

[4-21-55-23-W5] H-802

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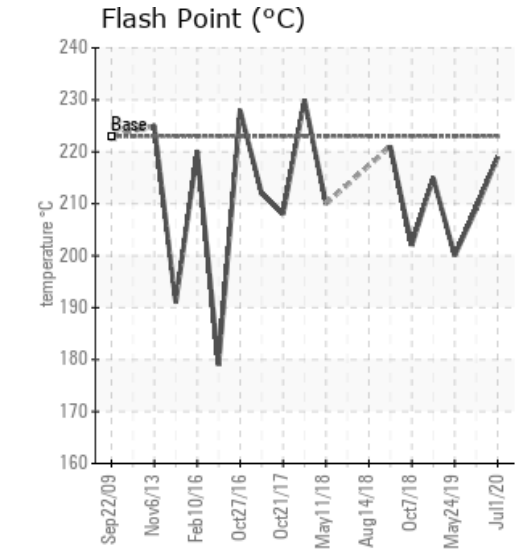
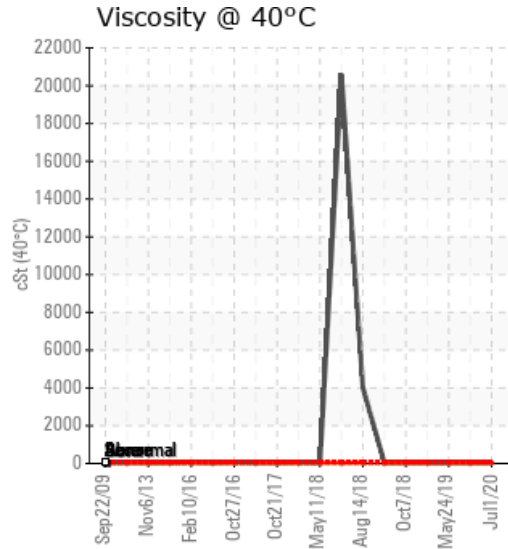
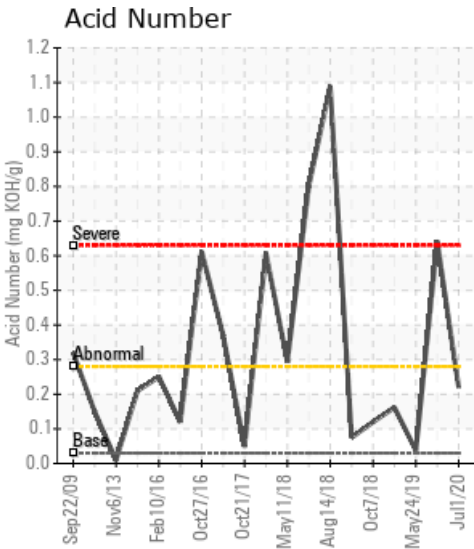
System Information
 System Volume: 15000 ltr
 Bulk Operating Temp: 338F / 170C
 Heating Source:
 Blanket:
 Fluid: PETRO CANADA PETRO-THERM
 Make: ALCO

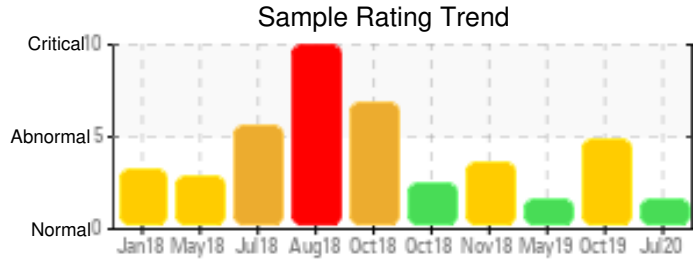
Sample Information
 Lab No: 02378292
 Analyst: Terry Veenstra
 Sample Date: 07/01/20
 Received Date: 09/28/20
 Completed: 10/05/20
 Terry Veenstra
 terry.veenstra@petrocanadalsp.com

Recommendation: Pentane insolubles are severely high however it is trending down from previous samples. GCD, Flash Point and Acid number all look good. Continue to run and resample in 6 months.

Comments: Pentane Insolubles levels are severely high.

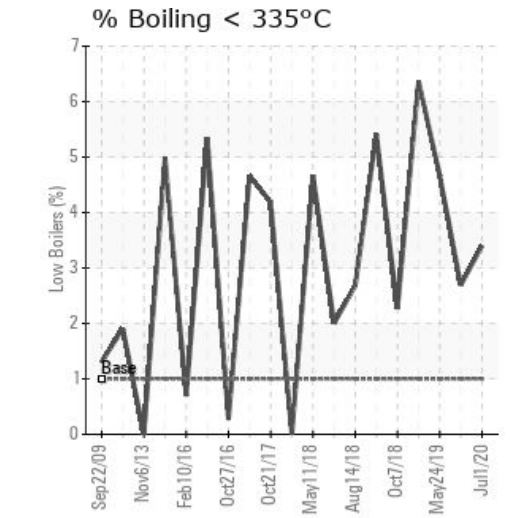
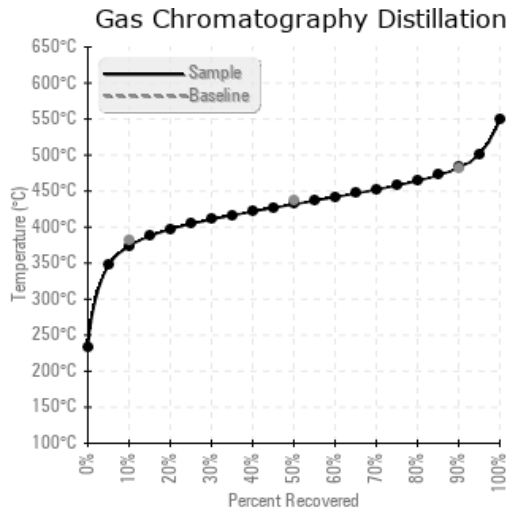
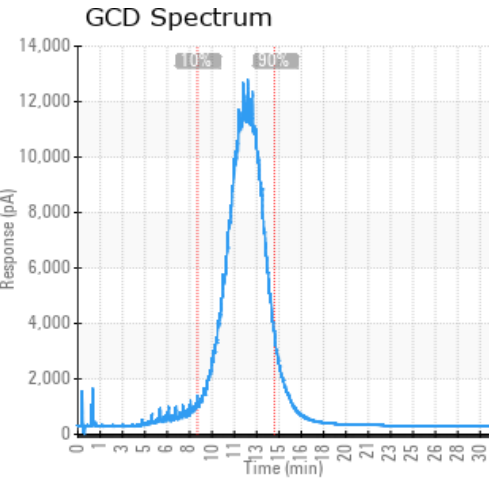
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
07/01/20	09/28/20	0m	Pump discharge	426 / 219	19.6	31.1	0.22	0.560	704 / 374	809 / 432	900 / 482	3.40
10/09/19	10/16/19	0m		408 / 209	11.0	34.6	0.641	0.987	697 / 369	797 / 425	884 / 473	2.69
05/24/19	06/03/19	0m	DISCHARGE SIDE PUMP	392 / 200	24.3	33.4	0.038	1.37	685 / 363	798 / 426	897 / 480	4.67
11/15/18	11/22/18	7m	PUMP DISCHARGE	419 / 215	26.5	34.3	0.162	0.150	651 / 344	750 / 399	852 / 455	6.37
10/07/18	10/17/18	0m		396 / 202	17.0	32.8	0.12	0.749	694 / 368	789 / 421	875 / 468	2.27
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
07/01/20	63	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	1	0	0	0
10/09/19	66	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	1	0	0	0
05/24/19	78	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	1	0	0	0	2	0	1	0
11/15/18	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/07/18	75	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0	1	0	0	0	2	0	1	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	
10/09/19	The fluid is in a reasonable condition and suitable for further use. The AN has increased as a result of fluid degradation. Low boiler vapor content is slight high. Please vent off low boiler vapor to atmosphere. The Pentane Insoluble (solids) content is double the reportable limit and therefore filtration of the fluid is recommended. To stop the fluid from becoming too acidic which will result in corrosion of the system it is recommended to sweeten the fill with 25% of its total volume. Please re-sample after sweetening. Pentane Insolubles levels are severely high. Acid Number (AN) is severely high.
05/24/19	The fluid is in a reasonable condition and suitable for further use. A slightly low Flash Point and 10% GCD temperature in combination with an elevated low boiler vapor content of 4.67% are indications of thermal degradation of the fluid. Please vent off the low boiler vapor to atmosphere. The pentane insolubles (solids) content of the fluid is almost 3x the reportable limit of 0.5%. It is recommended to start filtration of the fluid. Please re-sample in 6 months. Pentane Insolubles levels are severely high.
11/15/18	This sample has been in service for just over 1 month. (not 7 years) The initial water content has been boiled off. The Pentane Insoluble (solids) content has increased but is still well below the limit. The hot fluid has dissolved carbon that was not removed during the cleaning/flushing. The distillation curve is still not representative for Petro-Therm. It's overall low which at this level is not a problem for operation of the fluid but it will be brought up with the laboratory and Petro-Canada R&D. (to be continued) The fluid is in a good condition and suitable for further use. Please re-sample in 6 months. (GCD) 90% Distillation Point is severely low. (GCD) 10% Distillation Point is marginally low. (GCD) 50% Distillation Point is marginally low.
10/07/18	The fluid is in a good condition and suitable for further use. A slightly low Flash Point and 10% GCD temperature in combination with 2.27% low boiler vapor indicates normal thermal degradation. 90% GCD temperature is slightly low. This is no problem for system operation at this time. It is recommended to vent low boiler vapor to atmosphere on a regular basis. The Pentane Insoluble (solids) content of the fluid is lower than before but still exceeds the reportable limit of 0.5%. Therefore filtration of the fluid is recommended. Pentane Insolubles levels are severely high. (GCD) 90% Distillation Point is marginally low.

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