



# OIL ANALYSIS REPORT

WEAR	NORMAL
CONTAMINATION	NORMAL
FLUID CONDITION	NORMAL



Machine Id  
**ENG 4A**  
Component  
**Left Biogas Engine**  
Fluid  
**AMERICAN REFINING GROUP LOW ASH 40 (110 GAL)**

## RECOMMENDATION

Resample at the next service interval to monitor.

Test	UOM	Method	Limit/Abn	Current	History1	History2
Sample Number		Client Info		<b>WC0881524</b>	WC0881521	WC0881548
Sample Date		Client Info		<b>22 Jan 2024</b>	26 Dec 2023	04 Dec 2023
Machine Age	hrs	Client Info		<b>112148</b>	111506	110978
Oil Age	hrs	Client Info		<b>241</b>	1420	892
Filter Age	hrs	Client Info		<b>241</b>	1420	892
Oil Changed		Client Info		<b>Changed</b>	N/A	N/A
Filter Changed		Client Info		<b>Changed</b>	N/A	N/A
Sample Status				<b>NORMAL</b>	ABNORMAL	NORMAL

## WEAR

All component wear rates are normal.

Iron	ppm	ASTM D5185m	>45	<b>3</b>	3	4
Chromium	ppm	ASTM D5185m	>2	<b>&lt;1</b>	0	0
Nickel	ppm	ASTM D5185m	>2	<b>&lt;1</b>	0	0
Titanium	ppm	ASTM D5185m		<b>0</b>	0	0
Silver	ppm	ASTM D5185m	>5	<b>&lt;1</b>	0	0
Aluminum	ppm	ASTM D5185m	>10	<b>3</b>	3	3
Lead	ppm	ASTM D5185m	>5	<b>5</b>	▲ 5	1
Copper	ppm	ASTM D5185m	>14	<b>2</b>	1	1
Tin	ppm	ASTM D5185m	>13	<b>3</b>	3	3
Vanadium	ppm	ASTM D5185m		<b>&lt;1</b>	0	0
White Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE

## CONTAMINATION

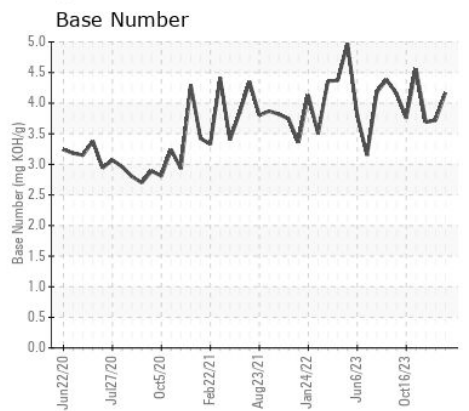
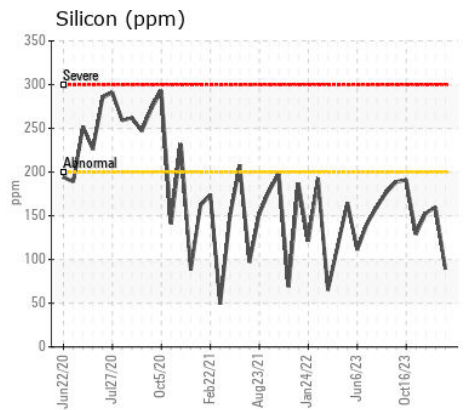
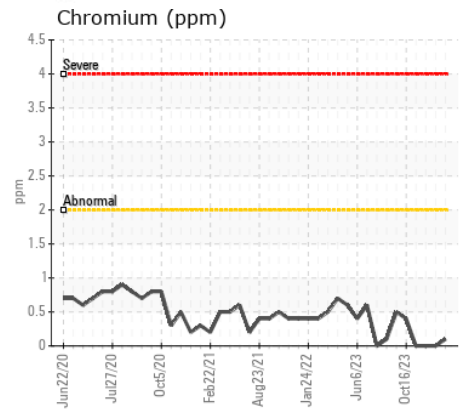
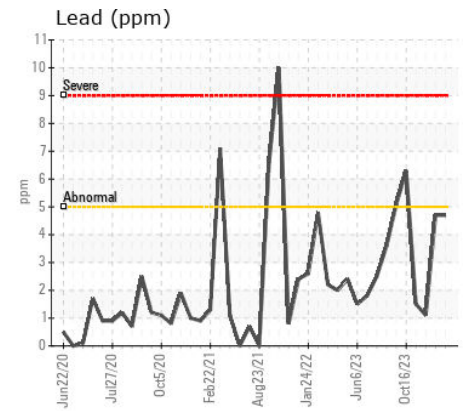
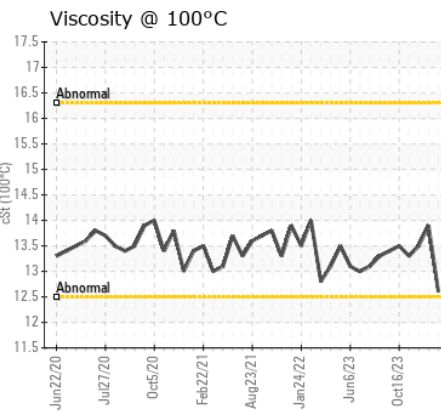
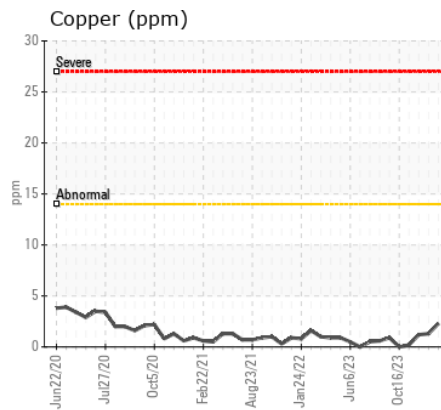
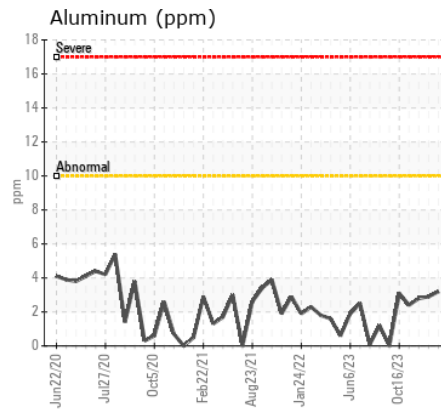
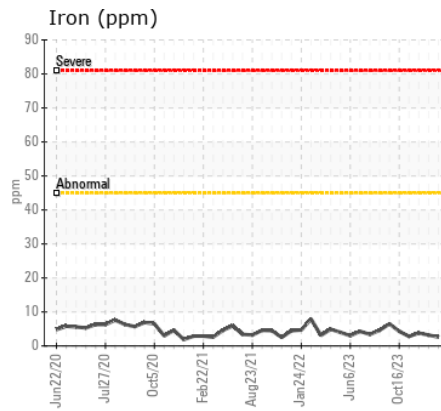
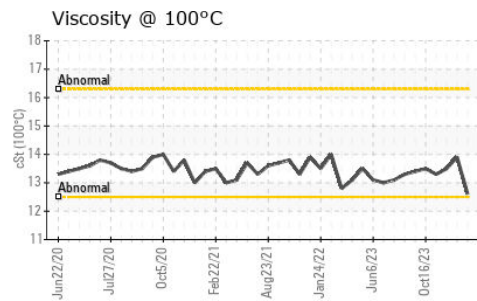
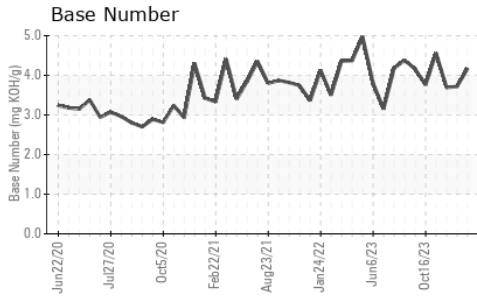
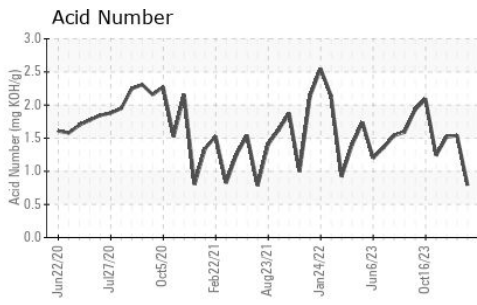
There is no indication of any contamination in the oil.

Silicon	ppm	ASTM D5185m	>200	<b>89</b>	160	153
Potassium	ppm	ASTM D5185m	>20	<b>4</b>	0	<1
Fuel		WC Method	>4.0	<b>&lt;1.0</b>	<1.0	<1.0
Water		WC Method	>0.1	<b>NEG</b>	NEG	NEG
Glycol		WC Method		<b>NEG</b>	NEG	NEG
Soot %	%	*ASTM D7844		<b>0</b>	0	0
Nitration	Abs/cm	*ASTM D7624	>20	<b>5.6</b>	7.0	6.7
Sulfation	Abs/.1mm	*ASTM D7415	>30	<b>17.3</b>	21.0	20.3
Silt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Debris	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	<b>NONE</b>	NONE	NONE
Appearance	scalar	*Visual	NORML	<b>NORML</b>	NORML	NORML
Odor	scalar	*Visual	NORML	<b>NORML</b>	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	<b>NEG</b>	NEG	NEG

## FLUID CONDITION

The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

Sodium	ppm	ASTM D5185m		<b>2</b>	2	1
Boron	ppm	ASTM D5185m		<b>18</b>	7	9
Barium	ppm	ASTM D5185m		<b>0</b>	0	0
Molybdenum	ppm	ASTM D5185m		<b>56</b>	9	9
Manganese	ppm	ASTM D5185m		<b>2</b>	<1	<1
Magnesium	ppm	ASTM D5185m		<b>70</b>	55	61
Calcium	ppm	ASTM D5185m		<b>1369</b>	1553	1475
Phosphorus	ppm	ASTM D5185m		<b>354</b>	362	347
Zinc	ppm	ASTM D5185m		<b>452</b>	477	456
Sulfur	ppm	ASTM D5185m		<b>2853</b>	2868	2867
Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>11.7</b>	17.8	16.7
Acid Number (AN)	mg KOH/g	ASTM D8045		<b>0.79</b>	1.54	1.52
Base Number (BN)	mg KOH/g	ASTM D2896		<b>4.17</b>	3.72	3.69
Visc @ 100°C	cSt	ASTM D445		<b>12.6</b>	13.9	13.5



Certificate L2367

**Laboratory** : WearCheck USA - 501 Madison Ave., Cary, NC 27513

**Sample No.** : WC0881524

**Lab Number** : 06077794

**Unique Number** : 10859885

**Test Package** : MOB 2

**Received** : 01 Feb 2024

**Tested** : 02 Feb 2024

**Diagnosed** : 04 Feb 2024 - Don Baldrige

**BROOME ENERGY**

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To discuss this sample report, contact Customer Service at 1-800-237-1369.

\* - Denotes test methods that are outside of the ISO 17025 scope of accreditation.

Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)