

September 15th, 2017

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

API 47-085-10074FH6A County Ritchie District Clay
Quad Pennsboro Pad Name PEN2HS Field/Pool Name Pennsboro
Farm Name KIESSLING, TERRY & HELEN Well Number PEN2JHS - Fracture
Operator (as registered with the OOG) CNX Gas Company LLC
Address P.O. Box 1248 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 4,354,132.20 m Easting 498,905.63 m
Landing Point of Curve Northing 4,353,851.99 m Easting 498,323.97 m
Bottom Hole Northing 4,355,602.63 m Easting 496,822.70 m

Elevation (ft) 1074.85' 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

Drilled 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)
Synthetic Oil Based.

Date Permit Issued 02/08/2017 Date drilling commenced 03/21/2017 Date drilling ceased 04/04/2017
Date completion activities began 03/21/2017 Date completion activities ceased 04/04/2017
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 454' Open mine(s) (Y/N) depths N
Salt water depth(s) ft None Noted for Offsets Void(s) encountered (Y/N) depths N
Coal depth(s) ft No Coal Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

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APPROVED
NAME: Michael Daff
DATE: 10-25-17

Reviewed by:
Honce, Mike

01/05/2018

API 47-085-10074FH6A Farm name KIESSLING, TERRY & HELEN Well number PEN2JHS - Fracture

CASING STRINGS Conductor	Hole Size 36"	Casing Size 30"	Depth 40'	New or Used	Grade wt/ft	Basket Depth(s)	Did cement Circulate (Y/N) * Provide details to the right *
Surface	17 1/2"	13 3/8"	598.7'	New	J-55 54.5# / 598.7'		Y
Coal							
Intermediate 1	12 3/8"	9 5/8"	5794'	N	HCK-55 36# / 5794'		Y
Intermediate 2							
Intermediate 3							
Production	8 3/4"	5 1/2"	14787.2'	N	P-110 20# / 14787.2'		Y
Tubing							
Packer Type and Depth Set		None					

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							
Surface	TYPE 1	532 sks	15.60	1.20	1151	0'	8
Coal							
Intermediate 1	Class A (Lead) / Class A (Tail)	1003 sks / 295 sks	12.0 / 15.60	1.94 / 1.19	201 / 167	0'	8
Intermediate 2							
Intermediate 3							
Production	Class A (Lead) / Class A (Tail)	461 sks / 1673 sks	12.3 / 14.8	1.62 / 1.37	207 / 201	4695'	8
Tubing							

Drillers TD (ft) 6,371' Loggers TD (ft) 6,268'
 Deepest formation penetrated: Marcellus Plug back to (ft) Not a Pilot Hole
 Plug back procedure: Not a Pilot Hole

Kick Off Depth (ft) 7,181'

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

Conductor - No centralizers used. Fresh Water / Surface - Surface - 5 centralizers used, one every third joint. Intermediate - 69 centralizers - bow spring centralizers on every joint to KOP, on every third joint from KOP to 100' from surface. Production - 245 centralizers - rigid bow spring every third joint from KOP to TOC, rigid bow spring every joint to KOP.

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS Plug And Perforation Shot Hole

WAS WELL COMPLETED OPEN HOLE Yes No DETAILS _____

WERE TRACERS USE Yes No TYPES OF TRACER(S) USED _____

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number Of Perforations	Formation(s)
1	3/21/2017	14464	14546	40	Marcellus
2	3/23/2017	14269	14431	40	Marcellus
3	3/23/2017	14069	14231	40	Marcellus
4	3/23/2017	13869	14031	40	Marcellus
5	3/24/2017	13669	13831	40	Marcellus
6	3/24/2017	13469	13631	40	Marcellus
7	3/24/2017	13269	13431	40	Marcellus
8	3/25/2017	13269	13431	40	Marcellus
9	3/25/2017	12869	13031	40	Marcellus
10	3/26/2017	12669	12850	40	Marcellus
11	3/26/2017	12469	12631	40	Marcellus
12	3/27/2017	12269	12450	40	Marcellus
13	3/27/2017	12069	12231	40	Marcellus
14	3/27/2017	11869	12031	40	Marcellus
15	3/28/2017	11669	11831	40	Marcellus
16	3/28/2017	11469	11631	40	Marcellus
17	3/28/2017	11269	11431	40	Marcellus
18	3/29/2017	11069	11231	40	Marcellus
19	3/30/2017	10869	11031	40	Marcellus
20	3/30/2017	10669	10831	40	Marcellus
21	3/31/2017	10631	10469	40	Marcellus
22	3/31/2017	10269	10431	40	Marcellus
23	3/31/2017	10069	10231	40	Marcellus
24	4/1/2017	10031	9869	40	Marcellus
25	4/1/2017	9669	9831	40	Marcellus
26	4/1/2017	9469	9631	40	Marcellus
27	4/2/2017	9269	9431	40	Marcellus
28	4/2/2017	9109	9250	40	Marcellus
29	4/2/2017	8869	9031	40	Marcellus
30	4/2/2017	8669	8831	40	Marcellus
31	4/3/2017	8469	8631	40	Marcellus
32	4/3/2017	8269	8431	40	Marcellus
33	4/3/2017	8069	8231	40	Marcellus
34	4/3/2017	7869	8031	40	Marcellus
35	4/3/2017	7831	7669	40	Marcellus
36	4/4/2017	7469	7631	40	Marcellus
37	4/4/2017	7269	7431	40	Marcellus

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STIMULATION INFORMATION PER STAGE

Stage No.	Stimulations Date	Avg Pump Rate (BPM)	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen / other (gals)
1	3/21/2017	86.8	8178	5321	4683	400884	9778	4650
2	3/23/2017	82.7	8418	5466	4460	400618	8316	4357
3	3/23/2017	80.1	8132	5865	4444	400199	7452	4331
4	3/23/2017	81.7	8122	5735	4455	400560	6790	4275
5	3/24/2017	86.8	8199	5502	4378	400486	7252	4265
6	3/24/2017	83.8	7757	5661	4606	401712	7446	4391
7	3/24/2017	86.5	7850	5092	3573	401118	7254	4276
8	3/25/2017	85.3	7594	5602	4518	401017	6253	4253
9	3/25/2017	82.1	7504	5389	4824	400734	5901	4246
10	3/26/2017	82.2	7230	5319	4392	400700	6665	4226
11	3/26/2017	89.7	7530	5223	4947	400820	6388	4221
12	3/27/2017	84.4	7708	5495	5184	401000	6197	4210
13	3/27/2017	83.9	7363	5370	4494	405218	6238	4206
14	3/27/2017	82.6	7308	5705	3939	400758	6404	4218
15	3/28/2017	79.8	7501	5608	4438	400832	6439	4221
16	3/28/2017	80.9	7117	5631	4182	401040	6073	4197
17	3/28/2017	84.7	7109	5654	3937	401817	6630	4229
18	3/29/2017	87.4	7289	5795	4661	401244	7553	4173
19	3/30/2017	77.4	7464	6010	3816	400819	7531	4457
20	3/30/2017	83.5	7615	6547	4640	383606	7207	4316
21	3/31/2017	84.2	7233	5560	3882	400646	7071	4297
22	3/31/2017	80.6	7084	6005	3551	400978	6473	4478
23	3/31/2017	83.8	7073	6474	4361	401028	6400	4219
24	4/1/2017	81.8	6806	6510	3850	400862	6499	4219
25	4/1/2017	80.2	6799	7112	4130	343900	5958	4237
26	4/1/2017	89.2	6998	6793	4036	400400	7121	4230
27	4/2/2017	83.3	7170	7211	3707	401541	6733	4238
28	4/2/2017	82.1	7220	6537	3606	400500	6427	4222
29	4/2/2017	88.7	7402	6584	4115	400400	9704	4473
30	4/2/2017	84.4	6963	5706	4856	401121	6887	4207
31	4/3/2017	90	6903	5993	4484	401451	6827	4203
32	4/3/2017	80.5	6750	6223	4606	400597	6881	4196
33	4/3/2017	78.8	6639	5871	4404	400520	6036	4173
34	4/3/2017	84.2	6669	7387	4789	401303	6498	4201
35	4/4/2017	90	6599	7637	5145	400975	6639	4199
36	4/4/2017	85.3	6664	7473	4000	401914	6354	4188
37	4/4/2017	83.7	7072	5693	4492	456092	6633	4338

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PRODUCING FORMATION(S)	DEPTHS	TVD	MD
MARCELLUS	6371'	14802'	

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 517 psi Bottom Hole 2774 psi DURATION OF TEST 4 hrs

OPEN FLOW Gas 2515 mcfpd Oil 110 bpd NGL N/A bpd Water 0 bpd

GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY / FORMATION	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 TYPE OF FLUID (FRESHWATER,BRINE,GAS,H2S, ETC)
					SEE ATTACHED

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Please insert additional pages as applicable.

Drilling Contractor NOMAC
Address 171 Locust Avenue Ext. City Mt. Morris State PA Zip 15349

Logging Company _____
Address _____ City _____ State _____ Zip _____

Cementing Company Schlumberger
Address 4600 J Barry Court, Suite 200 City Canonsburg State PA Zip 15317

Stimulating Company U.S. Well Service
Address 533 Industrial Park Drive City Jane Lew State WV Zip 26378

Please insert additional pages as applicable.

Completed by CNX Gas WV Operations Company, LLC - Drilling and Completions Telephone 304-884-2000
Signature [Signature] Title Adam Shutler - Completions Superintendent-Gas WV Date 9/7/17

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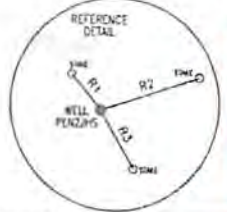
LITHOLOGY / FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY TYPE OF FLUID (FRESHWATER,BRINE,GAS,H2S, ETC)
	DEPTH IN FT	DEPTH IN FT	DEPTH IN FT	DEPTH IN FT	
	TVD	TVD	MD	MD	
SHALE AND SANDSTONE	0	1309	0	1309	
SANDSTONE	1309	1423	1309	1423	
SHALE AND SANDSTONE	1423	1593	1423	1593	
SANDSTONE	1593	1635	1593	1635	
SHALE AND SANDSTONE	1635	1737	1635	1737	
MAXTON SAND	1737	1820	1737	1820	
SHALE AND SANDSTONE	1820	1943	1820	1943	
BIG LIME	1943	1998	1943	1998	
BIG INJUN	1998	2133	1998	2133	
PRICE	2133	2405	2133	2405	
WEIR	2405	2444	2405	2444	
SHALE	2444	2724	2444	2724	
GORDON	2724	2741	2724	6301	
SHALE AND SANDSTONE	2741	2921	2741	6302	
5TH SAND	2921	2933	2921	6371	
SHALE	2933	3076	2933	Not Encountered	
SANDSTONE	3076	3090	3076	Not Encountered	
SHALE	3090	3498	3090	Not Encountered	
WARREN	3498	3560	3500	6300	
SHALE	3560	3894	3562	6301	
SANDSTONE	3894	3931	3900	6302	
SHALE AND SANDSTONE	3931	4925	3937	6371	
BENSON	4925	4987	4941	Not Encountered	
SHALE	4987	5147	5004	Not Encountered	
ALEXANDER	5147	5215	5166	Not Encountered	
SHALE	5215	5725	5234	Not Encountered	
RHEINSTREET	5725	6051	5750	Not Encountered	
CASHAQUA	6051	6143	6080	Not Encountered	
MIDDLESEX	6143	6172	6176	Not Encountered	
WEST RIVER	6172	6216	6206	Not Encountered	
BURKETT	6216	6259	6253	Not Encountered	
TULLY LIMESTONE	6259	6260	6300	Not Encountered	
HAMILTON	6260	6261	6301	6302	Gas
MARCELLUS	6261	6320	6302	6371	
ONONDAGA	6320		6371	Not Encountered	

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Well is located on topo map 13.974' feet south of Latitude: 39° 22' 30"

Well is located on topo map 3.601' feet west of Longitude: 81° 00' 00"

AS DRILLED PLAT



AS DRILLED
BOTTOM HOLE LOCATION (BH)
 UTM 17-NAD83
 N:4355602.63
 E:498822.70
 NAD27 WV NORTH
 N:313225.78
 E:1585351.86
 LAT/LON DATUM-NAD83
 LAT:39.349859
 LON:-81.036875

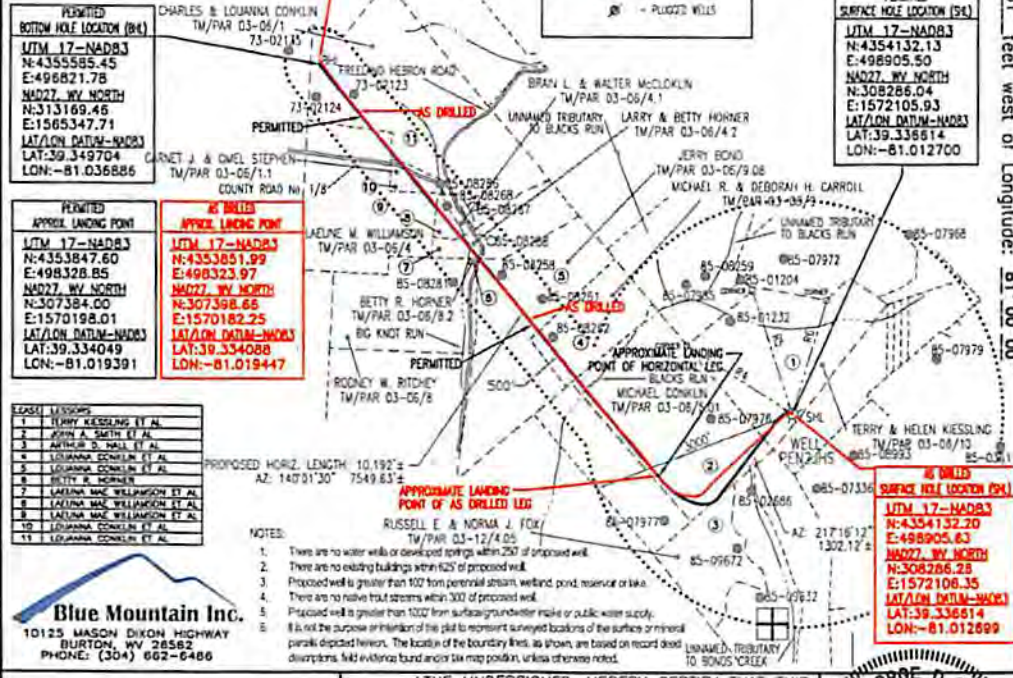
LEGEND

- TOPO MAP POINT
- WELL
- ALL ARE POINTS UNLESS OTHERWISE NOTED
- LEASE NUMBER
- MINERAL TRACT BOUNDARY
- PARCEL LINES
- WELL REFERENCE
- PROPOSED HORIZONTAL WELL
- ROAD
- STREAM CENTER LINE
- AS DRILLED

EXISTING WELLS

- EXISTING WELLS
- PLUGGED WELLS

LINE	BEARING	DISTANCE
R1	N 39°12'44" W	131.55'
R2	N 72°08'18" E	297.08'
R3	S 29°44'42" E	190.23'
R4	N 57°44'38" W	1781.40'
R5	N 18°17'02" W	1812.10'
R6	N 17°12'40" E	1661.39'



Blue Mountain Inc.
 10125 MASON DIXON HIGHWAY
 BURTON, WV 26562
 PHONE: (304) 662-6486

FILE #: PEN2JHS-AS DRILLED
 DRAWING #: PEN2JHS-AS DRILLED
 SCALE: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/2500
 PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

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 THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed: **PRELIMINARY**
 R.P.E.: _____ L.L.S.: P.S. No. 2000

GEORGE A SIX
 LICENSED
 No. 2000
 STATE OF WEST VIRGINIA
 PROFESSIONAL SURVEYOR

PLACE SEAL HERE

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304

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

WATERSHED: NORTH FORK HUGHES RIVER ELEVATION: 1081.34'±
 COUNTY/DISTRICT: RITCHIE / CLAY QUADRANGLE: ELLENBORO, WV 7.5'
 SURFACE OWNER: TERRY & HELEN KIESSLING ACREAGE: 79.242±
 OIL & GAS ROYALTY OWNER: TERRY KIESSLING ET AL ACREAGE: 589.154±

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 ESTIMATED DEPTH: TVD: 6,314'± TMD: 15,012'±

WELL OPERATOR NOBLE ENERGY, INC. DESIGNATED AGENT STEVEN M. GREEN
 Address 333 TECHNOLOGY DRIVE, SUITE 116 Address 500 VIRGINIA STREET EAST, UNITED CENTER SUITE 590
 City CANONSBURG State PA Zip Code 15317 City CHARLESTON State WV Zip Code 25301

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/21/2017
Job End Date:	4/4/2017
State:	West Virginia
County:	Ritchie
API Number:	47-085-10074-00-00
Operator Name:	CONSOL Energy Inc.
Well Name and Number:	PEN-2J-HS
Latitude:	39.33661400
Longitude:	-81.01270000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,268
Total Base Water Volume (gal):	11,319,420
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	Consol	Carrier/Base Fluid	Water	7732-18-5	100.00000	85.41985	None
Sand	JWS	Proppant	Crystalline Silica in the form of Quartz	14808-60-7	99.90000	13.17852	None
HCL Acid (7.5%)	JWS	Acidizing	Hydrochloric Acid	7647-01-0	7.50000	0.09557	None
Unislick ST50	JWS	Friction reducer	Petroleum distillates, hydrotreated light	64742-47-8	30.00000	0.01552	None
			Ammonium acetate	631-61-8	13.00000	0.00673	None
			Alcohols, ethoxylated	68439-50-9	5.00000	0.00259	None
			Alcohols, ethoxylated	68551-12-2	5.00000	0.00259	None
			Alcohols, ethoxylated	68002-97-1	5.00000	0.00259	None
WGA-7	JWS	Viscosifier	Distillates (petroleum), hydrotreated light	64742-47-8	55.00000	0.00458	None
			Guar Gum	9000-30-0	55.00000	0.00458	None
Aquar 714	JWS	Bioicide					

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			Water	7732-18-5	83.00000	0.00682	None
			Glutaraldehyde	111-30-8	14.00000	0.00115	None
			Quarternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	2.50000	0.00021	None
			Ethanol	64-17-5	0.30000	0.00002	None
HCL Acid (15%)	JWS	Acidizing					
			Hydrochloric Acid	7647-01-0	15.00000	0.00545	None
Scale Inhibitor E	JWS	Scale Inhibitor					
			Copolymer of Maleic and Acrylic Acid	52255-49-9	20.00000	0.00170	None
			Hexamethylene Triamine Penta (Methylene Phosphonic Acid)	34690-00-1	5.00000	0.00043	None
			DETA phosphonate	15827-60-8	5.00000	0.00043	None
Unihib G	JWS	Acid inhibitor					
			Butyl diglycol	112-34-5	75.00000	0.00077	None
			Alcohols, C10-16, ethoxylated	68002-97-1	50.00000	0.00051	None
			Methanol	67-56-1	5.00000	0.00005	None
			Thiourea	62-56-6	1.00000	0.00001	None
			Formaldehyde	50-00-0	1.00000	0.00001	None
AP Breaker	JWS	Gel breaker					
			Ammonium peroxydisulfate	7727-54-0	100.00000	0.00005	None
			Sulfuric acid	7664-93-9	0.50000	0.00000	None
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.							
Other Chemical(s)	Listed Above	See Trade Name(s) List					
			Water	7732-18-5	83.00000	0.00682	
			Ammonium acetate	631-61-8	13.00000	0.00673	
			Distillates (petroleum), hydrotreated light	64742-47-8	55.00000	0.00458	
			Alcohols, ethoxylated	68439-50-9	5.00000	0.00259	
			Alcohols, ethoxylated	68002-97-1	5.00000	0.00259	
			Alcohols, ethoxylated	68551-12-2	5.00000	0.00259	
			Alcohols, C10-16, ethoxylated	68002-97-1	50.00000	0.00051	
			DETA phosphonate	15827-60-8	5.00000	0.00043	
			Hexamethylene Triamine Penta (Methylene Phosphonic Acid)	34690-00-1	5.00000	0.00043	
			Quarternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	2.50000	0.00021	
			Methanol	67-56-1	5.00000	0.00005	
			Ethanol	64-17-5	0.30000	0.00002	
			Thiourea	62-56-6	1.00000	0.00001	
			Formaldehyde	50-00-0	1.00000	0.00001	
			Sulfuric acid	7664-93-9	0.50000	0.00000	

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* 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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