

[14-32-37-3W5] BTG ENERGY

Customer: PTRHTF20243

CFR CHEMICALS
38451 RRZZ
RED DEER, AB T4E 2N6 Canada
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System Information

System Volume: 10000 ltr
Bulk Operating Temp: 392F / 200C
Heating Source:
Blanket:
Fluid: CHEVRON HEAT TRANSFER OIL 46
Make:

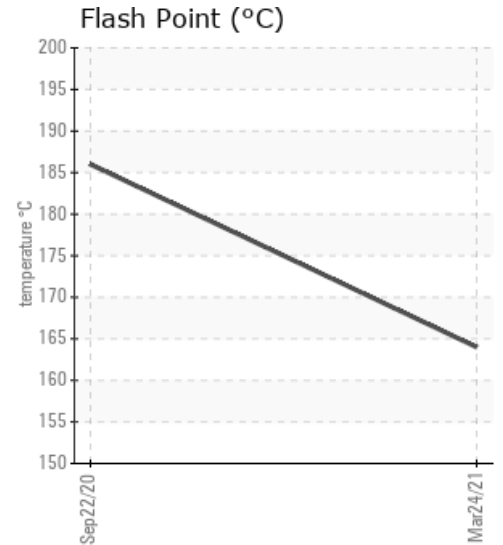
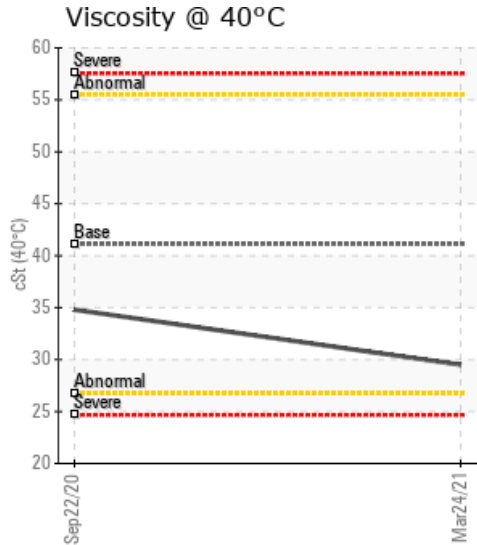
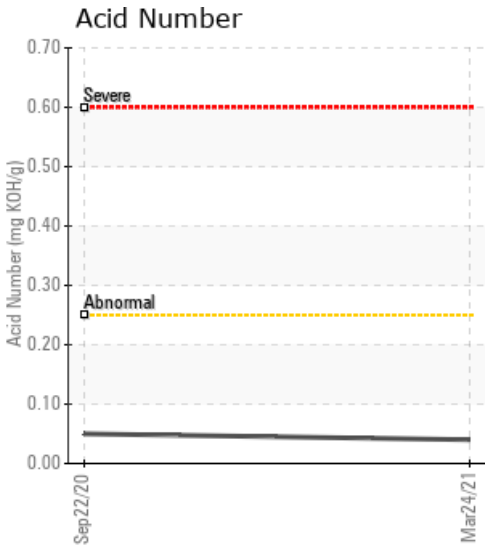
Sample Information

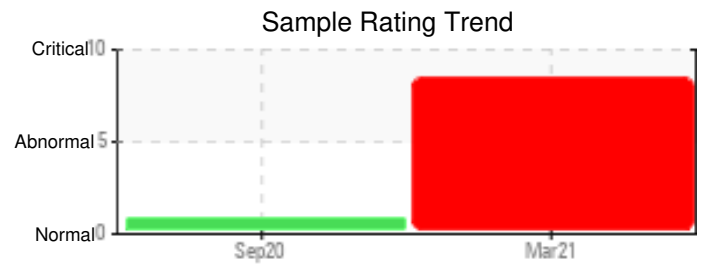
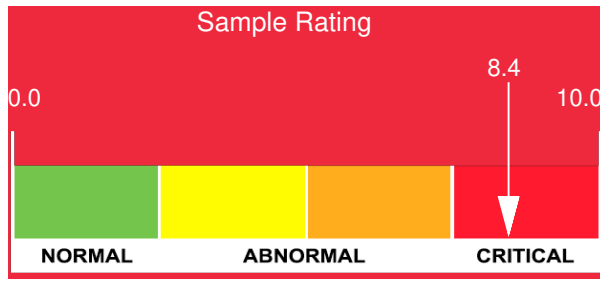
Lab No: 02412595
Analyst: Kevin McDermott
Sample Date: 03/24/21
Received Date: 03/31/21
Completed: 04/09/21
Kevin McDermott
kevin.mcdermott@hollyfrontier.com

Recommendation: Conditions from previous sample in Sept have worsened significantly. The flash point is now much lower than the bulk fluid temp which is a safety concern. The low boiler content is very high which can be reduced somewhat by venting off the surge tank but eventually the fluid will need to be replaced. These symptoms are either from thermal cracking or a process exchanger leaking hydrocarbons into the fluid. Cannot fully diagnose without knowing more about the process.

Comments: (GCD) % < 335°C is severely high. (GCD) 10% Distillation Point is severely low. COC Flash Point is severely low. (GCD) 90% Distillation Point is marginally low.

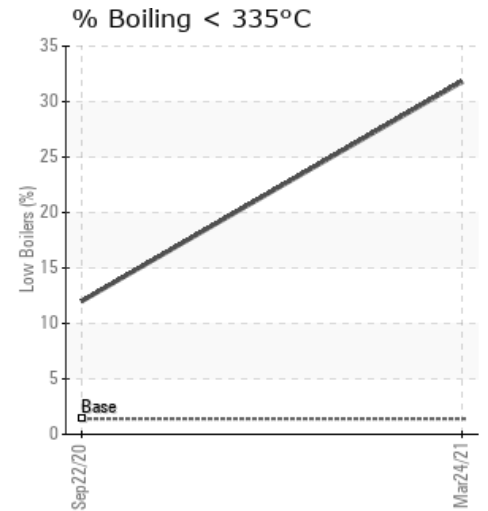
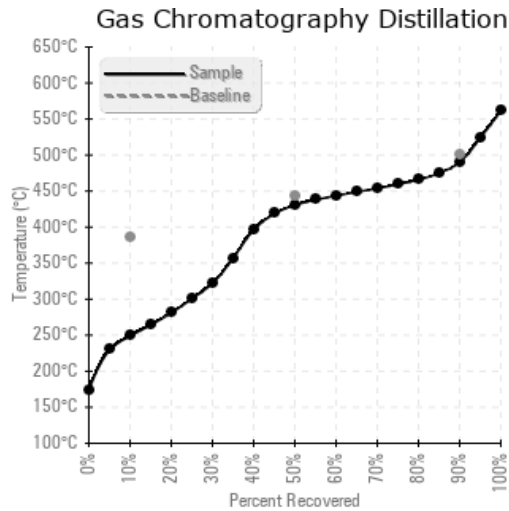
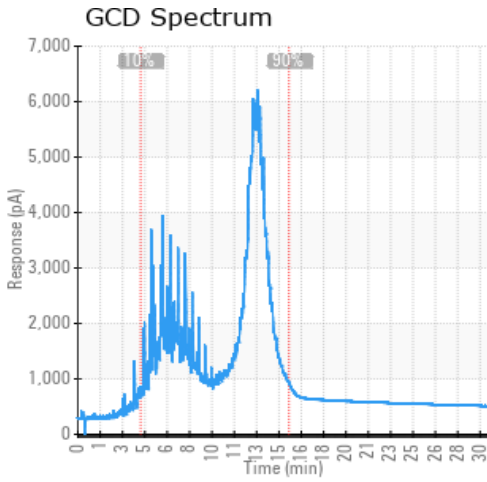
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
03/24/21	03/31/21	0.0y	Boiler	327 / 164	23.0	29.5	0.04	0.032	480 / 249	807 / 431	914 / 490	31.80
09/22/20	10/08/20	5.0y	Boiler	367 / 186	64.3	34.8	0.05	0.036	577 / 303	851 / 455	944 / 507	12.00
Baseline Data				464 / 240		41.1			727 / 386	828 / 442	932 / 500	1.4





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
03/24/21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/22/20	0	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	
09/22/20	Fluid is generally in good condition, however there is an unusually high degree of low-boiler content and reduced viscosity as well as lower-than-normal flash point. These symptoms could be caused by thermal degradation (cracking) or possibly exchanger leaking hydrocarbon liquids into the fluid. These are concerning, but not yet severe. Suggest another sample in 3 months to see if conditions worsen. (GCD) 10% Distillation Point is severely low. (GCD) % < 335°C is abnormally high. COC Flash Point is abnormally low.

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