
7,200.00	7,188.35	7,428.07	7,188.35	16.62	28.67	-174.32	-1,285.15	-361.77	1,477.85	1,443.67	34.18	43.236	
7,300.00	7,288.35	7,528.07	7,288.35	16.83	28.77	-174.32	-1,285.15	-361.77	1,477.85	1,443.28	34.57	42.749	
7,400.00	7,388.35	7,628.07	7,388.35	17.04	28.88	-174.32	-1,285.15	-361.77	1,477.85	1,442.89	34.96	42.272	
7,500.00	7,488.35	7,728.07	7,488.35	17.25	28.99	-174.32	-1,285.15	-361.77	1,477.85	1,442.50	35.35	41.803	
7,600.00	7,588.35	7,828.07	7,588.35	17.47	29.10	-174.32	-1,285.15	-361.77	1,477.85	1,442.11	35.75	41.343	
7,700.00	7,688.35	7,928.07	7,688.35	17.68	29.21	-174.32	-1,285.15	-361.77	1,477.85	1,441.71	36.14	40.892	
7,800.00	7,788.35	8,028.07	7,788.35	17.89	29.33	-174.32	-1,285.15	-361.77	1,477.85	1,441.32	36.54	40.450	
7,900.00	7,888.35	8,128.07	7,888.35	18.11	29.44	-174.32	-1,285.15	-361.77	1,477.85	1,440.92	36.93	40.015	
8,000.00	7,988.35	8,228.07	7,988.35	18.32	29.56	-174.32	-1,285.15	-361.77	1,477.85	1,440.52	37.33	39.589	
8,054.00	8,042.35	8,282.07	8,042.35	18.44	29.62	-174.32	-1,285.15	-361.77	1,477.85	1,440.31	37.55	39.361	
8,086.65	8,075.00	8,304.72	8,065.00	18.51	29.65	-174.32	-1,285.15	-361.77	1,477.89	1,440.23	37.66	39.245	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 12-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 12-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 32-3 - P_COTTONWOOD 32-33 - PLAN #1 2													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	45.11	14.22	14.27	20.14					
100.00	100.00	100.00	100.00	0.10	0.10	45.11	14.22	14.27	20.14	19.95	0.19	105.422		
200.00	200.00	200.00	200.00	0.32	0.32	45.11	14.22	14.27	20.14	19.50	0.64	31.442		
300.00	300.00	300.00	300.00	0.55	0.55	45.11	14.22	14.27	20.14	19.05	1.09	18.476		
400.00	400.00	400.00	400.00	0.77	0.77	45.11	14.22	14.27	20.14	18.60	1.54	13.082		
500.00	500.00	500.00	500.00	0.99	0.99	45.11	14.22	14.27	20.14	18.15	1.99	10.125		
600.00	600.00	600.00	600.00	1.22	1.22	45.11	14.22	14.27	20.14	17.70	2.44	8.259		
700.00	700.00	700.00	700.00	1.44	1.44	45.11	14.22	14.27	20.14	17.25	2.89	6.973		
800.00	800.00	800.00	800.00	1.67	1.67	45.11	14.22	14.27	20.14	16.80	3.34	6.034		
900.00	900.00	900.00	900.00	1.89	1.89	45.11	14.22	14.27	20.14	16.35	3.79	5.318		
1,000.00	1,000.00	1,000.00	1,000.00	2.12	2.12	45.11	14.22	14.27	20.14	15.90	4.24	4.754		
1,050.00	1,050.00	1,050.00	1,050.00	2.23	2.23	45.11	14.22	14.27	20.14	15.68	4.46	4.514 CC		
1,100.00	1,100.00	1,100.02	1,100.01	2.34	2.34	94.38	14.51	13.95	20.15	15.47	4.68	4.305		
1,200.00	1,199.93	1,200.05	1,199.98	2.56	2.56	94.36	16.87	11.37	20.26	15.14	5.12	3.960		
1,290.39	1,290.11	1,290.47	1,290.18	2.76	2.76	94.32	21.02	6.83	20.44	14.92	5.52	3.703		
1,300.00	1,299.68	1,300.08	1,299.76	2.78	2.78	94.27	21.58	6.22	20.47	14.90	5.56	3.679		
1,400.00	1,399.33	1,400.06	1,399.19	3.02	3.02	88.47	28.63	-1.49	20.73	14.70	6.04	3.434 ES		
1,500.00	1,498.98	1,499.77	1,497.93	3.25	3.28	73.91	37.99	-11.73	22.01	15.47	6.54	3.366 SF		
1,600.00	1,598.63	1,598.98	1,595.62	3.50	3.57	55.21	49.61	-24.43	26.43	19.40	7.03	3.758		
1,700.00	1,698.28	1,697.45	1,691.95	3.75	3.89	39.21	63.38	-39.49	35.47	27.98	7.49	4.736		
1,800.00	1,797.92	1,795.20	1,786.84	4.00	4.26	28.27	79.23	-56.82	49.11	41.18	7.93	6.195		
1,900.00	1,897.57	1,893.75	1,882.21	4.25	4.67	21.75	95.97	-75.12	64.85	56.48	8.37	7.747		
2,000.00	1,997.22	1,992.30	1,977.59	4.51	5.10	17.81	112.71	-93.43	81.10	72.27	8.83	9.185		
2,100.00	2,096.87	2,090.85	2,072.96	4.76	5.54	15.19	129.45	-111.74	97.60	88.30	9.30	10.496		
2,200.00	2,196.52	2,189.39	2,168.34	5.02	6.00	13.33	146.19	-130.04	114.23	104.46	9.77	11.689		
2,300.00	2,296.17	2,287.94	2,263.71	5.28	6.47	11.94	162.94	-148.35	130.96	120.71	10.25	12.775		
2,400.00	2,395.81	2,386.49	2,359.09	5.55	6.94	10.87	179.68	-166.65	147.74	137.01	10.73	13.764		
2,500.00	2,495.46	2,485.04	2,454.46	5.81	7.42	10.01	196.42	-184.96	164.56	153.34	11.22	14.667		
2,600.00	2,595.11	2,583.59	2,549.84	6.07	7.91	9.32	213.16	-203.26	181.41	169.70	11.71	15.495		
2,700.00	2,694.76	2,682.14	2,645.21	6.34	8.40	8.74	229.90	-221.57	198.29	186.09	12.20	16.255		
2,800.00	2,794.41	2,780.68	2,740.59	6.60	8.90	8.25	246.64	-239.87	215.17	202.48	12.69	16.955		
2,900.00	2,894.05	2,879.23	2,835.96	6.87	9.39	7.84	263.39	-258.18	232.08	218.89	13.18	17.602		
3,000.00	2,993.70	2,977.78	2,931.34	7.13	9.89	7.48	280.13	-276.49	248.99	235.31	13.68	18.200		
3,100.00	3,093.35	3,076.33	3,026.71	7.40	10.40	7.16	296.87	-294.79	265.91	251.73	14.18	18.756		
3,200.00	3,193.00	3,174.88	3,122.09	7.67	10.90	6.89	313.61	-313.10	282.84	268.16	14.68	19.273		
3,300.00	3,292.65	3,273.42	3,217.46	7.93	11.41	6.64	330.35	-331.40	299.77	284.60	15.17	19.755		
3,400.00	3,392.30	3,371.97	3,312.84	8.20	11.91	6.42	347.09	-349.71	316.71	301.04	15.67	20.206		
3,500.00	3,491.94	3,470.52	3,408.21	8.47	12.42	6.23	363.83	-368.01	333.65	317.48	16.18	20.628		
3,600.00	3,591.59	3,569.07	3,503.59	8.74	12.93	6.05	380.58	-386.32	350.60	333.92	16.68	21.023		
3,700.00	3,691.24	3,667.62	3,598.96	9.01	13.44	5.89	397.32	-404.63	367.55	350.37	17.18	21.395		
3,800.00	3,790.89	3,766.17	3,694.34	9.27	13.96	5.74	414.06	-422.93	384.50	366.82	17.68	21.746		
3,900.00	3,890.54	3,864.71	3,789.71	9.54	14.47	5.61	430.80	-441.24	401.45	383.27	18.18	22.076		
4,000.00	3,990.18	3,963.26	3,885.09	9.81	14.98	5.48	447.54	-459.54	418.41	399.72	18.69	22.388		
4,100.00	4,089.83	4,061.81	3,980.46	10.08	15.49	5.37	464.28	-477.85	435.36	416.17	19.19	22.683		
4,200.00	4,189.48	4,160.36	4,075.84	10.35	16.01	5.26	481.03	-496.15	452.32	432.62	19.70	22.963		
4,300.00	4,289.13	4,258.91	4,171.21	10.62	16.52	5.16	497.77	-514.46	469.28	449.08	20.20	23.228		
4,400.00	4,388.78	4,357.46	4,266.59	10.89	17.04	5.07	514.51	-532.76	486.24	465.53	20.71	23.480		
4,441.26	4,429.89	4,398.12	4,305.94	11.00	17.25	5.04	521.42	-540.32	493.24	472.32	20.92	23.581		
4,500.00	4,488.47	4,455.90	4,361.86	11.14	17.55	5.00	531.23	-551.05	503.80	482.62	21.17	23.794		
4,600.00	4,588.36	4,553.73	4,456.54	11.32	18.07	4.92	547.85	-569.22	524.47	502.92	21.55	24.332		
4,681.65	4,670.00	4,633.03	4,533.29	11.46	18.48	-44.43	561.32	-583.95	543.87	522.03	21.84	24.900		
4,700.00	4,688.35	4,650.79	4,550.47	11.49	18.57	-44.46	564.34	-587.25	548.48	526.56	21.93	25.015		

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_COTTONWOOD 12-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 12-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 32-3 - P_COTTONWOOD 32-33 - PLAN #1 2												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
4,800.00	4,788.35	4,747.57	4,644.14	11.69	19.08	-44.60	580.78	-605.23	573.62	551.22	22.40	25.604	
4,900.00	4,888.35	4,844.35	4,737.80	11.88	19.59	-44.72	597.22	-623.21	598.77	575.88	22.88	26.169	
5,000.00	4,988.35	4,941.13	4,831.46	12.08	20.10	-44.83	613.66	-641.18	623.91	600.55	23.36	26.709	
5,100.00	5,088.35	5,037.91	4,925.13	12.28	20.61	-44.94	630.11	-659.16	649.06	625.22	23.84	27.226	
5,200.00	5,188.35	5,134.69	5,018.79	12.48	21.12	-45.04	646.55	-677.14	674.20	649.89	24.32	27.723	
5,300.00	5,288.35	5,231.47	5,112.45	12.68	21.62	-45.13	662.99	-695.11	699.36	674.56	24.80	28.200	
5,400.00	5,388.35	5,328.25	5,206.12	12.89	22.13	-45.21	679.43	-713.09	724.51	699.23	25.28	28.658	
5,500.00	5,488.35	5,425.03	5,299.78	13.09	22.64	-45.29	695.87	-731.07	749.66	723.90	25.76	29.098	
5,600.00	5,588.35	5,521.81	5,393.45	13.29	23.15	-45.36	712.31	-749.05	774.81	748.57	26.25	29.522	
5,700.00	5,688.35	5,635.47	5,503.61	13.49	23.68	-45.44	731.20	-769.70	799.51	772.76	26.75	29.888	
5,800.00	5,788.35	5,771.82	5,636.96	13.70	24.16	-45.52	750.34	-790.63	820.30	793.04	27.26	30.087	
5,900.00	5,888.35	5,910.64	5,773.96	13.90	24.58	-45.57	765.40	-807.10	836.38	808.61	27.77	30.122	
6,000.00	5,988.35	6,051.35	5,913.76	14.11	24.90	-45.61	776.09	-818.78	847.62	819.37	28.25	30.005	
6,100.00	6,088.35	6,193.29	6,055.40	14.32	25.16	-45.63	782.15	-825.41	853.96	825.24	28.71	29.740	
6,200.00	6,188.35	6,326.26	6,188.35	14.52	25.31	-45.63	783.59	-826.99	855.45	826.31	29.15	29.349	
6,300.00	6,288.35	6,426.26	6,288.35	14.73	25.42	-45.63	783.59	-826.99	855.45	825.91	29.54	28.958	
6,400.00	6,388.35	6,526.26	6,388.35	14.94	25.54	-45.63	783.59	-826.99	855.45	825.51	29.95	28.566	
6,500.00	6,488.35	6,626.26	6,488.35	15.15	25.66	-45.63	783.59	-826.99	855.45	825.10	30.35	28.184	
6,600.00	6,588.35	6,726.26	6,588.35	15.36	25.78	-45.63	783.59	-826.99	855.45	824.69	30.76	27.810	
6,700.00	6,688.35	6,826.26	6,688.35	15.57	25.91	-45.63	783.59	-826.99	855.45	824.29	31.17	27.446	
6,800.00	6,788.35	6,926.26	6,788.35	15.78	26.03	-45.63	783.59	-826.99	855.45	823.88	31.58	27.090	
6,900.00	6,888.35	7,026.26	6,888.35	15.99	26.16	-45.63	783.59	-826.99	855.45	823.47	31.99	26.742	
7,000.00	6,988.35	7,126.26	6,988.35	16.20	26.28	-45.63	783.59	-826.99	855.45	823.05	32.40	26.402	
7,100.00	7,088.35	7,226.26	7,088.35	16.41	26.41	-45.63	783.59	-826.99	855.45	822.64	32.81	26.070	
7,200.00	7,188.35	7,326.26	7,188.35	16.62	26.54	-45.63	783.59	-826.99	855.45	822.23	33.23	25.746	
7,300.00	7,288.35	7,426.26	7,288.35	16.83	26.67	-45.63	783.59	-826.99	855.45	821.81	33.64	25.429	
7,400.00	7,388.35	7,526.26	7,388.35	17.04	26.81	-45.63	783.59	-826.99	855.45	821.40	34.06	25.118	
7,500.00	7,488.35	7,626.26	7,488.35	17.25	26.94	-45.63	783.59	-826.99	855.45	820.98	34.47	24.815	
7,600.00	7,588.35	7,726.26	7,588.35	17.47	27.07	-45.63	783.59	-826.99	855.45	820.57	34.89	24.519	
7,700.00	7,688.35	7,826.26	7,688.35	17.68	27.21	-45.63	783.59	-826.99	855.45	820.15	35.31	24.229	
7,800.00	7,788.35	7,926.26	7,788.35	17.89	27.35	-45.63	783.59	-826.99	855.45	819.73	35.73	23.945	
7,900.00	7,888.35	8,026.26	7,888.35	18.11	27.48	-45.63	783.59	-826.99	855.45	819.31	36.14	23.667	
8,000.00	7,988.35	8,126.26	7,988.35	18.32	27.62	-45.63	783.59	-826.99	855.45	818.89	36.56	23.396	
8,086.65	8,075.00	8,212.91	8,075.00	18.51	27.74	-45.63	783.59	-826.99	855.45	818.53	36.93	23.165	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 12-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 12-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 33-33 - P_COTTONWOOD 33-33 - PLAN #1												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)	Semi Major Axis 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	-134.88	-14.21	-14.27	20.14				
100.00	100.00	100.00	100.00	0.10	0.10	-134.88	-14.21	-14.27	20.14	19.94	0.19	105.391	
200.00	200.00	200.00	200.00	0.32	0.32	-134.88	-14.21	-14.27	20.14	19.49	0.64	31.433	
300.00	300.00	300.00	300.00	0.55	0.55	-134.88	-14.21	-14.27	20.14	19.05	1.09	18.471	
400.00	400.00	400.00	400.00	0.77	0.77	-134.88	-14.21	-14.27	20.14	18.60	1.54	13.078	
500.00	500.00	500.00	500.00	0.99	0.99	-134.88	-14.21	-14.27	20.14	18.15	1.99	10.122	
600.00	600.00	600.00	600.00	1.22	1.22	-134.88	-14.21	-14.27	20.14	17.70	2.44	8.256	
700.00	700.00	700.00	700.00	1.44	1.44	-134.88	-14.21	-14.27	20.14	17.25	2.89	6.971	
800.00	800.00	800.00	800.00	1.67	1.67	-134.88	-14.21	-14.27	20.14	16.80	3.34	6.033	
900.00	900.00	900.00	900.00	1.89	1.89	-134.88	-14.21	-14.27	20.14	16.35	3.79	5.316	
1,000.00	1,000.00	1,000.00	1,000.00	2.12	2.12	-134.88	-14.21	-14.27	20.14	15.90	4.24	4.752	
1,050.00	1,050.00	1,050.00	1,050.00	2.23	2.23	-134.88	-14.21	-14.27	20.14	15.67	4.46	4.513 CC, ES	
1,100.00	1,100.00	1,099.66	1,099.66	2.34	2.33	-86.48	-14.42	-14.64	20.52	15.85	4.67	4.392 SF	
1,200.00	1,199.93	1,198.85	1,198.79	2.56	2.52	-92.47	-16.12	-17.63	23.77	18.70	5.07	4.684	
1,290.39	1,290.11	1,288.22	1,287.94	2.76	2.70	-99.69	-19.11	-22.86	29.94	24.49	5.45	5.492	
1,300.00	1,299.68	1,297.70	1,297.39	2.78	2.72	-100.42	-19.51	-23.56	30.79	25.30	5.49	5.606	
1,400.00	1,399.33	1,396.06	1,395.22	3.02	2.93	-104.60	-24.56	-32.40	41.38	35.45	5.93	6.981	
1,500.00	1,498.98	1,493.81	1,492.03	3.25	3.17	-104.94	-31.22	-44.06	54.85	48.47	6.38	8.598	
1,600.00	1,598.63	1,590.71	1,587.50	3.50	3.44	-103.60	-39.43	-58.45	71.10	64.25	6.85	10.386	
1,700.00	1,698.28	1,688.00	1,682.85	3.75	3.76	-101.79	-49.02	-75.26	89.73	82.40	7.33	12.246	
1,800.00	1,797.92	1,786.16	1,778.99	4.00	4.10	-100.50	-58.85	-92.47	108.69	100.87	7.82	13.895	
1,900.00	1,897.57	1,884.33	1,875.13	4.25	4.46	-99.59	-68.68	-109.69	127.69	119.37	8.33	15.336	
2,000.00	1,997.22	1,982.49	1,971.27	4.51	4.83	-98.92	-78.51	-126.90	146.71	137.88	8.84	16.601	
2,100.00	2,096.87	2,080.65	2,067.41	4.76	5.21	-98.40	-88.34	-144.12	165.75	156.40	9.36	17.717	
2,200.00	2,196.52	2,178.81	2,163.55	5.02	5.61	-97.99	-98.17	-161.34	184.80	174.92	9.88	18.707	
2,300.00	2,296.17	2,276.97	2,259.69	5.28	6.01	-97.66	-108.00	-178.55	203.85	193.45	10.41	19.591	
2,400.00	2,395.81	2,375.13	2,355.83	5.55	6.42	-97.38	-117.82	-195.77	222.92	211.98	10.94	20.382	
2,500.00	2,495.46	2,473.29	2,451.96	5.81	6.83	-97.15	-127.65	-212.99	241.98	230.51	11.47	21.094	
2,600.00	2,595.11	2,571.46	2,548.10	6.07	7.24	-96.95	-137.48	-230.20	261.05	249.04	12.01	21.738	
2,700.00	2,694.76	2,669.62	2,644.24	6.34	7.66	-96.78	-147.31	-247.42	280.12	267.57	12.55	22.323	
2,800.00	2,794.41	2,767.78	2,740.38	6.60	8.08	-96.63	-157.14	-264.63	299.19	286.10	13.09	22.856	
2,900.00	2,894.05	2,865.94	2,836.52	6.87	8.51	-96.49	-166.97	-281.85	318.27	304.63	13.63	23.343	
3,000.00	2,993.70	2,964.10	2,932.66	7.13	8.93	-96.38	-176.80	-299.07	337.34	323.16	14.18	23.791	
3,100.00	3,093.35	3,062.26	3,028.80	7.40	9.36	-96.27	-186.62	-316.28	356.42	341.69	14.73	24.202	
3,200.00	3,193.00	3,160.42	3,124.94	7.67	9.79	-96.18	-196.45	-333.50	375.50	360.22	15.27	24.583	
3,300.00	3,292.65	3,258.59	3,221.07	7.93	10.22	-96.09	-206.28	-350.72	394.58	378.75	15.82	24.935	
3,400.00	3,392.30	3,356.75	3,317.21	8.20	10.65	-96.02	-216.11	-367.93	413.66	397.28	16.37	25.261	
3,500.00	3,491.94	3,454.91	3,413.35	8.47	11.08	-95.95	-225.94	-385.15	432.74	415.81	16.93	25.566	
3,600.00	3,591.59	3,553.07	3,509.49	8.74	11.52	-95.88	-235.77	-402.37	451.82	434.34	17.48	25.849	
3,700.00	3,691.24	3,651.23	3,605.63	9.01	11.95	-95.82	-245.60	-419.58	470.90	452.87	18.03	26.114	
3,800.00	3,790.89	3,749.39	3,701.77	9.27	12.39	-95.77	-255.42	-436.80	489.98	471.40	18.59	26.363	
3,900.00	3,890.54	3,847.56	3,797.91	9.54	12.82	-95.72	-265.25	-454.01	509.06	489.92	19.14	26.596	
4,000.00	3,990.18	3,945.72	3,894.05	9.81	13.26	-95.67	-275.08	-471.23	528.15	508.45	19.70	26.815	
4,100.00	4,089.83	4,043.88	3,990.19	10.08	13.70	-95.63	-284.91	-488.45	547.23	526.98	20.25	27.022	
4,200.00	4,189.48	4,142.04	4,086.32	10.35	14.13	-95.59	-294.74	-505.66	566.31	545.51	20.81	27.216	
4,300.00	4,289.13	4,240.20	4,182.46	10.62	14.57	-95.55	-304.57	-522.88	585.40	564.03	21.36	27.400	
4,400.00	4,388.78	4,338.36	4,278.60	10.89	15.01	-95.51	-314.40	-540.10	604.48	582.56	21.92	27.575	
4,441.26	4,429.89	4,378.87	4,318.27	11.00	15.19	-95.50	-318.45	-547.20	612.36	590.20	22.15	27.644	
4,500.00	4,488.47	4,436.53	4,374.75	11.14	15.45	-95.65	-324.22	-557.31	623.51	601.04	22.47	27.745	
4,600.00	4,588.36	4,534.67	4,470.86	11.32	15.89	-95.66	-334.05	-574.53	642.24	619.29	22.95	27.980	
4,681.65	4,670.00	4,614.71	4,549.25	11.46	16.25	-144.73	-342.06	-588.56	657.32	634.01	23.31	28.196	
4,700.00	4,688.35	4,632.68	4,566.85	11.49	16.33	-144.59	-343.86	-591.72	660.69	637.30	23.39	28.250	

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_COTTONWOOD 12-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 12-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 33-33 - P_COTTONWOOD 33-33 - PLAN #1												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
4,800.00	4,788.35	4,730.62	4,662.77	11.69	16.77	-143.88	-353.67	-608.89	679.13	655.32	23.81	28.518	
4,900.00	4,888.35	4,828.56	4,758.70	11.88	17.21	-143.20	-363.48	-626.07	697.67	673.43	24.24	28.779	
5,000.00	4,988.35	4,926.50	4,854.62	12.08	17.64	-142.56	-373.28	-643.25	716.30	691.63	24.67	29.033	
5,100.00	5,088.35	5,024.44	4,950.54	12.28	18.08	-141.95	-383.09	-660.42	735.01	709.91	25.10	29.281	
5,200.00	5,188.35	5,122.38	5,046.46	12.48	18.52	-141.37	-392.90	-677.60	753.80	728.26	25.53	29.521	
5,300.00	5,288.35	5,220.31	5,142.38	12.68	18.96	-140.82	-402.70	-694.78	772.65	746.69	25.97	29.755	
5,400.00	5,388.35	5,318.25	5,238.30	12.89	19.40	-140.29	-412.51	-711.96	791.58	765.18	26.40	29.983	
5,500.00	5,488.35	5,416.19	5,334.22	13.09	19.84	-139.79	-422.32	-729.13	810.56	783.73	26.84	30.204	
5,600.00	5,588.35	5,514.13	5,430.14	13.29	20.28	-139.32	-432.12	-746.31	829.61	802.33	27.27	30.418	
5,700.00	5,688.35	5,612.07	5,526.07	13.49	20.73	-138.86	-441.93	-763.49	848.70	820.99	27.71	30.627	
5,800.00	5,788.35	5,728.36	5,640.10	13.70	21.18	-138.36	-453.23	-783.28	867.37	839.19	28.17	30.788	
5,900.00	5,888.35	5,867.51	5,777.52	13.90	21.57	-137.90	-464.00	-802.15	882.20	853.56	28.64	30.802	
6,000.00	5,988.35	6,008.48	5,917.66	14.11	21.89	-137.60	-471.52	-815.33	892.45	863.35	29.10	30.664	
6,100.00	6,088.35	6,150.62	6,059.55	14.32	22.12	-137.44	-475.64	-822.54	898.02	868.47	29.55	30.388	
6,200.00	6,188.35	6,279.44	6,188.35	14.52	22.29	-137.40	-476.45	-823.95	899.11	869.13	29.98	29.994	
6,300.00	6,288.35	6,379.44	6,288.35	14.73	22.41	-137.40	-476.45	-823.95	899.11	868.75	30.35	29.620	
6,400.00	6,388.35	6,479.44	6,388.35	14.94	22.53	-137.40	-476.45	-823.95	899.11	868.37	30.73	29.254	
6,500.00	6,488.35	6,579.44	6,488.35	15.15	22.66	-137.40	-476.45	-823.95	899.11	867.99	31.12	28.895	
6,600.00	6,588.35	6,679.44	6,588.35	15.36	22.78	-137.40	-476.45	-823.95	899.11	867.61	31.50	28.544	
6,700.00	6,688.35	6,779.44	6,688.35	15.57	22.91	-137.40	-476.45	-823.95	899.11	867.22	31.88	28.199	
6,800.00	6,788.35	6,879.44	6,788.35	15.78	23.04	-137.40	-476.45	-823.95	899.11	866.84	32.27	27.861	
6,900.00	6,888.35	6,979.44	6,888.35	15.99	23.17	-137.40	-476.45	-823.95	899.11	866.45	32.66	27.530	
7,000.00	6,988.35	7,079.44	6,988.35	16.20	23.30	-137.40	-476.45	-823.95	899.11	866.06	33.05	27.205	
7,100.00	7,088.35	7,179.44	7,088.35	16.41	23.43	-137.40	-476.45	-823.95	899.11	865.67	33.44	26.887	
7,200.00	7,188.35	7,279.44	7,188.35	16.62	23.57	-137.40	-476.45	-823.95	899.11	865.27	33.83	26.575	
7,300.00	7,288.35	7,379.44	7,288.35	16.83	23.70	-137.40	-476.45	-823.95	899.11	864.88	34.23	26.269	
7,400.00	7,388.35	7,479.44	7,388.35	17.04	23.84	-137.40	-476.45	-823.95	899.11	864.48	34.62	25.969	
7,500.00	7,488.35	7,579.44	7,488.35	17.25	23.98	-137.40	-476.45	-823.95	899.11	864.09	35.02	25.675	
7,600.00	7,588.35	7,679.44	7,588.35	17.47	24.11	-137.40	-476.45	-823.95	899.11	863.69	35.42	25.386	
7,700.00	7,688.35	7,779.44	7,688.35	17.68	24.26	-137.40	-476.45	-823.95	899.11	863.29	35.82	25.104	
7,800.00	7,788.35	7,879.44	7,788.35	17.89	24.40	-137.40	-476.45	-823.95	899.11	862.89	36.22	24.826	
7,900.00	7,888.35	7,979.44	7,888.35	18.11	24.54	-137.40	-476.45	-823.95	899.11	862.49	36.62	24.554	
8,000.00	7,988.35	8,079.44	7,988.35	18.32	24.68	-137.40	-476.45	-823.95	899.11	862.09	37.02	24.287	
8,086.65	8,075.00	8,166.09	8,075.00	18.51	24.81	-137.40	-476.45	-823.95	899.11	861.74	37.37	24.060	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 12-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 12-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 34-33 - P_COTTONWOOD 34-33 - PLAN #1												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)	Semi Major Axis 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	-133.58	-6.92	-7.27	10.04				
100.00	100.00	100.00	100.00	0.10	0.10	-133.58	-6.92	-7.27	10.04	9.85	0.19	52.555	
200.00	200.00	200.00	200.00	0.32	0.32	-133.58	-6.92	-7.27	10.04	9.40	0.64	15.674	
300.00	300.00	300.00	300.00	0.55	0.55	-133.58	-6.92	-7.27	10.04	8.95	1.09	9.211 CC, ES	
400.00	400.00	399.63	399.61	0.77	0.74	-136.68	-8.49	-8.01	11.68	10.16	1.51	7.712 SF	
500.00	500.00	499.03	498.87	0.99	0.94	-142.26	-13.18	-10.20	16.71	14.77	1.94	8.632	
600.00	600.00	597.95	597.41	1.22	1.17	-146.56	-20.94	-13.83	25.23	22.85	2.38	10.590	
700.00	700.00	696.15	694.89	1.44	1.44	-149.25	-31.69	-18.86	37.23	34.38	2.86	13.034	
800.00	800.00	793.44	791.00	1.67	1.75	-150.90	-45.32	-25.23	52.65	49.29	3.36	15.669	
900.00	900.00	889.58	885.43	1.89	2.11	-151.94	-61.68	-32.88	71.40	67.51	3.89	18.334	
1,000.00	1,000.00	984.40	977.91	2.12	2.51	-152.63	-80.62	-41.74	93.44	88.98	4.46	20.940	
1,050.00	1,050.00	1,031.25	1,023.34	2.23	2.73	-152.89	-91.01	-46.59	105.66	100.90	4.76	22.198	
1,100.00	1,100.00	1,077.68	1,068.16	2.34	2.96	-103.77	-101.95	-51.71	118.77	114.16	4.61	25.778	
1,200.00	1,199.93	1,169.00	1,155.73	2.56	3.45	-104.78	-125.40	-62.68	147.96	142.90	5.06	29.236	
1,290.39	1,290.11	1,249.58	1,232.28	2.76	3.93	-106.08	-148.18	-73.33	177.79	172.31	5.48	32.465	
1,300.00	1,299.68	1,258.03	1,240.27	2.78	3.98	-106.29	-150.68	-74.50	181.15	175.63	5.52	32.810	
1,400.00	1,399.33	1,344.84	1,321.83	3.02	4.54	-108.05	-177.62	-87.09	217.79	211.79	6.00	36.315	
1,500.00	1,498.98	1,431.84	1,402.67	3.25	5.15	-109.29	-206.73	-100.71	257.20	250.71	6.49	39.640	
1,600.00	1,598.63	1,523.33	1,487.45	3.50	5.80	-110.23	-237.88	-115.27	297.36	290.35	7.01	42.444	
1,700.00	1,698.28	1,614.82	1,572.23	3.75	6.47	-110.96	-269.04	-129.84	337.56	330.03	7.53	44.814	
1,800.00	1,797.92	1,706.30	1,657.00	4.00	7.13	-111.52	-300.19	-144.41	377.81	369.74	8.07	46.836	
1,900.00	1,897.57	1,797.79	1,741.78	4.25	7.81	-111.98	-331.35	-158.98	418.07	409.47	8.61	48.575	
2,000.00	1,997.22	1,889.28	1,826.56	4.51	8.48	-112.36	-362.50	-173.55	458.36	449.21	9.15	50.083	
2,100.00	2,096.87	1,980.77	1,911.34	4.76	9.16	-112.68	-393.66	-188.12	498.66	488.96	9.70	51.402	
2,200.00	2,196.52	2,072.26	1,996.11	5.02	9.84	-112.95	-424.82	-202.69	538.97	528.72	10.25	52.563	
2,300.00	2,296.17	2,163.74	2,080.89	5.28	10.52	-113.18	-455.97	-217.26	579.29	568.48	10.81	53.593	
2,400.00	2,395.81	2,255.23	2,165.67	5.55	11.20	-113.38	-487.13	-231.82	619.62	608.25	11.37	54.512	
2,500.00	2,495.46	2,346.72	2,250.44	5.81	11.88	-113.56	-518.28	-246.39	659.95	648.02	11.93	55.335	
2,600.00	2,595.11	2,438.21	2,335.22	6.07	12.56	-113.72	-549.44	-260.96	700.28	687.80	12.49	56.077	
2,700.00	2,694.76	2,529.70	2,420.00	6.34	13.25	-113.86	-580.60	-275.53	740.63	727.57	13.05	56.749	
2,800.00	2,794.41	2,621.18	2,504.77	6.60	13.93	-113.98	-611.75	-290.10	780.97	767.35	13.62	57.360	
2,900.00	2,894.05	2,712.67	2,589.55	6.87	14.62	-114.10	-642.91	-304.67	821.32	807.14	14.18	57.917	
3,000.00	2,993.70	2,804.16	2,674.33	7.13	15.30	-114.20	-674.06	-319.24	861.67	846.92	14.75	58.428	
3,100.00	3,093.35	2,895.65	2,759.10	7.40	15.99	-114.29	-705.22	-333.81	902.02	886.70	15.32	58.897	
3,200.00	3,193.00	2,987.13	2,843.88	7.67	16.67	-114.38	-736.37	-348.37	942.37	926.49	15.88	59.330	
3,300.00	3,292.65	3,078.62	2,928.66	7.93	17.36	-114.46	-767.53	-362.94	982.72	966.27	16.45	59.730	
3,400.00	3,392.30	3,170.11	3,013.43	8.20	18.05	-114.53	-798.69	-377.51	1,023.08	1,006.06	17.02	60.101	
3,500.00	3,491.94	3,261.60	3,098.21	8.47	18.73	-114.59	-829.84	-392.08	1,063.44	1,045.85	17.59	60.446	
3,600.00	3,591.59	3,353.09	3,182.99	8.74	19.42	-114.66	-861.00	-406.65	1,103.80	1,085.63	18.16	60.768	
3,700.00	3,691.24	3,444.57	3,267.76	9.01	20.11	-114.71	-892.15	-421.22	1,144.16	1,125.42	18.74	61.068	
3,800.00	3,790.89	3,536.06	3,352.54	9.27	20.79	-114.77	-923.31	-435.79	1,184.52	1,165.21	19.31	61.350	
3,900.00	3,890.54	3,627.55	3,437.32	9.54	21.48	-114.82	-954.46	-450.36	1,224.88	1,205.00	19.88	61.614	
4,000.00	3,990.18	3,719.04	3,522.09	9.81	22.17	-114.86	-985.62	-464.93	1,265.24	1,244.79	20.45	61.862	
4,100.00	4,089.83	3,810.53	3,606.87	10.08	22.85	-114.91	-1,016.78	-479.49	1,305.60	1,284.58	21.03	62.095	
4,200.00	4,189.48	3,902.01	3,691.65	10.35	23.54	-114.95	-1,047.93	-494.06	1,345.97	1,324.37	21.60	62.316	
4,300.00	4,289.13	3,993.50	3,776.43	10.62	24.23	-114.99	-1,079.09	-508.63	1,386.33	1,364.16	22.17	62.524	
4,400.00	4,388.78	4,084.99	3,861.20	10.89	24.92	-115.02	-1,110.24	-523.20	1,426.69	1,403.95	22.75	62.720	
4,441.26	4,429.89	4,122.74	3,896.18	11.00	25.20	-115.04	-1,123.10	-529.21	1,443.35	1,420.37	22.98	62.799	
4,500.00	4,488.47	4,176.58	3,946.08	11.14	25.61	-115.50	-1,141.43	-537.79	1,466.82	1,443.44	23.38	62.729	
4,600.00	4,588.36	4,268.68	4,031.42	11.32	26.30	-116.15	-1,172.80	-552.45	1,505.69	1,481.68	24.01	62.704	
4,681.65	4,670.00	4,344.21	4,101.41	11.46	26.87	-165.84	-1,198.52	-564.48	1,536.38	1,511.88	24.51	62.694	
4,700.00	4,688.35	4,361.21	4,117.16	11.49	26.99	-165.80	-1,204.31	-567.19	1,543.17	1,518.58	24.59	62.752	

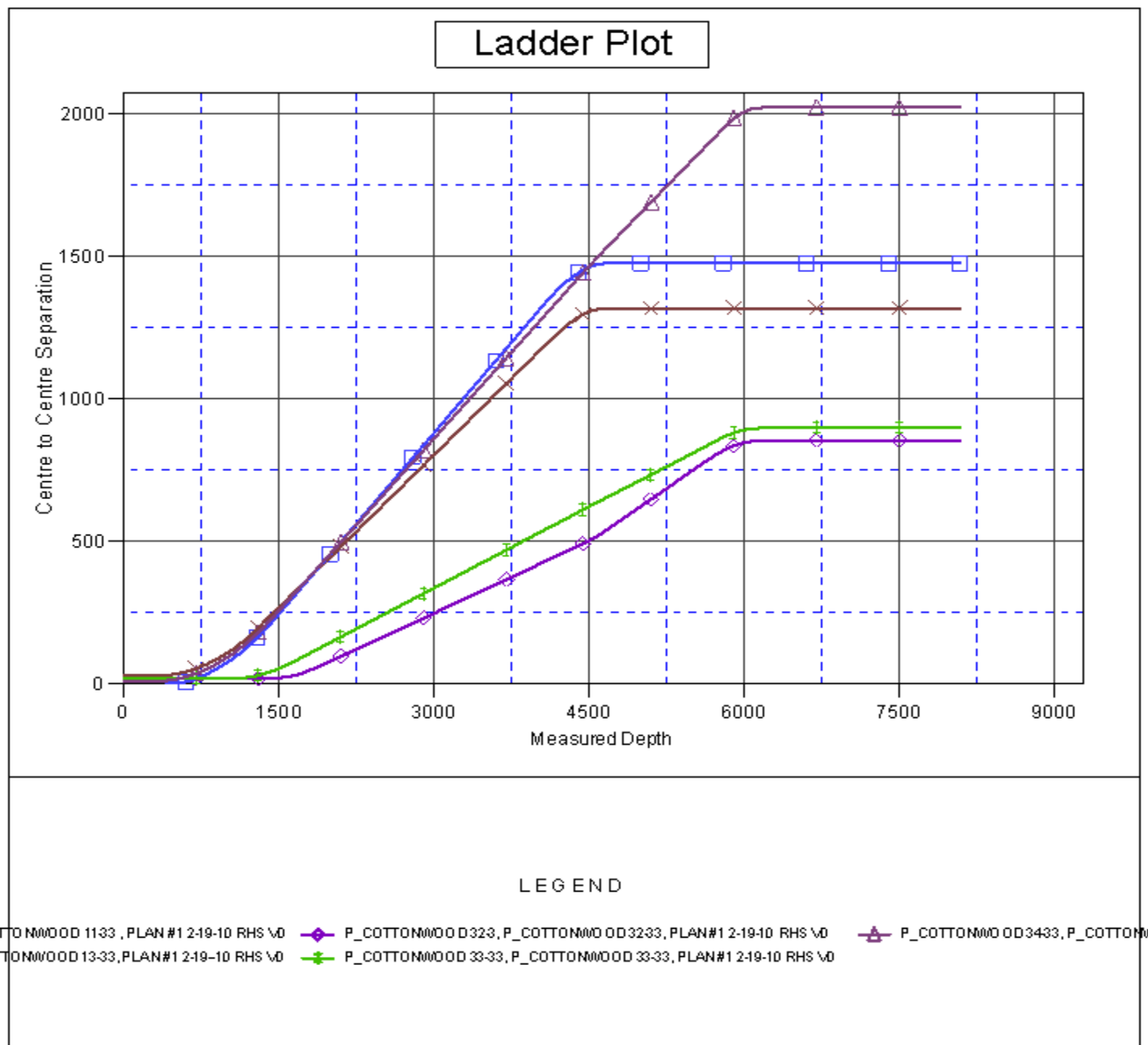
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 12-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 12-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 34-33 - P_COTTONWOOD 34-33 - PLAN #1												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
4,800.00	4,788.35	4,453.88	4,203.03	11.69	27.69	-165.54	-1,235.87	-581.94	1,580.20	1,555.12	25.08	63.009	
4,900.00	4,888.35	4,546.54	4,288.90	11.88	28.39	-165.30	-1,267.42	-596.70	1,617.25	1,591.69	25.57	63.254	
5,000.00	4,988.35	4,639.21	4,374.76	12.08	29.08	-165.06	-1,298.98	-611.46	1,654.33	1,628.27	26.06	63.488	
5,100.00	5,088.35	4,731.87	4,460.63	12.28	29.78	-164.84	-1,330.54	-626.21	1,691.43	1,664.88	26.55	63.712	
5,200.00	5,188.35	4,824.54	4,546.50	12.48	30.48	-164.62	-1,362.09	-640.97	1,728.55	1,701.51	27.04	63.926	
5,300.00	5,288.35	4,917.20	4,632.37	12.68	31.17	-164.42	-1,393.65	-655.72	1,765.70	1,738.16	27.53	64.131	
5,400.00	5,388.35	5,009.87	4,718.23	12.89	31.87	-164.22	-1,425.21	-670.48	1,802.86	1,774.83	28.03	64.327	
5,500.00	5,488.35	5,102.53	4,804.10	13.09	32.57	-164.03	-1,456.76	-685.24	1,840.04	1,811.51	28.52	64.515	
5,600.00	5,588.35	5,195.19	4,889.97	13.29	33.27	-163.85	-1,488.32	-699.99	1,877.23	1,848.21	29.02	64.696	
5,700.00	5,688.35	5,287.86	4,975.83	13.49	33.96	-163.68	-1,519.87	-714.75	1,914.44	1,884.93	29.51	64.869	
5,800.00	5,788.35	5,380.52	5,061.70	13.70	34.66	-163.51	-1,551.43	-729.51	1,951.67	1,921.66	30.01	65.035	
5,900.00	5,888.35	5,647.41	5,312.92	13.90	35.99	-163.11	-1,632.79	-767.55	1,985.42	1,954.49	30.93	64.193	
6,000.00	5,988.35	5,961.55	5,617.75	14.11	37.16	-162.80	-1,700.97	-799.43	2,009.21	1,977.34	31.86	63.057	
6,100.00	6,088.35	6,289.25	5,942.50	14.32	37.91	-162.63	-1,739.44	-817.42	2,022.08	1,989.40	32.68	61.879	
6,200.00	6,188.35	6,535.28	6,188.35	14.52	38.17	-162.60	-1,746.32	-820.64	2,024.34	1,991.10	33.24	60.900	
6,300.00	6,288.35	6,635.28	6,288.35	14.73	38.23	-162.60	-1,746.32	-820.64	2,024.34	1,990.76	33.58	60.290	
6,400.00	6,388.35	6,735.28	6,388.35	14.94	38.30	-162.60	-1,746.32	-820.64	2,024.34	1,990.43	33.92	59.687	
6,500.00	6,488.35	6,835.28	6,488.35	15.15	38.36	-162.60	-1,746.32	-820.64	2,024.34	1,990.08	34.26	59.093	
6,600.00	6,588.35	6,935.28	6,588.35	15.36	38.42	-162.60	-1,746.32	-820.64	2,024.34	1,989.74	34.60	58.507	
6,700.00	6,688.35	7,035.28	6,688.35	15.57	38.49	-162.60	-1,746.32	-820.64	2,024.34	1,989.40	34.95	57.929	
6,800.00	6,788.35	7,135.28	6,788.35	15.78	38.56	-162.60	-1,746.32	-820.64	2,024.34	1,989.05	35.29	57.358	
6,900.00	6,888.35	7,235.28	6,888.35	15.99	38.63	-162.60	-1,746.32	-820.64	2,024.34	1,988.70	35.64	56.796	
7,000.00	6,988.35	7,335.28	6,988.35	16.20	38.70	-162.60	-1,746.32	-820.64	2,024.34	1,988.35	35.99	56.242	
7,100.00	7,088.35	7,435.28	7,088.35	16.41	38.77	-162.60	-1,746.32	-820.64	2,024.34	1,988.00	36.35	55.695	
7,200.00	7,188.35	7,535.28	7,188.35	16.62	38.84	-162.60	-1,746.32	-820.64	2,024.34	1,987.64	36.70	55.156	
7,300.00	7,288.35	7,635.28	7,288.35	16.83	38.91	-162.60	-1,746.32	-820.64	2,024.34	1,987.28	37.06	54.625	
7,400.00	7,388.35	7,735.28	7,388.35	17.04	38.98	-162.60	-1,746.32	-820.64	2,024.34	1,986.92	37.42	54.102	
7,500.00	7,488.35	7,835.28	7,488.35	17.25	39.06	-162.60	-1,746.32	-820.64	2,024.34	1,986.56	37.78	53.586	
7,600.00	7,588.35	7,935.28	7,588.35	17.47	39.14	-162.60	-1,746.32	-820.64	2,024.34	1,986.20	38.14	53.077	
7,700.00	7,688.35	8,035.28	7,688.35	17.68	39.21	-162.60	-1,746.32	-820.64	2,024.34	1,985.84	38.50	52.576	
7,800.00	7,788.35	8,135.28	7,788.35	17.89	39.29	-162.60	-1,746.32	-820.64	2,024.34	1,985.47	38.87	52.082	
7,900.00	7,888.35	8,235.28	7,888.35	18.11	39.37	-162.60	-1,746.32	-820.64	2,024.34	1,985.11	39.24	51.595	
8,000.00	7,988.35	8,335.28	7,988.35	18.32	39.45	-162.60	-1,746.32	-820.64	2,024.34	1,984.74	39.60	51.115	
8,056.00	8,044.35	8,391.28	8,044.35	18.44	39.50	-162.60	-1,746.32	-820.64	2,024.34	1,984.53	39.81	50.849	
8,086.65	8,075.00	8,416.93	8,070.00	18.51	39.52	-162.60	-1,746.32	-820.64	2,024.35	1,984.43	39.92	50.715	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 12-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 12-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

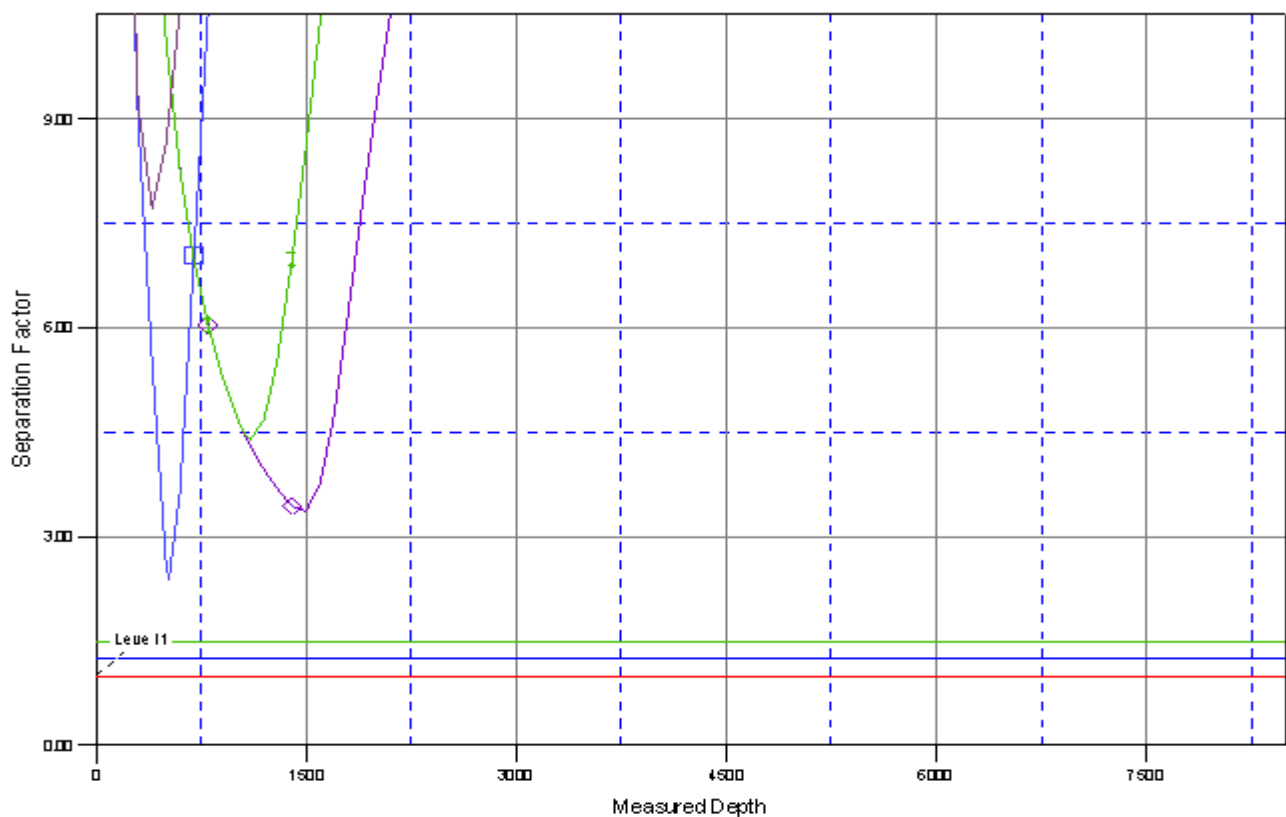
Reference Depths are relative to WELL @ 4964.00ft (Original Well Elev) Coordinates are relative to: P_COTTONWOOD 12-33
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is 105° 30' 0.000 W ° Grid Convergence at Surface is: 0.46°



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 12-33
Project:	COLORADO NORTHERN ZONE - 83	TVD Reference:	WELL @ 4964.00ft (Original Well Elev)
Reference Site:	WELD_COTTONWOOD 12-33 PAD	MD Reference:	WELL @ 4964.00ft (Original Well Elev)
Site Error:	0.00ft	North Reference:	True
Reference Well:	P_COTTONWOOD 12-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 12-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4964.00ft (Original Well Elev) Coordinates are relative to: P_COTTONWOOD 12-33
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: 0.46°

Separation Factor Plot



LEGEND

P_COTTONWOOD 11-33, PLAN #1 2-19-10 RHS \0 P_COTTONWOOD 12-33, PLAN #1 2-19-10 RHS \0 P_COTTONWOOD 13-33, PLAN #1 2-19-10 RHS \0
P_COTTONWOOD 12-33, PLAN #1 2-19-10 RHS \0 P_COTTONWOOD 13-33, PLAN #1 2-19-10 RHS \0 P_COTTONWOOD 14-33, PLAN #1 2-19-10 RHS \0