

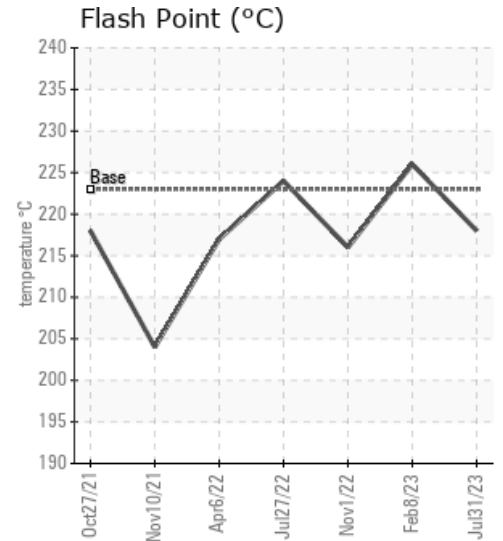
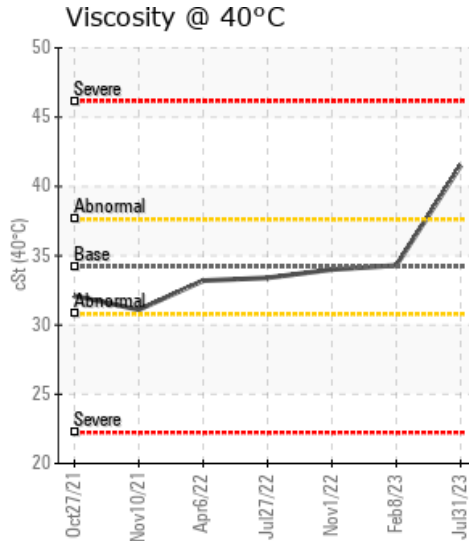
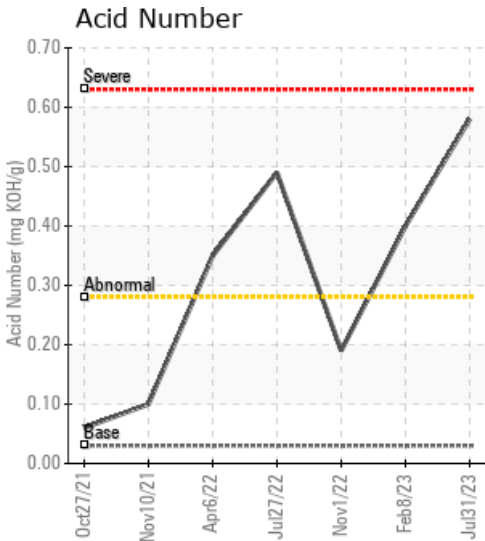
[VESTA SYLVAN LAKE] 6-20-37-1-W5 HEAT MEDIUM #2

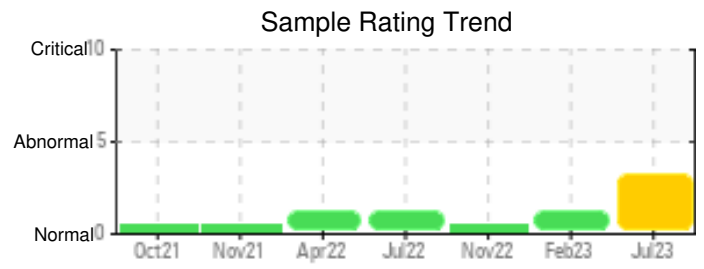
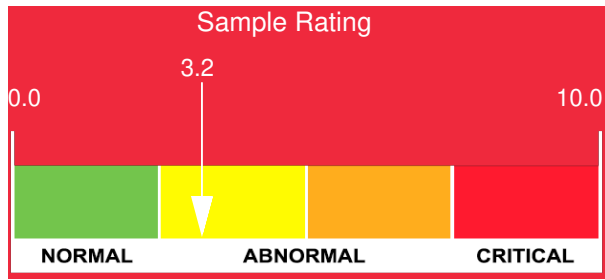
Customer: PTRHTF20261	System Information	Sample Information
VESTA ENERGY 6-20-37-1 W/5 SYLVON LAKE, AB CA Attn: JASON COFFIN Tel: (403)318-1291 E-Mail: jcoffin@vestaenergy.com	System Volume: 13000 ltr Bulk Operating Temp: 329F / 165C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: ASPIRE MANUFACTURING	Lab No: 02573905 Analyst: Yutong Gao Sample Date: 07/31/23 Received Date: 08/02/23 Completed: 08/14/23 Yutong Gao yutong.gao@HFSinclair.com

Recommendation: The sample has adequate distillation points comparing with the fresh fluid. However, the solid content has been elevated substantially only after 5 months operation since the last sample in Feb 2023. The viscosity and acid number test results are also higher than the previous samples. Referring to the system design parameters, please double check the fluid flow rate and expansion tank typical temperature. If they are all adequate enough, then please re-sample ASAP before taking any additional actions. Please use the same sample port, flush the port by 50 liters fluid, then take a representative sample. Yutong will contact Jason along with the Petro-Canada Lubricants local distributor to follow up the details.

Comments: An increase in the iron level is noted. Solid levels are severely high. Acid Number (AN) is abnormally high. Visc @ 40°C is abnormally high.

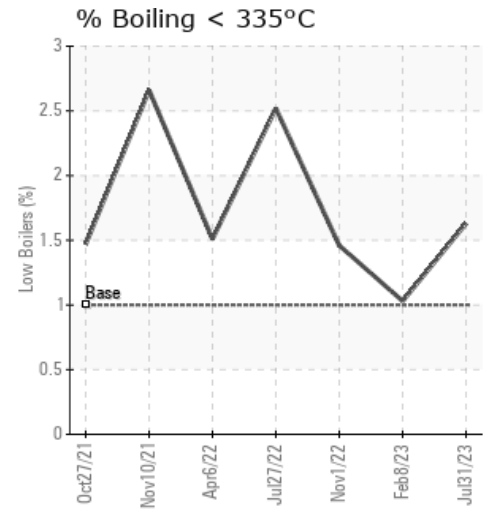
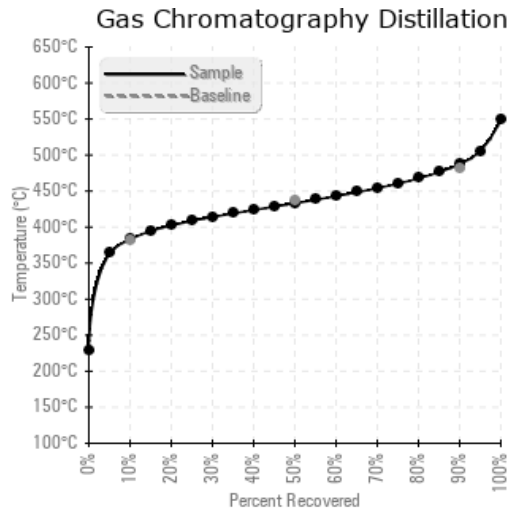
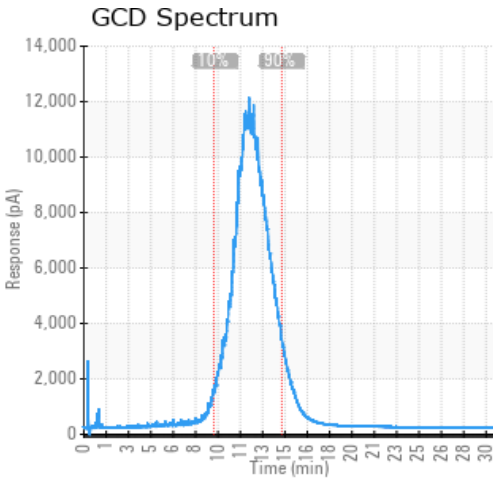
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
07/31/23	08/02/23	12.0m		424 / 218	148.1	41.5	0.58	2.03	721 / 383	812 / 433	909 / 487	1.63
02/08/23	02/09/23	9.0m		439 / 226	34.1	34.3	0.40	0.381	729 / 387	813 / 434	910 / 488	1.03
11/01/22	11/14/22	12.0m	DEETH REBOILER	421 / 216	258.0	34.0	0.19	0.203	724 / 384	811 / 433	907 / 486	1.46
07/27/22	07/29/22	0.0m	bottom drain	435 / 224	100.6	33.4	0.49	0.248	714 / 379	809 / 432	907 / 486	2.52
04/06/22	04/07/22	0.0m	death reboiler	423 / 217	9.6	33.2	0.35	0.126	722 / 383	812 / 433	911 / 488	1.51
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
07/31/23	73	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1
02/08/23	12	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
11/01/22	3	0	0	2	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
07/27/22	3	0	0	2	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
04/06/22	1	0	0	1	0	0	0	0	0	0	2	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

02/08/23	The current fluid has correct viscosity and decent distillation points. There is minimum water / dirt contaminations. The overall solid content is low. The acid number is elevated from last sample result, however, it is similar to the two samples in Apr/Jul 2022. Please continue to run this fluid and take one sample in Sept 2023 to monitor the conditions. To better understand the variation of the AN, please confirm if there was a high volume fluid top-up between Jul and Nov, 2022. Also please make sure to take samples from the same port and the sampling port shall be well flushed.
11/01/22	The current fluid has normal viscosity, flash point and distillation points. The acid number is low meaning the minimum fluid oxidation. The water level is also considered normal. Please continue to run the fluid and take one sample in Nov 2023 to monitor the conditions.
07/27/22	Fluid acid number is up slightly higher but the fluid PH is 7.24, fluid PH is neutral and would not be a concern to the system. Ensure the blanket gas is working but overall the fluid is in good condition for continued service. Resample in 6 months. Acid Number (AN) is abnormally high.
04/06/22	Acid number increased, check blanket gas system is functioning properly. Fluid oxidation will increase the acidity. All other sample results look to be good for continued service. Resample in 6 months. Acid Number (AN) is abnormally high.

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