

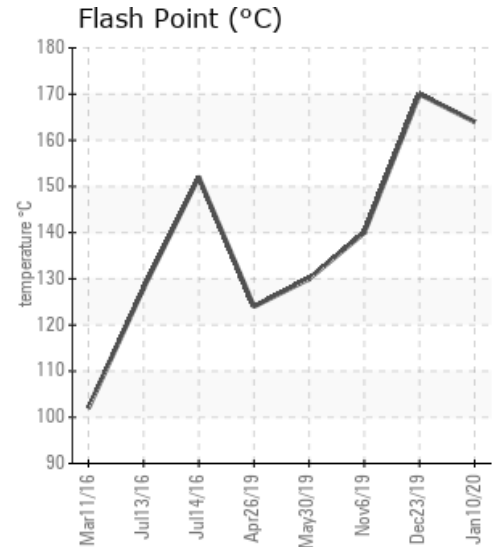
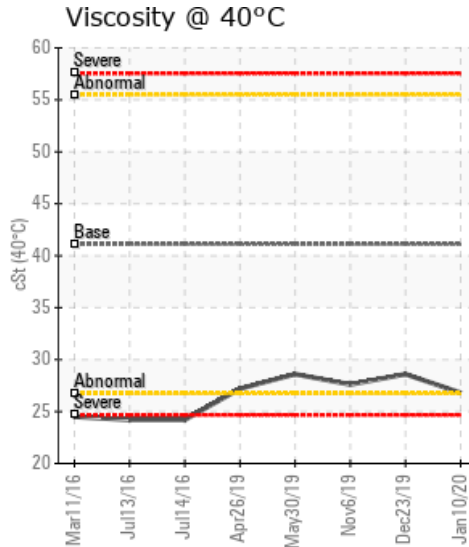
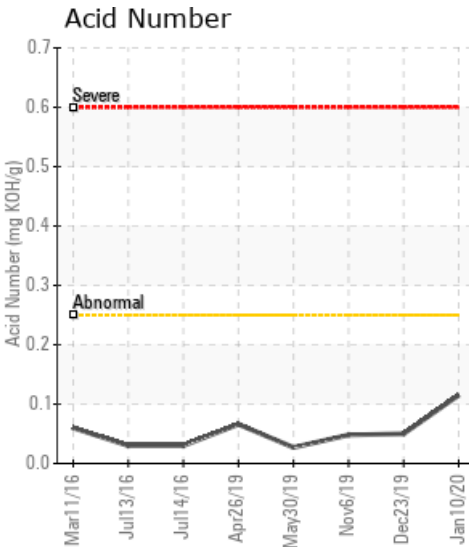
VEOLIA NORTH AMERICA CHICAGO BIOSOLIDS

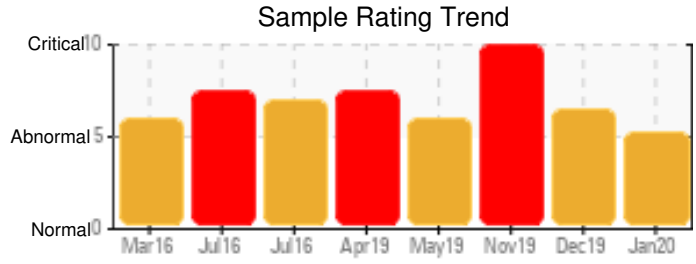
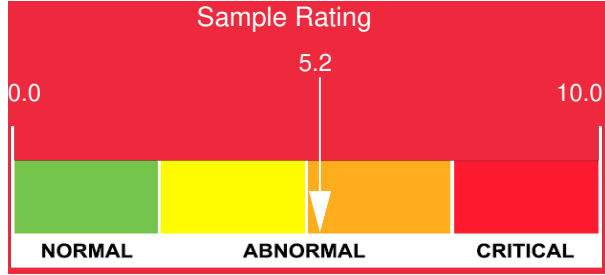
Customer: PTRHTF30090	System Information	Sample Information
VEOLIA NORTH AMERICA 6001 W. PERSHING RD CICERO, IL 60804 USA Attn: Richard Jania Tel: (708)652-0575 E-Mail: richard.jania@veolia.com	System Volume: 38200 gal Bulk Operating Temp: 585F / 307C Heating Source: Blanket: Fluid: CHEVRON HEAT TRANSFER OIL 46 Make: GTS ENERGY INC	Lab No: 02333148 Analyst: Yvette Trzcinski Sample Date: 01/10/20 Received Date: 01/21/20 Completed: 01/28/20 Yvette Trzcinski yvette.trzcinski@petrocanadalsp.com

Recommendation: Venting is helping to remove the light ends and vapors from the system, but the fluid is continuing to break down - as can be seen by the reduction in viscosity moving from an ISO 46 to ISO 32 to an ISO 22 in this last sample. The GCD 90% distillation point is still below the temperature it should be indicating the system operation is continuing to thermally break down the lubricant molecules into smaller molecule sizes lowering the boiling point of the fluid as well as the flash point at very low levels. Recommend scheduling a system change out to a heat transfer fluid that is rated for your system bulk operating temperature

Comments: COC Flash Point is severely low. (GCD) 90% Distillation Point is abnormally low. (GCD) % < 335°C is marginally high. (GCD) 10% Distillation Point is marginally low.

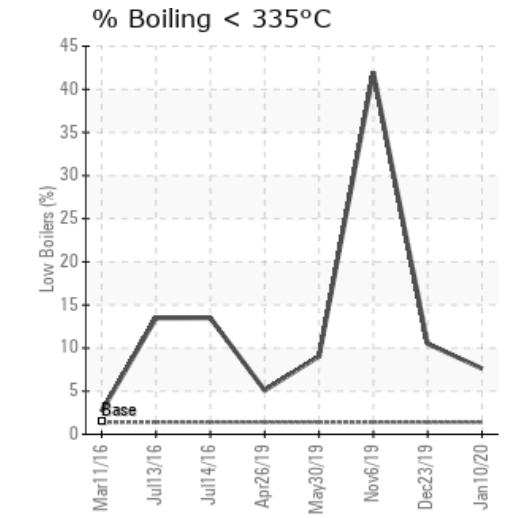
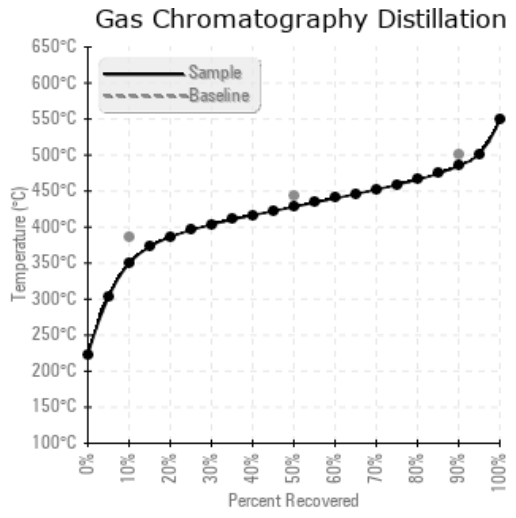
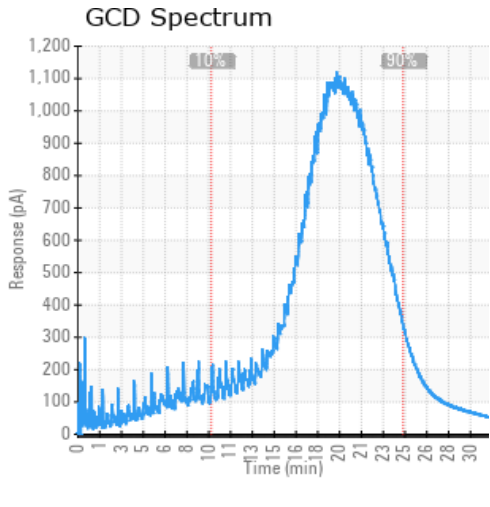
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
01/10/20	01/21/20	4y	RETURN LINE	327 / 164	10.1	26.8	0.115	0.030	661 / 349	803 / 428	905 / 485	7.63
12/23/19	12/30/19	0y	RETURN	338 / 170	5.0	28.6	0.050	0.087	622 / 328	790 / 421	909 / 487	10.50
11/06/19	11/21/19	0y	ANVBAR	284 / 140	8.9	27.6	0.048	0.057	412 / 211	681 / 361	846 / 452	41.97
05/30/19	06/07/19	3y	FILL DRAIN TANK	266 / 130	18.0	28.6	0.027	0.166	646 / 341	816 / 435	924 / 496	9.04
04/26/19	05/07/19	3y	DRAIN PORT FROM SIDE	255 / 124	3.3	27.2	0.066	0.026	700 / 371	824 / 440	928 / 498	5.09
Baseline Data				464 / 240		41.1			727 / 386	828 / 442	932 / 500	1.4





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
01/10/20	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12/23/19	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/06/19	29	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	3	2
05/30/19	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
04/26/19	4	0	0	0	0	0	0	0	0	0	0	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	
12/23/19	The venting has helped to reduce the low boilers from 42 % down to 10 % which has helped to increase the flash point from 140 C/284 F to 170 C/338 F though it is still critically low. The initial boiling range of the heat transfer fluid has dropped by close to 15%. The fluid will continue to degrade affecting the equipment operation and system performance and the flash point is still critically low. Recommend continuing to vent the system regularly and consider changing the fluid to one that is designed to operate under the specifications of the operating system - resample in 1 month (GCD) 10% Distillation Point is severely low. COC Flash Point is severely low. (GCD) % < 335°C is marginally high. (GCD) 90% Distillation Point is marginally low.
11/06/19	The fluid is showing signs of severe degradation and a large amount of light ends - GCD % < 335 C is much higher at 41.97 % compared to last samples. Recommend venting the system immediately and consider changing the heat transfer fluid and charging with a fluid that can handle the bulk oil operating temperature of 587 F the current fluid is only rated for bulk oil temperatures of 550 F. (GCD) % < 335°C is severely high. (GCD) 10% Distillation Point is severely low. (GCD) 50% Distillation Point is severely low. (GCD) 90% Distillation Point is severely low. COC Flash Point is severely low.
05/30/19	This sample is from the drain and fill tank May 30 2019 - Chevron 46 HTF fluid. Fluid is heavily contaminated with solids and thermally cracked light ends. Recommend to remove this fluid from the Drain and fill tank and not use to recharge the system COC Flash Point is severely low. (GCD) 10% Distillation Point is abnormally low. (GCD) % < 335°C is marginally high.
04/26/19	Need to verify the system temperature is 587 F the Chevron HTF 46 is rated for 550 F maximum bulk oil temperature. The system is showing signs of thermal degradation. The viscosity is at 27 cSt @ 40 C and new oil should be 41 that is a viscosity reductions of 34% and the flash point is very low at 124 C new oil should be 210 C. We would recommend venting the system and sweetening with new oil. COC Flash Point is severely low.

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