

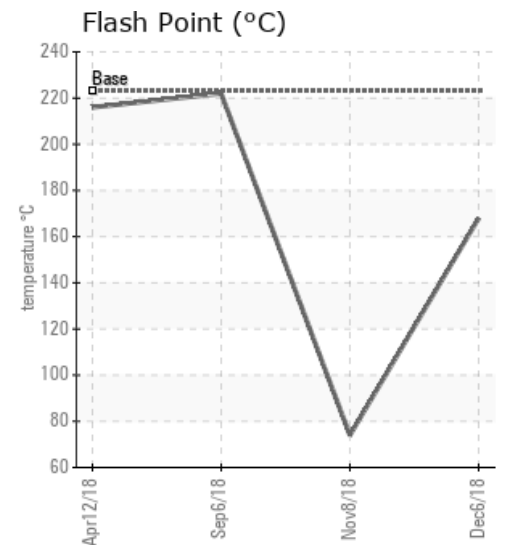
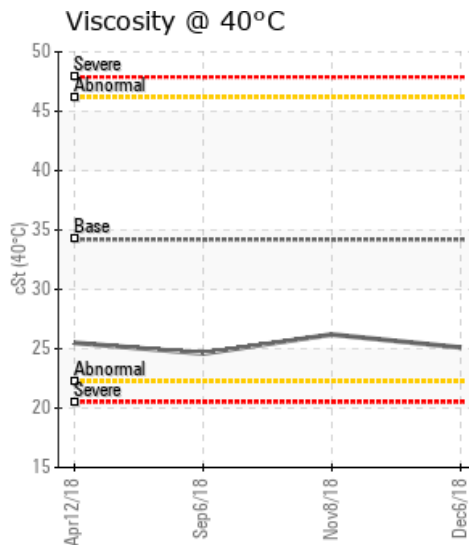
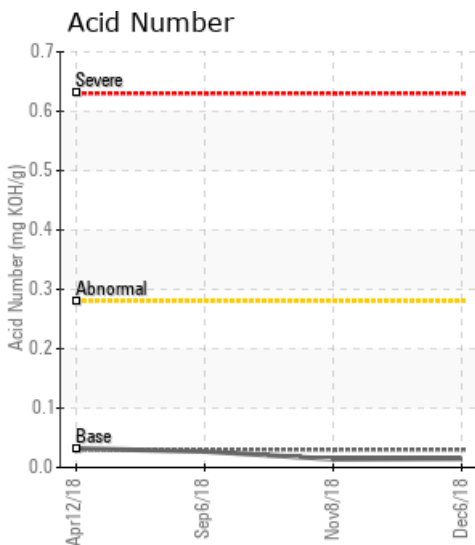
## H-3700/H-3750 LSD^ 14-23-58-26W45

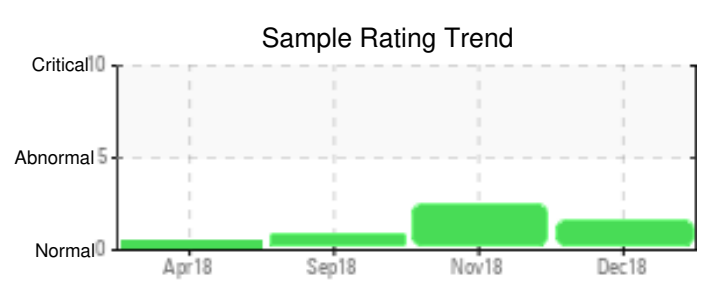
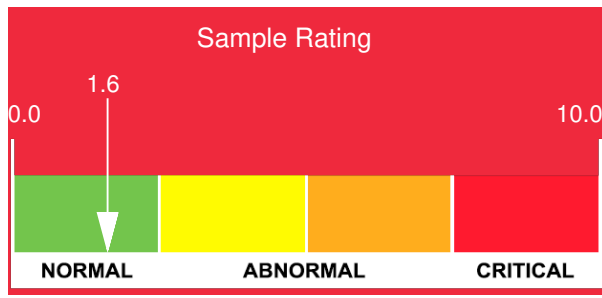
Customer: PTRHTF20103	System Information	Sample Information
CNRL WEST PLANT P.O. BOX 6808 EDSON, AB T7E 1L5 Canada Attn: Rodney Marcichiw Tel: (780)517-3542 E-Mail: rodney.marcichiw@cnrl.com	System Volume: 10000 ltr Bulk Operating Temp: 365F / 185C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: PETRO TECH HEATERS	Lab No: 02256871 Analyst: Peter Hartevelde Sample Date: 12/06/18 Received Date: 12/12/18 Completed: 12/18/18

Recommendation: The Flash Point and viscosity of the fluid are low and % boil-off <335C is slightly high. This can be the result of blanket gas ingress and/or thermal degradation. It is recommended to vent low boiler vapor to atmosphere on a regular basis. Fluid condition is good and suitable for further use. Please re-sample in 6 months.

Comments: COC Flash Point is abnormally low.

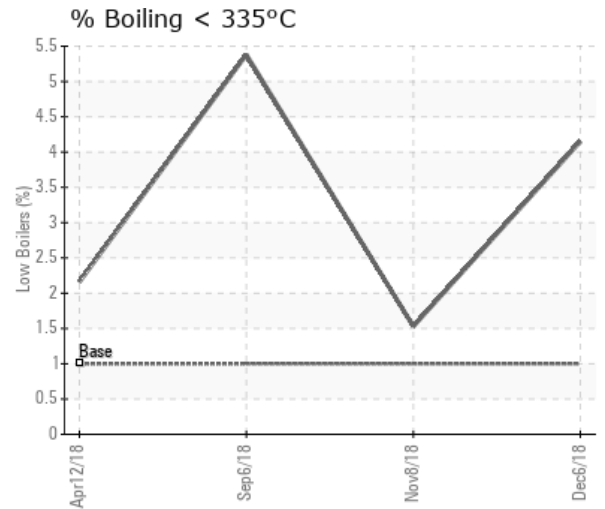
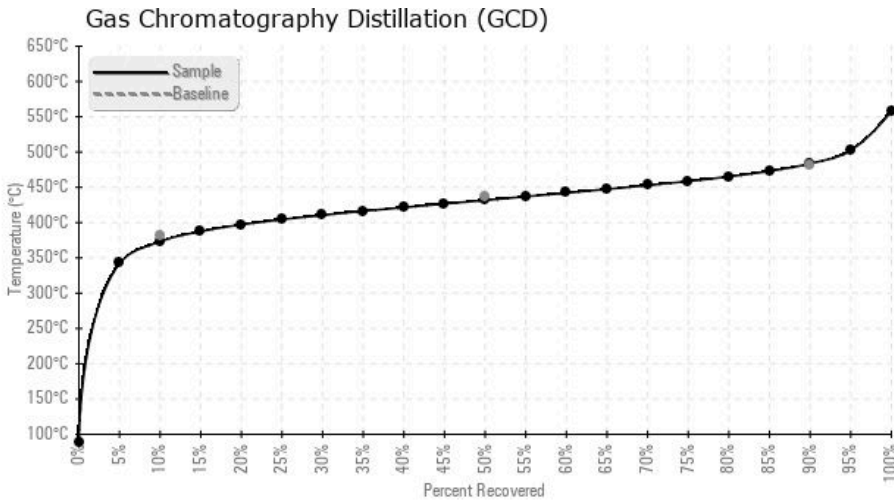
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
12/06/18	12/12/18	0y		334 / 168	57.1	25.1	0.015	0.055	704 / 373	809 / 432	903 / 484	4.15
11/08/18	11/15/18	0y		165 / 74	19.6	26.2	0.014	0.045	694 / 368	787 / 420	877 / 469	1.53
09/06/18	09/11/18	11y		432 / 222	43.0	24.6	0.027	0.050	704 / 373	788 / 420	872 / 467	5.38
04/12/18	04/19/18	10y		421 / 216	48.8	25.5	0.032	0.024	716 / 380	818 / 436	909 / 487	2.16
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
12/06/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/08/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/06/18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
04/12/18	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
<b>Baseline Data</b>			0	0						0			0	0					0				0	

Elemental analysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]



Historical Comments	
11/08/18	The Flash Point of the fluid is very low. This can be a safety hazard when the fluid comes into contact with air and a source of ignition. The viscosity and 90% GCD temperature are low. All of this combined points to ingress of a hydro-carbon process fluid. Please check for internal leaks and re-sample after the problem has been corrected. COC Flash Point is severely low. (GCD) 90% Distillation Point is marginally low.
09/06/18	The fluid is in a good condition and suitable for further use. Viscosity and 90% GCD temperature are low and not representative for Petro-Therm. The % boil-off <335°C. (low boiler vapor and blanket gas content of the fluid) is increasing. 5.4% is not yet a problem but it is recommended to start venting the low boiler vapors to atmosphere. Pump cavitation problems and flow stagnation may be observed when the low boiler vapor content exceeds 7%. (GCD) 90% Distillation Point is abnormally low.
04/12/18	The fluid is in a good condition and suitable for further use but the viscosity is very low and not representative for Petro-Therm. Please resample in 6 months.

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