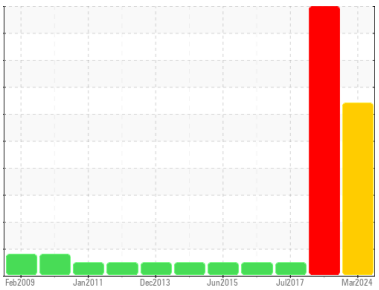
PROBLEM SUMMARY

Sample Rating Trend

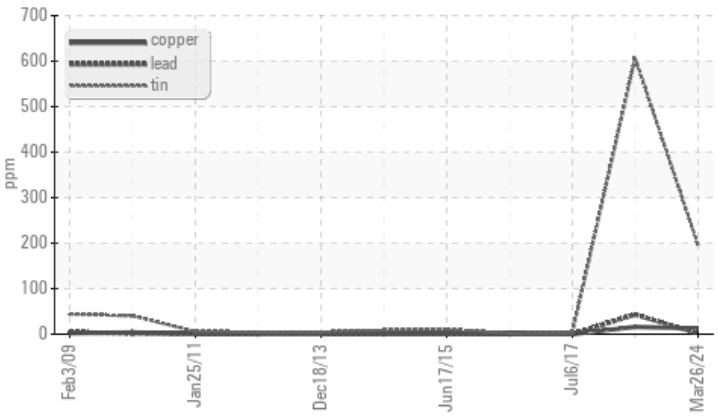


WEAR

Area
OIL ANALYSIS/UNIT 3/COND EXT PUMPS
Machine Id
X03-43210-P-001
Component
Pump
Fluid
ESSO TERESSO ISO 46 (29 LTR)

COMPONENT CONDITION SUMMARY

▲ Non-ferrous Metals



RECOMMENDATION

We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition.

PROBLEMATIC TEST RESULTS

Sample Status				SEVERE	SEVERE	NORMAL
Tin	ppm	ASTM D5185(m)	>9	▲ **197**	▲ 607	2
Antimony	ppm	ASTM D5185(m)		▲ **16**	▲ 44	0

Customer Id: OPGBAT
Sample No.: WC
Lab Number: 02625198
Test Package: IND 3

To manage this report scan the QR code

To discuss the diagnosis or test data:
Kevin Marson +1 (289)291-4644 x4644
Kevin.Marson@wearcheck.com

To change component or sample information:
Gloria Gonzalez +1 (289)291-4643 x4643
gloria.gonzalez@wearcheck.com

RECOMMENDED ACTIONS

Action	Status	Date	Done By	Description
Change Fluid	---	---	?	We recommend that you drain the oil from the component if this has not already been done.
Resample	---	---	?	We recommend an early resample to monitor this condition.

HISTORICAL DIAGNOSIS

WEAR

22 Jun 2023 Diag: Kevin Marson

We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition.Chromium and lead and tin and antimony ppm levels are severe. Wear particle analysis indicates that the ferrous cutting particles are abnormal. Copper ppm levels are abnormal. Ring wear is indicated. Bearing and/or bushing wear is indicated. The direct-reading & analytical ferrographic results are normal indicating no abnormal wear in the system. Cutting wear particles are caused by either hard protuberances (mis-aligned components, etc.), or abrasives entering the system and embeding themselves in softer materials (sand, etc.), and gouging out mating surfaces. High wear metal levels reflect the reported failure. There is no indication of any contamination in the oil. The AN level is acceptable for this fluid. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

view report

NORMAL

06 Jul 2017 Diag: Wes Davis

Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report

NORMAL

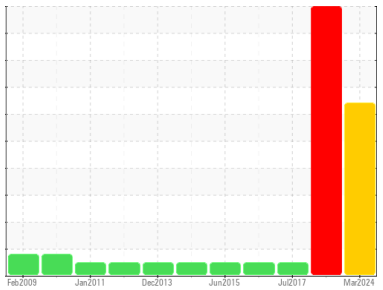
05 Feb 2016 Diag: Wes Davis

Resample at the next service interval to monitor.All component wear rates are normal. There is no indication of any contamination in the component. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report

OIL ANALYSIS REPORT

Sample Rating Trend



WEAR

Area
OIL ANALYSIS/UNIT 3/COND EXT PUMPS
Machine Id
X03-43210-P-001
Component
Pump
Fluid
ESSO TERESSO ISO 46 (29 LTR)

DIAGNOSIS

▲ Recommendation

We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition.

▲ Wear

Tin ppm levels are severe. Antimony ppm levels are abnormal. Bearing and/or bushing wear is indicated. The ferrography results are normal indicating no abnormal wear in the system.

Contaminants

There is no indication of any contamination in the oil.

Oil Condition

The AN level is acceptable for this fluid. The oil is no longer serviceable as a result of the abnormal and/or severe wear.

SAMPLE INFORMATION		method	limit/base	current	history1	history2
Sample Number		Client Info		**WC**	WC943370	WC
Sample Date		Client Info		**26 Mar 2024**	22 Jun 2023	06 Jul 2017
Machine Age	hrs	Client Info		**0**	0	0
Oil Age	hrs	Client Info		**0**	0	0
Oil Changed		Client Info		**N/A**	N/A	N/A
Sample Status				**SEVERE**	SEVERE	NORMAL

CONTAMINATION		method	limit/base	current	history1	history2
Water		WC Method	>.1	**NEG**	NEG	NEG

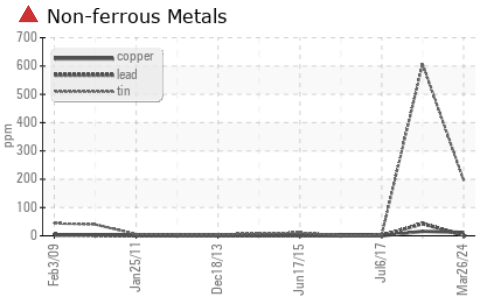
WEAR METALS		method	limit/base	current	history1	history2
PQ		ASTM D8184*		**0**	0	7
Iron	ppm	ASTM D5185(m)	>90	**19**	1	0
Chromium	ppm	ASTM D5185(m)	>5	**0**	▲ 27	0
Nickel	ppm	ASTM D5185(m)	>5	**0**	<1	0
Titanium	ppm	ASTM D5185(m)	>3	**0**	0	0
Silver	ppm	ASTM D5185(m)	>3	**0**	0	0
Aluminum	ppm	ASTM D5185(m)	>7	**0**	0	<1
Lead	ppm	ASTM D5185(m)	>12	**1**	▲ 43	<1
Copper	ppm	ASTM D5185(m)	>30	**12**	▲ 16	<1
Tin	ppm	ASTM D5185(m)	>9	**▲ 197**	▲ 607	2
Antimony	ppm	ASTM D5185(m)		**▲ 16**	▲ 44	0
Vanadium	ppm	ASTM D5185(m)		**0**	0	0
Beryllium	ppm	ASTM D5185(m)		**0**	0	0
Cadmium	ppm	ASTM D5185(m)		**0**	3	0

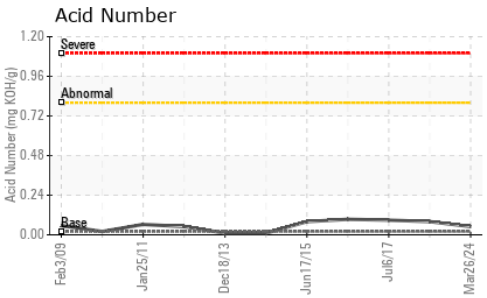
ADDITIVES		method	limit/base	current	history1	history2
Boron	ppm	ASTM D5185(m)	0	**0**	<1	<1
Barium	ppm	ASTM D5185(m)		**0**	0	0
Molybdenum	ppm	ASTM D5185(m)	0	**0**	0	0
Manganese	ppm	ASTM D5185(m)		**0**	0	0
Magnesium	ppm	ASTM D5185(m)	0	**<1**	0	0
Calcium	ppm	ASTM D5185(m)	0	**0**	1	0
Phosphorus	ppm	ASTM D5185(m)	2.4	**3**	4	<1
Zinc	ppm	ASTM D5185(m)	0	**2**	6	<1
Sulfur	ppm	ASTM D5185(m)		**614**	650	2011
Lithium	ppm	ASTM D5185(m)		**<1**	<1	<1

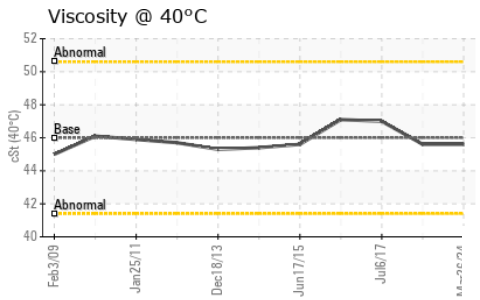
CONTAMINANTS		method	limit/base	current	history1	history2
Silicon	ppm	ASTM D5185(m)	>60	**0**	<1	<1
Sodium	ppm	ASTM D5185(m)		**<1**	<1	<1
Potassium	ppm	ASTM D5185(m)	>20	**0**	<1	<1

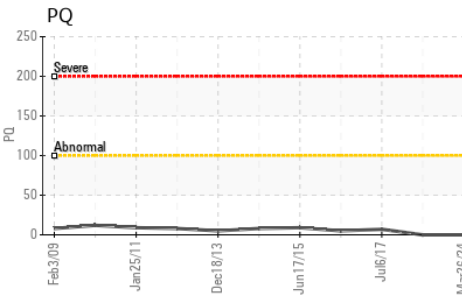
FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*	0.02	**0.05**	0.08	0.089

OIL ANALYSIS REPORT





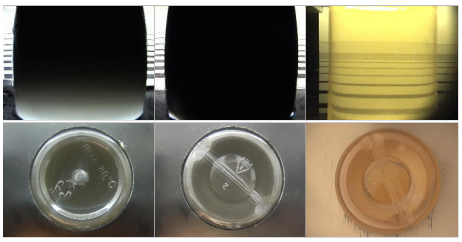




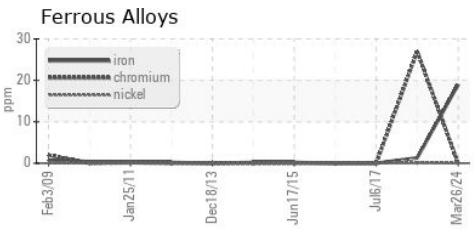
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	**NONE**	VLITE	NONE
Yellow Metal	scalar	Visual*	NONE	**NONE**	NONE	NONE
Precipitate	scalar	Visual*	NONE	**NONE**	NONE	NONE
Silt	scalar	Visual*	NONE	**NONE**	VLITE	NONE
Debris	scalar	Visual*	NONE	**VLITE**	NONE	NONE
Sand/Dirt	scalar	Visual*	NONE	**NONE**	NONE	NONE
Appearance	scalar	Visual*	NORML	**HAZY**	NORML	NORML
Odor	scalar	Visual*	NORML	**NORML**	NORML	NORML
Emulsified Water	scalar	Visual*	>.1	**NEG**	NEG	NEG
Free Water	scalar	Visual*		**NEG**	NEG	NEG

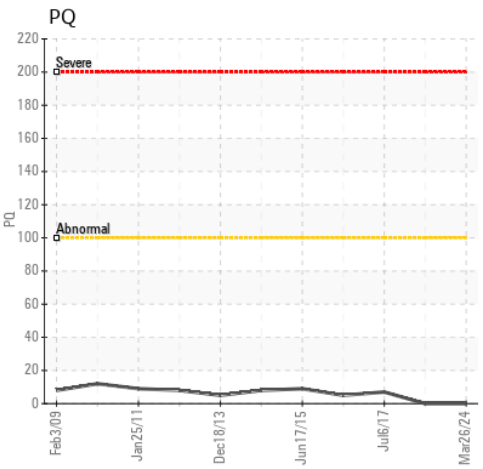
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	46	**45.6**	45.6	47.0

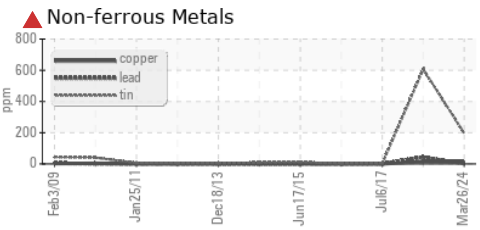
SAMPLE IMAGES	method	limit/base	current	history1	history2
Color					
Bottom					

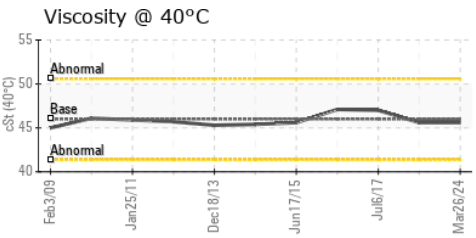


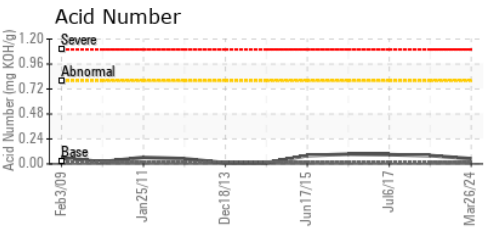
GRAPHS











ISO 17025:2017 Accredited Laboratory

Laboratory : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9
Sample No. : WC
Lab Number : 02625198
Unique Number : 5750317
Test Package : IND 3 (Additional Tests: TAN Man)
Received : 28 Mar 2024
Tested : 28 Mar 2024
Diagnosed : 03 Apr 2024 - Kevin Marson

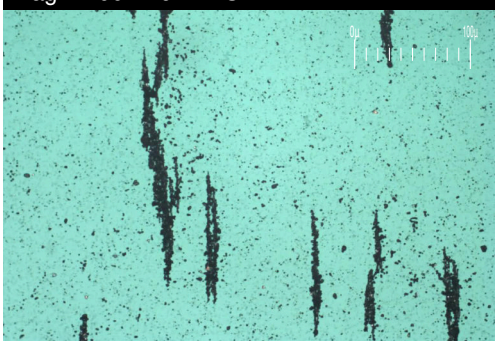
To discuss this sample report, contact Customer Service at 1-800-268-2131.
Test denoted (*) outside scope of accreditation, (m) method modified, (e) tested at external lab.
Validity of results and interpretation are based on the sample and information as supplied.

Ontario Power Generation
7263 Hwy #33 , P.O.Box 1000
BATH, ON
CA K0H 1G0
Contact: Abbas Eskandari
abbas.eskandari@opg.com
T: (613)352-3525
F:

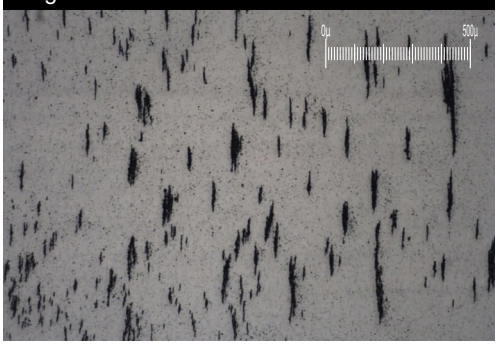
FERROGRAPHY REPORT

Area
OIL ANALYSIS/UNIT 3/COND EXT PUMPS
Machine Id
X03-43210-P-001
Component
Pump
Fluid
ESSO TERESSO ISO 46 (29 LTR)

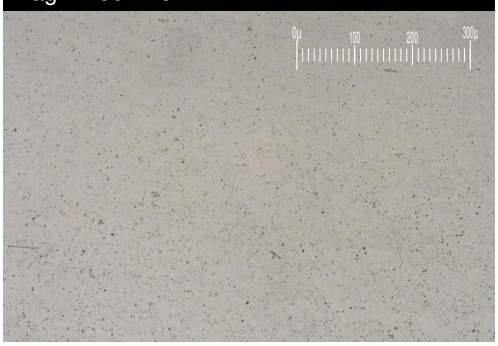
Magn: 200x Illum: BC



Magn: 50x Illum: RW



Magn: 100x Illum: RW

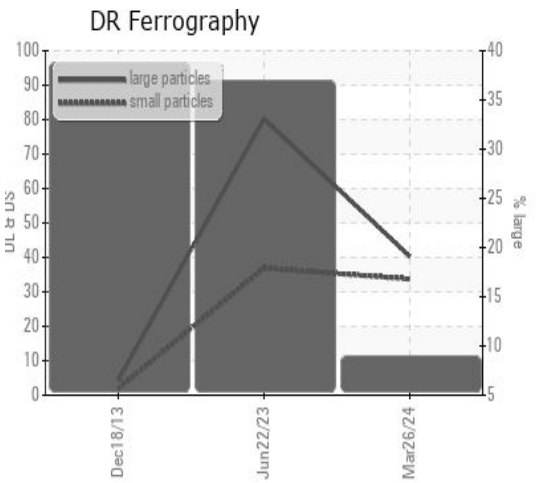


DR-FERROGRAPHY		method	limit/base	current	history1	history2
Large Particles		DR-Ferr*		**40.3**	80.2	---
Small Particles		DR-Ferr*		**33.7**	36.9	---
Total Particles		DR-Ferr*	>---	**74**	117.1	---
Large Particles Percentage	%	DR-Ferr*		**8.9**	37	---
Severity Index		DR-Ferr*		**266**	3473	---

FERROGRAPHY		method	limit/base	current	history1	history2
Ferrous Rubbing	Scale 0-10	ASTM D7684*		**4**	4	
Ferrous Sliding	Scale 0-10	ASTM D7684*				
Ferrous Cutting	Scale 0-10	ASTM D7684*			1	
Ferrous Rolling	Scale 0-10	ASTM D7684*		**2**	2	
Ferrous Break-in	Scale 0-10	ASTM D7684*				
Ferrous Spheres	Scale 0-10	ASTM D7684*				
Ferrous Black Oxides	Scale 0-10	ASTM D7684*		**1**		
Ferrous Red Oxides	Scale 0-10	ASTM D7684*				
Ferrous Corrosive	Scale 0-10	ASTM D7684*		**1**	1	
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	
Fibres	Scale 0-10	ASTM D7684*				
Spheres	Scale 0-10	ASTM D7684*				
Other	Scale 0-10	ASTM D7684*		**2**	2	

WEAR

Tin ppm levels are severe. Antimony ppm levels are abnormal. Bearing and/or bushing wear is indicated. The ferrography results are normal indicating no abnormal wear in the system.



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