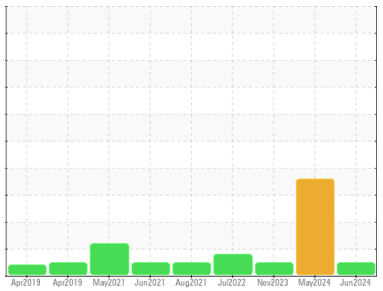
OIL ANALYSIS REPORT

Sample Rating Trend



NORMAL

Area
Powerhouse
Machine Id
SOLAR UNIT 2
Component
Turbine
Fluid
PETRO CANADA TURBOFLO XL32 (1800 LTR)

DIAGNOSIS

Recommendation
Resample at the next service interval to monitor.

Wear
All component wear rates are normal. The ferrography results are normal indicating no abnormal wear in the system.

Contaminants
The system cleanliness is acceptable for your target ISO 4406 cleanliness code. The water content is negligible. The system and fluid cleanliness is acceptable.

Oil Condition
The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**WC0872209**	WC0872208	WC0755989
Sample Date		Client Info		**05 Jun 2024**	21 May 2024	08 Nov 2023
Machine Age	yrs	Client Info		**0**	0	0
Oil Age	yrs	Client Info		**1**	1	6
Oil Changed		Client Info		**Filtered**	N/A	Changed
Sample Status				**NORMAL**	ABNORMAL	NORMAL

WEAR METALS		method	limit/base	current	history1	history2
PQ		ASTM D8184*		**0**	0	0
Iron	ppm	ASTM D5185(m)	>15	**0**	0	0
Chromium	ppm	ASTM D5185(m)	>4	**0**	0	0
Nickel	ppm	ASTM D5185(m)	>2	**0**	0	0
Titanium	ppm	ASTM D5185(m)		**0**	0	0
Silver	ppm	ASTM D5185(m)		**0**	0	<1
Aluminum	ppm	ASTM D5185(m)	>10	**0**	0	0
Lead	ppm	ASTM D5185(m)		**0**	0	<1
Copper	ppm	ASTM D5185(m)	>5	**<1**	<1	<1
Tin	ppm	ASTM D5185(m)	>5	**0**	0	0
Antimony	ppm	ASTM D5185(m)		**0**	0	0
Vanadium	ppm	ASTM D5185(m)		**0**	0	0
Beryllium	ppm	ASTM D5185(m)		**0**	0	0
Cadmium	ppm	ASTM D5185(m)		**0**	0	0

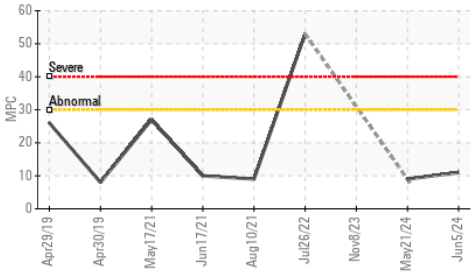
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m)	0	**0**	0	<1
Barium	ppm	ASTM D5185(m)	0	**0**	0	<1
Molybdenum	ppm	ASTM D5185(m)	0	**0**	0	0
Manganese	ppm	ASTM D5185(m)	0	**0**	0	0
Magnesium	ppm	ASTM D5185(m)	0	**0**	0	0
Calcium	ppm	ASTM D5185(m)	0	**0**	0	<1
Phosphorus	ppm	ASTM D5185(m)	5	**10**	9	6
Zinc	ppm	ASTM D5185(m)	0	**<1**	<1	<1
Sulfur	ppm	ASTM D5185(m)	750	**590**	566	623
Lithium	ppm	ASTM D5185(m)		**<1**	<1	<1

CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m)	>15	**0**	4	0
Sodium	ppm	ASTM D5185(m)		**0**	0	0
Potassium	ppm	ASTM D5185(m)	>20	**0**	0	0
Water	%	ASTM D6304*	>0.03	**0.002**	0.001	0.001
ppm Water	ppm	ASTM D6304*	>300	**23**	4	8.3

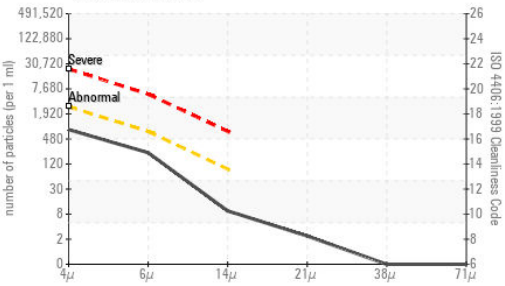
FLUID CLEANLINESS		method	limit/base	current	history1	history2
Particles >4µm		ASTM D7647	>2500	**708**	▲ 8595	216
Particles >6µm		ASTM D7647	>640	**198**	▲ 2102	43
Particles >14µm		ASTM D7647	>80	**8**	▲ 195	4
Particles >21µm		ASTM D7647	>20	**2**	▲ 61	1
Particles >38µm		ASTM D7647	>4	**0**	● 8	0
Particles >71µm		ASTM D7647	>3	**0**	0	0
Oil Cleanliness		ISO 4406 (c)	>18/16/13	**17/15/10**	▲ 20/18/15	15/13/9

OIL ANALYSIS REPORT

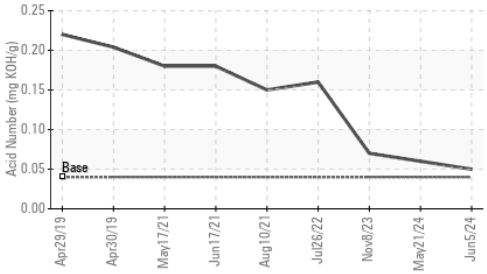
Varnish Potential



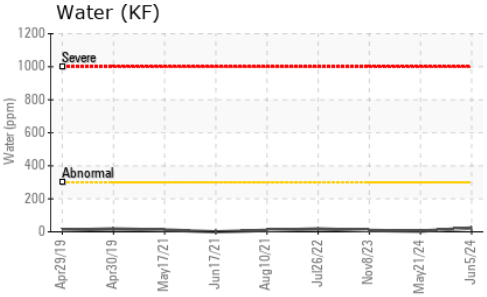
Particle Count



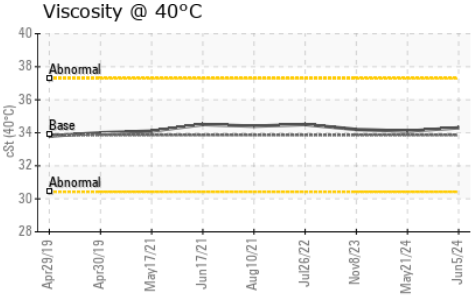
Acid Number



Water (KF)



Viscosity @ 40°C

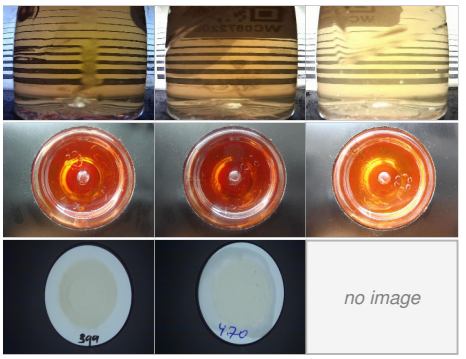


FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*	0.04	**0.05**	0.06	0.07
MPC Varnish Potential	Scale	ASTM D7843(m)*	>15	**11**	9	---

VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	**NONE**	NONE	NONE
Yellow Metal	scalar	Visual*	NONE	**NONE**	NONE	NONE
Precipitate	scalar	Visual*	NONE	**NONE**	NONE	NONE
Silt	scalar	Visual*	NONE	**NONE**	NONE	NONE
Debris	scalar	Visual*	NONE	**NONE**	NONE	NONE
Sand/Dirt	scalar	Visual*	NONE	**NONE**	NONE	NONE
Appearance	scalar	Visual*	NORML	**NORML**	NORML	NORML
Odor	scalar	Visual*	NORML	**NORML**	NORML	NORML
Emulsified Water	scalar	Visual*	>0.03	**NEG**	NEG	NEG
Free Water	scalar	Visual*		**NEG**	NEG	NEG

FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	33.86	**34.3**	34.1	34.2

SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					
Bottom					
MPC					



ISO 17025:2017 Accredited Laboratory

Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : WC0872209 **Received** : 12 Jun 2024
Lab Number : 02641399 **Tested** : 17 Jun 2024
Unique Number : 5798938 **Diagnosed** : 17 Jun 2024 - Kevin Marson
Test Package : IND 3 (Additional Tests: MPC)

To discuss this sample report, contact Customer Service at 1-800-268-2131.
Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.
Validity of results and interpretation are based on the sample and information as supplied.

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1100 Green Valley Road
London, ON
CA N6N 1E3
Contact: Mike O'neil
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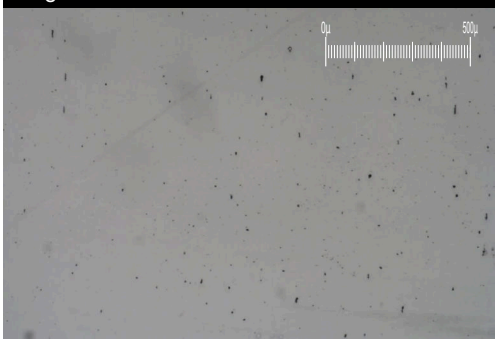
FERROGRAPHY REPORT

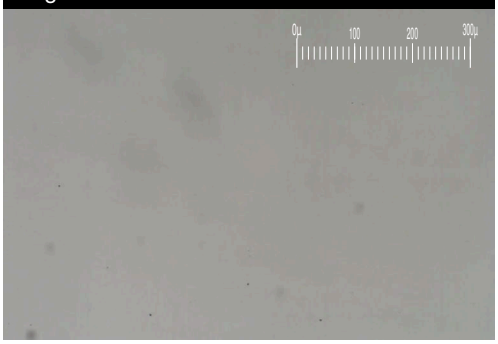
Area
Powerhouse
Machine Id
SOLAR UNIT 2
Component
Turbine
Fluid
PETRO CANADA TURBOFLO XL32 (1800 LTR)

Magn: 200x Illum: BC

Magn: 50x Illum: RW



Magn: 100x Illum: RW

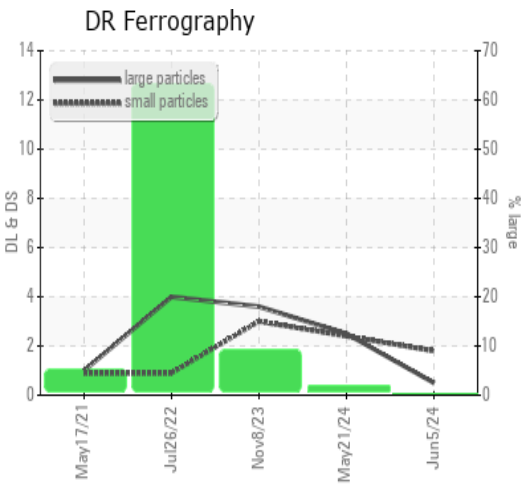


DR-FERROGRAPHY		method	limit/base	current	history1	history2
Large Particles		DR-Ferr*		**0.5**	2.5	3.6
Small Particles		DR-Ferr*		**1.8**	2.4	3.0
Total Particles		DR-Ferr*	>---	**2.3**	4.9	6.6
Large Particles Percentage	%	DR-Ferr*		**0**	2	9.1
Severity Index		DR-Ferr*		**1**	0	2

FERROGRAPHY		method	limit/base	current	history1	history2
Ferrous Rubbing	Scale 0-10	ASTM D7684*		**1**	1	1
Ferrous Sliding	Scale 0-10	ASTM D7684*			1	
Ferrous Cutting	Scale 0-10	ASTM D7684*				
Ferrous Rolling	Scale 0-10	ASTM D7684*		**1**	1	1
Ferrous Break-in	Scale 0-10	ASTM D7684*				
Ferrous Spheres	Scale 0-10	ASTM D7684*				
Ferrous Black Oxides	Scale 0-10	ASTM D7684*				
Ferrous Red Oxides	Scale 0-10	ASTM D7684*				
Ferrous Corrosive	Scale 0-10	ASTM D7684*				
Ferrous Other	Scale 0-10	ASTM D7684*				
Nonferrous Rubbing	Scale 0-10	ASTM D7684*				
Nonferrous Sliding	Scale 0-10	ASTM D7684*				
Nonferrous Cutting	Scale 0-10	ASTM D7684*				
Nonferrous Rolling	Scale 0-10	ASTM D7684*				
Nonferrous Other	Scale 0-10	ASTM D7684*				
Carbonaceous Material	Scale 0-10	ASTM D7684*				
Lubricant Degradation	Scale 0-10	ASTM D7684*				
Sand/Dirt	Scale 0-10	ASTM D7684*		**1**	1	1
Fibres	Scale 0-10	ASTM D7684*				
Spheres	Scale 0-10	ASTM D7684*				
Other	Scale 0-10	ASTM D7684*		**1**	1	1

WEAR

All component wear rates are normal. The ferrography results are normal indicating no abnormal wear in the system.



MPC (Varnish Test)

Sample Color & Clarity