

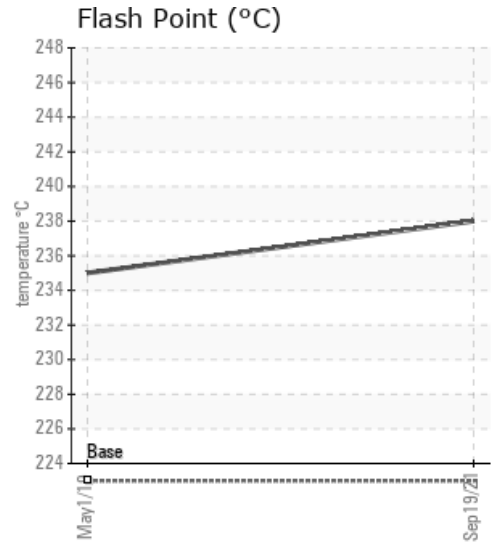
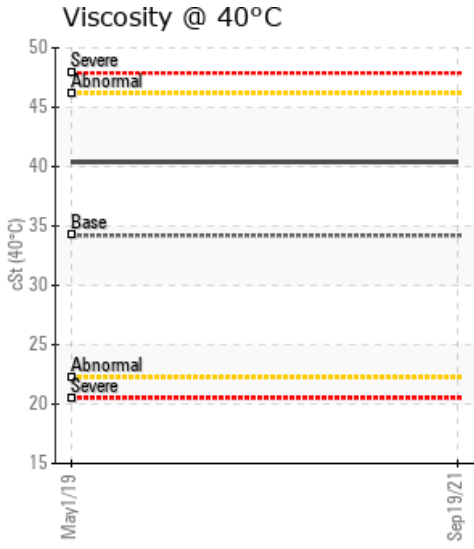
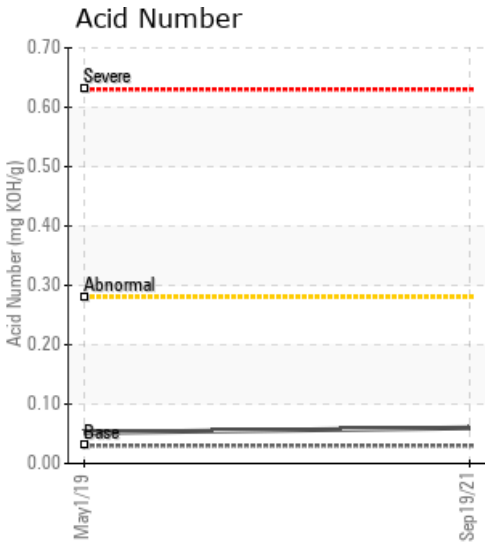
[CNRL Ferrier 7-18-40-09w5] HEAT TRANSFER

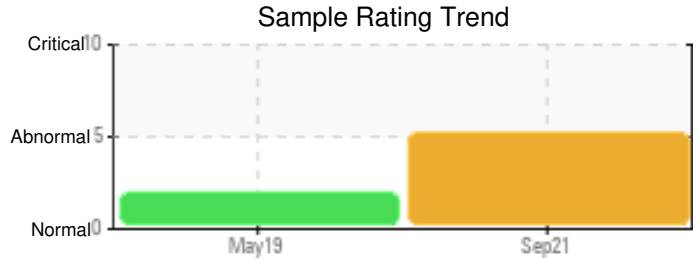
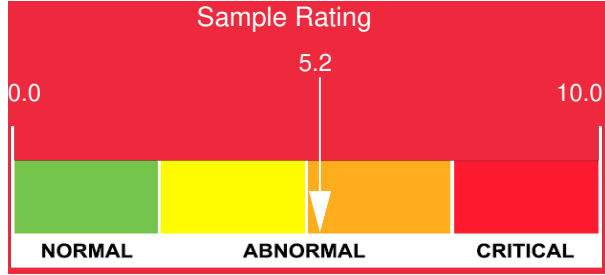
Customer: PTRHTF20046	System Information	Sample Information
QUADRA CHEMICALS 12925 146TH STREET EDMONTON, AB T5L 2H6 CANADA Attn: Quadra Samples Tel: E-Mail: quadra_samples@quadra.ca	System Volume: 0 ltr Bulk Operating Temp: 450F / 232C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: PROPAK SYSTEMS	Lab No: 02449310 Analyst: Lyle Dach Sample Date: 09/19/21 Received Date: 10/08/21 Completed: 10/18/21 Lyle Dach lyle.dach@hollyfrontier.com

Recommendation: Water very high - resample to confirm water content in system. If water content is correct filter or centrifuge system to remove water.

Comments: Water contamination levels are severely high. ppm Water contamination levels are severely high. (GCD) 90% Distillation Point is severely high.

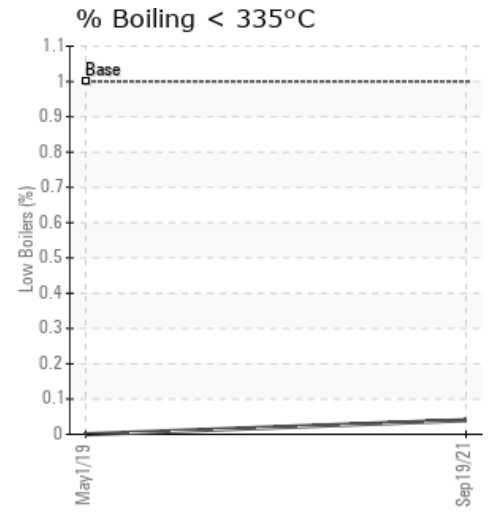
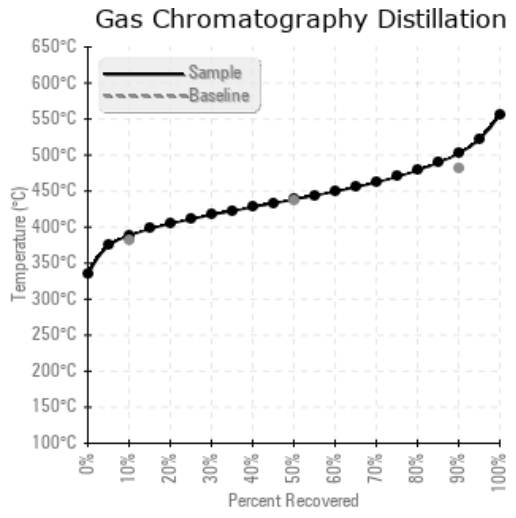
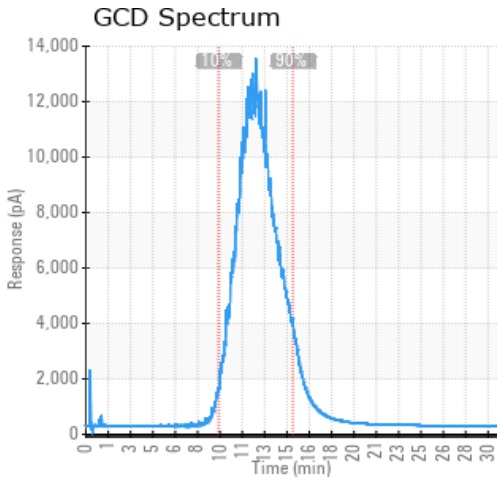
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
09/19/21	10/08/21	10.0y	de-eth line heater	460 / 238	3412.3	40.4	0.06	0.170	730 / 388	821 / 438	936 / 502	0.04
05/01/19	05/14/19	657.0y		455 / 235	43.8	40.4	0.052	0.041	723 / 384	828 / 442	958 / 514	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
09/19/21	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0
05/01/19	0	0	0	0	0	0	0	0	0	0	3	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

05/01/19	Oil looks to be a blend of older pre-2006 Petrotherm and newer Petrotherm which explains the higher slightly higher viscosity and GCD @ 90%. Resample in 6 months and confirm the age of the fluid in the system. (GCD) 90% Distillation Point is severely high.
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