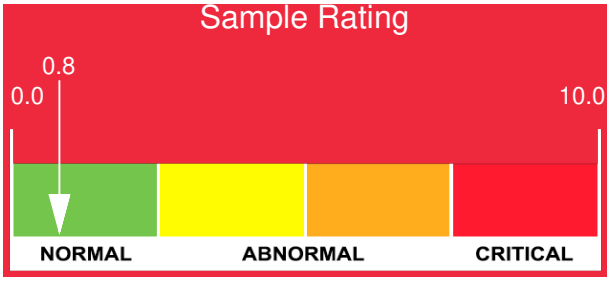
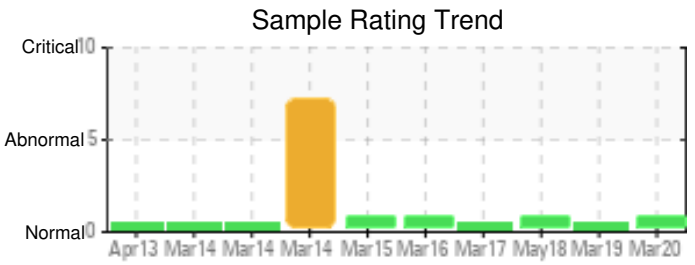




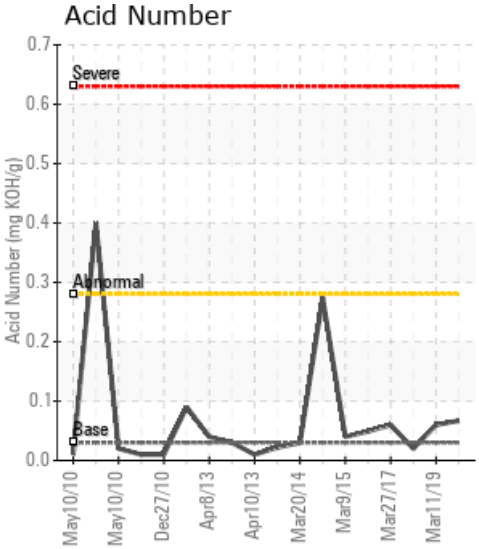
VOLCANIC HOT OIL HEATER MIDDLE

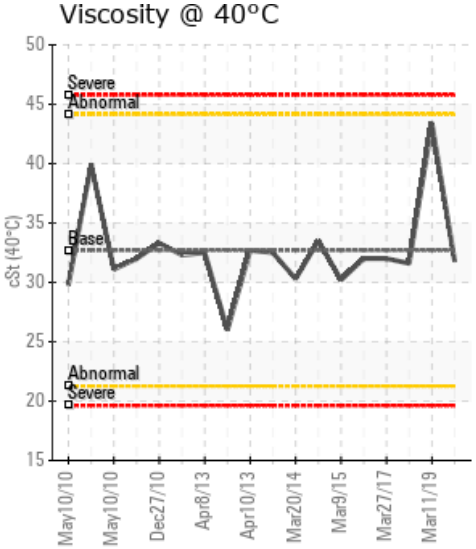
Customer: PTRHTF10039	System Information	Sample Information
Piedmont Chemical Industries 331 BURTON AVE. HIGH POINT, NC 27261 USA Attn: BOB BURGES Tel: (336)885-5131 E-Mail: bburges@piedmontchemical.com	System Volume: 1000 gal Bulk Operating Temp: 536F / 280C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make: VOLCANIC	Lab No: 02341644 Analyst: Manny Garcia Sample Date: 03/02/20 Received Date: 03/05/20 Completed: 03/11/20 Manny Garcia manuel.garcia@petrocanadalsp.com

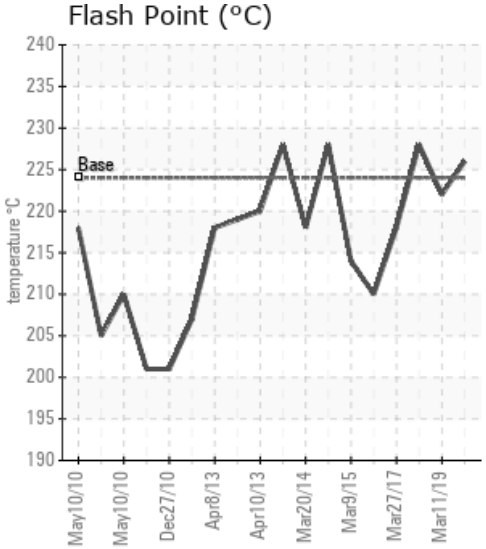
Recommendation: Oil is suitable for continued use. 'Venting' the system and filtration of the oil will assist in extending the use of the fluid and maintaining and efficient heat transfer system

Comments: (GCD) 90% Distillation Point is abnormally high & 'venting' of the system is recommended to mitigate this issue. Very light Silt & Debris found in the fluid - filtration during a 'safe' time is highly recommended. Any system filters should be changed at this time.

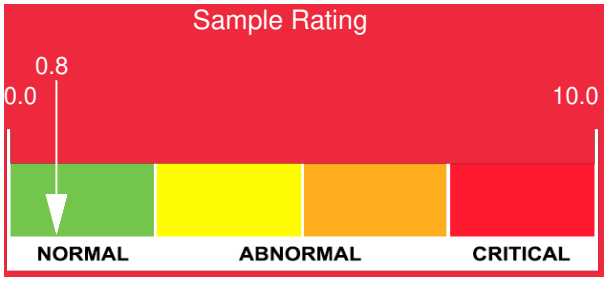
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
03/02/20	03/05/20	23y	TOP OF RESERVOIR	439 / 226	3.0	31.8	0.067	0.263	704 / 373	813 / 434	915 / 491	1.24
03/02/20	03/05/20	23y	MIDDLE RESERVOIR	435 / 224	0.00	31.9	0.058	0.141	704 / 373	812 / 434	914 / 490	1.23
03/11/19	03/20/19	22y		432 / 222	11.3	43.4	0.06	0.308	696 / 369	792 / 422	889 / 476	1.41
05/29/18	06/05/18	21y		442 / 228	6.9	31.6	0.02	0.217	699 / 371	768 / 409	856 / 458	0.00
03/27/17	03/30/17	19y	MIDDLE RESERVOIR	424 / 218	10.0	32.0	0.06	0.170	699 / 371	798 / 426	897 / 480	1.22
Baseline Data				435 / 224		32.7	0.03		693 / 367	790 / 421	887 / 475	2.5

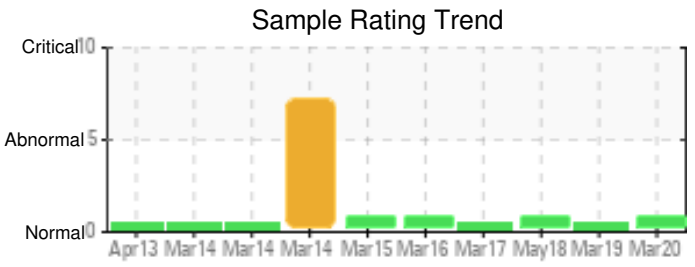






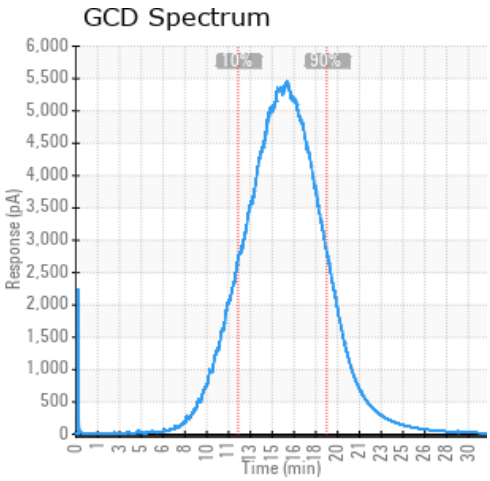
PETRO-CANADA LUBRICANTS

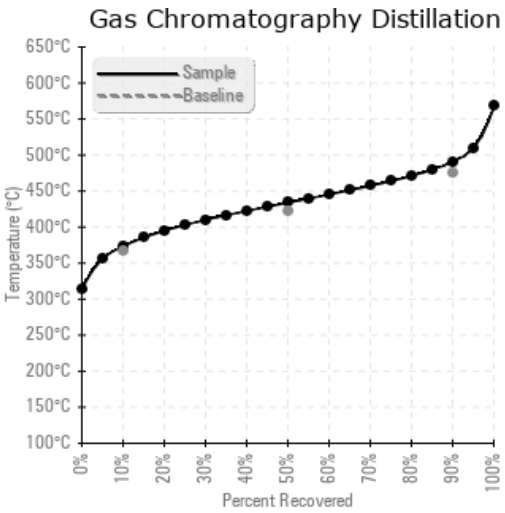


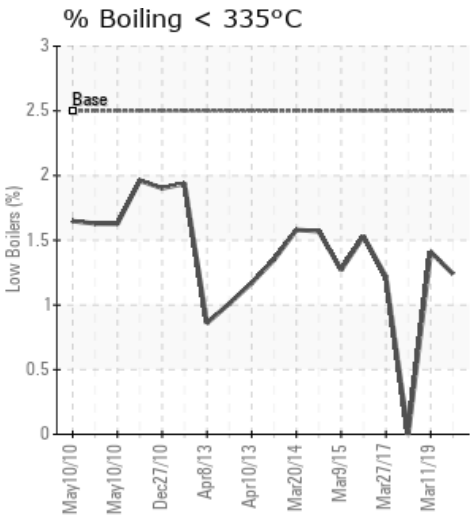


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
03/02/20	20	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	165	0
03/02/20	21	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	158	0
03/11/19	40	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	165	0
05/29/18	36	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	164	0
03/27/17	44	0	0	0	0	0	0	0	0	0	5	1	0	0	0	0	0	0	0	0	0	0	159	0
Baseline Data			0	0						0			0	0					0				270	

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







Historical Comments

03/02/20	Oil is suitable for continued use. Please re-submit sample in March 2021(GCD) 90% Distillation Point is abnormally high. 'Venting' the system is highly recommended to bring this value back in check. Very Light White metal and Silt has been detected in the fluid. Fluid system filtration is recommended and change-out of any filters at this time to maintain cleanliness.
03/11/19	Fluid is Suitable for continued use. Re-sample system in March of 2020.Wear metals are in check. The viscosity grade is up one grade for no apparent reason. There is no evidence of cross contamination with any other oils and an increase from 31.6 CsT to 43.4 CsT is not dangerous, but worth noting. We will monitor this moving forward. Visible debris noticed in sample. During a shutdown and during a safe outage, using a 2-stage kidney loop system to clean the visible debris will assist in maintaining fluid cleanliness
05/29/18	'Venting' the system will assist in getting the distillation points back in check. Filtering the fluid or changing system filters will clean up any contamination. Please re-submit annual sample in May 2019.(GCD) 90% Distillation Point is abnormally low. Very light silt noticed by the chemist.
03/27/17	System and fluid look very good. Please re-submit sample of fluid in March 2018.Wear metals are low; Contaminant levels are low; Water is low; Acid Number is low; Viscosity is good; pentane insoluble are low; very light white metal as visible in sample