

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	12/19/2011
Province:	BC
Region:	Altares
Well Number:	26660
Operator Name:	PETRONAS Energy Canada Ltd.
Well Name:	PETRONAS ET AL HZ ALTARES A- 100-L/094-A-04
Longitude:	-121.593710
Latitude:	56.143141
Long/Lat Projection:	NAD83
Production Type:	Undefined
True Vertical Depth (TVD):	4,500
Total Water Volume (m3)*:	16,402

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	Talisman	Base / Carrier Fluid					water
			water		100.00%	86.30000%	
HCl, Slickwater, ClearFRAC	Schlumberger	sand/propanat	Crystalline silica	14808-60-7	97.34%	13.34000%	
			Crystalline silica: Quartz (SiO2)	14808-60-7	0.00%	0.00000%	
			Crystalline silica: cristobalite	14464-46-1	0.00%	0.00000%	
			Crystalline silica	14808-60-7	97.34%	13.34000%	
			Crystalline silica: Quartz (SiO2)	14808-60-7	0.00%	0.00000%	
			Crystalline silica: cristobalite	14464-46-1	0.00%	0.00000%	
HCl, Slickwater, ClearFRAC	Schlumberger	acid	Hydrochloric Acid	7647-01-0	0.48%	0.07000%	
			Hydrochloric Acid	7647-01-0	0.48%	0.07000%	
HCl, Slickwater, ClearFRAC	Schlumberger	Antifoam Agent, Bactericide, Chelating Agent, Corrosion Inhibitor, Friction Reducer, Gelling Agent, Resin Coated Prop, Rheology Modifier, Scale Inhibitor, Surfactant	Distillates (petroleum), hydrotreated light	64742-47-8	0.27%	0.04000%	
			Sodium salt of aliphatic amine acid		0.04%	0.01000%	
			Ethane-1,2-diol	107-21-1	0.03%	0.00000%	
			Alcohol ethoxylate C-10/16 with 6.5 EO	68002-97-1	0.03%	0.00000%	
			Diatomaceous earth, calcined	91053-39-3	0.01%	0.00000%	
			Methanol	67-56-1	0.01%	0.00000%	
			Aliphatic acids		0.01%	0.00000%	
			Aliphatic alcohols, ethoxylated #1		0.01%	0.00000%	
			Aromatic hydrocarbon		0.01%	0.00000%	
Aliphatic amine polymer		0.01%	0.00000%				

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			Calcium chloride	10043-52-4	0.01%	0.00000%	
			Sodium chloride	7647-14-5	0.01%	0.00000%	
			Fatty acid amidoalkyl betaine		0.01%	0.00000%	
			Sodium hydroxide (impurity)	1310-73-2	0.00%	0.00000%	
			Propan-2-ol	67-63-0	0.00%	0.00000%	
			5-chloro-2-methyl-4-isothiazolin-3-one	26172-55-4	0.00%	0.00000%	
			Magnesium nitrate	10377-60-3	0.00%	0.00000%	
			Prop-2-yn-1-ol	107-19-7	0.00%	0.00000%	
			Ethoxylated alcohols		0.00%	0.00000%	
			Ethoxylated alcohols #2		0.00%	0.00000%	
			2-Methyl-4-isothiazolin-3-one	2682-20-4	0.00%	0.00000%	
			Magnesium chloride	7786-30-3	0.00%	0.00000%	
			Ethoxylated alcohol		0.00%	0.00000%	
			Trisodium nitrilotriacetate (impurity)	5064-31-3	0.00%	0.00000%	
			Distillates (petroleum), hydrotreated light	64742-47-8	0.27%	0.04000%	
			Sodium salt of aliphatic amine acid		0.04%	0.01000%	
			Ethane-1,2-diol	107-21-1	0.03%	0.00000%	
			Alcohol ethoxylate C-10/16 with 6.5 EO	68002-97-1	0.03%	0.00000%	
			Diatomaceous earth, calcined	91053-39-3	0.01%	0.00000%	
			Methanol	67-56-1	0.01%	0.00000%	
			Aliphatic acids		0.01%	0.00000%	
			Aliphatic alcohols, ethoxylated #1		0.01%	0.00000%	
			Aromatic hydrocarbon		0.01%	0.00000%	
			Aliphatic amine polymer		0.01%	0.00000%	
			Calcium chloride	10043-52-4	0.01%	0.00000%	
			Sodium chloride	7647-14-5	0.01%	0.00000%	
			Fatty acid amidoalkyl betaine		0.01%	0.00000%	
			Sodium hydroxide (impurity)	1310-73-2	0.00%	0.00000%	
			Propan-2-ol	67-63-0	0.00%	0.00000%	
			5-chloro-2-methyl-4-isothiazolin-3-one	26172-55-4	0.00%	0.00000%	
			Magnesium nitrate	10377-60-3	0.00%	0.00000%	
			Prop-2-yn-1-ol	107-19-7	0.00%	0.00000%	
			Ethoxylated alcohols		0.00%	0.00000%	
			Ethoxylated alcohols #2		0.00%	0.00000%	
			2-Methyl-4-isothiazolin-3-one	2682-20-4	0.00%	0.00000%	
			Magnesium chloride	7786-30-3	0.00%	0.00000%	
			Ethoxylated alcohol		0.00%	0.00000%	
			Trisodium nitrilotriacetate (impurity)	5064-31-3	0.00%	0.00000%	

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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
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* 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%

Information provided in this form with respect to ingredients in the fracturing fluid is consistent with the Material Safety Data Sheet (MSDS) information. The operator has completed this form with the information provided by the supplier. The operator cannot provide any of the supplier's proprietary information, trade secrets or confidential business information.