

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

API 47-049-02406 County Marion District Mannington
Quad Shinnston Pad Name Hughes Pad Field/Pool Name Marcellus
Farm name Rockwell, Faye Well Number Hughes 5H
Operator (as registered with the OOG) XTO Energy Inc.
Address PO Box 1008 City Jane Lew State WV Zip 26378

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4387327 Easting 554145
Landing Point of Curve Northing 4387450.5 Easting 553558.9
Bottom Hole Northing 4369473 Easting 552393

Elevation (ft) 1287 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)

APPROVED

NAME: Sam Ward
DATE: 8/23/17

Date permit issued 10/21/2015 Date drilling commenced 11/19/2015 Date drilling ceased 3/14/2016
Date completion activities began 7/28/2016 Date completion activities ceased 9/7/2016
Verbal plugging (Y/N) _____ Date permission granted _____ Granted by _____

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

Freshwater depth(s) ft 115 Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1410 Void(s) encountered (Y/N) depths N
Coal depth(s) ft 98-102', 470-477', 874-879' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) Yes

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Reviewed by:
NOV 09 2016

APPROVED

NAME

DATE

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WV Department of
Environmental Protection

09/15/2017

API 47-049 - 02406 Farm name Rockwell, Faye Well number Hughes 5H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	28"	24"	40'	New	PE&B 94.62#		Grouted to Surface
Surface	17 1/2"	13 3/8"	605'	New	H-40 48#		Y
Coal							
Intermediate 1	12 3/8"	9 5/8"	3,138'	New	J-55 36#		Y
Intermediate 2							
Intermediate 3							
Production	8 3/4" / 8 1/2"	5 1/2"	16,210'	New	P-110RY 20#		TOC- 4000'
Tubing							
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Redi-Mix	5 yards				0	8
Surface	A	520	15.60	1.19	618.8	0	8
Coal							
Intermediate 1	A	1130	15.60	1.19	1344.7	0	8
Intermediate 2							
Intermediate 3							
Production	Lead H / Tail 1	410 / 2435	15.20 / 15.60	1.07 / 1.18	438.7 / 2873.3	4000	8
Tubing							

Drillers TD (ft) 16,250' Loggers TD (ft) 16,250'

Deepest formation penetrated Marcellus Plug back to (ft) _____

Plug back procedure _____

Kick off depth (ft) 5595

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____

Surface - Every 3rd Joint

Intermediate - Every 3rd Joint

Production - Every other Joint (TD-TOC)

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WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

API 47- 049 - 02406 Farm name Rockwell, Faye Well number Hughes 5H

PRODUCING FORMATION(S)	DEPTHS			
<u>Marcellus</u>	<u>7531</u>	<u>TVD</u>	<u>16113</u>	<u>MD</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 2000 psi Bottom Hole 3485 psi DURATION OF TEST 24 hrs

OPEN FLOW Gas 1986 mcfpd Oil 0 bpd NGL 0 bpd Water 416 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	<u>0</u>		<u>0</u>		
<u>See attached</u>					

Please insert additional pages as applicable.

Drilling Contractor Nomac Drilling
Address 3400 South Radio Road City El Reno State OK Zip 73036

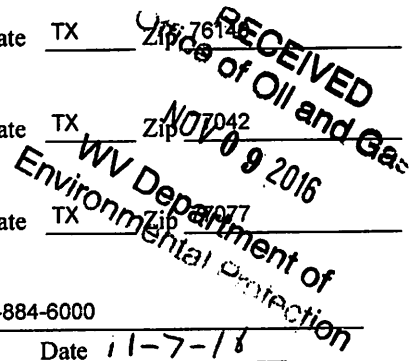
Logging Company MS Energy Services
Address 7821 Will Rogers Blvd City Ft. Worth State TX Zip 76142

Cementing Company C&J Energy Services
Address 3990 Rogerdale Rd. City Houston State TX Zip 77042

Stimulating Company Schlumberger Oilfield Services
Address 1325 S. Dairy Ashford Dr. City Houston State TX Zip 77047

Please insert additional pages as applicable.

Completed by Tim Sands Telephone 304-884-6000
Signature [Signature] Title Regulatory Compliance Technician Date 11-7-16



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

Perforation Record Hughes 5H 47-049-02406

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	7/28/2016	15,893	16,063	60	Marcellus
2	7/29/2016	15,658	15,825	60	Marcellus
3	8/18/2016	15,417	15,587	60	Marcellus
4	8/24/2016	15,179	15,349	60	Marcellus
5	8/24/2016	14,983	15,111	60	Marcellus
6	8/25/2016	14,703	14,873	60	Marcellus
7	8/25/2016	14,465	14,635	60	Marcellus
8	8/25/2016	14,227	14,398	60	Marcellus
9	8/25/2016	13,989	14,159	60	Marcellus
10	8/26/2016	13,751	13,921	60	Marcellus
11	8/26/2016	13,513	13,687	60	Marcellus
12	8/26/2016	13,275	13,445	60	Marcellus
13	8/26/2016	13,037	13,207	60	Marcellus
14	8/27/2016	12,799	12,969	60	Marcellus
15	8/27/2016	12,605	12,729	60	Marcellus
16	8/27/2016	12,323	12,493	60	Marcellus
17	8/31/2016	12,089	12,253	60	Marcellus
18	8/31/2016	11,855	12,019	60	Marcellus
19	8/31/2016	11,621	11,785	60	Marcellus
20	9/1/2016	11,387	11,551	60	Marcellus
21	9/1/2016	11,153	11,317	60	Marcellus
22	9/1/2016	10,916	11,083	60	Marcellus
23	9/1/2016	10,685	10,849	60	Marcellus
24	9/1/2016	10,451	10,617	60	Marcellus
25	9/2/2016	10,217	10,381	60	Marcellus
26	9/2/2016	9,983	10,152	60	Marcellus
27	9/2/2016	9,752	9,913	60	Marcellus
28	9/6/2016	9,515	9,679	60	Marcellus
29	9/6/2016	9,281	9,445	60	Marcellus
30	9/7/2016	9,047	9,211	60	Marcellus
31	9/7/2016	8,813	8,975	60	Marcellus
32	9/7/2016	8,579	8,743	60	Marcellus
33	9/7/2016	8,345	8,509	60	Marcellus

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Stimulation Information Per Stage Hughes 5H 47-049-02406

Stage No.	Stimulations 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 (units)
1	7/29/2016	75.5	8,849	6,965	5,720	111,115	8,211	0
2	7/29/2016	71.6	8,430	7,192	0	269,900	10,010	0
3	8/19/2016	68.8	8,660	6,881	8,734	203,940	10,140	0
4	8/24/2016	79.3	8,345	6,175	5,153	284,680	10,890	0
5	8/25/2016	82.6	8,291	6,906	5,032	400,780	12,487	0
6	8/25/2016	82.7	8,600	6,347	5,343	241,220	12,305	0
7	8/25/2016	81.9	8,558	6,425	5,527	130,540	8,813	0
8	8/25/2016	85.1	8,279	6,362	5,234	318,000	12,011	0
9	8/26/2016	82.5	8,159	6,714	5,062	386,420	12,258	0
10	8/26/2016	85.1	8,146	6,686	5,622	207,560	9,843	0
11	8/26/2016	85.1	8,122	7,080	4,273	276,980	10,225	0
12	8/26/2016	85.5	8,260	7,464	4,975	315,700	11,509	0
13	8/27/2016	77.8	8,246	8,271	4,660	284,340	11,317	0
14	8/27/2016	80.6	8,224	7,618	5,095	351,680	11,244	0
15	8/27/2016	81	8,043	7,127	5,468	346,120	11,716	0
16	8/28/2016	84.1	8,074	6,436	0	262,520	10,064	0
17	8/31/2016	83.6	8,414	7,112	5,947	401,580	10,244	0
18	8/31/2016	81.1	8,182	6,225	5,914	401,560	11,549	0
19	8/31/2016	81.2	8,131	6,475	6,078	363,800	9,757	0
20	9/1/2016	85.6	8,225	6,490	6,048	363,800	9,757	0
21	9/1/2016	68.7	8,797	7,415	5,320	120,720	10,521	0
22	9/1/2016	82.2	7,977	6,011	6,169	400,360	9,947	0
23	9/1/2016	81.7	7,894	6,003	5,653	367,260	11,693	0
24	9/2/2016	84.6	8,112	6,869	5,745	285,120	10,132	0
25	9/2/2016	81.6	7,978	6,135	4,863	401,280	12,276	0
26	9/2/2016	84.3	7,745	6,690	6,048	401,580	10,527	0
27	9/6/2016	81.5	7,825	6,483	2,290	400,980	10,506	0
28	9/6/2016	83	7,889	6,652	4,894	232,020	7,641	0
29	9/6/2016	82.1	7,463	6,267	5,745	400,560	10,274	0
30	9/7/2016	84.5	7,620	6,414	5,440	400,820	10,265	0
31	9/7/2016	83.6	7,718	7,246	5,929	369,880	9,975	0
32	9/7/2016	82.8	7,663	6,320	5,855	337,780	9,550	0
33	9/7/2016	85	7,591	6,575	5,574	334,820	9,451	0

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Lithology / Formation Name	Top Depth	Bottom Depth	Top Depth	Bottom Depth	Describe Rock Type and Record Quantity and Type of Fluid (Freshwater, Brine, Oil, Gas, H2S, ETC)
	in FT TVD	in FT TVD	in FT MD	in FT MD	
SOIL / GRAY SANDSTONE	0	98	0	98	
COAL	98	102	98	102	
SAND	102	300	102	300	10 GP @ 115' - FW
SAND&SHALE	300	400	300	400	
GRAY SANDSTONE	400	470	400	470	
COAL	470	477	470	477	
SAND AND SHALE	477	717	477	717	
GRAY SHALE	717	874	717	874	
COAL	874	879	874	879	
GRAY SHALE AND SAND	879	1383	879	1383	
GRAY SHALE	1383	1859	1383	1859	10 GP @1410' - SW
WHITE SAND	1859	2398	1859	2398	
RED ROCK	2398	2494	2398	2494	
GRAY SAND	2494	2716	2494	2716	
GRAY SHALE	2716	3193	2716	3193	
GRAY SAND AND SANDSTONE	3193	3415	3193	3415	
GRAY SHALE	3415	3670	3415	3670	
GRAY SAND AND SHALE	3670	4430	3670	4430	
SAND AND SHALE	4430	5000	4430	5000	
GRAY SAND SHALE	5000	5500	5000	5500	
SHALE, SANDSTONE, SILTSTONE			5550	5580	
SHALE, SILTSTONE			5580	5610	
SHALLE			5610	7740	
Limestone, Shale			7740	7890	
Shale & Limestone			7890	7920	
Shale			7920	8130	
Shale & Limestone			8130	8170	
Shale			8170	8430	
Shale & Marl			8430	8640	
Shale			8640	10170	
Shale & Marl			10170	10440	
Shale			10440	16250	

Geneseo Shale @ 7,670' MD / 7,130' TVD
Burkett Shale @ 7,702' MD / 7,148' TVD
Tully Limestone @ 7,744' MD / 7,174' TVD
Hamilton Shale @ 7,831'MD / 7,223' TVD
Upper Marcellus Shale @ 7,936'MD / 7,279' TVD
Purcell Limestone @8,152 MD / 7,370' TVD
Lower Marcellus Shale @ 8,167' MD / 7,376' TVD

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HUGHES

5H

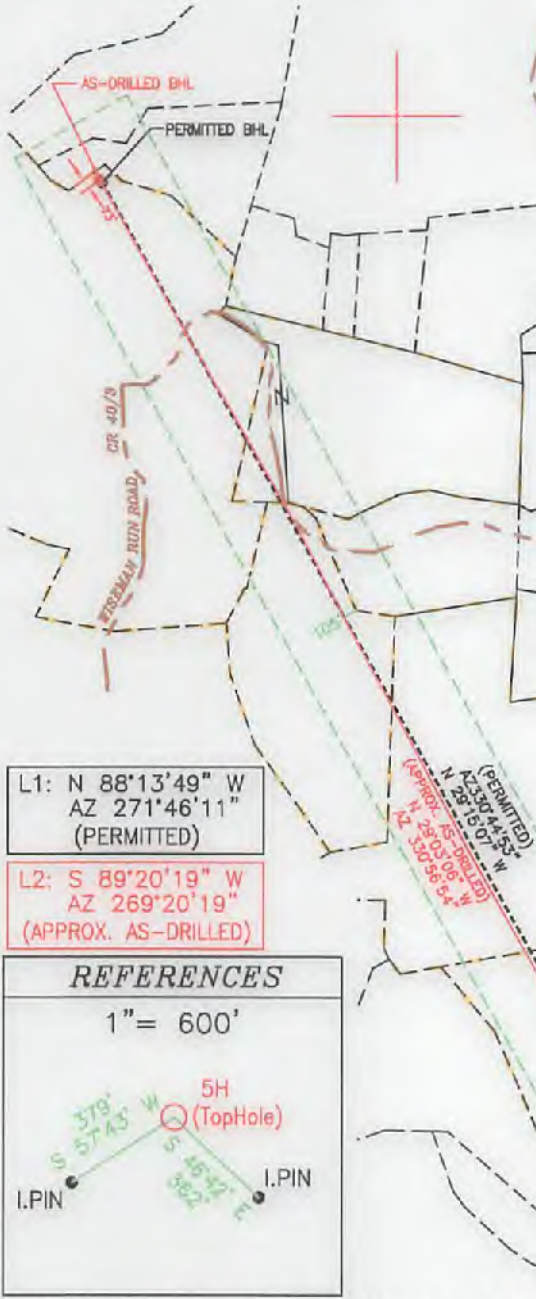
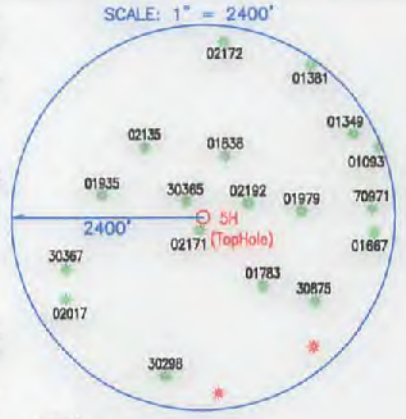
State Plane Coord.
West Virginia North
NAD27

Top Hole Loc
(N) 348558.038
(E) 1754094.025

LEGEND	
LEASE BOUNDARY	---
SURFACE BOUNDARY	- - - -
CREEK / STREAM	~ ~ ~ ~
ROADS	==
PROPOSED LATERAL	- - - -
AS-DRILLED LATERAL	---
500' LATERAL OFFSET	---
EXISTING GAS WELL	★
GROUNDWATER SOURCE / WATER SUPPLY	⊙

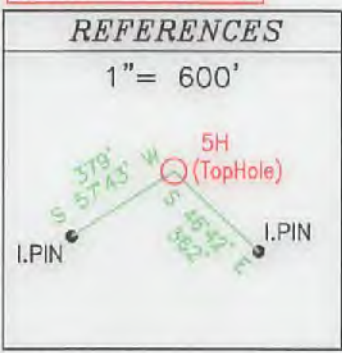
NOTES ON SURVEY:

1. NO DWELLINGS WITHIN 625' WERE FOUND.
2. NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' WERE FOUND.
3. TIES TO WELLS AND CORNERS ARE BASED ON STATE PLANE GRID NORTH WV NORTH ZONE NAD '83.
4. WELL ELEVATION ESTABLISHED BY DIRECT GPS NAVD88.
5. BOUNDARIES SHOWN ARE TAKEN FROM TAX MAPS, DEEDS, AND FIELD SURVEY. THIS DRAWING IS NOT REPRESENTATIVE OF A FULL BOUNDARY SURVEY.
6. SURFACE OWNER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF MARION COUNTY, WV IN AUGUST OF 2015. LEASE OWNERS AND BOUNDARIES PROVIDED BY XTO ENERGY, INC.
7. WELLS SHOWN ARE TAKEN FROM RECORDS OF WVDEP.



L1: N 88°13'49" W
AZ 271°46'11"
(PERMITTED)

L2: S 89°20'19" W
AZ 269°20'19"
(APPROX. AS-DRILLED)



TRI-COUNTY ENGINEERING, LLC

319 PAINTERSVILLE RD. HUNKER, PA 15639 TCE@TRICOUNTYENG.COM (724) 635-0210

PAGE 1 of 2

FILE # XTO-OG57
DRAWING # OG57-11-5H
SCALE: 1" = 1500'
MINIMUM DEGREE OF ACCURACY: 1:2500
PROVEN SOURCE OF ELEVATION: DIRECT GPS

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.

Signed: *Donald R. Hixson Jr.*
R.P.E.: 17818 L.L.S.: _____



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

WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTOWN, WV 25304



DATE: 6/28/2016 PLACE SEAL HERE
OPERATOR'S WELL #: HUGHES 5H
API WELL #: 47 49 02406
STATE COUNTY PERMIT

Well Type: Oil Waste Disposal Production Deep
 Gas Liquid Injection Storage Shallow

WATERSHED: BINGAMON CREEK WATERSHED ELEVATION: 1287'
COUNTY/DISTRICT: MARION / MANNINGTON QUADRANGLE (THL) SHINNSTON 7.5'
SURFACE OWNER FAYE C. ROCKWELL ACREAGE 107.50
OIL & GAS ROYALTY OWNER: BEVERLY & DAN M. KELLY et al. ACREAGE 50.00

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____

TARGET FORMATION MARCELLUS ACTUAL DEPTH: TVD: 7,535' / TMD: 16,250'

WELL OPERATOR XTO ENERGY INC.
Address 810 HOUSTON STREET
City FORT WORTH State TX Zip Code 76102

DESIGNATED AGENT GARY BEALL
Address P.O. BOX 1008
City JANE LEW State WV Zip Code 26378

09/15/2017

City FORT WORTH State TX Zip Code 76102
 Address 810 HOUSTON STREET
 WELL OPERATOR XTO ENERGY INC.
 Designated Agent GARY BEALL
 Address P.O. BOX 1008
 City JANE LEW State WV Zip Code 26728

TARGET FORMATION MARCELLUS
 ACTUAL DEPTH: TVD: 7,535' \ TMD: 16,250'
 CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY):
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE

7/15/2017
 SURFACE OWNER FAYE C. ROCKWELL
 COUNTY/DISTRICT: MARION \ MANNINGTON
 WATERSHED: BINGAMON CREEK WATERSHED
 Well Type: Oil Waste Disposal Production Deep
 Gas Liquid Injection Storage Shallow

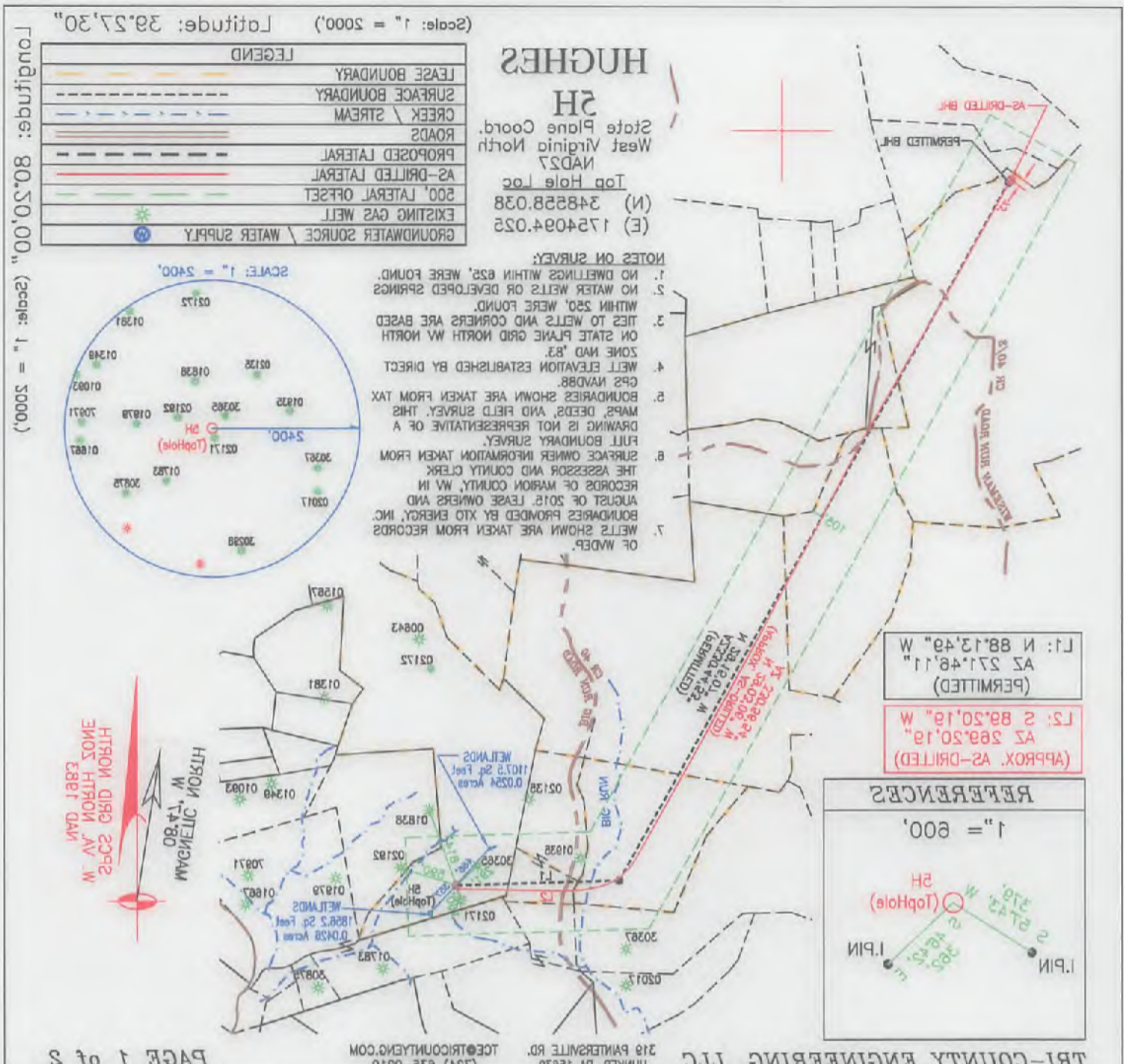
CHARLESTOWN, WV 25304
 OFFICE OF OIL & GAS
 601 57TH STREET
 WDEP
 WELL ON UNITED STATES TOPOGRAPHIC MAPS
 (+) DENOTES LOCATION OF AS-DRILLED

STATE COUNTY PERMIT 02406
 API WELL #: 47
 OPERATOR'S WELL #: HUGHES 5H
 DATE: 6/28/2016
 PLACE SEAL HERE



R.P.E.: 17818
 L.S.:
 Signed: _____
 THE DEPARTMENT OF ENVIRONMENTAL PROTECTION
 LAW AND REGULATIONS ISSUED AND PRESCRIBED BY
 BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY
 I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS
 PLAN IS CORRECT TO THE BEST OF MY KNOWLEDGE AND

FILE # XTO-0657
 DRAWING # 0657-11-5H
 SCALE: 1" = 1500'
 MINIMUM DEGREE
 OF ACCURACY: 1:2500
 PROVEN SOURCE
 OF ELEVATION: DIRECT GPS



Longitude: 80.50,00" (Scale: 1" = 5000.)
 Latitude: 39.27,30" (Scale: 1" = 2000.)

10233

4465'

(Scale: 1" = 2000') Latitude: 39°30'00"

Longitude: 80°22'30"

(Scale: 1" = 2000')

NOTES ON SURVEY:

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HUGHES 5H

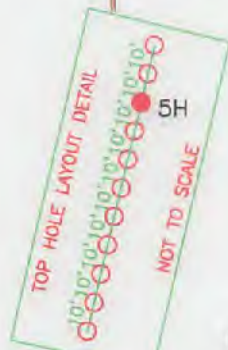
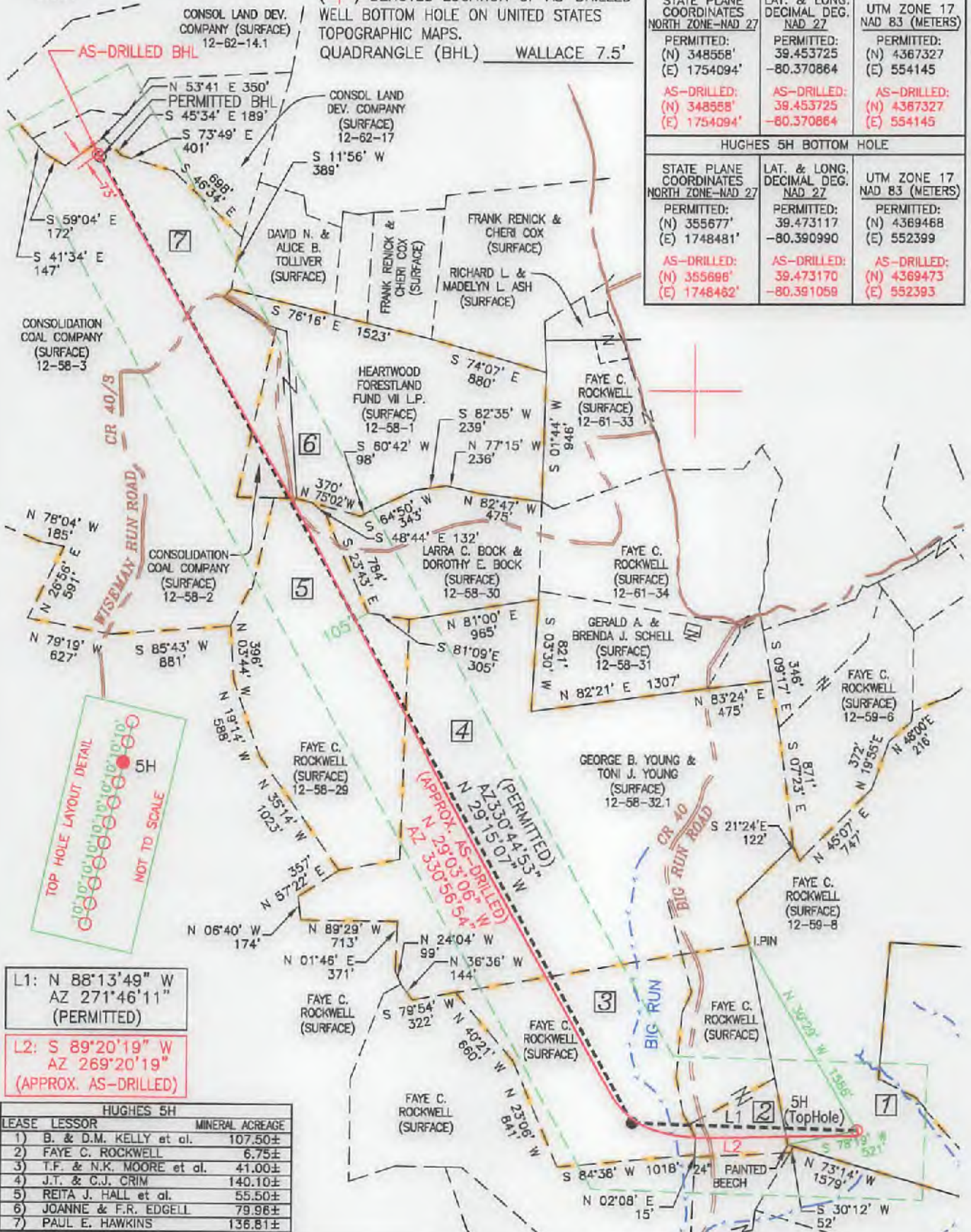
State Plane Coord.
West Virginia North
NAD27

Top Hole Loc
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(E) 1754094.025

LEGEND	
LEASE BOUNDARY	— — — — —
SURFACE BOUNDARY	— — — — —
CREEK / STREAM	— — — — —
ROADS	— — — — —
PROPOSED LATERAL	— — — — —
AS-DRILLED LATERAL	— — — — —
500' LATERAL OFFSET	— — — — —
EXISTING GAS WELL	⊕
GROUNDWATER SOURCE / WATER SUPPLY	⊕

(+) DENOTES LOCATION OF AS-DRILLED WELL BOTTOM HOLE ON UNITED STATES TOPOGRAPHIC MAPS.
QUADRANGLE (BHL) WALLACE 7.5'

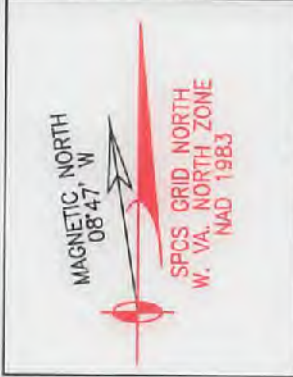
HUGHES 5H TOP HOLE		
STATE PLANE COORDINATES NORTH ZONE-NAD 27	LAT. & LONG. DECIMAL DEG. NAD 27	UTM ZONE 17 NAD 83 (METERS)
PERMITTED: (N) 348558' (E) 1754094'	PERMITTED: 39.453725 -80.370864	PERMITTED: (N) 4367327 (E) 554145
AS-DRILLED: (N) 348558' (E) 1754094'	AS-DRILLED: 39.453725 -80.370864	AS-DRILLED: (N) 4367327 (E) 554145
HUGHES 5H BOTTOM HOLE		
STATE PLANE COORDINATES NORTH ZONE-NAD 27	LAT. & LONG. DECIMAL DEG. NAD 27	UTM ZONE 17 NAD 83 (METERS)
PERMITTED: (N) 355697' (E) 1748481'	PERMITTED: 39.473117 -80.390990	PERMITTED: (N) 4369468 (E) 552399
AS-DRILLED: (N) 355696' (E) 1748482'	AS-DRILLED: 39.473170 -80.391059	AS-DRILLED: (N) 4369473 (E) 552393



L1: N 88°13'49" W
AZ 271°46'11"
(PERMITTED)

L2: S 89°20'19" W
AZ 269°20'19"
(APPROX. AS-DRILLED)

HUGHES 5H		
LEASE	LESSOR	MINERAL ACREAGE
1)	B. & D.M. KELLY et al.	107.50±
2)	FAYE C. ROCKWELL	6.75±
3)	T.F. & N.K. MOORE et al.	41.00±
4)	J.T. & C.J. CRIM	140.10±
5)	REITA J. HALL et al.	55.50±
6)	JOANNE & F.R. EDGELL	79.96±
7)	PAUL E. HAWKINS	136.81±



XTO ENERGY
810 HOUSTON STREET
FORT WORTH, TX 76102

0' 1000'
SCALE: 1" = 1000'

TRI-COUNTY ENGINEERING, LLC
An ENERCON Company
319 Paintersville Road
Hunker, PA 15639
www.tricountyeng.com

Voice: (724) 635-0210

Excellence-Every project. Every day.

SUPPLEMENTAL SURFACE & LESSOR EXHIBIT

HUGHES 5H

DRAWN BY: NJP
DATE: 6/28/2016
SCALE: 1"=1000'

MANNINGTON DISTRICT,
MARION COUNTY, WEST VIRGINIA

FILE NO. OG57-11

2 OF 2

09/15/2017
Fax: (724) 635-0676

09/15/2017

HUTTON
MAGNETIC N
124° 58' W

2092' N
3092' E
2092' W
3092' E

XTO ENERGY

810 HOUSTON STREET
FORT WORTH, TX 76102

SCALE: 1" = 1000'

0' 1000'



Excellence-Every project. Every day.

DATE: 09/28/2018	DRAWN BY: NRP
SHEET: 5 OF 5	FILE NO: 0657-11
MARRION COUNTY, WEST VIRGINIA	
MANNINGTON DISTRICT	
SURFACE & LESSOR EXHIBIT	
SUPPLEMENTAL	

TRICOUNTY ENGINEERING, LLC
An ENERCON Company
319 Paintersville Road
Hunker, PA 15629
www.tricountyeng.com
Fax: (724) 838-0878

LEASE LESSOR	MINERAL ACREAGE
1) B. & D.M. KELLY et al.	107.50±
2) FAYE C. ROCKWELL	6.75±
3) T.F. & N.K. MOORE et al.	41.00±
4) J.T. & C.J. CRIM	140.10±
5) RETA J. HALL et al.	55.50±
6) JOANNE & F.R. EDGELL	79.96±
7) PAUL E. HAWKINS	136.81±

(APPROX. AS-DRIILLED)
AZ 288°20'19"
AS 288°20'19" W

(PERMITTED)
AZ 271°48'11"
L1: N 88°13'49" W

407' HIGH TUNNEL DELIMIT
5H

407' HIGH TUNNEL DELIMIT
3H

HUGHES 5H TOP HOLE	
STATE PLANE NORTH ZONE-NAD 83	STATE PLANE NORTH ZONE-NAD 83
DECIMAL DEG. (N) 4284232	DECIMAL DEG. (N) 4284232
UTM ZONE 17	UTM ZONE 17
(E) 524145	(E) 524145
PERMITTED:	PERMITTED:
AS-DRIILLED: AS-DRIILLED:	AS-DRIILLED: AS-DRIILLED:
(N) 4284232 (E) 524145	(N) 4284232 (E) 524145

HUGHES 5H BOTTOM HOLE	
STATE PLANE NORTH ZONE-NAD 83	STATE PLANE NORTH ZONE-NAD 83
DECIMAL DEG. (N) 4284232	DECIMAL DEG. (N) 4284232
UTM ZONE 17	UTM ZONE 17
(E) 523299	(E) 523299
PERMITTED:	PERMITTED:
AS-DRIILLED: AS-DRIILLED:	AS-DRIILLED: AS-DRIILLED:
(N) 4284232 (E) 523299	(N) 4284232 (E) 523299

(+) DENOTES LOCATION OF AS-DRIILLED WELL BOTTOM HOLE ON UNITED STATES QUADRANGLE (BHL) WALLACE 7.5.

TOPOGRAPHIC MAPS.

CONSOLE LAND DEV. COMPANY (SURFACE) 15-82-14.1

HUGHES 5H

State Plane Coord.
West Virginia North
NAD27
Top Hole Loc
(N) 348528.038
(E) 1754094.025

LEGEND

- LEASE BOUNDARY
- SURFACE BOUNDARY
- CREEK / STREAM
- ROADS
- PROPOSED LATERAL
- AS-DRIILLED LATERAL
- 500' LATERAL OFFSET
- EXISTING GAS WELL
- GROUNDWATER SOURCE / WATER SUPPLY

NOTES ON SURVEY:

- NO DWELLINGS WITHIN 825' WERE FOUND.
- NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' WERE FOUND.
- TIES TO WELLS AND CORNERS ARE BASED ON STATE PLANE GRID NORTH W/ NORTH ZONE NAD '83.
- WELL ELEVATION ESTABLISHED BY DIRECT GPS NAVD88.
- BOUNDARIES SHOWN ARE TAKEN FROM TAX MAPS, DEEDS, AND FIELD SURVEY. THIS DRAWING IS NOT REPRESENTATIVE OF A FULL BOUNDARY SURVEY.
- SURFACE OWNER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF MARRION COUNTY, WV IN AUGUST OF 2012. LEASE OWNERS AND BOUNDARIES PROVIDED BY XTO ENERGY, INC. AND BOUNDARIES TAKEN FROM RECORDS OF WDEP.
- WELLS SHOWN ARE TAKEN FROM RECORDS OF WDEP.

Scale: 1" = 2000' (Latitude: 39°30'00")
Longitude: 80°55'30"

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	7/28/2016
Job End Date:	9/7/2016
State:	West Virginia
County:	Marion
API Number:	47-049-02406-00-00
Operator Name:	XTO Energy/ExxonMobil
Well Name and Number:	Hughes 5H
Latitude:	39.45372500
Longitude:	-80.37086400
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	7,535
Total Base Water Volume (gal):	14,567,464
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	Corrosion Inhibitor, Scale Inhibitor, Acid, Friction Reducer, Iron Control Agent, Myacide TS GA 25, Propping Agent, Fluid Loss Additive					

			Water (Including Mix Water Supplied by Client)*	7732-18-5		91.98243	
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.							
			Quartz, Crystalline silica	14808-60-7	97.99251	7.85662	
			Hydrochloric acid	7647-01-0	1.16573	0.09346	
			Glutaraldehyde	111-30-8	0.29596	0.02373	
			Ammonium sulfate	7783-20-2	0.24547	0.01968	
			Acrylamide, 2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer	38193-60-1	0.18118	0.01453	
			Ethanol, 2,2',2"-nitrilotris-, 1,1',1"-tris (dihydrogen phosphate), sodium salt	68171-29-9	0.03518	0.00282	
			Polymer of 2-acrylamido-2-methylpropanesulfonic acid sodium salt and methyl acrylate	136793-29-8	0.01941	0.00156	
			Trisodium ortho phosphate	7601-54-9	0.01546	0.00124	
			Urea	57-13-6	0.01192	0.00096	
			Sodium erythorbate	6381-77-7	0.01035	0.00083	
			Methanol	67-56-1	0.00752	0.00060	
			Ethylene Glycol	107-21-1	0.00440	0.00035	
			Reaction product of: acetophenone, formaldehyde, cyclohexylamine, methanol and acetic acid	224635-63-6	0.00311	0.00025	
			Sodium sulfate	7757-82-6	0.00278	0.00022	
			Silicon Dioxide	7631-86-9	0.00248	0.00020	
			Cinnamaldehyde	104-55-2	0.00172	0.00014	
			Alcohol, C9-C11, Ethoxylated	68439-46-3	0.00129	0.00010	
			Alcohols, C10-16, ethoxylated	68002-97-1	0.00086	0.00007	
			2-Propenamid (impurity)	79-06-1	0.00059	0.00005	

			Acetophenone	98-86-2	0.00033	0.00003	
			Acetic acid(impurity)	64-19-7	0.00033	0.00003	
			Tetrasodium ethylenediaminetetraacetate	64-02-8	0.00031	0.00002	
			Formaldehyde (impurity)	50-00-0	0.00021	0.00002	
			Amines, tallow alkyl, ethoxylated	61791-26-2	0.00026	0.00002	
			Dimethyl siloxanes and silicones	63148-62-9	0.00017	0.00001	
			Siloxanes and silicones, dimethyl, reaction products with silica	67762-90-7	0.00002		
			Octamethylcyclotetrasiloxane	556-67-2	0.00002		
			Decamethyl cyclopentasiloxane	541-02-6	0.00001		
			Copper(II) sulfate	7758-98-7	0.00001		
			Dodecamethylcyclohexasiloxane	540-97-6	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)