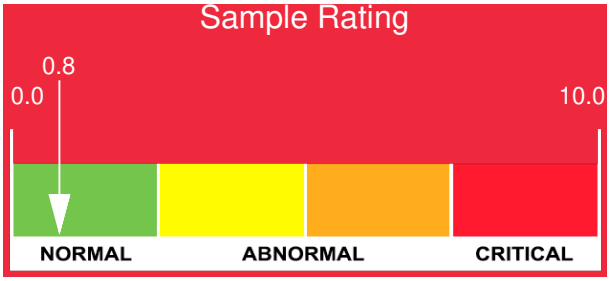
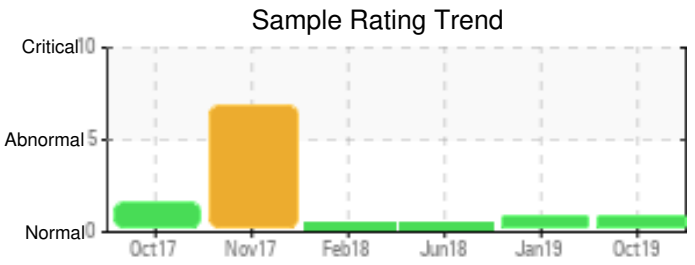




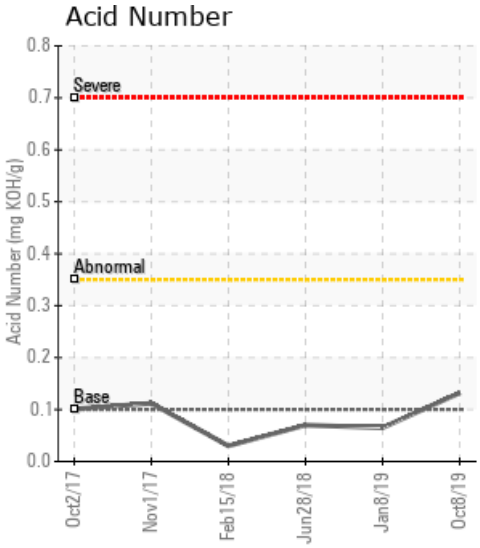
LN01 Filled Sealdown Loop Hot Oil System

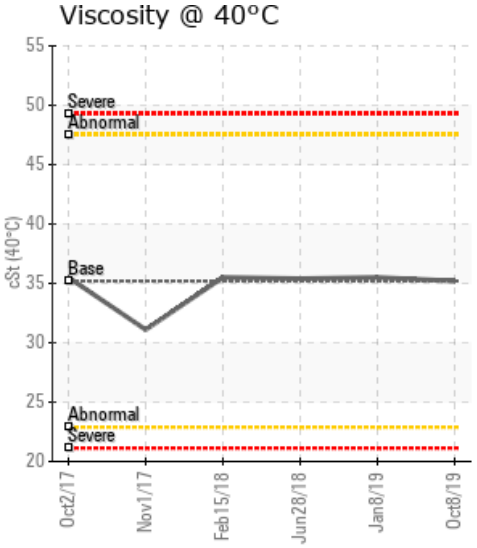
Customer: PTRHTF10141	System Information	Sample Information
TAMKO BUILDING PRODUCTS 2300 35TH ST TUSCALOOSA, AL 35401 USA Attn: Greg Colburn Tel: (205)752-3555 E-Mail: gregory_colburn@tamko.com	System Volume: 110 gal Bulk Operating Temp: 350F / 177C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO HTF Make: Heat Exchanger And T	Lab No: 02314439 Analyst: Jake Finn Sample Date: 10/08/19 Received Date: 10/15/19 Completed: 11/08/19

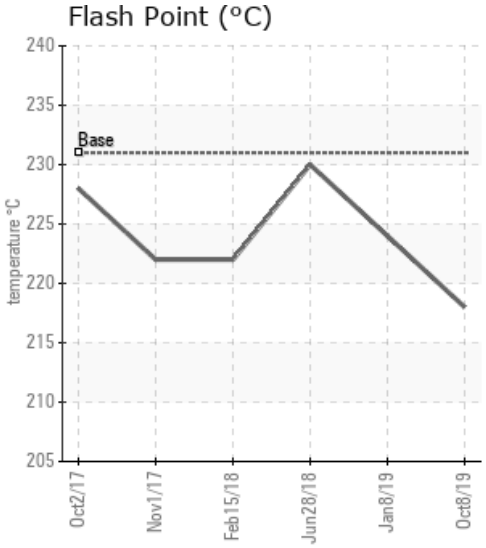
Recommendation: Oil is suitable for continued use. Please resubmit sample in one year.

Comments: (GCD) 10% Distillation Point is marginally high. (GCD) 90% Distillation point has improved compared to previous sample.

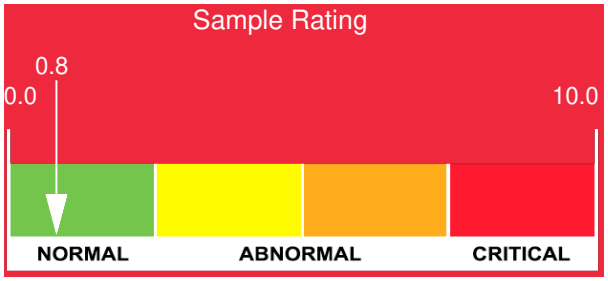
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
10/08/19	10/15/19	0m		424 / 218	9.2	35.2	0.132	0.081	741 / 394	830 / 443	924 / 496	0.00
01/08/19	01/17/19	13m		435 / 224	10.1	35.5	0.065	0.077	687 / 364	782 / 417	880 / 471	2.53
06/28/18	07/09/18	0m	PORT	446 / 230	13.8	35.4	0.07	0.023	724 / 385	809 / 432	910 / 488	0.50
02/15/18	02/22/18	9m		432 / 222	5.4	35.5	0.03	0.017	713 / 379	808 / 431	900 / 482	1.39
11/01/17	01/18/18	6m		432 / 222	14.9	31.1	0.112	0.275	634 / 334	658 / 348	778 / 414	10.41
Baseline Data				448 / 231		35.20	.1		712 / 378	810 / 432	910 / 488	1.75

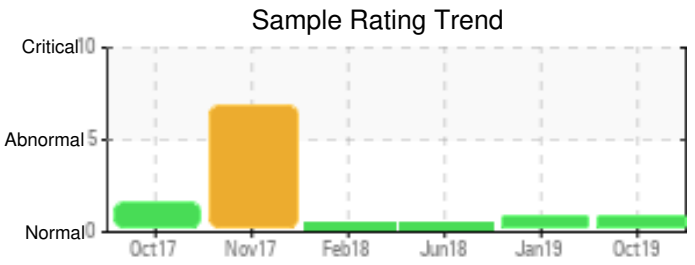






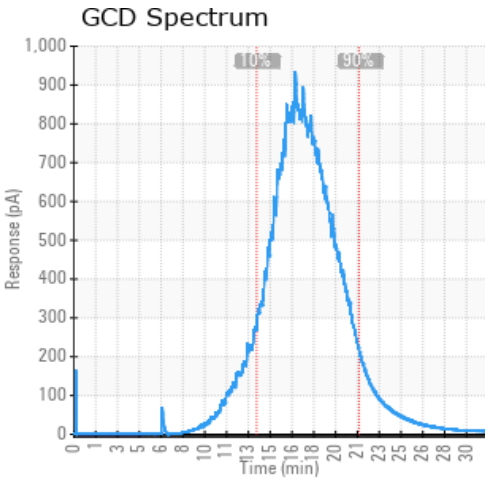
PETRO-CANADA LUBRICANTS

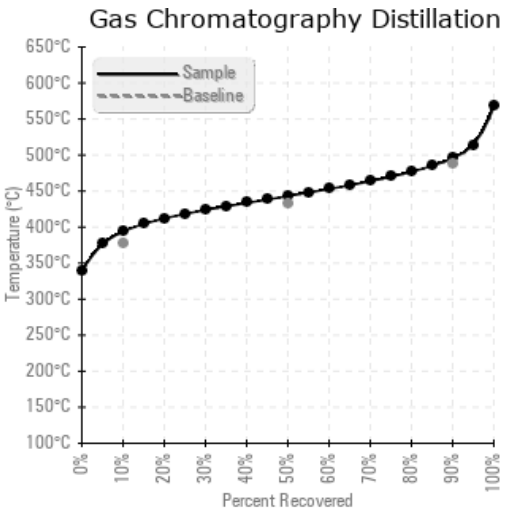


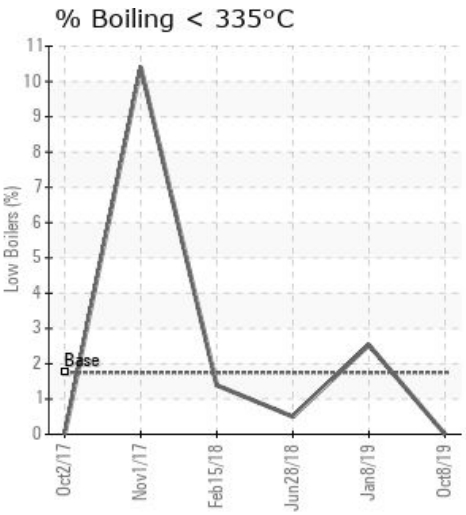


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
10/08/19	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	2
01/08/19	12	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	188	0
06/28/18	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	42	0
02/15/18	10	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	202	0
11/01/17	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Baseline Data			0	0						0			0	0					0				280	

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







Historical Comments

01/08/19	'Venting' system fluid may increase the distillation point values to desired levels. Fluid is suitable for continued use, please resubmit sample in December 2019.(GCD) 90% Distillation Point is abnormally low. (GCD) 90% Distillation Point is abnormally low.
06/28/18	Fluid is suitable for continued use. Please re-submit next sample in June 2019Some very light debris was noticed. Change any system filters regularly or tighten up the micron levels for a cleaner fluid. This fluid can be polished using a 2-stage kidney loop system safely during any shutdown periods.
02/15/18	Fluid is suitable for continued use.Improvements over the previous sample submitted 3.5 months earlier are noticeable. There was an increase in visible 'debris' although the color of the fluid is much clearer then before. If possible, filtering this fluid will assist in maintaining cleanliness or changing any system filters.
11/01/17	This sample has significantly changed negatively since the previous sample 1 month prior. This fluid may be a candidate for a drain, flush and fill with virgin Calflo HTF only because of the rate of change noticed between samples.Pentane Insolubles have increased from .02 to .2 which is a big leap in the 'solids' found in the oil. Oil oxidation may be occurring as witnessed in the severe increase in the distillation curve <335oC (GCD) 50% Distillation Point is severely low. (GCD) 90% Distillation Point is severely low. (GCD) 10% Distillation Point is abnormally low. (GCD) % < 335°C is marginally high.