

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	2/14/2018
Job End Date:	2/20/2018
State:	Texas
County:	Andrews
API Number:	42-003-47550-00-00
Operator Name:	Lime Rock Resources, LP
Well Name and Number:	UL 10 Nelson 3H
Latitude:	32.14591430
Longitude:	-102.69121190
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	4,540
Total Base Water Volume (gal):	2,118,354
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	Company Supplied	Carrier/Base Fluid					
			Water	7732-18-5	100.00000	89.77332	None
Sand (Proppant)	Mississippi Sand/Chieftain Sand/Santrol/Cadre/Uminin	Proppant					
			Quartz	14808-60-7	99.00000	8.96879	None
Hydrochloric Acid	Reef	Acid					
			Water	7732-18-5	85.00000	2.80284	None
			Hydrogen Chloride	7647-01-0	15.00000	0.49462	None
Plexgel 907 LEB	Chemplex	Slurried Guar					
			Distillate, petroleum, hydrotreated light	64742-47-8	70.00000	0.22049	None
			Propylene pentamer	15220-87-8	60.00000	0.18899	None
			C-11 to C-14 n-alkanes, mixed	1120-21-4	60.00000	0.18899	None
Ammonium Persulfate	Chemplex	Breaker					
			Peroxydisulfuric Acid Disodium Salt	7727-54-0	100.00000	0.10934	None
Plexbor 101	Chemplex	Crosslinker					
			Potassium Metaborate	13709-94-9	30.00000	0.02439	None

			Ethylene Glycol	107-21-1	10.00000	0.00813	None
			Potassium Hydroxide	1310-58-3	5.00000	0.00407	None
WRS	Chemplex	Surfactant					
			2-Butoxyethanol	111-76-2	35.00000	0.01814	None
			Methyl Alcohol	67-56-1	12.00000	0.00622	None
Caustic Soda Solution	Chemplex	Biuffer					
			Sodium Hydroxide	001310-73-2	50.00000	0.00759	None
The Reducer	Chemplex	Iron Control					
			Thioglycol	60-24-2	75.00000	0.00692	None
			Cupric Chloride Dihydrate	10125-13-0	7.00000	0.00065	None
Plexhib 256	Chemplex	Corrosion Inhibitor					
			Methyl Alcohol	67-56-1	30.00000	0.00289	None
			Propargyl Alcohol	107-19-7	4.00000	0.00038	None
Plexbreak 150	Chemplex	Non Emulsifier					
			Methyl Alcohol	67-56-1	50.00000	0.00126	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	85.00000	2.80284	
			Propylene pentamer	15220-87-8	60.00000	0.18899	
			C-11 to C-14 n-alkanes, mixed	1120-21-4	60.00000	0.18899	
			No hazardous ingredients per MSDS	Proprietary		0.06560	
			No hazardous ingredients per MSDS	Proprietary		0.06123	
			2-Butoxyethanol	111-76-2	35.00000	0.01814	
			Ethylene Glycol	107-21-1	10.00000	0.00813	
			Thioglycol	60-24-2	75.00000	0.00692	
			Potassium Hydroxide	1310-58-3	5.00000	0.00407	
			No hazardous ingredients per MSDS	Proprietary		0.00115	
			Propargyl Alcohol	107-19-7	4.00000	0.00038	
			Polyethylene Glycol Nonlphenyl Ether	9016-45-9	50.00000		
			Methanol	67-56-1	5.00000		
			Sodium Hydroxide	1310-73-2	4.00000		

* 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)