

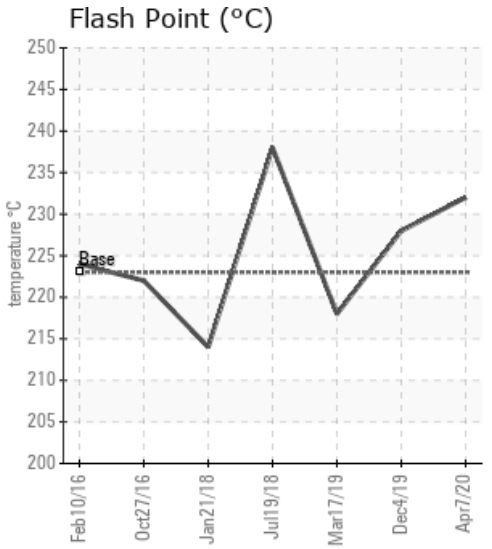
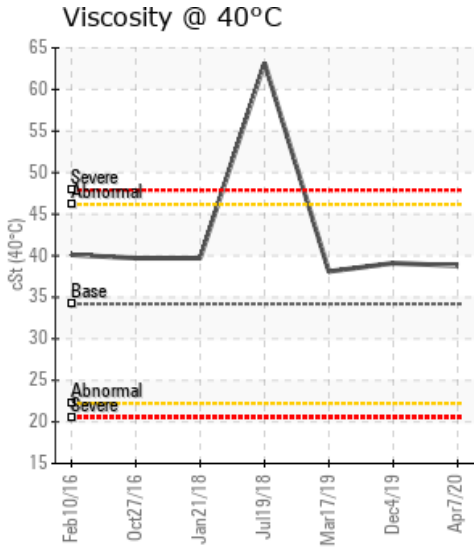
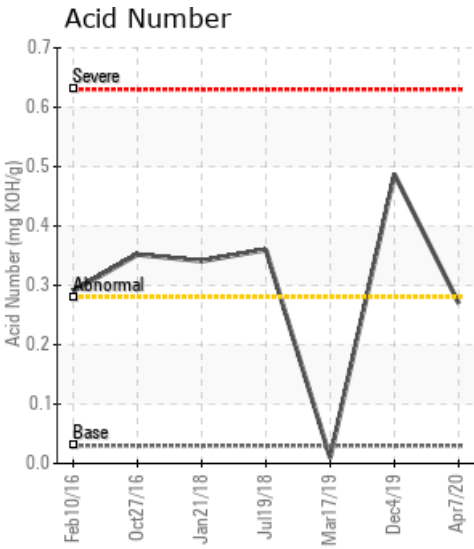
## [11-21-55-20W5M] H-1210

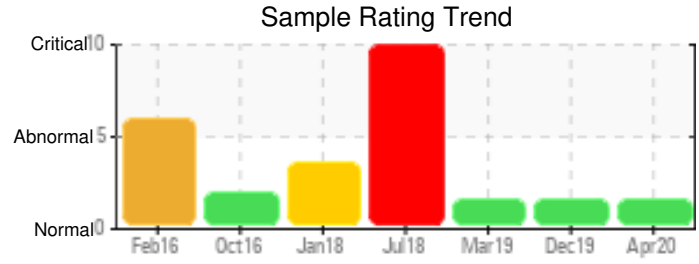
Customer: PTRHTF20228	System Information	Sample Information
PEYTO EXPLORATION Box 7198 EDSON, AB T7E 1V4 Canada Attn: Logan Pillage Tel: (780)712-9444 E-Mail: Lpillage@Peyto.com	System Volume: 26000 ltr Bulk Operating Temp: 320F / 160C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: ALCO	Lab No: 02348703 Analyst: Peter Harteveld Sample Date: 04/07/20 Received Date: 04/14/20 Completed: 04/24/20 Peter Harteveld peter.harteveld@petrocanadalsp.com

Recommendation: The fluid is in a good condition and suitable for further use. Despite the kidney loop filtration the solids content of the fluid has increased slightly. There is no indication in the analysis to explain this. It means it's either related to the repeatability/reproducibility of the test method or filtration is not efficient. Please ensure that filter elements are replaced before they reach high delta p to avoid rupture and/or solids carry-over. Please re-sample in 6 months.

Comments: Pentane Insolubles levels are severely high.

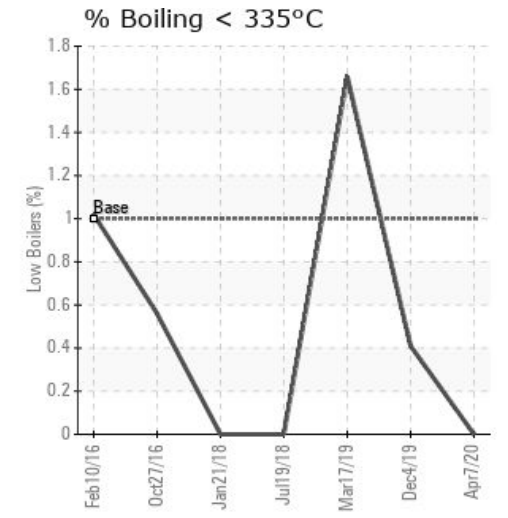
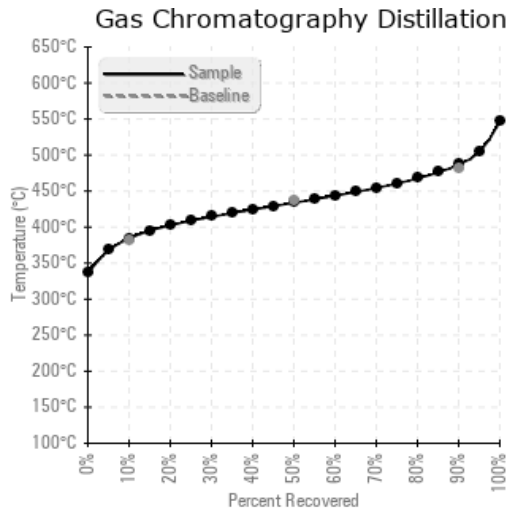
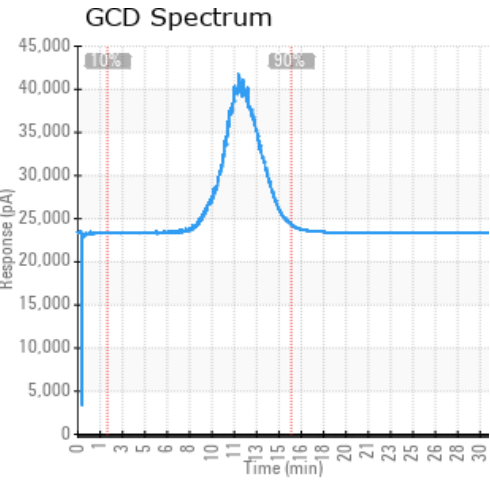
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
04/07/20	04/14/20	0y		450 / 232	10.6	38.8	0.27	0.934	724 / 384	813 / 434	908 / 487	0.00
12/04/19	12/09/19	0y	DISCHARGE	442 / 228	25.9	39.1	0.487	0.723	716 / 380	808 / 431	908 / 487	0.41
03/17/19	03/18/19	0y	DISCHARGE OF THE PUM	424 / 218	12.5	38.1	0.01	1.11	702 / 372	798 / 426	896 / 480	1.66
07/19/18	08/08/18	2y	PUMP DISCHARGE	460 / 238	1507.7	63.2	0.36	1.20	717 / 381	799 / 426	890 / 477	0.00
01/21/18	01/24/18	0y		417 / 214	15.6	39.7	0.341	0.955	749 / 398	823 / 440	895 / 480	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
04/07/20	35	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
12/04/19	36	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
03/17/19	31	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
07/19/18	375	0	0	0	0	0	0	0	0	0	4	11	0	0	0	0	4	0	0	0	3	0	1	2
01/21/18	38	0	0	0	0	0	0	0	0	0	4	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	
12/04/19	The fluid is in a good condition and suitable for further use. AN is slightly high which has resulted in some corrosion to take place. (Fe)Pentane insolubles (solids) content has just exceeded the reportable limit of 0.5% with 0.7%. This is not a problem at this moment. System is equipped with kidney loop filtration which seems to work efficient. Next sample will show that better. Please resample in 6 months. Comment for Logan: it is not recommended to connect this system with system H-802 because the fluid of system H-802 would contaminate this Fluid resulting in a reduction of the remaining life of the Fluid. It would also foul system H-1210 Pentane Insolubles levels are severely high. Acid Number (AN) is abnormally high.
03/17/19	The fluid is in a good condition but the Pentane Insoluble (solids) content is high. It is recommended to start filtration of the fluid and re-sample when filtration is completed. Pentane Insolubles levels are severely high.
07/19/18	The fluid is in a poor condition. The water content is too high which has resulted in a high Fe content as a result of corrosion. Viscosity is high. The Pentane Insoluble (solids) content is double that of the reportable limit which is 0.5%. If this sample was not taken from a low drain point in the system and thus representative for the fill of the system, it is recommended to clean/flush the system and fill with fresh Petro-Therm.PQ levels are severe. Iron ppm levels are abnormal. Water contamination levels are severely high. Water contamination levels are severely high. Pentane Insolubles levels are severely high. Visc @ 40°C is severely high. Acid Number (AN) is abnormally high.
01/21/18	The fluid is showing signs of degradation but is in a reasonable condition and suitable for further use. It is however recommended to start filtration of the fluid to lower the Pentane Insoluble (solids) content to a more acceptable level. The warning limit for solids is 0.5% and this sample contains almost twice the amount of solids. Pentane Insolubles levels are severely high. Acid Number (AN) is abnormally high. (GCD) 10% Distillation Point is marginally high.

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