

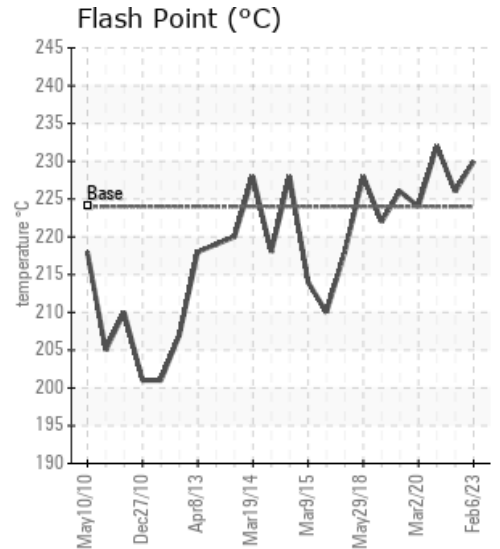
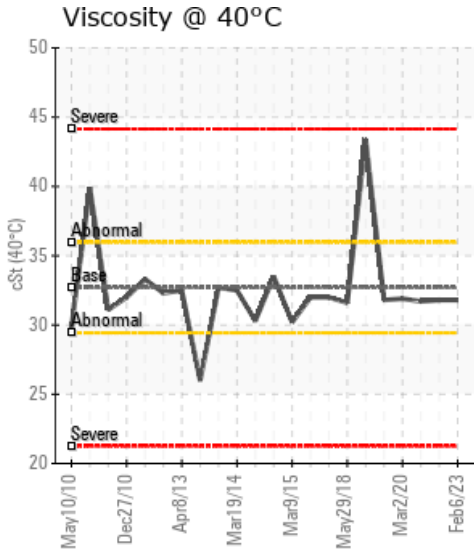
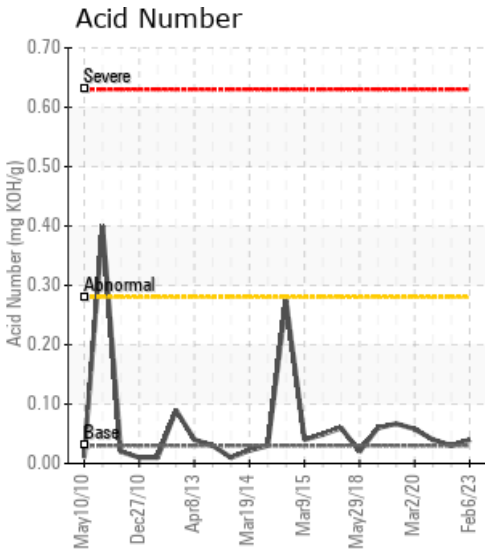
VOLCANIC HOT OIL HEATER MIDDLE

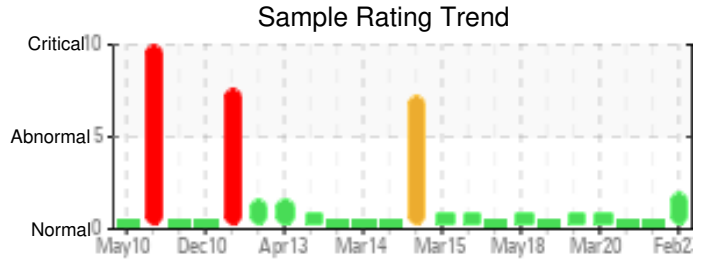
Customer: PTRHTF10039	System Information	Sample Information
Piedmont Chemical Industries 331 BURTON AVE. HIGH POINT, NC 27261 USA Attn: JUSTIN RUSSELL Tel: (336)885-5131 E-Mail: JRUSSELL@PIEDMONTCHEMI CAL.COM	System Volume: 1000 gal Bulk Operating Temp: 536F / 280C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make: VOLCANIC	Lab No: 02539375 Analyst: Manny Garcia Sample Date: 02/06/23 Received Date: 02/14/23 Completed: 02/16/23 Manny Garcia manuel.garcia@HFSinclair.com

Recommendation: Oil condition is very good, but the high distillation point for 90% can be mitigated by 'venting' the system.

Comments: 90% Distillation point is higher than expected.

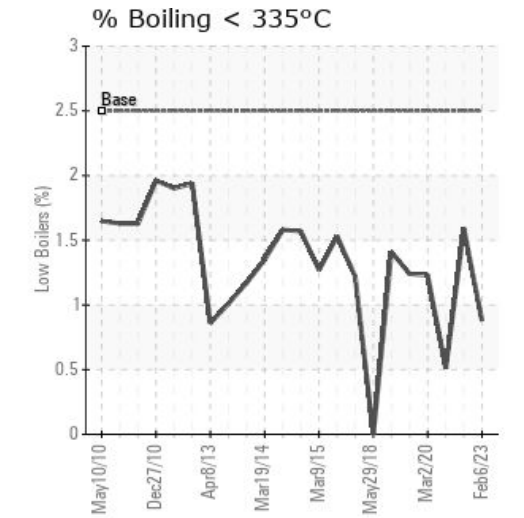
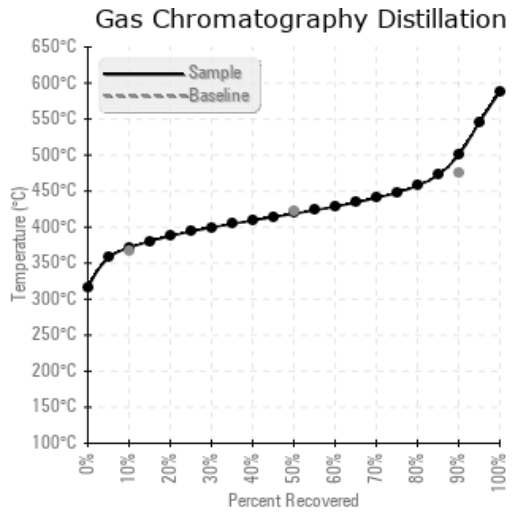
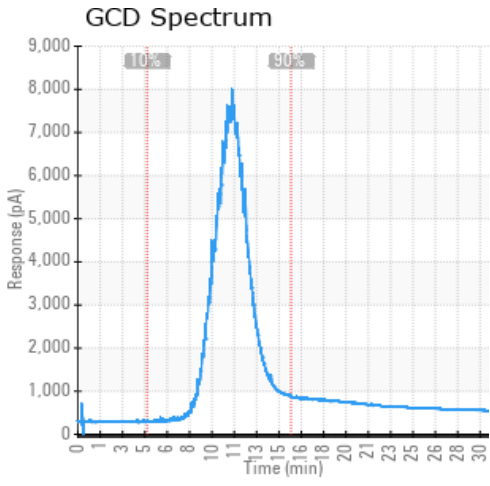
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
02/06/23	02/14/23	5.0y	RESERVOIR	446 / 230	1.5	31.8	0.04	0.202	700 / 371	785 / 419	932 / 500	0.88
03/07/22	03/17/22	24.0y		439 / 226	8.3	31.8	0.03	0.096	704 / 373	800 / 427	899 / 482	1.59
03/01/21	03/04/21	24.0y	reservoir tank	450 / 232	10.3	31.7	0.04	0.209	708 / 375	801 / 427	899 / 482	0.51
03/02/20	03/05/20	23.0y	MIDDLE RESERVOIR	435 / 224	0.00	31.9	0.058	0.141	704 / 373	812 / 434	914 / 490	1.23
03/02/20	03/05/20	23.0y	TOP OF RESERVOIR	439 / 226	3.0	31.8	0.067	0.263	704 / 373	813 / 434	915 / 491	1.24
Baseline Data				435 / 224		32.7	0.03		693 / 367	790 / 421	887 / 475	2.5





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
02/06/23	22	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	207	0
03/07/22	10	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	152	0
03/01/21	20	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	154	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
03/02/20	20	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	165	0
Baseline Data			0	0						0			0	0					0				270	

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



Historical Comments	
03/07/22	Satisfactory fluid sample results. Fluid is suitable for continued use. Please schedule next oil sample for March of 2023. Viscosity of the oil is perfect, contamination low and the distillation points in check. Very light debris noticed in the sample of fluid and changing system filters (if any) is recommended and potentially cleaning the fluid with an on-line oil filtration system (kidney loop).
03/01/21	Fluid is suitable for continued use. Filtration of the fluid during a safe down day will mitigate any debris seen in the oil sample. Recommend change any system filters if any. Please schedule to re-submit a fluid sample in March 2022. (GCD) 90% Distillation Point has improved over last year's value. Very Light Debris found in the sample
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.
03/02/20	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 an efficient heat transfer system. (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.

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