

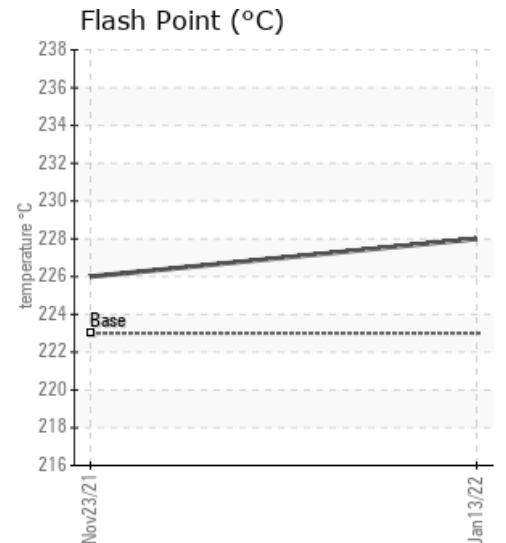
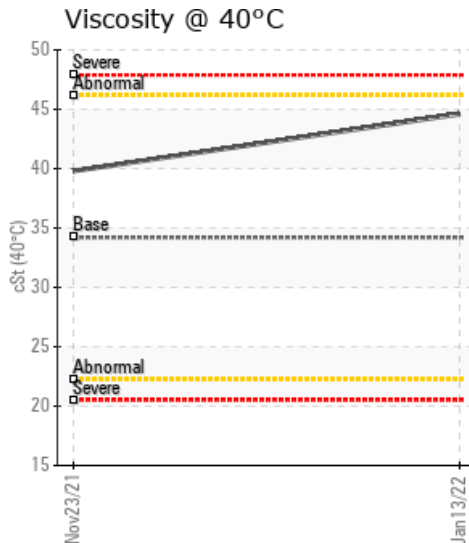
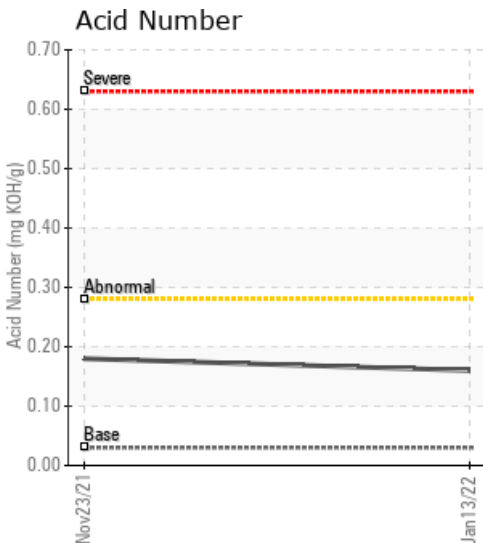
## [VESTA SYLVAN LAKE] 6-20-37-1-W5 HEAT MEDIUM #1

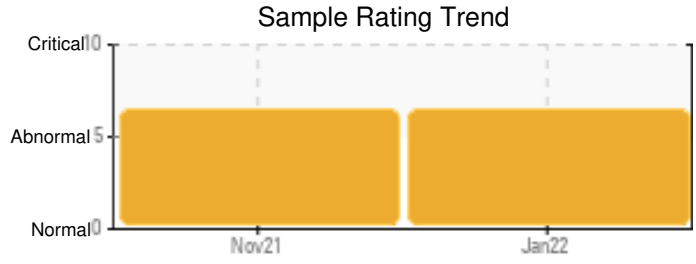
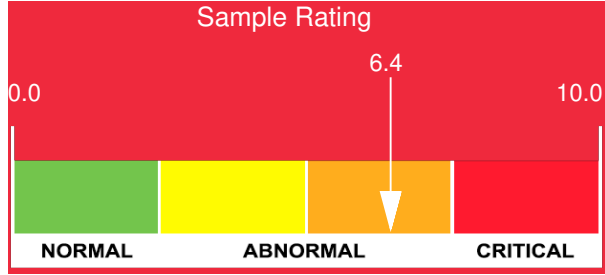
Customer: PTRHTF20261	System Information	Sample Information
VESTA ENERGY 6-20-37-1 W/5 SYLVON LAKE, AB Canada Attn: JASON COFFIN Tel: (403)318-1291 E-Mail: jcoffin@vestaenergy.com	System Volume: 4700 ltr Bulk Operating Temp: 329F / 165C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make:	Lab No: 02466377 Analyst: Lyle Dach Sample Date: 01/13/22 Received Date: 01/14/22 Completed: 01/25/22 Lyle Dach lyle.dach@hollyfrontier.com

Recommendation: PQ, iron, and viscosity are high and pentane insolubles are very high. Confirm gas blanket is in place and operating correctly, improper gas blanketing can cause fluid oxidation. High iron and pentane insolubles could be filtered out, high temperatures do make this difficult ensure filtration system is rated for the temperature. Resample in 6 months or after filtration has been attempted.

Comments: PQ levels are severe. Iron ppm levels are abnormal. Pentane Insolubles levels are severely high.

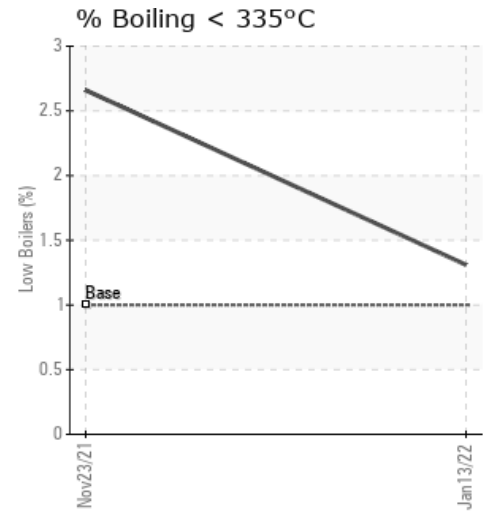
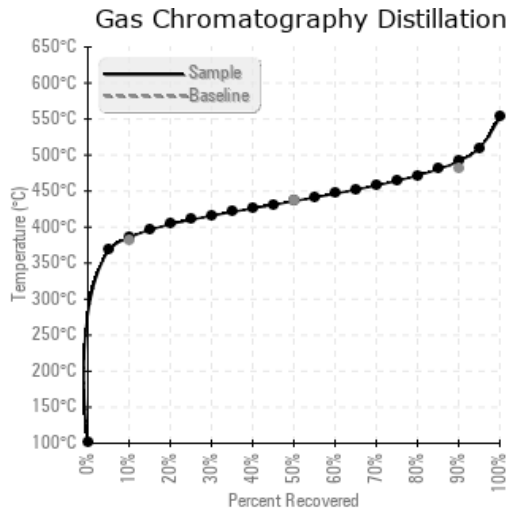
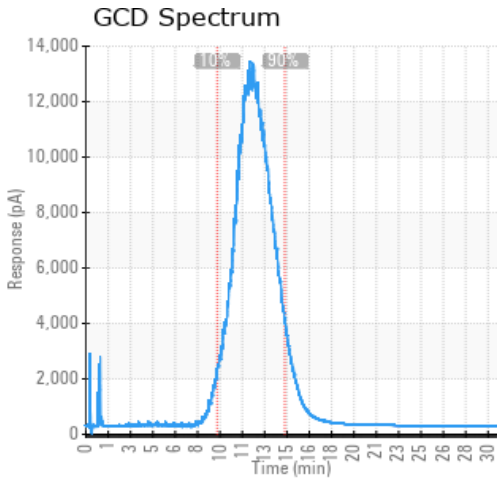
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/13/22	01/14/22	2.0m	disch off vessel	442 / 228	9.1	44.6	0.16	2.09	726 / 385	817 / 436	916 / 491	1.31
11/23/21	11/24/21	0.3m		439 / 226	163.0	39.8	0.18	0.676	723 / 384	820 / 438	916 / 491	2.66
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
01/13/22	309	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	4	0	0	0	1	0	1	0
11/23/21	273	0	0	2	0	0	0	0	0	0	1	3	0	0	0	0	3	0	4	0	1	0	1	1
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

11/23/21	Particle Quantifier (PQ) is the bulk magnetic index of the oil sample due to the high iron. Acid number is high for a new fluid. Viscosity is slightly high could this be residual fluid left in the system at the time of the change. Pentane insoluble are also high but if a system flush was not completed at the change this could also be due to residual fluid/contaminants or the sample point was not flushed long enough to ensure only current system fluid was sampled. Resample the system, samples should be collected from a hot turbulent area (pump discharge) and ensure that the piping or tubing is purged adequately so that the sample is representative of the system. We do not recommend collecting from the bottom of a site glass or low point drains. PQ levels are severe. Iron ppm levels are abnormal. Pentane Insolubles levels are severely high.
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