



EPW_RMP

CONCEPT WELL PLANNING - COLORADO (NAD83)

Searcy Gulch 1-27

Searcy Gulch 1-27

Searcy Gulch 1-27 Permit

Plan: Searcy Gulch 1-27 Permit

Standard Planning Report - Geographic

09 February, 2012





Shell EP

Planning Report - Geographic



Database:	EDM_UA_Production	Local Co-ordinate Reference:	Well Searcy Gulch 1-27
Company:	EPW_RMP	TVD Reference:	KB @ 6539.70ft (Original Well Elev)
Project:	CONCEPT WELL PLANNING - COLORADO (NAD83)	MD Reference:	KB @ 6539.70ft (Original Well Elev)
Site:	Searcy Gulch 1-27	North Reference:	Grid
Well:	Searcy Gulch 1-27	Survey Calculation Method:	Minimum Curvature
Wellbore:	Searcy Gulch 1-27 Permit		
Design:	Searcy Gulch 1-27 Permit		

Project	CONCEPT WELL PLANNING - COLORADO (NAD83)		
Map System:	EPW NAD83	System Datum:	Mean Sea Level
Geo Datum:	NAD83 [1188_4269]		
Map Zone:	NAD83 / UTM 13N [1188_26913]		

Site		Searcy Gulch 1-27			
Site Position:		Northing:	14,667,682.83 usft	Latitude:	40° 21' 37.901 N
From:	Lat/Long	Easting:	950,376.01 usft	Longitude:	107° 28' 36.959 W
Position Uncertainty:	1.00 ft	Slot Radius:	10.000 in	Grid Convergence:	-1.60 °

Well	Searcy Gulch 1-27					
Well Position	+N/-S	0.00 ft	Northing:	14,667,682.83 usft	Latitude:	40° 21' 37.901 N
	+E/-W	0.00 ft	Easting:	950,376.01 usft	Longitude:	107° 28' 36.959 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	6,527.70 ft	Ground Level:	6,527.70 ft

Wellbore	Searcy Gulch 1-27 Permit				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2009	1/10/2012	10.12	66.55	52,765

Design	Searcy Gulch 1-27 Permit			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	238.09

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	



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Well:	Searcy Gulch 1-27	Survey Calculation Method:	Minimum Curvature
Wellbore:	Searcy Gulch 1-27 Permit		
Design:	Searcy Gulch 1-27 Permit		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
100.00	0.00	0.00	100.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
200.00	0.00	0.00	200.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
300.00	0.00	0.00	300.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
400.00	0.00	0.00	400.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
500.00	0.00	0.00	500.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
600.00	0.00	0.00	600.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
700.00	0.00	0.00	700.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
800.00	0.00	0.00	800.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
10 3/4"										
900.00	0.00	0.00	900.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
1,700.00	0.00	0.00	1,700.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
1,800.00	0.00	0.00	1,800.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
1,900.00	0.00	0.00	1,900.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
2,000.00	0.00	0.00	2,000.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
2,100.00	0.00	0.00	2,100.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
2,200.00	0.00	0.00	2,200.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
2,300.00	0.00	0.00	2,300.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
2,400.00	0.00	0.00	2,400.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
2,500.00	0.00	0.00	2,500.00	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
2,544.21	0.00	0.00	2,544.21	0.00	0.00	14,667,682.83	950,376.01	40° 21' 37.901 N	107° 28' 36.959 W	
2,550.00	0.38	238.09	2,550.00	-0.01	-0.02	14,667,682.82	950,376.00	40° 21' 37.901 N	107° 28' 36.959 W	
2,600.00	3.63	238.09	2,599.96	-0.93	-1.50	14,667,681.90	950,374.52	40° 21' 37.891 N	107° 28' 36.978 W	
2,650.00	6.88	238.09	2,649.75	-3.35	-5.38	14,667,679.48	950,370.63	40° 21' 37.866 N	107° 28' 37.027 W	
2,700.00	10.13	238.09	2,699.19	-7.26	-11.66	14,667,675.58	950,364.36	40° 21' 37.826 N	107° 28' 37.107 W	
2,750.00	13.38	238.09	2,748.14	-12.64	-20.30	14,667,670.19	950,355.72	40° 21' 37.770 N	107° 28' 37.216 W	
2,800.00	16.63	238.09	2,796.43	-19.48	-31.28	14,667,663.35	950,344.73	40° 21' 37.700 N	107° 28' 37.356 W	
2,850.00	19.88	238.09	2,843.90	-27.76	-44.57	14,667,655.08	950,331.44	40° 21' 37.614 N	107° 28' 37.524 W	
2,900.00	23.13	238.09	2,890.42	-37.44	-60.13	14,667,645.39	950,315.89	40° 21' 37.514 N	107° 28' 37.722 W	
2,950.00	26.38	238.09	2,935.82	-48.50	-77.90	14,667,634.33	950,298.12	40° 21' 37.400 N	107° 28' 37.947 W	
3,000.00	29.63	238.09	2,979.96	-60.91	-97.82	14,667,621.92	950,278.19	40° 21' 37.272 N	107° 28' 38.200 W	
3,050.00	32.88	238.09	3,022.70	-74.62	-119.84	14,667,608.21	950,256.18	40° 21' 37.131 N	107° 28' 38.479 W	
3,100.00	36.13	238.09	3,063.90	-89.59	-143.88	14,667,593.24	950,232.14	40° 21' 36.976 N	107° 28' 38.784 W	
3,150.00	39.38	238.09	3,103.43	-105.77	-169.86	14,667,577.07	950,206.16	40° 21' 36.809 N	107° 28' 39.114 W	
3,200.00	42.63	238.09	3,141.16	-123.10	-197.70	14,667,559.73	950,178.31	40° 21' 36.630 N	107° 28' 39.467 W	
3,206.60	43.06	238.09	3,146.00	-125.48	-201.51	14,667,557.36	950,174.50	40° 21' 36.606 N	107° 28' 39.515 W	
7.625"										
3,250.00	45.88	238.09	3,176.97	-141.54	-227.31	14,667,541.29	950,148.70	40° 21' 36.440 N	107° 28' 39.842 W	
3,300.00	49.13	238.09	3,210.74	-161.03	-258.60	14,667,521.81	950,117.41	40° 21' 36.239 N	107° 28' 40.239 W	
3,350.00	52.38	238.09	3,242.37	-181.49	-291.47	14,667,501.34	950,084.55	40° 21' 36.028 N	107° 28' 40.656 W	
3,400.00	55.63	238.09	3,271.76	-202.87	-325.80	14,667,479.96	950,050.21	40° 21' 35.807 N	107° 28' 41.092 W	
3,450.00	58.88	238.09	3,298.80	-225.10	-361.50	14,667,457.74	950,014.52	40° 21' 35.578 N	107° 28' 41.545 W	
3,500.00	62.13	238.09	3,323.42	-248.10	-398.43	14,667,434.74	949,977.58	40° 21' 35.340 N	107° 28' 42.013 W	
3,544.21	65.00	238.09	3,343.10	-269.02	-432.04	14,667,413.81	949,943.98	40° 21' 35.124 N	107° 28' 42.439 W	
3,600.00	65.00	238.09	3,366.68	-295.74	-474.96	14,667,387.09	949,901.06	40° 21' 34.848 N	107° 28' 42.984 W	
3,644.21	65.00	238.09	3,385.36	-316.93	-508.97	14,667,365.91	949,867.04	40° 21' 34.630 N	107° 28' 43.415 W	



Shell EP

Planning Report - Geographic



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Project:	CONCEPT WELL PLANNING - COLORADO (NAD83)	MD Reference:	KB @ 6539.70ft (Original Well Elev)
Site:	Searcy Gulch 1-27	North Reference:	Grid
Well:	Searcy Gulch 1-27	Survey Calculation Method:	Minimum Curvature
Wellbore:	Searcy Gulch 1-27 Permit		
Design:	Searcy Gulch 1-27 Permit		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
3,650.00	65.54	238.09	3,387.78	-319.70	-513.43	14,667,363.13	949,862.58	40° 21' 34.601 N	107° 28' 43.472 W
3,700.00	70.20	238.09	3,406.62	-344.18	-552.74	14,667,338.66	949,823.28	40° 21' 34.349 N	107° 28' 43.971 W
3,750.00	74.85	238.09	3,421.63	-369.38	-593.21	14,667,313.45	949,782.80	40° 21' 34.088 N	107° 28' 44.484 W
3,800.00	79.51	238.09	3,432.72	-395.14	-634.59	14,667,287.69	949,741.43	40° 21' 33.823 N	107° 28' 45.009 W
3,850.00	84.17	238.09	3,439.81	-421.30	-676.59	14,667,261.54	949,699.43	40° 21' 33.553 N	107° 28' 45.542 W
3,900.00	88.82	238.09	3,442.87	-447.67	-718.94	14,667,235.16	949,657.07	40° 21' 33.280 N	107° 28' 46.079 W
3,912.64	90.00	238.09	3,443.00	-454.35	-729.67	14,667,228.48	949,646.35	40° 21' 33.211 N	107° 28' 46.215 W
3,913.05	90.01	238.09	3,443.00	-454.57	-730.02	14,667,228.27	949,646.00	40° 21' 33.209 N	107° 28' 46.219 W
4,000.00	91.75	238.09	3,441.67	-500.53	-803.82	14,667,182.31	949,572.20	40° 21' 32.735 N	107° 28' 47.156 W
4,019.54	92.14	238.09	3,441.01	-510.85	-820.39	14,667,171.99	949,555.63	40° 21' 32.628 N	107° 28' 47.366 W
4,100.00	92.14	238.09	3,438.00	-553.35	-888.64	14,667,129.48	949,487.37	40° 21' 32.190 N	107° 28' 48.232 W
4,200.00	92.14	238.09	3,434.27	-606.18	-973.47	14,667,076.65	949,402.55	40° 21' 31.644 N	107° 28' 49.308 W
4,300.00	92.14	238.09	3,430.54	-659.01	-1,058.29	14,667,023.82	949,317.72	40° 21' 31.099 N	107° 28' 50.384 W
4,400.00	92.14	238.09	3,426.81	-711.84	-1,143.12	14,666,971.00	949,232.90	40° 21' 30.554 N	107° 28' 51.460 W
4,500.00	92.14	238.09	3,423.08	-764.66	-1,227.94	14,666,918.17	949,148.07	40° 21' 30.009 N	107° 28' 52.536 W
4,600.00	92.14	238.09	3,419.35	-817.49	-1,312.77	14,666,865.34	949,063.25	40° 21' 29.463 N	107° 28' 53.612 W
4,700.00	92.14	238.09	3,415.62	-870.32	-1,397.60	14,666,812.52	948,978.42	40° 21' 28.918 N	107° 28' 54.688 W
4,800.00	92.14	238.09	3,411.89	-923.15	-1,482.42	14,666,759.69	948,893.60	40° 21' 28.373 N	107° 28' 55.764 W
4,900.00	92.14	238.09	3,408.16	-975.97	-1,567.25	14,666,706.86	948,808.77	40° 21' 27.828 N	107° 28' 56.840 W
5,000.00	92.14	238.09	3,404.43	-1,028.80	-1,652.07	14,666,654.03	948,723.95	40° 21' 27.282 N	107° 28' 57.915 W
5,100.00	92.14	238.09	3,400.70	-1,081.63	-1,736.90	14,666,601.21	948,639.12	40° 21' 26.737 N	107° 28' 58.991 W
5,200.00	92.14	238.09	3,396.97	-1,134.46	-1,821.72	14,666,548.38	948,554.30	40° 21' 26.192 N	107° 29' 0.067 W
5,300.00	92.14	238.09	3,393.24	-1,187.28	-1,906.55	14,666,495.55	948,469.47	40° 21' 25.647 N	107° 29' 1.143 W
5,400.00	92.14	238.09	3,389.51	-1,240.11	-1,991.37	14,666,442.73	948,384.65	40° 21' 25.101 N	107° 29' 2.219 W
5,500.00	92.14	238.09	3,385.78	-1,292.94	-2,076.20	14,666,389.90	948,299.82	40° 21' 24.556 N	107° 29' 3.295 W
5,600.00	92.14	238.09	3,382.05	-1,345.76	-2,161.02	14,666,337.07	948,215.00	40° 21' 24.011 N	107° 29' 4.371 W
5,700.00	92.14	238.09	3,378.31	-1,398.59	-2,245.85	14,666,284.24	948,130.17	40° 21' 23.465 N	107° 29' 5.447 W
5,800.00	92.14	238.09	3,374.58	-1,451.42	-2,330.67	14,666,231.42	948,045.34	40° 21' 22.920 N	107° 29' 6.523 W
5,900.00	92.14	238.09	3,370.85	-1,504.25	-2,415.50	14,666,178.59	947,960.52	40° 21' 22.375 N	107° 29' 7.599 W
6,000.00	92.14	238.09	3,367.12	-1,557.07	-2,500.33	14,666,125.76	947,875.69	40° 21' 21.830 N	107° 29' 8.675 W
6,100.00	92.14	238.09	3,363.39	-1,609.90	-2,585.15	14,666,072.93	947,790.87	40° 21' 21.284 N	107° 29' 9.751 W
6,200.00	92.14	238.09	3,359.66	-1,662.73	-2,669.98	14,666,020.11	947,706.04	40° 21' 20.739 N	107° 29' 10.827 W
6,300.00	92.14	238.09	3,355.93	-1,715.56	-2,754.80	14,665,967.28	947,621.22	40° 21' 20.194 N	107° 29' 11.903 W
6,400.00	92.14	238.09	3,352.20	-1,768.38	-2,839.63	14,665,914.45	947,536.39	40° 21' 19.648 N	107° 29' 12.979 W
6,500.00	92.14	238.09	3,348.47	-1,821.21	-2,924.45	14,665,861.63	947,451.57	40° 21' 19.103 N	107° 29' 14.054 W
6,600.00	92.14	238.09	3,344.74	-1,874.04	-3,009.28	14,665,808.80	947,366.74	40° 21' 18.558 N	107° 29' 15.130 W
6,700.00	92.14	238.09	3,341.01	-1,926.87	-3,094.10	14,665,755.97	947,281.92	40° 21' 18.012 N	107° 29' 16.206 W
6,800.00	92.14	238.09	3,337.28	-1,979.69	-3,178.93	14,665,703.14	947,197.09	40° 21' 17.467 N	107° 29' 17.282 W
6,900.00	92.14	238.09	3,333.55	-2,032.52	-3,263.75	14,665,650.32	947,112.27	40° 21' 16.922 N	107° 29' 18.358 W
7,000.00	92.14	238.09	3,329.82	-2,085.35	-3,348.58	14,665,597.49	947,027.44	40° 21' 16.377 N	107° 29' 19.434 W
7,100.00	92.14	238.09	3,326.09	-2,138.18	-3,433.41	14,665,544.66	946,942.62	40° 21' 15.831 N	107° 29' 20.510 W
7,182.74	92.14	238.09	3,323.00	-2,181.88	-3,503.59	14,665,500.95	946,872.43	40° 21' 15.380 N	107° 29' 21.400 W
5 1/2"									



Shell EP

Planning Report - Geographic



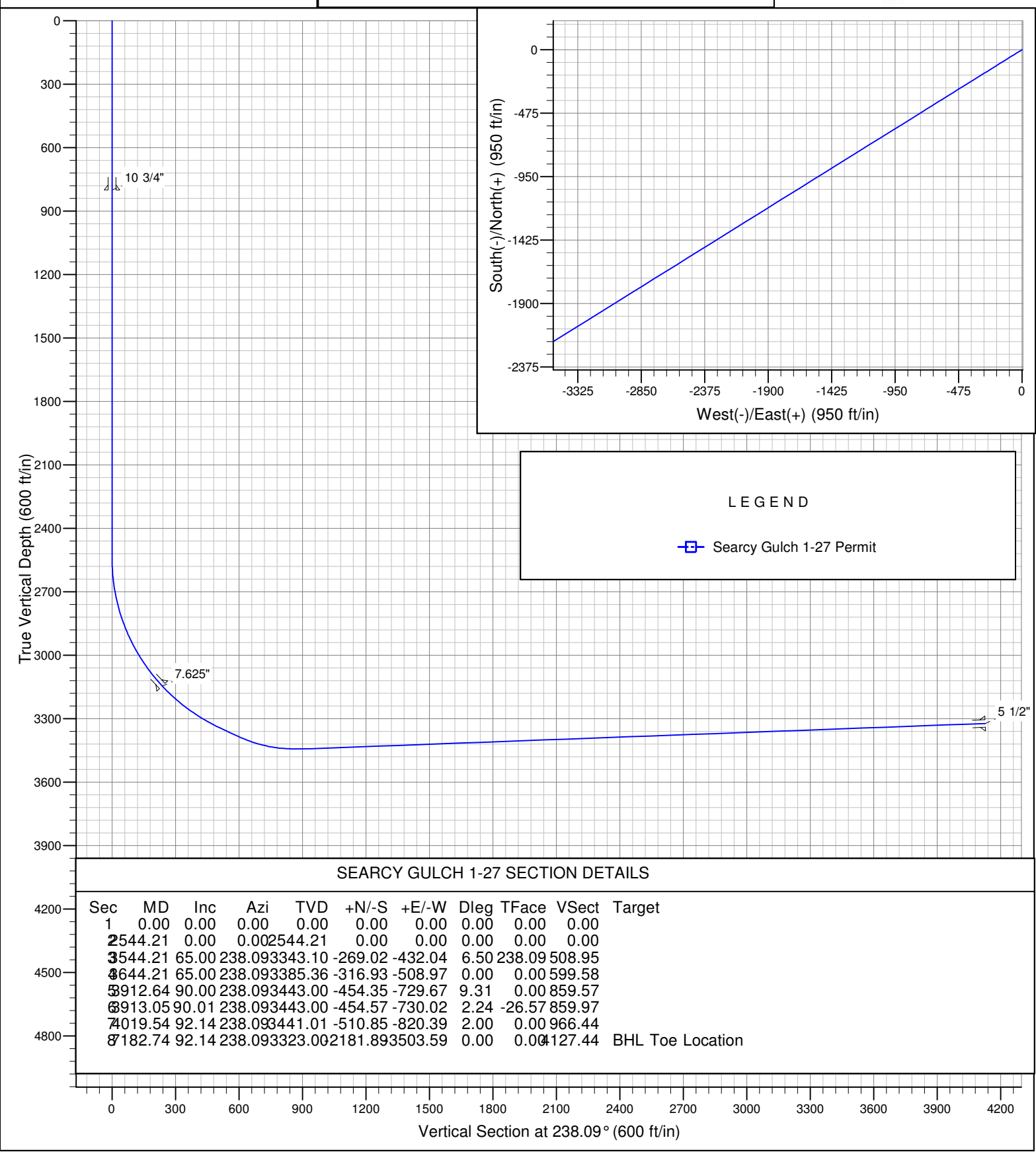
Database:	EDM_UA_Production	Local Co-ordinate Reference:	Well Searcy Gulch 1-27
Company:	EPW_RMP	TVD Reference:	KB @ 6539.70ft (Original Well Elev)
Project:	CONCEPT WELL PLANNING - COLORADO (NAD83)	MD Reference:	KB @ 6539.70ft (Original Well Elev)
Site:	Searcy Gulch 1-27	North Reference:	Grid
Well:	Searcy Gulch 1-27	Survey Calculation Method:	Minimum Curvature
Wellbore:	Searcy Gulch 1-27 Permit		
Design:	Searcy Gulch 1-27 Permit		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
BHL Toe Location	0.00	0.00	3,323.00	-2,181.89	-3,503.59	14,665,500.95	946,872.43	40° 21' 15.380 N	107° 29' 21.400 W
- plan hits target center									
- Point									
Heel Location	0.00	360.00	3,443.00	-636.98	-577.17	14,667,045.86	949,798.85	40° 21' 31.450 N	107° 28' 44.180 W
- plan misses target center by 235.64ft at 3879.76ft MD (3442.12 TVD, -436.98 N, -701.77 E)									
- Point									

Casing Points					
Measured Depth	Vertical Depth	Name		Casing Diameter	Hole Diameter
(ft)	(ft)			(in)	(in)
800.00	800.00	10 3/4"		10.750	12.250
3,206.60	3,146.00	7.625"		7.625	9.875
7,182.74	3,323.00	5 1/2"		5.500	6.750

Project: SWAN COLORADO (NAD83)
Site: Searcy Gulch 1-27
Well: Searcy Gulch 1-27
Wellbore: Searcy Gulch 1-27 Permit
Design: Searcy Gulch 1-27 Permit

SITE DETAILS: Searcy Gulch 1-27
Site Centre Latitude: 40° 21' 37.901 N
Longitude: 107° 28' 36.959 W
Positional Uncertainty: 1.00
Convergence: -1.60
Local North: Grid



SEARCY GULCH 1-27 SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V Sect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	544.21	0.00	0.00	544.21	0.00	0.00	0.00	0.00	0.00	
3	544.21	65.00	238.09	3343.10	-269.02	-432.04	6.50	238.09	508.95	
4	644.21	65.00	238.09	3385.36	-316.93	-508.97	0.00	0.00	599.58	
5	912.64	90.00	238.09	3443.00	-454.35	-729.67	9.31	0.00	859.57	
6	913.05	90.01	238.09	3443.00	-454.57	-730.02	2.24	-26.57	859.97	
7	019.54	92.14	238.09	3441.01	-510.85	-820.39	2.00	0.00	966.44	
8	182.74	92.14	238.09	3323.00	2181.89	3503.59	0.00	0.00	1127.44	BHL Toe Location

Searcy Gulch 1-27

T5N, R90W, Section 27

Wellbore Diagram

Updated: 2/7/2012
Location: Section 27 Township 5N Range 90W Moffat County, Colorado
Unit: Williams Fork Unit
API Number: Pending Elevation: 6527 GL
Target Zone: Niobrara Shale 6539 KB

Surface Section

Hole: 13-1/2"
Depth: 800
Casing: 10-3/4" 40.5# J-55, ST&C
Cement Top: Surface
Mud Weight: 8.4-9.3 ppg Water Base Mud

Intermediate Section

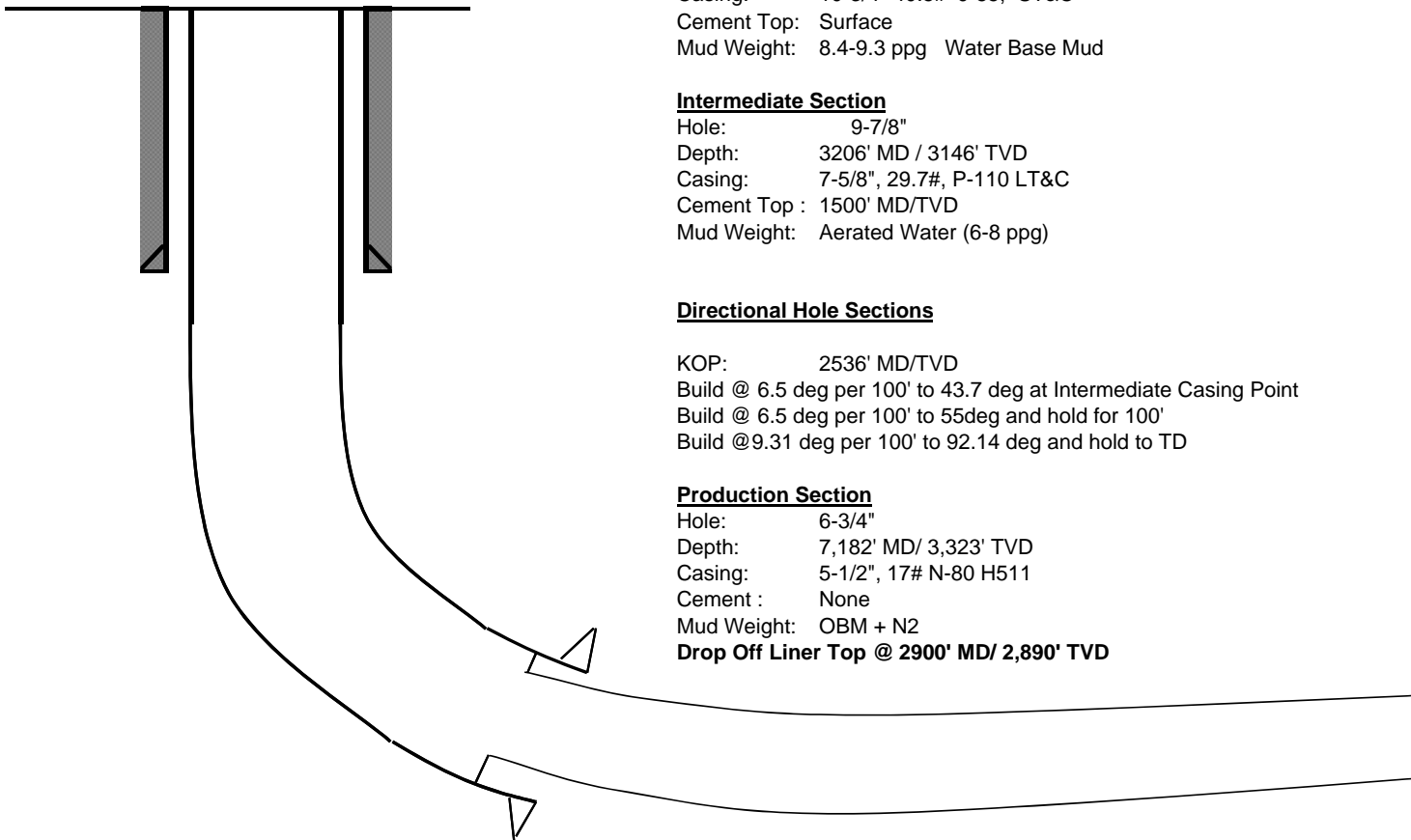
Hole: 9-7/8"
Depth: 3206' MD / 3146' TVD
Casing: 7-5/8", 29.7#, P-110 LT&C
Cement Top : 1500' MD/TVD
Mud Weight: Aerated Water (6-8 ppg)

Directional Hole Sections

KOP: 2536' MD/TVD
Build @ 6.5 deg per 100' to 43.7 deg at Intermediate Casing Point
Build @ 6.5 deg per 100' to 55deg and hold for 100'
Build @ 9.31 deg per 100' to 92.14 deg and hold to TD

Production Section

Hole: 6-3/4"
Depth: 7,182' MD/ 3,323' TVD
Casing: 5-1/2", 17# N-80 H511
Cement : None
Mud Weight: OBM + N2
Drop Off Liner Top @ 2900' MD/ 2,890' TVD



Drilling and Completion Plan – Horizontal Hole

This well is a “toe-up” horizontal well. See attached directional plan for well.

The surface hole will be 13-1/2” with a 10-3/4” casing cemented from the bottom to the surface. The intermediate hole will be a 9-7/8” with a 7-5/8” casing. The production section will be a 6-3/4” hole with a 5-1/2” casing. Depths of casing strings will vary by hole and are detailed on Form 2. All casing will be new, range 3 casing.

Completion of the main horizontal (lateral) borehole will consist of an open-hole section covered by a perforated or slotted liner run to the well TD by the drilling rig. The producing interval will be the Niobrara Formation and will start below the intermediate casing string set point near the top of the Niobrara Formation. If drilling with casing is required, a contingency will be to perforate the liner once landed in the well.

Artificial lift will consist of a sucker rod and pump jack system. The tubing will be run near the low spot of the well, the “heel”, and anchored above the producing interval. The sucker rods will be run with the pump set near the end of the tubing. All tubing and sucker rod equipment will be run with a workover rig or the drilling rig, each with a BOP package and a kill weight completion fluid system. Fracing or additional stimulation methods are not anticipated to be necessary. The surface pump unit will initially be a rental system to test the well, with a permanent pump jack unit being installed at a later date.