

# **OIL ANALYSIS REPORT**

### Sample Rating Trend







Grand River CAT 1 GRRM01BE

Biogas Engine

CHEVRON HDAX 9500 GAS ENGINE OIL 40 (90 GAL)

## DIAGNOSIS

#### Recommendation

Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

#### Contamination

There is no indication of any contamination in the oil.

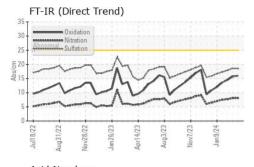
## **Fluid Condition**

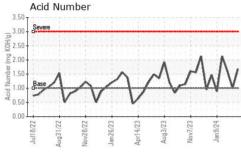
The BN result indicates that there is suitable alkalinity remaining in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

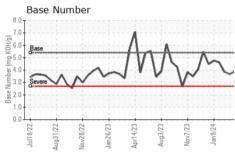
CAMPLE INCOR	4 A TION		1515.0		1.5.4	let et a
SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Sample Number		Client Info		WC0724920	WC0724921	WC0724924
Sample Date		Client Info		23 Apr 2024	17 Apr 2024	08 Apr 2024
Machine Age	hrs	Client Info		72556	72412	72196
Oil Age	hrs	Client Info		1420	1250	1063
Oil Changed		Client Info		Changed	Not Changd	Not Changd
Sample Status				NORMAL	NORMAL	NORMAL
CONTAMINATION	1	method	limit/base	current	history1	history2
Fuel		WC Method	>4.0	<1.0	<1.0	<1.0
Water		WC Method	>.11	NEG	NEG	NEG
Glycol		WC Method		NEG	NEG	NEG
WEAR METALS		method	limit/base	current	history1	history2
Iron	ppm	ASTM D5185m	>15	5	2	3
Chromium	ppm	ASTM D5185m	>4	<1	0	<1
Nickel	ppm	ASTM D5185m		<1	0	<1
Titanium	ppm	ASTM D5185m		<1	0	<1
Silver	ppm	ASTM D5185m		0	0	0
Aluminum	ppm	ASTM D5185m	>6	3	1	2
Lead	ppm	ASTM D5185m	>9	3	2	2
Copper	ppm	ASTM D5185m	>6	3	2	2
Tin	ppm	ASTM D5185m	>4	2	2	2
Vanadium	ppm	ASTM D5185m		<1	<1	<1
Cadmium	ppm	ASTM D5185m		<1	0	<1
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base	current 2	history1	history2 <1
	ppm		limit/base			
Boron		ASTM D5185m	limit/base	2	0	<1
Boron Barium	ppm	ASTM D5185m ASTM D5185m	limit/base	2 0	0	<1
Boron Barium Molybdenum	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	2 0 5	0 0 2	<1 0 3
Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	2 0 5 <1	0 0 2 <1	<1 0 3 <1
Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	2 0 5 <1 25	0 0 2 <1 9	<1 0 3 <1 11
Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	2 0 5 <1 25 1897	0 0 2 <1 9	<1 0 3 <1 11 1976
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	2 0 5 <1 25 1897 329	0 0 2 <1 9 1928 267	<1 0 3 <1 11 1976 313
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base	2 0 5 <1 25 1897 329 385	0 0 2 <1 9 1928 267 303	<1 0 3 <1 11 1976 313 370
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m		2 0 5 <1 25 1897 329 385 2375	0 0 2 <1 9 1928 267 303 1869	<1 0 3 <1 11 1976 313 370 2124
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base	2 0 5 <1 25 1897 329 385 2375	0 0 2 <1 9 1928 267 303 1869 history1	<1 0 3 <1 11 1976 313 370 2124 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >181	2 0 5 <1 25 1897 329 385 2375 current	0 0 2 <1 9 1928 267 303 1869 history1	<1 0 3 <1 11 1976 313 370 2124 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >181 >21	2 0 5 <1 25 1897 329 385 2375 current 46 2	0 0 2 <1 9 1928 267 303 1869 history1 46	<1 0 3 <1 11 1976 313 370 2124 history2 43
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >181 >21 >20	2 0 5 <1 25 1897 329 385 2375 current 46 2	0 0 2 <1 9 1928 267 303 1869 history1 46 2	<1 0 3 <1 11 1976 313 370 2124 history2 43 1
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	limit/base >181 >21 >20	2 0 5 <1 25 1897 329 385 2375 current 46 2 2	0 0 2 <1 9 1928 267 303 1869 history1 46 2 0	<1 0 3 <1 11 1976 313 370 2124 history2 43 1 2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m  method  *ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base >181 >21 >20	2 0 5 <1 25 1897 329 385 2375 current 46 2 2 current 0.1	0 0 2 <1 9 1928 267 303 1869 history1 46 2 0 history1 0	<1 0 3 <1 11 1976 313 370 2124 history2 43 1 2 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m  method  ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base >181 >21 >20	2 0 5 <1 25 1897 329 385 2375 current 46 2 2 current 0.1 8.1	0 0 2 <1 9 1928 267 303 1869 history1 46 2 0 history1 0 8.1	<1 0 3 <1 11 1976 313 370 2124 history2 43 1 2 history2 0 7.7
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m  method  *ASTM D5185m ASTM D5185m  ASTM D5185m ASTM D5185m  ASTM D5185m  ASTM D5185m  ASTM D5185m  method  *ASTM D7624 *ASTM D7624 *ASTM D7615  method	limit/base >181 >21 >20 limit/base	2 0 5 <1 25 1897 329 385 2375 current 46 2 2 current 0.1 8.1 18.5	0 0 2 <1 9 1928 267 303 1869 history1 46 2 0 history1 0 8.1 18.6 history1	<1 0 3 <1 11 1976 313 370 2124 history2 43 1 2 history2 0 7.7 17.9 history2
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m  Method  ASTM D5185m  Method  *ASTM D7844  *ASTM D7624  *ASTM D76145	limit/base >181 >21 >20 limit/base	2 0 5 <1 25 1897 329 385 2375 current 46 2 2 current 0.1 8.1 18.5 current	0 0 2 <1 9 1928 267 303 1869 history1 46 2 0 history1 0 8.1 18.6	<1 0 3 <1 11 1976 313 370 2124 history2 43 1 2 history2 0 7.7 17.9
Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA Oxidation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m  Method  ASTM D5185m ASTM D5185m  ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m  Method  *ASTM D7844  *ASTM D7624  *ASTM D7415  Method  *ASTM D7414	limit/base >181 >21 >20 limit/base	2 0 5 <1 25 1897 329 385 2375 current 46 2 2 current 0.1 8.1 18.5	0 0 2 <1 9 1928 267 303 1869 history1 46 2 0 history1 0 8.1 18.6 history1 15.7	<1 0 3 <1 11 1976 313 370 2124 history2 43 1 2 history2 0 7.7 17.9 history2 14.5

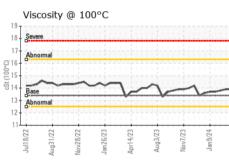


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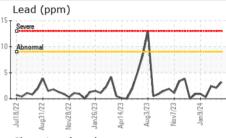


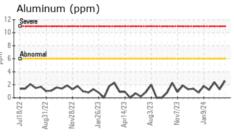


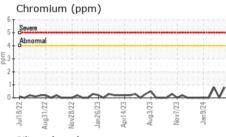
VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
<b>Emulsified Water</b>	scalar	*Visual	>.11	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG

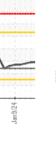
FLUID PROPERTIES		method				history2	
Visc @ 100°C	cSt	ASTM D445	13 4	13.9	13.9	13.8	

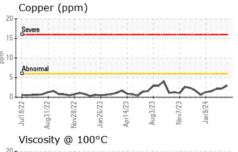
Iron 25 Seve	n (ppi	m)						
20 - Abno	ormal							1-1-
E 10-								
	~	~		~	-1	~		<u> </u>
Jul18/22	Aug31/22	Nov28/22	Jan26/23	Apr14/23	Aug3/23	Nov7/23	Jan9/24	
Alu	minu	m (pp	m)					

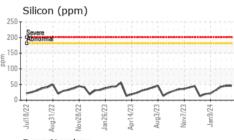


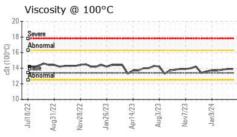


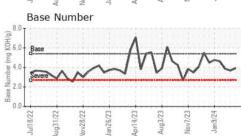
















Certificate 12367

Laboratory Sample No.

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Lab Number : 06160570

: WC0724920 Unique Number : 10995993 Test Package : MOB 2

Received **Tested** Diagnosed

: 25 Apr 2024 : 26 Apr 2024 : 26 Apr 2024 - Sean Felton

**EDL NA Recips-Grand River** Grand River Powerstation, 8550 West Grand River Hwy Grand Ledge, MI

> US 48837 Contact: JAMES ALEXANDER james.alexander@edlenergy.com

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)

Report Id: EDLGRAMI [WUSCAR] 06160570 (Generated: 04/26/2024 15:42:20) Rev: 1

Submitted By: Paul Jaworsky

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