

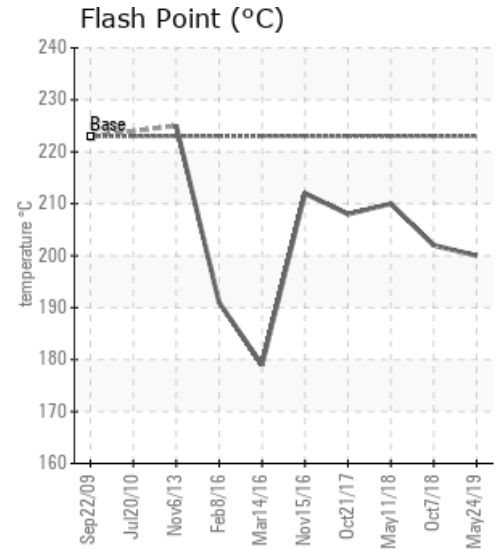
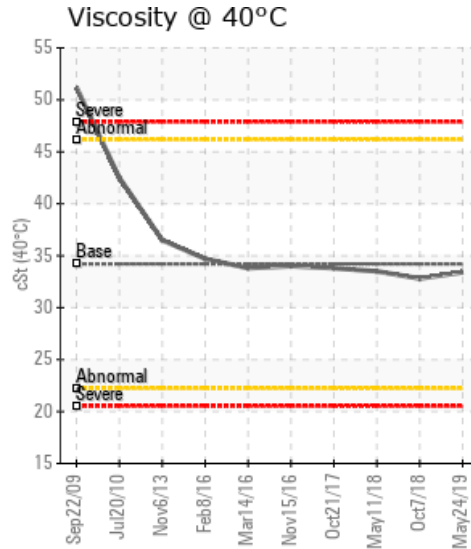
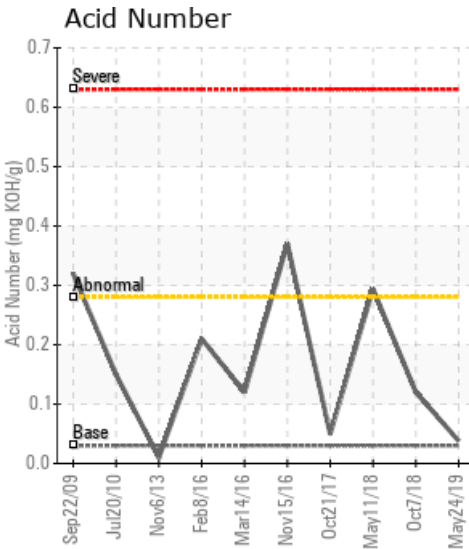
[4-21-55-23-W5M / Peyto Wildhax] H802

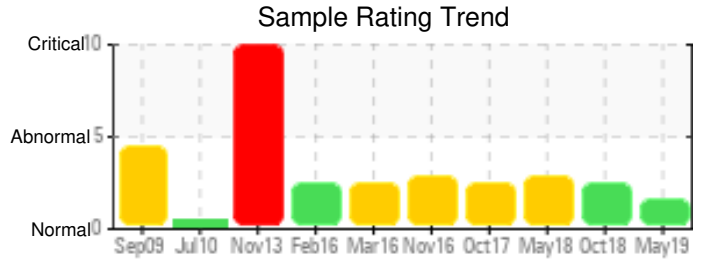
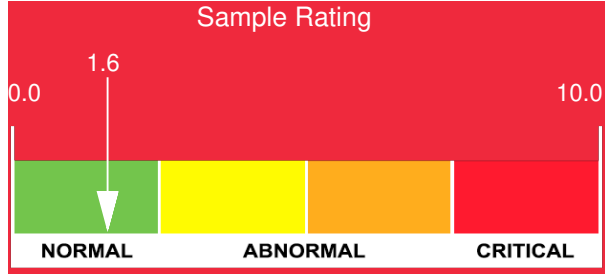
Customer: PTRHTF20124	System Information	Sample Information
PEYTO EXPLORATION BOX 7198 EDSON, AB T7E 1V4 Canada Attn: Brian Ford Tel: (780)712-0977 E-Mail: bford@peyto.com	System Volume: 15000 ltr Bulk Operating Temp: 347F / 175C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: ALCO OIL AND GAS	Lab No: 02288604 Analyst: Peter Harteveld Sample Date: 05/24/19 Received Date: 06/03/19 Completed: 06/04/19

Recommendation: The fluid is in a reasonable condition and suitable for further use. A slightly low Flash Point and 10% GCD temperature in combination with an elevated low boiler vapor content of 4.67% are indications of thermal degradation of the fluid. Please vent off the low boiler vapor to atmosphere. The pentane insolubles (solids) content of the fluid is almost 3x the reportable limit of 0.5%. It is recommended to start filtration of the fluid. Please re-sample in 6 months.

Comments: Pentane Insolubles levels are severely high.

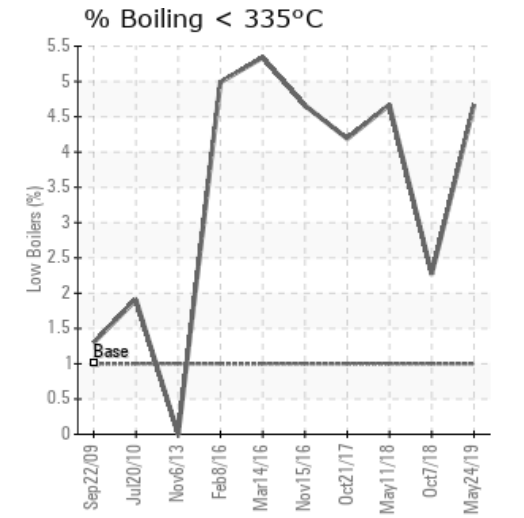
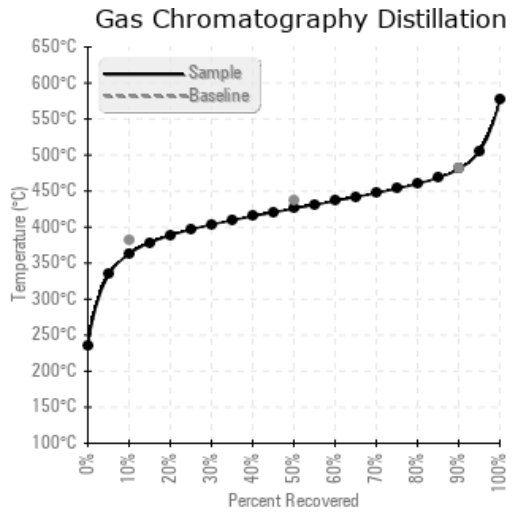
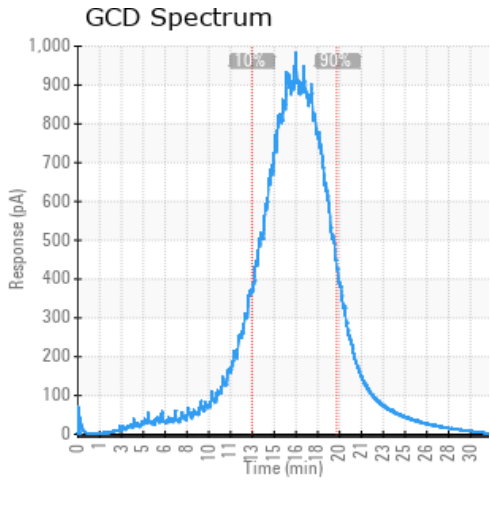
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
05/24/19	06/03/19	0m	DISCHARGE SIDE PUMP	392 / 200	24.3	33.4	0.038	1.37	685 / 363	798 / 426	897 / 480	4.67
10/07/18	10/17/18	0m		396 / 202	17.0	32.8	0.12	0.749	694 / 368	789 / 421	875 / 468	2.27
05/11/18	05/31/18	0m	DISCHARGE SIDE PUMP	410 / 210	23.7	33.5	0.294	1.04	686 / 364	802 / 428	887 / 475	4.67
10/21/17	10/30/17	0m	DOWNSTREAM OF PUMP	406 / 208	6.1	33.8	0.05	1.15	694 / 368	811 / 433	900 / 482	4.19
11/15/16	12/23/16	0m	DOWNSTREAM OF PUMP	414 / 212	0.7	34.0	0.370	0.879	688 / 365	808 / 431	898 / 481	4.66
03/14/16	03/15/16	0m	DISCHRG SIDE OF PUMP	354 / 179	8.7	33.8	0.12	0.926	681 / 360	802 / 428	897 / 480	5.34
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
05/24/19	78	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	1	0	0	0	2	0	1	0
10/07/18	75	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	1	0	0	0	2	0	1	0
05/11/18	85	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	1	0	0	0	1	0	0	0
10/21/17	86	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	1	0	0	0	0	0	0	0
11/15/16	84	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	1	0	0	0	0	0	0	0
03/14/16	90	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0	1	0	1	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	
10/07/18	The fluid is in a good condition and suitable for further use. A slightly low Flash Point and 10% GCD temperature in combination with 2.27% low boiler vapor indicates normal thermal degradation. 90% GCD temperature is slightly low. This is no problem for system operation at this time. It is recommended to vent low boiler vapor to atmosphere on a regular basis. The Pentane Insoluble (solids) content of the fluid is lower than before but still exceeds the reportable limit of 0.5%. Therefore filtration of the fluid is recommended. Pentane Insolubles levels are severely high. (GCD) 90% Distillation Point is marginally low.
05/11/18	The fluid is in reasonable condition but shows signs of thermal degradation. Fluid is suitable for further use. The low boiler vapor content is high (% boil-off <335C.) and the GCD 10% temperature is low. Pentane Insolubles (solids content) is high at 2x the limit (= 0.5%). It is recommended to vent off the low boiler vapors to atmosphere and start filtration of the fluid to lower the solids content. Please re-sample in 6 months. Pentane Insolubles levels are severely high. Acid Number (AN) is abnormally high.
10/21/17	The fluid is in a reasonable condition and suitable for further use but shows signs of thermal degradation. Indications of this are: Elevated % boil-off below 335 degrees C, slightly low 10% GCD temperature and increase in Pentane Insoluble (solids) content. It is recommended to vent off low boiler vapors to atmosphere on a regular basis and start filtration to lower the solids content. Please re-sample in 6 months and list the service life of the fluid at that time. Pentane Insolubles levels are severely high.
11/15/16	Flash Point is good. TAN has increased. Percentage boil-off <335 degrees C. has remained about the same. The 10% GCD temperature still shows a slight decrease. These are all indications of thermal degradation. Pentane Insoluble (solids) content is high. Filtration of the fluid is required. Please re-sample after 6 months. Indicate oil service life at the next sample !!! Pentane Insolubles levels are severely high. Acid Number (AN) is abnormally high.
03/14/16	Flash Point of the fluid has decreased further. TAN shows a slight decrease. Percentage boil-off <335 degrees C. has remained about the same. The 10% GCD temperature still shows a slight decrease. These are all indications of thermal degradation. Pentane Insoluble (solids) content is high. Filtration of the fluid needs to be continued for a longer period of time. Please re-sample after 6 months. Indicate oil service life at the next sample !!! Pentane Insolubles levels are severely high. COC Flash Point is marginally low.

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