

Project: Brooke County, WV (NAD 83)  
 Site: OV Royalty Trust LLC BRK  
 Well: OV Royalty Trust LLC BRK 1H  
 Wellbore: Wellbore #1  
 Design: Plan #3  
 Rig: SDC 46

**SECTION DETAILS**

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
3873.00	9.63	233.16	3837.64	-274.28	-339.53	0.00	0.00	-89.84	Tie-on to MWD Survey
3949.00	9.63	233.16	3912.57	-281.91	-349.71	0.00	0.00	-92.00	Projection to Bit
4969.00	9.63	233.16	4918.19	-384.21	-486.27	0.00	0.00	-121.00	Start Build/Turn
5194.56	27.20	247.92	5131.45	-415.16	-549.67	8.00	22.09	-119.72	Cont Build/Turn
6336.78	90.55	339.89	5776.94	147.70	-1112.73	8.00	91.50	637.64	End Build/Turn
13976.78	90.55	339.89	5703.60	7321.59	-3739.42	0.00	0.00	8221.25	TD

**WELLBORE TARGET DETAILS (MAP CO-ORDINATES)**

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
OV Royalty Trust LLC BRK 1H P3 BHL	5703.60	7321.59	-3739.42	40.305925	-80.597648
OV Royalty Trust LLC BRK 1H P3 LP	5776.94	147.70	-1112.73	40.286192	-80.586347

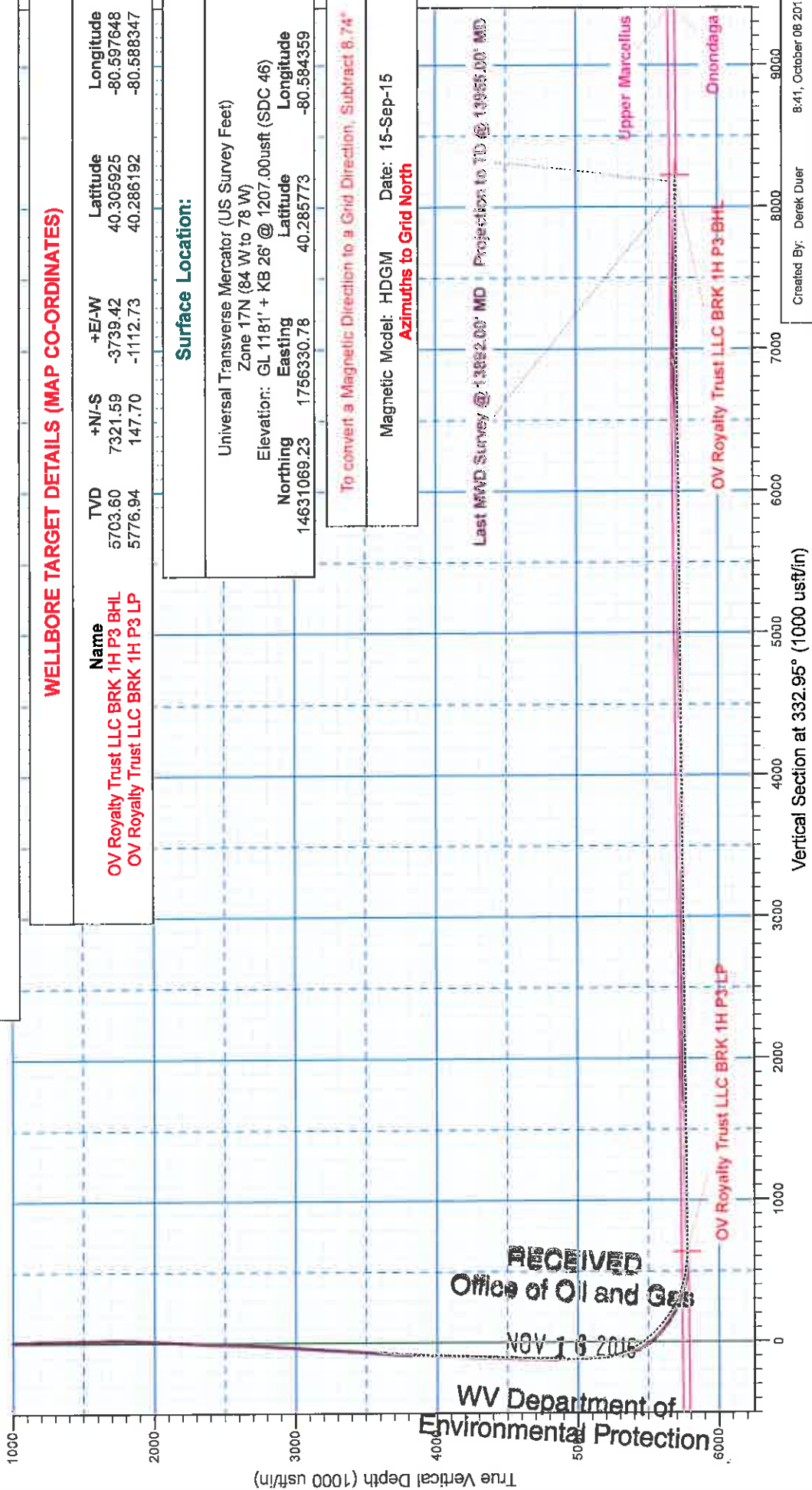
**Surface Location:**

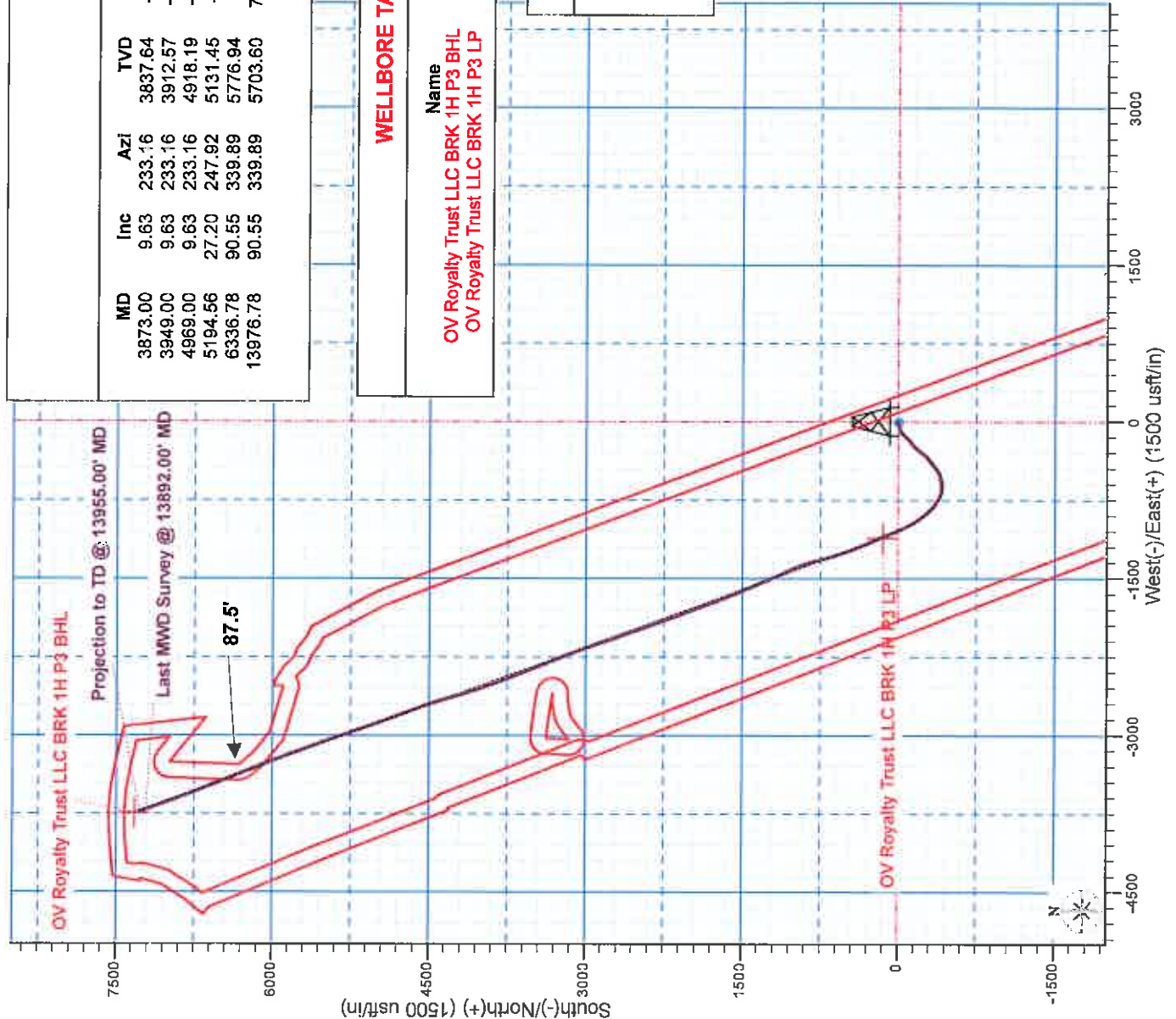
Universal Transverse Mercator (US Survey Feet)  
 Zone 17N (84 W to 78 W)  
 Elevation: GL 1181' + KB 26' @ 1207.00usft (SDC 46)

Northing	Easting	Latitude	Longitude
14631069.23	1756330.78	40.285773	-80.584359

To convert a Magnetic Direction to a Grid Direction, Subtract 8.74°

Magnetic Model: HDGM Date: 15-Sep-15  
 Azimuths to Grid North





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**Surface Location:**

Universal Transverse Mercator (US Survey Feet)  
 Zone 17N (84 W to 78 W)  
 Elevation: GL 1181' + KB 26' @ 1207.00usft (SDC 46)  
 Northing 14631069.23    Easting 17566330.78    Latitude 40.285773    Longitude -80.584359

To convert a Magnetic Direction to a Grid Direction, Subtract 8.74°

Magnetic Model: HDGM    Date: 15-Sep-15  
**Azimuths to Grid North**

**Project: Brooke County, WV (NAD 83)**  
**Site: OV Royalty Trust LLC BRK**  
**Well: OV Royalty Trust LLC BRK 1H**  
**Wellbore: Wellbore #1**  
**Design: Plan #3**  
**Rig: SDC 46**

**HALLIBURTON**

**Sperry Drilling**

# **SWN Production Company LLC**

**Brooke County, WV (NAD 83)**

**OV Royalty Trust LLC BRK**

**OV Royalty Trust LLC BRK 1H - Slot 1H**

**Wellbore #1**

**Design: Definitive Surveys**

## **Survey Report - Geographic**

**08 October, 2015**

**RECEIVED**  
**Office of Oil and Gas**  
**NOV 16 2016**  
**Southwestern Energy**  
**WV Department of**  
**Environmental Protection**

<b>Company:</b>	SWN Production Company LLC	<b>Local Co-ordinate Reference:</b>	Well OV Royalty Trust LLC BRK 1H - Slot 1H
<b>Project:</b>	Brooke County, WV (NAD 83)	<b>TVD Reference:</b>	GL 1181' + KB 26' @ 1207 00usft (SDC 46)
<b>Site:</b>	OV Royalty Trust LLC BRK	<b>MD Reference:</b>	GL 1181' + KB 26' @ 1207 00usft (SDC 46)
<b>Well:</b>	OV Royalty Trust LLC BRK 1H	<b>North Reference:</b>	Grnd
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Definitive Surveys	<b>Database:</b>	EDM 5000 1 Single User Db

<b>Project</b>	Brooke County, WV (NAD 83)		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	NAD83 West Virginia - HARN		
<b>Map Zone:</b>	Zone 17N (84 W to 78 W)		

<b>Site</b>	OV Royalty Trust LLC BRK				
<b>Site Position:</b>		<b>Northing:</b>	14,631,069.22 usft	<b>Latitude:</b>	40.285773
<b>From:</b>	Map	<b>Easting:</b>	1,756,330.78 usft	<b>Longitude:</b>	-80.584359
<b>Position Uncertainty:</b>	0.00 usft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b>	0.27 °

<b>Well</b>	OV Royalty Trust LLC BRK 1H - Slot 1H					
<b>Well Position</b>	<b>+N/-S</b>	0.00 usft	<b>Northing:</b>	14,631,069.22 usft	<b>Latitude:</b>	40.285773
	<b>+E/-W</b>	0.00 usft	<b>Easting:</b>	1,756,330.78 usft	<b>Longitude:</b>	-80.584359
<b>Position Uncertainty</b>		0.00 usft	<b>Wellhead Elevation:</b>	1,181.00 usft	<b>Ground Level:</b>	1,181.00 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	9/15/2015	-8.47	67.88	52,782

<b>Design</b>	Definitive Surveys				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	332.94	

<b>Survey Program</b>	Date 10/8/2015				
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
100.00	300.00	MS Gyro 1 (Wellbore #1)	NSG-CT_csg+cent	Continuous gyro in casing + centrollers	
390.00	713.00	Sperry MWD 1 (Wellbore #1)	MWD+HRGM	OWSG MWD + HRGM	
737.00	780.00	MS Gyro 2 (Wellbore #1)	NSG-CT_csg+cent	Continuous gyro in casing + centrollers	
852.00	852.00	Sperry MWD 2 (Wellbore #1)	MWD+HRGM	OWSG MWD + HRGM	
873.00	873.00	MS Gyro 3 (Wellbore #1)	NSG-CT_csg+cent	Continuous gyro in casing + centrollers	
945.00	13,955.00	Sperry MWD 3 (Wellbore #1)	MWD+HRGM	OWSG MWD + HRGM	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Map Northing (usft)</b>	<b>Map Easting (usft)</b>	<b>Latitude</b>	<b>Longitude</b>	
0.00	0.00	0.00	0.00	0.00	0.00	14,631,069.22	1,756,330.78	40.285773	-80.584359	
100.00	0.76	188.95	100.00	-0.66	-0.10	14,631,068.57	1,756,330.68	40.285771	-80.584360	
200.00	0.56	190.13	199.99	-1.79	-0.29	14,631,067.43	1,756,330.59	40.285769	-80.584360	
300.00	0.37	168.36	299.99	-2.59	-0.31	14,631,066.64	1,756,330.47	40.285766	-80.584360	
390.00	0.44	141.92	389.98	-3.15	-0.04	14,631,066.08	1,756,330.74	40.285764	-80.584359	
446.00	0.42	112.43	445.98	-3.39	0.28	14,631,065.83	1,756,331.66	40.285763	-80.584358	
529.00	0.69	52.70	528.98	-3.21	0.96	14,631,066.02	1,756,331.74	40.285764	-80.584356	

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NOV 16 2015



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<b>Design:</b>	Definitive Surveys	<b>Database:</b>	EDM 5000 1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
576.00	0.82	48.07	575.98	-2.81	1.44	14,631,066.41	1,756,332.22	40.285765	-80.584354
622.00	0.56	25.88	621.97	-2.39	1.78	14,631,066.84	1,756,332.56	40.285766	-80.584353
667.00	0.81	325.67	666.97	-1.93	1.69	14,631,067.30	1,756,332.48	40.285767	-80.584353
713.00	1.31	296.33	712.96	-1.43	1.04	14,631,067.80	1,756,331.82	40.285769	-80.584356
737.00	1.45	286.80	736.96	-1.22	0.50	14,631,068.01	1,756,331.29	40.285769	-80.584357
780.00	2.22	274.47	779.93	-0.99	-0.85	14,631,068.23	1,756,329.94	40.285770	-80.584362
852.00	4.23	272.31	851.82	-0.78	-4.89	14,631,068.45	1,756,325.89	40.285771	-80.584377
873.00	4.52	272.17	872.75	-0.72	-6.49	14,631,068.51	1,756,324.29	40.285771	-80.584383
945.00	5.75	274.72	944.46	-0.31	-12.92	14,631,068.91	1,756,317.86	40.285772	-80.584406
991.00	5.97	271.59	990.22	-0.06	-17.61	14,631,069.17	1,756,313.17	40.285773	-80.584422
1,084.00	6.54	260.47	1,082.67	-0.80	-27.67	14,631,068.43	1,756,303.12	40.285771	-80.584458
1,176.00	6.19	253.90	1,174.11	-3.04	-37.60	14,631,066.18	1,756,293.18	40.285765	-80.584494
1,269.00	5.32	248.07	1,266.64	-6.04	-46.42	14,631,063.18	1,756,284.37	40.285757	-80.584526
1,362.00	5.21	253.47	1,359.25	-8.85	-54.46	14,631,060.37	1,756,276.32	40.285749	-80.584555
1,455.00	5.45	254.84	1,451.84	-11.21	-62.78	14,631,058.01	1,756,268.01	40.285743	-80.584585
1,523.00	5.94	255.06	1,519.51	-12.96	-69.29	14,631,056.26	1,756,261.49	40.285738	-80.584608
1,634.00	6.07	252.32	1,629.90	-16.22	-80.43	14,631,053.00	1,756,250.35	40.285729	-80.584648
1,680.00	5.66	252.08	1,675.66	-17.66	-84.91	14,631,051.56	1,756,245.87	40.285725	-80.584664
1,727.00	6.39	243.76	1,722.40	-19.53	-89.46	14,631,049.69	1,756,241.32	40.285720	-80.584680
1,773.00	7.50	236.26	1,768.06	-22.33	-94.25	14,631,046.89	1,756,236.53	40.285713	-80.584698
1,820.00	8.10	232.11	1,814.63	-26.07	-99.42	14,631,043.16	1,756,231.37	40.285702	-80.584716
1,866.00	8.20	226.57	1,860.16	-30.31	-104.36	14,631,038.91	1,756,226.43	40.285691	-80.584734
1,912.00	8.61	225.16	1,905.67	-35.00	-109.18	14,631,034.23	1,756,221.60	40.285678	-80.584751
1,959.00	8.83	223.33	1,952.13	-40.10	-114.15	14,631,029.12	1,756,216.63	40.285664	-80.584769
2,005.00	9.33	221.59	1,997.55	-45.46	-119.05	14,631,023.77	1,756,211.73	40.285649	-80.584787
2,104.00	9.24	224.90	2,095.25	-57.09	-129.99	14,631,012.13	1,756,200.80	40.285618	-80.584826
2,197.00	9.16	226.38	2,187.06	-67.49	-140.62	14,631,001.74	1,756,190.17	40.285589	-80.584865
2,290.00	9.43	222.91	2,278.84	-78.17	-151.16	14,630,991.05	1,756,179.62	40.285560	-80.584903
2,383.00	9.05	221.96	2,370.63	-89.19	-161.24	14,630,980.03	1,756,169.54	40.285530	-80.584939
2,475.00	8.68	225.47	2,461.53	-99.44	-171.03	14,630,969.78	1,756,159.76	40.285502	-80.584974
2,568.00	9.30	235.71	2,553.39	-108.60	-182.24	14,630,960.63	1,756,148.55	40.285477	-80.585015
2,661.00	10.27	235.82	2,645.04	-117.49	-195.31	14,630,951.74	1,756,135.48	40.285453	-80.585062
2,754.00	10.94	233.62	2,736.45	-127.38	-209.27	14,630,941.84	1,756,121.51	40.285426	-80.585112
2,847.00	11.66	227.10	2,827.65	-139.01	-223.26	14,630,930.21	1,756,107.52	40.285394	-80.585162
2,939.00	12.17	222.71	2,917.67	-152.47	-236.65	14,630,916.76	1,756,094.14	40.285357	-80.585210
3,032.00	11.04	225.63	3,008.77	-165.90	-249.66	14,630,903.33	1,756,081.12	40.285320	-80.585257
3,125.00	9.95	214.93	3,100.22	-178.71	-260.63	14,630,890.51	1,756,070.15	40.285285	-80.585297
3,218.00	8.34	210.98	3,192.04	-191.08	-268.70	14,630,878.14	1,756,062.08	40.285251	-80.585326
3,311.00	7.99	225.28	3,284.10	-201.41	-276.77	14,630,867.81	1,756,054.02	40.285223	-80.585355
3,410.00	9.33	226.93	3,381.97	-211.74	-287.52	14,630,857.49	1,756,043.26	40.285195	-80.585394
3,502.00	11.55	219.44	3,472.45	-223.94	-298.82	14,630,845.28	1,756,031.96	40.285162	-80.585435
3,595.00	11.81	212.47	3,563.53	-239.16	-309.84	14,630,830.06	1,756,020.94	40.285120	-80.585474
3,688.00	9.09	219.26	3,654.98	-252.89	-319.60	14,630,816.34	1,756,011.18	40.285082	-80.585510
3,780.00	8.93	219.34	3,745.84	-264.03	-328.73	14,630,805.19	1,756,002.05	40.285052	-80.585542
3,873.00	9.63	233.16	3,837.64	-274.28	-339.53	14,630,794.94	1,755,991.25	40.285024	-80.585581
3,966.00	9.77	233.51	3,929.31	-283.64	-352.10	14,630,785.59	1,755,978.68	40.284998	-80.585627
4,058.00	10.03	229.64	4,019.94	-293.47	-364.48	14,630,775.75	1,755,966.30	40.284971	-80.585671
4,151.00	9.43	229.87	4,111.60	-303.62	-376.48	14,630,765.60	1,755,954.30	40.284919	-80.585714
4,243.00	8.83	233.72	4,202.44	-312.66	-387.93	14,630,756.56	1,755,942.85	40.284919	-80.585756
4,336.00	9.38	233.55	4,294.26	-321.39	-399.78	14,630,747.84	1,755,931.00	40.284899	-80.585798
4,429.00	10.97	233.70	4,385.80	-331.13	-413.01	14,630,738.10	1,755,917.77	40.284869	-80.585846
4,522.00	10.33	230.23	4,477.20	-341.70	-426.55	14,630,727.52	1,755,904.23	40.284849	-80.585894
4,615.00	9.23	225.70	4,568.85	-352.25	-438.30	14,630,716.98	1,755,892.48	40.284814	-80.585937
4,707.00	8.78	233.27	4,659.71	-361.60	-449.21	14,630,707.63	1,755,881.57	40.284785	-80.585976
4,800.00	9.36	240.65	4,751.55	-369.55	-461.49	14,630,699.67	1,755,869.29	40.284764	-80.586020

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**Survey**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,868.00	9.63	236.97	4,818.62	-375.36	-471.08	14,630,693.86	1,755,859.70	40.284748	-80.586055
4,931.00	9.80	232.73	4,880.72	-381.48	-479.76	14,630,687.74	1,755,851.02	40.284731	-80.586086
4,978.00	10.67	237.12	4,926.97	-386.26	-486.60	14,630,682.96	1,755,844.18	40.284718	-80.586111
5,024.00	13.97	248.41	4,971.91	-390.62	-495.34	14,630,678.60	1,755,835.44	40.284706	-80.586142
5,071.00	17.74	257.22	5,017.12	-394.29	-507.61	14,630,674.93	1,755,823.18	40.284696	-80.586186
5,117.00	20.30	257.60	5,060.61	-397.56	-522.24	14,630,671.67	1,755,808.54	40.284688	-80.586239
5,168.00	20.72	251.55	5,108.38	-402.31	-539.44	14,630,666.91	1,755,791.34	40.284675	-80.586300
5,214.00	20.91	253.33	5,151.38	-407.24	-555.02	14,630,661.98	1,755,775.76	40.284661	-80.586356
5,261.00	22.28	256.38	5,195.08	-411.75	-571.72	14,630,657.48	1,755,759.07	40.284649	-80.586416
5,307.00	23.39	259.34	5,237.48	-415.49	-589.17	14,630,653.73	1,755,741.62	40.284639	-80.586479
5,354.00	23.86	266.75	5,280.55	-417.76	-607.83	14,630,651.47	1,755,722.95	40.284633	-80.586546
5,400.00	25.18	273.10	5,322.41	-417.75	-626.89	14,630,651.47	1,755,703.89	40.284634	-80.586614
5,446.00	26.19	278.25	5,363.87	-415.77	-646.71	14,630,653.46	1,755,684.07	40.284639	-80.586685
5,493.00	28.45	281.39	5,405.62	-412.07	-667.96	14,630,657.16	1,755,662.83	40.284650	-80.586761
5,540.00	31.53	284.26	5,446.33	-406.83	-690.85	14,630,662.40	1,755,639.93	40.284664	-80.586843
5,586.00	40.32	292.01	5,483.56	-398.27	-716.37	14,630,670.96	1,755,614.42	40.284688	-80.586935
5,632.00	45.54	297.93	5,517.24	-384.99	-744.70	14,630,684.24	1,755,586.08	40.284725	-80.587036
5,678.00	47.49	303.56	5,548.91	-367.92	-773.35	14,630,701.31	1,755,557.44	40.284772	-80.587138
5,725.00	49.19	309.13	5,580.16	-347.10	-801.59	14,630,722.12	1,755,529.19	40.284830	-80.587239
5,771.00	52.14	312.79	5,609.32	-323.77	-828.44	14,630,745.45	1,755,502.35	40.284894	-80.587335
5,817.00	55.95	316.51	5,636.33	-297.60	-854.89	14,630,771.63	1,755,475.89	40.284966	-80.587430
5,864.00	58.91	320.53	5,661.64	-267.92	-881.10	14,630,801.30	1,755,449.68	40.285048	-80.587523
5,910.00	63.11	323.13	5,683.93	-236.29	-905.94	14,630,832.94	1,755,424.84	40.285135	-80.587612
5,957.00	66.62	326.03	5,703.90	-201.61	-930.58	14,630,867.61	1,755,400.20	40.285231	-80.587699
6,003.00	69.58	327.75	5,721.05	-165.86	-953.89	14,630,903.36	1,755,376.90	40.285329	-80.587782
6,049.00	70.33	330.07	5,736.82	-128.86	-976.20	14,630,940.36	1,755,354.59	40.285431	-80.587862
6,096.00	73.08	333.65	5,751.58	-89.52	-997.23	14,630,979.71	1,755,333.56	40.285540	-80.587937
6,142.00	78.34	335.55	5,762.93	-49.26	-1,016.33	14,631,019.96	1,755,314.45	40.285650	-80.588004
6,189.00	82.87	337.21	5,770.60	-6.79	-1,034.90	14,631,062.44	1,755,295.88	40.285767	-80.588070
6,235.00	88.22	338.43	5,774.17	35.66	-1,052.21	14,631,104.89	1,755,278.58	40.285884	-80.588132
6,276.00	88.27	338.73	5,775.43	73.81	-1,067.17	14,631,143.04	1,755,263.61	40.285989	-80.588185
6,369.00	90.31	337.83	5,776.58	160.20	-1,101.59	14,631,229.42	1,755,229.20	40.286227	-80.588307
6,462.00	91.85	335.71	5,774.83	245.64	-1,138.26	14,631,314.86	1,755,192.53	40.286462	-80.588437
6,554.00	92.16	336.62	5,771.61	329.74	-1,175.41	14,631,398.96	1,755,155.37	40.286693	-80.588568
6,647.00	90.25	337.80	5,769.65	415.45	-1,211.42	14,631,484.68	1,755,119.36	40.286929	-80.588696
6,740.00	91.48	341.47	5,768.25	502.61	-1,243.78	14,631,571.84	1,755,087.00	40.287169	-80.588811
6,832.00	90.93	340.89	5,766.31	589.68	-1,273.45	14,631,658.90	1,755,057.33	40.287408	-80.588916
6,925.00	91.42	344.96	5,764.40	678.54	-1,300.75	14,631,747.76	1,755,030.04	40.287653	-80.589012
7,018.00	90.12	346.91	5,763.16	768.74	-1,323.34	14,631,837.96	1,755,007.44	40.287900	-80.589092
7,111.00	89.57	342.26	5,763.41	858.36	-1,348.06	14,631,927.59	1,754,982.73	40.288147	-80.589179
7,204.00	90.62	338.38	5,763.25	945.91	-1,379.37	14,632,015.14	1,754,951.41	40.288388	-80.589290
7,297.00	91.79	336.40	5,761.30	1,031.74	-1,415.11	14,632,100.97	1,754,915.67	40.288624	-80.589416
7,389.00	93.96	333.43	5,756.68	1,114.95	-1,454.06	14,632,184.17	1,754,876.72	40.288853	-80.589555
7,482.00	93.27	337.21	5,750.82	1,199.27	-1,492.81	14,632,268.49	1,754,837.98	40.289085	-80.589692
7,575.00	90.12	337.83	5,748.07	1,285.15	-1,528.35	14,632,354.38	1,754,802.44	40.289321	-80.589818
7,668.00	90.49	336.62	5,747.57	1,370.90	-1,564.35	14,632,440.12	1,754,766.44	40.289557	-80.589946
7,761.00	89.01	336.11	5,747.98	1,456.09	-1,601.63	14,632,525.32	1,754,729.15	40.289792	-80.590078
7,853.00	90.12	337.86	5,748.67	1,540.76	-1,637.60	14,632,609.99	1,754,693.19	40.290024	-80.590206
7,946.00	90.37	338.85	5,748.28	1,627.20	-1,671.90	14,632,696.43	1,754,658.89	40.290262	-80.590327
8,039.00	90.80	338.34	5,747.33	1,713.78	-1,705.84	14,632,783.01	1,754,624.95	40.290499	-80.590447
8,132.00	90.12	339.46	5,746.58	1,800.54	-1,739.32	14,632,869.77	1,754,591.47	40.290739	-80.590566
8,224.00	90.80	338.92	5,745.84	1,886.54	-1,772.00	14,632,955.76	1,754,558.78	40.290979	-80.590682
8,317.00	90.19	340.10	5,745.04	1,973.65	-1,804.55	14,633,042.87	1,754,526.23	40.291215	-80.590797
8,410.00	90.43	339.76	5,744.54	2,061.00	-1,836.46	14,633,130.23	1,754,494.32	40.291456	-80.590910
8,503.00	90.43	341.06	5,743.84	2,148.61	-1,867.64	14,633,217.84	1,754,463.14	40.291697	-80.591020

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<b>Company:</b>	SWN Production Company LLC	<b>Local Co-ordinate Reference:</b>	Well OV Royalty Trust LLC BRK 1H - Slot 1H
<b>Project:</b>	Brooke County, WV (NAD 83)	<b>TVD Reference:</b>	GL 1181' + KB 26' @ 1207 00usft (SDC 46)
<b>Site:</b>	OV Royalty Trust LLC BRK	<b>MD Reference:</b>	GL 1181' + KB 26' @ 1207 00usft (SDC 46)
<b>Well:</b>	OV Royalty Trust LLC BRK 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Definitive Surveys	<b>Database:</b>	EDM 5000 1 Single User Db

**Survey**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
8,596.00	90.31	341.08	5,743.24	2,236.58	-1,897.81	14,633,305.81	1,754,432.97	40.291938	-80.591127
8,688.00	90.49	340.29	5,742.59	2,323.40	-1,928.24	14,633,392.62	1,754,402.54	40.292177	-80.591235
8,781.00	90.68	339.68	5,741.64	2,410.78	-1,960.07	14,633,480.00	1,754,370.71	40.292418	-80.591348
8,874.00	89.51	341.03	5,741.49	2,498.36	-1,991.34	14,633,567.59	1,754,339.45	40.292659	-80.591458
8,966.00	88.95	340.67	5,742.73	2,585.26	-2,021.51	14,633,654.49	1,754,309.27	40.292898	-80.591565
9,059.00	89.26	340.55	5,744.18	2,672.98	-2,052.39	14,633,742.20	1,754,278.40	40.293139	-80.591674
9,152.00	89.63	340.75	5,745.08	2,760.72	-2,083.20	14,633,829.94	1,754,247.58	40.293380	-80.591783
9,244.00	91.48	341.86	5,744.19	2,847.86	-2,112.68	14,633,917.08	1,754,218.10	40.293620	-80.591888
9,337.00	92.10	341.81	5,741.28	2,936.18	-2,141.66	14,634,005.40	1,754,189.12	40.293863	-80.591990
9,430.00	89.20	339.49	5,740.23	3,023.90	-2,172.47	14,634,093.13	1,754,158.31	40.294104	-80.592099
9,522.00	89.75	340.49	5,741.07	3,110.34	-2,203.95	14,634,179.57	1,754,126.83	40.294342	-80.592211
9,614.00	88.89	338.42	5,742.16	3,196.48	-2,236.23	14,634,265.71	1,754,094.55	40.294579	-80.592325
9,705.00	89.32	337.91	5,743.59	3,280.94	-2,270.07	14,634,350.17	1,754,060.71	40.294811	-80.592445
9,797.00	90.12	338.49	5,744.04	3,366.36	-2,304.24	14,634,435.58	1,754,026.54	40.295046	-80.592566
9,889.00	90.99	338.70	5,743.14	3,452.01	-2,337.81	14,634,521.23	1,753,992.97	40.295282	-80.592685
9,981.00	90.56	338.90	5,741.90	3,537.78	-2,371.08	14,634,607.00	1,753,959.70	40.295518	-80.592803
10,072.00	91.36	336.68	5,740.37	3,622.01	-2,405.47	14,634,691.23	1,753,925.31	40.295749	-80.592925
10,164.00	92.29	338.16	5,737.44	3,706.91	-2,440.78	14,634,776.13	1,753,890.01	40.295983	-80.593050
10,256.00	91.73	340.55	5,734.22	3,792.94	-2,473.19	14,634,862.16	1,753,857.59	40.296219	-80.593165
10,349.00	91.54	340.28	5,731.56	3,880.52	-2,504.35	14,634,949.75	1,753,826.43	40.296460	-80.593275
10,442.00	91.24	340.01	5,729.31	3,967.97	-2,535.93	14,635,037.19	1,753,794.85	40.296701	-80.593387
10,535.00	90.80	342.00	5,727.65	4,055.89	-2,566.19	14,635,125.11	1,753,764.59	40.296943	-80.593494
10,628.00	90.99	342.58	5,726.20	4,144.47	-2,594.48	14,635,213.69	1,753,736.30	40.297186	-80.593594
10,720.00	89.81	344.03	5,725.56	4,232.58	-2,620.91	14,635,301.81	1,753,709.88	40.297429	-80.593687
10,813.00	89.69	344.12	5,725.96	4,322.01	-2,646.43	14,635,391.24	1,753,684.36	40.297674	-80.593777
10,906.00	89.81	342.99	5,726.37	4,411.21	-2,672.75	14,635,480.43	1,753,658.03	40.297920	-80.593870
10,999.00	89.69	342.10	5,726.77	4,499.92	-2,700.65	14,635,569.15	1,753,630.14	40.298164	-80.593969
11,092.00	90.37	340.20	5,726.73	4,587.93	-2,730.69	14,635,657.15	1,753,600.09	40.298406	-80.594075
11,184.00	90.00	339.72	5,726.43	4,674.36	-2,762.22	14,635,743.58	1,753,568.56	40.298643	-80.594187
11,277.00	90.68	339.59	5,725.88	4,761.56	-2,794.55	14,635,830.78	1,753,536.23	40.298883	-80.594301
11,370.00	91.17	339.44	5,724.38	4,848.66	-2,827.09	14,635,917.89	1,753,503.69	40.299123	-80.594417
11,463.00	89.01	338.78	5,724.23	4,935.54	-2,860.25	14,636,004.77	1,753,470.53	40.299362	-80.594534
11,555.00	90.80	340.16	5,724.38	5,021.70	-2,892.52	14,636,090.92	1,753,438.27	40.299599	-80.594649
11,648.00	90.68	340.50	5,723.18	5,109.26	-2,923.82	14,636,178.49	1,753,406.97	40.299840	-80.594759
11,741.00	91.24	342.68	5,721.62	5,197.48	-2,953.18	14,636,266.71	1,753,377.60	40.300082	-80.594863
11,833.00	91.11	340.33	5,719.74	5,284.71	-2,982.36	14,636,353.93	1,753,348.42	40.300322	-80.594966
11,926.00	90.62	340.36	5,718.33	5,372.28	-3,013.64	14,636,441.50	1,753,317.15	40.300563	-80.595077
12,019.00	91.42	340.38	5,716.68	5,459.86	-3,044.87	14,636,529.08	1,753,285.91	40.300804	-80.595188
12,111.00	91.42	338.83	5,714.40	5,546.06	-3,076.92	14,636,615.29	1,753,253.86	40.301041	-80.595301
12,204.00	91.36	340.04	5,712.14	5,633.11	-3,109.58	14,636,702.33	1,753,221.20	40.301281	-80.595417
12,297.00	93.09	340.62	5,708.53	5,720.61	-3,140.86	14,636,789.84	1,753,189.92	40.301521	-80.595528
12,390.00	92.41	340.67	5,704.07	5,808.25	-3,171.65	14,636,877.48	1,753,159.14	40.301762	-80.595637
12,482.00	93.03	340.70	5,699.70	5,894.98	-3,202.04	14,636,964.20	1,753,128.74	40.302001	-80.595744
12,575.00	91.24	338.75	5,696.24	5,982.15	-3,234.25	14,637,051.37	1,753,096.54	40.302241	-80.595858
12,668.00	91.67	338.20	5,693.88	6,068.63	-3,268.36	14,637,137.86	1,753,062.43	40.302478	-80.595979
12,761.00	91.73	337.64	5,691.12	6,154.77	-3,303.30	14,637,224.00	1,753,027.48	40.302715	-80.596103
12,853.00	90.31	338.39	5,689.48	6,240.07	-3,337.73	14,637,309.29	1,752,993.05	40.302950	-80.596225
12,946.00	90.12	338.30	5,689.13	6,326.50	-3,372.05	14,637,395.73	1,752,958.73	40.303188	-80.596347
13,039.00	89.26	337.47	5,689.63	6,412.66	-3,407.06	14,637,481.88	1,752,923.72	40.303425	-80.596471
13,132.00	88.95	337.97	5,691.09	6,498.70	-3,442.32	14,637,567.93	1,752,888.47	40.303662	-80.596596
13,224.00	88.76	339.28	5,692.92	6,584.36	-3,475.84	14,637,653.58	1,752,854.94	40.303897	-80.596715
13,317.00	89.44	339.58	5,694.39	6,671.42	-3,508.51	14,637,740.64	1,752,821.27	40.304132	-80.596831
13,410.00	89.20	339.29	5,695.49	6,758.48	-3,541.18	14,637,827.71	1,752,789.60	40.304376	-80.596947
13,503.00	89.38	339.08	5,696.64	6,845.41	-3,574.22	14,637,914.63	1,752,756.56	40.304615	-80.597064
13,596.00	88.52	339.77	5,698.35	6,932.46	-3,606.90	14,638,001.68	1,752,723.89	40.304855	-80.597179

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<b>Company:</b>	SWN Production Company LLC	<b>Local Co-ordinate Reference:</b>	Well OV Royalty Trust LLC BRK 1H - Slot 1H
<b>Project:</b>	Brooke County, WV (NAD 83)	<b>TVD Reference:</b>	GL 1181' + KB 26' @ 1207.00usft (SDC 46)
<b>Site:</b>	OV Royalty Trust LLC BRK	<b>MD Reference:</b>	GL 1181' + KB 26' @ 1207.00usft (SDC 46)
<b>Well:</b>	OV Royalty Trust LLC BRK 1H	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Definitive Surveys	<b>Database:</b>	EDM 5000 1 Single User Db

**Survey**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
13,688.00	88.09	339.31	5,701.07	7,018.62	-3,639.05	14,638,087.84	1,752,691.74	40.305092	-80.597293
13,781.00	88.33	340.85	5,703.97	7,106.01	-3,670.72	14,638,175.23	1,752,660.07	40.305332	-80.597405
13,874.00	88.15	341.23	5,706.83	7,193.92	-3,700.92	14,638,263.14	1,752,629.87	40.305574	-80.597512
13,892.00	87.78	341.38	5,707.47	7,210.96	-3,706.68	14,638,280.18	1,752,624.10	40.305621	-80.597533
<b>Last MWD Survey @ 13892.00' MD</b>									
13,955.00	87.78	341.38	5,709.91	7,270.62	-3,726.78	14,638,339.84	1,752,604.00	40.305785	-80.597604
<b>Projection to TD @ 13955.00' MD</b>									

**Design Targets**

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
OV Royalty Trust LLC	0.00	0.00	5,703.60	7,321.59	-3,739.42	14,638,390.81	1,752,591.37	40.305925	-80.597648
- hit/miss target - actual wellpath misses target center by 52.89usft at 13955.00usft MD (5709.91 TVD, 7270.62 N, -3726.78 E)									
- Shape - Point									
OV Royalty Trust LLC	0.00	0.00	5,776.94	147.70	-1,112.73	14,631,216.92	1,755,218.05	40.286192	-80.588347
- actual wellpath misses target center by 15.04usft at 6361.52usft MD (5776.61 TVD, 153.27 N, -1098.77 E)									
- Point									

**Casing Points**

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)
100.00	100.00	20"	20.000	26.000
300.00	299.99	13 3/8"	13.375	17.500
1,580.00	1,576.20	9 5/8"	9.625	12.250
13,955.00	5,709.91	5 1/2"	5.500	8.500

**Design Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
13,892.00	5,707.47	7,210.96	-3,706.68	Last MWD Survey @ 13892.00' MD
13,955.00	5,709.91	7,270.62	-3,726.78	Projection to TD @ 13955.00' MD



# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	7/25/2016
Job End Date:	8/4/2016
State:	West Virginia
County:	Brooke
API Number:	47-009-00162-00-00
Operator Name:	Southwestern Energy
Well Name and Number:	OV Royalty Trust LLC BRK 1H
Latitude:	40.29429000
Longitude:	-80.58553000
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	5,777
Total Base Water Volume (gal):	9,477,680
Total Base Non Water Volume:	0



## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Schlumberger	Acid Corrosion Inhibitor, Acid, Breaker, Gelling Agent, Friction Reducer, Fluid Loss Additive, Propping Agent					
			Water (Including Mix Water Supplied by Client)*	7732-18-5		83.85650	

Items above are Trade Names with the exception of Base Water. Items below are the individual ingredients.

	Quartz, Crystalline silica	14808-60-7	98.55471	15.91018
	Hydrochloric acid	7647-01-0	1.18455	0.19123
	Ammonium sulfate	7783-20-2	0.12204	0.01970
	Acrylamide, 2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer	38193-60-1	0.09008	0.01454
	Guar gum	9000-30-0	0.02322	0.00375
	Polymer of 2-acrylamido-2-methylpropanesulfonic acid sodium salt and methyl acrylate	136793-29-8	0.00965	0.00156
	Urea	57-13-6	0.00593	0.00096
	Propan-2-ol	67-63-0	0.00255	0.00041
	Sodium sulfate	7757-82-6	0.00138	0.00022
	Non-crystalline silica (impurity)	7631-86-9	0.00129	0.00021
	Fatty acid, tall-oil reaction products with acetophenone	68188-40-9	0.00099	0.00016
	Diammonium peroxidisulphate	7727-54-0	0.00094	0.00015
	Alcohols, C12-C16, ethoxylated	68551-12-2	0.00083	0.00013
	Isodecanol w/6-7 Moles Ethylene Oxide	26183-52-8	0.00056	0.00009
	Cinnamaldehyde	104-55-2	0.00036	0.00006
	2-Propenamid (impurity)	79-06-1	0.00030	0.00005
	Tetrasodium ethylenediaminetetraacetate	64-02-8	0.00015	0.00002
	Amines, tallow alkyl, ethoxylated	61791-26-2	0.00011	0.00002
	Dimethyl siloxanes and silicones	63148-62-9	0.00008	0.00001
	Dodecyl poly (oxyethylene) ether	9002-92-0	0.00004	0.00001

					27306-79-2	0.00003	0.00001	
				Glycols, polyethylene, monotetradecyl ether				
				Dodecamethylcyclohexasiloxane	540-97-6			
				Copper(II) sulfate	7758-98-7			
				Siloxanes and silicones, dimethyl, reaction products with silica	67762-90-7	0.00001		
				Octamethylcyclotetrasiloxane	556-67-2	0.00001		
				Decamethyl cyclopentasiloxane	541-02-6	0.00001		

\* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water  
\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%  
\*\*\* If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line  
Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.  
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)