

## Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	12/14/2011
Province:	BC
Region:	Altares
Well Number:	26949
Operator Name:	Canadian Natural Resources Limited
Well Name:	CNRL HZ ALTARES B04-33-083-25
Longitude:	-121.535332
Latitude:	56.140463
Long/Lat Projection:	NAD83
Production Type:	Undefined
True Vertical Depth (TVD):	4,500
Total Water Volume (m3)*:	14,118

### 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
FR-9	Trican	Friction Reducer	petroleum distillate	64742-47-8	28.00%	0.02000%	
			ammonium chloride	12125-02-9	1.50%	0.00000%	
Busan 94	Trican	Biocide	2,2-dibromo-3-nitripropionamide	10222-01-2	30.00%	0.00000%	
			Sodium bromide	7647-15-6	4.00%	0.00000%	
			Polyethylene glycol	25322-68-3	60.00%	0.01000%	
			Dibromoacetoneitrile	3252-43-5	3.00%	0.00000%	
SI-2	Trican	Scale Inhibitor	Methanol	67-56-1	20.00%	0.00000%	
			Organic phosphonate 1		30.00%	0.01000%	
			Organic phosphonate 2		10.00%	0.00000%	
			Ammonium chloride	12125-02-9	10.00%	0.00000%	
			Amine salt		5.00%	0.00000%	
			Oxyalkylated polyamine		5.00%	0.00000%	
HCL 15%	Trican	Acid	hydrochloric acid	7647-01-0	14.93%	0.06000%	
			water	7732-18-5	85.00%	0.31000%	
S-8	Trican	Acid add. for gas wells	Methanol	67-56-1	60.00%	0.00000%	
			Oxyalkylated alkylphenolic resin	30704-64-4	30.00%	0.00000%	
			Polyglycol diepoxide	68036-95-3	5.00%	0.00000%	
			Polyglycol diepoxide	68036-92-0	5.00%	0.00000%	
			Xylene	1330-20-7	5.00%	0.00000%	
			Light aromatic naphtha	64742-95-6	5.00%	0.00000%	
			1,2,4-Trimethylbenzene	95-63-6	1.00%	0.00000%	
			Ethylbenzene	100-41-4	1.00%	0.00000%	

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			1,3,5-Trimethylbenzene	108-67-8	1.00%	0.00000%	
IC-3	Trican	Acid add. for gas wells	Sodium nitrilo-triacetate, monohydrate	18662-53-8	99.00%	0.00000%	
AI-9	Trican	Acid add. for gas wells	Methanol	67-56-1	60.00%	0.00000%	
			Polyoxyalkylenes	68951-67-7	30.00%	0.00000%	
			Modified thiourea polymer	68527-49-1	30.00%	0.00000%	
			Propargyl alcohol	107-19-7	10.00%	0.00000%	
			Olefin	64743-02-8	5.00%	0.00000%	
DF-1	Trican	Acid add. for gas wells	Undisclosed		100.00%	0.00000%	
Proppant	Trican	Proppoant	crystalline silica	14808-60-7	100.00%	15.54000%	
Water	Trican	water	water	7732-18-5	100.00%	82.76000%	
WG-3L	Trican	Gell	Undisclosed		100.00%	0.03000%	
WXZ-2	Trican	X-Link	Methanol	67-56-1	100.00%	0.01000%	
			n-propanol	71-23-8	5.00%	0.00000%	
WBO-2	Trican	Breaker	sodium persulfate	7775-27-1	100.00%	0.00000%	
Ph-2	Trican	Buffer	acetic acid	64-19-7	60.00%	0.00000%	

\* 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%

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.