

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	2/17/2017
Job End Date:	3/2/2017
State:	Texas
County:	Ward
API Number:	42-475-37122-00-00
Operator Name:	Forge Energy, LLC
Well Name and Number:	UL 18 DYK #1H
Latitude:	31.54239700
Longitude:	-103.25569200
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	18,000
Total Base Water Volume (gal):	10,955,070
Total Base Non Water Volume:	91,632



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
FE-100L	FTSI	Scale Inhibitor					
				Listed Below			
StimOil EN	FTSI	Surfactant					
				Listed Below			

FRW-200	FTSI	Friction reducer					
				Listed Below			
40/70 White	FTSI	Proppant					
				Listed Below			
APB-1	FTSI	Gel breaker					
				Listed Below			
KCLS-4	FTSI	Clay Control					
				Listed Below			
Water	Supplied by Operator	Base Fluid					
				Listed Below			
NE-100W	FTSI	Non-emulsifier					
				Listed Below			
10.1%-15.0% HCL	FTSI	Acid					
				Listed Below			
100 Mesh Sand	FTSI	Proppant					
				Listed Below			
CI-150	FTSI	Acid Corrosion Inhibitor					

				Listed Below			
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.							
			Water	7732-18-5	100.00000	91.04087	
			Silica, Quartz	14808-60-7	100.00000	5.65521	
			Silica, Quartz	14808-60-7	100.00000	2.49694	
			Water	7732-18-5	85.00000	0.44996	
			Water	7732-18-5	70.00000	0.09528	
			Hydrogen Chloride	7647-01-0	15.00000	0.07941	
			Water	7732-18-5	60.00000	0.05940	
			Polyamine Polyethers	Trade Secret	30.00000	0.04083	
			Isopropanol	67-63-0	30.00000	0.04083	
			Copolymer of acrylamide and sodium acrylate	25987-30-8	33.00000	0.03267	
			Petroleum distillate hydrotreated light	64742-47-8	30.00000	0.02970	
			Choline Chloride	67-48-1	75.00000	0.02853	
			Acrylamide P/W acrylic acid, ammonium salt	26100-47-0	25.00000	0.02475	
			Organic polyol	Trade Secret	13.00000	0.01769	
			Nonionic Alkoxylate	Trade Secret	10.00000	0.01361	
			Ammonium Chloride	12125-02-9	12.00000	0.01188	
			Water	7732-18-5	30.00000	0.01141	
			Surfactant	Proprietary	7.00000	0.00693	
			Surfactants	Trade Secret	5.00000	0.00681	
			Citrus Terpenes	68647-72-3	5.00000	0.00681	
			Hydrotreated heavy paraffinic	64742-54-7	5.00000	0.00495	
			Sorbitan, monooctadecanoate, poly(oxy-1,2-ethanediyl) Sorbitan, monooctadecanoate, poly(oxy-1,2-ethanediyl) derivs.	9005-67-8	5.00000	0.00495	

			Alcohols (C10-C16), ethoxylated	68002-97-1	4.00000	0.00396	
			Alcohols (C12-C16), ethoxylated	68551-12-2	4.00000	0.00396	
			Alcohols (C12-C14), ethoxylated	68439-50-9	4.00000	0.00396	
			Sorbitan Monooleate	1338-43-8	3.00000	0.00297	
			Polyethylene glycol monooleate	9004-96-0	3.00000	0.00297	
			Sorbitol Tetraoleate	61723-83-9	2.00000	0.00198	
			Dewaxed heavy paraffinic	64742-65-0	1.50000	0.00148	
			Oleic Acid Diethanolamide	93-83-4	1.50000	0.00148	
			Water	7732-18-5	75.00000	0.00130	
			Alkyloxypolyethyleneoxy ethanol	84133-50-6	1.00000	0.00099	
			Isopropanol	67-63-0	60.00000	0.00087	
			Methanol	67-56-1	60.00000	0.00087	
			Citric Acid	77-92-9	50.00000	0.00087	
			Ammonium Persulfate	7727-54-0	100.00000	0.00081	
			Ammonium Acrylate	10604-69-0	0.50000	0.00049	
			Aromatic aldehyde	Proprietary	30.00000	0.00043	
			Organic amine resin salt	Proprietary	30.00000	0.00043	
			Ethylene Glycol	107-21-1	30.00000	0.00043	
			Water	7732-18-5	30.00000	0.00043	
			Fatty amino compound salt	Proprietary	30.00000	0.00043	
			Aromatic Ketone compound	Proprietary	30.00000	0.00043	
			Ethoxylated fatty alcohol	Proprietary	30.00000	0.00043	
			Water	7732-18-5	80.00000	0.00039	
			Isopropanol	67-63-0	0.30000	0.00030	
			Ethylene glycol	107-21-1	10.00000	0.00017	
			Ethoxylated Alcohols	Proprietary	10.00000	0.00014	

			Alkylene Oxide Block Polymer	Proprietary	10.00000	0.00014	
			Polyalkylene glycol	Proprietary	10.00000	0.00014	
			Dimethylformamide	68-12-2	10.00000	0.00014	
			Quaternary ammonium compound	Proprietary	10.00000	0.00014	
			Acrylamide	79-06-1	0.10000	0.00010	
			Oxyalkylated Fatty Amine	Proprietary	5.00000	0.00007	
			Acetic Acid	64-19-7	5.00000	0.00007	
			Acetophenone	98-86-2	5.00000	0.00007	
			Oxyalkylated Alcohol	Proprietary	5.00000	0.00007	
			Formaldehyde	50-00-0	5.00000	0.00007	
			Methanol	67-56-1	15.00000	0.00007	
			2-Propanol	67-63-0	10.00000	0.00005	
			2-Butoxyethanol	111-76-2	10.00000	0.00005	
			Dodecylbenzenesulfonic acid	27176-87-0	5.00000	0.00002	
			Diethylene glycol	111-46-6	1.00000	0.00001	
			Fatty Acid	Proprietary	0.10000	0.00000	
			Fatty Acid Salt	Proprietary	0.10000	0.00000	
			Aliphatic alcohol	Proprietary	0.10000	0.00000	
			Aromatic Aldehyde	Proprietary			

* 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)

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/15/2017
Job End Date:	3/18/2017
State:	Texas
County:	Ward
API Number:	42-475-37122-00-00
Operator Name:	Forge Energy, LLC
Well Name and Number:	UL 18 DYK #1H
Latitude:	31.54239720
Longitude:	-103.25569170
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	18,000
Total Base Water Volume (gal):	3,799,236
Total Base Non Water Volume:	29,104



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	Supplied by Operator	Base Fluid					
			Water	7732-18-5	100.00000	96.60410	
Other Chemical (s)	Listed Above	See Trade Name (s) List					
			Water	7732-18-5	90.00000	0.00027	

			Water	7732-18-5	30.00000	0.01183	
			Water	7732-18-5	30.00000	0.00022	
			Water	7732-18-5	75.00000	0.00065	
			Water	7732-18-5	85.00000	0.40821	
			Water	7732-18-5	60.00000	0.05791	
			Water	7732-18-5	70.00000	0.09762	
100 Mesh Sand	FTSI	Proppant					
				Listed Below			
FE-100L	FTSI	Scale Inhibitor					
				Listed Below			
StimOil EN	FTSI	Surfactant					
				Listed Below			
NE-100	FTSI	Non-emulsifier					
				Listed Below			
FRW-200	FTSI	Friction reducer					
				Listed Below			
10.1%-15.0% HCL	FTSI	Acid					

				Listed Below			
Soda Ash	FTSI	pH Adjusting Agent					
				Listed Below			
KCLS-4	FTSI	Clay Control					
				Listed Below			
CI-150	FTSI	Acid Corrosion Inhibitor					
				Listed Below			
HVG-1 4.0	FTSI	Water gelling agent					
				Listed Below			
APB-1	FTSI	Gel breaker					
				Listed Below			
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.							
			Silica, Quartz	14808-60-7	100.00000	2.61376	
			Hydrogen Chloride	7647-01-0	15.00000	0.07204	
			Polyamine Polyethers	Trade Secret	30.00000	0.04184	
			Isopropanol	67-63-0	30.00000	0.04184	
			Copolymer of acrylamide and sodium acrylate	25987-30-8	33.00000	0.03185	
			Choline Chloride	67-48-1	75.00000	0.02958	
			Petroleum distillate hydrotreated light	64742-47-8	30.00000	0.02896	
			Acrylamide P/W acrylic acid, ammonium salt	26100-47-0	25.00000	0.02413	
			Sodium Carbonate	497-19-8	100.00000	0.01889	

			Organic polyol	Trade Secret	13.00000	0.01813	
			Nonionic Alkoxylate	Trade Secret	10.00000	0.01395	
			Ammonium Chloride	12125-02-9	12.00000	0.01158	
			Citrus Terpenes	68647-72-3	5.00000	0.00697	
			Surfactants	Trade Secret	5.00000	0.00697	
			Surfactant	Proprietary	7.00000	0.00676	
			Hydrotreated heavy paraffinic	64742-54-7	5.00000	0.00483	
			Sorbitan, monooctadecanoate, poly(oxy-1,2-ethanediyl) Sorbitan, monooctadecanoate, poly(oxy-1,2-ethanediyl) derivs.	9005-67-8	5.00000	0.00483	
			Alcohols (C12-C16), ethoxylated	68551-12-2	4.00000	0.00386	
			Alcohols (C12-C14), ethoxylated	68439-50-9	4.00000	0.00386	
			Alcohols (C10-C16), ethoxylated	68002-97-1	4.00000	0.00386	
			Sorbitan Monooleate	1338-43-8	3.00000	0.00290	
			Polyethylene glycol monooleate	9004-96-0	3.00000	0.00290	
			Ammonium Persulfate	7727-54-0	100.00000	0.00251	
			Sorbitol Tetraoleate	61723-83-9	2.00000	0.00193	
			Petroleum Distillate	64742-47-8	55.00000	0.00175	
			Guar gum	9000-30-0	55.00000	0.00175	
			Raffinates, Sorption Process	64741-85-1	55.00000	0.00175	
			Dewaxed heavy paraffinic	64742-65-0	1.50000	0.00145	
			Oleic Acid Diethanolamide	93-83-4	1.50000	0.00145	
			Alkyloxypolyethyleneoxy ethanol	84133-50-6	1.00000	0.00097	
			Ammonium Acrylate	10604-69-0	0.50000	0.00048	
			Isopropanol	67-63-0	60.00000	0.00044	

			Methanol	67-56-1	60.00000	0.00044	
			Citric Acid	77-92-9	50.00000	0.00043	
			Isopropanol	67-63-0	0.30000	0.00029	
			Fatty amino compound salt	Proprietary	30.00000	0.00022	
			Aromatic aldehyde	Proprietary	30.00000	0.00022	
			Aromatic Ketone compound	Proprietary	30.00000	0.00022	
			Organic amine resin salt	Proprietary	30.00000	0.00022	
			Ethylene Glycol	107-21-1	30.00000	0.00022	
			Ethoxylated fatty alcohol	Proprietary	30.00000	0.00022	
			Suspending Agent	1302-78-9	5.00000	0.00016	
			Quartz	14808-60-7	4.00000	0.00013	
			Acrylamide	79-06-1	0.10000	0.00010	
			Ethylene glycol	107-21-1	10.00000	0.00009	
			Dimethylformamide	68-12-2	10.00000	0.00007	
			Polyalkylene glycol	Proprietary	10.00000	0.00007	
			Ethoxylated Alcohols	Proprietary	10.00000	0.00007	
			Alkylene Oxide Block Polymer	Proprietary	10.00000	0.00007	
			Quaternary ammonium compound	Proprietary	10.00000	0.00007	
			Isotridecanol, ethoxylated	9043-30-5	2.00000	0.00006	
			Formaldehyde	50-00-0	5.00000	0.00004	
			Acetophenone	98-86-2	5.00000	0.00004	
			Oxyalkylated Fatty Amine	Proprietary	5.00000	0.00004	
			Acetic Acid	64-19-7	5.00000	0.00004	
			Oxyalkylated Alcohol	Proprietary	5.00000	0.00004	
			2-Butoxyethanol	111-76-2	10.00000	0.00003	
			2-Propanol	67-63-0	10.00000	0.00003	
			Dodecylbenzenesulfonic acid	27176-87-0	5.00000	0.00002	
			Diethylene glycol	111-46-6	1.00000	0.00001	

			Fatty Acid	Proprietary	0.10000	0.00000	
			Fatty Acid Salt	Proprietary	0.10000	0.00000	
			Aliphatic alcohol	Proprietary	0.10000	0.00000	
			Aromatic Aldehyde	Proprietary			

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