

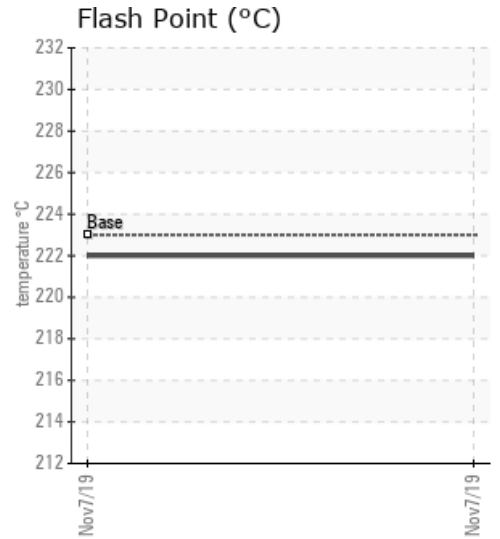
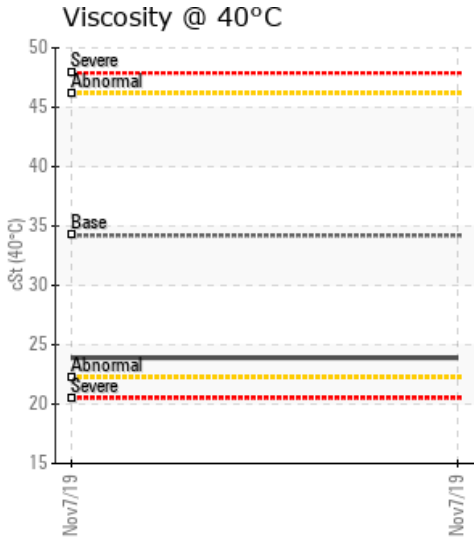
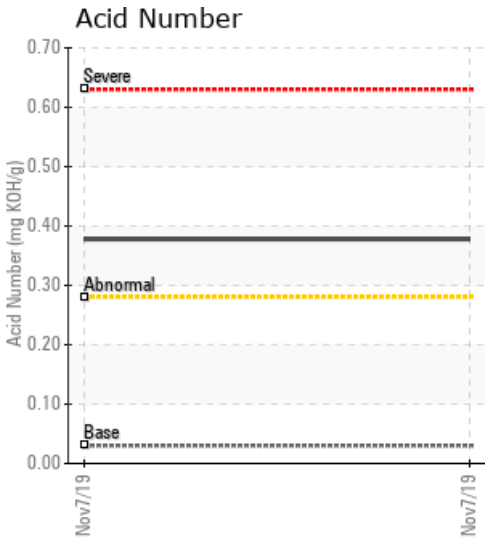
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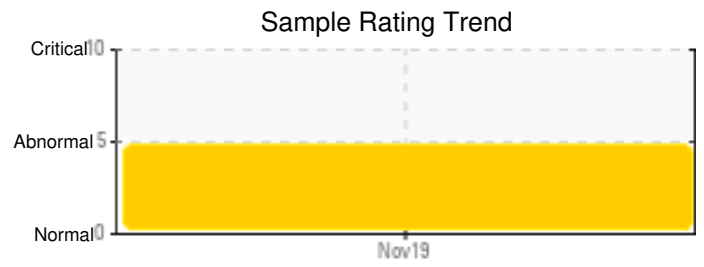
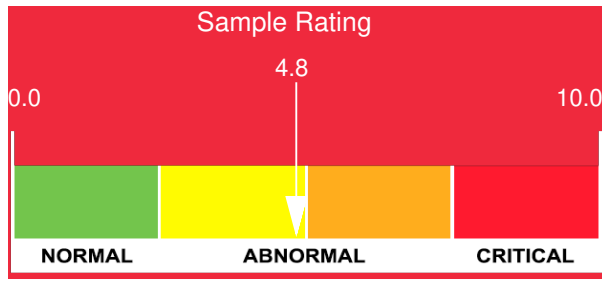
Customer: PTRHTF10225	System Information	Sample Information
MINNESOTA PAVING 518 28 AVE S. WAITE PARK, MN 56387 USA Attn: Brian Heger Tel: (712)229-2082 E-Mail: brian.heger@minnnp.com	System Volume: 300 gal Bulk Operating Temp: 300F / 149C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: HEATEC	Lab No: 02329487 Analyst: Neil Buchanan Sample Date: 11/07/19 Received Date: 01/02/20 Completed: 01/08/20 Neil Buchanan neil.buchanan@petrocanadalsp.com

Recommendation: Viscosity is lower than new Petrotherm at 23.9 cSt versus 35.5 cSt. Some thermal cracking of the oil is evident with lower GCD results and lower viscosity but flash point is good at 222C. Acid Number is rising but below 0.5. Pentane insoluble are moderately high at 0.3% and suggest adding filtration. Resample next regular interval.

Comments: (GCD) 90% Distillation Point is severely low. Acid Number (AN) is abnormally high. (GCD) 10% Distillation Point is marginally low. (GCD) 50% Distillation Point is marginally low.

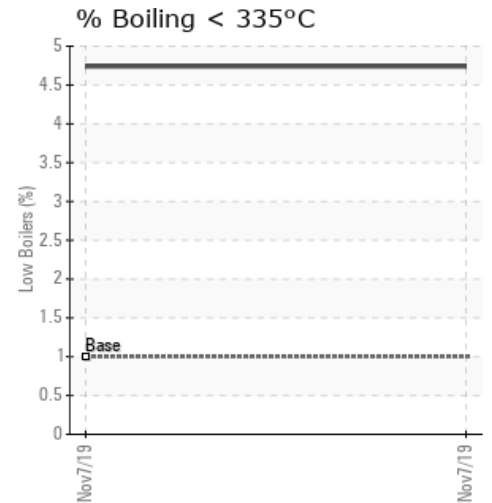
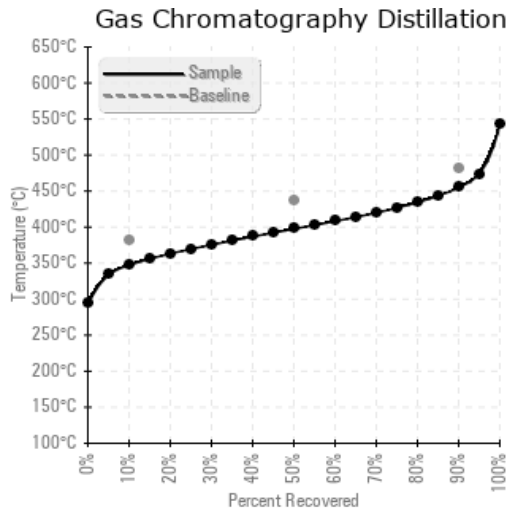
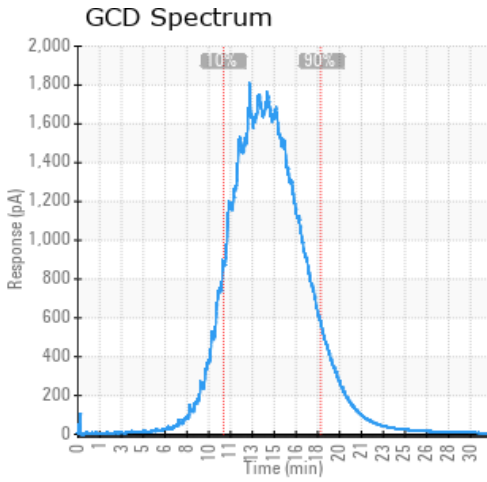
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
11/07/19	01/02/20	0y	LINE	432 / 222	4.9	23.9	0.378	0.299	657 / 347	748 / 398	851 / 455	4.74
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
11/07/19	11	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	11	4	10	6
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

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