

[TOURMALINE OIL CORP / LSD 4-17-51-18W5] TOURMALINE EDSON PLANT UH-5000

Customer: PTRHTF20046
 QUADRA CHEMICALS
 12925 146TH STREET
 EDMONTON, AB T5L 2H6 CANADA
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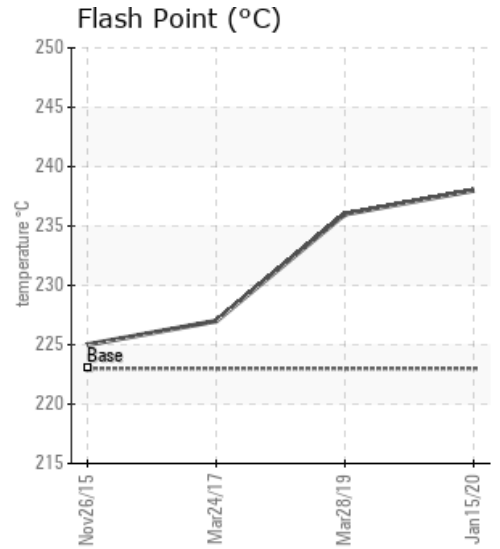
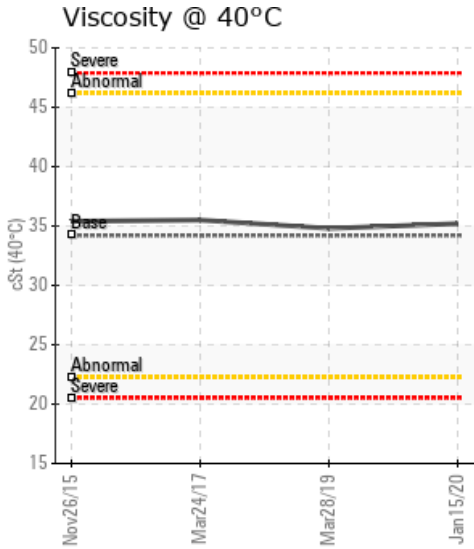
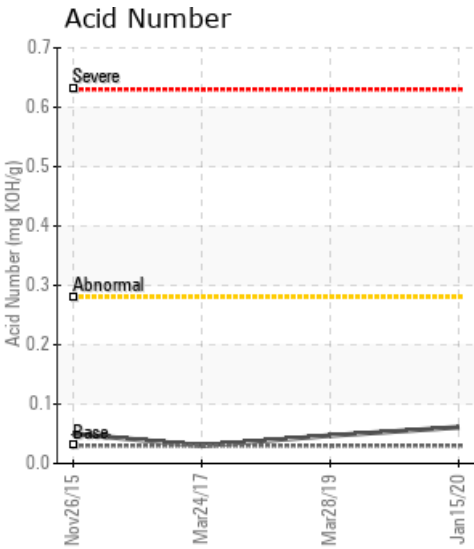
System Information
 System Volume: 19000 ltr
 Bulk Operating Temp: 437F / 225C
 Heating Source:
 Blanket:
 Fluid: PETRO CANADA PETRO-THERM
 Make:

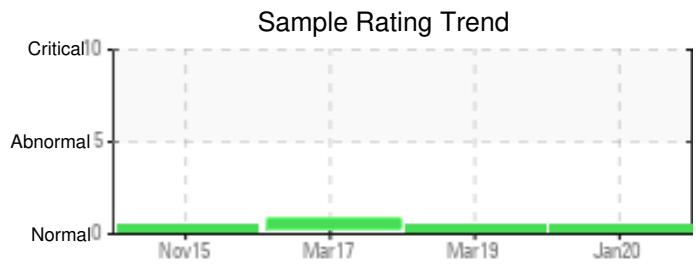
Sample Information
 Lab No: 02335525
 Analyst: Peter Harteveld
 Sample Date: 01/15/20
 Received Date: 02/03/20
 Completed: 02/14/20
 Peter Harteveld
 peter.harteveld@petrocanadalsp.com

Recommendation: The fluid is in good condition and suitable for further use. Please re-sample in 12 months.

Comments:

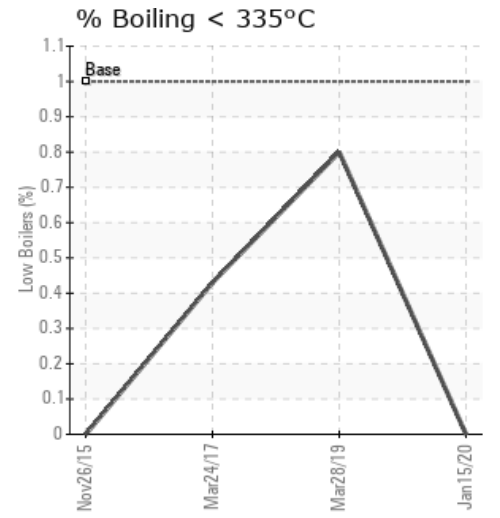
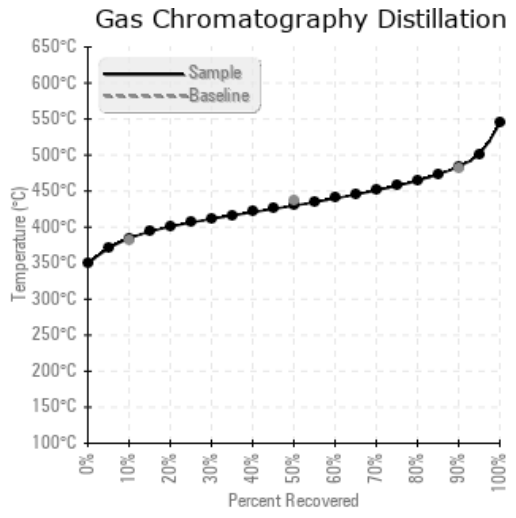
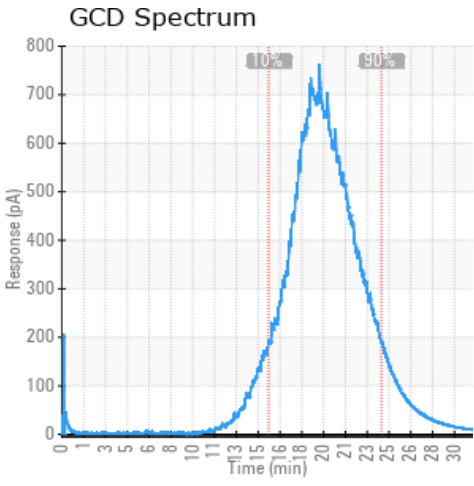
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/15/20	02/03/20	5y		460 / 238	7.2	35.2	0.061	0.078	723 / 384	806 / 430	903 / 484	0.00
03/28/19	04/08/19	3y		457 / 236	0.00	34.8	0.047	0.059	721 / 383	813 / 434	915 / 491	0.80
03/24/17	03/30/17	2y		441 / 227	6.3	35.5	0.03	0.031	724 / 385	817 / 436	920 / 494	0.43
11/26/15	12/07/15	1y		437 / 225	22.8	35.4	0.05	0.029	716 / 380	805 / 429	906 / 485	0.00
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00





Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
01/15/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/28/19	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	1	0
03/24/17	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
11/26/15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baseline Data			0	0						0		0	0					0				0		

Elemental analysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]



Historical Comments	
03/28/19	The fluid is in good condition and suitable for further use. Please re-sample in 6 months.
03/24/17	Aside from an increase in 90% GCD temperature which indicates fluid degradation by oxidation, the fluid is in good condition and suitable for further use. Make sure the blanket gas system works properly to prevent contact between the hot fluid and outside air (oxygen) Please resample in 12 months. (GCD) 90% Distillation Point is marginally high.
11/26/15	The condition of the fluid is excellent. Please re-sample in 6 months.

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