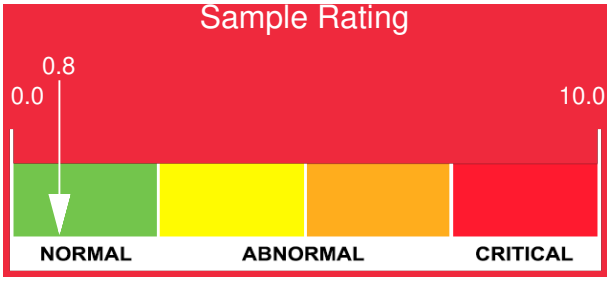
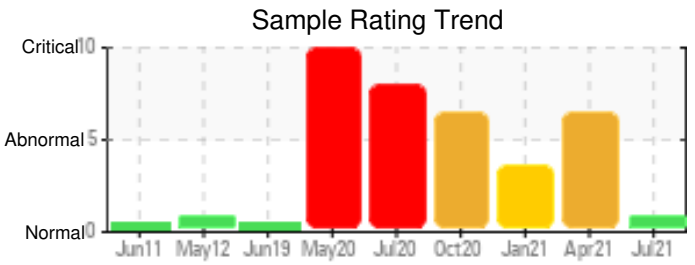




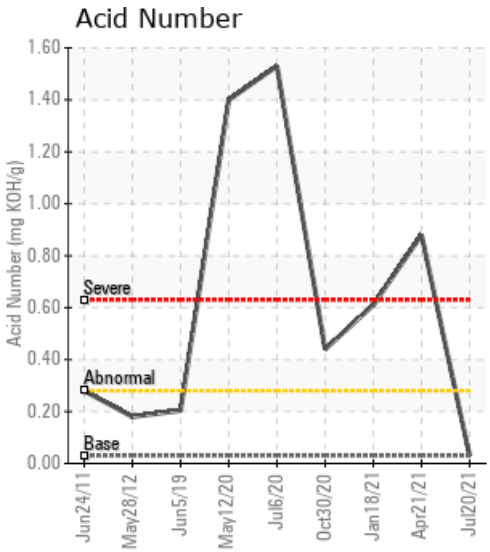
[02-11-60-04W6] H-802 Peyto Kakwa

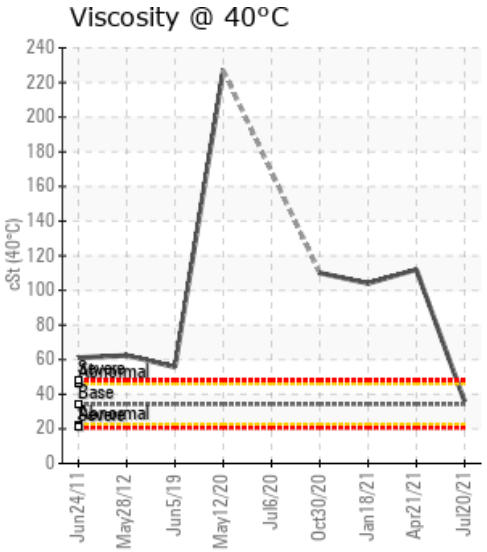
Customer: PTRHTF20175	System Information	Sample Information
QUADRA CHEMICALS 7802 98 STREET CLAIRMONT, AB T0H 0W0 Canada Attn: Quadra Samples Tel: E-Mail: quadra_samples@quadra.ca	System Volume: 30000 ltr Bulk Operating Temp: 752F / 400C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: ALCO	Lab No: 02436099 Analyst: Clinton Buhler Sample Date: 07/20/21 Received Date: 08/10/21 Completed: 08/11/21 Clinton Buhler Clinton.Buhler@hollyfrontier.com

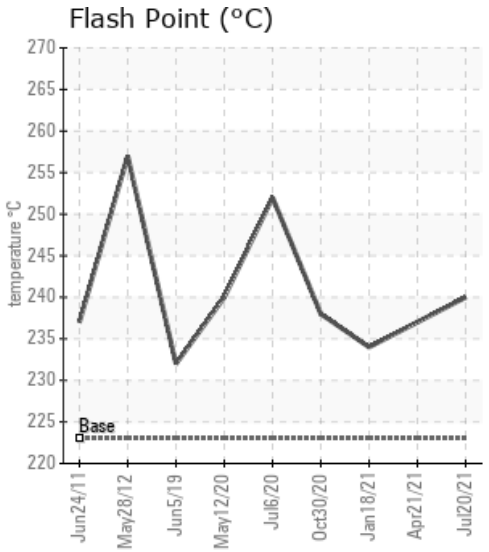
Recommendation: This appears to be the first sample taken since the system cleaning and fluid replacement that Peyto executed the week of July 12, 2021. Fluid condition has drastically changed for the better since this work: Fluid viscosity, solids content and acid number are back closer to like new levels. There is some indication of small amounts of residual degraded fluid remaining behind (slightly elevated flash point, 10 and 90% GCD temperature and viscosity (although this is vastly improved)).Please re-sample in 1 months time to help establish a trend for the fluid. Please ensure that blanket gas is operational above the fluid level in the expansion tank to help protect the fluid from oxidation in the future.

Comments: (GCD) 90% Distillation Point is marginally high.

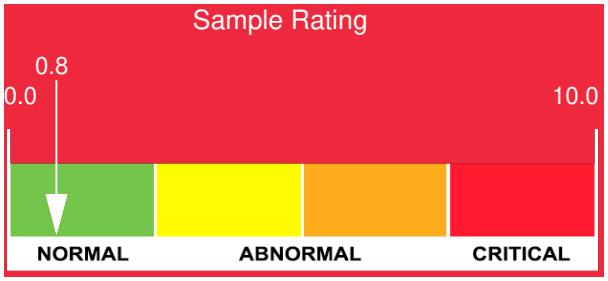
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
07/20/21	08/10/21	0.0m	Discharge pump	464 / 240	25.3	35.8	0.03	0.071	742 / 394	820 / 438	922 / 495	0.00
04/21/21	05/21/21	6.0m	Discharge after pump	459 / 237	21.2	112	0.88	1.60	735 / 391	820 / 438	920 / 494	0.47
01/18/21	02/04/21	3.0m	Pump discharge	453 / 234	0.7	104	0.61	1.94	743 / 395	829 / 443	911 / 488	0.00
10/30/20	11/20/20	0.1m	24 hour sample	460 / 238	51.6	110	0.44	2.15	745 / 396	833 / 445	922 / 494	0.00
07/06/20	10/13/20	0.0m	FILTER INLET	486 / 252	545.9		1.53	7.07	769 / 409	845 / 452	898 / 481	0.89
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

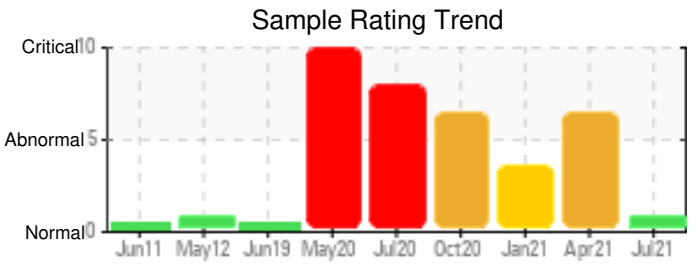






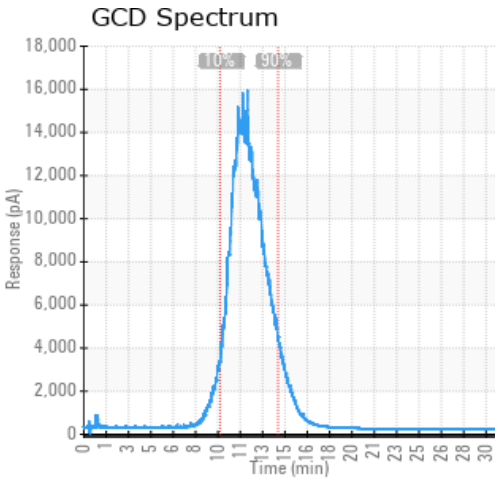
PETRO-CANADA LUBRICANTS

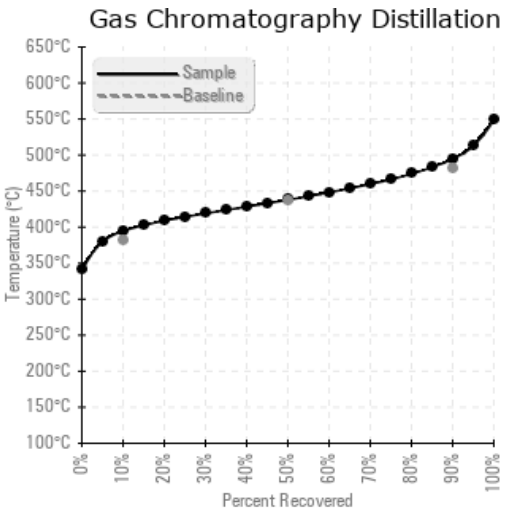


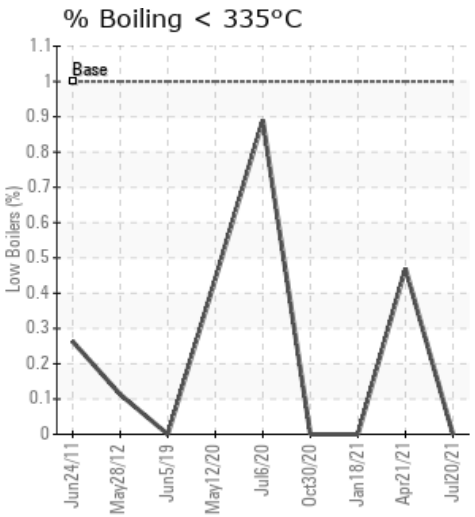


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
07/20/21	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3
04/21/21	142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	2
01/18/21	151	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	1	0	0	0	1	0	2	2
10/30/20	164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	2	2
07/06/20	52	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 anaysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]







Historical Comments

04/21/21	Sample results indicate continued fluid oxidation; see Acid Number and viscosity increases. Solids content remains high. It is advised to perform a system cleaning and fluid replacement. Please ensure that expansion tank blanket gas is properly operational.
01/18/21	Sample results indicate that the fluid has maintained similar condition to the previous sample taken 3 months prior which was taken 24 hours after the system was sweetened. Fluid viscosity remains over 3x that of fresh fluid and Acid Number and Solids content remain elevated. It is advised to continue to make plans to clean system and re-fill with fresh fluid during warmer months. Please re-sample in 3 months. Pentane Insolubles levels are severely high. Visc @ 40°C is severely high. Acid Number (AN) is abnormally high.
10/30/20	The sweetening of the system has improved the condition of the fluid. Viscosity is now measurable but is quite high at 110cSt and needs to be closely monitored. The sweetening of the system has also brought down the fluid`s Acid Number and Solids content although solids is still high. Please ensure blanket is set between 2-3 psi. Continue to make plans for system cleaning in 2021. Please re-sample system on or after December 30, 2020 so we can continue to trendIron ppm levels are marginal. Pentane Insolubles levels are severely high. Visc @ 40°C is severely high. Acid Number (AN) is abnormally high. (GCD) 90% Distillation Point is marginally high.
07/06/20	This fluid is heavily oxidized. Pentane Insolubles are at 7.07, viscosity is too high to measure, and acid number is severely high. Fluid needs to be changed. Pentane Insolubles levels are severely high. Water contamination levels are marginally high. Water contamination levels are marginally high.. ppm Water contamination levels are marginally high. Acid Number (AN) is severely high. (GCD) 10% Distillation Point is abnormally high. (GCD) 50% Distillation Point is marginally high. Viscosity is too high to measure.