



US ROCKIES REGION PLANNING

COLORADO NORTHERN ZONE - 83

WELD_COTTONWOOD 12-33 PAD

P_COTTONWOOD 33-33

P_COTTONWOOD 33-33

Plan: PLAN #1 2-19-10 RHS

Standard Planning Report

19 February, 2010

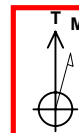




Project: COLORADO NORTHERN ZONE - 83
 Site: WELD_COTTONWOOD 12-33 PAD
 Well: P_COTTONWOOD 33-33
 Wellbore: P_COTTONWOOD 33-33
 Section: SECTION 33 T2N R66W
 SHL: 1780 FSL 861 FWL
 Design: PLAN #1 2-19-10 RHS
 Latitude: 40° 5' 32.096 N
 Longitude: 104° 47' 18.697 W
 GL: 4949.00
 KB: WELL @ 4964.00ft (Original Well Elev)



Weatherford



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

FORMATION TOP DETAILS			
TVDPath	MDPath	Formation	
4164.00	4221.35	PARKMAN	
4670.00	4738.00	SUSSEX	
7156.00	7247.09	NIO A	
7476.00	7567.09	CODELL	
7566.00	7657.09	GRNHRN	
7940.00	8031.09	JSAND	

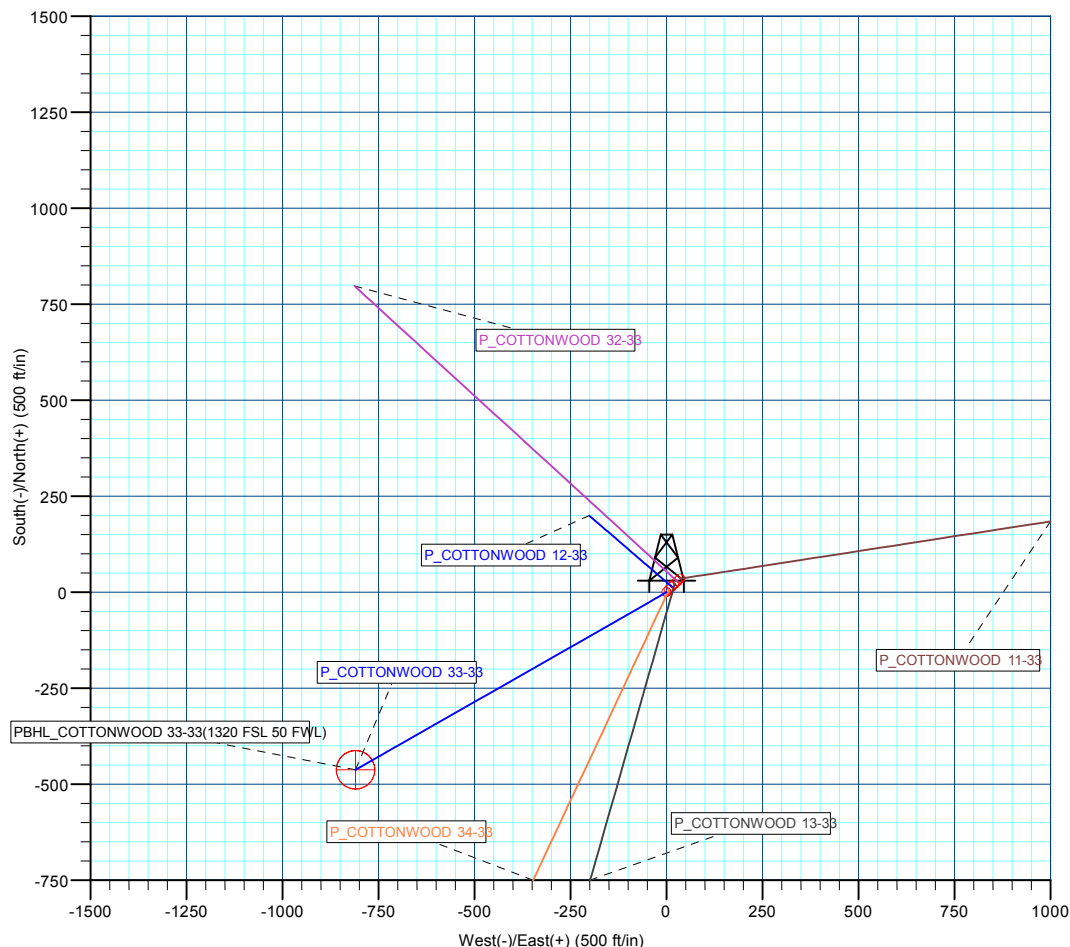
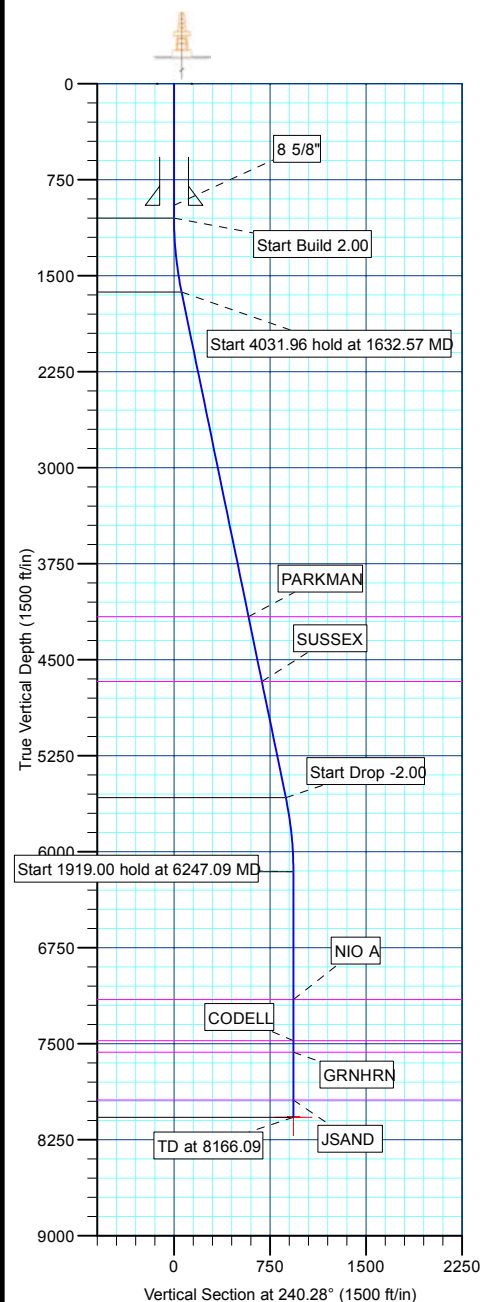
CASING DETAILS			
TVD	MD	Name	Size
950.00	950.00	8 5/8"	8.62

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	
1632.57	11.65	240.28	1628.56	-29.27	-51.26	2.00	240.28	59.03	Start 4031.96 hold at 1632.57 MD	
5664.53	11.65	240.28	5577.44	-432.97	-758.42	0.00	0.00	873.31	Start Drop -2.00	
6247.09	0.00	0.00	6156.00	-462.24	-809.68	2.00	180.00	932.34	Start 1919.00 hold at 6247.09 MD	
8166.09	0.00	0.00	8075.00	-462.24	-809.68	0.00	0.00	932.34	TD at 8166.09	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)							
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape	
PBHL	8075.00	-462.24	-809.68	40° 5' 32.096 N	104° 47' 29.116 W	Circle (Radius: 50.00)	

WELL DETAILS: P_COTTONWOOD 33-33						
+N/-S	+E/-W	Northing	Ground Level: Easting	4949.00 Latitude	Longitude	Slot
0.00	0.00	1277249.41	3199049.96	40° 5' 32.096 N	104° 47' 18.697 W	

LEGEND	
P_COTTONWOOD 11-33, P_COTTONWOOD 11-33, PLAN #1 2-19-10 RHS V0	
P_COTTONWOOD 12-33, P_COTTONWOOD 12-33, 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 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 33-33/P_COTTONWOOD 33-33)		
Created By:	Robert H. Scott	Date: 10:26, February 19 2010

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 33-33		
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 33-33			
Well Position	+N/-S	-35.35 ft	Northing:	1,277,249.41 ft
	+E/-W	-35.53 ft	Easting:	3,199,049.96 ft
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft
			Ground Level:	4,949.00 ft

Wellbore	P_COTTONWOOD 33-33				
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	240.28

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	
1,632.57	11.65	240.28	1,628.56	-29.27	-51.26	2.00	2.00	0.00	240.28	
5,664.53	11.65	240.28	5,577.44	-432.97	-758.42	0.00	0.00	0.00	0.00	
6,247.09	0.00	0.00	6,156.00	-462.24	-809.68	2.00	-2.00	0.00	180.00	
8,166.09	0.00	0.00	8,075.00	-462.24	-809.68	0.00	0.00	0.00	0.00	PBHL_COTTONW

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 33-33		
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	240.28	1,100.00	-0.22	-0.38	0.44	2.00	2.00	0.00
1,200.00	3.00	240.28	1,199.93	-1.95	-3.41	3.93	2.00	2.00	0.00
1,300.00	5.00	240.28	1,299.68	-5.40	-9.47	10.90	2.00	2.00	0.00
1,400.00	7.00	240.28	1,399.13	-10.59	-18.54	21.35	2.00	2.00	0.00
1,500.00	9.00	240.28	1,498.15	-17.49	-30.63	35.27	2.00	2.00	0.00
1,600.00	11.00	240.28	1,596.63	-26.10	-45.71	52.63	2.00	2.00	0.00
Start 4031.96 hold at 1632.57 MD									
1,632.57	11.65	240.28	1,628.56	-29.27	-51.26	59.03	2.00	2.00	0.00
1,700.00	11.65	240.28	1,694.60	-36.02	-63.09	72.65	0.00	0.00	0.00
1,800.00	11.65	240.28	1,792.54	-46.03	-80.63	92.84	0.00	0.00	0.00
1,900.00	11.65	240.28	1,890.48	-56.04	-98.17	113.04	0.00	0.00	0.00
2,000.00	11.65	240.28	1,988.42	-66.06	-115.71	133.24	0.00	0.00	0.00
2,100.00	11.65	240.28	2,086.36	-76.07	-133.25	153.43	0.00	0.00	0.00
2,200.00	11.65	240.28	2,184.30	-86.08	-150.78	173.63	0.00	0.00	0.00
2,300.00	11.65	240.28	2,282.24	-96.09	-168.32	193.82	0.00	0.00	0.00
2,400.00	11.65	240.28	2,380.18	-106.11	-185.86	214.02	0.00	0.00	0.00
2,500.00	11.65	240.28	2,478.12	-116.12	-203.40	234.21	0.00	0.00	0.00
2,600.00	11.65	240.28	2,576.06	-126.13	-220.94	254.41	0.00	0.00	0.00
2,700.00	11.65	240.28	2,674.00	-136.14	-238.48	274.60	0.00	0.00	0.00
2,800.00	11.65	240.28	2,771.94	-146.16	-256.02	294.80	0.00	0.00	0.00
2,900.00	11.65	240.28	2,869.88	-156.17	-273.56	315.00	0.00	0.00	0.00
3,000.00	11.65	240.28	2,967.82	-166.18	-291.10	335.19	0.00	0.00	0.00
3,100.00	11.65	240.28	3,065.76	-176.20	-308.63	355.39	0.00	0.00	0.00
3,200.00	11.65	240.28	3,163.70	-186.21	-326.17	375.58	0.00	0.00	0.00
3,300.00	11.65	240.28	3,261.64	-196.22	-343.71	395.78	0.00	0.00	0.00
3,400.00	11.65	240.28	3,359.57	-206.23	-361.25	415.97	0.00	0.00	0.00
3,500.00	11.65	240.28	3,457.51	-216.25	-378.79	436.17	0.00	0.00	0.00
3,600.00	11.65	240.28	3,555.45	-226.26	-396.33	456.36	0.00	0.00	0.00
3,700.00	11.65	240.28	3,653.39	-236.27	-413.87	476.56	0.00	0.00	0.00
3,800.00	11.65	240.28	3,751.33	-246.28	-431.41	496.76	0.00	0.00	0.00
3,900.00	11.65	240.28	3,849.27	-256.30	-448.94	516.95	0.00	0.00	0.00
4,000.00	11.65	240.28	3,947.21	-266.31	-466.48	537.15	0.00	0.00	0.00
4,100.00	11.65	240.28	4,045.15	-276.32	-484.02	557.34	0.00	0.00	0.00
4,200.00	11.65	240.28	4,143.09	-286.33	-501.56	577.54	0.00	0.00	0.00
PARKMAN									
4,221.35	11.65	240.28	4,164.00	-288.47	-505.30	581.85	0.00	0.00	0.00
4,300.00	11.65	240.28	4,241.03	-296.35	-519.10	597.73	0.00	0.00	0.00
4,400.00	11.65	240.28	4,338.97	-306.36	-536.64	617.93	0.00	0.00	0.00
4,500.00	11.65	240.28	4,436.91	-316.37	-554.18	638.12	0.00	0.00	0.00
4,600.00	11.65	240.28	4,534.85	-326.39	-571.72	658.32	0.00	0.00	0.00
4,700.00	11.65	240.28	4,632.79	-336.40	-589.25	678.52	0.00	0.00	0.00
SUSSEX									
4,738.00	11.65	240.28	4,670.00	-340.20	-595.92	686.19	0.00	0.00	0.00
4,800.00	11.65	240.28	4,730.73	-346.41	-606.79	698.71	0.00	0.00	0.00
4,900.00	11.65	240.28	4,828.67	-356.42	-624.33	718.91	0.00	0.00	0.00
5,000.00	11.65	240.28	4,926.61	-366.44	-641.87	739.10	0.00	0.00	0.00
5,100.00	11.65	240.28	5,024.55	-376.45	-659.41	759.30	0.00	0.00	0.00
5,200.00	11.65	240.28	5,122.48	-386.46	-676.95	779.49	0.00	0.00	0.00
5,300.00	11.65	240.28	5,220.42	-396.47	-694.49	799.69	0.00	0.00	0.00
5,400.00	11.65	240.28	5,318.36	-406.49	-712.03	819.89	0.00	0.00	0.00
5,500.00	11.65	240.28	5,416.30	-416.50	-729.56	840.08	0.00	0.00	0.00

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 33-33		
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)
5,600.00	11.65	240.28	5,514.24	-426.51	-747.10	860.28	0.00	0.00	0.00
Start Drop -2.00									
5,664.53	11.65	240.28	5,577.44	-432.97	-758.42	873.31	0.00	0.00	0.00
5,700.00	10.94	240.28	5,612.23	-436.42	-764.45	880.26	2.00	-2.00	0.00
5,800.00	8.94	240.28	5,710.72	-444.98	-779.45	897.52	2.00	-2.00	0.00
5,900.00	6.94	240.28	5,809.75	-451.83	-791.45	911.34	2.00	-2.00	0.00
6,000.00	4.94	240.28	5,909.21	-456.96	-800.44	921.69	2.00	-2.00	0.00
6,100.00	2.94	240.28	6,008.97	-460.37	-806.41	928.56	2.00	-2.00	0.00
6,200.00	0.94	240.28	6,108.91	-462.05	-809.35	931.95	2.00	-2.00	0.00
Start 1919.00 hold at 6247.09 MD									
6,247.09	0.00	0.00	6,156.00	-462.24	-809.68	932.34	2.00	-2.00	254.22
6,300.00	0.00	0.00	6,208.91	-462.24	-809.68	932.34	0.00	0.00	0.00
6,400.00	0.00	0.00	6,308.91	-462.24	-809.68	932.34	0.00	0.00	0.00
6,500.00	0.00	0.00	6,408.91	-462.24	-809.68	932.34	0.00	0.00	0.00
6,600.00	0.00	0.00	6,508.91	-462.24	-809.68	932.34	0.00	0.00	0.00
6,700.00	0.00	0.00	6,608.91	-462.24	-809.68	932.34	0.00	0.00	0.00
6,800.00	0.00	0.00	6,708.91	-462.24	-809.68	932.34	0.00	0.00	0.00
6,900.00	0.00	0.00	6,808.91	-462.24	-809.68	932.34	0.00	0.00	0.00
7,000.00	0.00	0.00	6,908.91	-462.24	-809.68	932.34	0.00	0.00	0.00
7,100.00	0.00	0.00	7,008.91	-462.24	-809.68	932.34	0.00	0.00	0.00
7,200.00	0.00	0.00	7,108.91	-462.24	-809.68	932.34	0.00	0.00	0.00
NIO A									
7,247.09	0.00	0.00	7,156.00	-462.24	-809.68	932.34	0.00	0.00	0.00
7,300.00	0.00	0.00	7,208.91	-462.24	-809.68	932.34	0.00	0.00	0.00
7,400.00	0.00	0.00	7,308.91	-462.24	-809.68	932.34	0.00	0.00	0.00
7,500.00	0.00	0.00	7,408.91	-462.24	-809.68	932.34	0.00	0.00	0.00
CODELL									
7,567.09	0.00	0.00	7,476.00	-462.24	-809.68	932.34	0.00	0.00	0.00
7,600.00	0.00	0.00	7,508.91	-462.24	-809.68	932.34	0.00	0.00	0.00
GRNHRN									
7,657.09	0.00	0.00	7,566.00	-462.24	-809.68	932.34	0.00	0.00	0.00
7,700.00	0.00	0.00	7,608.91	-462.24	-809.68	932.34	0.00	0.00	0.00
7,800.00	0.00	0.00	7,708.91	-462.24	-809.68	932.34	0.00	0.00	0.00
7,900.00	0.00	0.00	7,808.91	-462.24	-809.68	932.34	0.00	0.00	0.00
8,000.00	0.00	0.00	7,908.91	-462.24	-809.68	932.34	0.00	0.00	0.00
JSAND									
8,031.09	0.00	0.00	7,940.00	-462.24	-809.68	932.34	0.00	0.00	0.00
8,100.00	0.00	0.00	8,008.91	-462.24	-809.68	932.34	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	-462.24	-809.68	1,276,780.69	3,198,244.01	40° 5' 27.528 N	104° 47' 29.116 W
- plan misses target center by 66.09ft at 8100.00ft MD (8008.91 TVD, -462.24 N, -809.68 E)									
- Circle (radius 50.00)									

Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Well P_COTTONWOOD 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Wellbore:	P_COTTONWOOD 33-33		
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 (°)	
4,221.35	4,164.00	PARKMAN				
4,738.00	4,670.00	SUSSEX				
7,247.09	7,156.00	NIO A				
7,567.09	7,476.00	CODELL				
7,657.09	7,566.00	GRNHRN				
8,031.09	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	
1,632.57	1,628.56	-29.27	-51.26	Start 4031.96 hold at 1632.57 MD	
5,664.53	5,577.44	-432.97	-758.42	Start Drop -2.00	
6,247.09	6,156.00	-462.24	-809.68	Start 1919.00 hold at 6247.09 MD	
8,166.09	8,075.00	-462.24	-809.68	TD at 8166.09	



US ROCKIES REGION PLANNING

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

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

Anticollision Report

19 February, 2010



Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 33-33	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	8,166.09	PLAN #1 2-19-10 RHS (P_COTTONWOO	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_COTTONWOOD 12-33 PAD						
P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - F	300.00	300.00	50.12	49.03	45.979	CC, ES
P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - F	700.00	691.96	74.06	71.13	25.326	SF
P_COTTONWOOD 12-33 - P_COTTONWOOD 12-33 - F	1,050.00	1,050.00	20.14	15.67	4.513	CC, ES
P_COTTONWOOD 12-33 - P_COTTONWOOD 12-33 - F	1,100.00	1,100.02	20.53	15.85	4.393	SF
P_COTTONWOOD 13-33 - P_COTTONWOOD 13-33 - F	686.21	687.39	14.65	11.88	5.299	CC, ES
P_COTTONWOOD 13-33 - P_COTTONWOOD 13-33 - F	700.00	701.04	14.77	11.93	5.206	SF
P_COTTONWOOD 32-3 - P_COTTONWOOD 32-33 - PL	1,050.00	1,050.00	40.28	35.81	9.027	CC, ES
P_COTTONWOOD 32-3 - P_COTTONWOOD 32-33 - PL	1,200.00	1,199.96	43.98	38.91	8.671	SF
P_COTTONWOOD 34-33 - P_COTTONWOOD 34-33 - F	530.67	530.94	3.26	1.19	1.577	CC, ES, SF

Offset Design WELD_COTTONWOOD 12-33 PAD - P_COTTONWOOD 11-33 - P_COTTONWOOD 11-33 - PLAN #1												
Survey Program: 0-MWD												
Reference Offset Semi Major Axis												
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)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor
0.00	0.00	0.00	0.00	0.00	0.00	45.15	35.35	35.53	50.12	49.93	0.19	262.349
100.00	100.00	100.00	100.00	0.10	0.10	45.15	35.35	35.53	50.12	49.48	0.64	78.245
200.00	200.00	200.00	200.00	0.32	0.32	45.15	35.35	35.53	50.12	49.03	1.09	45.979 CC, ES
300.00	300.00	300.00	300.00	0.55	0.55	45.15	35.35	35.53	50.12	49.03	1.09	45.979 CC, ES
400.00	400.00	398.57	398.55	0.77	0.76	46.26	35.61	37.21	51.52	50.00	1.53	33.736
500.00	500.00	496.90	496.75	0.99	0.97	49.24	36.39	42.22	55.83	53.86	1.97	28.367
600.00	600.00	594.77	594.25	1.22	1.21	53.28	37.67	50.51	63.27	60.84	2.43	26.024
700.00	700.00	691.96	690.74	1.44	1.48	57.53	39.44	61.99	74.06	71.13	2.92	25.326 SF
800.00	800.00	788.24	785.88	1.67	1.79	61.42	41.70	76.55	88.30	84.85	3.45	25.579
900.00	900.00	883.43	879.41	1.89	2.13	64.72	44.40	94.04	106.02	102.00	4.02	26.384
1,000.00	1,000.00	977.33	971.04	2.12	2.53	67.42	47.54	114.29	127.13	122.51	4.62	27.500
1,050.00	1,050.00	1,023.74	1,016.07	2.23	2.74	68.56	49.25	125.40	138.93	133.99	4.94	28.129
1,100.00	1,100.00	1,069.66	1,060.44	2.33	2.97	-170.69	51.06	137.09	151.96	147.29	4.68	32.482
1,200.00	1,199.93	1,159.51	1,146.67	2.52	3.44	-169.06	54.92	162.00	182.84	177.76	5.08	35.963
1,300.00	1,299.68	1,251.39	1,234.28	2.72	3.97	-167.89	59.15	189.37	219.04	213.55	5.50	39.840
1,400.00	1,399.13	1,343.24	1,321.84	2.94	4.52	-167.15	63.39	216.79	258.51	252.60	5.91	43.739
1,500.00	1,498.15	1,433.71	1,408.08	3.19	5.06	-166.69	67.57	243.80	301.10	294.78	6.32	47.665
1,600.00	1,596.63	1,522.68	1,492.90	3.47	5.60	-166.42	71.68	270.37	346.73	340.02	6.72	51.617

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 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 33-33	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-MWMD												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
1,632.57	1,628.56	1,551.32	1,520.20	3.57	5.77	-166.36	73.01	278.91	362.24	355.40	6.85	52.909	
1,700.00	1,694.60	1,610.43	1,576.55	3.80	6.14	-166.42	75.74	296.56	394.69	387.53	7.16	55.122	
1,800.00	1,792.54	1,698.10	1,660.11	4.15	6.67	-166.48	79.78	322.74	442.80	435.17	7.63	58.011	
1,900.00	1,890.48	1,785.76	1,743.68	4.51	7.22	-166.54	83.83	348.91	490.91	482.80	8.11	60.505	
2,000.00	1,988.42	1,873.43	1,827.25	4.90	7.76	-166.58	87.88	375.08	539.03	530.43	8.60	62.676	
2,100.00	2,086.36	1,961.09	1,910.82	5.29	8.30	-166.62	91.93	401.26	587.14	578.05	9.09	64.577	
2,200.00	2,184.30	2,048.75	1,994.39	5.69	8.85	-166.65	95.98	427.43	635.25	625.66	9.59	66.254	
2,300.00	2,282.24	2,136.42	2,077.95	6.10	9.40	-166.68	100.03	453.60	683.37	673.28	10.09	67.740	
2,400.00	2,380.18	2,224.08	2,161.52	6.52	9.94	-166.70	104.08	479.77	731.48	720.89	10.59	69.066	
2,500.00	2,478.12	2,311.75	2,245.09	6.94	10.49	-166.72	108.13	505.95	779.59	768.50	11.10	70.255	
2,600.00	2,576.06	2,399.41	2,328.66	7.36	11.04	-166.74	112.18	532.12	827.71	816.10	11.60	71.325	
2,700.00	2,674.00	2,487.08	2,412.22	7.79	11.59	-166.76	116.23	558.29	875.82	863.71	12.11	72.293	
2,800.00	2,771.94	2,574.74	2,495.79	8.22	12.14	-166.77	120.28	584.47	923.94	911.31	12.63	73.172	
2,900.00	2,869.88	2,662.40	2,579.36	8.65	12.69	-166.79	124.33	610.64	972.05	958.91	13.14	73.974	
3,000.00	2,967.82	2,750.07	2,662.93	9.09	13.24	-166.80	128.37	636.81	1,020.16	1,006.51	13.66	74.708	
3,100.00	3,065.76	2,837.73	2,746.50	9.52	13.79	-166.81	132.42	662.99	1,068.28	1,054.11	14.17	75.382	
3,200.00	3,163.70	2,925.40	2,830.06	9.96	14.34	-166.82	136.47	689.16	1,116.39	1,101.70	14.69	76.003	
3,300.00	3,261.64	3,013.06	2,913.63	10.40	14.89	-166.83	140.52	715.33	1,164.51	1,149.30	15.21	76.577	
3,400.00	3,359.57	3,100.72	2,997.20	10.84	15.44	-166.84	144.57	741.50	1,212.62	1,196.89	15.73	77.108	
3,500.00	3,457.51	3,188.39	3,080.77	11.28	15.99	-166.84	148.62	767.68	1,260.73	1,244.49	16.25	77.602	
3,600.00	3,555.45	3,276.05	3,164.34	11.73	16.55	-166.85	152.67	793.85	1,308.85	1,292.08	16.77	78.061	
3,700.00	3,653.39	3,363.72	3,247.90	12.17	17.10	-166.86	156.72	820.02	1,356.96	1,339.67	17.29	78.490	
3,800.00	3,751.33	3,451.38	3,331.47	12.61	17.65	-166.86	160.77	846.20	1,405.08	1,387.27	17.81	78.892	
3,900.00	3,849.27	3,539.05	3,415.04	13.06	18.20	-166.87	164.82	872.37	1,453.19	1,434.86	18.33	79.268	
4,000.00	3,947.21	3,626.71	3,498.61	13.50	18.75	-166.88	168.87	898.54	1,501.31	1,482.45	18.86	79.621	
4,100.00	4,045.15	3,714.37	3,582.17	13.95	19.30	-166.88	172.92	924.72	1,549.42	1,530.04	19.38	79.953	
4,200.00	4,143.09	3,802.04	3,665.74	14.39	19.86	-166.89	176.96	950.89	1,597.53	1,577.63	19.90	80.266	
4,300.00	4,241.03	3,889.70	3,749.31	14.84	20.41	-166.89	181.01	977.06	1,645.65	1,625.22	20.43	80.561	
4,400.00	4,338.97	4,056.10	3,908.84	15.29	21.27	-166.92	188.24	1,023.74	1,692.46	1,671.34	21.12	80.121	
4,500.00	4,436.91	4,279.83	4,127.09	15.73	22.11	-167.03	195.73	1,072.16	1,732.98	1,711.09	21.89	79.181	
4,600.00	4,534.85	4,518.06	4,362.91	16.18	22.74	-167.23	200.81	1,105.05	1,766.09	1,743.47	22.62	78.076	
4,700.00	4,632.79	4,768.64	4,613.03	16.63	23.12	-167.53	202.92	1,118.64	1,791.13	1,767.82	23.30	76.859	
4,800.00	4,730.73	4,866.34	4,730.73	17.08	23.23	-167.69	202.94	1,118.81	1,810.94	1,787.18	23.76	76.211	
4,900.00	4,828.67	4,984.28	4,828.67	17.53	23.32	-167.83	202.94	1,118.81	1,830.69	1,806.50	24.19	75.665	
5,000.00	4,926.61	5,082.22	4,926.61	17.97	23.42	-167.96	202.94	1,118.81	1,850.46	1,825.83	24.63	75.132	
5,100.00	5,024.55	5,180.16	5,024.55	18.42	23.51	-168.09	202.94	1,118.81	1,870.23	1,845.17	25.07	74.614	
5,200.00	5,122.48	5,278.09	5,122.48	18.87	23.61	-168.21	202.94	1,118.81	1,890.01	1,864.51	25.50	74.111	
5,300.00	5,220.42	5,376.03	5,220.42	19.32	23.71	-168.34	202.94	1,118.81	1,909.80	1,883.86	25.94	73.620	
5,400.00	5,318.36	5,473.97	5,318.36	19.77	23.82	-168.46	202.94	1,118.81	1,929.60	1,903.22	26.38	73.144	
5,500.00	5,416.30	5,571.91	5,416.30	20.22	23.92	-168.58	202.94	1,118.81	1,949.41	1,922.59	26.82	72.680	
5,600.00	5,514.24	5,669.85	5,514.24	20.67	24.02	-168.69	202.94	1,118.81	1,969.23	1,941.96	27.26	72.228	
5,664.53	5,577.44	5,733.05	5,577.44	20.96	24.09	-168.77	202.94	1,118.81	1,982.02	1,954.47	27.55	71.943	
5,700.00	5,612.23	5,767.84	5,612.23	21.10	24.13	-168.83	202.94	1,118.81	1,988.84	1,961.07	27.77	71.613	
5,800.00	5,710.72	5,866.33	5,710.72	21.39	24.24	-168.99	202.94	1,118.81	2,005.79	1,977.44	28.35	70.755	
5,900.00	5,809.75	5,965.36	5,809.75	21.65	24.35	-169.12	202.94	1,118.81	2,019.36	1,990.48	28.88	69.912	
6,000.00	5,909.21	6,064.82	5,909.21	21.87	24.46	-169.21	202.94	1,118.81	2,029.53	2,000.15	29.38	69.083	
6,100.00	6,008.97	6,164.58	6,008.97	22.05	24.58	-169.28	202.94	1,118.81	2,036.28	2,006.45	29.83	68.267	
6,200.00	6,108.91	6,264.52	6,108.91	22.20	24.70	-169.31	202.94	1,118.81	2,039.61	2,009.38	30.23	67.461	
6,247.09	6,156.00	6,311.61	6,156.00	22.25	24.75	70.97	202.94	1,118.81	2,039.99	2,009.58	30.41	67.073	
6,300.00	6,208.91	6,364.52	6,208.91	22.32	24.81	70.97	202.94	1,118.81	2,039.99	2,009.39	30.60	66.661	
6,400.00	6,308.91	6,464.52	6,308.91	22.44	24.93	70.97	202.94	1,118.81	2,039.99	2,009.04	30.95	65.903	
6,500.00	6,408.91	6,564.52	6,408.91	22.56	25.06	70.97	202.94	1,118.81	2,039.99	2,008.68	31.31	65.158	

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 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 33-33	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						
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
6,600.00	6,508.91	6,664.52	6,508.91	22.68	25.18	70.97	202.94	1,118.81	2,039.99	2,008.33	31.67	64.424	
6,700.00	6,608.91	6,764.52	6,608.91	22.81	25.30	70.97	202.94	1,118.81	2,039.99	2,007.97	32.02	63.702	
6,800.00	6,708.91	6,864.52	6,708.91	22.94	25.43	70.97	202.94	1,118.81	2,039.99	2,007.61	32.39	62.991	
6,900.00	6,808.91	6,964.52	6,808.91	23.06	25.55	70.97	202.94	1,118.81	2,039.99	2,007.24	32.75	62.292	
7,000.00	6,908.91	7,064.52	6,908.91	23.19	25.68	70.97	202.94	1,118.81	2,039.99	2,006.88	33.11	61.605	
7,100.00	7,008.91	7,164.52	7,008.91	23.33	25.81	70.97	202.94	1,118.81	2,039.99	2,006.51	33.48	60.928	
7,200.00	7,108.91	7,264.52	7,108.91	23.46	25.94	70.97	202.94	1,118.81	2,039.99	2,006.14	33.85	60.263	
7,300.00	7,208.91	7,364.52	7,208.91	23.59	26.07	70.97	202.94	1,118.81	2,039.99	2,005.77	34.22	59.609	
7,400.00	7,308.91	7,464.52	7,308.91	23.73	26.21	70.97	202.94	1,118.81	2,039.99	2,005.40	34.60	58.966	
7,500.00	7,408.91	7,564.52	7,408.91	23.87	26.34	70.97	202.94	1,118.81	2,039.99	2,005.02	34.97	58.333	
7,600.00	7,508.91	7,664.52	7,508.91	24.00	26.48	70.97	202.94	1,118.81	2,039.99	2,004.64	35.35	57.711	
7,700.00	7,608.91	7,764.52	7,608.91	24.14	26.61	70.97	202.94	1,118.81	2,039.99	2,004.27	35.73	57.100	
7,800.00	7,708.91	7,864.52	7,708.91	24.28	26.75	70.97	202.94	1,118.81	2,039.99	2,003.88	36.11	56.499	
7,900.00	7,808.91	7,964.52	7,808.91	24.43	26.89	70.97	202.94	1,118.81	2,039.99	2,003.50	36.49	55.907	
8,000.00	7,908.91	8,064.52	7,908.91	24.57	27.03	70.97	202.94	1,118.81	2,039.99	2,003.12	36.87	55.326	
8,100.00	8,008.91	8,164.52	8,008.91	24.71	27.17	70.97	202.94	1,118.81	2,039.99	2,002.74	37.26	54.755	
8,130.66	8,039.57	8,195.18	8,039.57	24.76	27.22	70.97	202.94	1,118.81	2,039.99	2,002.62	37.38	54.582	
8,166.09	8,075.00	8,205.61	8,050.00	24.81	27.23	70.97	202.94	1,118.81	2,040.15	2,002.68	37.46	54.458	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 33-33	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 12-33 - P_COTTONWOOD 12-33 - 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
0.00	0.00	0.00	0.00	0.00	0.00	45.12	14.21	14.27	20.14				
100.00	100.00	100.00	100.00	0.10	0.10	45.12	14.21	14.27	20.14	19.94	0.19	105.391	
200.00	200.00	200.00	200.00	0.32	0.32	45.12	14.21	14.27	20.14	19.49	0.64	31.433	
300.00	300.00	300.00	300.00	0.55	0.55	45.12	14.21	14.27	20.14	19.05	1.09	18.471	
400.00	400.00	400.00	400.00	0.77	0.77	45.12	14.21	14.27	20.14	18.60	1.54	13.078	
500.00	500.00	500.00	500.00	0.99	0.99	45.12	14.21	14.27	20.14	18.15	1.99	10.122	
600.00	600.00	600.00	600.00	1.22	1.22	45.12	14.21	14.27	20.14	17.70	2.44	8.256	
700.00	700.00	700.00	700.00	1.44	1.44	45.12	14.21	14.27	20.14	17.25	2.89	6.971	
800.00	800.00	800.00	800.00	1.67	1.67	45.12	14.21	14.27	20.14	16.80	3.34	6.033	
900.00	900.00	900.00	900.00	1.89	1.89	45.12	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	45.12	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	45.12	14.21	14.27	20.14	15.67	4.46	4.513 CC, ES	
1,100.00	1,100.00	1,100.02	1,100.02	2.33	2.34	163.95	14.49	13.94	20.53	15.85	4.67	4.393 SF	
1,200.00	1,199.93	1,199.94	1,199.88	2.52	2.56	157.85	16.77	11.30	23.80	18.73	5.07	4.693	
1,300.00	1,299.68	1,299.52	1,299.21	2.72	2.78	149.76	21.28	6.05	30.87	25.39	5.48	5.631	
1,400.00	1,399.13	1,398.91	1,398.25	2.94	3.01	145.54	26.72	-0.26	41.55	35.64	5.91	7.033	
1,500.00	1,498.15	1,497.98	1,496.96	3.19	3.25	145.16	32.13	-6.56	55.16	48.82	6.34	8.695	
1,600.00	1,596.63	1,596.59	1,595.23	3.47	3.49	146.45	37.53	-12.82	71.63	64.84	6.79	10.551	
1,632.57	1,628.56	1,628.59	1,627.12	3.57	3.57	147.04	39.28	-14.85	77.63	70.69	6.94	11.192	
1,700.00	1,694.60	1,694.79	1,693.08	3.80	3.73	148.25	42.89	-19.06	90.38	83.12	7.26	12.445	
1,800.00	1,792.54	1,792.95	1,790.90	4.15	3.98	149.52	48.26	-25.29	109.34	101.59	7.76	14.096	
1,900.00	1,890.48	1,891.11	1,888.71	4.51	4.23	150.42	53.63	-31.53	128.34	120.08	8.26	15.536	
2,000.00	1,988.42	1,989.27	1,986.53	4.90	4.48	151.08	59.00	-37.76	147.37	138.59	8.77	16.797	
2,100.00	2,086.36	2,087.43	2,084.34	5.29	4.73	151.59	64.36	-44.00	166.40	157.11	9.29	17.908	
2,200.00	2,184.30	2,185.59	2,182.16	5.69	4.99	152.00	69.73	-50.24	185.45	175.64	9.82	18.893	
2,300.00	2,282.24	2,283.75	2,279.98	6.10	5.24	152.33	75.10	-56.47	204.51	194.16	10.34	19.769	
2,400.00	2,380.18	2,381.92	2,377.79	6.52	5.50	152.61	80.47	-62.71	223.57	212.69	10.88	20.553	
2,500.00	2,478.12	2,480.08	2,475.61	6.94	5.76	152.84	85.83	-68.94	242.63	231.22	11.41	21.258	
2,600.00	2,576.06	2,578.24	2,573.43	7.36	6.01	153.04	91.20	-75.18	261.70	249.75	11.95	21.896	
2,700.00	2,674.00	2,676.40	2,671.24	7.79	6.27	153.21	96.57	-81.41	280.77	268.28	12.49	22.473	
2,800.00	2,771.94	2,774.56	2,769.06	8.22	6.53	153.36	101.93	-87.65	299.84	286.81	13.04	23.000	
2,900.00	2,869.88	2,872.72	2,866.87	8.65	6.79	153.49	107.30	-93.88	318.92	305.34	13.58	23.480	
3,000.00	2,967.82	2,970.88	2,964.69	9.09	7.06	153.61	112.67	-100.12	337.99	323.87	14.13	23.922	
3,100.00	3,065.76	3,069.05	3,062.51	9.52	7.32	153.71	118.04	-106.35	357.07	342.39	14.68	24.327	
3,200.00	3,163.70	3,167.21	3,160.32	9.96	7.58	153.81	123.40	-112.59	376.15	360.92	15.23	24.702	
3,300.00	3,261.64	3,265.37	3,258.14	10.40	7.84	153.89	128.77	-118.82	395.23	379.45	15.78	25.048	
3,400.00	3,359.57	3,363.53	3,355.95	10.84	8.10	153.97	134.14	-125.06	414.31	397.98	16.33	25.370	
3,500.00	3,457.51	3,461.69	3,453.77	11.28	8.37	154.04	139.51	-131.29	433.39	416.51	16.88	25.669	
3,600.00	3,555.45	3,559.85	3,551.59	11.73	8.63	154.10	144.87	-137.53	452.47	435.03	17.44	25.948	
3,700.00	3,653.39	3,658.01	3,649.40	12.17	8.89	154.16	150.24	-143.76	471.55	453.56	17.99	26.209	
3,800.00	3,751.33	3,756.18	3,747.22	12.61	9.16	154.21	155.61	-150.00	490.63	472.09	18.55	26.453	
3,900.00	3,849.27	3,854.34	3,845.03	13.06	9.42	154.27	160.97	-156.24	509.72	490.61	19.10	26.682	
4,000.00	3,947.21	3,952.50	3,942.85	13.50	9.69	154.31	166.34	-162.47	528.80	509.14	19.66	26.897	
4,100.00	4,045.15	4,050.66	4,040.67	13.95	9.95	154.36	171.71	-168.71	547.88	527.67	20.22	27.100	
4,200.00	4,143.09	4,148.82	4,138.48	14.39	10.21	154.40	177.08	-174.94	566.97	546.19	20.77	27.291	
4,300.00	4,241.03	4,246.98	4,236.30	14.84	10.48	154.43	182.44	-181.18	586.05	564.72	21.33	27.472	
4,400.00	4,338.97	4,345.15	4,334.11	15.29	10.74	154.47	187.81	-187.41	605.13	583.24	21.89	27.643	
4,500.00	4,436.91	4,443.35	4,431.97	15.73	11.01	154.50	193.18	-193.65	624.22	601.77	22.45	27.805	
4,600.00	4,534.85	4,543.60	4,532.00	16.18	11.22	154.70	197.47	-198.64	643.14	620.19	22.94	28.031	
4,700.00	4,632.79	4,643.70	4,632.05	16.63	11.40	155.19	199.48	-200.97	661.76	638.39	23.38	28.308	
4,800.00	4,730.73	4,742.38	4,730.73	17.08	11.57	155.89	199.64	-201.16	680.23	656.44	23.79	28.587	
4,900.00	4,828.67	4,840.32	4,828.67	17.53	11.77	156.56	199.64	-201.16	698.77	674.55	24.23	28.845	

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 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 33-33	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 12-33 - P_COTTONWOOD 12-33 - 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
5,000.00	4,926.61	4,938.26	4,926.61	17.97	11.96	157.20	199.64	-201.16	717.41	692.75	24.66	29.096	
5,100.00	5,024.55	5,036.20	5,024.55	18.42	12.16	157.81	199.64	-201.16	736.12	711.03	25.09	29.340	
5,200.00	5,122.48	5,134.14	5,122.48	18.87	12.35	158.39	199.64	-201.16	754.91	729.39	25.52	29.578	
5,300.00	5,220.42	5,232.07	5,220.42	19.32	12.55	158.93	199.64	-201.16	773.78	747.82	25.96	29.809	
5,400.00	5,318.36	5,330.01	5,318.36	19.77	12.74	159.46	199.64	-201.16	792.70	766.31	26.39	30.033	
5,500.00	5,416.30	5,427.95	5,416.30	20.22	12.94	159.96	199.64	-201.16	811.69	784.86	26.83	30.251	
5,600.00	5,514.24	5,525.89	5,514.24	20.67	13.14	160.43	199.64	-201.16	830.74	803.47	27.27	30.463	
5,664.53	5,577.44	5,589.09	5,577.44	20.96	13.27	160.73	199.64	-201.16	843.06	815.50	27.55	30.596	
5,700.00	5,612.23	5,623.88	5,612.23	21.10	13.34	160.93	199.64	-201.16	849.63	821.90	27.73	30.639	
5,800.00	5,710.72	5,722.37	5,710.72	21.39	13.54	161.41	199.64	-201.16	866.00	837.81	28.19	30.724	
5,900.00	5,809.75	5,821.41	5,809.75	21.65	13.74	161.78	199.64	-201.16	879.12	850.51	28.61	30.723	
6,000.00	5,909.21	5,920.86	5,909.21	21.87	13.95	162.05	199.64	-201.16	888.97	859.96	29.01	30.642	
6,100.00	6,008.97	6,020.62	6,008.97	22.05	14.15	162.22	199.64	-201.16	895.51	866.13	29.38	30.485	
6,200.00	6,108.91	6,120.56	6,108.91	22.20	14.36	162.31	199.64	-201.16	898.74	869.03	29.71	30.254	
6,247.09	6,156.00	6,167.65	6,156.00	22.25	14.46	42.60	199.64	-201.16	899.11	869.25	29.85	30.117	
6,300.00	6,208.91	6,220.56	6,208.91	22.32	14.57	42.60	199.64	-201.16	899.11	869.05	30.05	29.916	
6,400.00	6,308.91	6,320.56	6,308.91	22.44	14.77	42.60	199.64	-201.16	899.11	868.67	30.43	29.544	
6,500.00	6,408.91	6,420.56	6,408.91	22.56	14.98	42.60	199.64	-201.16	899.11	868.29	30.81	29.180	
6,600.00	6,508.91	6,520.56	6,508.91	22.68	15.19	42.60	199.64	-201.16	899.11	867.91	31.19	28.823	
6,700.00	6,608.91	6,620.56	6,608.91	22.81	15.40	42.60	199.64	-201.16	899.11	867.53	31.58	28.472	
6,800.00	6,708.91	6,720.56	6,708.91	22.94	15.61	42.60	199.64	-201.16	899.11	867.14	31.96	28.129	
6,900.00	6,808.91	6,820.56	6,808.91	23.06	15.82	42.60	199.64	-201.16	899.11	866.76	32.35	27.792	
7,000.00	6,908.91	6,920.56	6,908.91	23.19	16.03	42.60	199.64	-201.16	899.11	866.37	32.74	27.463	
7,100.00	7,008.91	7,020.56	7,008.91	23.33	16.24	42.60	199.64	-201.16	899.11	865.98	33.13	27.139	
7,200.00	7,108.91	7,120.56	7,108.91	23.46	16.45	42.60	199.64	-201.16	899.11	865.59	33.52	26.822	
7,300.00	7,208.91	7,220.56	7,208.91	23.59	16.66	42.60	199.64	-201.16	899.11	865.19	33.91	26.511	
7,400.00	7,308.91	7,320.56	7,308.91	23.73	16.87	42.60	199.64	-201.16	899.11	864.80	34.31	26.207	
7,500.00	7,408.91	7,420.56	7,408.91	23.87	17.09	42.60	199.64	-201.16	899.11	864.40	34.70	25.908	
7,600.00	7,508.91	7,520.56	7,508.91	24.00	17.30	42.60	199.64	-201.16	899.11	864.01	35.10	25.615	
7,700.00	7,608.91	7,620.56	7,608.91	24.14	17.51	42.60	199.64	-201.16	899.11	863.61	35.50	25.328	
7,800.00	7,708.91	7,720.56	7,708.91	24.28	17.72	42.60	199.64	-201.16	899.11	863.21	35.90	25.046	
7,900.00	7,808.91	7,820.56	7,808.91	24.43	17.94	42.60	199.64	-201.16	899.11	862.81	36.30	24.770	
8,000.00	7,908.91	7,920.56	7,908.91	24.57	18.15	42.60	199.64	-201.16	899.11	862.41	36.70	24.499	
8,100.00	8,008.91	8,020.56	8,008.91	24.71	18.37	42.60	199.64	-201.16	899.11	862.00	37.10	24.233	
8,166.09	8,075.00	8,086.65	8,075.00	24.81	18.51	42.60	199.64	-201.16	899.11	861.74	37.37	24.060	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 33-33	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	45.18	21.13	21.26	29.98					
100.00	100.00	100.00	100.00	0.10	0.10	45.18	21.13	21.26	29.98	29.78	0.19	156.896		
200.00	200.00	200.00	200.00	0.32	0.32	45.18	21.13	21.26	29.98	29.33	0.64	46.794		
300.00	300.00	300.00	300.00	0.55	0.55	45.18	21.13	21.26	29.98	28.89	1.09	27.497		
400.00	400.00	400.88	400.86	0.77	0.75	46.93	19.42	20.78	28.45	26.94	1.52	18.764		
500.00	500.00	501.51	501.34	0.99	0.95	53.46	14.32	19.32	24.08	22.15	1.94	12.445		
600.00	600.00	601.64	601.09	1.22	1.18	70.85	5.87	16.91	17.93	15.57	2.37	7.581		
686.21	686.21	687.39	686.21	1.41	1.41	105.93	-4.02	14.09	14.65	11.88	2.76	5.299 CC, ES		
700.00	700.00	701.04	699.74	1.44	1.45	113.22	-5.82	13.57	14.77	11.93	2.84	5.206 SF		
800.00	800.00	799.48	796.96	1.67	1.77	155.64	-20.64	9.34	22.86	19.43	3.43	6.662		
900.00	900.00	896.74	892.44	1.89	2.13	173.66	-38.42	4.27	39.39	35.36	4.03	9.785		
1,000.00	1,000.00	992.63	985.90	2.12	2.54	-178.44	-59.00	-1.60	60.68	56.04	4.64	13.074		
1,050.00	1,050.00	1,040.00	1,031.80	2.23	2.77	-176.07	-70.27	-4.82	72.75	67.78	4.97	14.649		
1,100.00	1,100.00	1,087.04	1,077.18	2.33	3.00	-54.59	-82.18	-8.22	85.44	80.79	4.65	18.384		
1,200.00	1,199.93	1,180.32	1,166.54	2.52	3.51	-53.02	-107.92	-15.57	111.77	106.68	5.09	21.969		
1,300.00	1,299.68	1,272.51	1,253.94	2.72	4.06	-52.82	-136.08	-23.61	139.17	133.62	5.55	25.064		
1,400.00	1,399.13	1,363.54	1,339.28	2.94	4.65	-53.29	-166.54	-32.30	167.61	161.56	6.05	27.714		
1,500.00	1,498.15	1,454.56	1,423.58	3.19	5.29	-54.14	-199.53	-41.71	197.03	190.45	6.58	29.929		
1,600.00	1,596.63	1,550.19	1,511.79	3.47	5.99	-55.39	-235.04	-51.85	225.60	218.41	7.19	31.377		
1,632.57	1,628.56	1,581.41	1,540.58	3.57	6.22	-55.87	-246.64	-55.16	234.54	227.13	7.40	31.689		
1,700.00	1,694.60	1,646.09	1,600.24	3.80	6.70	-57.12	-270.66	-62.02	252.91	245.05	7.86	32.172		
1,800.00	1,792.54	1,742.00	1,688.72	4.15	7.42	-58.67	-306.29	-72.18	280.33	271.76	8.57	32.700		
1,900.00	1,890.48	1,837.92	1,777.19	4.51	8.14	-59.94	-341.91	-82.35	307.91	298.59	9.31	33.059		
2,000.00	1,988.42	1,933.84	1,865.66	4.90	8.86	-61.00	-377.54	-92.52	335.60	325.52	10.08	33.300		
2,100.00	2,086.36	2,029.75	1,954.14	5.29	9.58	-61.90	-413.16	-102.69	363.39	352.53	10.86	33.458		
2,200.00	2,184.30	2,125.67	2,042.61	5.69	10.31	-62.67	-448.79	-112.85	391.24	379.58	11.66	33.557		
2,300.00	2,282.24	2,221.59	2,131.08	6.10	11.03	-63.35	-484.41	-123.02	419.16	406.69	12.47	33.615		
2,400.00	2,380.18	2,317.50	2,219.56	6.52	11.76	-63.93	-520.04	-133.19	447.12	433.83	13.29	33.644		
2,500.00	2,478.12	2,413.42	2,308.03	6.94	12.49	-64.45	-555.66	-143.36	475.12	461.00	14.12	33.653		
2,600.00	2,576.06	2,509.34	2,396.50	7.36	13.22	-64.91	-591.29	-153.52	503.15	488.19	14.95	33.646		
2,700.00	2,674.00	2,605.26	2,484.98	7.79	13.95	-65.32	-626.91	-163.69	531.20	515.41	15.80	33.630		
2,800.00	2,771.94	2,701.17	2,573.45	8.22	14.68	-65.69	-662.54	-173.86	559.28	542.64	16.64	33.607		
2,900.00	2,869.88	2,797.09	2,661.92	8.65	15.41	-66.03	-698.16	-184.03	587.38	569.89	17.49	33.579		
3,000.00	2,967.82	2,893.01	2,750.40	9.09	16.14	-66.33	-733.79	-194.19	615.50	597.15	18.35	33.548		
3,100.00	3,065.76	2,988.92	2,838.87	9.52	16.88	-66.61	-769.41	-204.36	643.63	624.42	19.20	33.514		
3,200.00	3,163.70	3,084.84	2,927.34	9.96	17.61	-66.87	-805.04	-214.53	671.77	651.71	20.07	33.480		
3,300.00	3,261.64	3,180.76	3,015.82	10.40	18.34	-67.10	-840.66	-224.70	699.93	679.00	20.93	33.445		
3,400.00	3,359.57	3,276.67	3,104.29	10.84	19.07	-67.32	-876.29	-234.86	728.09	706.30	21.79	33.410		
3,500.00	3,457.51	3,372.59	3,192.77	11.28	19.81	-67.52	-911.91	-245.03	756.27	733.61	22.66	33.375		
3,600.00	3,555.45	3,468.51	3,281.24	11.73	20.54	-67.70	-947.54	-255.20	784.45	760.92	23.53	33.341		
3,700.00	3,653.39	3,564.42	3,369.71	12.17	21.27	-67.87	-983.16	-265.37	812.64	788.24	24.40	33.307		
3,800.00	3,751.33	3,660.34	3,458.19	12.61	22.01	-68.04	-1,018.79	-275.53	840.83	815.56	25.27	33.275		
3,900.00	3,849.27	3,756.26	3,546.66	13.06	22.74	-68.19	-1,054.41	-285.70	869.03	842.89	26.14	33.243		
4,000.00	3,947.21	3,856.87	3,638.12	13.50	23.47	-68.45	-1,100.56	-298.87	895.52	868.43	27.10	33.050		
4,100.00	4,045.15	4,022.93	3,796.84	13.95	24.12	-68.89	-1,142.93	-310.96	917.94	889.88	28.06	32.712		
4,200.00	4,143.09	4,161.10	3,929.54	14.39	24.70	-69.48	-1,179.89	-321.51	936.20	907.16	29.04	32.236		
4,300.00	4,241.03	4,300.78	4,065.42	14.84	25.22	-70.23	-1,210.96	-330.38	950.25	920.21	30.04	31.636		
4,400.00	4,338.97	4,441.32	4,203.55	15.29	25.65	-71.15	-1,235.76	-337.46	960.10	929.07	31.03	30.940		
4,500.00	4,436.91	4,582.04	4,342.98	15.73	26.00	-72.24	-1,254.03	-342.67	965.79	933.76	32.03	30.151		
4,600.00	4,534.85	4,722.28	4,482.68	16.18	26.25	-73.51	-1,265.66	-345.99	967.43	934.40	33.03	29.289		
4,700.00	4,632.79	4,861.36	4,621.65	16.63	26.42	-74.96	-1,270.70	-347.43	965.15	931.13	34.03	28.363		
4,800.00	4,730.73	4,970.44	4,730.73	17.08	26.51	-76.22	-1,270.95	-347.50	960.21	925.29	34.92	27.500		

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 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 33-33	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
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	
4,900.00	4,828.67	5,068.38	4,828.67	17.53	26.58	-77.38	-1,270.95	-347.50	955.50	919.75	35.75	26.724	
5,000.00	4,926.61	5,166.32	4,926.61	17.97	26.65	-78.54	-1,270.95	-347.50	951.21	914.61	36.59	25.995	
5,100.00	5,024.55	5,264.26	5,024.55	18.42	26.72	-79.71	-1,270.95	-347.50	947.32	909.89	37.43	25.308	
5,200.00	5,122.48	5,362.20	5,122.48	18.87	26.80	-80.90	-1,270.95	-347.50	943.85	905.58	38.27	24.663	
5,300.00	5,220.42	5,460.14	5,220.42	19.32	26.87	-82.09	-1,270.95	-347.50	940.80	901.69	39.11	24.057	
5,400.00	5,318.36	5,558.08	5,318.36	19.77	26.94	-83.28	-1,270.95	-347.50	938.17	898.23	39.94	23.488	
5,500.00	5,416.30	5,656.02	5,416.30	20.22	27.02	-84.49	-1,270.95	-347.50	935.98	895.20	40.77	22.955	
5,600.00	5,514.24	5,753.96	5,514.24	20.67	27.10	-85.69	-1,270.95	-347.50	934.21	892.61	41.60	22.456	
5,664.53	5,577.44	5,817.16	5,577.44	20.96	27.15	-86.47	-1,270.95	-347.50	933.30	891.17	42.13	22.151	
5,700.00	5,612.23	5,851.94	5,612.23	21.10	27.18	-86.88	-1,270.95	-347.50	932.89	890.50	42.39	22.006	
5,800.00	5,710.72	5,950.44	5,710.72	21.39	27.26	-87.91	-1,270.95	-347.50	932.10	889.09	43.01	21.671	
5,900.00	5,809.75	6,049.47	5,809.75	21.65	27.34	-88.74	-1,270.95	-347.50	931.69	888.14	43.55	21.393	
6,000.00	5,909.21	6,148.93	5,909.21	21.87	27.43	-89.37	-1,270.95	-347.50	931.52	887.51	44.01	21.165	
6,100.00	6,008.97	6,248.69	6,008.97	22.05	27.52	-89.79	-1,270.95	-347.50	931.47	887.08	44.39	20.984	
6,196.62	6,105.53	6,345.24	6,105.53	22.19	27.60	-90.00	-1,270.95	-347.50	931.46	886.78	44.68	20.848	
6,200.00	6,108.91	6,348.63	6,108.91	22.20	27.61	-90.00	-1,270.95	-347.50	931.46	886.78	44.69	20.844	
6,247.09	6,156.00	6,395.72	6,156.00	22.25	27.65	150.25	-1,270.95	-347.50	931.46	886.66	44.80	20.790	
6,300.00	6,208.91	6,448.62	6,208.91	22.32	27.70	150.25	-1,270.95	-347.50	931.46	886.54	44.93	20.732	
6,400.00	6,308.91	6,548.62	6,308.91	22.44	27.79	150.25	-1,270.95	-347.50	931.46	886.30	45.16	20.624	
6,500.00	6,408.91	6,648.62	6,408.91	22.56	27.88	150.25	-1,270.95	-347.50	931.46	886.06	45.40	20.515	
6,600.00	6,508.91	6,748.62	6,508.91	22.68	27.98	150.25	-1,270.95	-347.50	931.46	885.82	45.65	20.406	
6,700.00	6,608.91	6,848.62	6,608.91	22.81	28.08	150.25	-1,270.95	-347.50	931.46	885.57	45.89	20.297	
6,800.00	6,708.91	6,948.62	6,708.91	22.94	28.18	150.25	-1,270.95	-347.50	931.46	885.32	46.14	20.187	
6,900.00	6,808.91	7,048.62	6,808.91	23.06	28.28	150.25	-1,270.95	-347.50	931.46	885.07	46.39	20.078	
7,000.00	6,908.91	7,148.62	6,908.91	23.19	28.38	150.25	-1,270.95	-347.50	931.46	884.82	46.65	19.968	
7,100.00	7,008.91	7,248.62	7,008.91	23.33	28.48	150.25	-1,270.95	-347.50	931.46	884.56	46.90	19.859	
7,200.00	7,108.91	7,348.62	7,108.91	23.46	28.58	150.25	-1,270.95	-347.50	931.46	884.30	47.17	19.749	
7,300.00	7,208.91	7,448.62	7,208.91	23.59	28.69	150.25	-1,270.95	-347.50	931.46	884.03	47.43	19.639	
7,400.00	7,308.91	7,548.62	7,308.91	23.73	28.80	150.25	-1,270.95	-347.50	931.46	883.77	47.69	19.530	
7,500.00	7,408.91	7,648.62	7,408.91	23.87	28.90	150.25	-1,270.95	-347.50	931.46	883.50	47.96	19.420	
7,600.00	7,508.91	7,748.62	7,508.91	24.00	29.01	150.25	-1,270.95	-347.50	931.46	883.23	48.24	19.311	
7,700.00	7,608.91	7,848.62	7,608.91	24.14	29.12	150.25	-1,270.95	-347.50	931.46	882.95	48.51	19.202	
7,800.00	7,708.91	7,948.62	7,708.91	24.28	29.24	150.25	-1,270.95	-347.50	931.46	882.68	48.79	19.093	
7,900.00	7,808.91	8,048.62	7,808.91	24.43	29.35	150.25	-1,270.95	-347.50	931.46	882.40	49.07	18.984	
8,000.00	7,908.91	8,148.62	7,908.91	24.57	29.46	150.25	-1,270.95	-347.50	931.46	882.12	49.35	18.875	
8,100.00	8,008.91	8,248.62	8,008.91	24.71	29.58	150.25	-1,270.95	-347.50	931.46	881.83	49.63	18.767	
8,140.13	8,049.04	8,288.76	8,049.04	24.77	29.63	150.25	-1,270.95	-347.50	931.46	881.72	49.75	18.724	
8,166.09	8,075.00	8,304.72	8,065.00	24.81	29.65	150.25	-1,270.95	-347.50	931.52	881.71	49.81	18.702	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 33-33	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						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	45.12	28.42	28.54	40.28				
100.00	100.00	100.00	100.00	0.10	0.10	45.12	28.42	28.54	40.28	40.09	0.19	210.814	
200.00	200.00	200.00	200.00	0.32	0.32	45.12	28.42	28.54	40.28	39.64	0.64	62.874	
300.00	300.00	300.00	300.00	0.55	0.55	45.12	28.42	28.54	40.28	39.19	1.09	36.947	
400.00	400.00	400.00	400.00	0.77	0.77	45.12	28.42	28.54	40.28	38.74	1.54	26.159	
500.00	500.00	500.00	500.00	0.99	0.99	45.12	28.42	28.54	40.28	38.29	1.99	20.248	
600.00	600.00	600.00	600.00	1.22	1.22	45.12	28.42	28.54	40.28	37.84	2.44	16.515	
700.00	700.00	700.00	700.00	1.44	1.44	45.12	28.42	28.54	40.28	37.39	2.89	13.945	
800.00	800.00	800.00	800.00	1.67	1.67	45.12	28.42	28.54	40.28	36.94	3.34	12.067	
900.00	900.00	900.00	900.00	1.89	1.89	45.12	28.42	28.54	40.28	36.49	3.79	10.635	
1,000.00	1,000.00	1,000.00	1,000.00	2.12	2.12	45.12	28.42	28.54	40.28	36.04	4.24	9.506	
1,050.00	1,050.00	1,050.00	1,050.00	2.23	2.23	45.12	28.42	28.54	40.28	35.81	4.46	9.027 CC, ES	
1,100.00	1,100.00	1,100.03	1,100.02	2.33	2.34	164.38	28.72	28.21	40.68	36.01	4.67	8.705	
1,200.00	1,199.93	1,199.96	1,199.89	2.52	2.56	161.04	31.07	25.64	43.98	38.91	5.07	8.671 SF	
1,300.00	1,299.68	1,299.51	1,299.19	2.72	2.78	155.70	35.75	20.52	50.93	45.45	5.48	9.293	
1,400.00	1,399.13	1,398.43	1,397.57	2.94	3.02	150.01	42.70	12.92	61.91	56.00	5.91	10.480	
1,500.00	1,498.15	1,496.49	1,494.69	3.19	3.27	144.97	51.86	2.91	77.11	70.74	6.36	12.116	
1,600.00	1,596.63	1,593.47	1,590.21	3.47	3.55	140.89	63.11	-9.39	96.53	89.66	6.86	14.064	
1,632.57	1,628.56	1,624.78	1,620.93	3.57	3.65	139.77	67.21	-13.87	103.75	96.71	7.04	14.740	
1,700.00	1,694.60	1,689.25	1,683.96	3.80	3.87	137.66	76.36	-23.88	119.50	112.06	7.43	16.081	
1,800.00	1,792.54	1,784.10	1,776.10	4.15	4.22	134.43	91.55	-40.49	144.26	136.20	8.06	17.904	
1,900.00	1,890.48	1,880.45	1,869.34	4.51	4.61	131.67	107.92	-58.38	170.04	161.30	8.73	19.471	
2,000.00	1,988.42	1,976.79	1,962.58	4.90	5.03	129.64	124.28	-76.28	196.09	186.66	9.43	20.793	
2,100.00	2,086.36	2,073.13	2,055.82	5.29	5.46	128.08	140.65	-94.18	222.32	212.17	10.15	21.909	
2,200.00	2,184.30	2,169.47	2,149.06	5.69	5.91	126.85	157.02	-112.07	248.67	237.79	10.88	22.857	
2,300.00	2,282.24	2,265.82	2,242.30	6.10	6.36	125.86	173.38	-129.97	275.11	263.49	11.62	23.668	
2,400.00	2,380.18	2,362.16	2,335.54	6.52	6.83	125.04	189.75	-147.86	301.61	289.23	12.38	24.367	
2,500.00	2,478.12	2,458.50	2,428.78	6.94	7.29	124.35	206.12	-165.76	328.16	315.02	13.14	24.973	
2,600.00	2,576.06	2,554.85	2,522.02	7.36	7.77	123.77	222.48	-183.66	354.74	340.84	13.91	25.503	
2,700.00	2,674.00	2,651.19	2,615.26	7.79	8.25	123.27	238.85	-201.55	381.36	366.68	14.68	25.969	
2,800.00	2,771.94	2,747.53	2,708.50	8.22	8.73	122.83	255.22	-219.45	408.00	392.54	15.47	26.382	
2,900.00	2,869.88	2,843.87	2,801.74	8.65	9.22	122.44	271.59	-237.34	434.66	418.41	16.25	26.749	
3,000.00	2,967.82	2,940.22	2,894.98	9.09	9.70	122.11	287.95	-255.24	461.33	444.30	17.04	27.077	
3,100.00	3,065.76	3,036.56	2,988.22	9.52	10.19	121.80	304.32	-273.14	488.02	470.19	17.83	27.372	
3,200.00	3,163.70	3,132.90	3,081.46	9.96	10.69	121.53	320.69	-291.03	514.72	496.10	18.62	27.639	
3,300.00	3,261.64	3,229.24	3,174.70	10.40	11.18	121.29	337.05	-308.93	541.43	522.01	19.42	27.880	
3,400.00	3,359.57	3,325.59	3,267.94	10.84	11.68	121.07	353.42	-326.82	568.15	547.93	20.22	28.101	
3,500.00	3,457.51	3,421.93	3,361.18	11.28	12.17	120.87	369.79	-344.72	594.87	573.85	21.02	28.302	
3,600.00	3,555.45	3,518.27	3,454.42	11.73	12.67	120.68	386.15	-362.62	621.60	599.78	21.82	28.486	
3,700.00	3,653.39	3,614.61	3,547.67	12.17	13.17	120.51	402.52	-380.51	648.34	625.72	22.62	28.656	
3,800.00	3,751.33	3,710.96	3,640.91	12.61	13.67	120.36	418.89	-398.41	675.08	651.65	23.43	28.813	
3,900.00	3,849.27	3,807.30	3,734.15	13.06	14.17	120.21	435.25	-416.30	701.83	677.59	24.24	28.958	
4,000.00	3,947.21	3,903.64	3,827.39	13.50	14.67	120.08	451.62	-434.20	728.58	703.53	25.04	29.092	
4,100.00	4,045.15	3,999.99	3,920.63	13.95	15.17	119.96	467.99	-452.09	755.33	729.48	25.85	29.217	
4,200.00	4,143.09	4,096.33	4,013.87	14.39	15.67	119.84	484.35	-469.99	782.09	755.42	26.66	29.334	
4,300.00	4,241.03	4,192.67	4,107.11	14.84	16.18	119.73	500.72	-487.89	808.84	781.37	27.47	29.443	
4,400.00	4,338.97	4,289.01	4,200.35	15.29	16.68	119.63	517.09	-505.78	835.61	807.32	28.28	29.545	
4,500.00	4,436.91	4,385.36	4,293.59	15.73	17.18	119.54	533.46	-523.68	862.37	833.27	29.09	29.641	
4,600.00	4,534.85	4,481.70	4,386.83	16.18	17.69	119.45	549.82	-541.57	889.13	859.23	29.91	29.731	
4,700.00	4,632.79	4,578.04	4,480.07	16.63	18.19	119.37	566.19	-559.47	915.90	885.18	30.72	29.815	
4,800.00	4,730.73	4,674.38	4,573.31	17.08	18.70	119.29	582.56	-577.37	942.67	911.14	31.53	29.895	
4,900.00	4,828.67	4,770.73	4,666.55	17.53	19.20	119.21	598.92	-595.26	969.44	937.09	32.35	29.971	

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 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 33-33	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
5,000.00	4,926.61	4,867.07	4,759.79	17.97	19.71	119.14	615.29	-613.16	996.21	963.05	33.16	30.042	
5,100.00	5,024.55	4,963.41	4,853.03	18.42	20.22	119.08	631.66	-631.05	1,022.99	989.01	33.98	30.109	
5,200.00	5,122.48	5,059.75	4,946.27	18.87	20.72	119.01	648.02	-648.95	1,049.76	1,014.97	34.79	30.174	
5,300.00	5,220.42	5,156.10	5,039.51	19.32	21.23	118.95	664.39	-666.85	1,076.54	1,040.93	35.61	30.235	
5,400.00	5,318.36	5,252.44	5,132.75	19.77	21.73	118.89	680.76	-684.74	1,103.31	1,066.89	36.42	30.292	
5,500.00	5,416.30	5,348.78	5,225.99	20.22	22.24	118.84	697.12	-702.64	1,130.09	1,092.85	37.24	30.348	
5,600.00	5,514.24	5,445.13	5,319.23	20.67	22.75	118.79	713.49	-720.53	1,156.87	1,118.81	38.05	30.400	
5,664.53	5,577.44	5,507.29	5,379.40	20.96	23.08	118.76	724.05	-732.08	1,174.15	1,135.57	38.58	30.433	
5,700.00	5,612.23	5,541.49	5,412.50	21.10	23.26	118.90	729.86	-738.43	1,183.55	1,144.66	38.89	30.434	
5,800.00	5,710.72	5,663.17	5,530.58	21.39	23.79	119.17	749.64	-760.06	1,208.28	1,168.59	39.69	30.445	
5,900.00	5,809.75	5,800.34	5,665.02	21.65	24.26	119.35	768.01	-780.14	1,228.44	1,188.04	40.40	30.406	
6,000.00	5,909.21	5,939.70	5,802.77	21.87	24.65	119.48	782.20	-795.66	1,243.73	1,202.72	41.01	30.327	
6,100.00	6,008.97	6,080.67	5,942.98	22.05	24.96	119.56	791.93	-806.30	1,254.04	1,212.52	41.52	30.204	
6,200.00	6,108.91	6,222.65	6,084.74	22.20	25.19	119.59	797.02	-811.87	1,259.30	1,217.39	41.92	30.043	
6,247.09	6,156.00	6,289.68	6,151.76	22.25	25.27	-0.14	797.78	-812.69	1,260.03	1,217.96	42.07	29.951	
6,300.00	6,208.91	6,346.82	6,208.91	22.32	25.34	-0.14	797.80	-812.72	1,260.04	1,217.83	42.21	29.852	
6,400.00	6,308.91	6,446.82	6,308.91	22.44	25.45	-0.14	797.80	-812.72	1,260.04	1,217.57	42.47	29.667	
6,500.00	6,408.91	6,546.82	6,408.91	22.56	25.57	-0.14	797.80	-812.72	1,260.04	1,217.30	42.75	29.477	
6,600.00	6,508.91	6,646.82	6,508.91	22.68	25.69	-0.14	797.80	-812.72	1,260.04	1,217.02	43.02	29.287	
6,700.00	6,608.91	6,746.82	6,608.91	22.81	25.81	-0.14	797.80	-812.72	1,260.04	1,216.74	43.30	29.097	
6,800.00	6,708.91	6,846.82	6,708.91	22.94	25.93	-0.14	797.80	-812.72	1,260.04	1,216.46	43.59	28.909	
6,900.00	6,808.91	6,946.82	6,808.91	23.06	26.06	-0.14	797.80	-812.72	1,260.04	1,216.17	43.87	28.720	
7,000.00	6,908.91	7,046.82	6,908.91	23.19	26.18	-0.14	797.80	-812.72	1,260.04	1,215.88	44.16	28.533	
7,100.00	7,008.91	7,146.82	7,008.91	23.33	26.31	-0.14	797.80	-812.72	1,260.04	1,215.59	44.45	28.346	
7,200.00	7,108.91	7,246.82	7,108.91	23.46	26.44	-0.14	797.80	-812.72	1,260.04	1,215.30	44.75	28.160	
7,300.00	7,208.91	7,346.82	7,208.91	23.59	26.57	-0.14	797.80	-812.72	1,260.04	1,215.00	45.04	27.975	
7,400.00	7,308.91	7,446.82	7,308.91	23.73	26.70	-0.14	797.80	-812.72	1,260.04	1,214.70	45.34	27.790	
7,500.00	7,408.91	7,546.82	7,408.91	23.87	26.83	-0.14	797.80	-812.72	1,260.04	1,214.40	45.64	27.607	
7,600.00	7,508.91	7,646.82	7,508.91	24.00	26.97	-0.14	797.80	-812.72	1,260.04	1,214.10	45.95	27.424	
7,700.00	7,608.91	7,746.82	7,608.91	24.14	27.10	-0.14	797.80	-812.72	1,260.04	1,213.79	46.25	27.243	
7,800.00	7,708.91	7,846.82	7,708.91	24.28	27.24	-0.14	797.80	-812.72	1,260.04	1,213.48	46.56	27.062	
7,900.00	7,808.91	7,946.82	7,808.91	24.43	27.37	-0.14	797.80	-812.72	1,260.04	1,213.17	46.87	26.883	
8,000.00	7,908.91	8,046.82	7,908.91	24.57	27.51	-0.14	797.80	-812.72	1,260.04	1,212.86	47.18	26.705	
8,100.00	8,008.91	8,146.82	8,008.91	24.71	27.65	-0.14	797.80	-812.72	1,260.04	1,212.54	47.50	26.527	
8,166.09	8,075.00	8,212.91	8,075.00	24.81	27.74	-0.14	797.80	-812.72	1,260.04	1,212.33	47.71	26.411	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 33-33	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
0.00	0.00	0.00	0.00	0.00	0.00	43.83	7.29	6.99	10.10				
100.00	100.00	100.00	100.00	0.10	0.10	43.83	7.29	6.99	10.10	9.91	0.19	52.863	
200.00	200.00	200.00	200.00	0.32	0.32	43.83	7.29	6.99	10.10	9.46	0.64	15.766	
300.00	300.00	300.00	300.00	0.55	0.55	43.83	7.29	6.99	10.10	9.01	1.09	9.265	
400.00	400.00	400.29	400.27	0.77	0.75	47.66	5.70	6.25	8.46	6.94	1.52	5.581	
500.00	500.00	500.34	500.18	0.99	0.95	76.83	0.94	4.03	4.14	2.21	1.93	2.142	
530.67	530.67	530.94	530.69	1.06	1.02	110.51	-1.14	3.05	3.26	1.19	2.07	1.577	CC, ES, SF
600.00	600.00	600.00	599.45	1.22	1.18	177.14	-6.93	0.35	6.96	4.56	2.40	2.901	
700.00	700.00	698.74	697.46	1.44	1.45	-165.09	-17.81	-4.74	18.61	15.72	2.89	6.441	
800.00	800.00	796.64	794.15	1.67	1.76	-160.50	-31.61	-11.19	34.04	30.63	3.41	9.975	
900.00	900.00	893.38	889.14	1.89	2.12	-158.54	-48.18	-18.94	52.90	48.92	3.98	13.302	
1,000.00	1,000.00	988.76	982.14	2.12	2.53	-157.49	-67.36	-27.91	75.06	70.48	4.58	16.384	
1,050.00	1,050.00	1,035.89	1,027.82	2.23	2.76	-157.14	-77.86	-32.82	87.36	82.46	4.90	17.820	
1,100.00	1,100.00	1,082.70	1,073.00	2.33	2.99	-37.13	-88.97	-38.02	100.11	95.50	4.62	21.689	
1,200.00	1,199.93	1,175.63	1,162.06	2.52	3.49	-37.31	-113.00	-49.25	125.97	120.91	5.06	24.919	
1,300.00	1,299.68	1,267.61	1,249.32	2.72	4.04	-38.05	-139.34	-61.57	152.28	146.77	5.51	27.627	
1,400.00	1,399.13	1,358.62	1,334.69	2.94	4.64	-39.07	-167.89	-74.92	179.09	173.10	5.99	29.893	
1,500.00	1,498.15	1,451.82	1,421.19	3.19	5.29	-40.31	-199.32	-89.62	206.08	199.57	6.51	31.667	
1,600.00	1,596.63	1,548.41	1,510.69	3.47	5.98	-41.81	-232.21	-105.00	231.05	223.98	7.08	32.653	
1,632.57	1,628.56	1,579.96	1,539.93	3.57	6.21	-42.35	-242.96	-110.02	238.69	231.42	7.27	32.824	
1,700.00	1,694.60	1,645.34	1,600.51	3.80	6.69	-43.62	-265.23	-120.44	254.32	246.62	7.70	33.037	
1,800.00	1,792.54	1,742.30	1,690.36	4.15	7.40	-45.23	-298.24	-135.87	277.68	269.32	8.36	33.226	
1,900.00	1,890.48	1,839.26	1,780.21	4.51	8.11	-46.60	-331.26	-151.31	301.22	292.17	9.05	33.301	
2,000.00	1,988.42	1,936.21	1,870.05	4.90	8.83	-47.77	-364.28	-166.75	324.89	315.14	9.76	33.298	
2,100.00	2,086.36	2,033.17	1,959.90	5.29	9.55	-48.78	-397.30	-182.19	348.68	338.19	10.49	33.244	
2,200.00	2,184.30	2,130.13	2,049.74	5.69	10.27	-49.66	-430.32	-197.63	372.56	361.32	11.24	33.156	
2,300.00	2,282.24	2,227.09	2,139.59	6.10	10.99	-50.43	-463.34	-213.07	396.51	384.51	12.00	33.047	
2,400.00	2,380.18	2,324.05	2,229.43	6.52	11.71	-51.12	-496.36	-228.51	420.52	407.75	12.77	32.926	
2,500.00	2,478.12	2,421.00	2,319.28	6.94	12.44	-51.73	-529.37	-243.95	444.58	431.03	13.55	32.799	
2,600.00	2,576.06	2,517.96	2,409.12	7.36	13.16	-52.28	-562.39	-259.39	468.69	454.34	14.35	32.671	
2,700.00	2,674.00	2,614.92	2,498.97	7.79	13.89	-52.78	-595.41	-274.83	492.83	477.69	15.14	32.543	
2,800.00	2,771.94	2,711.88	2,588.81	8.22	14.61	-53.23	-628.43	-290.27	517.00	501.06	15.95	32.418	
2,900.00	2,869.88	2,808.84	2,678.66	8.65	15.34	-53.64	-661.45	-305.71	541.21	524.45	16.76	32.296	
3,000.00	2,967.82	2,905.79	2,768.51	9.09	16.06	-54.01	-694.47	-321.15	565.43	547.86	17.57	32.178	
3,100.00	3,065.76	3,002.75	2,858.35	9.52	16.79	-54.36	-727.48	-336.59	589.68	571.29	18.39	32.065	
3,200.00	3,163.70	3,099.71	2,948.20	9.96	17.52	-54.67	-760.50	-352.03	613.94	594.73	19.21	31.957	
3,300.00	3,261.64	3,196.67	3,038.04	10.40	18.24	-54.97	-793.52	-367.47	638.22	618.19	20.04	31.854	
3,400.00	3,359.57	3,293.62	3,127.89	10.84	18.97	-55.24	-826.54	-382.91	662.52	641.65	20.86	31.755	
3,500.00	3,457.51	3,390.58	3,217.73	11.28	19.70	-55.49	-859.56	-398.35	686.83	665.13	21.69	31.661	
3,600.00	3,555.45	3,487.54	3,307.58	11.73	20.43	-55.73	-892.58	-413.79	711.15	688.62	22.53	31.571	
3,700.00	3,653.39	3,584.50	3,397.42	12.17	21.16	-55.94	-925.60	-429.23	735.48	712.12	23.36	31.486	
3,800.00	3,751.33	3,681.46	3,487.27	12.61	21.88	-56.15	-958.61	-444.67	759.82	735.62	24.19	31.404	
3,900.00	3,849.27	3,778.41	3,577.11	13.06	22.61	-56.34	-991.63	-460.11	784.16	759.13	25.03	31.327	
4,000.00	3,947.21	3,875.37	3,666.96	13.50	23.34	-56.52	-1,024.65	-475.55	808.52	782.65	25.87	31.253	
4,100.00	4,045.15	3,972.33	3,756.80	13.95	24.07	-56.69	-1,057.67	-490.99	832.88	806.17	26.71	31.182	
4,200.00	4,143.09	4,069.29	3,846.65	14.39	24.80	-56.85	-1,090.69	-506.43	857.25	829.70	27.55	31.115	
4,300.00	4,241.03	4,166.24	3,936.50	14.84	25.53	-57.01	-1,123.71	-521.87	881.63	853.24	28.39	31.050	
4,400.00	4,338.97	4,263.20	4,026.34	15.29	26.26	-57.15	-1,156.73	-537.31	906.01	876.78	29.24	30.989	
4,500.00	4,436.91	4,360.16	4,116.19	15.73	26.99	-57.29	-1,189.74	-552.75	930.40	900.32	30.08	30.930	
4,600.00	4,534.85	4,457.12	4,206.03	16.18	27.71	-57.42	-1,222.76	-568.19	954.79	923.86	30.93	30.874	
4,700.00	4,632.79	4,554.08	4,295.88	16.63	28.44	-57.54	-1,255.78	-583.63	979.19	947.41	31.77	30.820	
4,800.00	4,730.73	4,651.03	4,385.72	17.08	29.17	-57.66	-1,288.80	-599.07	1,003.59	970.97	32.62	30.768	

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 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 33-33	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
4,900.00	4,828.67	4,747.99	4,475.57	17.53	29.90	-57.77	-1,321.82	-614.51	1,027.99	994.52	33.46	30.719	
5,000.00	4,926.61	4,844.95	4,565.41	17.97	30.63	-57.87	-1,354.84	-629.95	1,052.40	1,018.08	34.31	30.671	
5,100.00	5,024.55	4,941.91	4,655.26	18.42	31.36	-57.97	-1,387.86	-645.39	1,076.81	1,041.65	35.16	30.626	
5,200.00	5,122.48	5,038.86	4,745.10	18.87	32.09	-58.07	-1,420.87	-660.83	1,101.22	1,065.21	36.01	30.582	
5,300.00	5,220.42	5,135.82	4,834.95	19.32	32.82	-58.16	-1,453.89	-676.27	1,125.64	1,088.78	36.86	30.540	
5,400.00	5,318.36	5,232.78	4,924.80	19.77	33.55	-58.25	-1,486.91	-691.71	1,150.05	1,112.35	37.71	30.499	
5,500.00	5,416.30	5,329.74	5,014.64	20.22	34.28	-58.34	-1,519.93	-707.15	1,174.48	1,135.92	38.56	30.460	
5,600.00	5,514.24	5,446.88	5,123.37	20.67	35.04	-58.44	-1,559.41	-725.61	1,198.62	1,159.16	39.46	30.374	
5,664.53	5,577.44	5,548.94	5,219.27	20.96	35.54	-58.60	-1,591.03	-740.39	1,212.31	1,172.19	40.12	30.215	
5,700.00	5,612.23	5,605.56	5,272.99	21.10	35.81	-58.82	-1,607.23	-747.97	1,219.08	1,178.59	40.48	30.113	
5,800.00	5,710.72	5,766.75	5,427.74	21.39	36.48	-59.36	-1,648.05	-767.06	1,235.96	1,194.60	41.37	29.879	
5,900.00	5,809.75	5,930.00	5,586.78	21.65	37.06	-59.78	-1,681.28	-782.60	1,249.54	1,207.42	42.12	29.663	
6,000.00	5,909.21	6,094.87	5,749.27	21.87	37.53	-60.10	-1,706.47	-794.38	1,259.72	1,216.97	42.75	29.467	
6,100.00	6,008.97	6,260.91	5,914.26	22.05	37.87	-60.31	-1,723.24	-802.22	1,266.42	1,223.19	43.23	29.295	
6,200.00	6,108.91	6,427.65	6,080.73	22.20	38.09	-60.41	-1,731.33	-806.00	1,269.60	1,226.03	43.57	29.139	
6,247.09	6,156.00	6,502.93	6,156.00	22.25	38.15	179.85	-1,732.11	-806.37	1,269.88	1,226.19	43.69	29.067	
6,300.00	6,208.91	6,555.84	6,208.91	22.32	38.19	179.85	-1,732.11	-806.37	1,269.88	1,226.07	43.81	28.985	
6,400.00	6,308.91	6,655.84	6,308.91	22.44	38.25	179.85	-1,732.11	-806.37	1,269.88	1,225.83	44.05	28.829	
6,500.00	6,408.91	6,755.84	6,408.91	22.56	38.31	179.85	-1,732.11	-806.37	1,269.88	1,225.59	44.29	28.672	
6,600.00	6,508.91	6,855.84	6,508.91	22.68	38.37	179.85	-1,732.11	-806.37	1,269.88	1,225.34	44.53	28.515	
6,700.00	6,608.91	6,955.84	6,608.91	22.81	38.44	179.85	-1,732.11	-806.37	1,269.88	1,225.10	44.78	28.358	
6,800.00	6,708.91	7,055.84	6,708.91	22.94	38.50	179.85	-1,732.11	-806.37	1,269.88	1,224.85	45.03	28.200	
6,900.00	6,808.91	7,155.84	6,808.91	23.06	38.57	179.85	-1,732.11	-806.37	1,269.88	1,224.59	45.28	28.042	
7,000.00	6,908.91	7,255.84	6,908.91	23.19	38.64	179.85	-1,732.11	-806.37	1,269.88	1,224.34	45.54	27.885	
7,100.00	7,008.91	7,355.84	7,008.91	23.33	38.71	179.85	-1,732.11	-806.37	1,269.88	1,224.08	45.80	27.727	
7,200.00	7,108.91	7,455.84	7,108.91	23.46	38.78	179.85	-1,732.11	-806.37	1,269.88	1,223.82	46.06	27.569	
7,300.00	7,208.91	7,555.84	7,208.91	23.59	38.85	179.85	-1,732.11	-806.37	1,269.88	1,223.55	46.33	27.411	
7,400.00	7,308.91	7,655.84	7,308.91	23.73	38.93	179.85	-1,732.11	-806.37	1,269.88	1,223.28	46.59	27.254	
7,500.00	7,408.91	7,755.84	7,408.91	23.87	39.00	179.85	-1,732.11	-806.37	1,269.88	1,223.01	46.86	27.097	
7,600.00	7,508.91	7,855.84	7,508.91	24.00	39.08	179.85	-1,732.11	-806.37	1,269.88	1,222.74	47.14	26.939	
7,700.00	7,608.91	7,955.84	7,608.91	24.14	39.15	179.85	-1,732.11	-806.37	1,269.88	1,222.46	47.41	26.783	
7,800.00	7,708.91	8,055.84	7,708.91	24.28	39.23	179.85	-1,732.11	-806.37	1,269.88	1,222.19	47.69	26.626	
7,900.00	7,808.91	8,155.84	7,808.91	24.43	39.31	179.85	-1,732.11	-806.37	1,269.88	1,221.90	47.97	26.470	
8,000.00	7,908.91	8,255.84	7,908.91	24.57	39.39	179.85	-1,732.11	-806.37	1,269.88	1,221.62	48.26	26.315	
8,100.00	8,008.91	8,355.84	8,008.91	24.71	39.47	179.85	-1,732.11	-806.37	1,269.88	1,221.33	48.54	26.160	
8,142.26	8,051.17	8,398.09	8,051.17	24.78	39.50	179.85	-1,732.11	-806.37	1,269.88	1,221.21	48.67	26.094	
8,166.09	8,075.00	8,416.93	8,070.00	24.81	39.52	179.85	-1,732.11	-806.37	1,269.89	1,221.16	48.73	26.061	

Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 33-33	Database:	EDM 2003.21 Single User Db
Reference Design:	PLAN #1 2-19-10 RHS	Offset TVD Reference:	Offset Datum

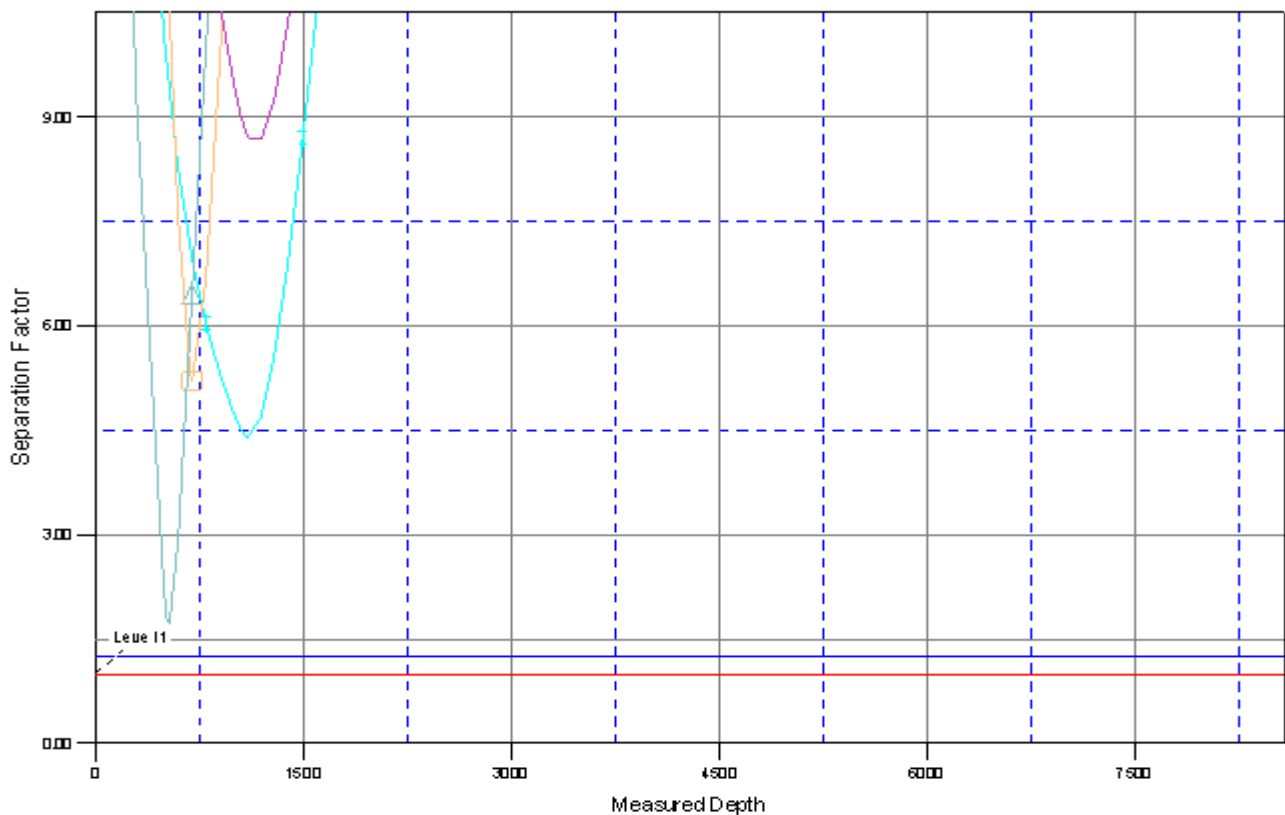
Reference Depths are relative to WELL @ 4964.00ft (Original Well Elev) Coordinates are relative to: P_COTTONWOOD 33-33
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is 105° 30' 0.000 W ° Grid Convergence at Surface is: 0.46°






Company:	US ROCKIES REGION PLANNING	Local Co-ordinate Reference:	Well P_COTTONWOOD 33-33
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 33-33	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00ft	Output errors are at	2.00 sigma
Reference Wellbore	P_COTTONWOOD 33-33	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 33-33
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

COTTONWOOD 11-33, PLAN #1 2-19-10 RHS \0  P_COTTONWOOD 13-33, P_COTTONWOOD 13-33, PLAN #1 2-19-10 RHS \0  P_COTTONWOOD 34-33, P_COTTONWOOD 34-33, PLAN #1 2-19-10 RHS \0
 COTTONWOOD 12-33, PLAN #1 2-19-10 RHS \0  P_COTTONWOOD 32-33, P_COTTONWOOD 32-33, PLAN #1 2-19-10 RHS \0