

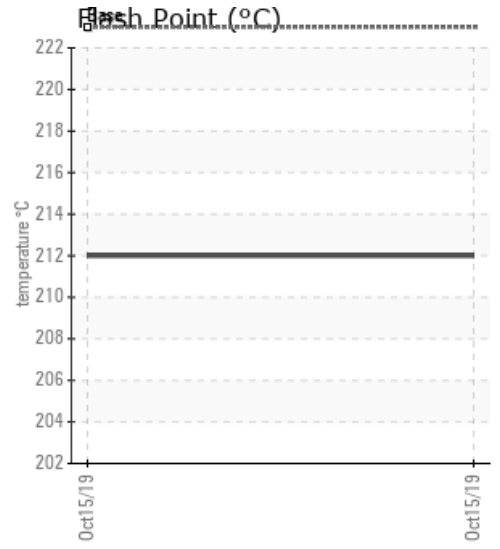
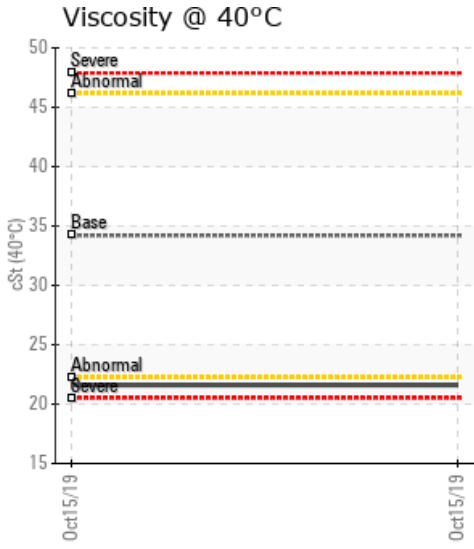
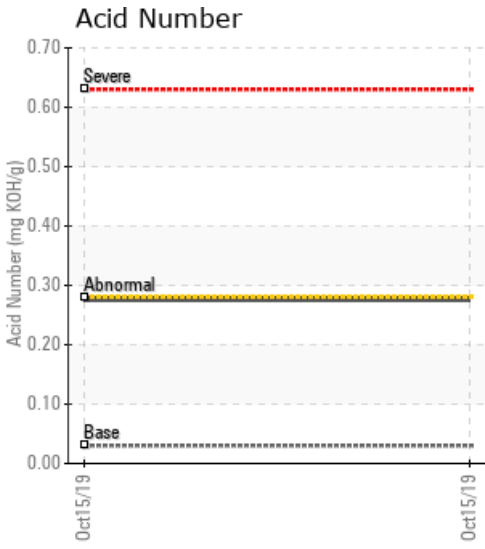
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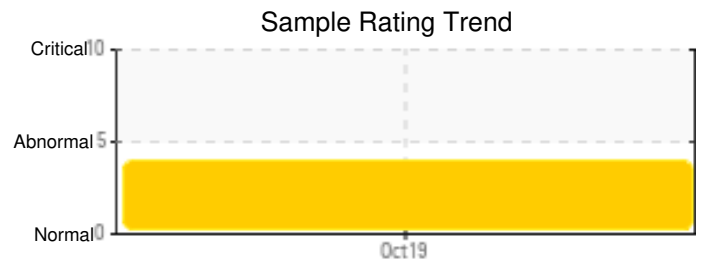
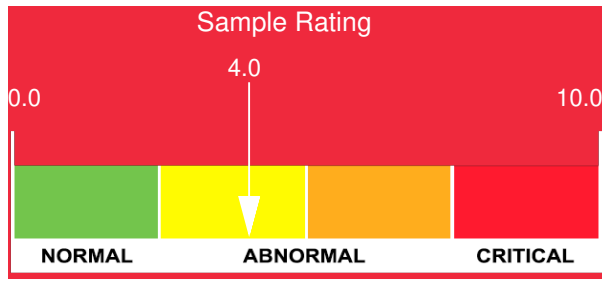
Customer: PTRHTF10225	System Information	Sample Information
MINNESOTA PAVING 518 28 AVE S. WAITE PARK, MN 56387 USA Attn: Brian Heger Tel: (712)229-2082 E-Mail: brian.heger@minnnp.com	System Volume: 350 ltr Bulk Operating Temp: 350F / 177C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: CEI	Lab No: 02329488 Analyst: Neil Buchanan Sample Date: 10/15/19 Received Date: 01/02/20 Completed: 01/08/20 Neil Buchanan neil.buchanan@petrocanadalsp.com

Recommendation: Viscosity is lower than new Petrotherm at 21.6 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 212C. Acid Number is rising but below 0.5. Pentane insoluble are moderately high at 0.18% and suggest adding filtration. Resample next regular interval.

Comments: (GCD) 90% Distillation Point is severely low. (GCD) 50% Distillation Point is abnormally low. Visc @ 40°C is abnormally low. (GCD) 10% Distillation Point is marginally low.

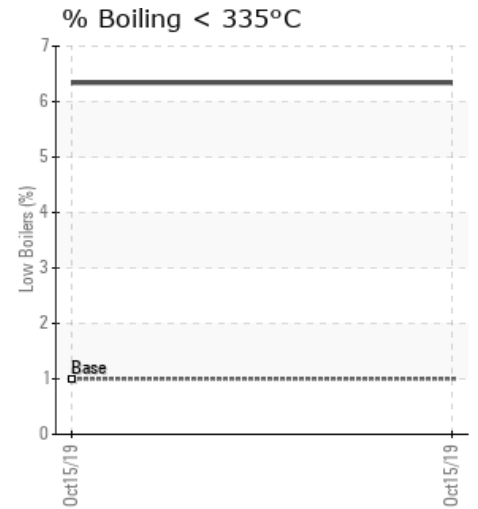
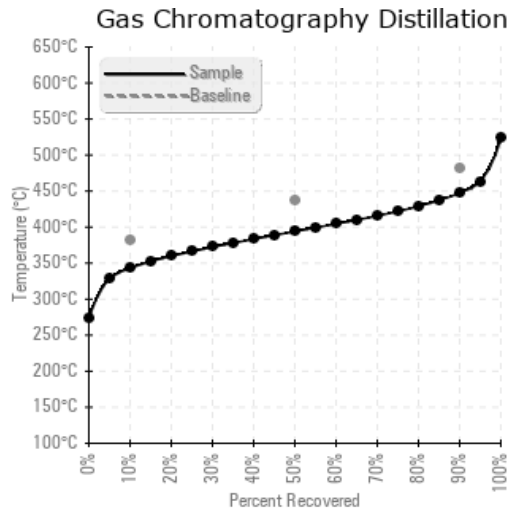
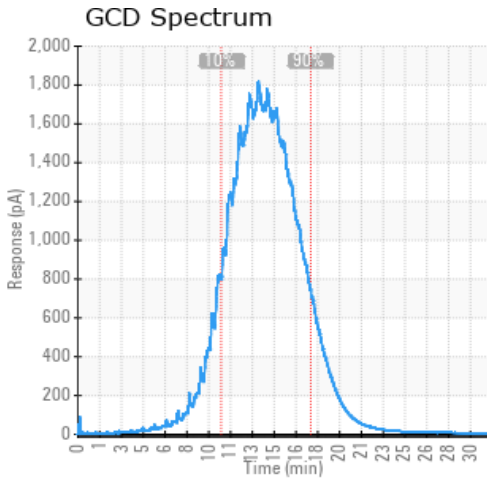
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
10/15/19	01/02/20	0h	AC INJECT LINE	414 / 212	17.7	21.6	0.276	0.180	649 / 343	741 / 394	838 / 448	6.34
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
10/15/19	6	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
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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