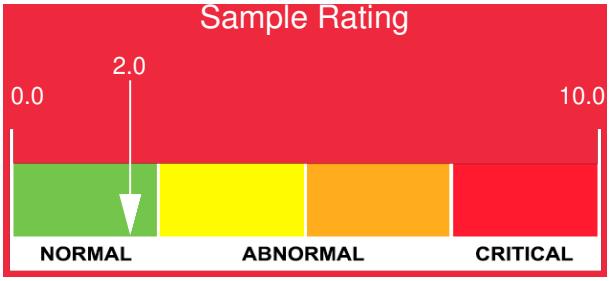
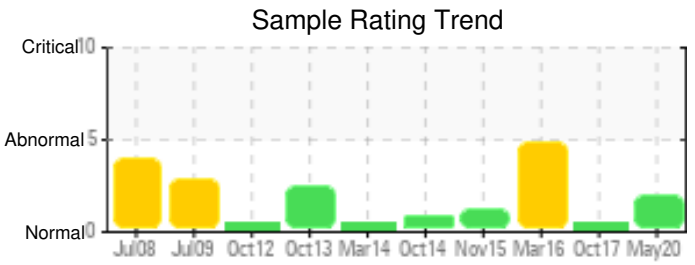




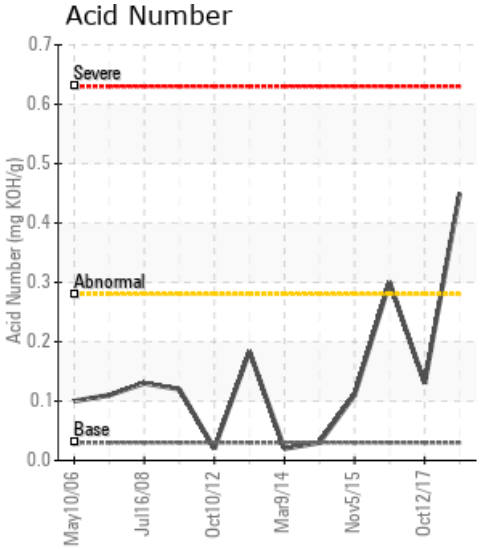
WELLONS

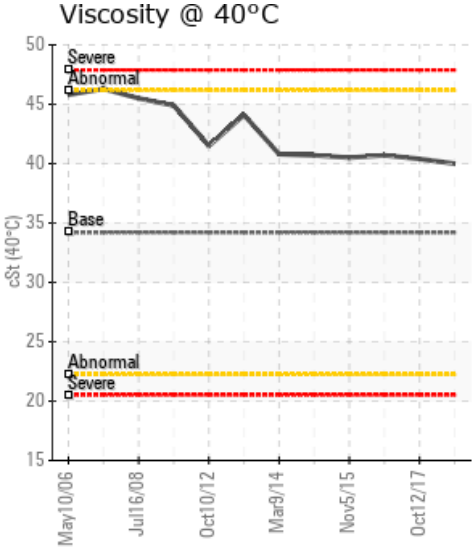
Customer: PTRHTF20077	System Information	Sample Information
TOLKO 180 HODGSON ROAD WILLIAMS LAKE, BC V2G 2P6 CANADA Attn: BRIAN DOWNING Tel: (250)392-3371 E-Mail: BRIAN.DOWNING@TOLKO.COM	System Volume: 0 ltr Bulk Operating Temp: 254F / 123C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: WELLONS	Lab No: 02358332 Analyst: Rob Spiller Sample Date: 05/27/20 Received Date: 06/08/20 Completed: 06/11/20 Rob Spiller Rob.Spiller@petrocanadalsp.com

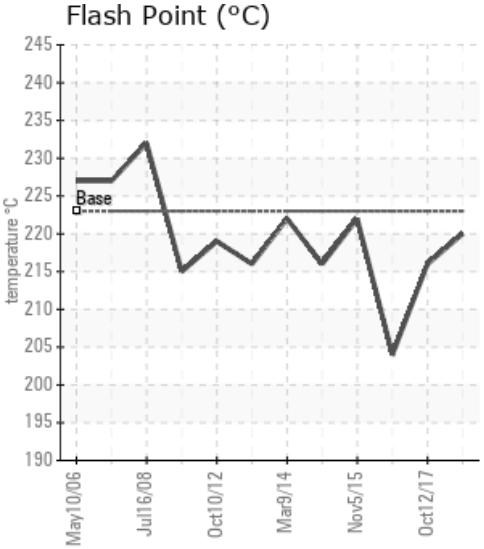
Recommendation: The Petro-Therm fluid is in good condition, however there are some trends that should be monitored. The Total Acid Number (TAN) has increased to a warning level, if TAN gets much higher may recommend sweetening oil with new Petro-Therm. Viscosity @ 40°C is high, but this is likely because the fluid used to initially fill the system was an older formulation of Petro-Therm when it was an ISO 46 viscosity grade, this may also affect the GCD results and be the reason for the GCD at 90% being slightly different. Recommend taking sample in six months to monitor trends.

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

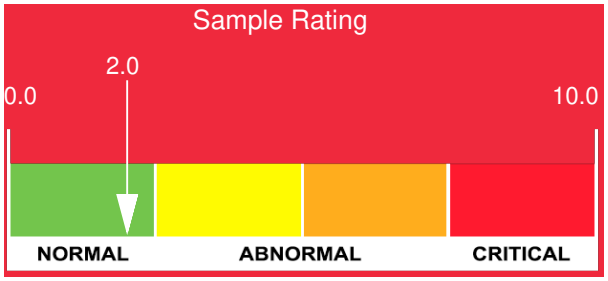
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
05/27/20	06/08/20	30y	PRESSURE VALVE	428 / 220	49.1	40.0	0.45	0.115	712 / 378	829 / 443	936 / 502	2.61
10/12/17	11/07/17	0y	CIRC PUMP	421 / 216	16.1	40.4	0.130	0.167	727 / 386	822 / 439	915 / 490	0.00
03/08/16	03/21/16	29y	CIRCULATION PUMP	399 / 204	20.7	40.7	0.300	0.104	743 / 395	863 / 462	949 / 510	1.09
11/05/15	12/04/15	29y	CIRCULATION PUMP	432 / 222	28.7	40.5	0.11	0.195	708 / 375	822 / 439	917 / 492	2.67
10/17/14	11/03/14	0y	CURCULATION PUMP	421 / 216	32.5	40.7	0.03	0.123	713 / 378	825 / 441	928 / 498	1.75
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

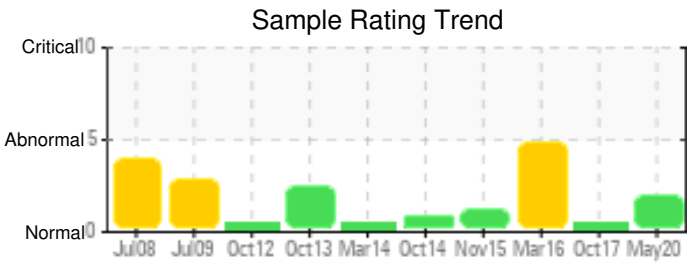






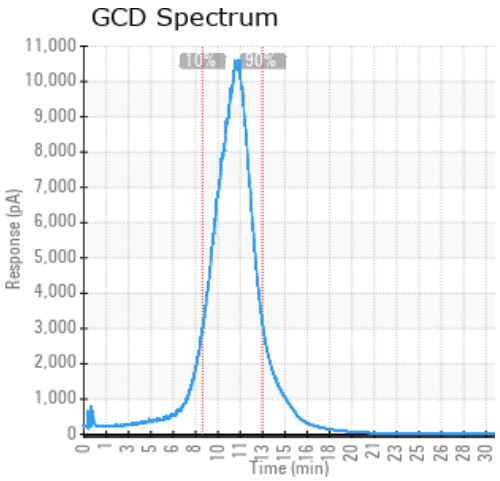
PETRO-CANADA LUBRICANTS

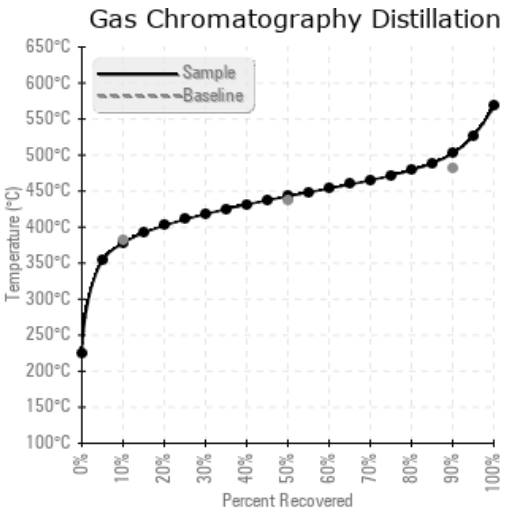


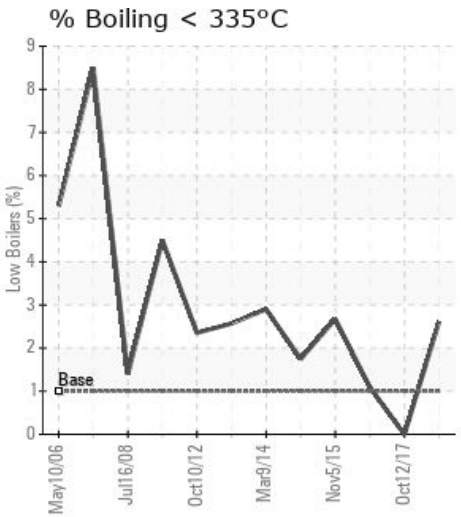


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
05/27/20	9	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/12/17	14	0	1	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03/08/16	18	0	1	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11/05/15	17	0	1	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/17/14	21	0	1	0	20	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	3	0	0	2
Baseline Data			0	0						0			0	0					0				0	

Elemental anaysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]







Historical Comments

10/12/17	The condition of the Petro-Therm fluid looks good. Recommend continuing with yearly sampling. Viscosity @ 40°C is abnormally high, but this is likely because fluid in the system was from an older formulation of Petro-Therm when it was an ISO 46 viscosity grade.
03/08/16	The current condition of the Petro-Therm fluid looks OK, however there are some trends that should be monitored. The Total Acid Number (TAN) has significantly increased to a warning level (0.3), if TAN gets any higher would recommend sweetening oil with new Petro-Therm. Some decrease in Flash Point should be monitored, may be indication of fluid thermal degradation. Viscosity @ 40°C is high, but this is likely because the fluid used to initially fill the system was an older formulation of Petro-Therm when it was an ISO 46 viscosity grade, this may also affect the GCD results. The copper is slightly elevated and we are not sure of the cause, but not a concern at this time. Recommend taking sample in six months to monitor trends.Copper ppm levels are abnormal. Acid Number (AN) is abnormally high. (GCD) 90% Distillation Point is severely high. (GCD) 50% Distillation Point is abnormally high.
11/05/15	The condition of the Petro-Therm fluid looks very good. The copper is slightly elevated but not a concern at this time. Recommend continuing with yearly sampling.Copper ppm levels are abnormal. Visc @ 40°C is abnormally high, but this is likely because some of the fluid in the system was an older formulation of Petro-Therm when it was and ISO 46 viscosity grade.
10/17/14	The condition of the Petro-Therm fluid looks quite good. The 90% distillation point is slightly elevated but not a concern at this time. Recommend continuing with yearly sampling. (GCD) 90% Distillation Point is abnormally high.

