

[TOURMALINE, KAKWA / 01-35-60-5-W6] H-720

Customer: PTRHTF20175
 QUADRA CHEMICALS
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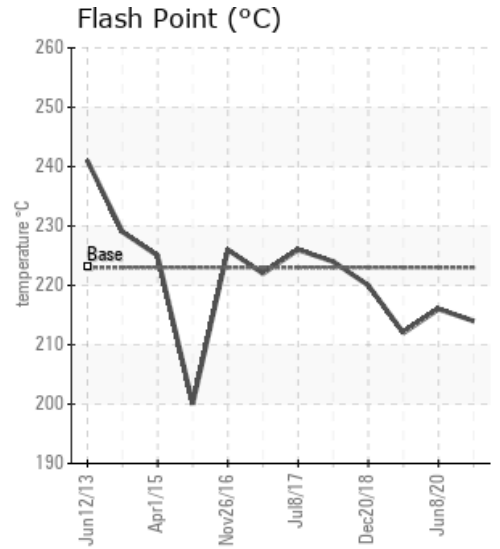
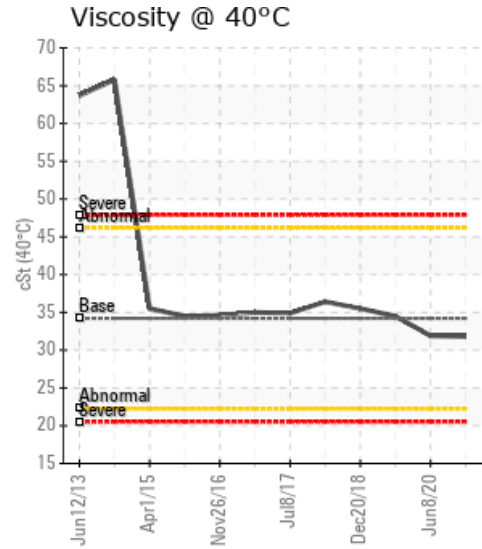
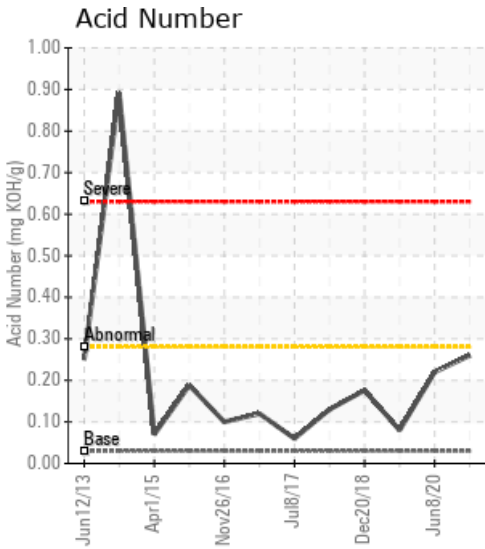
System Information
 System Volume: 19600 ltr
 Bulk Operating Temp: 338F / 170C
 Heating Source:
 Blanket:
 Fluid: PETRO CANADA PETRO-THERM
 Make: HEATECH

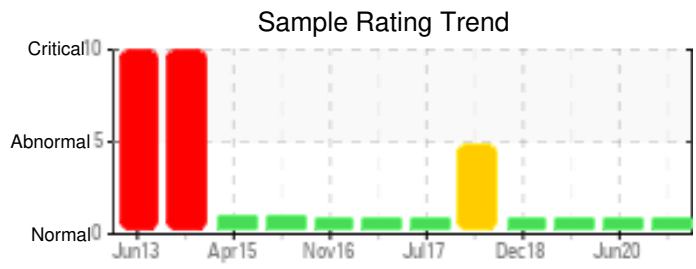
Sample Information
 Lab No: 02393763
 Analyst: Kevin McDermott
 Sample Date: 12/02/20
 Received Date: 12/18/20
 Completed: 12/21/20
 Kevin McDermott
 kevin.mcdermott@HFSinclair.com

Recommendation: Fluid remains in very good condition overall. Iron content is rather high which suggests corrosion is or has been taking place. The solids content is quite high - the system could benefit from a slipstream filter to slowly reduce the solids content.

Comments:

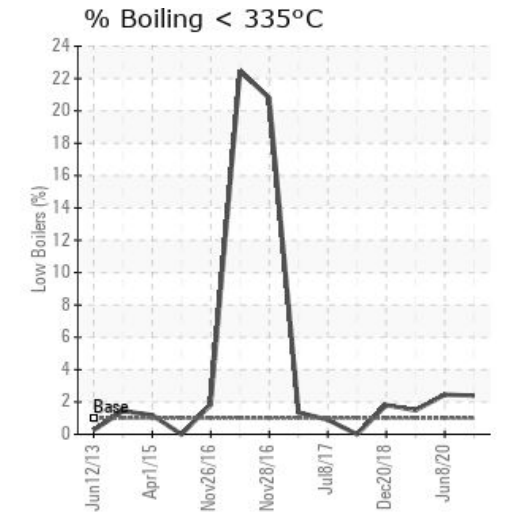
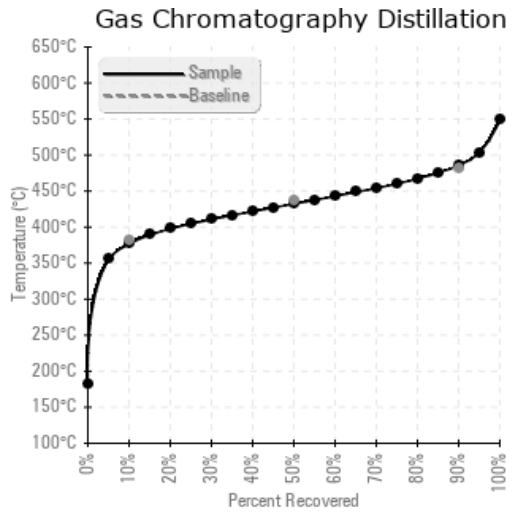
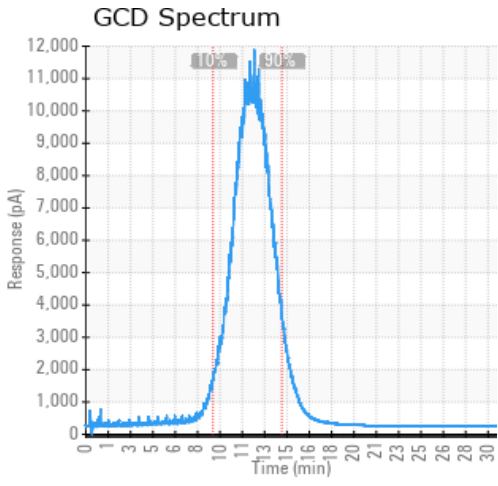
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
12/02/20	12/18/20	7.0y	Heater return	417 / 214	58.6	31.8	0.26	0.527	710 / 377	810 / 432	906 / 486	2.39
06/08/20	06/22/20	3.0y	PUMP DISCHARGE	421 / 216	13.2	31.9	0.22	0.421	710 / 377	811 / 433	906 / 486	2.45
05/30/19	06/06/19	0.0y		414 / 212	14.1	34.5	0.080	0.427	706 / 374	807 / 431	909 / 487	1.49
12/20/18	01/21/19	54.0y	DISCHARGE	428 / 220	145.1	35.5	0.176	0.433	692 / 367	789 / 420	883 / 473	1.81
02/09/18	02/20/18	54.0y		435 / 224	479.3	36.4	0.13	0.532	745 / 396	820 / 438	909 / 487	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
12/02/20	95	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	2	0	0	0	1	0	0	1
06/08/20	38	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
05/30/19	40	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0
12/20/18	73	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	1	0	0	0
02/09/18	186	0	0	0	0	0	0	0	0	0	3	4	0	0	0	0	4	0	0	0	6	0	1	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	
06/08/20	The fluid is in a good condition and suitable for further use. Venting of low boiler vapor to atmosphere on a regular basis is recommended to maintain the vapor % <335C close to that of the fresh oil. Please re-sample in 12 months.
05/30/19	Sample results indicate that the fluid is suitable for continued service. Solids content of 0.427% comparable to last analysis which is positive in that it hasn't increased, but solids content still undesirable. Plans for fluid filtration would be recommended if solids content increases much beyond 0.5%. Continue regular venting of fluid to remove low boiling vapors. Please re-sample in 6-12 months
12/20/18	Sample results indicate that the fluid is suitable for continued service. % boil-off has increased since last sample which can indicate some thermal degradation. Regular venting of low boiling vapors from the expansion tank is recommended. Solids continues to be present. Please ensure blanket gas is operational. Please re-sample in 6 months
02/09/18	Sample results indicate that the fluid itself is suitable for continued service. However, Iron, pentane insolubles and water levels may indicate that there is corrosion ongoing or that possibly the sample was drawn from a dead leg that may not have been purged thoroughly. Consider investigating source of Iron and Water in system. Please ensure future samples are drawn from a hot, turbulent zone that is representative of system condition, and not from still, low lying zones with little fluid movement. Please ensure sample card is completely filled out with machine # and time on fluid. Re-sample in 6 months. Iron ppm levels are marginal. Pentane Insolubles levels are abnormally high. ppm Water contamination levels are marginally high. Water contamination levels are marginally high.

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