

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	11/1/2018
Job End Date:	11/3/2018
State:	Texas
County:	Winkler
API Number:	42-495-34108-00-00
Operator Name:	FELIX ENERGY HOLDINGS II, LLC
Well Name and Number:	University Lands Maroon 0904-21 1H
Latitude:	31.74289965
Longitude:	-103.23302236
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	11,923
Total Base Water Volume (gal):	4,883,029
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	Operator	Carrier					
			Water	7732-18-5	100.00000	87.69056	None
Crystalline Silica Quartz / US Silica	Liberty Oilfield Services	Sand					
			Crystalline Silica (quartz)	14808-60-7	99.90000	11.58092	None
			Aluminum Oxide	1344-28-1	1.00000	0.11593	None
			Titanium Oxide	13463-67-7	0.10000	0.01159	None
			Iron Oxide	1309-37-1	0.10000	0.01159	None
HCL-15	Liberty Oilfield Services	Solvent					
			Water	7732-18-5	85.00000	0.44964	None
			Hydrochloric Acid	7647-01-0	15.00000	0.07935	None
FR-1405	CoilChem	Friction reduction					
			Alkane Hydrocarbon	Proprietary	45.00000	0.05274	None
			Polymer	9003-05-8	40.00000	0.04688	None
			C10-16 Alkenes	68991-52-6	20.00000	0.02344	None
SFT-92	Liberty Oilfield Services	Flowback Additive					
			Alkyl Sulfonic Acid Amine Salt	Proprietary	100.00000	0.06493	None

BLE-18	Liberty Oilfield Services	Gel Breaker					
			Ammonium Persulfate	7727-54-0	75.00000	0.00226	None
			Acrylic Copolymer	Proprietary	20.00000	0.00060	None
			Proprietary Ingredient	Proprietary	6.00000	0.00018	None
			Diethylene Glycol Monobutyl Ether	112-34-5	5.00000	0.00015	None
ACI-97	Liberty Oilfield Services	Corrosion Inhibitor					
			Ethylene glycol	107-21-1	40.00000	0.00045	None
			Dipropylene glycol, monomethyl ether	34590-94-8	20.00000	0.00022	None
			Ethoxylated alcohol	Proprietary	10.00000	0.00011	None
			Formic acid	64-18-6	10.00000	0.00011	None
			Tar bases, quinoline derivs., benzyl chloride-quaternized	72480-70-7	10.00000	0.00011	None
			Cinnamaldehyde	104-55-2	10.00000	0.00011	None
			Isopropyl alcohol	67-63-0	5.00000	0.00006	None
ICI-5L	Liberty Oilfield Services	Iron Sequestering Agent					
			Citric acid	77-92-9	60.00000	0.00073	None
ASF-67	Liberty Oilfield Services	Nonionic Non-Emulsifier					
			Methanol	67-56-1	50.00000	0.00023	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 Chemicals					
			Sulfuric acid	7664-93-9			
			Tar bases, quinoline derivs.	68513-87-1			
			Polyalkylene glycol	52624-57-4			
			n-Propyl alcohol	71-23-8			
			Alcohol Ethoxylate	Proprietary			
			Polglycol	9082-00-2			
			Water	7732-18-5			
			Acetaldehyde	75-07-0			
			Diethylene glycol	111-46-6			
			Isopropyl ether	108-20-3			

\* 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)