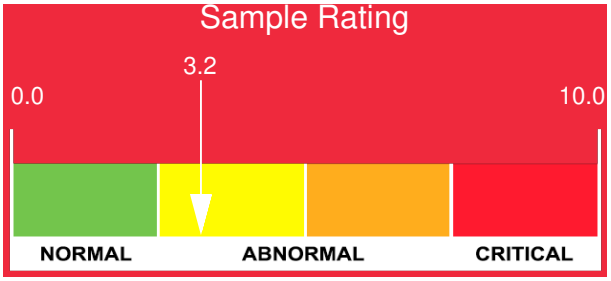
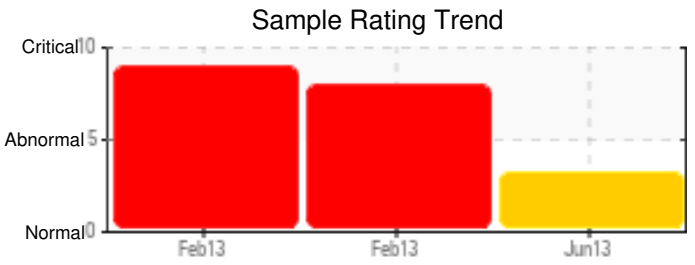




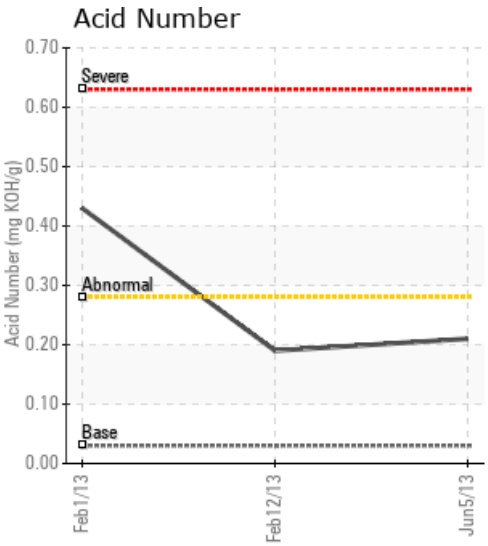
CALDERA #1

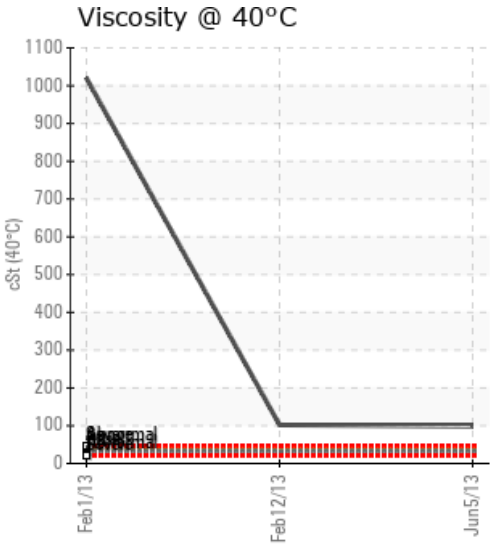
Customer: PTRHTF60001	System Information	Sample Information
LUBRIIMPORT S.A. 5 AVENIDA 5-08 ZONA 9 GUATEMALA CITY, GUATEMALA Attn: RAUL DE LEON Tel: 5(022)383-7777 E-Mail: rdeleon@lubriimport.com.gt	System Volume: 1230 ltr Bulk Operating Temp: 500F / 260C Heating Source: Blanket: Fluid: PETRO CANADA CALFLO AF Make:	Lab No: 01842982 Analyst: Michael Kaufman Sample Date: 06/05/13 Received Date: 06/10/13 Completed: 07/19/13 Michael Kaufman mkaufman@suncor.com

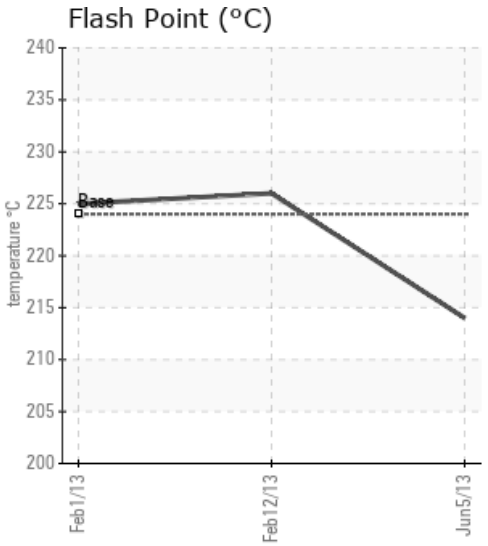
Recommendation: The oil is still very viscous as it appears to be about 3x the viscosity of Calflo AF (32 cSt). A high fluid viscosity will result in decreased thermal properties. Insoluble solids have improved slighly since the last report. Overall if this sample is a truly representative of the oil in the system, the fluid should be replaced soon.

Comments: Pentane Insolubles levels are severely high. Visc @ 40°C is severely high. (GCD) 90% Distillation Point is marginally high.

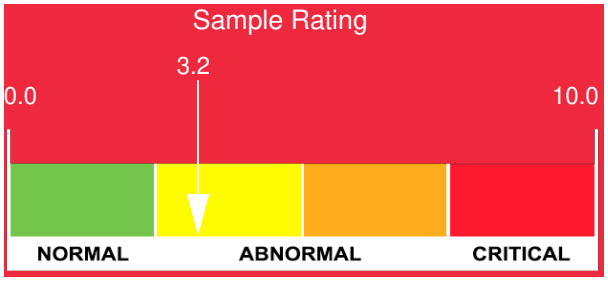
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
06/05/13	06/10/13	0.0h	TANK DRAIN PIPE	417 / 214	47.0	98.6	0.21	3.22	697 / 370	799 / 426	907 / 486	1.37
02/12/13	02/19/13	12.0h	TUBERIA DEL TANQUE	439 / 226	313.9	102	0.19	5.19	700 / 371	802 / 428	913 / 489	1.69
02/01/13	02/04/13	2.0h	TUBERIA DEL TANQUE	437 / 225	30.8	1020	0.43	6.61	710 / 377	820 / 438	973 / 523	2.30
Baseline Data				435 / 224		32.7	0.03		693 / 367	790 / 421	887 / 475	2.5

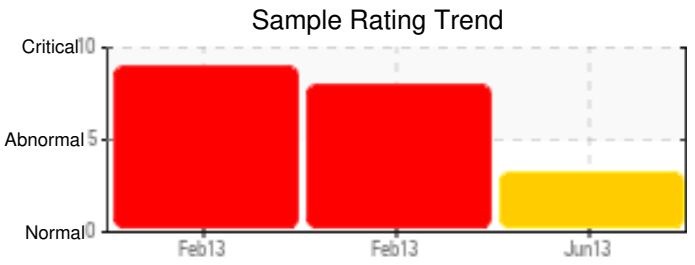






PETRO-CANADA LUBRICANTS

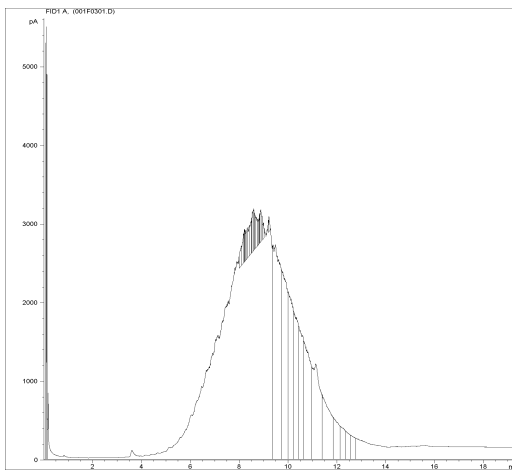


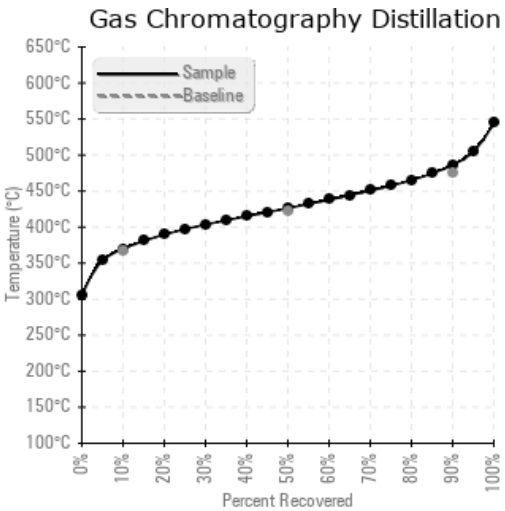


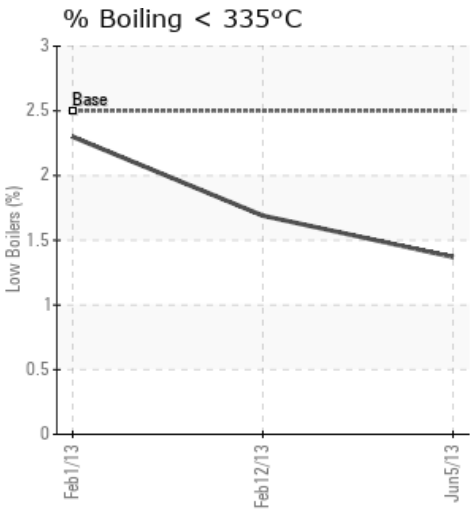
Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
06/05/13	19	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	123	2
02/12/13	15	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	1	0	172	1
02/01/13	33	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	2	0	74	2
Baseline Data			0	0						0			0	0					0				270	

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

GCD Spectrum







Historical Comments

02/12/13	The oil is still very viscous, as the viscosity is 100 cSt@40C, about 3x heavier than Calflo AF. Although this is much better than the 1000 cSt form the last sample. Oxidation (Acid Number) is lower too. Insoiluble Solids remain very high. Overall if this sample is a true representation of what circulates in the system this oil will need to be replaced in the near future. Remember that before collecting a sample, it is always recommended to flush the sampling pipe/valve with 4 to 5 times the amount of oil that the piping holds and letting it drain in a metal bucket for disposal. This ensures we have a representative sample of what is circulating inside the system. Pentane Insolubles levels are severely high. (GCD) 90% Distillation Point is severely low. Visc @ 40°C is severely high. (GCD) % < 335°C is abnormally high. (GCD) 10% Distillation Point is marginally low.
02/01/13	The sample has a very high amount of solids. The viscosity is also extreme at 1000 cSt at 40C, about 33 times higher than fresh Calflo AF. To thicken the oil this much in only 2 months some type of contaminant must have entered the oil system. The oxidation level (TAN) is rising but is considered moderate at this point. If this sample is a true representation of the entire 1230L of fluid in this system this is a troubling situation that must be investiogated and fixed. Pentane Insolubles levels are severely high. (GCD) 90% Distillation Point is severely high. Visc @ 40°C is severely high. Acid Number (AN) is abnormally high. (GCD) 50% Distillation Point is marginally high.