Sample Rating

0.0 — 10.0

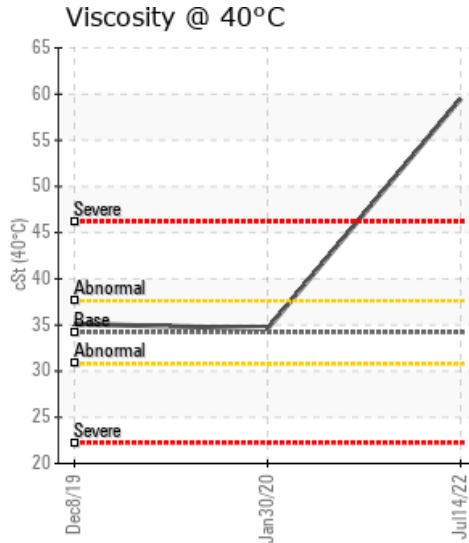| NORMAL | ABNORMAL | CRITICAL |

Sample Rating Trend

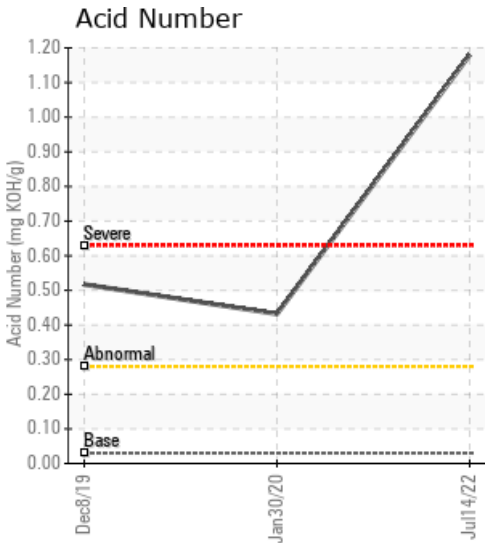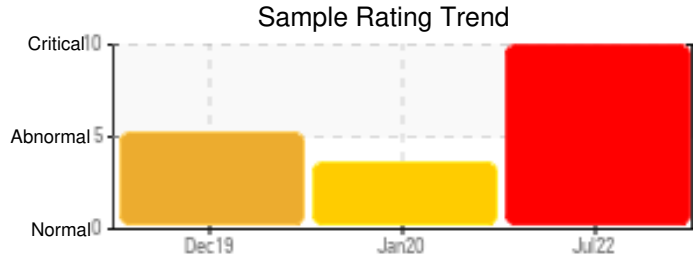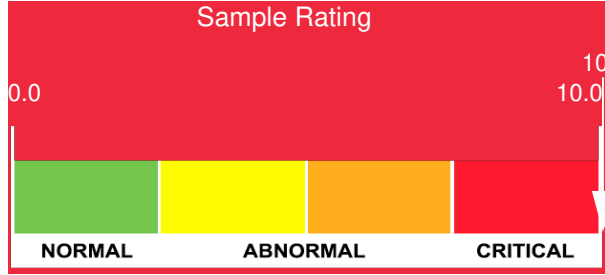# [8-11-47-16W5] PECO

Customer: PTRHTF20233	System Information	Sample Information
CANLIN ENERGY 8-11-47-16W5 EDSON, AB Canada Attn: Dana Erickson Tel: (780)517-7585 E-Mail: dana.erickson@canlinenergy.com	System Volume: 7000 ltr Bulk Operating Temp: 410F / 210C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: ALCO	Lab No: 02501992 Analyst: Lyle Dach Sample Date: 07/14/22 Received Date: 07/26/22 Completed: 08/16/22 Lyle Dach lyle.dach@hollyfrontier.com

Recommendation: This sample indicates the fluid is poor condition, resample to confirm condition. Ensure a system representative sample is collected, if possible the sample should be collect at a hot turbulent area of the system, pump discharge is best. If there are no system pumps, the sample location needs to be purged well and hot fluid needs to be flowing for several seconds to get any static residual fluid removed before collecting the sample. *** viscosity test performed twice (59.0 and 59.5 cSt). ***

Comments: Iron ppm levels are severe. PQ levels are severe. Pentane Insolubles levels are severely high. Acid Number (AN) is severely high. Visc @ 40°C is severely high.
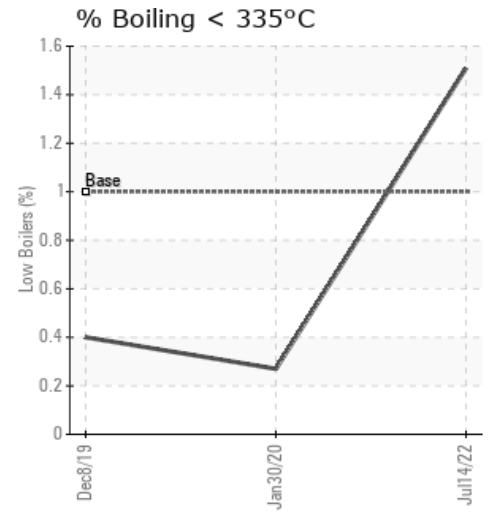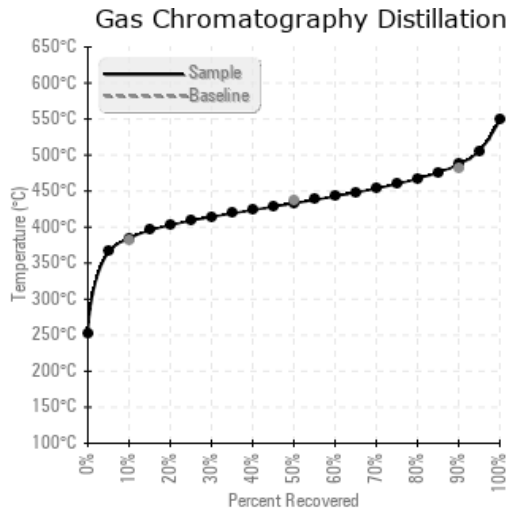
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
07/14/22	07/26/22	6.0y		428 / 220	276.9	59.5	1.18	3.35	724 / 385	811 / 433	909 / 487	1.51
01/30/20	02/12/20	2.0y	SIGHT GLASS	421 / 216	26.0	34.6	0.432	0.625	738 / 392	834 / 446	925 / 496	0.27
12/08/19	12/17/19	2.0y			1063.9	35.1	0.517	0.429	705 / 374	792 / 422	902 / 483	0.40
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

Acid Number

Viscosity @ 40°C

Flash Point (°C)

Sample Rating

0.0 10.0

10

| NORMAL | ABNORMAL | CRITICAL |

Sample Rating Trend

Critical 10
Abnormal 5
Normal 0

Dec19 — Jan20 — Jul22
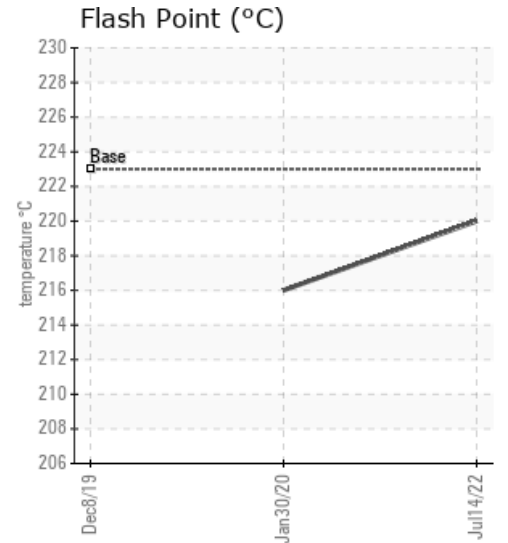
Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
07/14/22	601	0	0	4	0	3	0	0	0	0	2	0	4	0	0	0	8	0	2	0	0	0	1	0
01/30/20	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12/08/19	16	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 anaysis results (above) in parts per million (ppm). [10,000 ppm = 1.0%]

GCD Spectrum

Response (pA) vs Time (min). 10% — 90% markers.

Gas Chromatography Distillation

Temperature (°C) vs Percent Recovered. Sample (solid), Baseline (dashed).

% Boiling < 335°C

Low Boilers (%) vs dates Dec8/19 — Jan30/20 — Jul14/22. Base line shown.

Historical Comments

01/30/20	Pentane Insoluable and Acid Number are higher then normal. Fluid may have has some thermal cracking. Ensure gas blanker is in place and functioning. Consideration should be given to filtering the oil. Resample in 6 months. Pentane Insolubles levels are severely high. Acid Number (AN) is abnormally high. (GCD) 90% Distillation Point is marginally high.
12/08/19	Sample contains a significant amount of water. Please ensure the sample is taken from a circulated area and that the sample line has been purged sufficiently. Too much water in the system can be a safety concern due to risk of boiler over. Results indicate that the sample may not be representative. Please resample and resubmit ASAP. Water contamination levels are severely high. ppm Water contamination levels are severely high. ppm Water contamination levels are severely high.. Pentane Insolubles levels are abnormally high. Acid Number (AN) is abnormally high.