

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	2/12/2013
State:	PENNSYLVANIA
County:	BRADFORD
API Number:	3701521965
Operator Name:	CHESAPEAKE APPALACHIA LLC
Well Name and Number:	ALEXANDER NE BRA 1H
Longitude:	-76.312699
Latitude:	41.612726
Long/Lat Projection:	NAD27
Production Type:	GAS
True Vertical Depth (TVD):	7,583
Total Water Volume (gal)*:	4,548,432

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
Fresh Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.00%	58.54863%	
Recycled Produced Water	CHESAPEAKE ENERGY	Carrier/Base Fluid	Water	007732-18-5	100.00%	27.28080%	

Northern White Sand	PUMPCO	Proppant - Natural	Crystalline Silica (Quartz Sand, Silicon Dioxide)	014808-60-7	100.00%	12.46132%	
100 Mesh Sand	PUMPCO	Proppant - Natural	Crystalline Silica (Quartz Sand, Silicon Dioxide)	014808-60-7	100.00%	1.34947%	
Acid HCL	PUMPCO	Acid	Hydrochloric Acid	007647-01-0	15.00%	0.03829%	
			Water	007732-18-5	85.00%	0.21696%	
Plexbreak 145	PUMPCO	Non-Emulsifier	2-Butoxyethanol (Ethylene Glycol Monobutyl Ether)	000111-76-2	15.00%	0.00006%	
			Coconut oil, Diethanolamide	068603-42-9	10.00%	0.00004%	
			Diethanolamine	000111-42-2	2.00%	0.00001%	
			Methanol (Methyl Alcohol)	000067-56-1	15.00%	0.00006%	
Plexhib 256	PUMPCO	Corrosion Inhibitor	Water	007732-18-5	65.00%	0.00027%	
			Alkenes^ C>10 alpha-	064743-02-8	5.00%	0.00002%	
			Ethoxylated Alcohols^ C14-15	068951-67-7	30.00%	0.00011%	
			Methanol (Methyl Alcohol)	000067-56-1	60.00%	0.00023%	

			Propargyl Alcohol (2-Propynol)	000107-19-7	10.00%	0.00004%	
Ferriplex 40	PUMPCO	Iron Control Agent	Sodium Hydroxide	001310-73-2	1.00%	0.00002%	
			Sodium Sulfate	007757-82-6	2.00%	0.00003%	
			Trisodium Nitrilotriacetate	005064-31-3	40.00%	0.00061%	
			Water	007732-18-5	60.00%	0.00092%	
SC30	X CHEM	Scale Inhibitor	Sodium Polyacrylate	009003-04-7	100.00%	0.00885%	
SFR-451	X CHEM	Friction Reducer	Ammonium Acetate	000631-61-8	6.00%	0.00399%	
			Petroleum Distillate Hydrotreated Light	064742-47-8	35.00%	0.02329%	
B84	X CHEM	Anti-Bacterial Agent	Didecyl Dimethyl Ammonium Chloride	007173-51-5	8.00%	0.00214%	
			Ethanol	000064-17-5	4.00%	0.00107%	
			Glutaraldehyde (Pentanediol)	000111-30-8	27.00%	0.00724%	
			Quaternary Ammonium Compound	068424-85-1	6.00%	0.00147%	

Additional Ingredients Not Listed on MSDS

B84, SC30, SFR-451	X CHEM	Anti-Bacterial Agent, Friction Reducer, Scale Inhibitor	Alcohol ethoxylate C-10/16 with 6.5 EO	068002-97-1			
			Alcohols ethoxylated C12-16	068551-12-2			
			Ethoxylated Alcohol	068439-50-9			
			Ethoxylated Oleylamine	026635-93-8			
			Polypropenamamide	910644-97-2			
			Proprietary Surfactant	TRADE SECRET			
			Sorbitan Monooleate	001338-43-8			
			Water	007732-18-5			

* 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%

"Additional Ingredients Not Listed on MSDS" component information were obtained directly from the supplier. As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of this information should be directed to the supplier who provided it.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)