

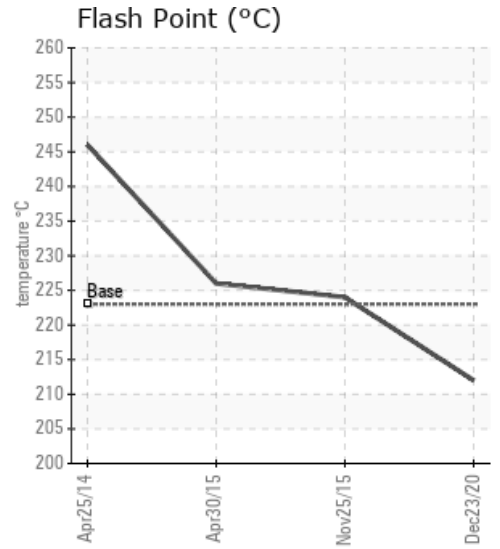
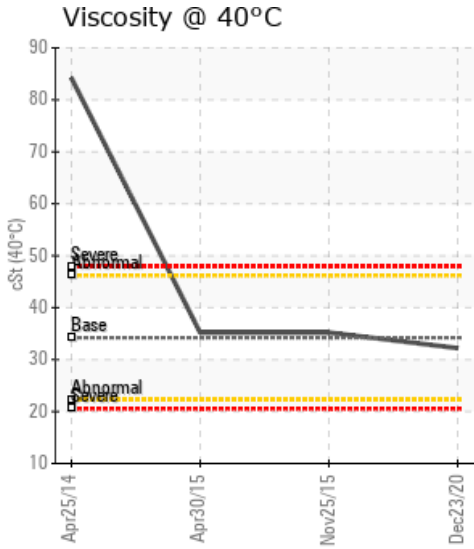
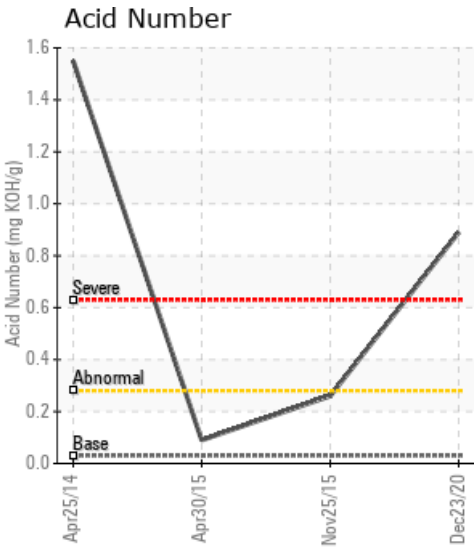
SMALL TANK FARM HEAT TRANSFER FLUID

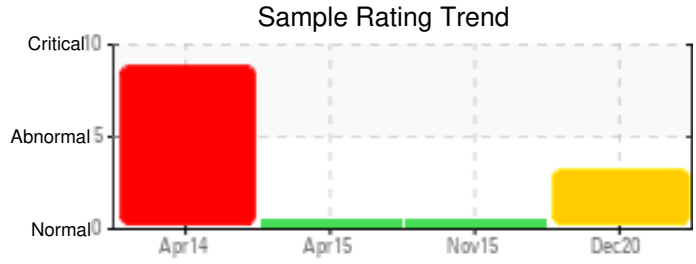
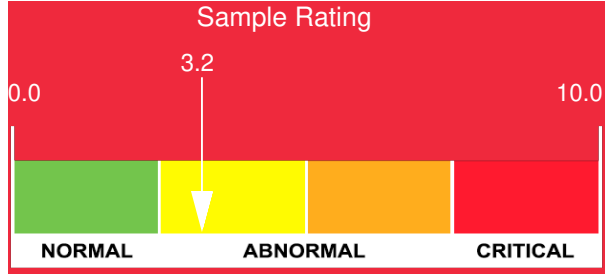
Customer: PTRHTF10147	System Information	Sample Information
MYRL AND ROYS PAVING INC 1300 N BAHNSON AVE SIOUX FALLS, SD 57103 USA Attn: Rich Kilmer Tel: (605)366-5220 E-Mail: hp1@lgeverist.com	System Volume: 425 gal Bulk Operating Temp: 325F / 163C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: HYWAY	Lab No: 02396128 Analyst: Neil Buchanan Sample Date: 12/23/20 Received Date: 01/07/21 Completed: 01/14/21 Neil Buchanan neil.buchanan@petrocanadalsp.com

Recommendation: Sample is acceptable with the exception of the Acid Number which is very high. Before making a recommendation to change the fluid, please send in another oil sample to confirm the result. Wear Check will also be instructed to rerun the Acid Number test.

Comments: Acid Number (AN) is severely high.

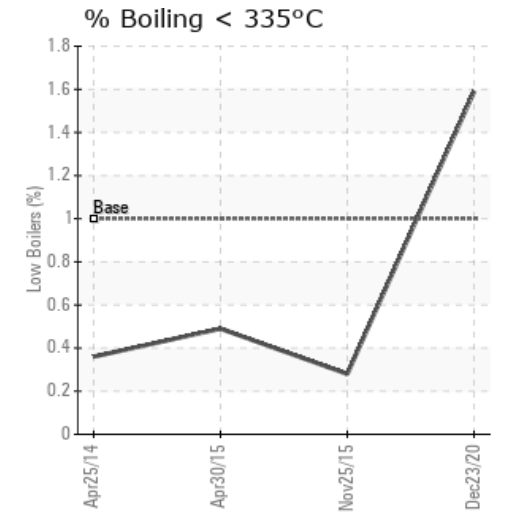
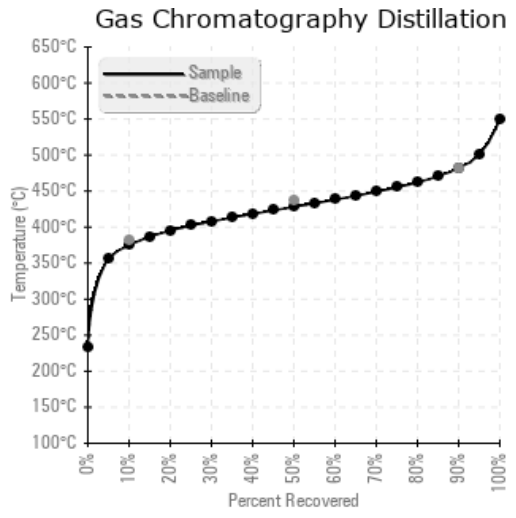
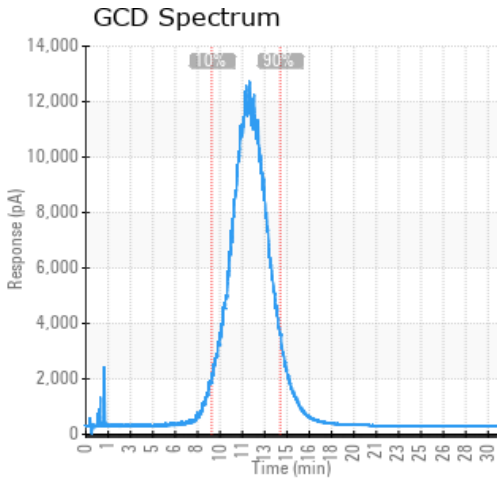
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
12/23/20	01/07/21	0m	Heaters/Valve	414 / 212	170.7	32.2	0.89	0.251	706 / 375	803 / 428	900 / 482	1.59
11/25/15	12/09/15	6m	24" IN FRONT OF PUMP	435 / 224	17.5	35.2	0.26	0.072	716 / 380	803 / 429	901 / 483	0.28
04/30/15	05/15/15	15m	6" IN FRONT OF PUMP	439 / 226	20.6	35.2	0.09	0.042	721 / 383	814 / 434	910 / 488	0.49
04/25/14	05/02/14	0m	6" BEFORE PUMP	475 / 246	486.1	84.2	1.55	5.30	758 / 403	862 / 461	977 / 525	0.36
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00





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
12/23/20	9	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
11/25/15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04/30/15	3	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	2	2
04/25/14	355	0	0	0	0	3	0	0	0	0	1	301	0	0	2	0	1	0	3	2	494	0	20	20
Baseline Data			0	0						0			0	0					0				0	

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



Historical Comments	
11/25/15	Sample looks good and fluid is fit for further use. Resample next interval to monitor.
04/30/15	New oil sample looks good. Presence of 1800 ppm of Sulphur indicates a possible mixture of products besides Petrotherm.
04/25/14	The oil contains a very high amount of solids and small metal particles and minerals (calcium and sodium). Water is also a bit high. The elevated Acid Number shows this oil to be excessively degraded and probably a bit corrosive, hence the high iron content. The viscosity increased from 68 to 84 cSt due to the oxidation, which penalizes heat transfer efficiency. We can never be 100% certain as we're trying to determine if a system leaks asphalt based on a 4oz sample, but based on the 0 ppm Vanadium and the fact the viscosity did not rise to 100 or more cSt at 40C, it appears there is no asphalt leak. A thorough cleaning, flush and refill with fresh Petro-Therm should drastically restore the system's efficiency. Iron ppm levels are abnormal. Pentane Insolubles levels are severely high. Water contamination levels are marginally high. ppm Water contamination levels are marginally high. Sodium ppm levels are severely high. Calcium ppm levels are severely high.

Petro-Canada makes no representation or warranty of any kind, either express or implied, as to the accuracy or completeness of the analysis and assumes no responsibility and shall have no liability whatsoever with respect to such analysis, or a party's use of it. Petro-Canada is a division of HollyFrontier Corporation.