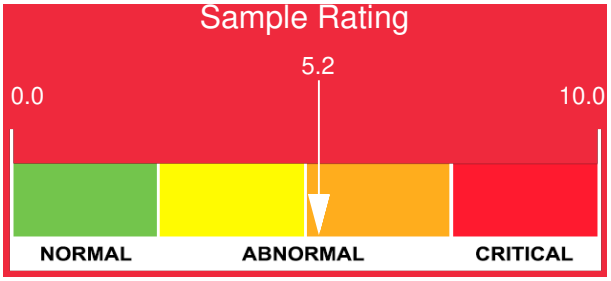
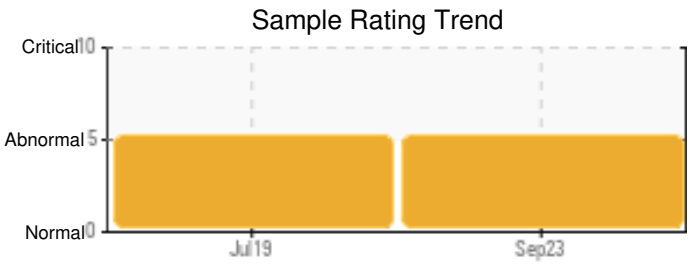




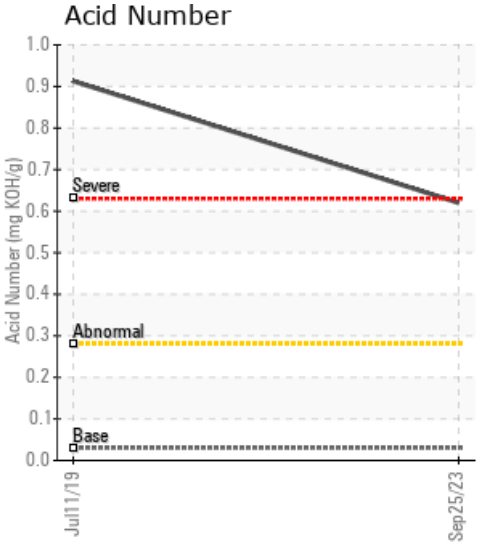
[#1 INLET TO TANK 104] HEAT TRANSFER

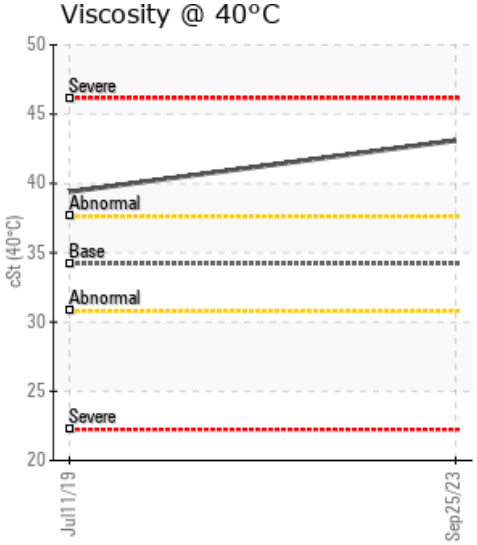
Customer: PTRHTF10217	System Information	Sample Information
HOLLY FRONTIER ASPHALT 2411 N FREEMAN ARTESIA, NM 88210 US Attn: Roger Kilpatrick Tel: (575)748-1368 E-Mail: roger.kilpatrick@HFSinclair.com	System Volume: 0 gal Bulk Operating Temp: 380F / 193C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: AMERICAN HEAT	Lab No: 02586955 Analyst: LYLE HOFFMAN Sample Date: 09/25/23 Received Date: 10/04/23 Completed: 10/11/23 LYLE HOFFMAN lyle.hoffman@HFSinclair.com

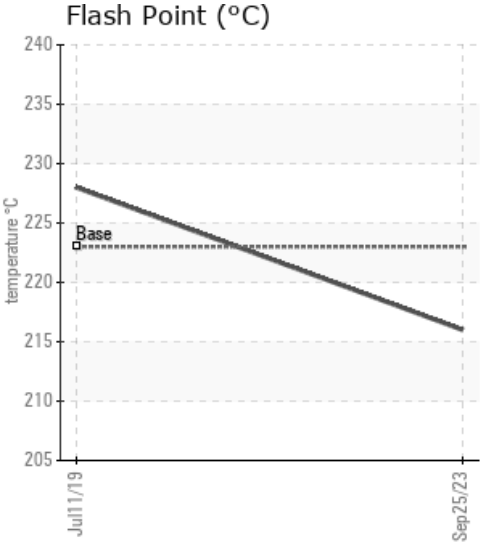
Recommendation: Although some aspects of sample are concerning, it appears that it has been over 4 years since a sample of this system has been analyzed. Most all parameters have normal changes with exception of calcium. A more regular testing of this system is needed. Please resample in 6 months to verify system condition and continue regular testing.

Comments: Pentane Insolubles levels are severely high. Calcium ppm levels are severely high. Acid Number (AN) is abnormally high. (GCD) 90% Distillation Point is abnormally high. Visc @ 40°C is abnormally high.

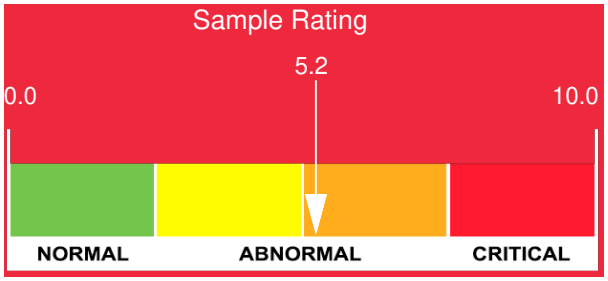
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
09/25/23	10/04/23	0.0h		421 / 216	58.4	43.1	0.62	1.51	692 / 366	805 / 429	928 / 498	3.29
07/11/19	07/19/19	0.0h		442 / 228	158.6	39.4	0.913	1.88	712 / 378	807 / 431	906 / 486	0.00
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

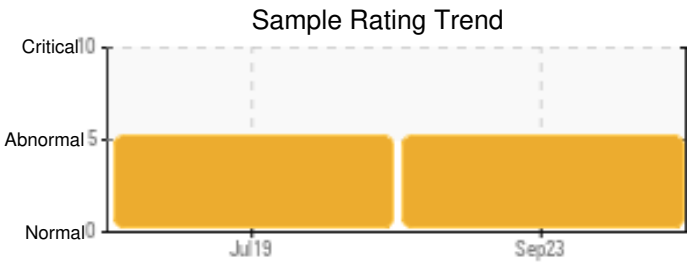






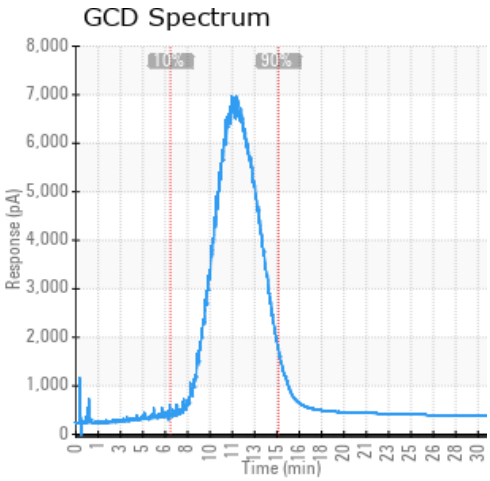
PETRO-CANADA LUBRICANTS

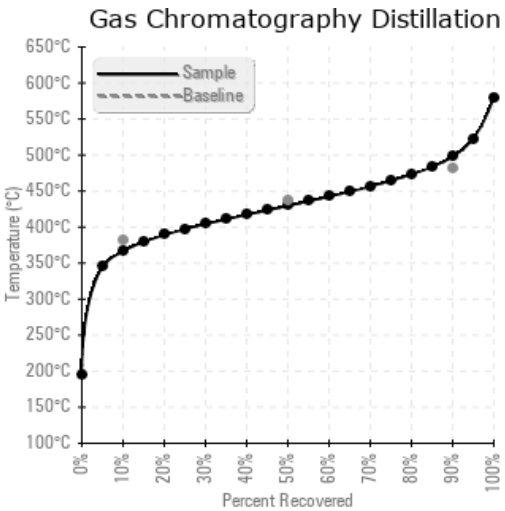


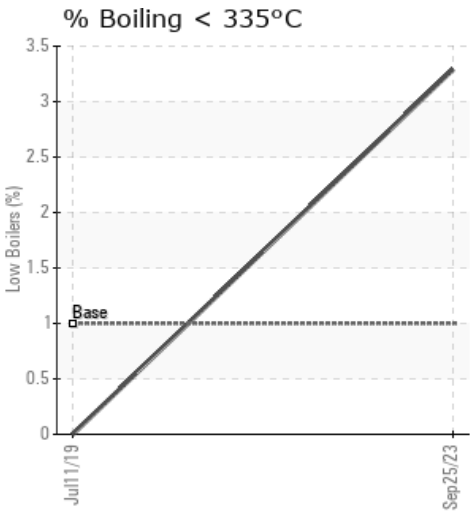


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
09/25/23	59	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	126	0	5	0
07/11/19	64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2	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

07/11/19	The fluid was described as a mixture of various products over the last 10 years. It does not appear to have been contaminated with asphalt since the viscosity is somewhat within an acceptable range and Vanadium is not present. The oil is heavily oxidized (degraded) however as the Acid Number is very high and the amount of solids (insoluble) is high. We don't think the system will need a full cleaning unless you see signs of obstructed jackets or pipes or reduced furnace efficiency. If no actions are to be taken before the 2020 shut down, we suggest to plan for a drain, flush and refill in 2020. If there is money in the budget for a partial fluid replacement in 2019 this would help reduce the need for a flush in 2020. In this case we recommend to replace 30% of the oil with fresh Petro-Therm in order to reduce the acidity level and concentration of debris in the oil. Pentane Insolubles levels are severely high. COC Flash Point is severely high. Acid Number (AN) is severely high.