

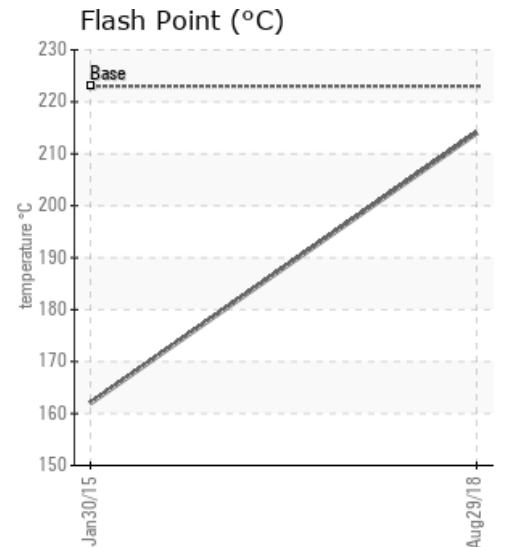
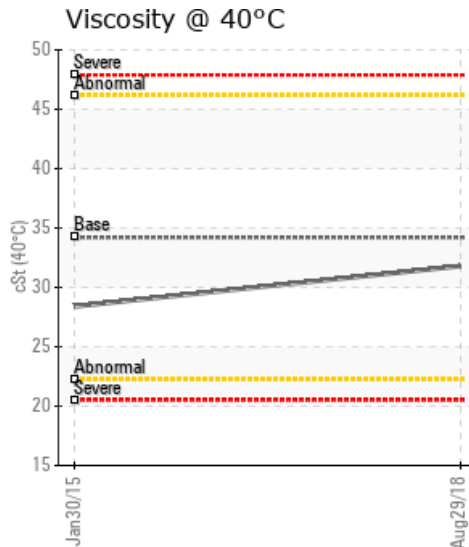
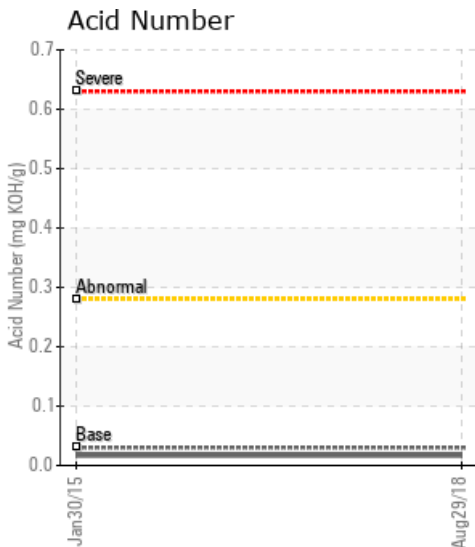
## Jenner 11-21-20-8W4M Heat Transfer System

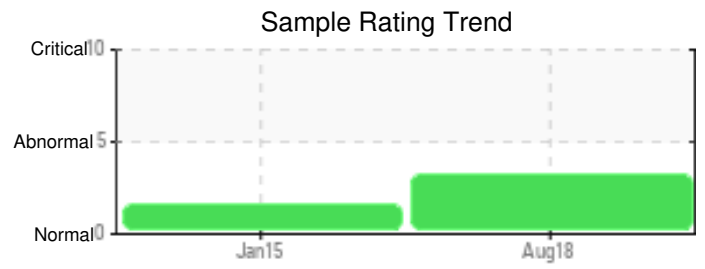
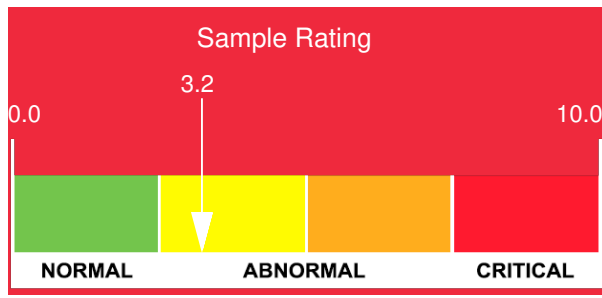
Customer: PTRHTF20153	System Information	Sample Information
CARDINAL ENERGY LTD 2702 BOX SPRING CLOSE NW SUITE B-103 MEDICINE HAT, AB T1C 0C8 Canada Attn: Travis Watts Tel: (403)548-9633 E-Mail: travisw@cardinalenergy.ca	System Volume: 5000 ltr Bulk Operating Temp: 581F / 305C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make:	Lab No: 02239068 Analyst: Kevin McDermott Sample Date: 08/29/18 Received Date: 09/13/18 Completed: 09/14/18 To discuss this report contact Kevin McDermott at (403)215-7052

Recommendation: Fluid is in very good condition overall. The only concern is the water content which is a little high. Often high water content can be a result of inadequate sample point purging at the time the sample was taken.

Comments: Water contamination levels are marginally high. Suggest submitting samples annually to proactively monitor fluid condition.

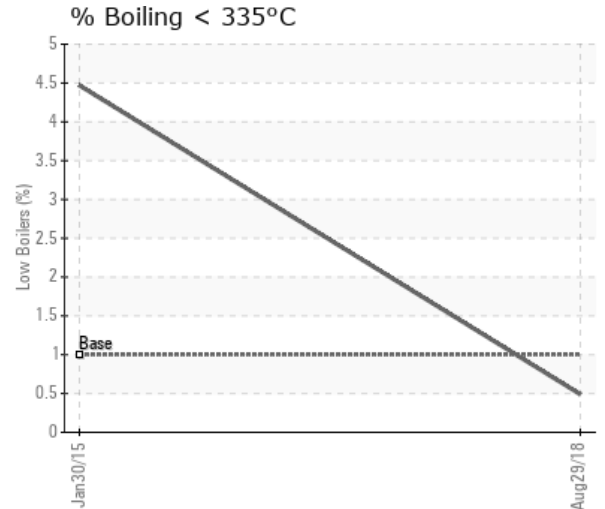
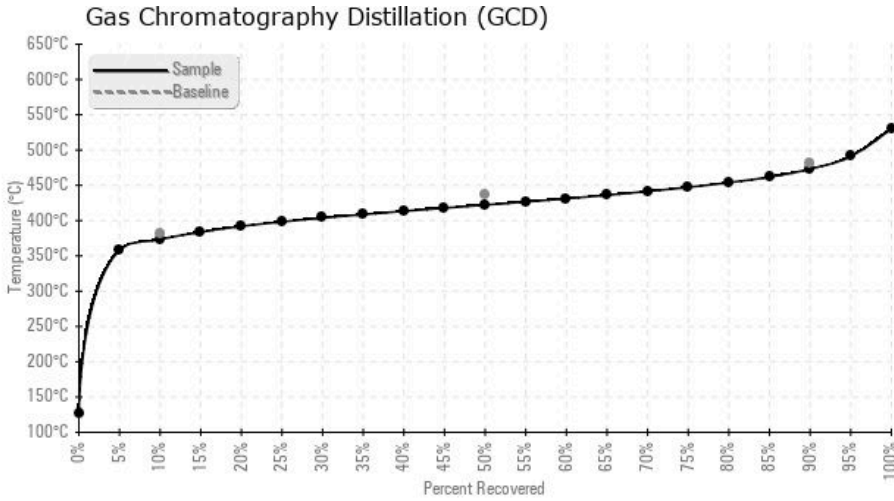
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
08/29/18	09/13/18	0y	PTRHTF20153	417 / 214	552.8	31.8	0.017	0.049	704 / 373	792 / 422	884 / 473	0.49
01/30/15	02/06/15	4y	PUMP DISCHARGE	324 / 162	174.5	28.4	0.017	0.034	681 / 361	807 / 431	905 / 485	4.47
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	
08/29/18	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
01/30/15	0	0	0	0	0	0	0	0	0	0	0	0	1	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	
01/30/15	The fluid is in good condition and suitable for further use. Thermal degradation of the fluid is taking place. Indications of this are low Flash Point (162c), viscosity and the presence of low boiler vapors. It is recommended to vent off the low boiler vapors to bring the Flash Point up to a more acceptable level. Please contact your Petro-Canada Technical Service Advisor for advise about venting.

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