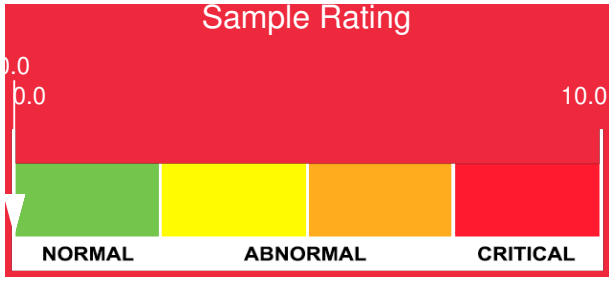
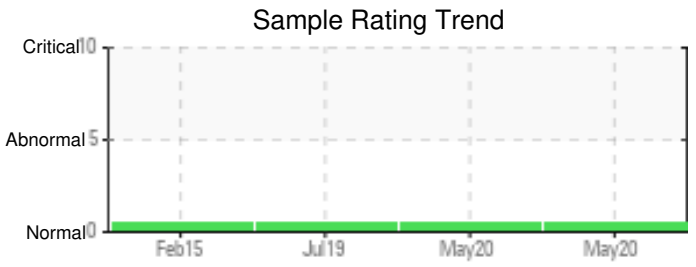




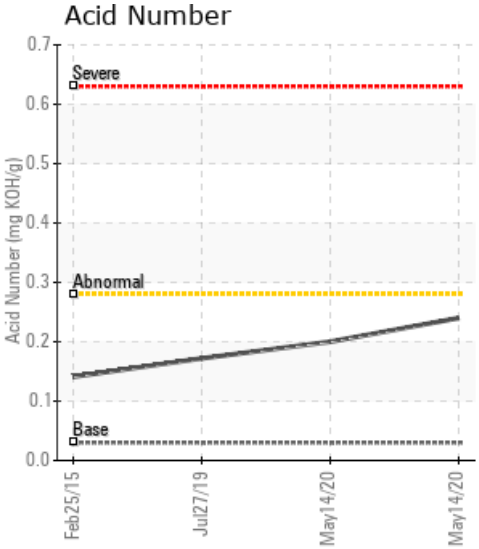
BABINE ENERGY SYSTEM

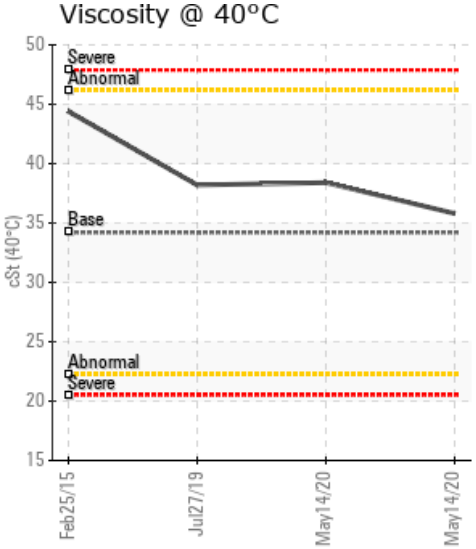
Customer: PTRHTF20130	System Information	Sample Information
BABINE FOREST PRODUCTS 19479 HIGHWAY 16 EAST BURNS LAKE, BC V0J1E0 Canada Attn: Bob Petkau Tel: (250)692-6598 E-Mail:	System Volume: 50000 ltr Bulk Operating Temp: 500F / 260C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: WELLONS	Lab No: 02354551 Analyst: Ray Rolston Sample Date: 05/14/20 Received Date: 05/19/20 Completed: 06/09/20 Ray Rolston Ray.Rolston@petrocanadalsp.com

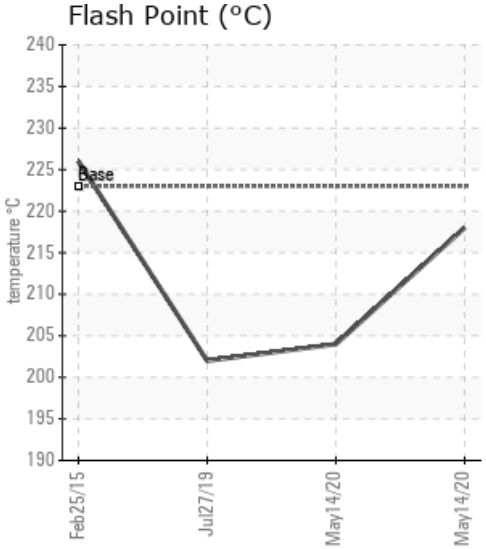
Recommendation: Note: Lab Number 02354550 sample was obtained from Primary Pump; 02354551 was obtained from Radiant Coil Section; 0234552 was obtained from Booster Pump. Used oil analysis results from 02354550 were provided on May 25, 2020.Note 53 ppm iron wear content and lower viscosity (30.2 cSt @ 40 C) from 02354551 Booster Pump. Note low Initial Boiling Point on all 3 samples, but normal 10% through Final Boiling Point Distillation Range.Petro-Therm is suitable for continued use; re-sample in one year to monitor fluid's condition.

Comments:

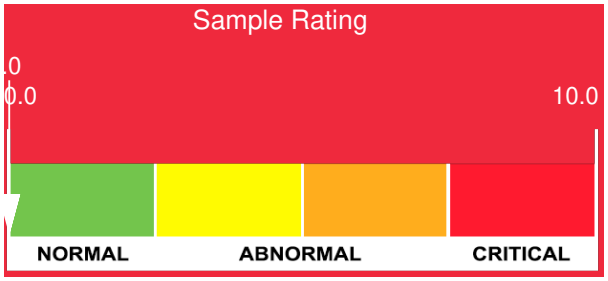
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
05/14/20	05/19/20	0y	RADIANT COIL	424 / 218	9.0	35.8	0.24	0.232	721 / 383	830 / 443	912 / 489	3.12
05/14/20	05/19/20	0y	BOOSTER PUMP	424 / 218	8.4	30.2	0.18	0.283	724 / 385	830 / 443	911 / 488	2.35
05/14/20	05/19/20	0y	PRIMARY PUMP	399 / 204	25.8	38.4	0.20	0.191	725 / 385	830 / 444	912 / 489	2.34
07/27/19	08/06/19	0y	OUTCRT OF PUMP	396 / 202	13.0	38.2	0.172	0.079	704 / 373	799 / 426	888 / 475	0.94
02/25/15	03/09/15	0y	OUTLET OF PUMP	439 / 226	21.8	44.4	0.141	0.078	743 / 395	841 / 449	913 / 490	1.08
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

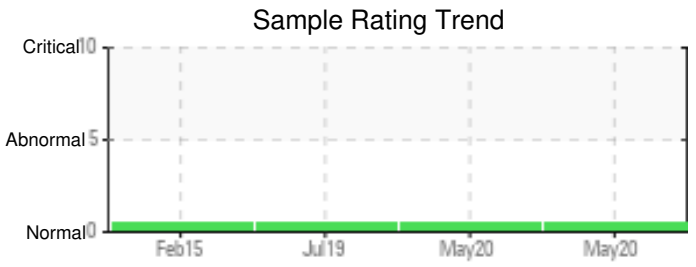






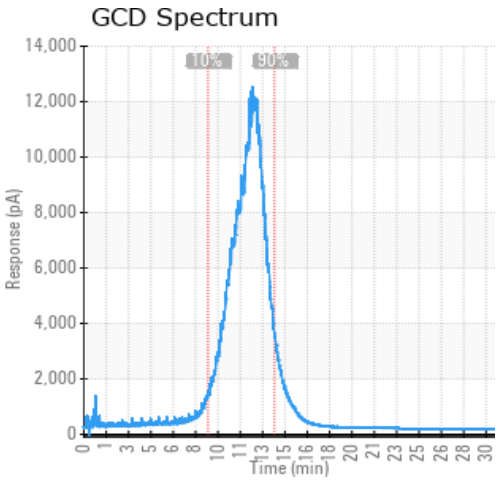
PETRO-CANADA LUBRICANTS

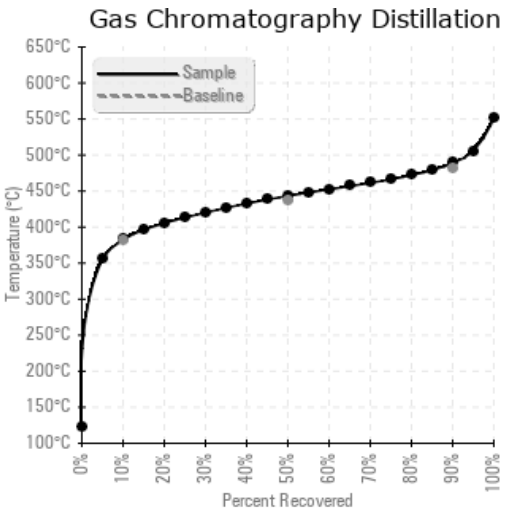


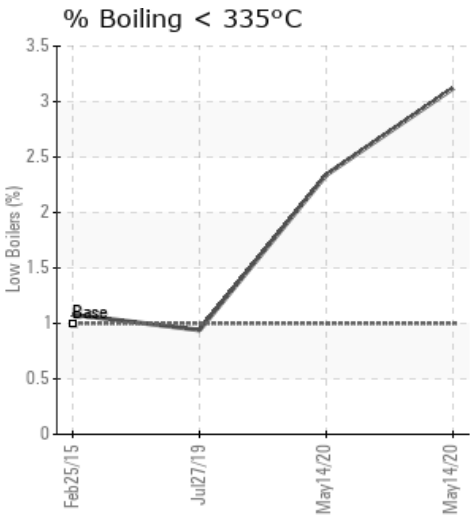


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
05/14/20	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/14/20	53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
05/14/20	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
07/27/19	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	2
02/25/15	84	0	0	0	0	8	0	0	0	0	1	2	0	0	0	0	1	0	0	0	8	0	4	4
Baseline Data			0	0						0			0	0					0				0	

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







Historical Comments

05/14/20	
05/14/20	Petro-Therm heat transfer fluid is in satisfactory condition for continued use. Recommend re-sampling in one year to monitor.
07/27/19	This sample of Petro-Therm heat transfer fluid is in very good condition. Wear and additive metals are normal. Water content is low at 0.001% / 13 ppm. The Acid Number (AN) has increased slightly to 0.172 as expected. The fluid`s viscosity at 38.2 cSt @ 40 C is normal. The Cleveland Open Cup flash point is good at 202 deg C. Gas Chromatography Distillation results are good. Sludge and sediment are low as Pentane Insolubles is 0.079 mg.Recommend that the system continue to be monitored, and another sample be submitted in one year.
02/25/15	Over the analysis data is very good other than the noted high viscosity. However it would appear that this based on the original oil which was an ISO 46 and therefore the viscosity is normal. None of the other analysis data shows any signs of thermal degradation. Visc @ 40°C is abnormally high.