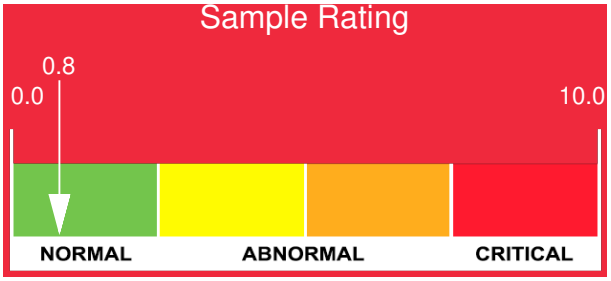
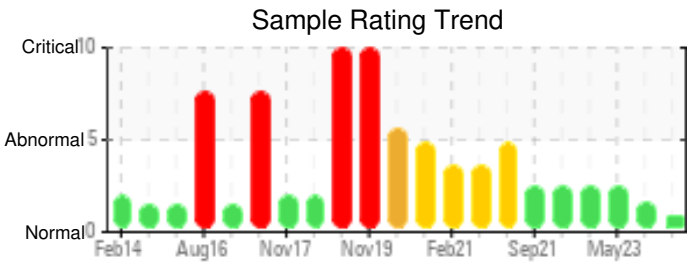




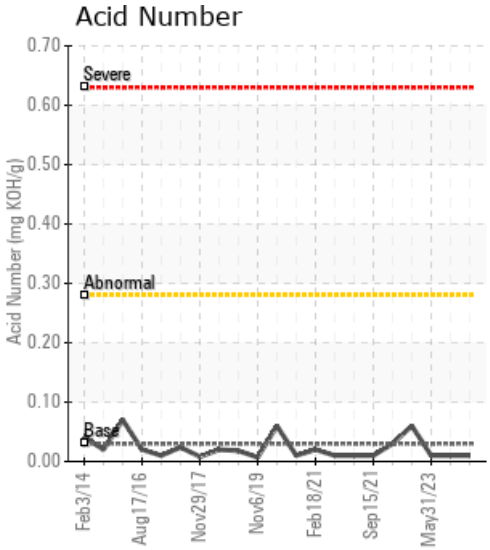
PM #1 STACK HOT OIL SYSTEM

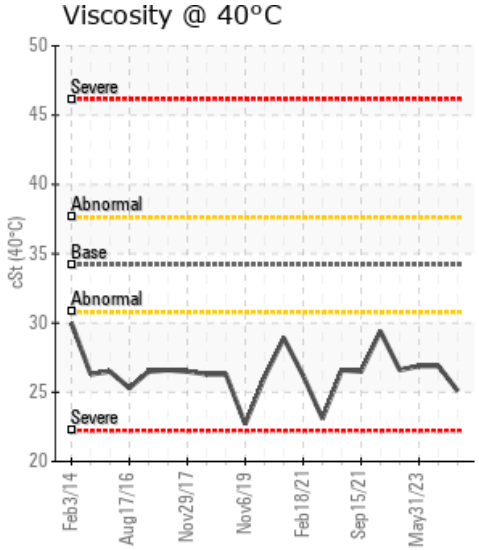
Customer: PTRHTF30073	System Information	Sample Information
IRVING PAPER LTD 435 BAYSIDE DRIVE SAINT JOHN, NB E2L 4K9 CA Attn: Anthony Bass Tel: (506)650-8435 E-Mail: bass.anthony@irvingpaper.com	System Volume: 3500 ltr Bulk Operating Temp: 536F / 280C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: METSO	Lab No: 02643283 Analyst: Luc Leblanc Sample Date: 06/13/24 Received Date: 06/20/24 Completed: 06/25/24 Luc Leblanc luc.leblanc@HFSinclair.com

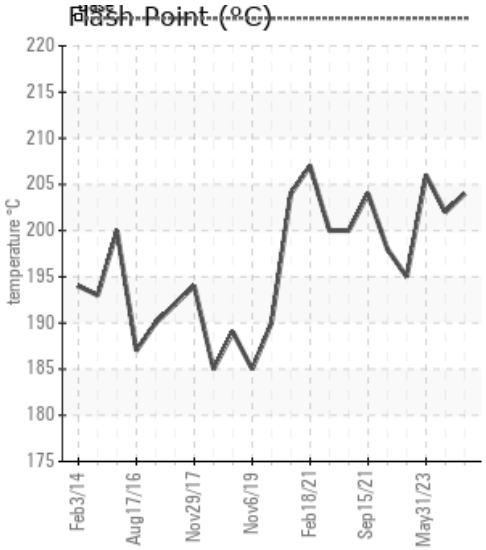
Recommendation: The fluid is in good condition and suitable for continued use, with stable values for key properties. Resample at your regular 6-month interval if no significant events take place prior to that time. Keep up the good maintenance practices.

Comments: Negligible contamination from water, wear metals, or insolubles. The 10% distillation point, and %<335°C (GCD) results are consistently off-spec but related to the blend of different fluids (Petro-Therm + Therminol 66), and often observed with the use of nitrogen blanketing. Acid number remains excellent at 0.01; Flash point is stable and acceptable at 204°C.

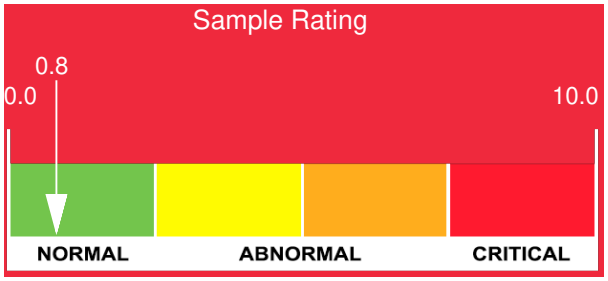
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
06/13/24	06/20/24	11.0y		399 / 204	32	25.1	0.01	0.031	646 / 341	767 / 408	889 / 476	6.06
12/05/23	12/13/23	10.0y		396 / 202	30	26.9	0.01	0.068	645 / 341	758 / 403	882 / 472	6.13
05/31/23	06/06/23	10.0y	MANIFOLD	403 / 206	4.4	26.9	0.01	0.154	648 / 342	756 / 402	878 / 470	4.68
10/19/22	10/26/22	10.0y	system manifold	383 / 195	26.0	26.6	0.06	0.022	648 / 342	748 / 398	875 / 468	4.97
05/04/22	05/13/22	9.0y	manifold from system	388 / 198	21.7	29.4	0.03	0.016	645 / 341	751 / 399	879 / 470	5.06
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

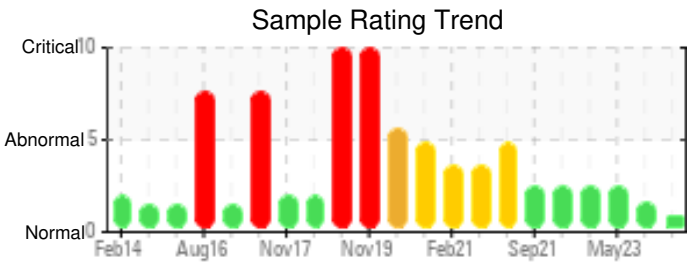






PETRO-CANADA LUBRICANTS

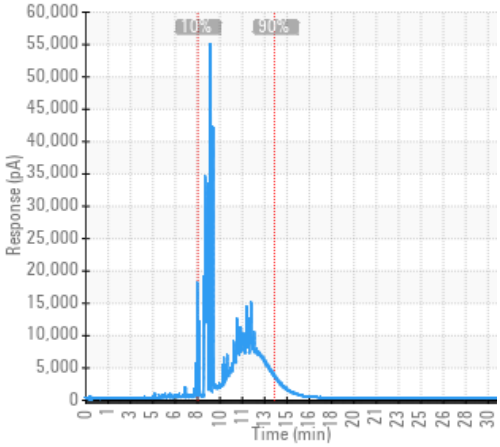




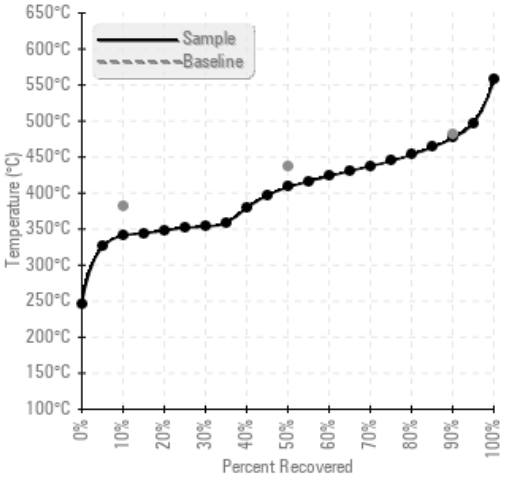
Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
06/13/24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12/05/23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/31/23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/19/22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05/04/22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Baseline Data			0	0						0			0	0					0				0	

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

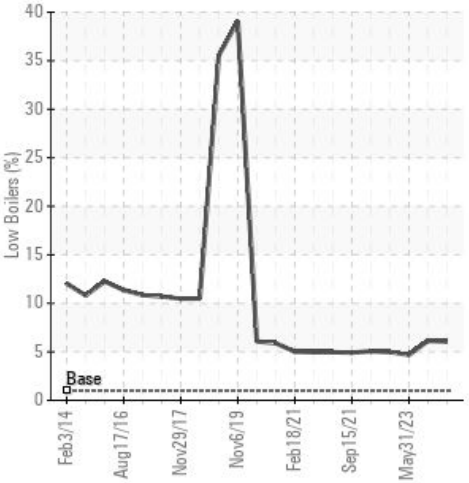
GCD Spectrum



Gas Chromatography Distillation



% Boiling < 335°C



Historical Comments

12/05/23	No immediate action is needed. Resample at your regular interval. Continue to indicate whenever there is topping up, venting of light ends, or other notable maintenance events.The fluid mixture is clean, showing little metals, but improved insolubles concentration. Water content is low at 30 ppm. Flash point, Acid Number, Viscosity are all stable and acceptable. ***The values for GCD 10% and 50% distillation points, as well as the GCD %<335C are persistently in the caution state based on pure Petro-Therm limits.
05/31/23	The overall condition remains good. Pentane insolubles have risen (0.15%), but remain below our limit. We will monitor the rising tendency with the next sample. If it does not improve, we will recommend a filtration service.Continue to indicate on the sample label whenever there is a mixture of fluids, sweetening, venting of light ends, or other notable maintenance events.The fluid contains no wear/corrosion metals, and very little water. Flash point is relatively stable, though it is still below our fresh Petro-Therm value. The low (GCD) distillation points across the curve continue to be low. However, they are likely attributed to the blend of different fluids. The Acid Number is low @0.01 and remains stable through the years.
10/19/22	No immediate action is needed. Resample at your regular interval, keeping an eye on the evolution of flash point, GCD curve, and TAN. Continue to indicate whenever there is a mixture of fluids, sweetening, venting of light ends, or other notable maintenance events.Elemental analysis of wear and rust particles is excellent. Both pentane insolubles (0.022%) and water concentrations are very low, and doing well. (GCD) 10% and 50% Distillation Points are stable, but below target. The flash point is slightly reduced again (195°C) compared to the previous sample. These trends, along with the slightly elevated GCD 4.97% <335°C have been observed with high nitrogen blanket pressures, or mixtures with other fluids. The Acid Number of 0.06 is excellent, well below the warning threshold.
05/04/22	The fluid is in great condition overall. Exact maintenance practices (fluid top ups, venting) are unknown. Consult with your Petro-Canada representative should you have questions. Continue monitoring results for flash point and GCD distillation curve in the next sample.Elemental analysis of wear and rust particles is excellent. Both pentane insolubles and water concentrations are very low. (GCD) 10% Distillation Point is abnormally low, but stable. The flash point is slightly reduced (198°C). These trends, along with the slightly elevated GCD 5.06% <335°C can be attributed to high nitrogen blanket pressures. The Acid Number of 0.03 is well below the warning threshold.

