

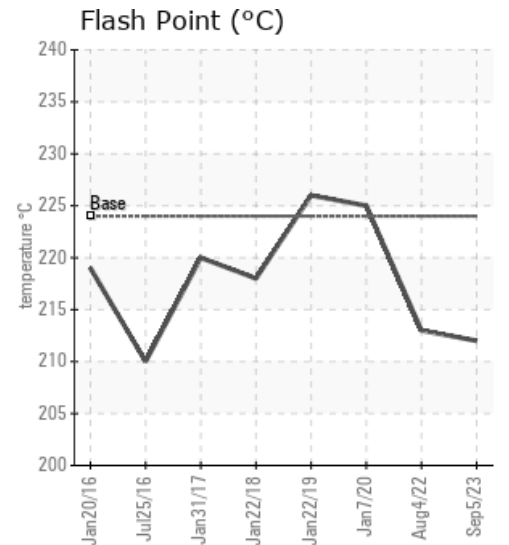
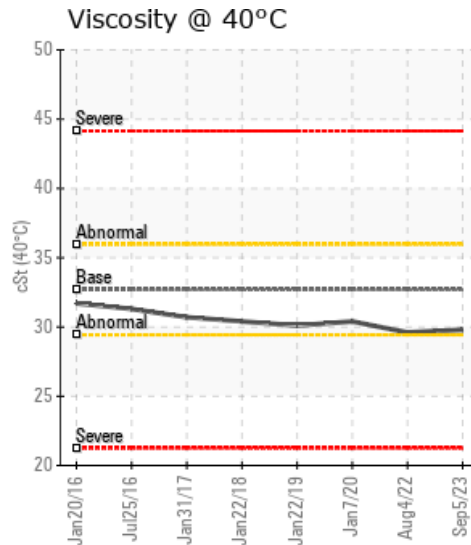
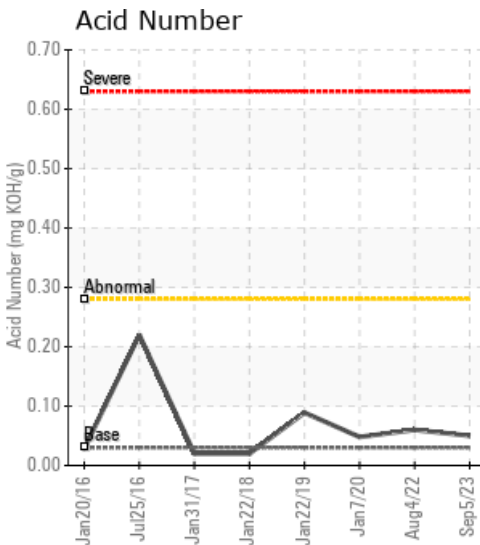
[PEMBINA KAKWA / LSD 8-13-63-5W6] PHASE #4 HEAT MEDIUM

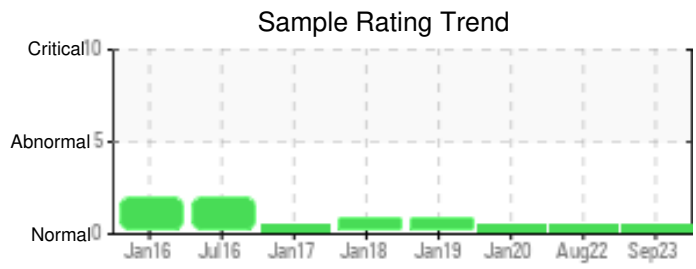
Customer: PTRHTF20062	System Information	Sample Information
Pembina Gas Services	System Volume: 40000 ltr	Lab No: 02582629
GRANDE PRAIRIE, AB T8V 7K2 CA	Bulk Operating Temp: 500F / 260C	Analyst: Clinton Buhler
Attn: Nicolas Brooks	Heating Source:	Sample Date: 09/05/23
Tel: (403)874-8047	Blanket:	Received Date: 09/14/23
E-Mail: nbrooks@pembina.com	Fluid: PETRO CANADA CALFLO AF	Completed: 09/19/23
	Make: HEATECH	Clinton Buhler
		Clinton.Buhler@HFSinclair.com

Recommendation: Sample results indicate the fluid is in suitable condition for continued service. Iron concentration has increased slightly, yet the fluid's Acid Number remains low. Please re-sample in 12 months.

Comments:

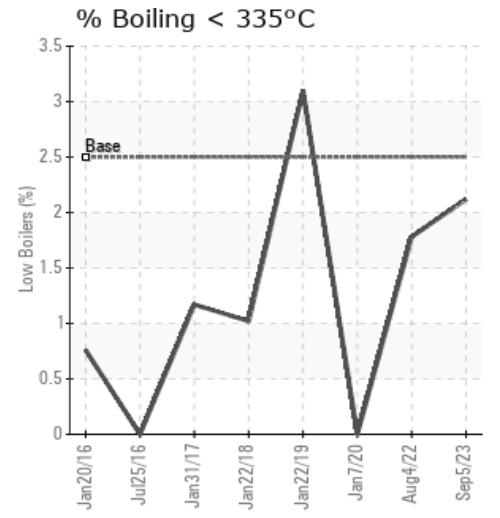
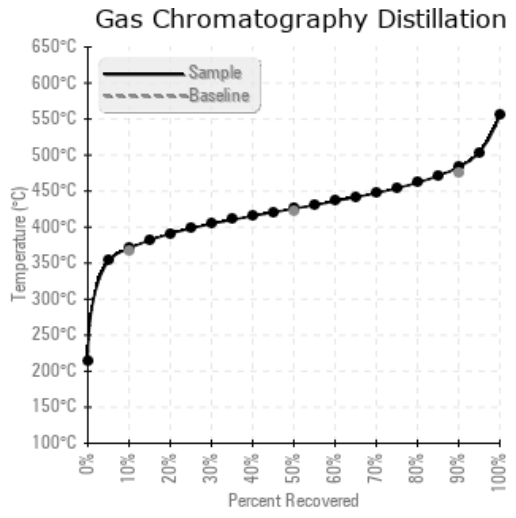
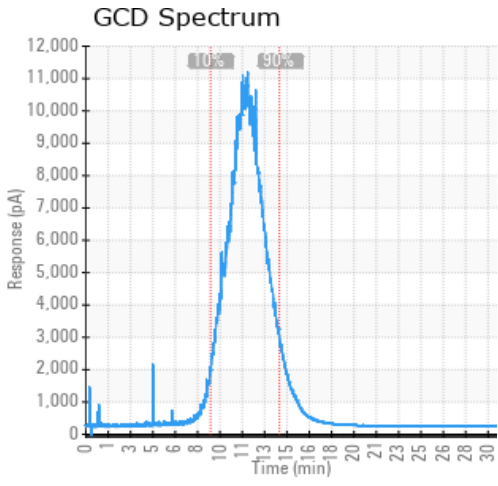
Sample Date	Received Date	Fluid Age	Sample Location	Flash Point (COC)	Water (KF)	Viscosity (40°C)	Acid Number	Solids	GCD 10%	GCD 50%	GCD 90%	GCD % < 335°C
	mm/dd/yy			°F/°C	ppm	cSt	mg/KOH/g	%wt	°F/°C	°F/°C	°F/°C	%
09/05/23	09/14/23	8.0y	top of filter pot	414 / 212	28.4	29.8	0.05	0.056	699 / 370	798 / 426	902 / 483	2.12
08/04/22	10/18/22	0.0y	FILTER POT LINE	415 / 213	10.7	29.6	0.06	0.042	702 / 372	799 / 426	899 / 482	1.78
01/07/20	02/03/20	4.0y	SLIPSTREAM	437 / 225	0.00	30.4	0.048	0.084	691 / 366	784 / 418	883 / 473	0.00
01/22/19	02/04/19	4.0y	FILTER POT	439 / 226	28.9	30.1	0.089	0.067	675 / 357	775 / 413	877 / 469	3.10
01/22/18	01/29/18	3.0y		424 / 218	0.00	30.4	0.02	0.083	706 / 375	804 / 429	904 / 484	1.02
Baseline Data				435 / 224		32.7	0.03		693 / 367	790 / 421	887 / 475	2.5





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
09/05/23	45	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	39	2
08/04/22	32	0	0	0	0	0	1	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	30	0
01/07/20	25	0	0	0	0	0	0	0	0	0	7	2	0	0	0	0	0	0	0	0	0	0	29	0
01/22/19	246	0	0	0	0	0	0	0	0	0	1	20	0	0	0	0	3	0	0	0	0	0	128	0
01/22/18	215	0	0	0	0	0	0	0	0	0	2	16	0	0	0	0	3	0	0	0	0	0	126	0
Baseline Data			0	0						0		0	0					0					270	

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



Historical Comments	
08/04/22	Sample results indicate the fluid is in suitable condition for continued service. Please re-sample in 12 months
01/07/20	Sample results indicate the fluid is suitable for continued service. Please re-sample in 12 months
01/22/19	Sample results indicate that the fluid is suitable for continued service. Please note iron levels have increased from last year. This can be related to erosion or corrosion. The fluid's Acid number has increased since last year yet remains below alarm limits. Investigate source of iron. Please re-sample in 12 months. Iron ppm levels are abnormal.
01/22/18	Sample results indicate that the HT fluid is healthy and suitable for continued service. However, please note the level of iron (215 PPM) in the fluid. Further investigation into the source of iron should be considered as this is abnormal. Iron ppm levels are abnormal.

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