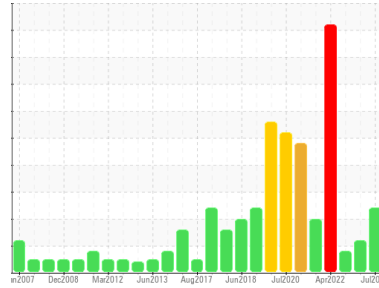


# PROBLEM SUMMARY

Sample Rating Trend

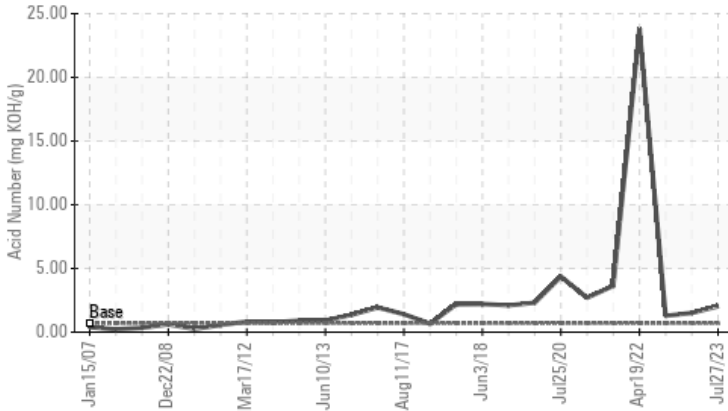
**DEGRADATION**

Area  
**1430**  
Machine Id  
**1430-5652-4003 - Cu/Ni AERATION TANK 2 AGITATOR**  
Component  
**Gearbox**  
Fluid  
**PETRO CANADA ENDURATEX SYNTHETIC EP 220 (100 LTR)**

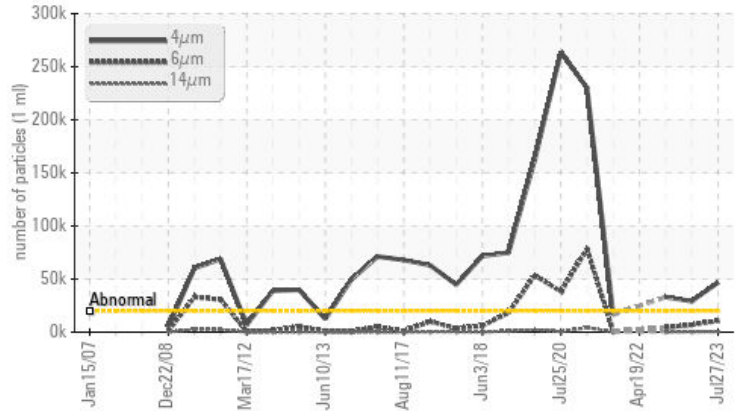


## COMPONENT CONDITION SUMMARY

### ▲ Acid Number



### ▲ Particle Trend



## RECOMMENDATION

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

## PROBLEMATIC TEST RESULTS

Sample Status			<b>ABNORMAL</b>	ATTENTION	ATTENTION
Particles >4µm	ASTM D7647	>20000	▲ <b>46726</b>	▲ 29160	▲ 33018
Particles >6µm	ASTM D7647	>5000	▲ <b>10665</b>	▲ 6914	▲ 4483
Oil Cleanliness	ISO 4406 (c)	>21/19/16	▲ <b>23/21/16</b>	▲ 22/20/16	▲ 22/19/15
Acid Number (AN)	mg KOH/g	ASTM D974* 0.7	▲ <b>2.03</b>	1.51	1.28

Customer Id: INCVOS  
Sample No.: PC0077337  
Lab Number: 02578545  
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](mailto:Kevin.Marson@wearcheck.com)

To change component or sample information:  
Gloria Gonzalez +1 (289)291-4643 x4643  
[gloria.gonzalez@wearcheck.com](mailto: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.
Change Filter	---	---	?	We recommend you service the filters on this component.
Resample	---	---	?	We recommend an early resample to monitor this condition.

## HISTORICAL DIAGNOSIS

### 04 Feb 2023 Diag: Wes Davis

ISO



We recommend you service the filters on this component. Resample at the next service interval to monitor. All component wear rates are normal. There is a light amount of silt (particulates < 14 microns in size) present in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report



### 08 Sep 2022 Diag: Wes Davis

ISO



We recommend you service the filters on this component. Resample at the next service interval to monitor. All component wear rates are normal. There is a light amount of silt (particulates < 14 microns in size) present in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

view report



### 19 Apr 2022 Diag: Kevin Marson

WEAR

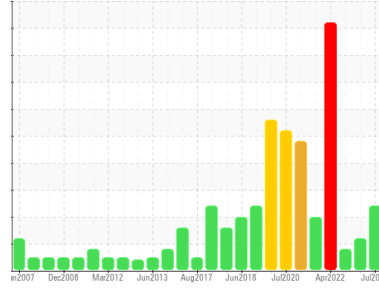


We recommend that you drain the oil from the component if this has not already been done. We recommend an early resample to monitor this condition. Please note that the oil was too thick to perform some of the normal laboratory tests. The iron level is severe. There is no indication of any contamination in the component (unconfirmed). The AN level is slightly above the recommended limit. The oil is no longer serviceable.

view report



Area  
**1430**  
Machine Id  
**1430-5652-4003 - Cu/Ni AERATION TANK 2 AGITATOR**  
Component  
**Gearbox**  
Fluid  
**PETRO CANADA ENDURATEX SYNTHETIC EP 220 (100 LTR)**



**DIAGNOSIS**

**Recommendation**

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

**Wear**

All component wear rates are normal. The direct-reading & analytical ferrographic results are normal indicating no abnormal wear in the system.

**Contaminants**

There is a moderate amount of silt (particulates < 14 microns in size) present in the oil.

**Oil Condition**

The AN level is above the recommended limit. The oil is no longer serviceable.

**SAMPLE INFORMATION**

method	limit/base	current	history1	history2
Sample Number	Client Info	<b>PC0077337</b>	PC0058640	PC0040261
Sample Date	Client Info	<b>27 Jul 2023</b>	04 Feb 2023	08 Sep 2022
Machine Age	days	<b>0</b>	0	0
Oil Age	days	<b>0</b>	0	0
Oil Changed	Client Info	<b>N/A</b>	N/A	N/A
Sample Status		<b>ABNORMAL</b>	ATTENTION	ATTENTION

**WEAR METALS**

method	limit/base	current	history1	history2
PQ	ASTM D8184*	<b>0</b>	0	0
Iron	ppm	<b>15</b>	12	31
Chromium	ppm	<b>0</b>	0	0
Nickel	ppm	<b>0</b>	0	<1
Titanium	ppm	<b>0</b>	0	0
Silver	ppm	<b>0</b>	0	0
Aluminum	ppm	<b>&lt;1</b>	0	0
Lead	ppm	<b>0</b>	0	<1
Copper	ppm	<b>&lt;1</b>	0	2
Tin	ppm	<b>0</b>	0	0
Antimony	ppm	<b>0</b>	0	<1
Vanadium	ppm	<b>0</b>	0	0
Beryllium	ppm	<b>0</b>	0	0
Cadmium	ppm	<b>0</b>	0	0

**ADDITIVES**

method	limit/base	current	history1	history2
Boron	ppm	<b>29</b>	30	26
Barium	ppm	<b>0</b>	0	0
Molybdenum	ppm	<b>0</b>	0	0
Manganese	ppm	<b>&lt;1</b>	<1	<1
Magnesium	ppm	<b>&lt;1</b>	<1	0
Calcium	ppm	<b>2</b>	0	1
Phosphorus	ppm	<b>371</b>	425	414
Zinc	ppm	<b>8</b>	7	8
Sulfur	ppm	<b>4520</b>	4645	4773
Lithium	ppm	<b>&lt;1</b>	<1	<1

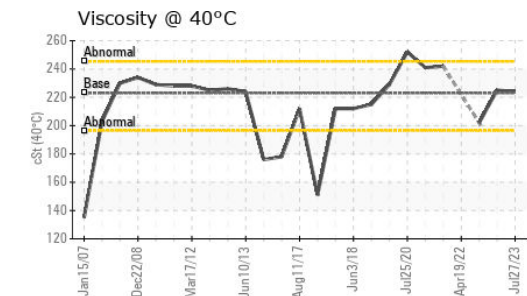
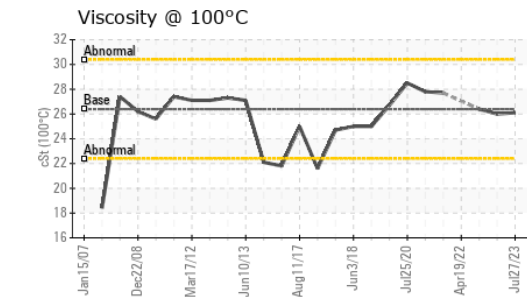
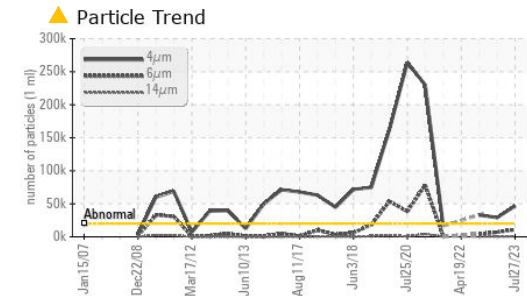
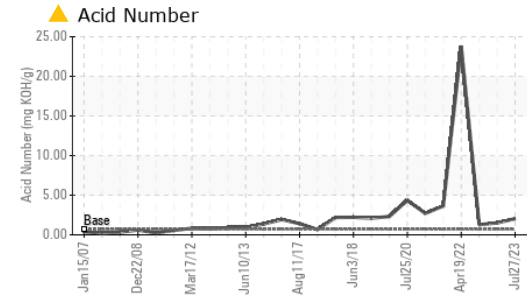
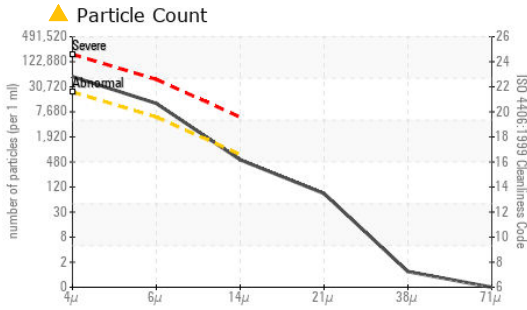
**CONTAMINANTS**

method	limit/base	current	history1	history2
Silicon	ppm	<b>3</b>	3	3
Sodium	ppm	<b>&lt;1</b>	<1	<1
Potassium	ppm	<b>&lt;1</b>	<1	<1

**FLUID CLEANLINESS**

method	limit/base	current	history1	history2
Particles >4µm	ASTM D7647	<b>▲ 46726</b>	▲ 29160	▲ 33018
Particles >6µm	ASTM D7647	<b>▲ 10665</b>	▲ 6914	4483
Particles >14µm	ASTM D7647	<b>475</b>	403	172
Particles >21µm	ASTM D7647	<b>74</b>	88	37
Particles >38µm	ASTM D7647	<b>1</b>	2	0
Particles >71µm	ASTM D7647	<b>0</b>	0	0
Oil Cleanliness	ISO 4406 (c)	<b>▲ 23/21/16</b>	▲ 22/20/16	▲ 22/19/15

# OIL ANALYSIS REPORT



ISO 17025:2017  
Accredited  
Laboratory

**Laboratory** : WearCheck - C8-1175 Appleby Line, Burlington, ON L7L 5H9  
**Sample No.** : PC0077337  
**Lab Number** : 02578545  
**Unique Number** : 5631605  
**Test Package** : IND 3 ( Additional Tests: KV100, PrtCount, TAN Man, VI )

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.

**Vale - Voisey's Bay**  
 Voisey's Bay Mine Site, P.O. Box 7001, Str. C Happy Valley  
 Goose Bay, NL  
 CA A0P 1C0  
 Contact: Robert Feltham  
 robert.feltham@vale.com

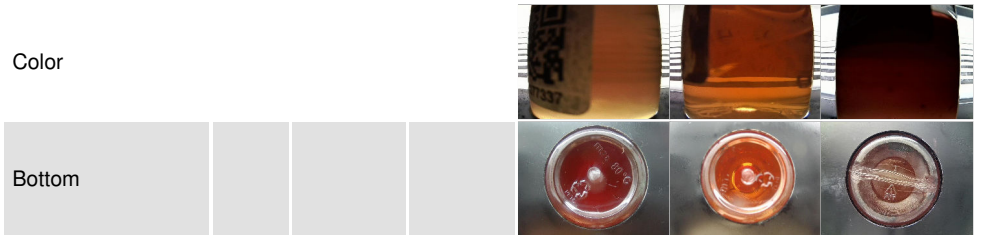
T:  
F: x:

FLUID DEGRADATION		method	limit/base	current	history1	history2
Acid Number (AN)	mg KOH/g	ASTM D974*	0.7	▲ 2.03	1.51	1.28

VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	Visual*	NONE	VLITE	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	LIGHT
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*	>0.2	NEG	NEG	NEG
Free Water	scalar	Visual*		NEG	NEG	NEG

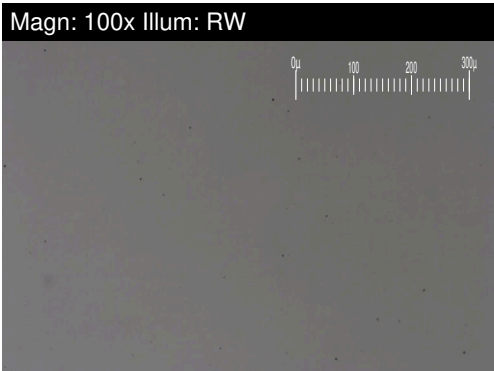
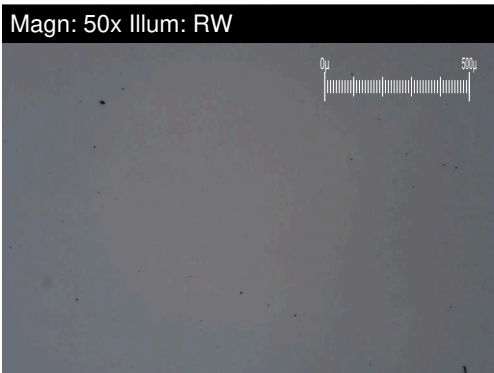
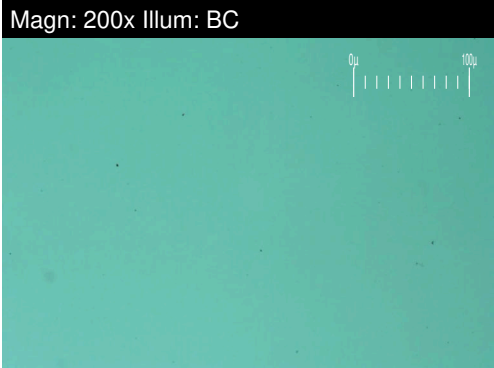
FLUID PROPERTIES		method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D7279(m)	223	224	225	202
Visc @ 100°C	cSt	ASTM D7279(m)	26.39	26.1	26.0	26.4
Viscosity Index (VI)	Scale	ASTM D2270*	151	148	147	165

## SAMPLE IMAGES



# FERROGRAPHY REPORT

Area  
**1430**  
Machine Id  
**1430-5652-4003 - Cu/Ni AERATION TANK 2 AGITATOR**  
Component  
**Gearbox**  
Fluid  
**PETRO CANADA ENDURATEX SYNTHETIC EP 220 (100 LTR)**

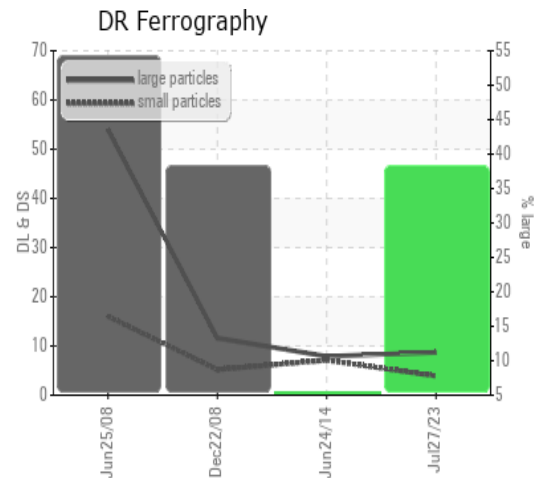


DR-FERROGRAPHY		method	limit/base	current	history1	history2
Large Particles		DR-Ferr*		<b>8.7</b>	---	---
Small Particles		DR-Ferr*		<b>3.9</b>	---	---
Total Particles		DR-Ferr*	>---	<b>12.6</b>	---	---
Large Particles Percentage	%	DR-Ferr*		<b>38.1</b>	---	---
Severity Index		DR-Ferr*		<b>42</b>	---	---

FERROGRAPHY		method	limit/base	current	history1	history2
Ferrous Rubbing	Scale 0-10	ASTM D7684*		<b>1</b>		
Ferrous Sliding	Scale 0-10	ASTM D7684*				
Ferrous Cutting	Scale 0-10	ASTM D7684*				
Ferrous Rolling	Scale 0-10	ASTM D7684*				
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*				
Fibres	Scale 0-10	ASTM D7684*				
Spheres	Scale 0-10	ASTM D7684*				
Other	Scale 0-10	ASTM D7684*		<b>1</b>		

### WEAR

All component wear rates are normal. The direct-reading & analytical ferrographic results are normal indicating no abnormal wear in the system.



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