



# Wellbore Details

Provide Signature Page for Directional Survey

30-015-43934

Well Name HH SO 8 P2 6H	Lease HH SO 8 P2	Field Name Purple Sage	Business Unit Mid-Continent	
Ground Elevation (ft) 3,245.00	Original RKB Elevation (ft) 3,273.00	Current RKB Elevation 3,273.00, 5/14/2017	Mud Line Elevation (ft)	Water Depth (ft)
Current KB to Ground (ft) 28.00	Current KB to Mud Line (ft)	Current KB to Csg Flange (ft)	Current KB to Tubing Head (ft)	

<b>Logs</b>				
Type	Logging Company	Date	Planned?	Cased?
Wellbore	Job	Depth Top (MD) (ft)	Bottom Depth (ft)	
Comment				

<b>Wellbores</b>				
Wellbore Name Original Hole	Parent Wellbore Original Hole	Directional Type Horizontal	Start Depth (MD) (ft) 28	
Alt. Wellbore Identifier	TAML Classification N/A	TAML Functionality	Casing Configuration Class 1	
Bottom Hole Legal Location	Wellbore UWI 300154393400	Wellbore ChevNo PJ8436-00	Vertical Section Direction (°) 3.19	

<b>Wellbore Sections</b>					
Hole Size (in)	Start Date	Act Top (ft)	Act Btm (ft)	Prop Top (ft)	Prop Btm (ft)

<b>Kick Offs &amp; Key Depths</b>					
Date	Type	Point or Interval	Top Depth (ft)	Depth Top (TVD) (ft)	Method Open-hole

<b>Last 5 PBTD's</b>					
Type	Date	PBTD (ft)	Depth (TVD) (ft)	Method	Com

<b>Geologic Horizons</b>						
Formation Name	Prog Top (TVD SS) Override (ft(lev))	Prog Top (TVD) (ft)	Prog Btm (TVD SS) Override (ft(lev))	Prog Btm (TVD) (ft)	Drill Top MD (ft)	Drill Btm MD (ft)

<b>Directional Surveys</b>					
Description MWD	Date 12/2/2017	Definitive? N	Planned? N	Job Drill and Suspend, 5/14/2017 06:00	
Azimuth Tie In (°)	MD Tie In (ft)	Inclination Tie In (°)	NS Tie In (ft)	EW Tie In (ft)	TVD Tie In (ft)

Comment					
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<b>Survey Data</b>										
Date	MD (ft)	Incl (°)	Azm (°)	TVD (ft)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Method	Survey Company
5/15/2017	170	0.40	136.00	170.00	-0.40	-0.43	0.41	0.24	Magn MWD	Phoenix Directional
5/15/2017	263	0.20	252.00	263.00	-0.68	-0.71	0.48	0.56	Magn MWD	
5/15/2017	355	1.00	38.00	354.99	-0.08	-0.13	0.82	1.27	Magn MWD	
5/15/2017	427.5	0.30	110.00	427.49	0.38	0.31	1.39	1.31	Magn MWD	
7/4/2017	509	1.14	77.16	508.98	0.55	0.41	2.38	1.11	Magn MWD	
7/4/2017	594	1.35	89.76	593.96	0.84	0.61	4.21	0.40	Magn MWD	
7/4/2017	687	2.04	104.19	686.92	0.59	0.20	6.91	0.87	Magn MWD	
7/4/2017	873	4.25	105.52	872.63	-1.52	-2.45	16.76	1.19	Magn MWD	
7/4/2017	968	4.95	108.06	967.32	-3.32	-4.66	24.05	0.77	Magn MWD	
7/4/2017	1,062	5.19	106.85	1,060.96	-5.36	-7.15	31.97	0.28	Magn MWD	
7/4/2017	1,157	7.42	100.54	1,155.38	-7.16	-9.52	42.12	2.45	Magn MWD	
7/4/2017	1,251	9.65	97.04	1,248.33	-8.47	-11.60	55.91	2.43	Magn MWD	
7/4/2017	1,346	10.38	95.74	1,341.88	-9.38	-13.43	72.33	0.80	Magn MWD	
7/4/2017	1,441	11.25	92.26	1,435.19	-9.61	-14.65	90.10	1.14	Magn MWD	
7/4/2017	1,536	12.32	87.97	1,528.19	-8.54	-14.66	109.49	1.46	Magn MWD	
7/5/2017	1,630	12.39	88.04	1,620.02	-6.72	-13.96	129.59	0.08	Magn MWD	
7/5/2017	1,725	12.84	87.99	1,712.72	-4.85	-13.24	150.33	0.47	Magn MWD	
7/5/2017	1,820	13.54	87.10	1,805.22	-2.72	-12.31	171.98	0.77	Magn MWD	
7/5/2017	1,914	11.94	87.52	1,896.90	-0.59	-11.33	192.69	1.70	Magn MWD	
7/5/2017	2,009	10.31	87.29	1,990.11	1.26	-10.50	211.00	1.72	Magn MWD	
7/5/2017	2,104	9.50	88.81	2,083.69	2.73	-9.94	227.33	0.90	Magn MWD	
7/5/2017	2,198	10.67	87.09	2,176.24	4.25	-9.33	243.78	1.29	Magn MWD	
7/5/2017	2,293	11.96	84.86	2,269.39	6.61	-8.01	262.36	1.43	Magn MWD	
7/5/2017	2,388	12.12	83.65	2,362.30	9.69	-6.02	282.08	0.31	Magn MWD	
7/5/2017	2,482	12.45	83.47	2,454.15	13.03	-3.78	301.95	0.35	Magn MWD	
7/5/2017	2,577	13.14	83.71	2,546.79	16.54	-1.43	322.86	0.73	Magn MWD	



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Current KB to Ground (ft) 28.00	Current KB to Mud Line (ft)	Current KB to Csg Flange (ft)	Current KB to Tubing Head (ft)	

Survey Data											
Date	MD (ft)	Incl (°)	Azm (°)	TVD (ft)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Method	Survey Company	
7/5/2017	2,671	13.74	85.28	2,638.22	19.84	0.66	344.61	0.75	Magn MWD	Phoenix Directional	
7/5/2017	2,766	13.48	83.76	2,730.55	23.20	2.79	366.86	0.47	Magn MWD	Phoenix Directional	
7/5/2017	2,861	13.73	83.68	2,822.88	26.88	5.24	389.07	0.26	Magn MWD	Phoenix Directional	
7/5/2017	2,956	13.26	83.24	2,915.26	30.62	7.76	411.10	0.51	Magn MWD	Phoenix Directional	
7/5/2017	3,050	12.82	81.90	3,006.83	34.53	10.50	432.13	0.57	Magn MWD	Phoenix Directional	
7/5/2017	3,145	13.02	84.66	3,099.43	38.18	12.98	453.22	0.68	Magn MWD	Phoenix Directional	
7/5/2017	3,240	13.84	89.60	3,191.84	40.48	14.06	475.23	1.48	Magn MWD	Phoenix Directional	
7/5/2017	3,335	14.13	89.11	3,284.02	42.02	14.31	498.19	0.33	Magn MWD	Phoenix Directional	
7/5/2017	3,430	13.81	90.16	3,376.21	43.44	14.46	521.12	0.43	Magn MWD	Phoenix Directional	
7/5/2017	3,524	12.26	95.04	3,467.79	43.71	13.55	542.29	2.02	Magn MWD	Phoenix Directional	
7/5/2017	3,619	12.20	93.87	3,560.63	43.27	11.99	562.35	0.27	Magn MWD	Phoenix Directional	
7/5/2017	3,714	10.44	96.99	3,653.78	42.58	10.27	580.91	1.96	Magn MWD	Phoenix Directional	
7/6/2017	3,809	8.31	105.28	3,747.51	40.57	7.41	596.08	2.65	Magn MWD	Phoenix Directional	
7/6/2017	3,903	7.18	111.24	3,840.65	37.32	3.49	608.11	1.47	Magn MWD	Phoenix Directional	
7/6/2017	3,998	5.57	106.30	3,935.06	34.44	0.05	618.07	1.79	Magn MWD	Phoenix Directional	
7/6/2017	4,093	2.60	93.69	4,029.81	33.37	-1.39	624.64	3.25	Magn MWD	Phoenix Directional	
7/6/2017	4,188	1.37	78.06	4,124.75	33.65	-1.29	627.90	1.40	Magn MWD	Phoenix Directional	
7/6/2017	4,283	1.21	75.90	4,219.73	34.25	-0.81	629.99	0.18	Magn MWD	Phoenix Directional	
7/6/2017	4,378	1.01	74.23	4,314.71	34.82	-0.34	631.77	0.21	Magn MWD	Phoenix Directional	
7/6/2017	4,472	1.16	73.01	4,408.70	35.41	0.16	633.47	0.16	Magn MWD	Phoenix Directional	
7/6/2017	4,567	0.64	90.39	4,503.68	35.77	0.44	634.92	0.61	Magn MWD	Phoenix Directional	
7/6/2017	4,661	0.55	169.49	4,597.68	35.36	-0.01	635.53	0.81	Magn MWD	Phoenix Directional	
7/7/2017	4,756	0.63	176.97	4,692.68	34.40	-0.98	635.64	0.12	Magn MWD	Phoenix Directional	
7/7/2017	4,851	0.48	188.45	4,787.67	33.48	-1.89	635.61	0.20	Magn MWD	Phoenix Directional	
7/7/2017	4,946	0.62	180.69	4,882.67	32.57	-2.80	635.55	0.17	Magn MWD	Phoenix Directional	
7/7/2017	5,041	0.74	179.41	4,977.66	31.45	-3.93	635.55	0.13	Magn MWD	Phoenix Directional	
7/7/2017	5,135	0.86	189.29	5,071.65	30.14	-5.23	635.44	0.19	Magn MWD	Phoenix Directional	
7/7/2017	5,230	0.87	190.50	5,166.64	28.71	-6.64	635.19	0.02	Magn MWD	Phoenix Directional	
7/7/2017	5,325	0.99	185.60	5,261.63	27.18	-8.17	634.98	0.15	Magn MWD	Phoenix Directional	
7/7/2017	5,419	1.07	189.42	5,355.61	25.50	-9.84	634.76	0.11	Magn MWD	Phoenix Directional	
7/8/2017	5,514	1.20	188.60	5,450.59	23.62	-11.70	634.46	0.14	Magn MWD	Phoenix Directional	
7/8/2017	5,608	1.52	187.19	5,544.57	21.40	-13.91	634.16	0.34	Magn MWD	Phoenix Directional	
7/9/2017	5,703	1.22	187.10	5,639.54	19.13	-16.16	633.88	0.32	Magn MWD	Phoenix Directional	
7/9/2017	5,797	0.19	292.33	5,733.53	18.19	-17.10	633.61	1.36	Magn MWD	Phoenix Directional	
7/9/2017	5,892	0.75	345.36	5,828.53	18.83	-16.44	633.31	0.69	Magn MWD	Phoenix Directional	
7/9/2017	5,987	0.70	326.90	5,923.52	19.89	-15.35	632.83	0.25	Magn MWD	Phoenix Directional	
7/9/2017	6,082	0.71	321.68	6,018.51	20.80	-14.40	632.15	0.07	Magn MWD	Phoenix Directional	
7/9/2017	6,177	0.64	321.10	6,113.51	21.63	-13.53	631.45	0.07	Magn MWD	Phoenix Directional	
7/9/2017	6,271	0.68	302.56	6,207.50	22.30	-12.82	630.65	0.23	Magn MWD	Phoenix Directional	
7/9/2017	6,366	0.76	291.86	6,302.49	22.77	-12.28	629.59	0.16	Magn MWD	Phoenix Directional	
7/9/2017	6,461	1.13	287.70	6,397.48	23.21	-11.76	628.12	0.40	Magn MWD	Phoenix Directional	
7/10/2017	6,556	1.61	275.54	6,492.45	23.50	-11.35	625.90	0.59	Magn MWD	Phoenix Directional	
7/10/2017	6,650	1.78	264.82	6,586.41	23.34	-11.35	623.13	0.38	Magn MWD	Phoenix Directional	
7/10/2017	6,745	1.77	256.50	6,681.37	22.71	-11.83	620.23	0.27	Magn MWD	Phoenix Directional	
7/10/2017	6,840	1.81	262.13	6,776.32	22.00	-12.38	617.32	0.19	Magn MWD	Phoenix Directional	
7/10/2017	6,935	1.95	264.27	6,871.27	21.46	-12.74	614.22	0.16	Magn MWD	Phoenix Directional	
7/10/2017	7,029	1.86	258.31	6,965.22	20.82	-13.21	611.14	0.23	Magn MWD	Phoenix Directional	
7/10/2017	7,124	1.58	252.42	7,060.18	19.96	-13.92	608.38	0.35	Magn MWD	Phoenix Directional	
7/11/2017	7,219	1.45	258.42	7,155.14	19.19	-14.56	605.96	0.22	Magn MWD	Phoenix Directional	
7/11/2017	7,314	2.00	255.35	7,250.10	18.37	-15.22	603.17	0.59	Magn MWD	Phoenix Directional	
7/11/2017	7,409	2.08	242.48	7,345.04	16.98	-16.43	600.04	0.49	Magn MWD	Phoenix Directional	
7/11/2017	7,504	1.99	229.08	7,439.98	14.96	-18.31	597.27	0.51	Magn MWD	Phoenix Directional	
7/11/2017	7,600	1.98	223.45	7,535.92	12.53	-20.60	594.87	0.20	Magn MWD	Phoenix Directional	
7/11/2017	7,695	2.14	212.99	7,630.86	9.74	-23.28	592.77	0.43	Magn MWD	Phoenix Directional	
7/11/2017	7,790	2.61	208.60	7,725.78	6.25	-26.67	590.77	0.53	Magn MWD	Phoenix Directional	
7/12/2017	7,980	3.37	217.45	7,915.52	-2.28	-34.90	585.30	0.47	Magn MWD	Phoenix Directional	
7/12/2017	8,075	3.14	222.41	8,010.37	-6.60	-39.04	581.85	0.38	Magn MWD	Phoenix Directional	



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Current KB to Ground (ft) 28.00	Current KB to Mud Line (ft)	Current KB to Csg Flange (ft)	Current KB to Tubing Head (ft)	

## Survey Data

Date	MD (RKB)	Incl (°)	Azm (°)	TVD (RKB)	VS (ft)	NS (ft)	EW (ft)	DLS (*/100R)	Method	Survey Company
7/12/2017	8,169	2.64	228.18	8,104.25	-10.13	-42.38	578.50	0.61	Magn MWD	Phoenix Directional
7/12/2017	8,264	2.50	232.14	8,199.15	-13.03	-45.12	575.23	0.24	Magn MWD	Phoenix Directional
7/12/2017	8,359	2.53	241.23	8,294.06	-15.51	-47.40	571.76	0.42	Magn MWD	Phoenix Directional
7/12/2017	8,453	2.54	247.23	8,387.97	-17.52	-49.20	568.02	0.28	Magn MWD	Phoenix Directional
7/12/2017	8,548	2.56	247.98	8,482.88	-19.34	-50.81	564.11	0.04	Magn MWD	Phoenix Directional
7/13/2017	8,643	2.66	247.54	8,577.78	-21.20	-52.45	560.11	0.11	Magn MWD	Phoenix Directional
7/13/2017	8,737	2.71	246.60	8,671.67	-23.14	-54.16	556.05	0.07	Magn MWD	Phoenix Directional
7/13/2017	8,832	2.77	242.56	8,766.56	-25.31	-56.11	551.96	0.21	Magn MWD	Phoenix Directional
7/13/2017	9,028	2.80	239.48	8,962.33	-30.38	-60.73	543.63	0.08	Magn MWD	Phoenix Directional
7/13/2017	9,075	2.69	239.34	9,009.28	-31.63	-61.87	541.69	0.23	Magn MWD	Phoenix Directional
7/13/2017	9,122	1.04	7.86	9,056.26	-31.82	-62.01	540.80	7.31	Magn MWD	Phoenix Directional
7/13/2017	9,169	7.28	40.58	9,103.12	-29.03	-59.33	542.80	13.68	Magn MWD	Phoenix Directional
7/13/2017	9,217	13.36	43.25	9,150.32	-22.36	-52.97	548.58	12.70	Magn MWD	Phoenix Directional
7/13/2017	9,264	19.11	31.27	9,195.44	-11.41	-42.43	556.30	14.10	Magn MWD	Phoenix Directional
7/13/2017	9,311	25.16	20.27	9,238.97	4.95	-26.46	553.77	15.55	Magn MWD	Phoenix Directional
7/13/2017	9,358	29.33	18.54	9,280.75	25.62	-6.16	570.89	9.03	Magn MWD	Phoenix Directional
7/13/2017	9,405	31.46	15.86	9,321.29	48.69	16.55	577.91	5.37	Magn MWD	Phoenix Directional
7/13/2017	9,452	34.43	12.76	9,360.73	73.76	41.32	584.20	7.26	Magn MWD	Phoenix Directional
7/13/2017	9,500	39.80	11.63	9,399.00	102.36	69.62	590.29	11.28	Magn MWD	Phoenix Directional
7/13/2017	9,547	42.16	8.44	9,434.48	132.95	99.96	595.64	6.71	Magn MWD	Phoenix Directional
7/13/2017	9,594	44.02	7.35	9,468.80	164.95	131.76	600.05	4.26	Magn MWD	Phoenix Directional
7/13/2017	9,641	47.65	6.57	9,501.54	198.59	165.23	604.13	7.81	Magn MWD	Phoenix Directional
7/13/2017	9,689	53.04	5.82	9,532.16	235.48	201.95	608.10	11.29	Magn MWD	Phoenix Directional
7/13/2017	9,783	58.77	2.97	9,584.84	313.26	279.53	614.00	6.59	Magn MWD	Phoenix Directional
7/13/2017	9,830	62.83	2.80	9,607.77	354.28	320.49	616.06	8.64	Magn MWD	Phoenix Directional
7/13/2017	9,879	66.33	2.30	9,628.80	398.52	364.70	618.03	7.20	Magn MWD	Phoenix Directional
7/13/2017	9,977	73.37	2.48	9,662.53	490.46	456.56	621.87	7.19	Magn MWD	Phoenix Directional
7/13/2017	10,072	83.94	4.07	9,681.20	583.47	549.42	627.20	11.25	Magn MWD	Phoenix Directional
7/13/2017	10,103	88.46	3.95	9,683.25	614.39	580.26	629.37	14.59	Magn MWD	Phoenix Directional
7/13/2017	10,166	91.60	2.00	9,683.22	677.38	643.17	632.63	5.87	Magn MWD	Phoenix Directional
7/13/2017	10,260	94.96	359.68	9,677.84	771.12	736.98	634.01	4.34	Magn MWD	Phoenix Directional
7/13/2017	10,355	94.94	359.12	9,669.64	865.56	831.62	633.02	0.59	Magn MWD	Phoenix Directional
7/13/2017	10,449	94.29	359.88	9,662.08	959.06	925.32	632.20	1.06	Magn MWD	Phoenix Directional
7/13/2017	10,543	92.02	358.56	9,656.91	1,052.69	1,019.16	630.93	2.79	Magn MWD	Phoenix Directional
7/13/2017	10,638	91.90	358.50	9,653.66	1,147.32	1,114.07	628.49	0.14	Magn MWD	Phoenix Directional
7/13/2017	10,732	92.07	358.88	9,650.40	1,240.97	1,207.99	626.34	0.44	Magn MWD	Phoenix Directional
7/13/2017	10,826	95.05	359.22	9,644.56	1,334.53	1,301.78	624.79	3.19	Magn MWD	Phoenix Directional
7/13/2017	10,921	96.39	358.50	9,635.10	1,428.79	1,396.29	622.91	1.60	Magn MWD	Phoenix Directional
7/13/2017	11,015	95.21	358.07	9,625.60	1,521.96	1,489.76	620.11	1.34	Magn MWD	Phoenix Directional
7/13/2017	11,109	90.76	356.97	9,620.70	1,615.35	1,583.52	616.05	4.88	Magn MWD	Phoenix Directional
7/13/2017	11,203	86.64	356.09	9,622.83	1,708.67	1,677.31	610.36	4.48	Magn MWD	Phoenix Directional
7/13/2017	11,298	89.02	356.21	9,626.43	1,802.88	1,772.02	603.99	2.51	Magn MWD	Phoenix Directional
7/13/2017	11,422	91.43	355.71	9,625.94	1,925.88	1,895.70	595.25	1.98	Magn MWD	Phoenix Directional
7/13/2017	11,515	89.27	357.72	9,625.38	2,018.28	1,988.53	589.92	3.17	Magn MWD	Phoenix Directional
7/13/2017	11,608	89.58	0.44	9,626.31	2,111.03	2,081.51	588.43	2.94	Magn MWD	Phoenix Directional
7/13/2017	11,700	92.10	1.18	9,624.96	2,202.93	2,173.48	589.73	2.85	Magn MWD	Phoenix Directional
7/13/2017	11,793	92.49	0.71	9,621.24	2,295.78	2,266.39	591.26	0.66	Magn MWD	Phoenix Directional
7/13/2017	11,885	92.10	358.88	9,617.55	2,387.54	2,358.31	590.93	2.03	Magn MWD	Phoenix Directional
7/13/2017	11,978	91.51	359.59	9,614.62	2,480.27	2,451.26	589.69	0.99	Magn MWD	Phoenix Directional
7/13/2017	12,071	91.57	359.92	9,612.12	2,573.07	2,544.22	589.29	0.36	Magn MWD	Phoenix Directional
7/13/2017	12,165	90.22	358.53	9,610.66	2,666.83	2,638.20	588.02	2.06	Magn MWD	Phoenix Directional
7/13/2017	12,259	89.30	359.61	9,611.05	2,760.59	2,732.18	586.50	1.51	Magn MWD	Phoenix Directional
7/13/2017	12,354	91.99	3.24	9,609.98	2,855.51	2,827.12	588.86	4.76	Magn MWD	Phoenix Directional
7/13/2017	12,448	89.72	1.99	9,608.58	2,949.49	2,921.01	593.15	2.76	Magn MWD	Phoenix Directional
7/13/2017	12,542	90.87	2.42	9,608.09	3,043.47	3,014.93	596.76	1.31	Magn MWD	Phoenix Directional
7/13/2017	12,636	89.39	1.84	9,607.88	3,137.45	3,108.87	600.26	1.69	Magn MWD	Phoenix Directional
7/13/2017	12,730	88.29	0.63	9,609.78	3,231.37	3,202.82	602.28	1.74	Magn MWD	Phoenix Directional



# Wellbore Details

Well Name HH SO 8 P2 6H	Lease HH SO 8 P2	Field Name Purple Sage	Business Unit Mid-Continent	
Ground Elevation (ft) 3,245.00	Original RKB Elevation (ft) 3,273.00	Current RKB Elevation 3,273.00, 5/14/2017	Mud Line Elevation (ft)	Water Depth (ft)
Current KB to Ground (ft) 28.00	Current KB to Mud Line (ft)	Current KB to Csg Flange (ft)	Current KB to Tubing Head (ft)	

Survey Data											
Date	MD (RKB)	Incl (°)	Azm (°)	TVD (ft)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Method	Survey Company	
7/13/2017	12,824	89.66	1.50	9,611.46	3,325.29	3,296.79	604.03	1.73	Magn MWD	Phoenix Directional	
7/13/2017	12,919	92.43	0.90	9,609.73	3,420.21	3,391.74	606.02	2.98	Magn MWD	Phoenix Directional	
7/13/2017	13,013	96.51	1.65	9,602.41	3,513.85	3,485.41	608.10	4.41	Magn MWD	Phoenix Directional	
7/13/2017	13,108	96.20	359.80	9,591.89	3,608.18	3,579.82	609.29	1.96	Magn MWD	Phoenix Directional	
7/13/2017	13,202	93.36	358.80	9,584.06	3,701.62	3,673.47	608.15	3.20	Magn MWD	Phoenix Directional	
7/13/2017	13,297	93.10	358.85	9,578.71	3,796.20	3,768.30	606.20	0.28	Magn MWD	Phoenix Directional	
7/13/2017	13,391	89.83	357.49	9,576.30	3,889.79	3,862.21	603.20	3.77	Magn MWD	Phoenix Directional	
7/13/2017	13,486	89.10	356.61	9,577.19	3,984.24	3,957.08	598.31	1.20	Magn MWD	Phoenix Directional	
7/13/2017	13,581	89.22	356.57	9,578.58	4,078.60	4,051.90	592.66	0.13	Magn MWD	Phoenix Directional	
7/13/2017	13,675	89.38	357.92	9,579.73	4,172.08	4,145.78	588.15	1.45	Magn MWD	Phoenix Directional	
7/13/2017	13,770	90.14	357.30	9,580.13	4,266.63	4,240.69	584.18	1.03	Magn MWD	Phoenix Directional	
7/13/2017	13,864	90.87	357.05	9,579.30	4,360.11	4,334.58	579.55	0.82	Magn MWD	Phoenix Directional	
7/13/2017	13,958	89.97	358.62	9,578.61	4,453.69	4,428.50	576.00	1.93	Magn MWD	Phoenix Directional	
7/13/2017	14,052	90.56	1.15	9,578.18	4,547.53	4,522.49	575.81	2.76	Magn MWD	Phoenix Directional	
7/13/2017	14,156	89.64	359.95	9,578.00	4,651.41	4,626.49	576.81	1.45	Magn MWD	Phoenix Directional	
7/13/2017	14,242	90.76	358.48	9,577.70	4,737.20	4,712.47	575.63	2.15	Magn MWD	Phoenix Directional	
7/13/2017	14,336	90.08	357.38	9,577.01	4,830.80	4,806.41	572.24	1.38	Magn MWD	Phoenix Directional	
7/13/2017	14,430	90.84	357.09	9,576.25	4,924.29	4,900.29	567.70	0.87	Magn MWD	Phoenix Directional	
7/13/2017	14,525	91.71	0.56	9,574.14	5,018.98	4,995.23	565.76	3.76	Magn MWD	Phoenix Directional	
7/13/2017	14,619	90.28	0.54	9,572.50	5,112.86	5,089.21	566.66	1.52	Magn MWD	Phoenix Directional	
7/13/2017	14,714	87.74	0.22	9,574.15	5,207.72	5,184.19	567.29	2.69	Magn MWD	Phoenix Directional	
7/13/2017	14,808	87.06	359.57	9,578.41	5,301.47	5,278.09	567.12	1.00	Magn MWD	Phoenix Directional	
7/13/2017	14,903	88.77	359.00						Magn MWD	Phoenix Directional	
7/13/2017	14,997	88.60	359.03	9,585.57	5,489.89	5,466.94	564.81	0.86	Magn MWD	Phoenix Directional	
7/13/2017	15,091	90.39	358.32	9,586.39	5,583.59	5,560.90	562.63	2.05	Magn MWD	Phoenix Directional	
7/13/2017	15,186	89.36	357.40	9,586.60	5,678.18	5,655.83	559.09	1.45	Magn MWD	Phoenix Directional	
7/13/2017	15,280	91.43	358.03	9,585.95	5,771.75	5,749.75	555.34	2.30	Magn MWD	Phoenix Directional	
7/13/2017	15,374	87.79	358.14	9,586.59	5,865.35	5,843.68	552.20	3.87	Magn MWD	Phoenix Directional	
7/13/2017	15,468	87.28	358.89	9,590.64	5,958.95	5,937.56	549.76	0.96	Magn MWD	Phoenix Directional	
7/13/2017	15,563	88.01	0.65	9,594.54	6,053.70	6,032.48	549.38	2.00	Magn MWD	Phoenix Directional	
7/13/2017	15,657	86.92	1.86	9,598.70	6,147.55	6,126.36	551.44	1.73	Magn MWD	Phoenix Directional	
7/13/2017	15,752	84.76	1.66	9,605.59	6,242.27	6,221.06	554.35	2.28	Magn MWD	Phoenix Directional	
11/21/2017	15,846	84.90	0.31	9,614.06	6,335.81	6,314.66	555.96	1.44	Magn MWD	Phoenix Directional	
11/21/2017	15,941	85.43	359.50	9,622.07	6,430.32	6,409.32	555.80	1.02	Magn MWD	Phoenix Directional	
11/21/2017	16,035	85.80	1.16	9,629.26	6,523.92	6,503.04	556.34	1.80	Magn MWD	Phoenix Directional	
11/21/2017	16,130	85.94	0.73	9,636.10	6,618.60	6,597.78	557.91	0.47	Magn MWD	Phoenix Directional	
11/21/2017	16,224	86.75	2.95	9,642.09	6,712.38	6,691.53	560.92	2.51	Magn MWD	Phoenix Directional	
11/21/2017	16,319	86.17	1.91	9,647.96	6,807.19	6,786.27	564.94	1.25	Magn MWD	Phoenix Directional	
11/21/2017	16,413	89.64	3.44	9,651.39	6,901.10	6,880.08	569.32	4.03	Magn MWD	Phoenix Directional	
11/21/2017	16,508	91.59	4.45	9,650.37	6,996.08	6,974.85	575.86	2.31	Magn MWD	Phoenix Directional	
11/21/2017	16,602	90.56	3.44	9,648.61	7,090.06	7,068.60	582.32	1.53	Magn MWD	Phoenix Directional	
11/22/2017	16,697	91.57	3.44	9,646.84	7,185.04	7,163.42	588.02	1.06	Magn MWD	Phoenix Directional	
11/22/2017	16,791	89.24	2.28	9,646.18	7,279.03	7,257.29	592.71	2.77	Magn MWD	Phoenix Directional	
11/22/2017	16,886	90.81	0.55	9,646.14	7,373.97	7,352.25	595.06	2.46	Magn MWD	Phoenix Directional	
11/22/2017	16,981	91.93	359.61	9,643.87	7,468.80	7,447.22	595.19	1.54	Magn MWD	Phoenix Directional	
11/22/2017	17,075	90.53	358.80	9,641.85	7,562.55	7,541.19	593.89	1.72	Magn MWD	Phoenix Directional	
11/22/2017	17,170	89.24	358.01	9,642.04	7,657.22	7,636.15	591.24	1.59	Magn MWD	Phoenix Directional	
11/22/2017	17,265	89.52	357.07	9,643.07	7,751.75	7,731.06	587.17	1.03	Magn MWD	Phoenix Directional	
11/23/2017	17,360	87.00	354.48	9,645.95	7,845.90	7,825.74	580.17	3.80	Magn MWD	Phoenix Directional	
11/23/2017	17,454	88.04	358.13	9,650.02	7,939.11	7,919.44	574.12	4.03	Magn MWD	Phoenix Directional	
11/23/2017	17,549	90.39	1.55	9,651.32	8,033.92	8,014.41	573.86	4.37	Magn MWD	Phoenix Directional	
11/23/2017	17,644	90.81	2.73	9,650.33	8,128.90	8,109.33	577.41	1.32	Magn MWD	Phoenix Directional	
11/23/2017	17,739	90.34	2.45	9,649.37	8,223.89	8,204.23	581.70	0.58	Magn MWD	Phoenix Directional	
11/23/2017	17,834	87.98	1.50	9,650.77	8,318.85	8,299.16	584.97	2.68	Magn MWD	Phoenix Directional	
11/23/2017	17,928	89.13	0.78	9,653.14	8,412.76	8,393.11	586.84	1.44	Magn MWD	Phoenix Directional	
11/23/2017	18,023	88.99	0.74	9,654.70	8,507.66	8,488.09	588.10	0.15	Magn MWD	Phoenix Directional	
11/24/2017	18,118	88.51	0.88	9,656.77	8,602.55	8,583.05	589.44	0.53	Magn MWD	Phoenix Directional	



# Wellbore Details

Well Name HH SO 8 P2 6H	Lease HH SO 8 P2	Field Name Purple Sage	Business Unit Mid-Continent	
Ground Elevation (ft) 3,245.00	Original RKB Elevation (ft) 3,273.00	Current RKB Elevation 3,273.00, 5/14/2017	Mud Line Elevation (ft)	Water Depth (ft)
Current KB to Ground (ft) 28.00	Current KB to Mud Line (ft)	Current KB to Csg Flange (ft)	Current KB to Tubing Head (ft)	

Survey Data										
Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Method	Survey Company
11/24/2017	18,212	87.25	0.52	9,660.25	8,696.40	8,676.98	590.59	1.39	Magn MWD	Phoenix Directional
11/24/2017	18,307	89.55	1.80	9,662.90	8,791.29	8,771.91	592.51	2.77	Magn MWD	Phoenix Directional
11/24/2017	18,402	87.70	0.20	9,665.18	8,886.19	8,866.87	594.17	2.57	Magn MWD	Phoenix Directional
11/24/2017	18,496	90.90	358.70	9,666.33	8,979.97	8,960.84	593.27	3.76	Magn MWD	Phoenix Directional
11/24/2017	18,591	89.66	358.82	9,665.86	9,074.68	9,055.81	591.21	1.31	Magn MWD	Phoenix Directional
11/25/2017	18,685	89.38	359.57	9,666.65	9,168.45	9,149.80	589.89	0.85	Magn MWD	Phoenix Directional
11/25/2017	18,780	89.66	359.75	9,667.44	9,263.27	9,244.80	589.33	0.35	Magn MWD	Phoenix Directional
11/25/2017	18,874	90.53	0.98	9,667.29	9,357.15	9,338.79	589.93	1.60	Magn MWD	Phoenix Directional
11/25/2017	18,969	90.70	359.87	9,666.27	9,452.03	9,433.78	590.63	1.18	Magn MWD	Phoenix Directional
11/25/2017	19,064	86.87	358.54	9,668.28	9,546.76	9,528.73	589.32	4.27	Magn MWD	Phoenix Directional
11/25/2017	19,159	90.03	359.09	9,670.85	9,641.44	9,623.66	587.35	3.38	Magn MWD	Phoenix Directional
11/26/2017	19,253	90.64	359.29	9,670.30	9,735.21	9,717.65	586.02	0.68	Magn MWD	Phoenix Directional
11/26/2017	19,348	90.95	0.04	9,668.99	9,830.02	9,812.64	585.47	0.85	Magn MWD	Phoenix Directional
11/26/2017	19,443	92.24	0.34	9,666.34	9,924.85	9,907.60	585.78	1.39	Magn MWD	Phoenix Directional
11/28/2017	19,538	89.64	0.18	9,664.78	10,019.70	10,002.58	586.21	2.74	Magn MWD	Phoenix Directional
11/28/2017	19,633	88.01	0.18	9,666.73	10,114.55	10,097.56	586.51	1.72	Magn MWD	Phoenix Directional
11/28/2017	19,727	86.50	1.50	9,671.23	10,208.36	10,191.43	587.89	2.13	Magn MWD	Phoenix Directional
11/28/2017	19,822	87.09	1.71	9,676.54	10,303.17	10,286.25	590.55	0.66	Magn MWD	Phoenix Directional
11/28/2017	19,917	85.84	1.46	9,682.40	10,397.95	10,381.03	593.17	1.34	Magn MWD	Phoenix Directional
11/28/2017	20,011	84.52	0.82	9,690.30	10,491.56	10,474.67	595.03	1.56	Magn MWD	Phoenix Directional
11/28/2017	20,106	83.91	0.26	9,699.87	10,585.97	10,569.19	595.92	0.87	Magn MWD	Phoenix Directional
11/28/2017	20,152	83.72	0.72	9,704.83	10,631.65	10,614.92	596.31	1.08	Magn MWD	Phoenix Directional
11/28/2017	20,207	83.72	0.72	9,710.85	10,686.27	10,669.58	597.00	0.00	Magn MWD	Phoenix Directional

Zones						
Zone Name	Top (ftKB)	Btm (ftKB)	Zone Comp Method	Completion ChevNo	Completion UWI	Completion License No.
Wolfcamp C	10,152.0	20,036.0	Proppant Frac	PJ8436-00-01	30015439340001	

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