

Nighthawk Production, LLC

Lincoln County, CO

Powderhorn Pad

Salen 14-35

Wellbore #1

Plan: Plan #1 13Jun14 kjs

Standard Planning Report - Geographic

13 June, 2014

New Tech

Planning Report - Geographic

Database:	EDM 2003.16 Single User Db	Local Co-ordinate Reference:	Well Salen 14-35
Company:	Nighthawk Production, LLC	TVD Reference:	WELL @ 5172.0ft (Original Well Elev)
Project:	Lincoln County, CO	MD Reference:	WELL @ 5172.0ft (Original Well Elev)
Site:	Powderhorn Pad	North Reference:	True
Well:	Salen 14-35	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 13Jun14 kjs		

Project	Lincoln County, CO, Lincoln, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site	Powderhorn Pad				
Site Position:		Northing:	1,640,257.41 ft	Latitude:	39° 34' 20.676 N
From:	Lat/Long	Easting:	3,593,520.00 ft	Longitude:	103° 23' 39.624 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	1.33 °

Well	Salen 14-35					
Well Position	+N/-S	0.0 ft	Northing:	1,638,730.87 ft	Latitude:	39° 34' 5.844 N
	+E/-W	0.0 ft	Easting:	3,592,421.81 ft	Longitude:	103° 23' 54.096 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,160.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/13/2014	7.65	66.49	52,513

Design	Plan #1 13Jun14 kjs			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	231.37

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,745.9	3.69	231.37	1,745.7	-4.9	-6.2	1.50	1.50	0.00	231.37	
5,762.8	3.69	231.37	5,754.3	-166.3	-208.1	0.00	0.00	0.00	0.00	
6,008.7	0.00	0.00	6,000.0	-171.2	-214.3	1.50	-1.50	0.00	180.00	Target (50' Radius) S
9,008.7	0.00	0.00	9,000.0	-171.2	-214.3	0.00	0.00	0.00	0.00	

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Project:	Lincoln County, CO	MD Reference:	WELL @ 5172.0ft (Original Well Elev)
Site:	Powderhorn Pad	North Reference:	True
Well:	Salen 14-35	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 13Jun14 kjs		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	1,638,730.87	3,592,421.81	39° 34' 5.844 N	103° 23' 54.096 W
200.0	0.00	0.00	200.0	0.0	0.0	1,638,730.87	3,592,421.81	39° 34' 5.844 N	103° 23' 54.096 W
400.0	0.00	0.00	400.0	0.0	0.0	1,638,730.87	3,592,421.81	39° 34' 5.844 N	103° 23' 54.096 W
600.0	0.00	0.00	600.0	0.0	0.0	1,638,730.87	3,592,421.81	39° 34' 5.844 N	103° 23' 54.096 W
800.0	0.00	0.00	800.0	0.0	0.0	1,638,730.87	3,592,421.81	39° 34' 5.844 N	103° 23' 54.096 W
1,000.0	0.00	0.00	1,000.0	0.0	0.0	1,638,730.87	3,592,421.81	39° 34' 5.844 N	103° 23' 54.096 W
1,200.0	0.00	0.00	1,200.0	0.0	0.0	1,638,730.87	3,592,421.81	39° 34' 5.844 N	103° 23' 54.096 W
1,400.0	0.00	0.00	1,400.0	0.0	0.0	1,638,730.87	3,592,421.81	39° 34' 5.844 N	103° 23' 54.096 W
1,500.0	0.00	0.00	1,500.0	0.0	0.0	1,638,730.87	3,592,421.81	39° 34' 5.844 N	103° 23' 54.096 W
Start Build 1.50									
1,600.0	1.50	231.37	1,600.0	-0.8	-1.0	1,638,730.03	3,592,420.80	39° 34' 5.836 N	103° 23' 54.109 W
1,745.9	3.69	231.37	1,745.7	-4.9	-6.2	1,638,725.79	3,592,415.74	39° 34' 5.795 N	103° 23' 54.175 W
Hold 3.69 Inclination									
1,800.0	3.69	231.37	1,799.7	-7.1	-8.9	1,638,723.55	3,592,413.07	39° 34' 5.774 N	103° 23' 54.210 W
2,000.0	3.69	231.37	1,999.3	-15.1	-19.0	1,638,715.29	3,592,403.21	39° 34' 5.694 N	103° 23' 54.338 W
2,200.0	3.69	231.37	2,198.9	-23.2	-29.0	1,638,707.03	3,592,393.35	39° 34' 5.615 N	103° 23' 54.466 W
2,400.0	3.69	231.37	2,398.5	-31.2	-39.1	1,638,698.76	3,592,383.48	39° 34' 5.536 N	103° 23' 54.595 W
2,600.0	3.69	231.37	2,598.1	-39.2	-49.1	1,638,690.50	3,592,373.62	39° 34' 5.456 N	103° 23' 54.723 W
2,800.0	3.69	231.37	2,797.6	-47.3	-59.2	1,638,682.24	3,592,363.76	39° 34' 5.377 N	103° 23' 54.851 W
3,000.0	3.69	231.37	2,997.2	-55.3	-69.2	1,638,673.98	3,592,353.89	39° 34' 5.297 N	103° 23' 54.980 W
3,200.0	3.69	231.37	3,196.8	-63.3	-79.3	1,638,665.72	3,592,344.03	39° 34' 5.218 N	103° 23' 55.108 W
3,400.0	3.69	231.37	3,396.4	-71.4	-89.3	1,638,657.45	3,592,334.16	39° 34' 5.139 N	103° 23' 55.237 W
3,600.0	3.69	231.37	3,596.0	-79.4	-99.4	1,638,649.19	3,592,324.30	39° 34' 5.059 N	103° 23' 55.365 W
3,679.2	3.69	231.37	3,675.0	-82.6	-103.3	1,638,645.92	3,592,320.40	39° 34' 5.028 N	103° 23' 55.416 W
Niobrara									
3,800.0	3.69	231.37	3,795.6	-87.4	-109.4	1,638,640.93	3,592,314.44	39° 34' 4.980 N	103° 23' 55.493 W
4,000.0	3.69	231.37	3,995.2	-95.5	-119.5	1,638,632.67	3,592,304.57	39° 34' 4.900 N	103° 23' 55.622 W
4,037.9	3.69	231.37	4,033.0	-97.0	-121.4	1,638,631.10	3,592,302.70	39° 34' 4.885 N	103° 23' 55.646 W
Ft. Hayes									
4,200.0	3.69	231.37	4,194.7	-103.5	-129.5	1,638,624.40	3,592,294.71	39° 34' 4.821 N	103° 23' 55.750 W
4,400.0	3.69	231.37	4,394.3	-111.5	-139.6	1,638,616.14	3,592,284.85	39° 34' 4.742 N	103° 23' 55.878 W
4,533.9	3.69	231.37	4,528.0	-116.9	-146.3	1,638,610.61	3,592,278.24	39° 34' 4.689 N	103° 23' 55.964 W
D Sand									
4,600.0	3.69	231.37	4,593.9	-119.6	-149.6	1,638,607.88	3,592,274.98	39° 34' 4.662 N	103° 23' 56.007 W
4,800.0	3.69	231.37	4,793.5	-127.6	-159.7	1,638,599.62	3,592,265.12	39° 34' 4.583 N	103° 23' 56.135 W
5,000.0	3.69	231.37	4,993.1	-135.6	-169.7	1,638,591.35	3,592,255.25	39° 34' 4.504 N	103° 23' 56.264 W
5,200.0	3.69	231.37	5,192.7	-143.7	-179.8	1,638,583.09	3,592,245.39	39° 34' 4.424 N	103° 23' 56.392 W
5,400.0	3.69	231.37	5,392.3	-151.7	-189.8	1,638,574.83	3,592,235.53	39° 34' 4.345 N	103° 23' 56.520 W
5,600.0	3.69	231.37	5,591.8	-159.7	-199.9	1,638,566.57	3,592,225.66	39° 34' 4.265 N	103° 23' 56.649 W
5,762.8	3.69	231.37	5,754.3	-166.3	-208.1	1,638,559.84	3,592,217.64	39° 34' 4.201 N	103° 23' 56.753 W
Start Drop -1.50									
5,800.0	3.13	231.37	5,791.4	-167.6	-209.8	1,638,558.42	3,592,215.94	39° 34' 4.187 N	103° 23' 56.775 W
6,000.0	0.13	231.37	5,991.3	-171.2	-214.2	1,638,554.77	3,592,211.58	39° 34' 4.152 N	103° 23' 56.832 W
6,008.7	0.00	0.00	6,000.0	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
Vertical - Target (50' Radius) Salen 14-35									
6,151.7	0.00	0.00	6,143.0	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
PENNSYLVANIAN									
6,200.0	0.00	0.00	6,191.3	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
6,400.0	0.00	0.00	6,391.3	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
6,600.0	0.00	0.00	6,591.3	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
6,800.0	0.00	0.00	6,791.3	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
6,855.7	0.00	0.00	6,847.0	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
LKC									

New Tech

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Project:	Lincoln County, CO	MD Reference:	WELL @ 5172.0ft (Original Well Elev)
Site:	Powderhorn Pad	North Reference:	True
Well:	Salen 14-35	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 13Jun14 kjs		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (ft)	Map Easting (ft)	Latitude	Longitude
7,000.0	0.00	0.00	6,991.3	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
7,187.7	0.00	0.00	7,179.0	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
MARMATON									
7,200.0	0.00	0.00	7,191.3	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
7,368.7	0.00	0.00	7,360.0	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
CHEROKEE									
7,400.0	0.00	0.00	7,391.3	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
7,600.0	0.00	0.00	7,591.3	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
7,800.0	0.00	0.00	7,791.3	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
7,981.7	0.00	0.00	7,973.0	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
MISSISSIPPIAN									
8,000.0	0.00	0.00	7,991.3	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
8,052.7	0.00	0.00	8,044.0	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
SPERGEN									
8,200.0	0.00	0.00	8,191.3	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
8,400.0	0.00	0.00	8,391.3	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
8,600.0	0.00	0.00	8,591.3	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
8,800.0	0.00	0.00	8,791.3	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
9,000.0	0.00	0.00	8,991.3	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
9,008.7	0.00	0.00	9,000.0	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
TD at 9008.7									

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									
Target (50' Radius) Sale	0.00	0.00	6,000.0	-171.2	-214.3	1,638,554.76	3,592,211.57	39° 34' 4.152 N	103° 23' 56.832 W
- plan hits target									
- Circle (radius 50.0)									

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
7,187.7	7,179.0	MARMATON				
4,037.9	4,033.0	Ft. Hayes				
7,368.7	7,360.0	CHEROKEE				
4,533.9	4,528.0	D Sand				
6,151.7	6,143.0	PENNSYLVANIAN				
3,679.2	3,675.0	Niobrara				
8,052.7	8,044.0	SPERGEN				
9,008.7	9,000.0	TD				
6,855.7	6,847.0	LKC				
7,981.7	7,973.0	MISSISSIPPIAN				

New Tech

Planning Report - Geographic

Database:	EDM 2003.16 Single User Db	Local Co-ordinate Reference:	Well Salen 14-35
Company:	Nighthawk Production, LLC	TVD Reference:	WELL @ 5172.0ft (Original Well Elev)
Project:	Lincoln County, CO	MD Reference:	WELL @ 5172.0ft (Original Well Elev)
Site:	Powderhorn Pad	North Reference:	True
Well:	Salen 14-35	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 13Jun14 kjs		

Plan Annotations

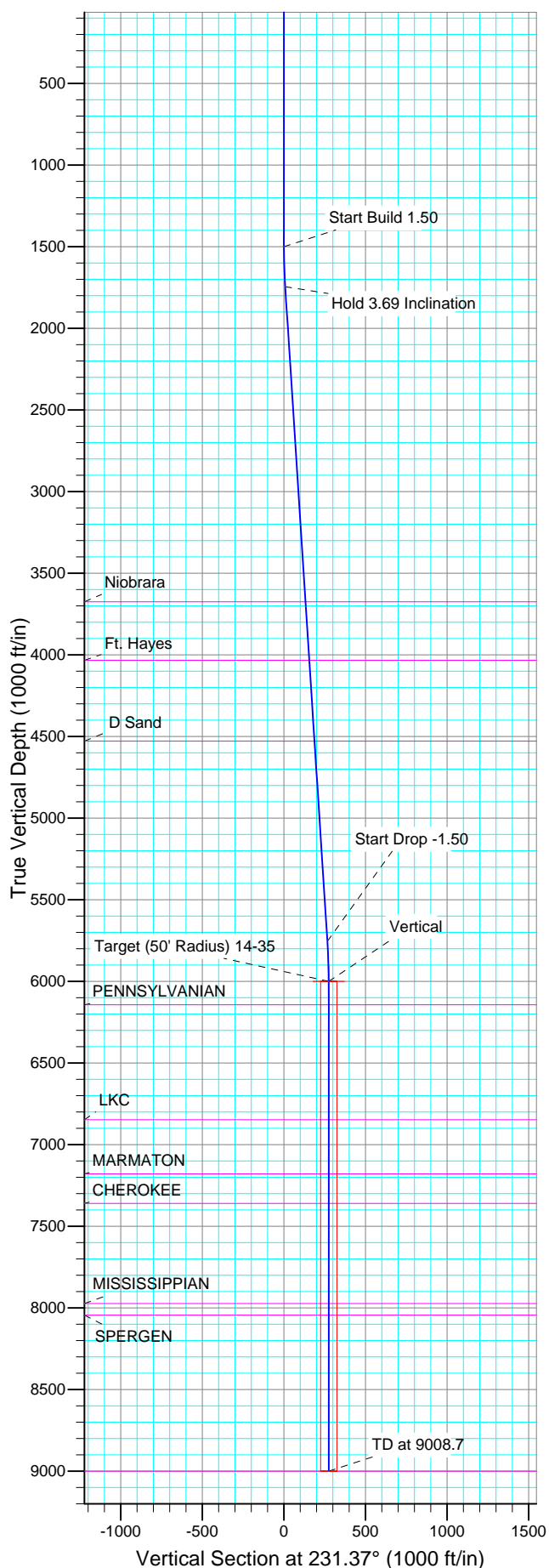
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,500.0	1,500.0	0.0	0.0	Start Build 1.50
1,745.9	1,745.7	-4.9	-6.2	Hold 3.69 Inclination
5,762.8	5,754.3	-166.3	-208.1	Start Drop -1.50
6,008.7	6,000.0	-171.2	-214.3	Vertical
9,008.7	9,000.0	-171.2	-214.3	TD at 9008.7



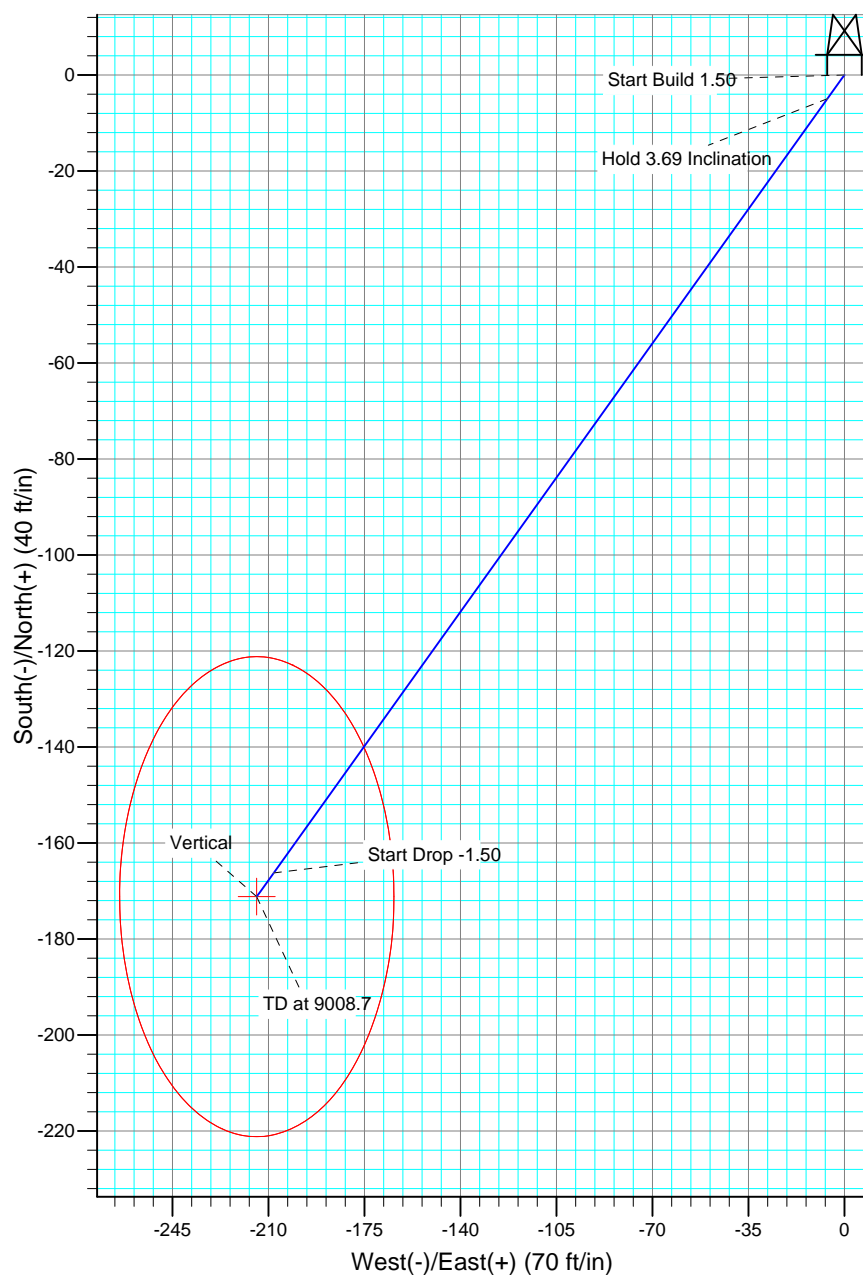
Well Name: Salen 14-35
Surface Location: Powderhorn Pad
North American Datum 1983
US State Plane 1983 , Colorado Central Zone
Ground Elevation: 5160.0
WELL @ 5172.0ft (Original Well Elev)

Project: Lincoln County, CO
Site: Powderhorn Pad
Well: Salen 14-35
Wellbore: Wellbore #1
Design: Plan #1 13Jun14 kjs

+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1638730.87 3592421.81 39° 34' 5.844 N 103° 23' 54.096 W



SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1500.0	0.00	0.00	1500.0	0.0	0.0	0.00	0.00	0.0	
3	1745.9	3.69	231.37	1745.7	-4.9	-6.2	1.50	231.37	7.9	
4	5762.8	3.69	231.37	5754.3	-166.3	-208.1	0.00	0.00	266.3	
5	6008.7	0.00	0.00	6000.0	-171.2	-214.3	1.50	180.00	274.2	Target (50' Radius) Salen 14-35
6	9008.7	0.00	0.00	9000.0	-171.2	-214.3	0.00	0.00	274.2	



FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
3675.0	3679.2	Niobrara
4033.0	4037.9	Ft. Hayes
4528.0	4533.9	D Sand
6143.0	6151.7	PENNSYLVANIAN
6847.0	6855.7	LKC
7179.0	7187.7	MARMATON
7360.0	7368.7	CHEROKEE
7973.0	7981.7	MISSISSIPPIAN
8044.0	8052.7	SPERGEN
9000.0	9008.7	TD

