WR-35
Rev. 8/23/13

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47 - 069 - 00212 County OHIO District TRIADELPHIA
Quad VALLEY GROVE, WV Pad Name DEBORAH CRAIG-OHI-PAD1 Field/Pool Name PANHANDLE FIELD WET
Farm name CRAIG, DEBORAH ANN Well Number DEBORAH CRAIG OHI 10H
Operator (as registered with the OOG) SWN PRODUCTION COMPANY, LLC
Address PO BOX 12359 City SPRING State TX Zip 77391-2359

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey

Top hole	Northing 4,443,145.929	Easting 535,443.465
Landing Point of Curve	Northing 4,433,118.653	Easting 535,669.224
Bottom Hole	Northing 4,430,986.752	Easting 537,029.385

Elevation (ft) 1329.3' GL Type of Well ■New □ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal ■ Horizontal 6A □ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework ■ Stimulate

Well Type □ Brine Disposal □ CBM ■ Gas □ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other _____

Type of Completion ■ Single □ Multiple Fluids Produced □ Brine ■Gas □ NGL □ Oil □ Other _____
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud ■Fresh Water Intermediate hole ■ Air □ Mud □ Fresh Water □ Brine
Production hole ■ Air ■ Mud □ Fresh Water □ Brine
Mud Type(s) and Additive(s)
SOBM

Date permit issued 2/22/2017 Date drilling commenced 5/09/2017 Date drilling ceased 7/22/2017
Date completion activities began 8/17/2017 Date completion activities ceased 10/10/2017
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 560' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 812' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 682' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

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Reviewed
C. B. 2-7-18

Reviewed by:
SB 2-7-18

WR-35
Rev. 8/23/13

API 47- 069 - 00212 Farm name CRAIG, DEBORAH ANN Well number DEBORAH CRAIG OHI 10H

PRODUCING FORMATION(S)	DEPTHS	
MARCELLUS	6545.47' TVD	6854.34' MD

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ☐ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface 2,021 psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	5268 mcfpd	385 bpd	_____ bpd	378 bpd	☐ Estimated ☐ Orifice ☐ Pilot

LITHOLOGY/ FORMATION NAME	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		
	SEE	ATTACHMENT	3		

Please insert additional pages as applicable.

Drilling Contractor SWN DRILLING COMPANY
Address PO BOX 12359 City SPRING State TX Zip 77391-2359

Logging Company WEATHERFORD
Address 2000 ST. JAMES PLACE City HOUSTON State TX Zip 77056

Cementing Company SCHLUMBERGER WELL SERVICES
Address 110 SCHLUMBERGER DRIVE City SUGAR LAND State TX Zip 77478

Stimulating Company US WELL SERVICES
Address 770 S POST OAK LN #405 City HOUSTON State TX Zip 77056

Please insert additional pages as applicable.

Completed by DENISE GRANTHAM Telephone 832-796-6139
Signature Denise Grantham Title REGULATORY TECHNICIAN Date 1/3/2018

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Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

DEBORAH CRAIG OHI 10H

PERF SUMMARY

STAGE NUM	Perf Date	Perf Top MD	Perf Bottom MD	# SHOTS PER STG
1	8/4/2017	15,110	15,182	72
2	8/17/2017	15,005	15,077	72
3	8/18/2017	14,900	14,972	72
4	8/18/2017	14,795	14,867	72
5	8/18/2017	14,690	14,762	72
6	8/19/2017	14,585	14,657	72
7	8/19/2017	14,480	14,552	72
8	8/19/2017	14,375	14,447	72
9	8/19/2017	14,270	14,342	72
10	8/20/2017	14,165	14,237	72
11	8/20/2017	14,060	14,132	72
12	8/20/2017	13,955	14,027	72
13	8/20/2017	13,850	13,922	72
14	8/21/2017	13,745	13,817	72
15	8/21/2017	13,640	13,712	72
16	8/21/2017	13,535	13,607	72
17	8/22/2017	13,430	13,502	72
18	8/22/2017	13,325	13,397	72
19	8/22/2017	13,220	13,292	72
20	8/22/2017	13,115	13,187	72
21	8/23/2017	13,010	13,082	72
22	8/23/2017	12,905	12,972	72
23	8/23/2017	12,800	12,872	72
24	8/23/2017	12,695	12,767	72
25	8/24/2017	12,590	12,662	72
26	8/24/2017	12,485	12,557	72
27	8/24/2017	12,380	12,452	72
28	8/25/2017	12,275	12,347	72
29	8/25/2017	12,172	12,242	72
30	8/25/2017	12,065	12,137	72
31	8/26/2017	11,960	12,032	72
32	8/26/2017	11,855	11,923	72
33	8/26/2017	11,750	11,822	72
34	8/27/2017	11,650	11,717	72
35	8/27/2017	11,540	11,612	72
36	8/28/2017	11,435	11,507	72
37	8/28/2017	11,330	11,398	72
38	8/28/2017	11,225	11,297	72
39	8/29/2017	11,120	11,192	72
40	8/29/2017	11,015	11,087	72
41	8/30/2017	10,910	10,982	72
42	8/30/2017	10,805	10,874	72
43	8/30/2017	10,700	10,772	72
44	8/31/2017	10,595	10,667	72
45	8/31/2017	10,490	10,562	72
46	8/31/2017	10,385	10,457	72
47	9/1/2017	10,280	10,352	72

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DEBORAH CRAIG OHI 10H

PERF SUMMARY

48	9/1/2017	10,175	10,247	72
49	9/1/2017	10,070	10,142	72
50	9/2/2017	9,965	10,037	72
51	9/2/2017	9,864	9,932	72
52	9/2/2017	9,755	9,827	72
53	9/2/2017	9,650	9,722	72
54	9/3/2017	9,545	9,617	72
55	9/3/2017	9,440	9,512	72
56	9/4/2017	9,340	9,407	72
57	9/4/2017	9,230	9,302	72
58	9/5/2017	9,125	9,197	72
59	9/6/2017	9,020	9,092	72
60	9/6/2017	8,915	8,987	72
61	9/7/2017	8,810	8,882	72
62	9/7/2017	8,705	8,777	72
63	9/8/2017	8,600	8,672	72
64	9/8/2017	8,495	8,567	72
65	9/9/2017	8,390	8,462	72
66	9/10/2017	8,285	8,357	72
67	9/10/2017	8,180	8,252	72
68	9/10/2017	8,075	8,147	72
69	9/11/2017	7,970	8,042	72
70	9/11/2017	7,865	7,937	72
71	9/12/2017	7,760	7,832	72
72	9/12/2017	7,655	7,727	72
73	9/14/2017	7,550	7,622	72
74	9/14/2017	7,445	7,517	72
75	9/14/2017	7,340	7,412	72
76	9/15/2017	7,235	7,307	72
77	9/15/2017	7,130	7,202	72
78	9/16/2017	7,025	7,097	72
79	9/16/2017	6,920	6,992	72

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DEBORAH CRAIG OHI 10H

FRAC STAGE SUMMARY

STAGE NUM	Stim Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of water bbls	Amount of nitrogen/other
1	8/4/2017	88	8,141	8,599	3,948	748,460	15,318	
2	8/17/2017	88	7,823	8,490	4,556	747,680	12,424	
3	8/18/2017	86	7,743	8,514	5,121	749,400	11,842	
4	8/18/2017	85	7,527	8,382	5,016	750,600	11,434	
5	8/18/2017	85	7,790	8,917	4,870	751,000	11,774	
6	8/19/2017	83	7,567	8,714	4,726	754,960	11,666	
7	8/19/2017	85	7,579	8,987	4,840	750,960	11,730	
8	8/19/2017	74	8,117	9,313	5,035	748,240	14,188	
9	8/19/2017	85	7,480	8,147	4,651	747,600	11,786	
10	8/20/2017	80	7,325	8,272	4,782	749,940	11,012	
11	8/20/2017	81	7,288	8,601	5,177	759,560	11,130	
12	8/20/2017	84	7,566	8,794	5,086	752,880	11,804	
13	8/20/2017	85	7,301	7,615	4,906	749,680	12,522	
14	8/21/2017	81	7,228	8,008	4,913	753,600	11,032	
15	8/21/2017	80	7,464	8,196	4,707	752,000	10,866	
16	8/21/2017	75	7,157	8,053	4,805	750,520	11,302	
17	8/22/2017	77	7,429	8,863	4,861	742,818	10,842	
18	8/22/2017	81	7,367	8,259	4,895	747,600	11,060	
19	8/22/2017	85	7,480	8,372	4,805	751,000	11,384	
20	8/22/2017	85	7,496	8,406	5,167	750,600	11,234	
21	8/23/2017	84	7,569	8,677	5,042	750,640	11,320	
22	8/23/2017	84	7,195	7,506	4,934	743,920	13,236	
23	8/23/2017	84	7,379	8,665	4,877	753,460	11,304	
24	8/23/2017	83	7,338	8,494	5,138	750,500	11,012	
25	8/24/2017	91	7,907	8,321	4,774	749,500	11,224	
26	8/24/2017	88	7,651	8,261	4,685	750,820	11,278	
27	8/24/2017	80	7,692	9,126	4,941	750,640	11,418	
28	8/25/2017	87	7,898	8,665	4,698	756,520	11,206	
29	8/25/2017	78	8,192	9,321	4,761	751,740	11,388	
30	8/25/2017	75	7,932	9,276	4,595	753,160	11,266	
31	8/26/2017	86	7,724	9,037	4,712	746,720	11,274	
32	8/26/2017	85	7,085	8,119	4,764	751,600	11,190	
33	8/26/2017	84	7,311	7,668	4,987	742,980	10,948	
34	8/27/2017	83	7,059	8,488	4,872	752,600	10,828	
35	8/27/2017	83	7,513	9,066	4,405	754,260	11,070	
36	8/28/2017	84	6,920	8,195	4,544	749,040	11,202	
37	8/28/2017	83	7,316	8,771	5,086	744,440	11,082	
38	8/28/2017	68	8,313	8,966	4,890	91,500	5,748	
39	8/29/2017	85	6,976	7,655	4,698	753,520	11,024	
40	8/29/2017	84	6,950	7,623	4,830	761,520	10,904	
41	8/30/2017	84	7,225	8,604	4,913	678,480	10,124	
42	8/30/2017	64	8,400	8,685	4,872	600,480	10,354	
43	8/30/2017	86	7,161	8,738	5,001	758,320	11,794	
44	8/31/2017	89	7,226	7,767	4,725	754,720	10,878	
45	8/31/2017	89	7,197	7,775	5,277	744,000	10,976	
46	8/31/2017	92	7,247	7,752	5,287	758,960	11,084	
47	9/1/2017	90	6,943	7,511	4,624	750,260	11,020	
48	9/1/2017	90	7,226	8,606	4,635	752,840	11,072	
49	9/1/2017	92	7,193	8,937	5,129	746,120	11,036	
50	9/2/2017	89	6,989	7,471	4,871	748,600	10,788	
51	9/2/2017	90	7,199	8,464	4,668	722,200	10,508	
52	9/2/2017	91	7,182	8,348	5,090	757,600	10,774	
53	9/2/2017	89	7,137	8,767	5,064	754,720	10,856	
54	9/3/2017	90	6,974	7,598	4,714	755,020	10,670	
55	9/3/2017	90	7,114	8,840	4,832	757,080	10,916	
56	9/4/2017	90	7,198	8,699	5,426	752,440	10,720	
57	9/4/2017	91	7,200	7,726	5,271	757,000	10,694	
58	9/5/2017	90	6,957	8,202	4,683	751,520	10,572	

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DEBORAH CRAIG OHI 10H
FRAC STAGE SUMMARY

59	9/6/2017	90	7,299	8,435	4,628	754,040	10,766
60	9/6/2017	90	6,991	7,340	5,206	762,320	10,856
61	9/7/2017	82	6,515	7,168	4,695	755,380	10,706
62	9/7/2017	82	7,561	9,229	4,728	752,060	11,392
63	9/8/2017	89	7,297	8,440	4,825	670,320	10,046
64	9/8/2017	89	7,043	7,852	5,248	756,160	15,896
65	9/9/2017	91	6,875	7,389	4,878	763,320	10,726
66	9/10/2017	86	6,893	7,420	5,159	757,760	10,590
67	9/10/2017	90	7,162	7,744	5,016	744,680	10,608
68	9/10/2017	90	6,972	7,441	5,079	747,560	10,584
69	9/11/2017	86	7,196	8,147	5,410	751,000	10,578
70	9/11/2017	89	6,979	7,670	4,931	745,880	10,430
71	9/12/2017	89	6,906	7,998	4,854	753,200	10,422
72	9/12/2017	90	6,770	7,544	5,167	745,840	10,536
73	9/14/2017	85	7,045	8,625	4,751	750,780	10,476
74	9/14/2017	90	7,076	7,477	5,365	747,240	10,512
75	9/14/2017	90	7,163	7,914	5,143	750,560	10,458
76	9/15/2017	86	6,866	7,402	4,369	755,660	10,346
77	9/15/2017	85	6,534	6,874	5,191	748,560	10,246
78	9/16/2017	90	6,838	7,080	5,416	752,420	10,184
79	9/16/2017	85	6,561	7,550	5,010	745,720	10,128

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Well Name: DEBORAH CRAIG OHI 10H 47069002120000

LITHOLOGY/FORMATION	TOP DEPTH, MD (FT)	TOP DEPTH, TVD (FT)	BOTTOM DEPTH, MD (FT)	BOTTOM DEPTH, TVD (FT)	QUANTITY AND TYPE OF FLUID
Base of Fresh Water	N.A.	N.A.	560.00	560.00	
Top of Salt Water	812.00	812.00	N.A.	N.A.	
Pittsburgh Coal	682.00	682.00	689.00	689.00	
Big Injun (ss)	1940.00	1940.00	2054.00	2054.00	
Berea (siltstone)	2404.00	2404.00	2447.00	2447.00	
Rhinestreet (shale)	6035.82	5988.29	6366.86	6281.11	
Cashaqua (shale)	6366.56	6281.11	6390.40	6299.16	
Middlesex (shale)	6390.40	6299.16	6469.81	6356.86	
Burket (shale)	6469.81	6356.89	6507.74	6382.67	
Tully (ls)	6507.74	6382.67	6560.00	6416.84	
Mahantango (shale)	6560.00	6416.84	6854.34	6545.47	
Marcellus (shale)	6854.34	6545.47	N.A.	N.A.	GAS

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Deborah Craig OHI 10H
Ohio County, WV
SDC 40

Southwestern Energy

Drawing By: TVH Date: 07/11/2017
Weatherford Drilling Services
7725 W. Reno, Ste. #220
Oklahoma City, OK 73127
+1.405.773.1100 Main
+1.405.773.1887 Fax

True Grid Mag
Grid Convergence: 0.27°
Mag Declination: -8.82°
Bearing:
True = Mag - 8.82°
Grid = True - 0.27°

Weatherford

KB: 1355.3'
GL: 1329.3'

Plan Data for Deborah Craig OHI 10H

Plan Point Information:
DogLeg Severity Unit: °/100.00ft Position offsets from Slot centre

MD (USft)	Inc (°)	Az (°)	TVD (USft)	+N/-S (USft)	+E/-W (USft)	VSec (USft)	DLS (DLSU)	Toolface (°)	Comments
1795.00	1.35	127.00	1794.94	3.55	1.74	-1.83	0.48	14.2	
1882.00	1.35	127.00	1881.92	2.31	3.38	0.14	0.00	0.0	
1949.50	0.00	0.00	1949.41	1.83	4.02	0.90	2.00	180.0	
2130.00	0.00	0.00	2129.91	1.83	4.02	0.90	0.00	0.0	
2600.00	0.00	0.00	2599.91	1.83	4.02	0.90	0.00	0.0	KOP
3100.00	10.00	31.00	3097.38	39.14	26.43	-15.92	2.00	31.0	Hold
5754.34	10.00	31.00	5711.39	434.23	263.82	-194.01	0.00	0.0	Build / Turn
6676.85	60.05	145.48	6478.94	141.98	564.04	219.21	7.00	119.2	Build / Turn
6941.08	83.83	145.49	6560.27	-63.53	705.35	468.50	9.00	0.0	Landing Point
7001.08	89.23	145.49	6563.90	-112.86	739.27	528.34	9.00	0.0	Hold
12815.20	89.23	145.49	6642.03	-4903.42	4032.97	6339.19	0.00	0.0	Turn
13152.20	89.32	152.23	6646.30	-5191.68	4207.13	6674.63	2.00	89.3	Hold
15292.55	89.32	152.23	6671.71	-7085.38	5204.29	8791.31	0.00	0.0	BHL

Target Set Information:
Name: Deborah Craig OHI 10H
Position offsets from Slot centre

Name	TVD (USft)	+N/-S (USft)	+E/-W (USft)	Northing (USft)	Easting (USft)	Lat (°)	Long (°)
LP DC10H	6564.00	-114.71	735.23	14544298.22	1757436.07	40.047481	-80.581860
Turn DC10H	6646.44	-5193.58	4203.66	14539219.35	1760904.50	40.033489	-80.569555
PBHL DC10H	6672.00	-7087.00	5200.55	14537325.93	1761901.39	40.028276	-80.566027

Plan Data for Deborah Craig OHI 10H

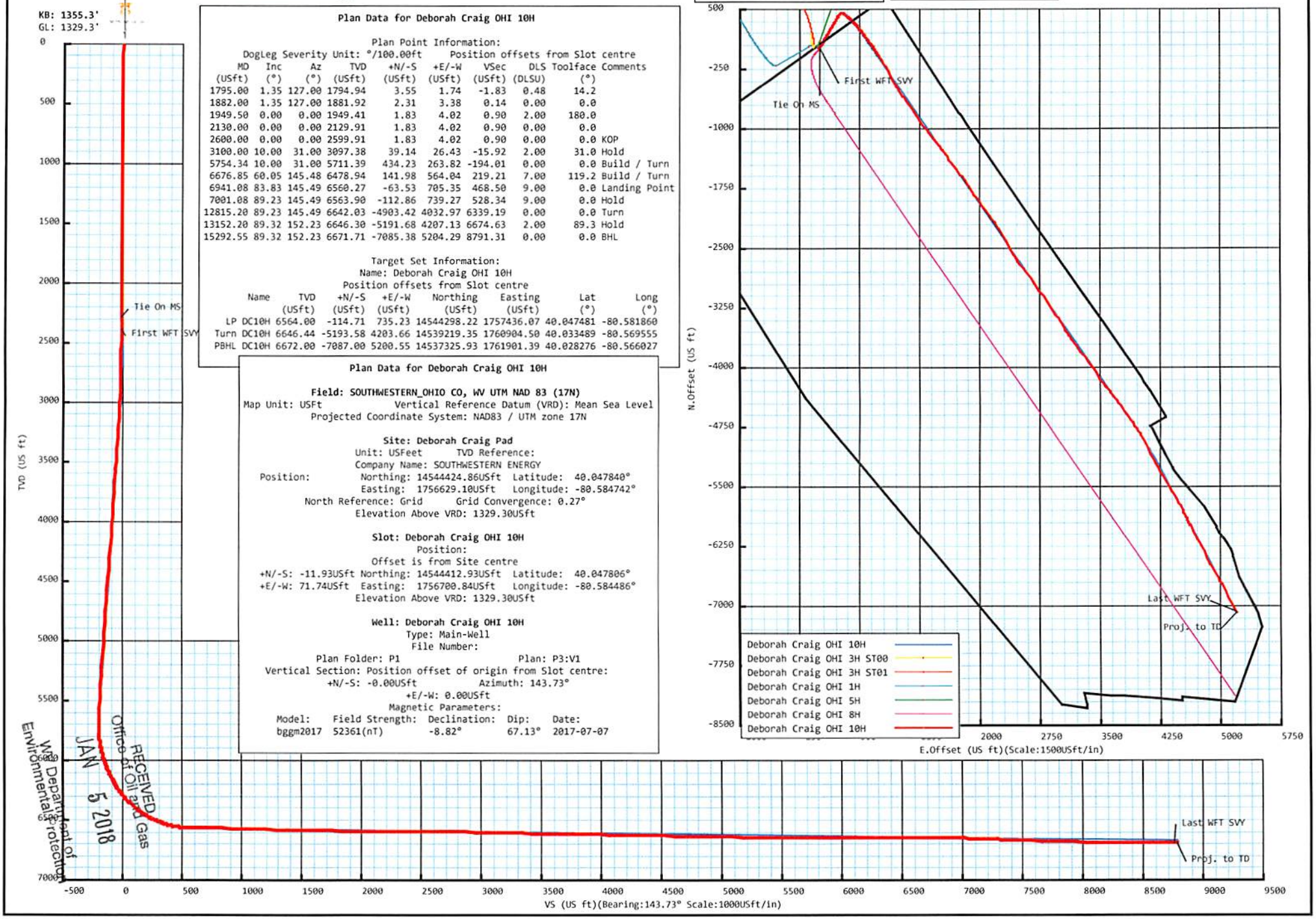
Field: SOUTHWESTERN_OHIO CO, WV UTM NAD 83 (17N)
Map Unit: USFt Vertical Reference Datum (VRD): Mean Sea Level
Projected Coordinate System: NAD83 / UTM zone 17N

Site: Deborah Craig Pad
Unit: USFeet TVD Reference:
Company Name: SOUTHWESTERN ENERGY
Position: Northing: 14544424.86USft Latitude: 40.047840°
Easting: 1756629.10USft Longitude: -80.584742°
North Reference: Grid Grid Convergence: 0.27°
Elevation Above VRD: 1329.30USft

Slot: Deborah Craig OHI 10H
Position:
Offset is from Site centre
+N/-S: -11.93USft Northing: 14544412.93USft Latitude: 40.047806°
+E/-W: 71.74USft Easting: 1756700.84USft Longitude: -80.584486°
Elevation Above VRD: 1329.30USft

Well: Deborah Craig OHI 10H
Type: Main-Well
File Number:
Plan Folder: P1 Plan: P3:V1
Vertical Section: Position offset of origin from Slot centre:
+N/-S: -0.00USft Azimuth: 143.73°
+E/-W: 0.00USft
Magnetic Parameters:

Model:	Field Strength:	Declination:	Dip:	Date:
bggm2017	52361(nT)	-8.82°	67.13°	2017-07-07



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SURVEY REPORT

Weatherford®

Report Date:	7/19/2017		
Customer:	SWN Production Co., LLC	Field:	Panhande
Job Name:	NE-12532444	Rig:	SDC 40
Well Name:	Deborah Craig OHI 10H	Rig Loc:	Ohio Co., WV

Survey Calculation Method: **Minimum Curvature**

Magnetic Reference	Target Direction	Total Magnetic Field	Magnetic Dip Angle	Magnetic Declination	Grid Convergence	Total Correction
Grid North	**143.73 deg**	**52360 nT**	**67.13 deg**	**-8.82 deg**	**0.27 deg**	**-9.09 deg**

Survey Tie-On	Depth	INC	AZ	TVD	NS	EW
	0.00 ft	**0.00 deg**	**0.00 deg**	**0.00 ft**	**0.00 ft**	**0.00 ft**

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head NS (ft)	EW (ft)	VSect (ft)	Dogleg (deg/100ft)
100.00	0.75	349.43	100.00	0.64	-0.12	-0.59	0.75
200.00	0.74	351.57	199.99	1.93	-0.33	-1.75	0.03
300.00	0.59	341.26	299.98	3.05	-0.59	-2.81	0.19
400.00	0.74	343.16	399.98	4.16	-0.95	-3.91	0.15
500.00	0.43	343.06	499.97	5.13	-1.24	-4.88	0.31
600.00	0.29	332.81	599.97	5.72	-1.47	-5.48	0.15
700.00	0.21	253.27	699.97	5.89	-1.76	-5.79	0.33
800.00	0.23	267.49	799.97	5.83	-2.14	-5.96	0.06
900.00	0.24	280.58	899.97	5.86	-2.54	-6.23	0.05
1000.00	0.13	254.13	999.96	5.87	-2.86	-6.42	0.14
1100.00	0.11	236.70	1099.96	5.78	-3.05	-6.46	0.04
1200.00	0.24	268.98	1199.96	5.73	-3.34	-6.59	0.16
1300.00	0.10	301.51	1299.96	5.77	-3.62	-6.79	0.16
1400.00	0.15	4.60	1399.96	5.94	-3.68	-6.97	0.14
1500.00	0.15	55.03	1499.96	6.15	-3.57	-7.07	0.13
1600.00	0.62	114.36	1599.96	6.00	-2.97	-6.59	0.56
1700.00	0.75	125.90	1699.95	5.39	-1.94	-5.50	0.19
1800.00	1.36	126.09	1799.94	4.31	-0.45	-3.74	0.61
1900.00	1.34	103.39	1899.91	3.34	1.64	-1.72	0.53
2000.00	1.68	52.11	1999.88	3.97	3.94	-0.87	1.34
2100.00	1.67	30.22	2099.84	6.13	5.83	-1.50	0.64
2200.00	1.52	353.68	2199.80	8.71	6.41	-3.23	1.01
2291.00	2.18	5.30	2290.75	11.63	6.44	-5.57	0.83
2387.00	2.76	27.22	2386.67	15.50	7.67	-7.96	1.14
2480.00	2.92	28.09	2479.55	19.59	9.81	-9.99	0.18
2573.00	2.97	22.48	2572.43	23.90	11.84	-12.26	0.31
2666.00	3.38	28.97	2665.29	28.53	14.09	-14.66	0.59
2759.00	3.80	37.67	2758.10	33.36	17.30	-16.66	0.74
2851.00	3.74	35.68	2849.90	38.21	20.92	-18.44	0.16
2944.00	4.75	36.57	2942.65	43.77	24.98	-20.51	1.09
3037.00	6.26	32.34	3035.22	51.15	29.99	-23.50	1.68
3130.00	6.34	27.76	3127.66	59.98	35.09	-27.60	0.55
3223.00	7.13	24.63	3220.01	69.77	39.89	-32.65	0.94
3315.00	6.99	20.29	3311.32	80.21	44.21	-38.51	0.60
3405.00	7.40	26.39	3400.61	90.54	48.68	-44.19	0.96

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Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head NS (ft)	EW (ft)	VSect (ft)	Dogleg (deg/100ft)
3498.00	9.00	30.94	3492.66	102.14	55.09	-49.76	1.86
3590.00	10.44	30.94	3583.33	115.46	63.07	-55.78	1.57
3683.00	10.42	28.11	3674.80	130.11	71.37	-62.68	0.55
3776.00	10.06	32.46	3766.32	144.38	79.69	-69.26	0.92
3869.00	9.33	30.69	3857.99	157.72	87.90	-75.16	0.85
3962.00	9.12	33.54	3949.79	170.34	95.82	-80.65	0.54
4055.00	9.81	32.66	4041.52	183.16	104.16	-86.04	0.76
4147.00	10.84	30.25	4132.03	197.23	112.75	-92.31	1.21
4237.00	10.24	26.84	4220.51	211.68	120.63	-99.30	0.96
4327.00	10.51	27.57	4309.04	226.09	128.04	-106.54	0.33
4417.00	11.27	29.98	4397.42	240.99	136.23	-113.70	0.98
4509.00	11.74	35.86	4487.57	256.36	146.21	-120.19	1.37
4602.00	11.41	35.99	4578.68	271.47	157.16	-125.90	0.36
4695.00	10.70	33.42	4669.96	286.12	167.32	-131.70	0.93
4785.00	10.08	31.22	4758.48	299.83	176.00	-137.61	0.82
4874.00	9.72	29.78	4846.15	313.01	183.77	-143.64	0.49
4967.00	10.01	32.63	4937.78	326.63	192.03	-149.74	0.61
5060.00	10.07	32.87	5029.36	340.27	200.80	-155.55	0.08
5150.00	9.82	30.87	5118.00	353.46	209.01	-161.33	0.47
5243.00	9.87	29.83	5209.63	367.19	217.04	-167.64	0.20
5335.00	9.76	27.38	5300.29	380.95	224.55	-174.29	0.47
5428.00	9.33	35.30	5392.00	394.10	232.53	-180.18	1.48
5521.00	8.72	34.06	5483.85	406.10	240.84	-184.93	0.69
5611.00	9.39	35.87	5572.73	417.70	248.96	-189.48	0.81
5703.00	10.67	38.69	5663.32	430.43	258.68	-193.99	1.49
5750.00	10.87	49.88	5709.50	436.68	264.79	-195.42	4.46
5796.00	10.53	65.26	5754.71	441.24	271.93	-194.87	6.23
5842.00	10.86	81.50	5799.92	443.64	280.03	-192.01	6.57
5889.00	11.77	95.38	5846.02	443.84	289.19	-186.76	6.09
5935.00	13.28	108.54	5890.93	441.72	298.87	-179.32	7.00
5982.00	14.68	119.68	5936.54	437.05	309.16	-169.47	6.44
6028.00	16.56	129.52	5980.85	429.99	319.29	-157.79	7.05
6074.00	19.47	132.28	6024.59	420.66	330.02	-143.92	6.59
6121.00	22.49	132.33	6068.47	409.34	342.46	-127.43	6.43
6190.00	26.08	132.28	6131.36	390.24	363.45	-99.62	5.20
6237.00	28.47	132.30	6173.13	375.75	379.38	-78.51	5.09
6283.00	31.91	131.70	6212.88	360.28	396.57	-55.86	7.51
6330.00	35.77	132.98	6251.91	342.64	415.90	-30.21	8.35
6376.00	39.39	135.58	6288.36	323.04	435.96	-2.54	8.59
6422.00	43.20	138.07	6322.92	300.90	456.71	27.59	9.02
6469.00	46.16	139.89	6356.34	275.96	478.38	60.52	6.86
6515.00	48.08	141.51	6387.64	249.87	499.72	94.18	4.91
6559.00	50.68	143.03	6416.28	223.46	520.15	127.56	6.46
6605.00	55.17	143.64	6444.01	194.02	542.06	164.25	9.82
6651.00	60.10	143.19	6468.62	162.83	565.21	203.09	10.75
6698.00	64.15	142.90	6490.59	129.64	590.18	244.62	8.63
6744.00	66.80	143.07	6509.69	96.23	615.38	286.47	5.77
6791.00	69.91	144.16	6527.02	61.06	641.28	330.15	6.96
6837.00	74.01	145.71	6541.26	25.27	666.40	373.86	9.47
6883.00	77.63	147.26	6552.53	-11.91	691.02	418.40	8.50

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Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head NS (ft)	EW (ft)	VSect (ft)	Dogleg (deg/100ft)
6930.00	82.76	147.41	6560.53	-50.89	716.00	464.61	10.92
6976.00	87.16	147.41	6564.57	-89.49	740.68	510.33	9.57
7023.00	88.27	146.80	6566.45	-128.92	766.18	557.21	2.69
7115.00	89.32	149.09	6568.38	-206.87	815.00	648.93	2.74
7208.00	88.83	152.06	6569.88	-287.85	860.67	741.24	3.24
7301.00	88.94	151.52	6571.69	-369.79	904.63	833.31	0.59
7394.00	88.77	150.81	6573.55	-451.24	949.47	925.51	0.78
7487.00	88.46	145.86	6575.80	-530.35	998.26	1018.15	5.33
7579.00	87.78	145.02	6578.82	-606.07	1050.42	1110.06	1.17
7672.00	87.90	144.29	6582.32	-681.88	1104.18	1202.98	0.79
7765.00	88.64	143.90	6585.13	-757.17	1158.70	1295.93	0.90
7858.00	88.52	145.91	6587.44	-833.24	1212.15	1388.88	2.16
7950.00	89.69	145.14	6588.87	-909.07	1264.22	1480.82	1.52
8043.00	89.26	143.53	6589.73	-984.62	1318.43	1573.81	1.79
8136.00	88.64	141.76	6591.43	-1058.53	1374.85	1666.77	2.02
8229.00	89.38	141.84	6593.04	-1131.60	1432.35	1759.71	0.80
8322.00	89.07	141.95	6594.29	-1204.77	1489.74	1852.65	0.35
8414.00	89.63	145.11	6595.34	-1278.74	1544.41	1944.63	3.49
8507.00	89.29	145.17	6596.22	-1355.05	1597.57	2037.60	0.37
8600.00	89.38	143.18	6597.29	-1430.45	1651.99	2130.59	2.14
8693.00	89.51	143.28	6598.20	-1504.94	1707.66	2223.58	0.18
8786.00	90.18	142.68	6598.45	-1579.19	1763.66	2316.57	0.97
8878.00	89.94	145.37	6598.35	-1653.64	1817.69	2408.56	2.94
8971.00	89.75	148.03	6598.60	-1731.36	1868.75	2501.42	2.87
9064.00	90.00	147.81	6598.81	-1810.16	1918.14	2594.18	0.36
9157.00	89.20	143.94	6599.45	-1887.13	1970.30	2687.09	4.25
9249.00	88.46	142.32	6601.33	-1960.71	2025.49	2779.06	1.94
9342.00	89.20	142.61	6603.23	-2034.44	2082.14	2872.02	0.85
9435.00	88.64	142.98	6604.99	-2108.50	2138.36	2964.99	0.72
9528.00	88.89	146.08	6606.99	-2184.22	2192.31	3057.95	3.34
9621.00	88.52	148.86	6609.09	-2262.60	2242.30	3150.72	3.01
9713.00	88.95	148.62	6611.12	-2341.22	2290.03	3242.34	0.54
9806.00	88.64	149.58	6613.08	-2421.00	2337.78	3334.91	1.08
9899.00	89.14	149.03	6614.88	-2500.96	2385.24	3427.45	0.80
9992.00	89.08	149.94	6616.33	-2581.07	2432.46	3519.97	0.98
10084.00	89.01	146.44	6617.86	-2659.23	2480.94	3611.67	3.80
10177.00	88.83	144.82	6619.61	-2735.97	2533.43	3704.60	1.75
10270.00	88.83	144.80	6621.51	-2811.96	2587.01	3797.56	0.02
10363.00	88.95	144.45	6623.31	-2887.78	2640.84	3890.53	0.40
10455.00	88.95	143.66	6625.00	-2962.24	2694.84	3982.52	0.86
10545.00	89.01	144.03	6626.60	-3034.90	2747.92	4072.50	0.42
10635.00	88.83	145.57	6628.30	-3108.43	2799.79	4162.47	1.72
10728.00	88.95	145.68	6630.10	-3185.17	2852.29	4255.40	0.18
10817.00	89.26	146.54	6631.49	-3259.04	2901.91	4344.31	1.03
10909.00	89.32	146.97	6632.63	-3335.98	2952.34	4436.17	0.47
11002.00	88.71	148.35	6634.23	-3414.54	3002.08	4528.94	1.62
11095.00	89.14	148.26	6635.97	-3493.66	3050.94	4621.63	0.47
11187.00	88.77	146.43	6637.65	-3571.10	3100.57	4713.42	2.03
11280.00	88.77	143.48	6639.65	-3647.21	3153.95	4806.37	3.17
11373.00	88.89	144.10	6641.55	-3722.23	3208.88	4899.35	0.68

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WFRA-1000	U.S. Well Services, LLC	Friction Reducer					
			2-Propenoic acid, polymer with 2 propenamide	9003-06-9	30.00000	0.01013	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.00830	
BIOC11139A	Nalco Champion	Anti-Bacterial Agent					
			Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	30.00000	0.00603	
			Glutaraldehyde	111-30-8	10.00000	0.00201	
			Ethanol	64-17-5	5.00000	0.00078	
SCAL16486A	Nalco Champion	Scale Inhibitor					
			Ethylene Glycol	107-21-1	30.00000	0.00172	
			Amine Triphosphate	Proprietary	30.00000	0.00154	
WFRA 2500	U.S. Well Services, LLC	Friction Reducer					
			Petroleum naphtha	64742-47-8	30.00000	0.00089	
			Quaternary ammonium compund	Proprietary	5.00000	0.00018	
AI-303	U.S. Well Services, LLC	Acid Corrosion Inhibitors					
			Ethylene glycol	107-21-1	40.00000	0.00014	
			Cinnamaldehyde	104-55-2	20.00000	0.00005	
			Formic acid	64-18-6	20.00000	0.00005	
			Butyl cellosolve	111-76-2	20.00000	0.00004	
			Polyether	60828-78-6	10.00000	0.00002	
			Acetophenone,thiourea,formaldehyde polymer	68527-49-1	5.00000	0.00001	
OPTI-FLEX	U.S. Well Services, LLC	Friction Reducer					
			Trade Secret	Proprietary	50.00000	0.00003	
			Distillates, petroleum, hydrotreated light	64742-47-8	50.00000	0.00002	
AP One	U.S. Well Services, LLC	Gel Breakers					
			Ammonium Persulfate	7727-54-0	100.00000	0.00000	

Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

* Total Water Volume sources may include fresh water, produced water, and/or recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%

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)

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Latitude: 40°05'00" SURFACE HOLE 322'

Latitude: 40°02'30" BOTTOM HOLE 6818'

JACKSON SURVEYING INC.
P.O. Box 1460
677 W. Main St.
Clarksburg, WV 26302
304-623-5851

SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,433,145.927
EASTING: 535,443.487

LANDING POINT (LPT):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,433,110.964
EASTING: 535,667.585

AZIMUTH TURN (AZT)
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,431,562.921
EASTING: 536,724.765

BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS)
NORTHING: 4,430,985.805
EASTING: 537,028.618

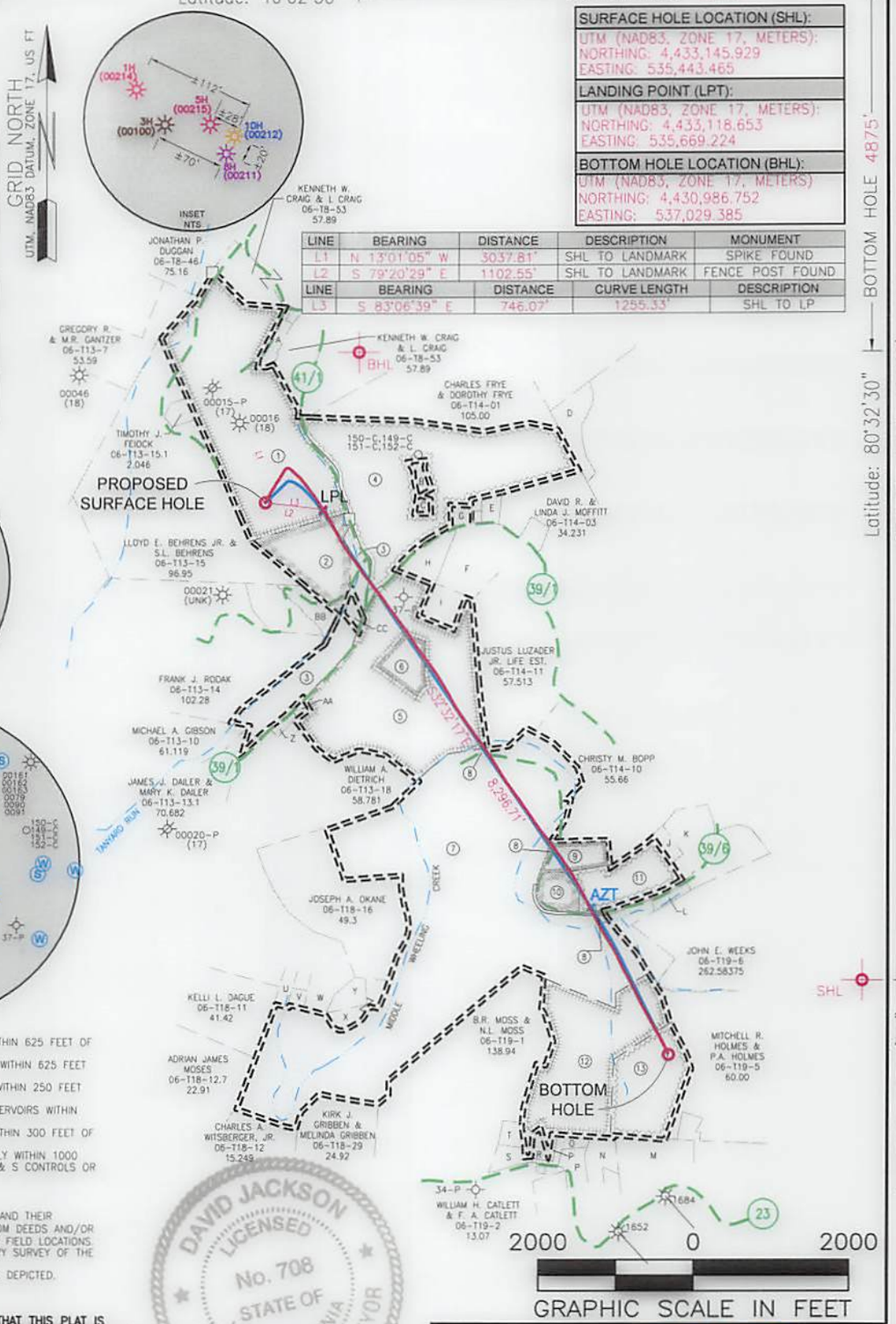
SURFACE HOLE LOCATION (SHL):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,433,145.929
EASTING: 535,443.465

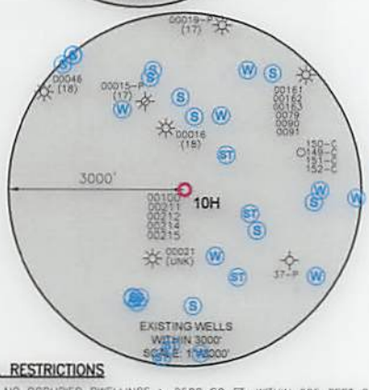
LANDING POINT (LPT):
UTM (NAD83, ZONE 17, METERS):
NORTHING: 4,433,118.653
EASTING: 535,669.224

BOTTOM HOLE LOCATION (BHL):
UTM (NAD83, ZONE 17, METERS)
NORTHING: 4,430,986.752
EASTING: 537,029.385

LINE	BEARING	DISTANCE	DESCRIPTION	MONUMENT
L1	N 13°01'05" W	3037.81'	SHL TO LANDMARK	SPIKE FOUND
L2	S 79°20'29" E	1102.55'	SHL TO LANDMARK	FENCE POST FOUND

LINE	BEARING	DISTANCE	CURVE LENGTH	DESCRIPTION
L3	S 83°06'39" E	746.07'	1255.33'	SHL TO LP





Latitude: 80°32'30"

SURFACE HOLE 12942'

BOTTOM HOLE 4875'

Longitude: 80°35'00"

WELL RESTRICTIONS

1. NO OCCUPIED DWELLINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
2. NO AGRICULTURE BUILDINGS > 2500 SQ FT. WITHIN 625 FEET OF CENTER OF PAD.
3. WATER WELLS OR DEVELOPED SPRINGS ARE WITHIN 250 FEET OF PROPOSED WELL.
4. PERENNIAL STREAMS, LAKES, PONDS, OR RESERVOIRS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
5. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.
6. NO GROUND INTAKE OR PUBLIC WATER SUPPLY WITHIN 1000 FEET OF WELL PAD, LIMITS OF DISTURBANCE, E & S CONTROLS OR PUBLIC WATER SUPPLY.

NOTES ON SURVEY

1. SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND/OR FIELD LOCATIONS.
2. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. ALL INSETS ARE GRID NORTH UNLESS OTHERWISE DEPICTED.

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

P.S. 708 David L. Jackson

DAVID JACKSON LICENSED No. 708 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

COMPANY: SWN Production Company, LLC — SWN Production Company™

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25034

MINIMUM DEGREE OF ACCURACY: 1/200

PROVEN SOURCE OF ELEVATION: SURVEY GRADE GPS (NAVD 88, US FT)

OPERATOR'S WELL #: DEBORAH CRAIG OHI 10H

API WELL #: 47 (STATE) 069 (COUNTY) 00212 (PERMIT)

WELL TYPE: OIL ☐ WASTE DISPOSAL ☐ PRODUCTION ☒ DEEP ☐ GAS ☒ LIQUID INJECTION ☐ STORAGE ☐ SHALLOW ☒

WATERSHED: TANYARD RUN OF MIDDLE WHEELING CREEK ELEVATION: 1329.3'

DISTRICT: TRIADELPHIA COUNTY: OHIO QUADRANGLE: VALLEY GROVE, WV

SURFACE OWNER: DEBORAH ANN CRAIG ACREAGE: ±84.63

OIL & GAS ROYALTY OWNER: DEBORAH ANN CRAIG ACREAGE: ±84.63

DRILL ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☐ PLUG OFF OLD FORMATION ☐ PERFORATE NEW FORMATION ☐

CONVERT ☐ PLUG & ABANDON ☐ CLEAN OUT & REPLUG ☐ OTHER CHANGE ☒ (SPECIFY) ASDRILLED

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 6,690 TVD 15,291 TMD

WELL OPERATOR: SWN PRODUCTION COMPANY, LLC DESIGNATED AGENT: DEE SOUTHALL
ADDRESS: P.O. BOX 1300 ADDRESS: P.O. BOX 1300
CITY: JANE LEW STATE: WV ZIP CODE: 26378 CITY: JANE LEW STATE: WV ZIP CODE: 26378

LEGEND:
- PROPOSED SURFACE HOLE / BOTTOM HOLE
- EXISTING / PRODUCING WELLHEAD
- LPL LANDING POINT LOCATION
- (W) EXISTING WATER WELL
- (S) EXISTING SPRING
- SURVEYED BOUNDARY
- DRILLING UNIT
- LEASE BOUNDARY
- ASDRILLED PATH
- PROPOSED PATH

REVISIONS:

DATE: 09-08-2017
DRAWN BY: N. MANO
SCALE: 1" = 2000'
DRAWING NO:
WELL LOCATION PLAT

\\HOME-40029E45C4\1-03-17 DJ\SWN\DEBORAH CRAIG OHI\WELL PLATS\10H\FINAL\FINAL CRAIG 10H 09-08-17\SWN DEBORAH CRAIGH 10H 09-08-2017. PROPERTY NUMBER 2501164551
FRIDAY SEPTEMBER 08 2017 11:47AM
PAD ID 3001156094

JACKSON SURVEYING
INC.
P.O. Box 1460
677 W. Main St.
Clarksburg, WV 26302
304-623-5851

WELL BORE TABLE FOR SURFACE / ROYALTY OWNERS			
TRACT	SURFACE OWNER (S) / ROYALTY OWNER (R)	TAX PARCEL	ACRES
1	DEBORAH ANN CRAIG (S/R)	06-T13-16	84.63
TRACT	SURFACE OWNER	TAX PARCEL	ACRES
2	WM. A. LANGMYER & M.J. LANGMYER (S)	06-T13-17.2	21.61
3	ROBERT LEECH (S)	06-T13-17	22.06
4	RONALD W. MEYER (S)	06-T14-02	91.58
5	NELLIE M. FISHER L.E. & DEBORAH A. CRAIG (S)	06-T14-05	90.081
6	ROI ANN CRAIG (S)	06-T14-05.1	6.883
7	WHEELING CREEK WATERSHED PROTECTION & FLOOD PROTECTION COMM (S)	06-T14-06	251.16
8	WEST VIRGINIA DEPARTMENT OF TRANSPORTATION (S)	WV COUNTY RT. 39/6	
9	CHARLES T. HOHMAN & MARY S. HOHMAN (S)	06-T14-10.3	8.514
10	CHARLES T. HOHMAN & M.S. HOHMAN (S)	06-T14-07	5.848
11	BETH ANN STEPHEN ET AL (S)	06-T14-08	14.251
12	JAMES A. MITCHAM & B.A. MITCHAM (S)	06-T19-1.14	59.522
13	JAMES A. MITCHAM & B.A. MITCHAM (S)	06-T19-1.12	25.00

ADJOINING OWNERS TABLE			
TRACT	SURFACE OWNER	TAX PARCEL	ACRES
A	DEBORAH ANN CRAIG	06-T8-50	1.924
B	RONALD W. MEYER	06-T14-2.2	0.712
C	RONALD W. MEYER	06-T14-2.3	0.41
D	MATTHEW J. CROFT & SADIE L. CROFT	06-T14-61	5.92
E	DONALD L. MOFFITT JR. & L.L. MOFFITT	06-T14-3.3	2.032
F	ROBERT F. LEECH & DEBORAH A. LEECH	06-T14-4.1	7.1
G	JOHN E. VASCAVITCH & DEBORAH VASCAVITCH	06-T14-2.1	1.04
H	CAROLE ANN GRIFFITH	06-T14-4	12.7
I	SETH C. CRAIG	06-T14-5.2	4.309
J	JOHN M. WEITZEL & ANGELA L. WEITZEL	06-T14-9.1	1.695
K	JOHN E. WEITZEL & T.M. WEITZEL	06-T14-9	9.094
L	WHEELING CREEK WATERSHED PROTECTION & FLOOD PREVENTION COMMISSION	06-T14-6.1	2.00
M	JACK MITCHAM & ROSE MITCHAM-LE: JAMES A. MITCHAM & BERNICE MITCHAM	06-T19-1.13	9.234
N	MARY E. HELT & PAUL T. HELT	06-T19-1.3	8.348
O	JANICE A. MITCHAM & BERNICE A. MITCHAM	06-T19-1.18	1.717
P	JAMES A. MITCHAM & BERNICE A. MITCHAM	06-T19-1.15	0.93
Q	JAY MICHAEL IRWIN	06-T19-14.1	0.281
R	ROBERT A. MITCHAM & MARIECA J. MITCHAM	06-T19-1.19	0.288
S	LOUIS WHITECOTTEN & SHARON WHITECOTTEN-LE P.L. HENDERSON & D.A. WHITECOTTON	06-T19-1.9	1.779
T	SUSAN E. OBERLE	06-T18-1.22	1.8
U	GEORGE W. HELDEFFER & JUDITH D. HELDEFFER	06-T18-9.1	1.8
V	GARY R. HUGHES & W.C. HUGHES	06-T18-11.4	0.659
W	JOHN SCHMITT	06-T18-13.3	1.673
X	STEPHEN P. SCHMITT	06-T19-16.2	1.24
Y	STEPHEN P. SCHMITT	06-T18-13.1	1.47
Z	E.R. DIETRICH	06-T13-18.2	0.83
AA	E.R. DIETRICH	06-T13-18.1	0.409
BB	WILLIAM LANGMYER & MARY J. LANGMYER	06-T13-14.1	3.6
CC	ROBERT E. CROW JR.	06-T18-17.1	1.41

REVISIONS:

COMPANY: SWN Production Company, LLC — SWN Production Company™

OPERATOR'S WELL #: DEBORAH CRAIG OHI 10H

DISTRICT: TRIADELPHIA | COUNTY: OHIO | STATE: WV

DATE: 09-08-2017
DRAWN BY: N. MANO
SCALE: N/A
DRAWING NO: WELL LOCATION PLAT 2

\\HOME-40029E45C4\1-03-17 DJ\SWN\DEBORAH CRAIG OHI\WELL PLATS\10H\FINAL\FINAL CRAIG 10H 09-08-17\SWN DEBORAH CRAIGH 10H 09-08-2017.
FRIDAY SEPTEMBER 08 2017 11:47AM