

# [KEYERA BRAZEAU RIVER GAS PLANT / 3-12-46-14W5] HOT OIL SYSTEM PLT 1

**Customer: PTRHTF30084**  
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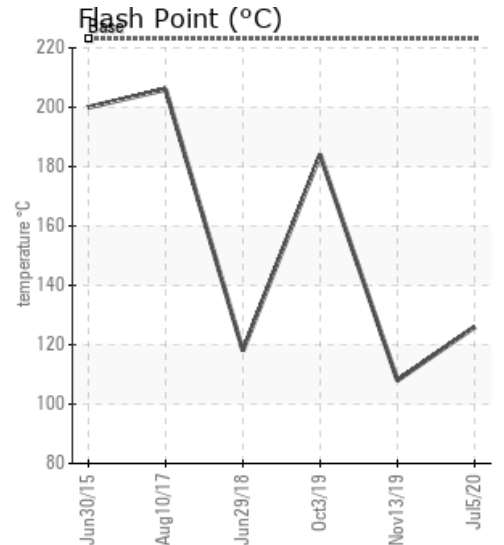
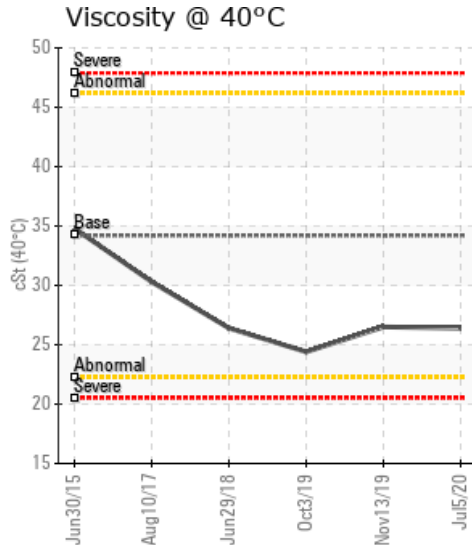
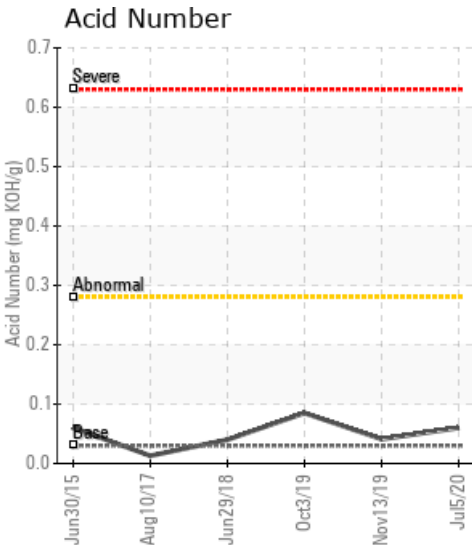
**System Information**  
 System Volume: 14000 ltr  
 Bulk Operating Temp: 446F / 230C  
 Heating Source:  
 Blanket:  
 Fluid: PETRO CANADA PETRO-THERM  
 Make: IAP HEATER

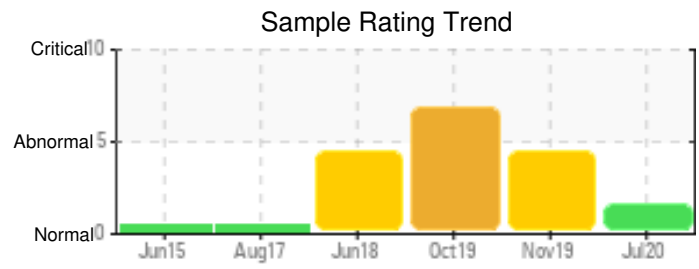
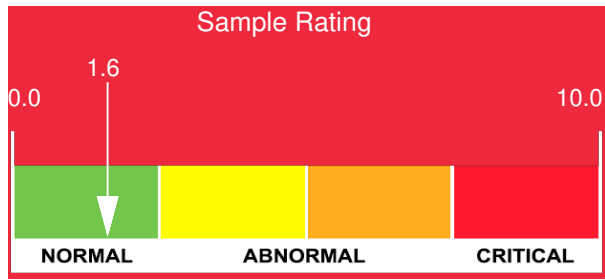
**Sample Information**  
 Lab No: 02364496  
 Analyst: Kevin McDermott  
 Sample Date: 07/05/20  
 Received Date: 07/14/20  
 Completed: 08/04/20  
 Kevin McDermott  
 kevin.mcdermott@petrocanadalsp.com

Recommendation: Fluid remains in good condition overall with very little change from the previous sample in Nov 2019. The viscosity is slightly low and the flash point is really low. Given the history these low values are likely from a previous exchanger leak.

Comments: COC Flash Point is severely low.

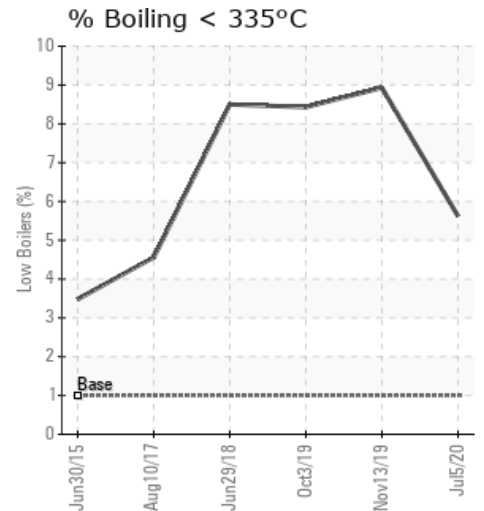
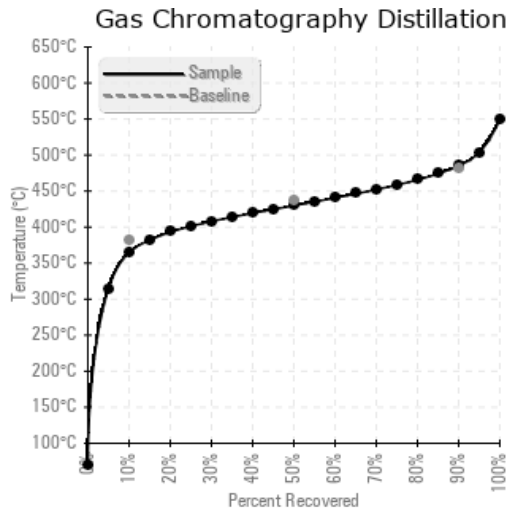
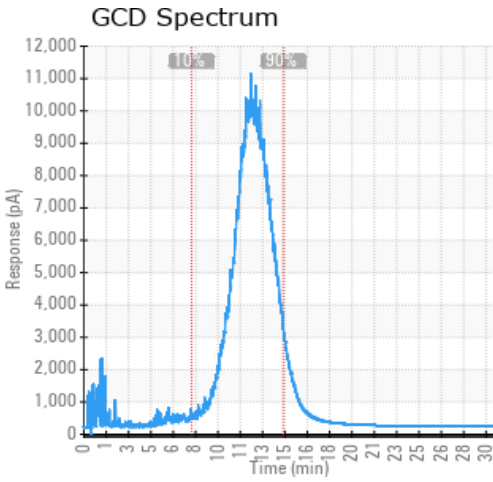
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
07/05/20	07/14/20	5y	SLIPSTREAM FILTER	259 / 126	40.4	26.4	0.06	0.032	689 / 365	806 / 430	905 / 485	5.62
11/13/19	11/20/19	0y	HOT/COLD 100P	226 / 108	18.1	26.5	0.041	0.116	642 / 339	778 / 415	882 / 472	8.93
10/03/19	10/30/19	9y	TANK	363 / 184	5187.7	24.4	0.085	0.044	647 / 342	781 / 416	888 / 476	8.43
06/29/18	07/10/18	0y	MAIN PUMP	244 / 118	55.2	26.4	0.04	0.026	649 / 343	784 / 418	889 / 476	8.50
08/10/17	08/22/17	2y	AT THE PUMP	403 / 206	4.2	30.3	0.013	0.021	687 / 364	801 / 427	904 / 485	4.56
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
07/05/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/13/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/03/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06/29/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08/10/17	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	
11/13/19	Nice to see absence of water that we saw in the Oct 30 sample. Must have been a bad sample. Suggest submitting annual samples - sooner if fluid gets exposed to stressed condition or exchange leak is suspected. Water content seen in previous sample is resolved. Flash point is very low, GCD 10% & viscosity also low. Likely from previous thermal cracking and/or exchanger leak. However these valve are all very similar to sample from July 2018.
10/03/19	Some level of thermal cracking has occurred over time but no additional degradation since the June 2018 sample. There is significant amount of water present in the fluid sample. Water contamination can sometimes be from a poorly purged sample point. Suggest to submit another sample ensuring a thorough purge of sample point. (GCD) 10% Distillation Point is abnormally low. (GCD) % < 335°C is marginally high. COC Flash Point is marginally low.
06/29/18	The very low flash point, decrease in viscosity and increasing GCD<335 indicate that thermal cracking is occurring. Suggest venting off light ends from fluid. Also make sure there is adequate circulation to prevent further thermal degradation. COC Flash Point is severely low. (GCD) % < 335°C is marginally high. (GCD) 10% Distillation Point is marginally low.
08/10/17	Fluid remains in very good condition. Very little change from the June 2015 sample. Suggest annual sample submission to proactively monitor fluid condition.

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