

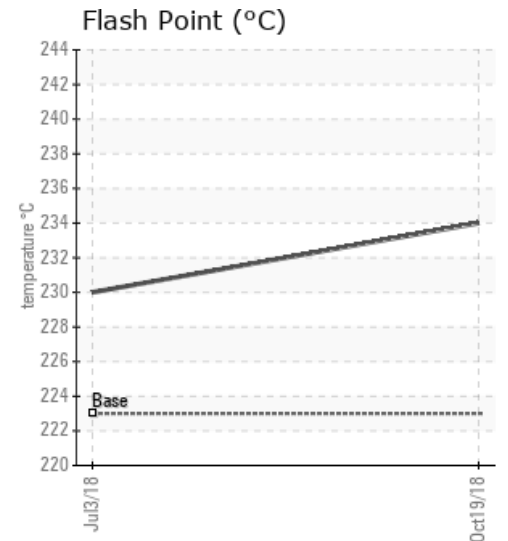
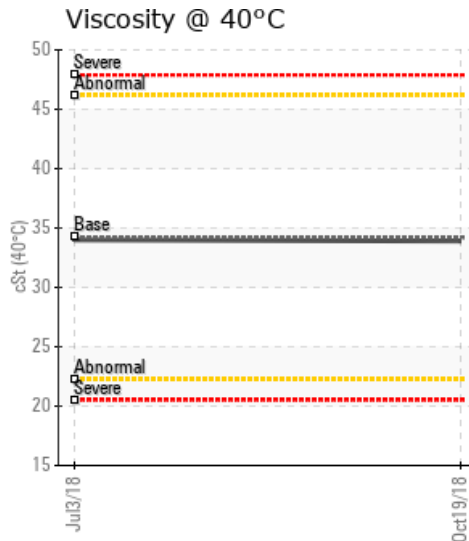
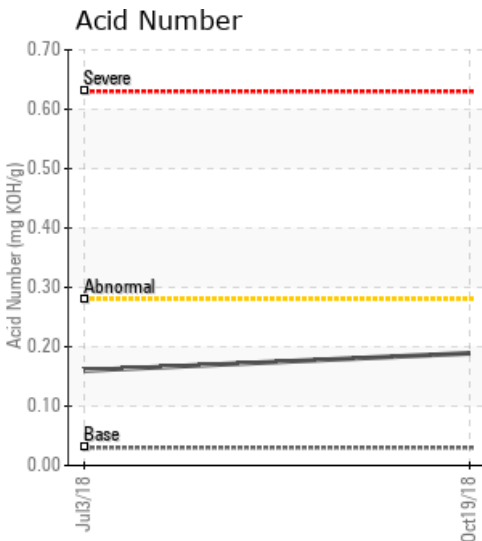
## [ELKO ENERGY PLANT] CANFOR SAMPLE PORT 1

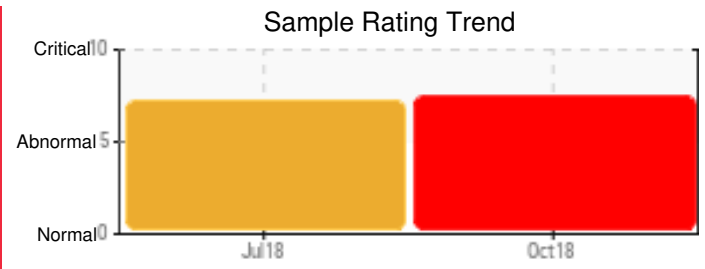
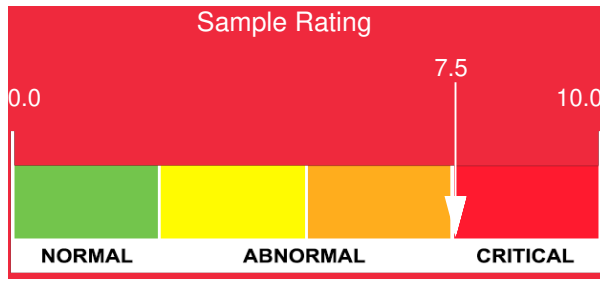
Customer: PTRHTF20200	System Information	Sample Information
CANFOR-ELKO ENERGY PLANT 9600 CASCADE RD ELKO, BC V0B 1T3 Canada Attn: Steve Wilson Tel: (250)464-9101 E-Mail: steven.wilson@canfor.com	System Volume: 75000 ltr Bulk Operating Temp: 482F / 250C Heating Source: Blanket: Fluid: PETRO CANADA PETRO-THERM Make: DELTECH MANUFACT	Lab No: 02247773 Analyst: Rob Spiller Sample Date: 10/19/18 Received Date: 10/26/18 Completed: 10/29/18 Rob Spiller Rob.Spiller@hollyfrontier.com

Recommendation: Still seeing high Sodium and Calcium levels with re-sample. Unsure on source of Sodium and Calcium but possibly minerals from water contamination, with 200-300 ppm water present. Overall fluid condition looks good. The elevated 90% distillation temperature shows some signs of fluid degradation but not a concern at this time. Recommend monitoring system by sampling again in 6 months.

Comments: Sodium & Calcium ppm levels are severely high. (GCD) 90% Distillation Point is 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	%
10/19/18	10/26/18	4.5y		453 / 234	220.7	33.9	0.189	0.043	734 / 390	818 / 437	940 / 504	0.04
07/03/18	07/10/18	3.5y		446 / 230	276.0	34.0	0.16	0.089	745 / 396	794 / 423	886 / 475	0.00
Baseline Data				433 / 223		34.2	0.03		720 / 382	817 / 436	900 / 482	1.00

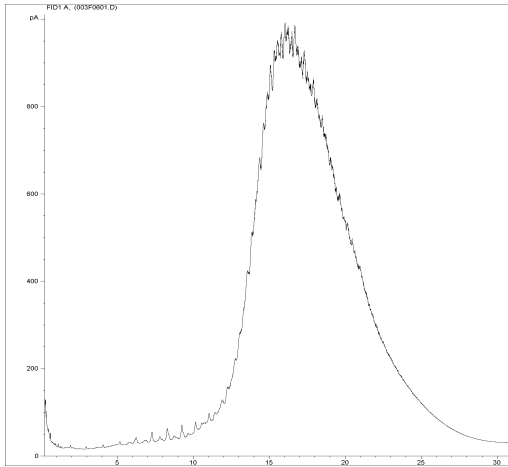




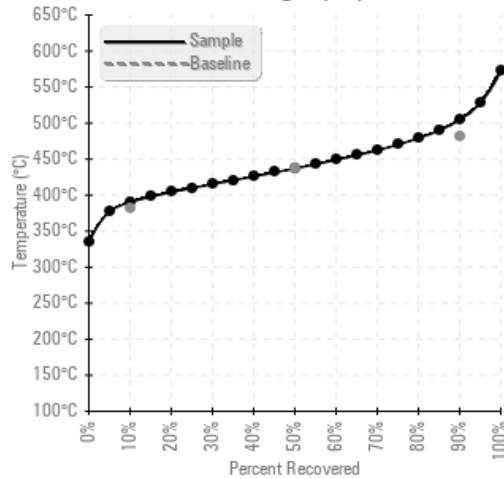
Sample Date	Iron	Chromium	Nickel	Aluminum	Copper	Lead	Tin	Cadmium	Silver	Vanadium	Silicon	Sodium	Potassium	Titanium	Molybdenum	Antimony	Manganese	Lithium	Boron	Magnesium	Calcium	Barium	Phosphorus	Zinc
10/19/18	6	0	0	0	0	0	0	0	0	0	0	276	0	0	0	0	0	0	0	1	381	0	4	2
07/03/18	5	0	0	0	0	0	0	0	0	0	0	271	1	0	0	0	0	0	0	2	379	0	4	2
Baseline Data			0	0						0			0	0					0				0	

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

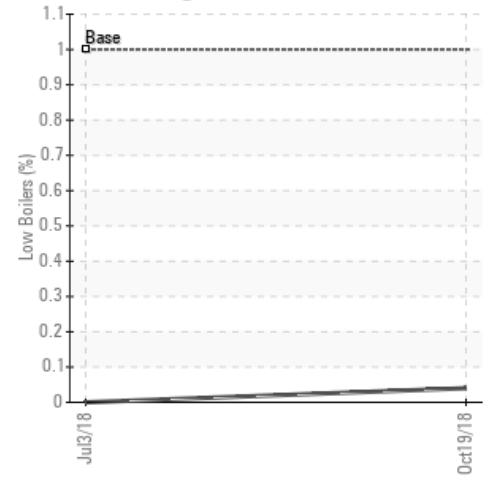
#### GCD Spectrum



#### Gas Chromatography Distillation



#### % Boiling < 335°C



### Historical Comments

07/03/18	Unsure of source of abnormally high Sodium and Calcium Levels. Had discussion with Steve at Canfor Elko. Recommend taking another sample and ensure it is representative of bulk oil circulating in the system. Also make sure that any stagnant oil in the sample port is flushed out before taking sample. Sodium ppm levels are severely high. Calcium ppm levels are severely high.

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