

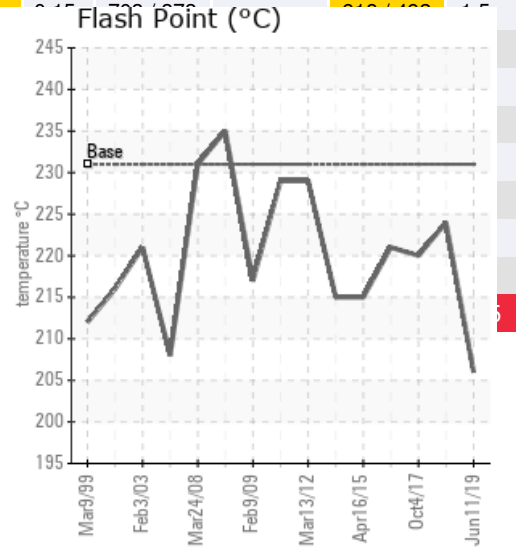
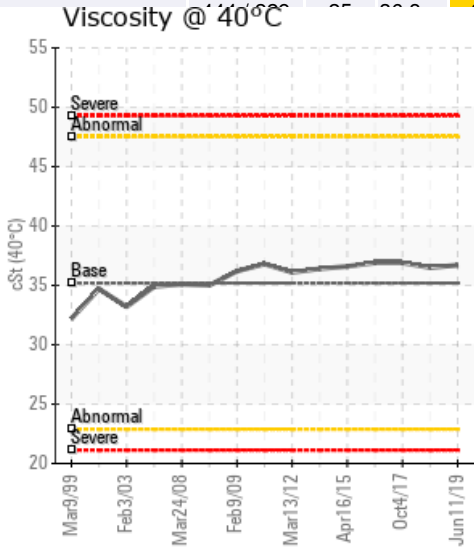
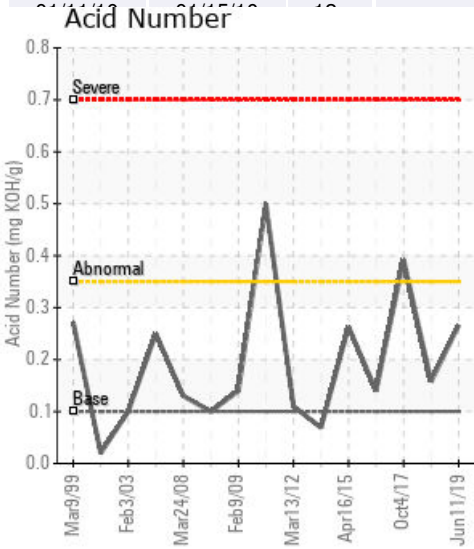
[CENOVUS PECO / 12-01-49-16W5] H800

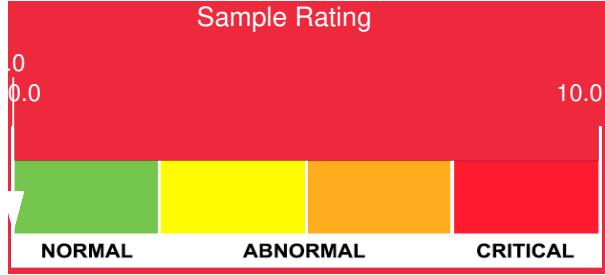
Customer: PTRHTF20039	System Information	Sample Information
BRENNTAG CANADA INC 3124-54TH AVENUE SE CALGARY, AB T2A 0A8 CANADA Attn: Toader Georgiana Tel: E-Mail: gtoader@brenntag.ca	System Volume: 12000 ltr Bulk Operating Temp: 410F / 210C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO HTF Make: PRO FAB CANADIAN	Lab No: 02291241 Analyst: Kevin McDermott Sample Date: 06/11/19 Received Date: 06/14/19 Completed: 06/18/19

Recommendation: Fluid is in very good condition. The solids content and acid number that were marginally high a couple years ago are now in the normal range. Suggest annual sample submissions to proactively monitor fluid condition.

Comments:

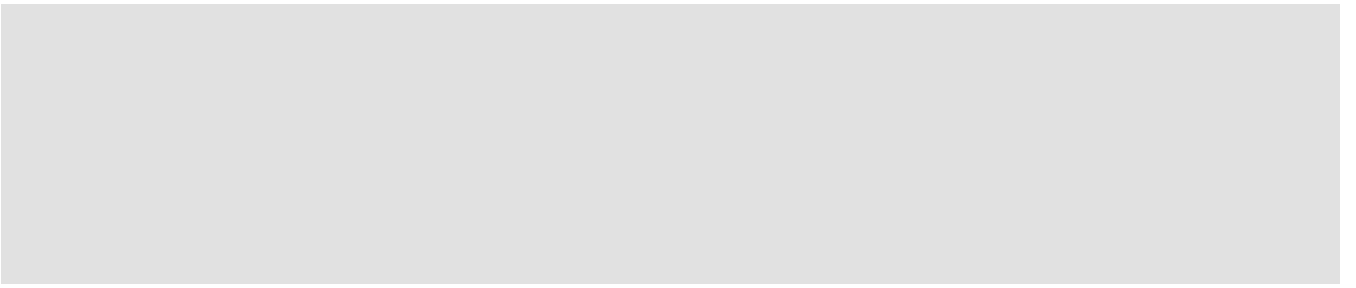
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
06/11/19	06/14/19	6y	TANK OUTLET	403 / 206	22.0	36.7	0.266	0.275	706 / 374	800 / 427	901 / 483	0.00
04/11/19	04/18/19	0y	DISCHARGE OF PUMPS	435 / 224	12.8	36.5	0.158	0.517	708 / 375	802 / 428	905 / 485	0.00
10/04/17	10/18/17	0y		428 / 220	17.0	36.9	0.392	0.830	702 / 372	800 / 427	903 / 484	0.82
02/25/16	03/07/16	0y	BY HEAT EXCHANGER	430 / 221	3.3	36.9	0.14	0.639	699 / 370	795 / 424	892 / 478	0.62
04/16/15	04/24/15	1998y	PUMP DISCHARGE Y STR	419 / 215	9.0	36.6	0.263	0.444	701 / 372	801 / 427	903 / 484	1.28
12/12/13	12/23/13	0y	PUMP DISCHARGE	419 / 215	15.1	36.4	0.069	0.743	699 / 371	798 / 425	895 / 480	1.24
03/13/12	03/16/12			444 / 229	75	36.1	0.11	0.489	703 / 373	795 / 424	894 / 479	1.14





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
06/11/19	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	0
04/11/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	0
10/04/17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79	0
02/25/16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73	0
04/16/15	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	73	0
12/12/13	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	68	0
03/13/12	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	67	0
Elemental analysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]														0	0	0	0	0	0	58	1			
02/09/09	13	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	61	0
04/10/08	8	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	0
03/24/08	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	0
01/26/04	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	0
02/03/03	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	22	0
11/22/99	1	0	0	0	0	2	1	0	0	0	5	3	0	0	0	0	0	0	2	2	0	0	17	1
03/09/99	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	30	0
Baseline Data			0	0					0			0	0						0				280	

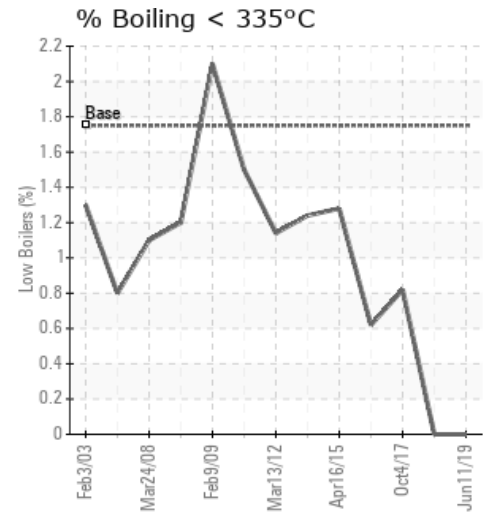
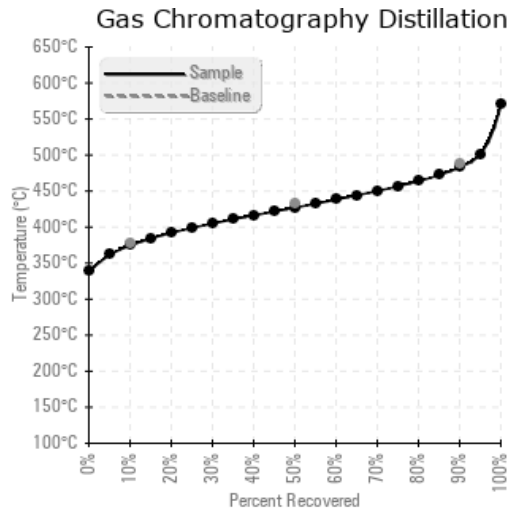
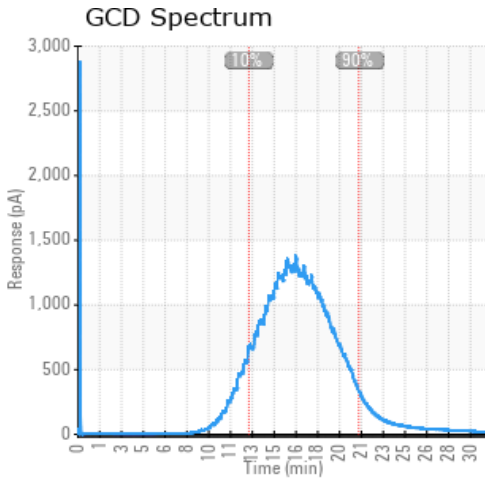
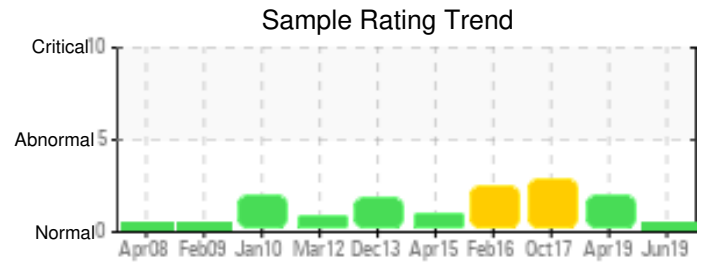
Historical Comments	
04/11/19	The fluid is in good condition and suitable for further use. The Pentane Insoluble (solids) content is borderline high. Consider filtration of the fluid while transferring from the temporary storage tank back into the system. Please re-sample after the system has been filled. Pentane Insolubles levels are abnormally high.
10/04/17	The TAN is elevated indication some oxidation has occurred. Pentane insolubles are high. Ensure gas blanket is operating. Resample in 6 months. Pentane Insolubles levels are severely high. Acid Number (AN) is abnormally high.
02/25/16	The fluid is in good condition and suitable for further use. Pentane Insolubles (solids content) has exceeded the reportable limit of 0.5%. Please consider filtration of the fluid and resample after filtration has taken place. Pentane Insolubles levels are severely high.
04/16/15	The fluid is in good condition and suitable for further use. TAN is elevated but no reason for concern at this moment. Pentane Insolubles (solids content) is close to the reportable limit of 0.5%. Please resample in 6 months.
12/12/13	There is no significant change in fluid condition. Solids content has increased slightly and is considered to be high. The fluid is showing normal degradation by oxidation. It is recommended to maintain a gas blanket and keep sampling on an annual basis. Pentane Insolubles levels are high.
03/13/12	The oil condition looks very similar to previous samples. There has been a slight thickening of the fluid but tests for oxidation do not seem to indicate major degradation. Keep sampling every year at least.
01/11/10	





03/09/99

This is a baseline read-out on the submitted sample. The viscosity index is 12.



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