

## Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	6/8/2019
Job End Date:	7/1/2019
State:	Texas
County:	Andrews
API Number:	42-003-47977-00-00
Operator Name:	Lime Rock Resources, LP
Well Name and Number:	University Lands 8HD
Latitude:	32.14102000
Longitude:	-102.59050900
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	10,840
Total Base Water Volume (gal):	11,557,548
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
SlickWater	OneStim	Acid Corrosion Inhibitor A286, Gelling Agent B306, Water Friction Reducing Agent B315F, Non-Emulsifying Agent B526, Water Friction Reducing Agent B596, Water Friction Reducing Agent B598, Surfactant F114, Acid, Low Temperature Fiber, Diverting Agent,					
			Water (Including Mix Water Supplied by Client)*	7732-18-5		88.74180	
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.							
			Quartz, Crystalline silica	14808-60-7	98.64101	11.10520	
			Hydrochloric acid	7647-01-0	0.82927	0.09336	
			Acrylic polymer	Proprietary	0.23966	0.02698	TEST - Trade Secret Texas Comment
			Propan-2-ol	67-63-0	0.06079	0.00684	
			Polyethylene glycol monohexyl ether	31726-34-8	0.04053	0.00456	
			Acrylamide, 2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer	38193-60-1	0.04027	0.00453	
			Polymer of fatty acid	Proprietary	0.03474	0.00391	TEST - Trade Secret Texas Comment
			Cellulose	9004-34-6	0.01976	0.00222	

			Alcohols, C11-14-iso-, C13-rich, ethoxylated*	78330-21-9	0.01902	0.00214	
			Distillates, petroleum, hydrotreated light	64742-47-8	0.01851	0.00208	
			Ammonium Sulphate	7783-20-2	0.01254	0.00141	
			1,4-Dioxane-2,5-dione, 3,6- dimethyl-, (3Rcis)-, polymer with (3S-cis)-3,6 -dimethyl-	9051-89-2	0.00981	0.00110	
			Fatty acid, tall-oil reaction products with acetophenone	68188-40-9	0.00739	0.00083	
			Guar gum	9000-30-0	0.00729	0.00082	
			Alcohols, C12-C16, ethoxylated	68551-12-2	0.00616	0.00069	
			Sodium erythorbate	6381-77-7	0.00531	0.00060	
			Isodecanol w/6-7 Moles Ethylene Oxide	26183-52-8	0.00414	0.00047	
			Dicoco dimethyl quaternary ammonium chloride	61789-77-3	0.00338	0.00038	
			Tetrasodium ethylenediaminetetraacetate	64-02-8	0.00340	0.00038	
			Cinnamaldehyde	104-55-2	0.00270	0.00030	
			Alcohols, C12-15- branched and linear, ethoxylated propoxylated	120313-48-6	0.00228	0.00026	
			White mineral oil (petroleum)	8042-47-5	0.00220	0.00025	
			Alcohols, C12-15, ethoxylated propoxylated	68551-13-3	0.00171	0.00019	
			Poly(oxy-1,2-ethanediyl),.alpha.-(4-nonylphenyl)-.omega.-hydroxy, branched	127087-87-0	0.00171	0.00019	
			Sodium hydroxide	1310-73-2	0.00125	0.00014	
			Amines, tallow alkyl, ethoxylated	61791-26-2	0.00079	0.00009	

			Sorbitan monooleate, ethoxylated	9005-65-6	0.00068	0.00008	
			Dodecan-1-ol, ethoxylated	9002-92-0	0.00033	0.00004	
			Amines, dicoco alkylmethyl	61788-62-3	0.00034	0.00004	
			impurity	Proprietary	0.00035	0.00004	TEST - Trade Secret Texas Comment
			Urea	57-13-6	0.00040	0.00004	
			Sodium Glycolate (impurity)	2836-32-0	0.00028	0.00003	
			Bis(hydrogenated tallow alkyl)dimethylammonium bentonite	68953-58-2	0.00030	0.00003	
			Glycols, polyethylene, monotetradecyl ether	27306-79-2	0.00024	0.00003	
			Alcohols, C12-13, ethoxylated	66455-14-9	0.00008	0.00001	
			Trisodium Ethylenediaminetetraacetate (impurity)	150-38-9	0.00009	0.00001	
			Trisodium nitrilotriacetate (impurity)	5064-31-3	0.00005	0.00001	
			Disodium Ethylene Diamine Tetra Acetate (impurity)	139-33-3	0.00009	0.00001	
			Magnesium stearate	557-04-0	0.00002		
			N,N'-ethylenedi (stearamide)	110-30-5	0.00001		
			Phosphoric acid, dodecyl ester, potassium salt	39322-78-6			
			C12 fatty alcohol	112-53-8			
			Oxirane, 2-methyl-, polymer with oxirane, mono-(9Z)-9-octadecenoate, methyl ether	72283-36-4			

			1,4-Benzenedicarboxylic acid, polymer with 1,2-ethanediol and a-hydroxy- w-hydroxypoly(oxy-1,2-ethanediyl)	9016-88-0			
			C13 alcohol ethoxylate	9043-30-5			
			2-bromo-2-nitropropane-1,3-diol	52-51-7			

\* 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)