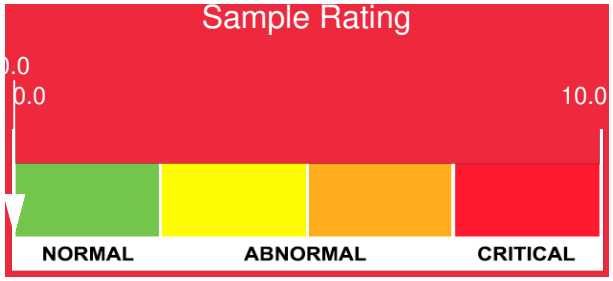
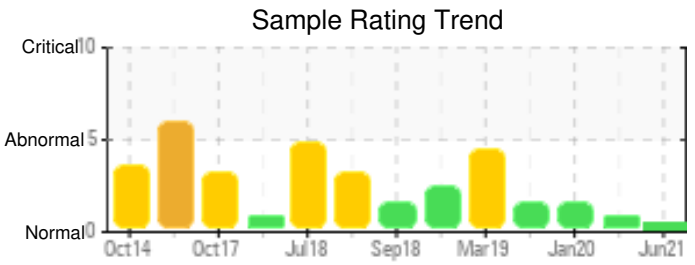




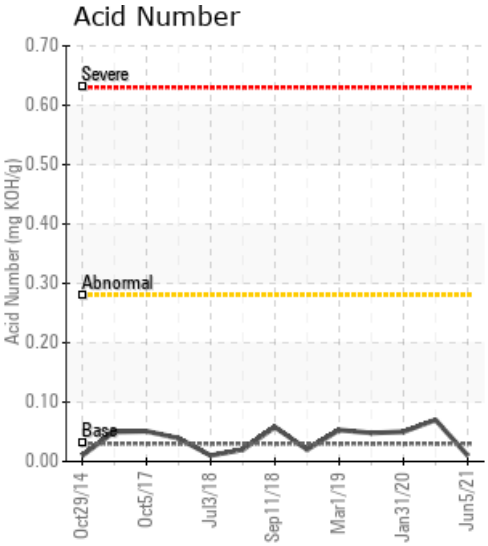
[LSD / 6-25-45-10W5] H-704

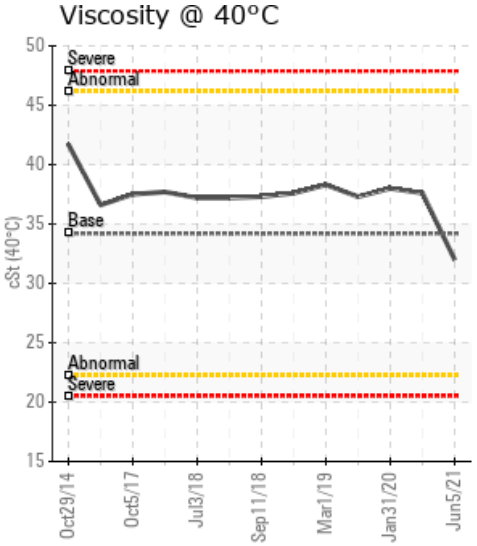
Customer: PTRHTF20190	System Information	Sample Information
Cenovus Sand Creek 5023 54A Ave Eckville, AB T0M 0X0 Canada Attn: Brendon Emmett Tel: (780)898-7136 E-Mail: brendon.emmett@cenovus.com	System Volume: 43000 ltr Bulk Operating Temp: 455F / 235C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: BORN	Lab No: 02426841 Analyst: Kevin McDermott Sample Date: 06/05/21 Received Date: 06/14/21 Completed: 06/16/21 Kevin McDermott kevin.mcdermott@hollyfrontier.com

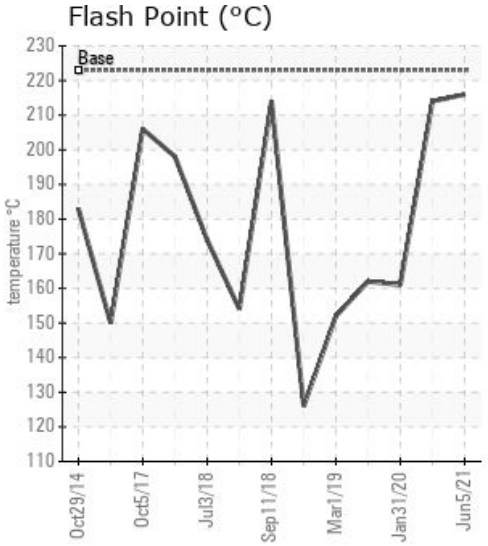
Recommendation: Fluid is in excellent condition.

Comments:

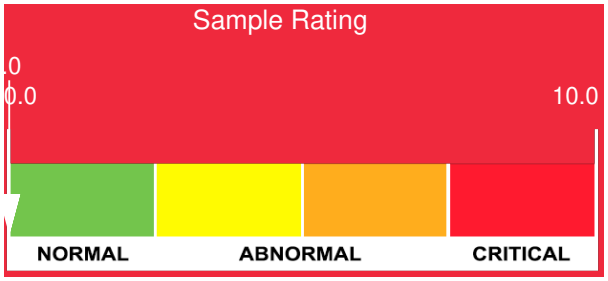
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
06/05/21	06/14/21	4.0d	PUMP SAMPLE PUMP	421 / 216	29.1	32.0	0.01	0.030	719 / 382	818 / 437	911 / 488	2.47
04/14/21	04/23/21	25.0d	Pump discharge	417 / 214	182.5	37.6	0.07	0.042	710 / 377	831 / 444	929 / 499	5.89
01/31/20	02/04/20	23.0d	DISCHARGE P832	322 / 161	122.4	38.0	0.050	0.077	726 / 386	842 / 450	895 / 480	5.85
03/25/19	03/27/19	23.0d	OUTLET OF SURGE DRUM	324 / 162	126.4	37.3	0.048	0.013	739 / 393	841 / 450	913 / 489	3.14
03/01/19	03/07/19	22.0d	SUPPLY	306 / 152	31.3	38.3	0.053	0.080	690 / 366	825 / 441	900 / 482	6.86
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

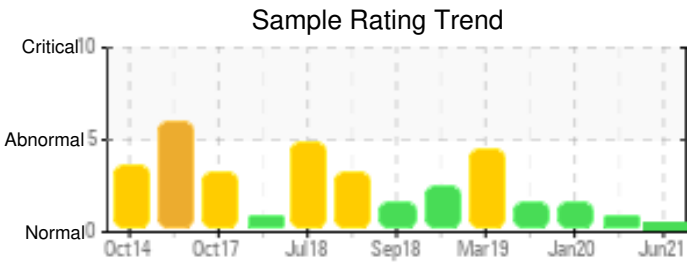






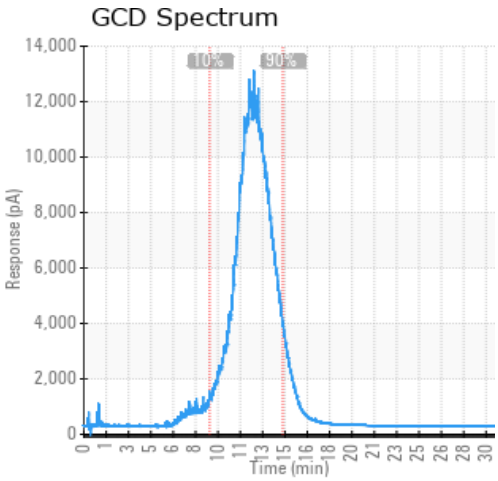
PETRO-CANADA LUBRICANTS

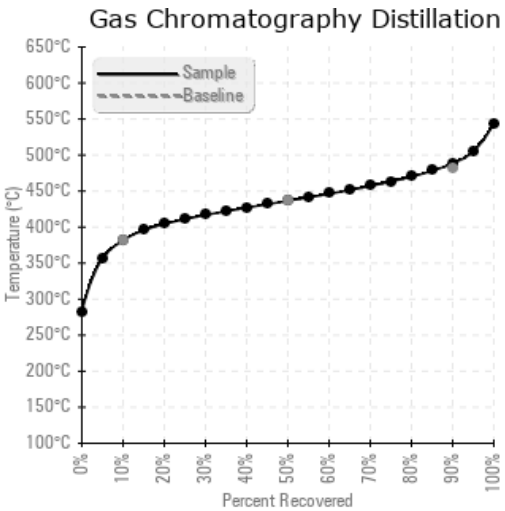


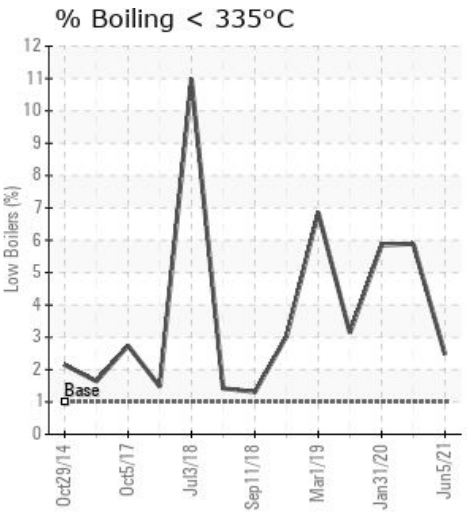


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
06/05/21	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	3
04/14/21	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01/31/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/25/19	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
03/01/19	2	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	4	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

04/14/21	The fluid is in a reasonable condition. Low boiler vapor content (GCD% <335C.) is slightly high at 5.89% (fresh = 1%). This can be lowered by venting the vapors to atmosphere. The 90% GCD temperature is high which indicates degradation of the fluid by oxidation. The sample was taken mainly to look at Pentane Insolubles (solids) content of the fluid to determine whether one cleaning run is sufficient for cleaning of the system which will take place during the week of May 31st. The solids content hasn't changed significantly since January 2020 and therefore one cleaning run is still recommended. (GCD) 90% Distillation Point is abnormally high.
01/31/20	The fluid is in a similar condition as it was in March of 2019. The Flash Point is low and low boiler vapor content (GCD% <335C.) has increased. These are indications of thermal degradation. The Pentane Insoluble (solids) content of the fluid has increased but is still sufficiently low to clean the system with one cleaning run followed by a flush. COC Flash Point is severely low.
03/25/19	COC Flash point is low indicating that venting of the system to expel low boils is required. Vent system safely and resample. COC Flash Point is severely low.
03/01/19	Cleveland open cup Flashpoint amd GCD 10% are very low and GCD 335°C is slightly high. Venting of heat transfer system to eliminate light ends is part of good fluid maintenance. Vent system and resample in 6 months. COC Flash Point is severely low. (GCD) 10% Distillation Point is abnormally low. (GCD) % < 335°C is marginally high.

