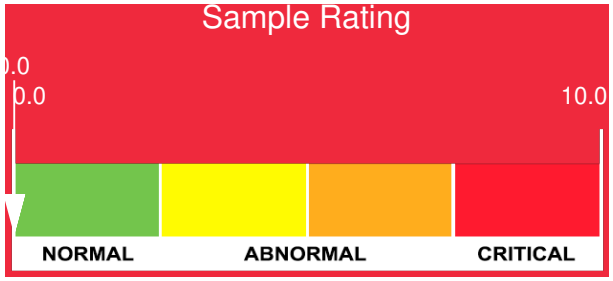
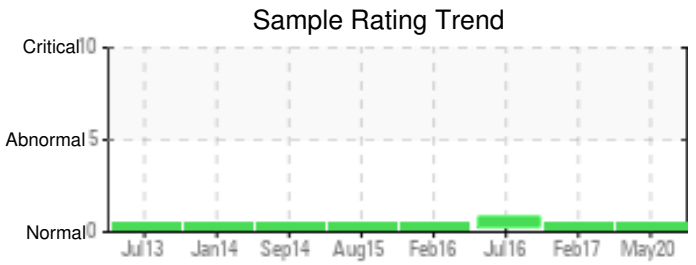




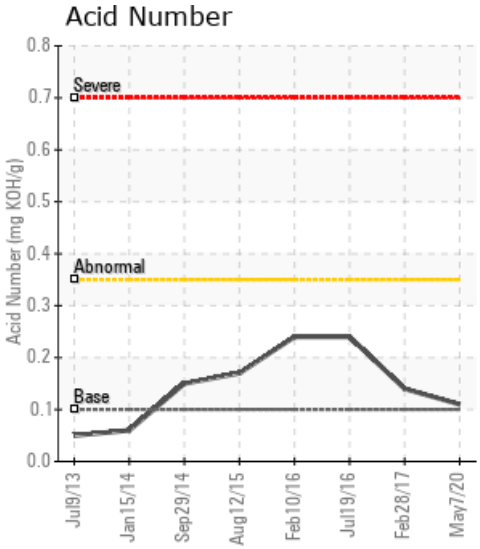
[DREW @ CELANESE] 5R FULTON SKID

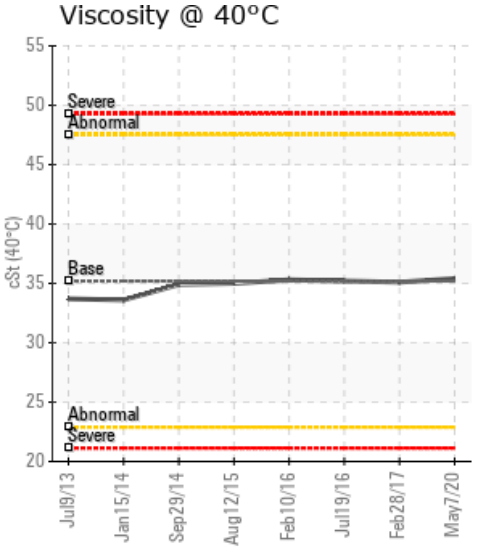
Customer: PTRHTF20087	System Information	Sample Information
Celanese Eva Performance Poly 4405-101 AVE. P.O. 428 EDMONTON, AB T5J 2K1 Canada Attn: Greg Hein Tel: E-Mail: greg.hein@celanese.com	System Volume: 0 ltr Bulk Operating Temp: Not Specified Heating Source: Blanket: Fluid: PETRO CANADA CALFLO HTF Make:	Lab No: 02353403 Analyst: Yutong Gao Sample Date: 05/07/20 Received Date: 05/12/20 Completed: 05/14/20 Yutong Gao yutong.gao@petrocanadalsp.com

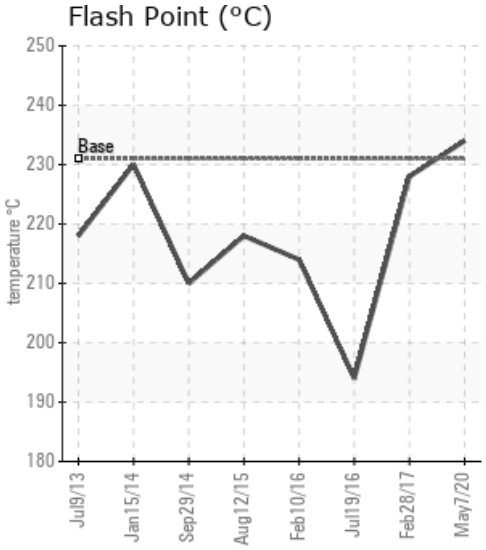
Recommendation: The current fluid has a very similar condition as the sample in 2017. The oil viscosity and flash point are normal. There is minimum oxidation or water contamination. It is suitable for further use. Please take one sample in 18 months to monitor the conditions.

Comments:

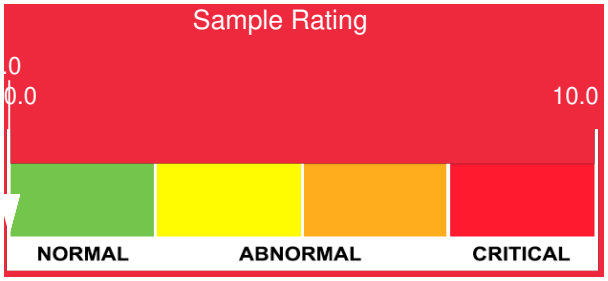
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
05/07/20	05/12/20	17m	PUMP 2	453 / 234	8.2	35.4	0.11	0.047	729 / 387	816 / 436	922 / 494	0.40
02/28/17	03/02/17	0m	DRAIN	442 / 228	6.4	35.1	0.14	0.076	721 / 383	809 / 432	918 / 492	0.53
07/19/16	07/21/16	0m	FILTER POT DRAIN	381 / 194	0.6	35.2	0.24	0.046	723 / 384	801 / 427	903 / 484	0.00
02/10/16	02/12/16	0m	PIPING	417 / 214	9.3	35.3	0.24	0.058	721 / 383	813 / 434	919 / 493	0.77
08/12/15	08/14/15	0m	DRAIN	424 / 218	22.0	35.0	0.17	0.056	717 / 381	809 / 432	919 / 493	0.47
Baseline Data				448 / 231		35.20	.1		712 / 378	810 / 432	910 / 488	1.75

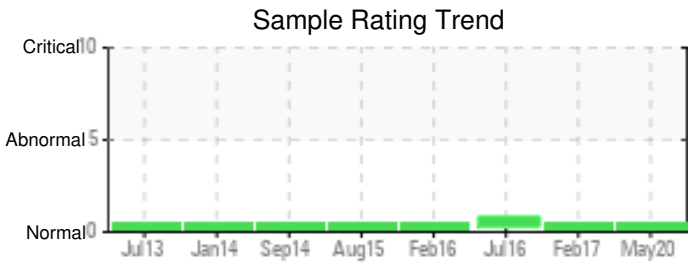






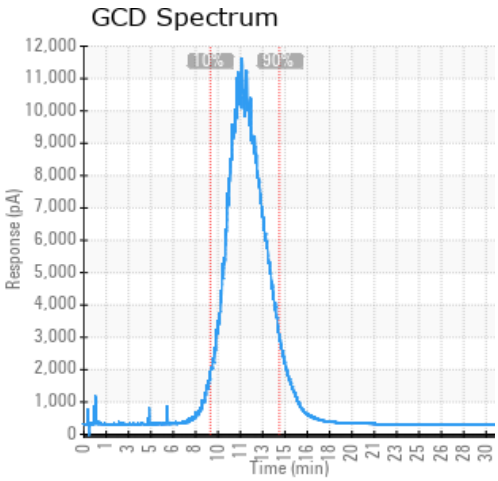
PETRO-CANADA LUBRICANTS

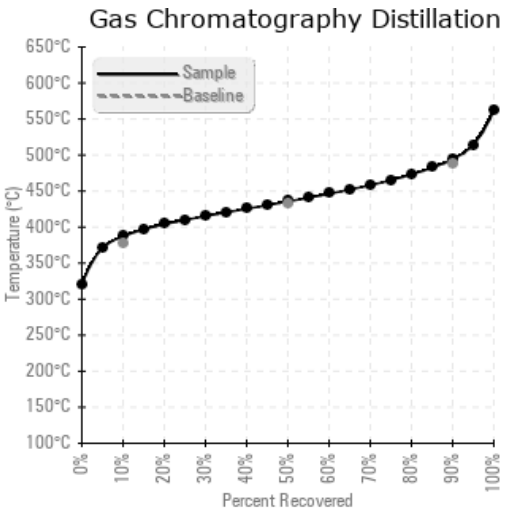


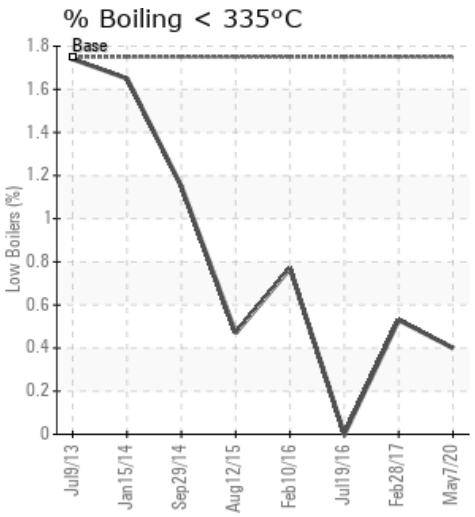


Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
05/07/20	23	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	161	2
02/28/17	31	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	196	0
07/19/16	20	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	193	0
02/10/16	10	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	249	0
08/12/15	37	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	152	0
Baseline Data			0	0						0			0	0					0				280	

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







Historical Comments

02/28/17	Results are normal.
07/19/16	Note the flash point is reducing and is typically associated with thermal degradation of the heat transfer oil. Note the acid number is creeping higher. Acid number increase is likely due to the formation of oxidation by products. Oxidation is a chemical reaction between oxygen and the components of the oil whereby the hydrocarbon in the oil turns into weak carboxylic acids and other carbon-oxygen containing species. The higher the temperature, the worse the oxidation becomes and it will feed off of itself becoming exponentially worse over time when the additives are depleted. In a closed heat transfer system, the most probable place for fluid oxidation to occur is in the expansion tank (without an inert gas blanket). In an open system, the fluid oxidizes rapidly at its operating temperature. Different oils vary considerably in their resistance to oxidation largely due to the base oil used and the antioxidant additives used in the oil.Resample at the next interval and continue to monitor. COC Flash Point is marginally low.
02/10/16	Results are within acceptable guidelines. Continue to monitor system and resample at the next interval.
08/12/15	Oil is in good condition, please resample at next maintenance interval.I agree with the laboratories interpretation.

