

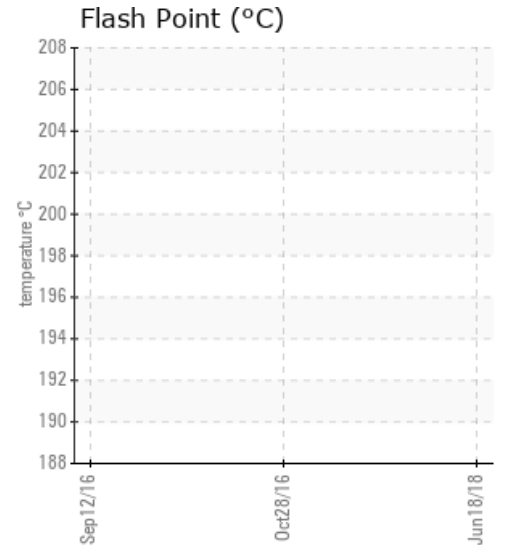
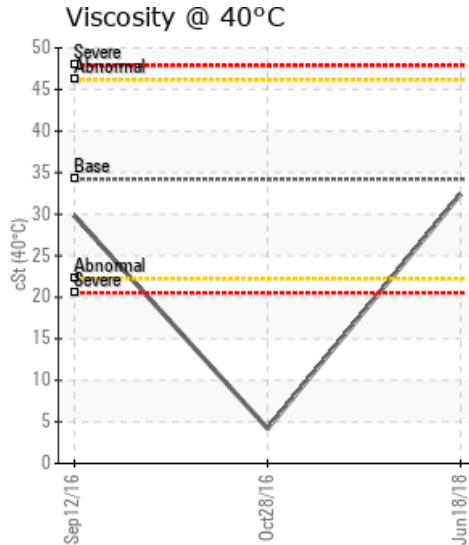
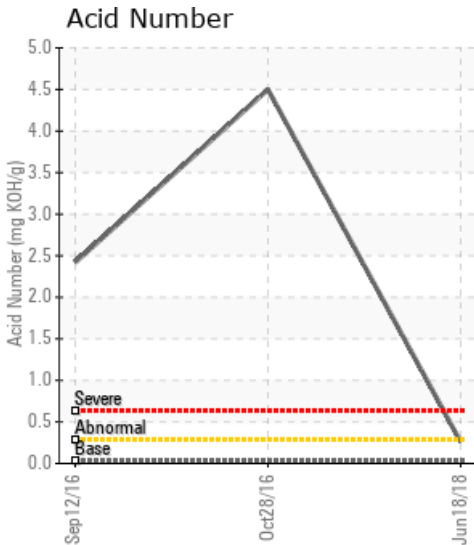
[ARC RESOURCES LSD / 10-36-65-25-W5] ARC SIMONETTE

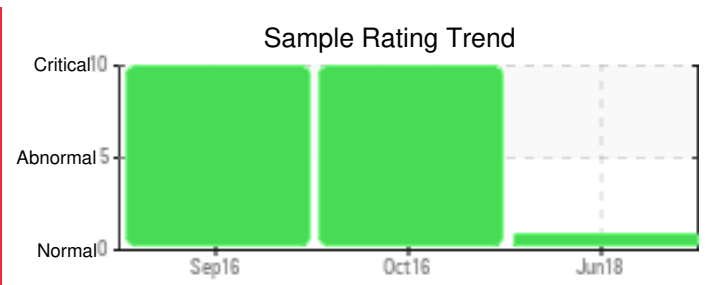
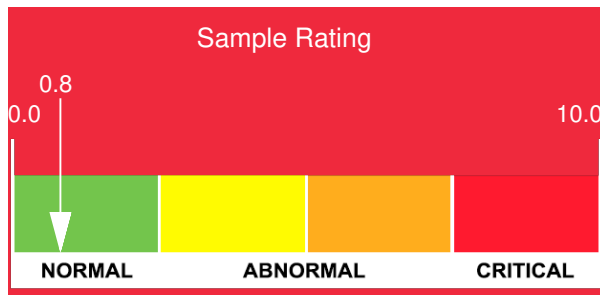
Customer: PTRHTF20177	System Information	Sample Information
ARC RESOURCES LTD. 10-36-65-25-W5 VALLEYVIEW, AB T0H 3N0 Canada Attn: Duane Penson Tel: (780)552-3022 E-Mail: dpenson@arcresources.com	System Volume: 2500 ltr Bulk Operating Temp: 150F / 66C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make:	Lab No: 02224169 Analyst: Peter Harteveld Sample Date: 06/18/18 Received Date: 06/25/18 Completed: 07/03/18 To discuss this report contact Peter Harteveld at (780)967-4234

Recommendation: The fluid is in good condition but the distillation curve as a whole is not representative for Petro-Therm. This in combination with a slightly decreased Flash Point and increased low boiler vapor content (%<335C.) may indicate mixing with a lighter fluid. The fluid is suitable for further use. Please re-sample in 6 months.

Comments: (GCD) 90% Distillation Point is abnormally low.

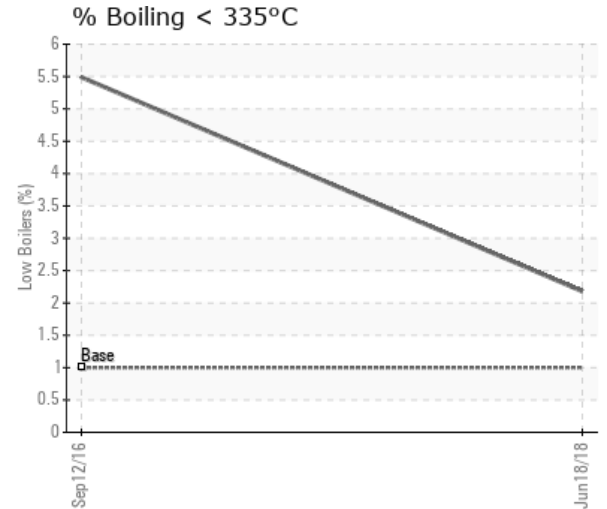
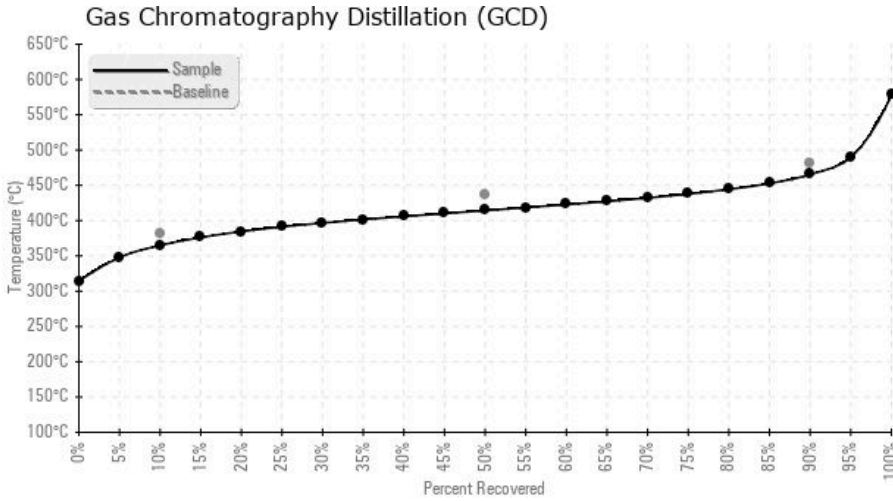
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
06/18/18	06/25/18	4y		388 / 198	40.4	32.4	0.26	0.213	689 / 365	778 / 414	870 / 465	2.18
10/28/16	11/07/16	17y			264750	4.2	4.50					
09/12/16	09/29/16	18y			27322.8	29.8	2.42	5.44	683 / 361	807 / 430	914 / 490	5.49
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
06/18/18	37	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
10/28/16	1156	1	2	10	1	1	0	105	1	1	15	585	447	0	14	3	42	1	16	9	105	0	6	4
09/12/16	475	0	0	50	1	0	1	29	0	0	347	104	26	2	0	1	8	0	3	8	29	1	17	29
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	
10/28/16	The acidity of the fluid is at an unacceptable high level. Corrosion is taking place. It is recommended to drain the fluid, flush the system and re-fill with fresh Petro-Therm. Before doing this the source of contamination has to be eliminated. NOTE: The sample was approximately 50% glycol. Suspect that the customer has sampled from a low point in the system and that is why the glycol content is so high. Iron and manganese ppm levels are severe. PQ levels are abnormal. Glycol contamination levels are severely high. Water contamination levels are severely high. Water contamination levels are severely high. ppm Water contamination levels are severely high. Potassium ppm levels are abnormally high. Acid Number (AN) is severely high. Calcium ppm levels are severely high. Visc @ 40°C is severely low. Sodium ppm levels are notably high.
09/12/16	This sample has 2.7% Water in it. If this is representative of the oil in the system, you risk doing a boil over of the water causing the system to overflow. This could create a potentially dangerous situation. The metallic components are indicate contamination. This system needs to be either cleaned up or replaced. TAN is severely high indicating the oil requires changing. Verify whether the sample taken was representative of the oil in the system. If in fact it is, an oil change and system cleaning is recommended. Aluminum and iron ppm levels are severe. Silicon ppm levels are severely high. Water contamination levels are severely high. Water contamination levels are severely high. ppm Water contamination levels are severely high. Pentane Insolubles levels are severely high. Potassium ppm levels are abnormally high. Sodium ppm levels are severely high. Acid Number (AN) is severely high. Zinc ppm levels are abnormally high. Calcium ppm levels are abnormally 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.