Hydraulic Fracturing Fluid Product Component Information Disclosure

Last Fracture Date	8/21/2012
State:	California
County:	Los Angeles Offshore
API Number:	04-237-27278
Operator Name:	Thums Long Beach Co
Well Name and Number:	C-252
Longitude:	-118.137054443
Latitude:	33.739616394
Long/Lat Projection:	NAD27
Production Type:	Oil
True Vertical Depth (TVD):	10,049
Total Water Volume (gal)*:	182,154

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	100.00%	82.65210%	
X-Cide 207	Baker Hughes	Biocide	2-Methyl-4-Isothiazolin-3-One	2682-20-4	5.00%	0.00013%	
			5-Chloro-2-Methyl-4-Isothiazolin-3-One	26172-55-4	10.00%	0.00026%	
			Crystalline Silica: Cristobalite	14464-46-1	1.00%	0.00003%	
			Crystalline Silica: Quartz (SiO2)	14808-60-7	1.00%	0.00003%	
			Diatomaceous Earth, Calcined	91053-39-3	60.00%	0.00157%	
			Magnesium Chloride	7786-30-3	5.00%	0.00013%	
			Magnesium Nitrate	10377-60-3	10.00%	0.00026%	
Enzyme G-I	Baker Hughes	Breaker	Hemicellulase Enzyme Concentrate	9025-56-3	3.00%	0.00525%	SmartCare Product
			Water	7732-18-5	97.00%	0.16989%	
High Perm CRB	Baker Hughes	Breaker	Ammonium Persulphate	7727-54-0	60.00%	0.00653%	SmartCare Product
			Crystalline Silica Quartz	14808-60-7	30.00%	0.00327%	
Caustic Liquid, 25% Solution	Baker Hughes	Buffer	Sodium Hydroxide	1310-73-2	25.00%	0.00312%	
			Water	7732-18-5	75.00%	0.00937%	
BF-7L	Baker Hughes	Buffer	Potassium Carbonate	584-08-7	60.00%	0.58546%	SmartCare Product
			Potassium Hydroxide	1310-58-3	1.00%	0.00976%	
			Water	7732-18-5	60.00%	0.58546%	
XLW-56, 330 gal	Baker	Crosslinker	D-Glucitol	50-70-4	10.00%	0.05459%	

tote	Hughes								
			Glyoxal	107-22-2	30.00%	0.16376%			
			Sodium Hydroxide	1310-73-2	5.00%	0.02729%			
			Sodium Tetraborate	1330-43-4	10.00%	0.05459%			
Econoprop, 30/50	Baker Hughes	Proppant	Mullite	1302-76-7	70.00%	11.33005%			
			Silicon Dioxide (Crystalline)	60676-86-0	25.00%	4.04645%			
GasFlo G, 330 gal tote	Baker Hughes	Surfactant	Methanol	67-56-1	30.00%	0.06159%	SmartCare Product		
			Mixture of Surfactants	Trade Secret	60.00%	0.12317%			
			Water	7732-18-5	50.00%	0.10264%			
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.									
			Crystalline Silica: Cristobalite	14464-46-1					
			Cured Acrylic Resin	Trade Secret		0.0032652388%			
			Silica	7631-86-9					

^{*} Total Water Volume sources may include fresh water, produced water, and/or recycled water

All component information listed was obtained from the supplier's Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration's (OSHA) regulations govern the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(i) and Appendix D.

^{**} Information is based on the maximum potential for concentration and thus the total may be over 100%