

[1-34-51-18W5] H900

Customer: PTRHTF60072
 Tourmaline Oil Corp
 1-34-51-18W5
 5991 3 Ave.
 Edson, AB T7E 1R8 CA
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 E-Mail: marc.morin@tourmalineoil.com

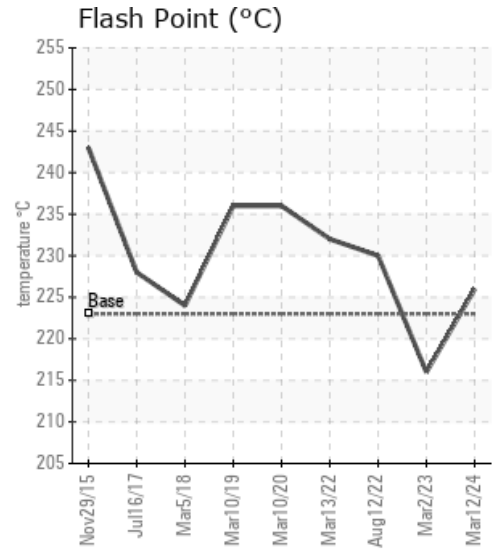
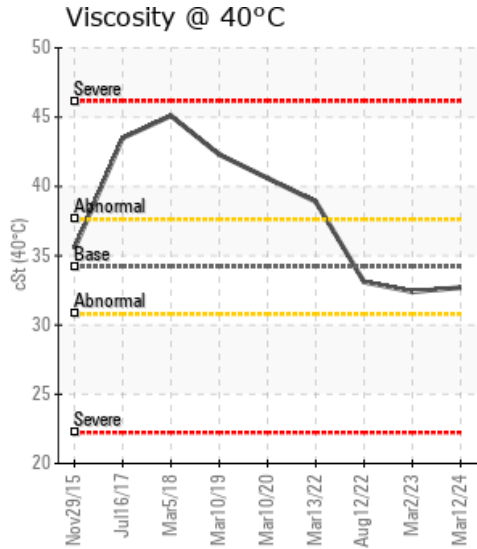
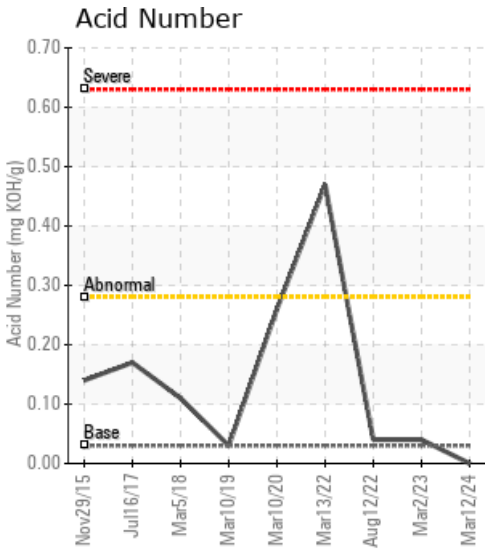
System Information
 System Volume: 10000 ltr
 Bulk Operating Temp: 406F / 208C
 Heating Source:
 Blanket:
 Fluid: PETRO CANADA PETRO-THERM
 Make: ALCO

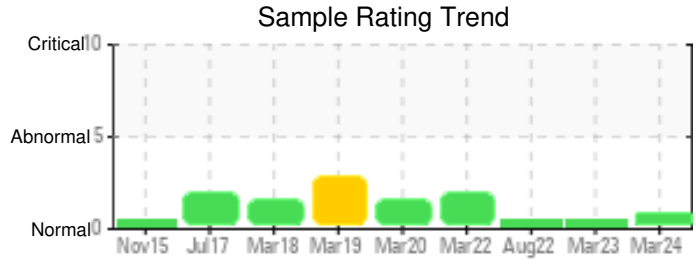
Sample Information
 Lab No: 02626249
 Analyst: Clinton Buhler
 Sample Date: 03/12/24
 Received Date: 04/02/24
 Completed: 04/10/24
 Clinton Buhler
 Clinton.Buhler@HFSinclair.com

Recommendation: Sample results indicate the fluid is in suitable condition for continued service. Please re-sample in 12 months.

Comments: (GCD) 90% Distillation Point is marginally high.

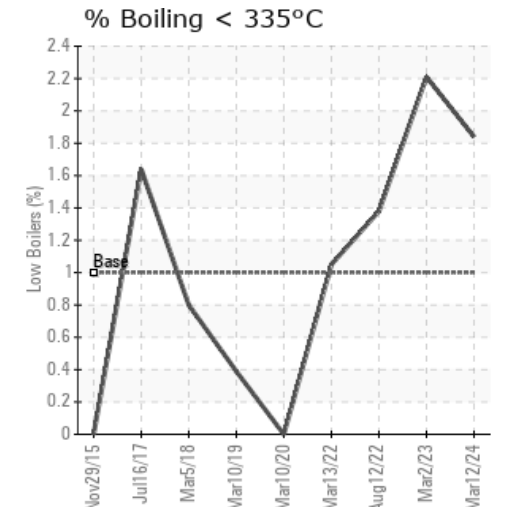
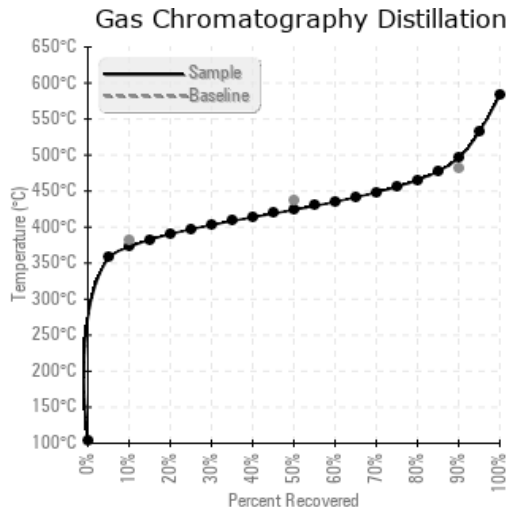
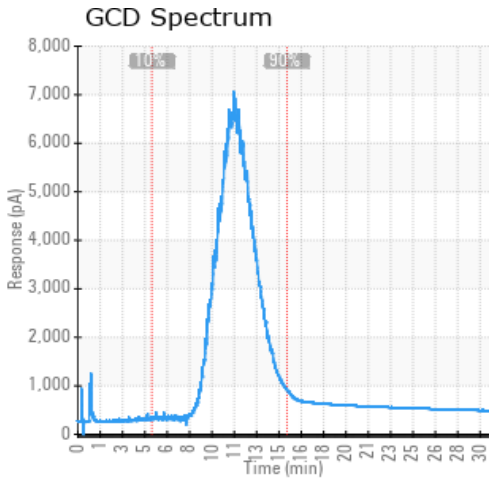
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
03/12/24	04/02/24	0.0y	return line	439 / 226	6	32.7	0.00	0.043	702 / 372	795 / 424	924 / 496	1.84
03/02/23	03/31/23	0.0y	pump discharge	421 / 216	13.7	32.4	0.04	0.038	710 / 377	806 / 430	906 / 486	2.21
08/12/22	08/30/22	0.2y	pump bleed	446 / 230	9.1	33.1	0.04	0.091	717 / 380	808 / 431	907 / 486	1.38
03/13/22	04/11/22	5.0y	pump discharge	450 / 232	6.4	38.9	0.47	0.509	730 / 388	818 / 437	917 / 492	1.05
03/10/20	04/14/20	4.0y	PUMP	457 / 236	12.2	40.6	0.26	0.755	738 / 392	820 / 438	916 / 491	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
03/12/24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/02/23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/12/22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/13/22	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/10/20	16	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

03/02/23	Sample results indicate that the fluid is in suitable condition for continued service. Please re-sample in 12 months
08/12/22	This is the first sample taken since the fluid was replaced in early June 2022. Sample results indicate the fluid is in suitable condition for continued service. Please ensure blanket gas is operational in the expansion tank to prevent future oxidation of the fluid. Re-sample in 6 months.
03/13/22	Sample results indicate that fluid degradation continues as evidenced by increased Acid Number and elevated solids content. These along with elevated fluid viscosity and flash point suggest fluid oxidation is ongoing. Please ensure blanket gas is operational. Fluid is not yet at condemnable levels but the increased Acid Number is going that direction (limit is 1). Solids content can be associated to oxidation and thermal degradation and indicates fouling of the system. Filtration is optimal. Please re-sample in 6 months
03/10/20	Pentane insolubles are higher than normal is Acid number indicating some oxidation of fluid. Ensure gas blanket is in place and functioning. Resample in 6 months. Pentane Insolubles levels are severely high.

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