

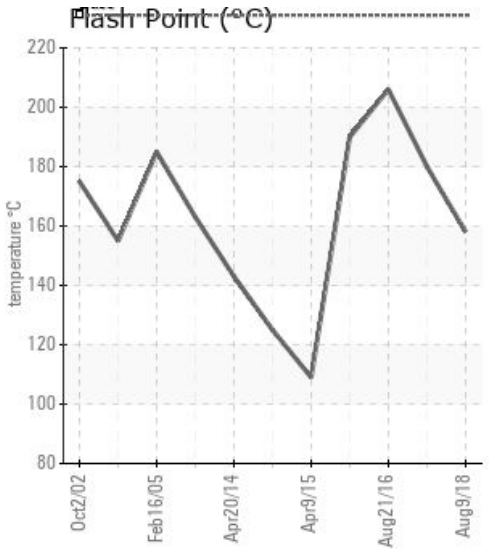
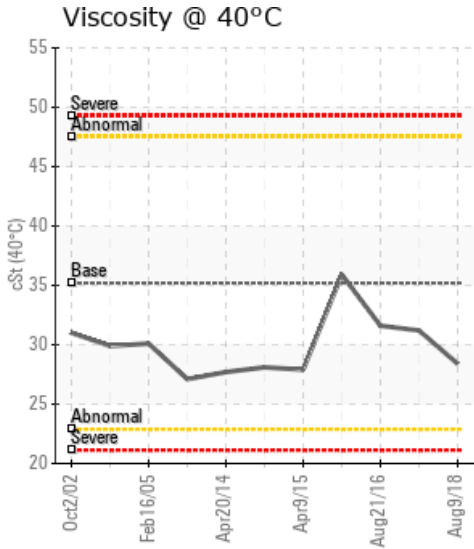
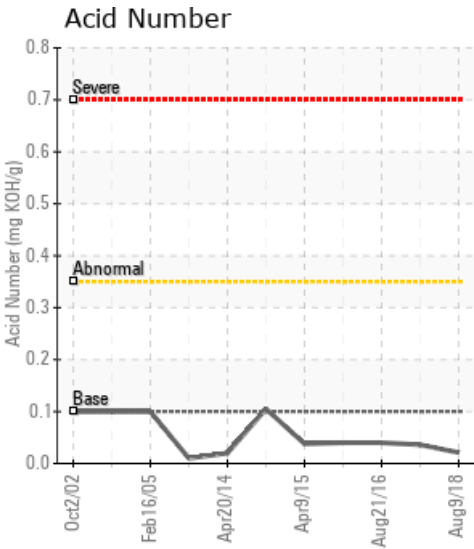
LINE 1

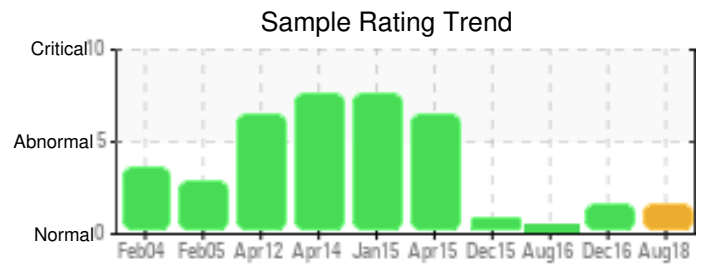
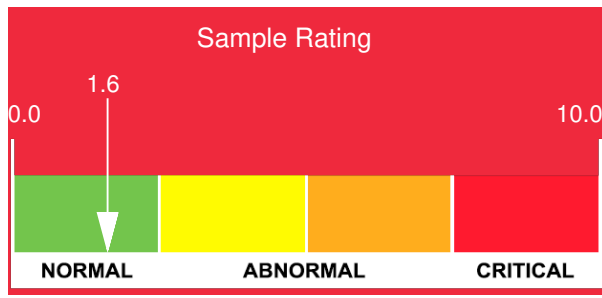
Customer: PTRHTF20031	System Information	Sample Information
MCCAIN FOODS PORTAGE PO BOX 220 1 McCain Avenue PORTAGE LA PRARIE, MB R1N 3B5 Canada Attn: Mark Nelissen Tel: x:	System Volume: 19000 ltr Bulk Operating Temp: 540F / 282C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO HTF Make: KONUS-KESSEL	Lab No: 02233912 Analyst: Yutong Gao Sample Date: 08/09/18 Received Date: 08/15/18 Completed: 08/29/18 To discuss this report contact Yutong Gao at (403)873-1876

Recommendation: The current fluid has normal viscosity, acid number and the distillation points. However, the fluid has high content of the low boiler due to the thermal cracking at the 285 C bulk working temperature. Please conduct a longer and more efficient system venting and take one sample in 6 months to monitor the conditions. It is also better to get the AIT test done to verify the property.

Comments: COC Flash Point is severely low.

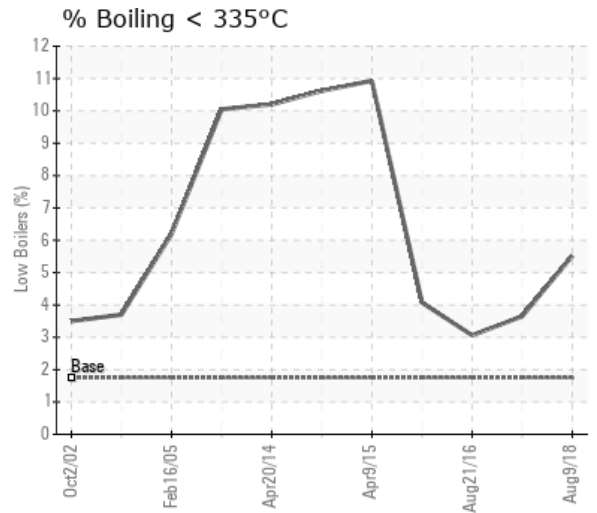
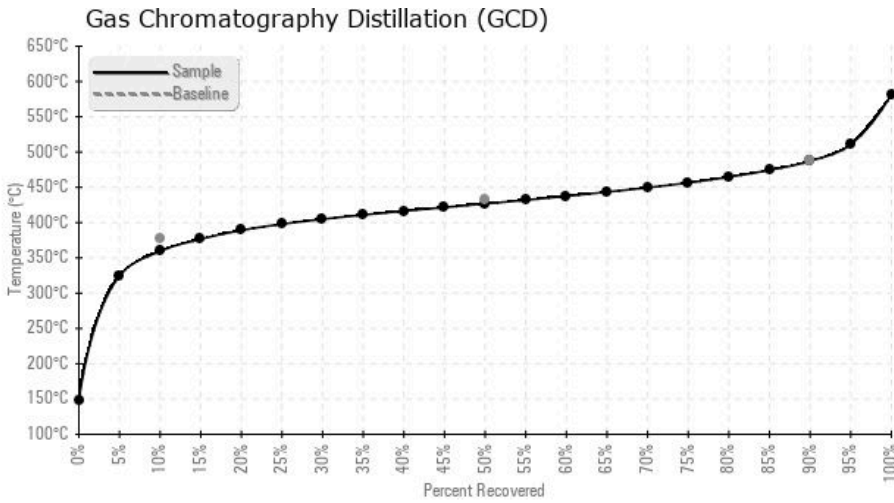
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
08/09/18	08/15/18	3y	#2 THERMAL OIL PUMP	316 / 158	17.1	28.4	0.021	0.021	679 / 360	800 / 427	909 / 487	5.52
12/29/16	01/06/17	1y	#2 PRIMARY PMP DISCH	356 / 180	28.9	31.2	0.036	0.039	699 / 371	817 / 436	931 / 499	3.65
08/21/16	08/31/16	1y	#2 PUMP DISCHARGE	403 / 206	19.2	31.6	0.040	0.077	703 / 373	807 / 431	916 / 491	3.06
12/28/15	01/06/16	4y	#2 PRIMARY PUMP DIS	374 / 190	7.0	35.9	0.04	0.071	693 / 367	803 / 428	897 / 481	4.07
04/09/15	04/13/15	0y		228 / 109	18.8	27.9	0.038	0.039	622 / 328	763 / 406	877 / 470	10.93
01/16/15	01/21/15	18y	#2 PRIM PUMP DISCHAR	257 / 125	19.6	28.1	0.105	0.093	619 / 326	793 / 423	945 / 507	10.62
Baseline Data				448 / 231		35.20	.1		712 / 378	810 / 432	910 / 488	1.75





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	
08/09/18	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	
12/29/16	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	0
08/21/16	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	49	0
12/28/15	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	0
04/09/15	7	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	1	0	
01/16/15	12	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	1	
Baseline Data			0	0						0		0	0					0					280		

Elemental analysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]



Historical Comments

12/29/16	The fluid has adequate viscosity, TAN, solid content and the GCD distillation point. The flash point is reduced a little bit from the result in Summer 2016, but the oil is suitable for the further run. Please continue to do the effective system venting to release the low boilers.
08/21/16	The current fluid have adequate viscosity, flash point, distillation points. The water and solid contents are very low. Please keep conducting the current maintenance and venting process. Take one sample in 9~12 months to monitor the conditions.
12/28/15	The current fluid is good for future use. The viscosity, TAN, water level, solid level and distillation points are all normal. The reduced flash point indicates the slightly fluid thermal cracking from the constant ~285°C high operation temperature. Like what has discussed in the past, please find an effective way to vent the low boiler (light end fluid) out of the system as a routine maintenance practice.
04/09/15	The flash point is further reduced, but the other parameters are very similar to the last samples. Not sure how many venting process has been done between Jan and April. The effective venting needs to be conducted as soon as possible. As per discussed, please send one sample for the AIT test to confirm the current fluid conditions. (GCD) 10% Distillation Point is severely low. COC Flash Point is severely low. (GCD) % < 335°C is marginally high. (GCD) 90% Distillation Point is marginally low.
01/16/15	The current fluid is still severely thermal cracked, there are a lot of light end fluid build up over the years operation. The current venting is not efficient, so please increase the vening duration and frequency considering the large system, and keep a good record of the oil top up volume. You may also consider the 25%-30% partial oil change to bring back the GCD distillation point and flash point to reduce the safety risks. The system has been running the same fluid for 18 years, it is due for the system cleaning and flushing to remove the deposits and increase the overall heat transfer efficiency. (GCD) 90% Distillation Point is severely high. (GCD) 10% Distillation Point is severely low. COC Flash Point is severely low. (GCD) % < 335°C is marginally high.