

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date	10/21/2012
State:	California
County:	Ventura
API Number:	04-111-22156
Operator Name:	SENECA RESOURCES CORP
Well Name and Number:	Frankel A-502
Longitude:	-118.879485
Latitude:	34.480854
Long/Lat Projection:	NAD27
Production Type:	Oil
True Vertical Depth (TVD):	5,321
Total Water Volume (gal)*:	380,868

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
Lease Water	Operator				100.00%	76.95941%	Density = 8.330
SAND - PREMIUM - 20/40	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	100.00%	22.30001%	
MO-67	Halliburton	pH Control Additive	Sodium hydroxide	1310-73-2	30.00%	0.03400%	
GBW-30 BREAKER	Halliburton	Breaker	Hemicellulase enzyme	9012-54-8	15.00%	0.00682%	
			Carbohydrates	Confidential Business Information	95.00%	0.04319%	
FDP-S1047-12	Halliburton	Surfactant	Methanol	67-56-1	100.00%	0.05960%	
			Sulfonate	Confidential Business Information	10.00%	0.00596%	
CLA-STA FS ADDITIVE	Halliburton	Clay Stabilizer	Ammonium chloride	12125-02-9	30.00%	0.03504%	
FE-1A ACIDIZING	Halliburton	Additive	Acetic acid	64-19-7	60.00%	0.00391%	

COMPOSITION

			Acetic anhydride	108-24-7	100.00%	0.00652%
CLA-WEB™	Halliburton	Additive	Ammonium salt	Confidential Business Information	50.00%	0.02000%
BC-140	Halliburton	Crosslinker	Ethylene glycol	107-21-1	30.00%	0.01710%
			Monoethanolamine borate	26038-87-9	60.00%	0.03420%
BE-3S BACTERICIDE	Halliburton	Biocide	2,2 Dibromo-3-nitrilopropionamide	10222-01-2	100.00%	0.00121%
			2-Monobromo-3-nitrilopropionamide	1113-55-9	5.00%	0.00006%
SP BREAKER	Halliburton	Breaker	Sodium persulfate	7775-27-1	100.00%	0.01201%
GBW-30 BREAKER	Halliburton	Breaker	Hemicellulase enzyme	9012-54-8	15.00%	0.00055%
			Carbohydrates	Confidential Business Information	95.00%	0.00346%
WG-35 GELLING AGENT	Halliburton	Gelling Agent	Guar gum	9000-30-0	100.00%	0.28500%
WFT 1755FS	Kings Chemical Service	Scale Inhibitor	Phosphonomethylated polyamine	68132-59-2	20.00%	0.02780%

* 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.

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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.