

## **OIL ANALYSIS REPORT**

Sample Rating Trend

#### NORMAL



Area Surplus Machine Id CARM19BE (S/N GZJ00331) Component

Biogas Engine

## MAHLER HA 40 (150 GAL)





SAMPLE INFORMATION		method				history2
Sample Number		Client Info		WC0668951	WC0668972	WC0502610
Sample Date		Client Info		20 Oct 2022	13 Oct 2022	06 Oct 2022
Machine Age	hrs	Client Info		83192	83064	82905
Oil Age	hrs	Client Info		102	1082	923
Oil Changed		Client Info		N/A	N/A	Not Change
Sample Status				NORMAL	SEVERE	ABNORMAI
			11.0011/10.000		Internet and	history O
CONTAMINATION	N	method	limit/base	current	nistory i	nistory2
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	>15	4	9	8
Chromium	ppm	ASTM D5185m	>4	<1	<1	<1
Nickel	ppm	ASTM D5185m		0	0	0
Titanium	ppm	ASTM D5185m		0	0	0
Silver	ppm	ASTM D5185m		0	0	0
Aluminum	ppm	ASTM D5185m	>6	2	4	4
Lead	ppm	ASTM D5185m	>9	3	5	2
Copper	ppm	ASTM D5185m	>6	1	2	2
Tin	ppm	ASTM D5185m	>4	6	17	13
Vanadium	ppm	ASTM D5185m		0	0	0
Cadmium	ppm	ASTM D5185m		0	0	0
ADDITIVES		method	limit/base	current	history1	history2
ADDITIVES Boron	ppm	method ASTM D5185m	limit/base 97	current 2	history1 2	history2 3
ADDITIVES Boron Barium	ppm ppm	method ASTM D5185m ASTM D5185m	limit/base 97	current 2 0	history1 2 0	history2 3 0
ADDITIVES Boron Barium Molybdenum	ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 97	current 2 0 2	history1 2 0 2	history2 3 0 3
ADDITIVES Boron Barium Molybdenum Manganese	ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 97	current 2 0 2 <1	history1 2 0 2 <1	history2 3 0 3 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 97	current 2 0 2 <1 15	history1 2 0 2 <1 7	history2 3 0 3 <1 10
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 97 2100	current 2 0 2 <1 15 1687	history1 2 0 2 <1 7 1750	history2 3 0 3 <1 10 1671
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 97 2100 330	current 2 0 2 <1 15 1687 288	history1 2 0 2 <1 7 1750 288	history2 3 0 3 <1 10 1671 271
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 97 2100 330 390	current 2 0 2 <1 15 1687 288 354	history1           2           0           2           <1           7           1750           288           371	history2 3 0 3 <1 10 1671 271 353
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 97 2100 330 390 4000	current           2           0           2           <1           15           1687           288           354           3288	history1           2           0           2           <1           7           1750           288           371           3337	history2 3 0 3 <1 10 1671 271 353 2997
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm ppm	method ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	limit/base 97 2100 330 390 4000 limit/base	current 2 0 2 <1 15 1687 288 354 3288 Current	history1         2         0         2         <1         7         1750         288         371         3337         history1	history2 3 0 3 <1 10 1671 271 353 2997 history2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	limit/base 97 2100 330 390 4000 limit/base >181	current 2 0 2 <1 15 1687 288 354 3288 current 73	history1         2         0         2         <1         7         1750         288         371         3337         history1	history2 3 0 3 <1 10 1671 271 353 2997 history2 ▲ 188
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	limit/base 97 2100 330 390 4000 limit/base >181	current           2           0           2           <1           15           1687           288           354           3288           current           73           0	history1         2         0         2         <1         7         1750         288         371         3337         history1         ● 221         0	history2 3 0 3 <1 10 1671 271 353 2997 history2 ▲ 188 <1
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	limit/base 97 2100 330 390 4000 limit/base >181 >20	current           2           0           2           <1           15           1687           288           354           3288           current           73           0           0	history1         2         0         2         <1         7         1750         288         371         3337         history1         •         221         0         2	history2 3 0 3 <1 10 1671 271 353 2997 history2 ▲ 188 <1 2
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m	limit/base 97 2100 330 390 4000 limit/base >181 >20 limit/base	current           2           0           2           <1           15           1687           288           354           3288           current           73           0           0           current	history1         2         0         21         7         1750         288         371         3337         history1         ● 221         0         2         history1	history2 3 0 3 <1 10 1671 271 353 2997 history2 ▲ 188 <1 2 history2
ADDITIVES 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	method           ASTM D5185m	limit/base 97 2100 330 390 4000 limit/base >181 >20 limit/base	current           2           0           2           <1           15           1687           288           354           3288           current           73           0           0           current           0           0           0           0           0           0           0           0           0	history1         2         0         2         <1         7         1750         288         371         3337         history1         221         0         2         history1         0         0         0         0	history2 3 0 3 <1 10 1671 271 353 2997 history2 ▲ 188 <1 2 history2 0 1
ADDITIVES 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	method           ASTM D5185m	limit/base 97 2100 330 390 4000 limit/base >181 >20 limit/base	current           2           0           2           <1           15           1687           288           354           3288           current           73           0           0           current           0.1           4.7	history1 2 0 2 <1 7 1750 288 371 3337 history1 0 2 1 0 2 history1 0.1 5.8	history2 3 0 3 <1 10 1671 271 353 2997 history2 ▲ 188 <1 2 history2 0.1 5.4
ADDITIVES 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	method           ASTM D5185m	limit/base 97 2100 330 390 4000 limit/base >181 >20 limit/base >20 }	current           2           0           2           <1           15           1687           288           354           3288           current           73           0           0           current           0.1           4.7           18.1	history1         2         0         21         7         1750         288         371         3337         bistory1         0         221         0         2         history1         0.1         5.8         21.7	history2 3 0 3 <1 10 1671 271 353 2997 history2 ▲ 188 <1 2 history2 0.1 5.4 20.8
ADDITIVES 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	method           ASTM D5185m           ASTM D7844           *ASTM D7624           *ASTM D7415	limit/base 97 2100 330 390 4000 limit/base >181 >20 limit/base >20 s30	current           2           0           2           <1           15           1687           288           354           3288           Current           73           0           0           current           0.1           4.7           18.1	history1         2         0         21         7         1750         288         371         3337         history1         221         0         2         history1         0.1         5.8         21.7	history2 3 0 3 <1 10 1671 271 353 2997 history2 ▲ 188 <1 2 history2 0.1 5.4 20.8 bistory2
ADDITIVES 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	method           ASTM D5185m           ASTM D7844           *ASTM D7415           method	limit/base 97 2100 330 390 4000 limit/base >181 >20 limit/base >20 s30	current           2           0           2           <1           15           1687           288           354           3288           current           73           0           0           current           0.1           4.7           18.1           current           0.6	history1         2         0         2         <1         7         1750         288         371         3337         history1         0         221         0         2         history1         0.1         5.8         21.7         history1	history2 3 0 3 <1 10 1671 271 353 2997 history2 188 <1 2 188 <1 2 history2 0.1 5.4 20.8 history2
ADDITIVES 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	method           ASTM D5185m           ASTM D7844           *ASTM D7415           method           *ASTM D7414	limit/base 97 2100 330 390 4000 limit/base >181 >20 limit/base >20 s30 limit/base >20	current           2           0           2           <1           15           1687           288           354           3288           current           73           0           0           current           0.1           4.7           18.1           current           9.6           0.61	history1         2         0         21         7         1750         288         371         3337         history1         0         221         0         2         history1         0.1         5.8         21.7         history1         13.9         1.418	history2 3 0 3 <1 10 1671 271 353 2997 history2 188 <1 2 188 <1 2 history2 0.1 5.4 20.8 history2 0.1 5.4 20.8
ADDITIVES Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA Oxidation Acid Number (AN) Base Number (PN)	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	method           ASTM D5185m           ASTM D7844           *ASTM D7414           *ASTM D7414           ASTM D72464	limit/base 97 2100 330 390 4000 limit/base >181 >20 limit/base >20 s30 limit/base >25 0.62 7 9	current           2           0           2           <1           15           1687           288           354           3288           current           73           0           0           current           0.1           4.7           18.1           current           9.6           0.61           4.01	history1         2         0         21         7         1750         288         371         3337         history1         •         221         0         2         history1         •         1750         288         371         3337         history1         0.1         5.8         21.7         history1         13.9         1.418         3.14	history2         3         0         3         <1         10         1671         271         353         2997         history2         188         <1         2         history2         0.1         5.4         20.8         history2         12.4         1.27         3.36

### Fluid Condition

Contamination

Recommendation

Wear

oil.

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.

There is no indication of any contamination in the

Resample at the next service interval to monitor.

All component wear rates are normal.

Contact/Location: RICK DURHAM - ENELOW



# **OIL ANALYSIS REPORT**







	VISUAL		method	limit/base	current	riistory i	nistory2
	White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
ΛΛΛ	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
NA ////	Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
VIAIVI	Silt	scalar	*Visual	NONE	NONE	NONE	NONE
	Debris	scalar	*Visual	NONF	NONE	NONE	NONE
	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
22 - 22 -	Annearance	scalar	*Visual	NORMI	NORM	NORMI	NORMI
Jun2 Jul11 Sep1,	Odor	scalar	*Vieual	NORMI	NORM	NORMI	NORM
90 B	Emulaified Water	scalar	*Vieual		NEC	NEG	NEC
		Sudiar	*Vioual	>∪.1	NEG	NEG	NEG
na dan Kanada dan Banda dan Kanada Kanada dan Banda Kanada dan Banda dan Banda dan Banda dan Banda dan Banda d	Free water	scalar	visual		NEG	NEG	NEG
	FLUID PROPERT	TIES	method	limit/base	current	history1	history2
V	Visc @ 100°C	cSt	ASTM D445	14.4	14.2	14.4	14.2
4	GRAPHS						
	25 <sub>T</sub> and a concernent of the second			15	Lead (ppm)		
22 -	20 - Severe				Severe		
Jun2/ Juli 1// Sep 1//	_ 15 - Abnormal			10	Abnormal		
	E 10-			Шd			
	A AA	A	A A	5			1
	~VV	N	100		$\sim$		
	8/21 8/21	9/22	1/22	U	8/21	9/22	1/22
	Nov1: Jan28 Mar19	Apr25	Juni Juli Seni		Nov1 Dec1	Mar1: Apr2: Jun2	Sep1
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Aluminum (ppm)				Chromium (pp	om)	
V	12 Severe		110000000000000000000000000000000000000	6	Savara		
	10-			5	Abnormal		
	Abnormal			4 E 2			
un2/2: i111/22	4- · · · · · · · · · · · · · · · · · · ·		٨	∧ 2			
Ju Se	2 11	n	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				
		2+	2+2	0			
	ov12/2 sc18/2 n28/2 r19/2	129/2	un2/2 111/2 ep1/2		ov12// sc18/2 n28/2	ar19/2 1r29/2 1n2/2	ul11/2 ep1/2
	No Jar Ma	Ap	r r š		Ne Jar	Ma Ap	JL IS
	Copper (ppm)			200	Silicon (ppm)		
	Severe			300			
	15 -			200	Severe A	A	
	톱 10-			특 150	· _ /\/	1 A	1
	Abnormal			100	A ///	V	1 AL
			Λ.	50	VV	W	VV
				0	21	22	22
	ov12/ ec18/. m28/2 ar19/2	pr29/2	lun2/. ul11/2 ie01/2		ov12/ ec18/. n28/2	ar19/2 pr29/2 un2/2	ul11/A
	≊ ⊂ ຶ ≊ Viscositv @ 100°C	Υ.	n in s		≥ ⊂ ¬ Base Number	Ar J	i s
	18 Abnomal			€ <sup>8.0</sup>	Base		
	16		4 4	HOX 6.0			
	Base			E 40	mr.	AAA	$-\Lambda$
	평 Abnormal	V	V	equin	V~		5-2
	12			₹ 2.0 Se			
		2	2		2	2	2
	v12/2 c18/2 r28/2:	r29/2	II1/2: 11/2:		v12/2 c18/2 v28/2	r19/2 r29/2: in2/2 <sup>2</sup>	il11/2
	an an	Ap.	Ju Ju Se		No Jan	Ma Api	Ju Se
	2 1 7 2						
Laboratory	: WearCheck USA - F	501 Madie	son Ave Ca	rv. NC 27513			Recips-Carbo
Laboratory Sample No.	: WearCheck USA - 5 : WC0668951	501 Madis Received	son Ave., Ca 1 : 25 (	ry, NC 27513 Oct 2022	CARBON LIMES	EDL NA F STONE POWER STATION. 796	Recips-Carbo NO SOUTH STATE LINE RC
Laboratory Sample No. Lab Number	: WearCheck USA - 5 : WC0668951	501 Madis Received Diagnos	son Ave., Ca d : 25 ( ed : 27 (	ry, NC 27513 Oct 2022 Oct 2022	CARBON LIMES	EDL NA F STONE POWER STATION, 796 LOW	Recips-Carbo IO SOUTH STATE LINE RO YELLVILLE, O
Laboratory Sample No. Lab Number Unique Number	: WearCheck USA - 5 : WC0668951 : 05675794 : 10190365	501 Madis Received Diagnose Diagnost	son Ave., Ca d : 25 ( ed : 27 ( tician : Ang	ry, NC 27513 Oct 2022 Oct 2022 Jela Borella	CARBON LIMES	EDL NA F STONE POWER STATION, 796 LOW	Recips-Carbo 10 SOUTH STATE LINE RC 'ELLVILLE, O US 4443
Laboratory Sample No. Lab Number Unique Number Test Package	: WearCheck USA - 5 : WC0668951 : 05675794 : 10190365 : MOB 2	501 Madis Received Diagnose Diagnost	son Ave., Ca d : 25 ( ed : 27 ( tician : Ang	ry, NC 27513 Oct 2022 Oct 2022 Jela Borella	CARBON LIMES	EDL NA F STONE POWER STATION, 796 LOW Contact: F	Recips-Carbo No South State LINE R (ELL VILLE, C US 4443 RICK DURHA

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