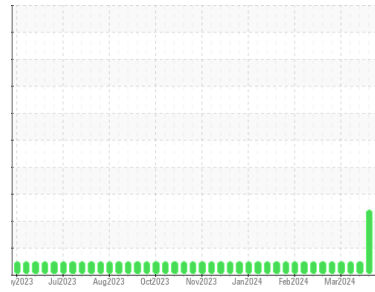




OIL ANALYSIS REPORT

Sample Rating Trend



GLYCOL



Machine Id

E-2 (S/N 1144675)

Component

Biogas Engine

Fluid

MAHLER Q8 Mahler G8 SAE 40 (--- GAL)

DIAGNOSIS

Recommendation

We advise that you check for possible coolant leak. Check for low coolant level. We recommend an early resample to monitor this condition.

Wear

All component wear rates are normal.

Contamination

Sodium and/or potassium levels remain high.

Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil.

SAMPLE INFORMATION

	method	limit/base	current	history1	history2
Sample Number	Client Info		WC0914280	WC0914283	WC0914276
Sample Date	Client Info		22 Apr 2024	17 Apr 2024	08 Apr 2024
Machine Age	hrs	Client Info	0	12464	12404
Oil Age	hrs	Client Info	0	34	5668
Oil Changed	Client Info		Not Changed	Changed	Not Changed
Sample Status			ABNORMAL	ABNORMAL	NORMAL

CONTAMINATION

	method	limit/base	current	history1	history2
Fuel	WC Method	>4.0	<1.0	<1.0	<1.0
Water	WC Method	>0.1	NEG	NEG	NEG
Glycol	WC Method		NEG	NEG	NEG

WEAR METALS

	method	limit/base	current	history1	history2	
Iron	ppm	ASTM D5185m	>45	6	8	7
Chromium	ppm	ASTM D5185m	>2	<1	<1	1
Nickel	ppm	ASTM D5185m	>2	0	0	1
Titanium	ppm	ASTM D5185m		<1	0	<1
Silver	ppm	ASTM D5185m	>5	0	0	0
Aluminum	ppm	ASTM D5185m	>10	4	4	6
Lead	ppm	ASTM D5185m	>5	2	3	5
Copper	ppm	ASTM D5185m	>14	2	<1	2
Tin	ppm	ASTM D5185m	>13	2	4	6
Vanadium	ppm	ASTM D5185m		0	0	<1
Cadmium	ppm	ASTM D5185m		0	<1	<1

ADDITIVES

	method	limit/base	current	history1	history2	
Boron	ppm	ASTM D5185m		0	3	0
Barium	ppm	ASTM D5185m		0	2	0
Molybdenum	ppm	ASTM D5185m		2	2	2
Manganese	ppm	ASTM D5185m		<1	<1	1
Magnesium	ppm	ASTM D5185m		7	10	10
Calcium	ppm	ASTM D5185m		2354	2421	2725
Phosphorus	ppm	ASTM D5185m		417	430	503
Zinc	ppm	ASTM D5185m		464	517	567
Sulfur	ppm	ASTM D5185m		2795	2902	3282

CONTAMINANTS

	method	limit/base	current	history1	history2	
Silicon	ppm	ASTM D5185m	>200	22	27	46
Sodium	ppm	ASTM D5185m		▲ 264	▲ 275	2
Potassium	ppm	ASTM D5185m	>20	▲ 34	▲ 41	3

INFRA-RED

	method	limit/base	current	history1	history2	
Soot %	%	*ASTM D7844		0	0	0
Nitration	Abs/cm	*ASTM D7624	>20	9.1	9.0	10.0
Sulfation	Abs/.1mm	*ASTM D7415	>30	18.9	19.0	23.4

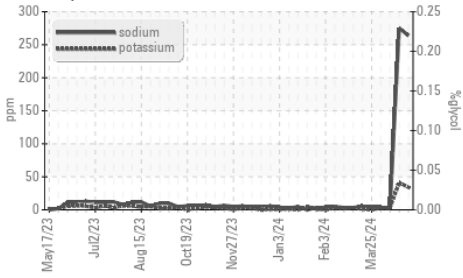
FLUID DEGRADATION

	method	limit/base	current	history1	history2	
Oxidation	Abs/.1mm	*ASTM D7414	>25	13.3	12.6	19.8
Acid Number (AN)	mg KOH/g	ASTM D8045		0.35	0.92	2.09
Base Number (BN)	mg KOH/g	ASTM D2896	8.0	7.36	7.40	5.32

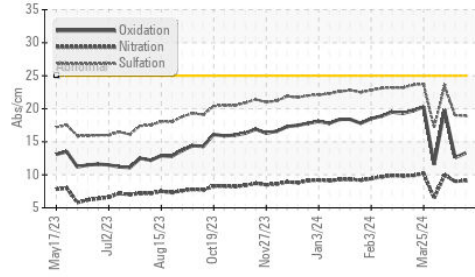


OIL ANALYSIS REPORT

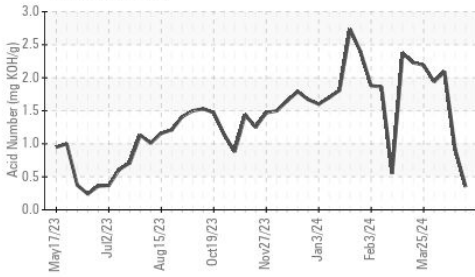
▲ Glycol Contamination



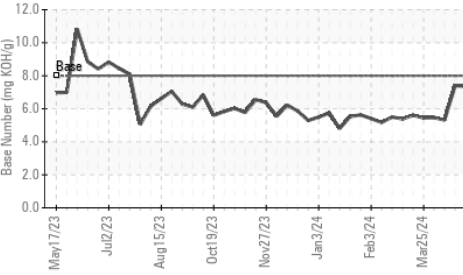
FT-IR (Direct Trend)



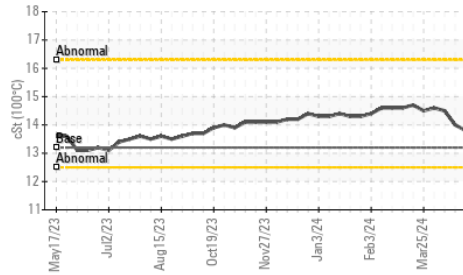
Acid Number



Base Number



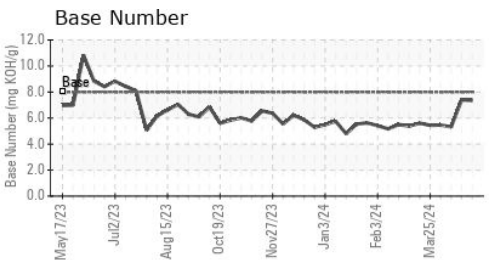
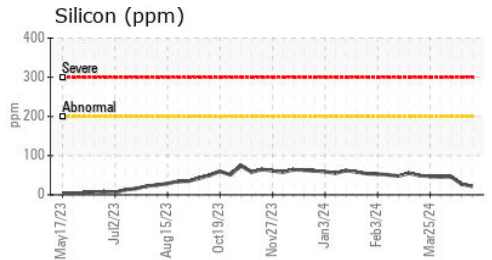
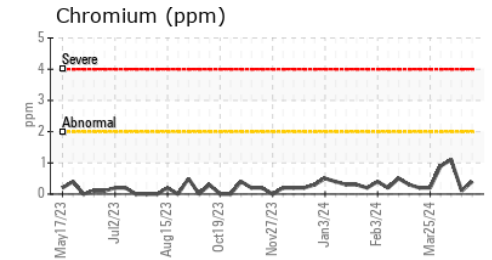
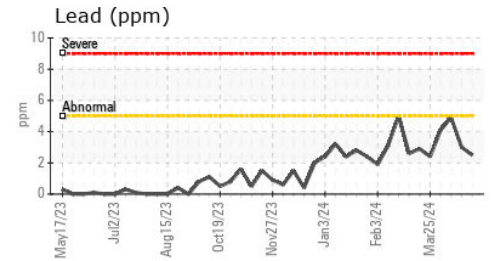
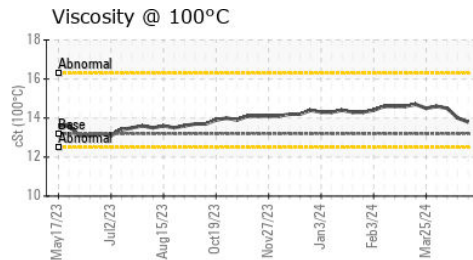
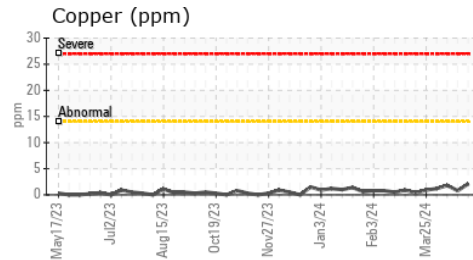
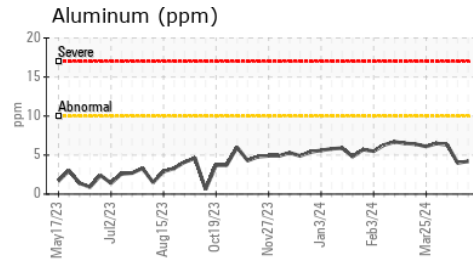
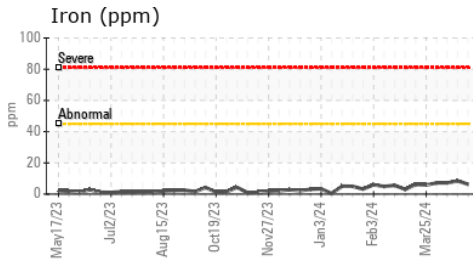
Viscosity @ 100°C



VISUAL	method	limit/base	current	history1	history2	
White Metal	scalar	*Visual	NONE	LIGHT	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	>0.1	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

FLUID PROPERTIES	method	limit/base	current	history1	history2	
Visc @ 100°C	cSt	ASTM D445	13.2	13.8	14.0	14.5

GRAPHS



Certificate L2367

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

Sample No. : WC0914280

Lab Number : 06161694

Unique Number : 10997117

Test Package : MOB 2

Received : 26 Apr 2024

Tested : 29 Apr 2024

Diagnosed : 01 May 2024 - Jonathan Hester

OAK GROVE GA

967 CARL-BETHLEHEM RD

WINDER, GA

US 30680

Contact: ZACK GRAVES

zack.graves@cubedistrictenergy.com

T: (470)596-8000

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)