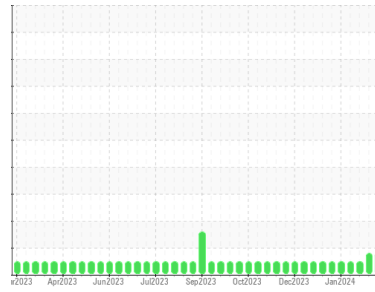




# OIL ANALYSIS REPORT

Sample Rating Trend



**WEAR**



Machine Id

**LGS00180**

Component

**Middle Biogas Engine**

Fluid

**CITGO PACEMAKER GAS ENGINE LFG LA 40 (--- GAL)**

## DIAGNOSIS

### Recommendation

No corrective action is recommended at this time. We recommend an early resample to monitor this condition.

### Wear

The nickel level is abnormal. All other component wear rates are normal.

### Contamination

There is no indication of any contamination in the oil.

### 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.

## SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		<b>WC0803466</b>	WC0803465	WC0803454
Sample Date	Client Info		<b>24 May 2024</b>	20 May 2024	05 Feb 2024
Machine Age	hrs	Client Info	<b>61569</b>	61477	61379
Oil Age	hrs	Client Info	<b>190</b>	98	247
Oil Changed	Client Info		<b>N/A</b>	N/A	N/A
Sample Status			<b>ABNORMAL</b>	ABNORMAL	NORMAL

## CONTAMINATION

	method	limit/base	current	history1	history2
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

## WEAR METALS

	method	limit/base	current	history1	history2	
Iron	ppm	ASTM D5185m	>45	<b>14</b>	14	0
Chromium	ppm	ASTM D5185m	>2	<b>1</b>	<1	0
Nickel	ppm	ASTM D5185m	>2	<b>▲ 4</b>	▲ 4	0
Titanium	ppm	ASTM D5185m		<b>&lt;1</b>	<1	0
Silver	ppm	ASTM D5185m	>5	<b>1</b>	<1	0
Aluminum	ppm	ASTM D5185m	>10	<b>2</b>	2	<1
Lead	ppm	ASTM D5185m	>5	<b>&lt;1</b>	<1	1
Copper	ppm	ASTM D5185m	>14	<b>2</b>	2	<1
Tin	ppm	ASTM D5185m	>13	<b>4</b>	3	1
Vanadium	ppm	ASTM D5185m		<b>&lt;1</b>	<1	0
Cadmium	ppm	ASTM D5185m		<b>&lt;1</b>	0	0

## ADDITIVES

	method	limit/base	current	history1	history2	
Boron	ppm	ASTM D5185m		<b>0</b>	2	2
Barium	ppm	ASTM D5185m		<b>0</b>	0	0
Molybdenum	ppm	ASTM D5185m		<b>4</b>	4	2
Manganese	ppm	ASTM D5185m		<b>&lt;1</b>	<1	<1
Magnesium	ppm	ASTM D5185m		<b>31</b>	35	20
Calcium	ppm	ASTM D5185m		<b>1328</b>	1402	1308
Phosphorus	ppm	ASTM D5185m		<b>284</b>	313	232
Zinc	ppm	ASTM D5185m		<b>337</b>	375	333
Sulfur	ppm	ASTM D5185m		<b>3340</b>	3307	2598

## CONTAMINANTS

	method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m	>200	<b>155</b>	116	78
Sodium	ppm	ASTM D5185m		<b>&lt;1</b>	0	<1
Potassium	ppm	ASTM D5185m	>20	<b>2</b>	2	<1

## INFRA-RED

	method	limit/base	current	history1	history2	
Soot %	%	*ASTM D7844		<b>0.1</b>	0	0.1
Nitration	Abs/cm	*ASTM D7624	>20	<b>3.2</b>	4.6	10.2
Sulfation	Abs/.1mm	*ASTM D7415	>30	<b>15.7</b>	16.7	20.1

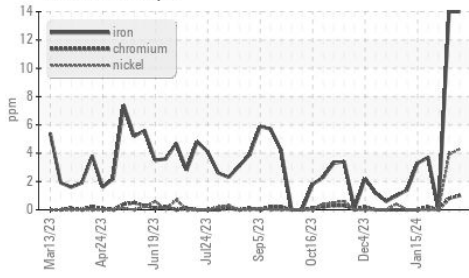
## FLUID DEGRADATION

	method	limit/base	current	history1	history2	
Oxidation	Abs/.1mm	*ASTM D7414	>25	<b>6.8</b>	8.9	17.2
Acid Number (AN)	mg KOH/g	ASTM D8045	1.16	<b>0.92</b>	0.85	0.69
Base Number (BN)	mg KOH/g	ASTM D2896	5	<b>3.61</b>	3.83	3.33

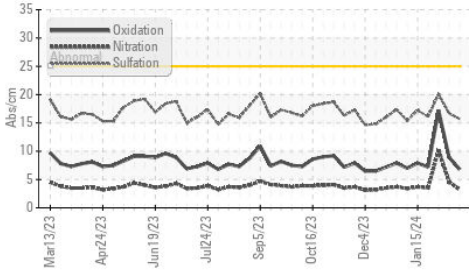


# OIL ANALYSIS REPORT

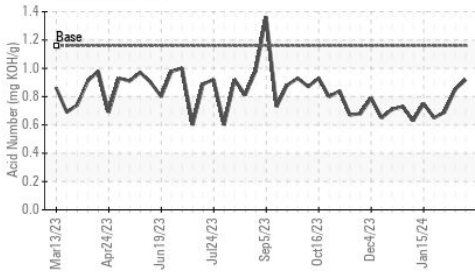
## ▲ Ferrous Alloys



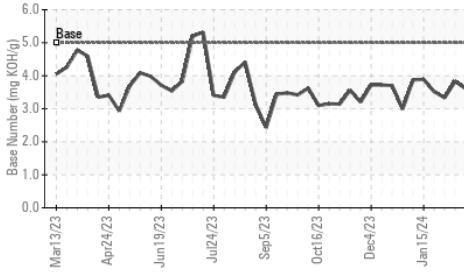
## FT-IR (Direct Trend)



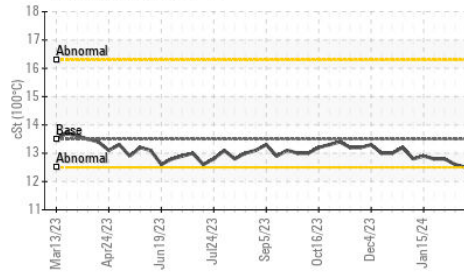
## Acid Number



## Base Number



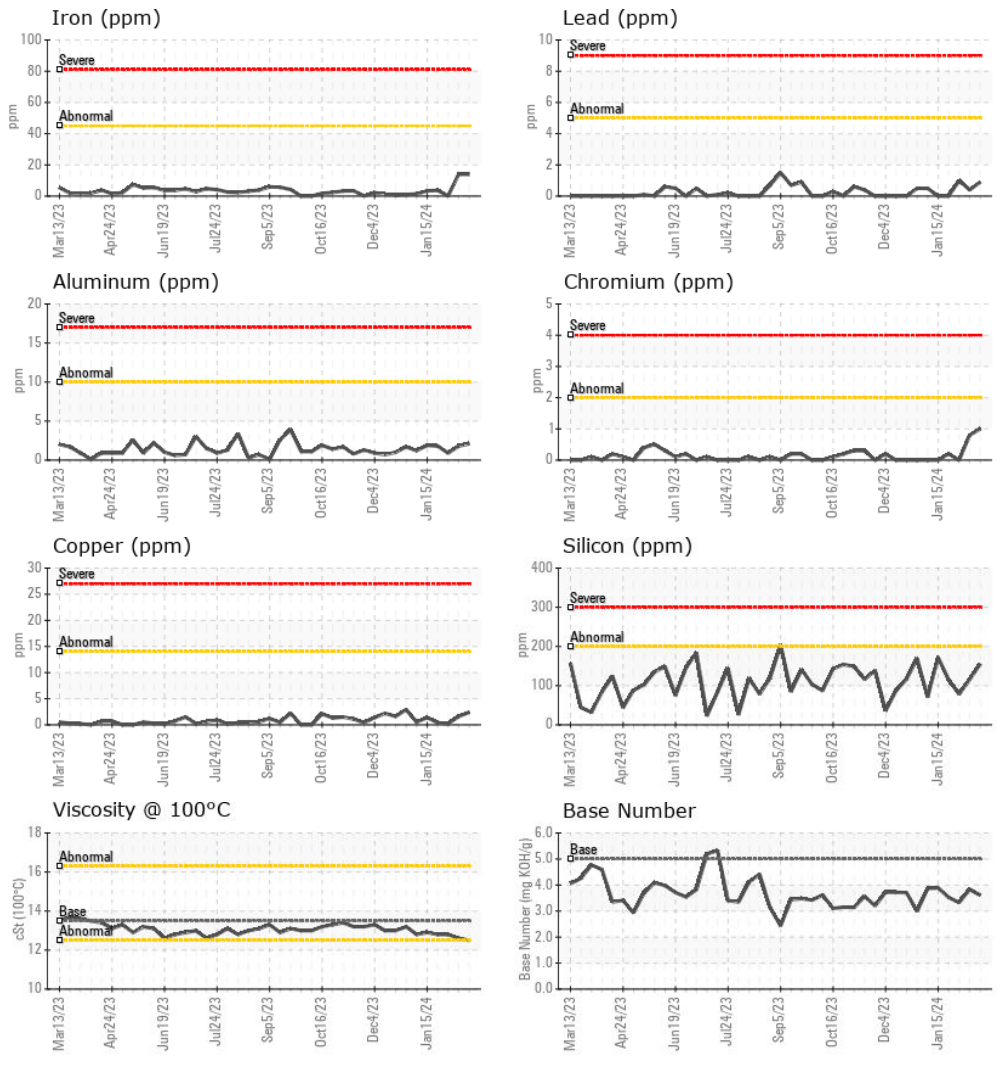
## Viscosity @ 100°C



VISUAL	method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.1	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2
Visc @ 100°C	cSt	ASTM D445	13.5	12.5	12.6

## GRAPHS



Certificate L2367

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

**Sample No.** : WC0803466

**Lab Number** : 06194228

**Unique Number** : 11056351

**Test Package** : MOB 2

**Received** : 29 May 2024

**Tested** : 30 May 2024

**Diagnosed** : 31 May 2024 - Angela Borella

**BLACK OAK**

5054 HWY HH

HARTVILLE, MO

US 65667

Contact: CHIP MATHEWS

chip.matthews@cubedistrictenergy.com

T:

F:

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)