

## **OIL ANALYSIS REPORT**

### STEAM AND POWER Machine Id 416.0115 (1) PRIMARY CLARIFIER #1 GEARBOX

Circle Gearbox

{not provided} (--- GAL)

#### DIAGNOSIS

#### Recommendation

We recommend you service the filters on this component if applicable. Resample at the next service interval to monitor. Please specify the brand, type, and viscosity of the oil on your next sample.

#### Wear

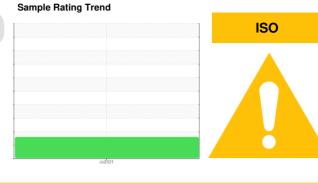
All component wear rates are normal.

#### Contamination

There is a high amount of particulates present in the oil.

#### **Fluid Condition**

The AN level is acceptable for this fluid. The condition of the oil is acceptable for the time in service.



Water         WC Method         >0.2         NEG             WEAR METALS         method         limit/base         current         history1         history1           PQ         ASTM D8184         27              Iron         ppm         ASTM D8184         27             Chromium         ppm         ASTM D5185m         >200         14             Nickel         ppm         ASTM D5185m         >10         0             Nickel         ppm         ASTM D5185m         <1              Aluminum         ppm         ASTM D5185m         <1              Aluminum         ppm         ASTM D5185m         <1              Copper         ppm         ASTM D5185m         <1              Cadmium         ppm         ASTM D5185m         <1              Maganese         ppm         ASTM D5185m         0	SAMPLE INFORM	ATION	method	limit/base	current	history1	history2
Machine Age         hrs         Client Info         0             Oil Age         hrs         Client Info         N/A              Sample Status         I         Imit/base         current         history1             CONTAMINATION         method         limit/base         current         history1             Water         WC Method         >0.2         NEG              WEAR METALS         method         limit/base         current         history1             WEAR METALS         method         limit/base         current         history1             Vater         VC Method         >0.2         NEG  <	Sample Number		Client Info		PE0001510		
Machine Age         hrs         Client Info         0             Oil Age         hrs         Client Info         N/A              Oil Changed         Client Info         N/A               Sample Status         Imathone         current         history             CONTAMINATION         method         limit/base         current         history            Water         WC Method         >0.2         NEG              WEAR METALS         method         limit/base         current         history             Vear         ASTM D518m         >10         0              PQ         ASTM D518m         >10         0              Nickel         ppm         ASTM D518m         -1              Silver         ppm         ASTM D518m         <14	Sample Date		Client Info		09 Jul 2024		
Oil Changed Sample Status         Client Info         N/A             Sample Status         Imit Vase         Current         Inistory1         Inistory1           CONTAMINATION         We Method         >0.2         NEG             Wear         WC Method         >0.2         NEG             WEAR METALS         method         limit/base         current         history1         history1           PQ         ASTM D8185m         >200         14             Iron         ppm         ASTM D5185m         >10         0             Nickel         ppm         ASTM D5185m         >10         0             Aluminum         ppm         ASTM D5185m         14              Aluminum         ppm         ASTM D5185m         129              Aduminum         ppm         ASTM D5185m         129              Copper         ppm         ASTM D5185m         11              Sofon <td></td> <td>hrs</td> <td>Client Info</td> <td></td> <td>0</td> <td></td> <td></td>		hrs	Client Info		0		
Oil Changed Sample Status         Client Info         N/A             CONTAMINATION         method         limit/base         current         history1         history1           WC Method         >0.2         NEG             WEAR METALS         method         limit/base         current         history1         history1           PQ         ASTM D5185m         >200         14             Iron         ppm         ASTM D5185m         >10         <1             Nickel         ppm         ASTM D5185m         >10         0             Aluminum         ppm         ASTM D5185m         <10         0             Lead         ppm         ASTM D5185m         14             ADDITIVES         ppm         ASTM D5185m         129             ADDITIVES         method         limit/base         current         history1         history1           Boron         ppm         ASTM D5185m         <1             ADDITIVES         method <thlimit <="" base<="" td=""><td>Dil Age</td><td>hrs</td><td>Client Info</td><td></td><td>0</td><td></td><td></td></thlimit>	Dil Age	hrs	Client Info		0		
Sample Status         Image Status         Method         Imit/base         current         history1         history1           CONTAMINATION         WC Method         >0.2         NEG             WEAR METALS         method         limit/base         current         history1         history1           PQ         ASTM D8184         27              Iron         ppm         ASTM D5185m         >200         14             Nickel         ppm         ASTM D5185m         >10         0             Nickel         ppm         ASTM D5185m         >10         0             Silver         ppm         ASTM D5185m         114             Aluminum         ppm         ASTM D5185m         129             Copper         ppm         ASTM D5185m         114             Vanadium         ppm         ASTM D5185m         129             Cadmium         ppm         ASTM D5185m         0             Bar	Dil Changed		Client Info		N/A		
Water         WC Method         >0.2         NEG             WEAR METALS         method         limit/base         current         history1         history1           PQ         ASTM D8184         27              Iron         ppm         ASTM D5185m         >200         14             Chromium         ppm         ASTM D5185m         >10         0             Nickel         ppm         ASTM D5185m         >10         0             Nickel         ppm         ASTM D5185m         <1	-				ABNORMAL		
WEAR METALS         method         limit/base         current         history1         history1           PQ         ASTM D8184         27             Iron         ppm         ASTM D5185m<>200         14             Chromium         ppm         ASTM D5185m         >10         <1	CONTAMINATION	l	method	limit/base	current	history1	history2
PQ         ASTM D8184         27             Iron         ppm         ASTM D5185m         >200         14             Chromium         ppm         ASTM D5185m         >10         1             Nickel         ppm         ASTM D5185m         >10         0             Titanium         ppm         ASTM D5185m         <1	Vater		WC Method	>0.2	NEG		
Iron         ppm         ASTM D5185m         >200         14             Chromium         ppm         ASTM D5185m         >10         <1	WEAR METALS		method	limit/base	current	history1	history2
Chromium         ppm         ASTM D5185m         >10         <1             Nickel         ppm         ASTM D5185m         >10         0             Titanium         ppm         ASTM D5185m         <1	PQ		ASTM D8184		27		
Nickel         ppm         ASTM D5185m         >10         0             Titanium         ppm         ASTM D5185m         <1	ron	ppm	ASTM D5185m	>200	14		
Titanium       ppm       ASTM D5185m       <1	Chromium	ppm	ASTM D5185m	>10	<1		
Silver         ppm         ASTM D5185m         <1             Aluminum         ppm         ASTM D5185m         14             Lead         ppm         ASTM D5185m         129             Copper         ppm         ASTM D5185m         129             Tin         ppm         ASTM D5185m         <1	Nickel	ppm	ASTM D5185m	>10	0		
Aluminum       ppm       ASTM D5185m       14           Lead       ppm       ASTM D5185m       <1	Titanium	ppm	ASTM D5185m		<1		
Lead         ppm         ASTM D5185m         <1             Copper         ppm         ASTM D5185m         129             Tin         ppm         ASTM D5185m         <1	Silver	ppm	ASTM D5185m		<1		
Copper         ppm         ASTM D5185m         129             Tin         ppm         ASTM D5185m         <1	Aluminum	ppm	ASTM D5185m		14		
TinppmASTM D5185m<1VanadiumppmASTM D5185m<1	ead	ppm	ASTM D5185m		<1		
TinppmASTM D5185m<1VanadiumppmASTM D5185m<1	Copper	ppm	ASTM D5185m		129		
VanadiumppmASTM D5185m<1CadmiumppmASTM D5185m0ADDITIVESmethodlimit/basecurrenthistory1history1BoronppmASTM D5185m0BariumppmASTM D5185m0MolybdenumppmASTM D5185m0ManganeseppmASTM D5185m0MagnesiumppmASTM D5185m<1			ASTM D5185m		<1		
CadmiumppmASTM D5185m0ADDITIVESmethodlimit/basecurrenthistory1history1BoronppmASTM D5185m0BariumppmASTM D5185m<1	/anadium		ASTM D5185m		<1		
Boron         ppm         ASTM D5185m         0             Barium         ppm         ASTM D5185m         <1	Cadmium	ppm	ASTM D5185m		0		
Barium         ppm         ASTM D5185m         <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         0             Manganese         ppm         ASTM D5185m         16             Magnesium         ppm         ASTM D5185m         <1             Calcium         ppm         ASTM D5185m         <1             Calcium         ppm         ASTM D5185m         0             Phosphorus         ppm         ASTM D5185m         206             Zinc         ppm         ASTM D5185m         98             Sulfur         ppm         ASTM D5185m         98             CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         20         2             Sodium         ppm         ASTM D5185m         >20         2             Potassium         ppm         ASTM D5185m         >20         2             FLUID CLEANLINESS         method </td <td>Boron</td> <td>ppm</td> <td>ASTM D5185m</td> <td></td> <td>0</td> <td></td> <td></td>	Boron	ppm	ASTM D5185m		0		
Manganese         ppm         ASTM D5185m         16             Magnesium         ppm         ASTM D5185m         <1	Barium	ppm	ASTM D5185m		<1		
Magnesium         ppm         ASTM D5185m         <1             Calcium         ppm         ASTM D5185m         0              Phosphorus         ppm         ASTM D5185m         00              Zinc         ppm         ASTM D5185m         206              Zinc         ppm         ASTM D5185m         98              Sulfur         ppm         ASTM D5185m         98              CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         2             Sodium         ppm         ASTM D5185m         0             Potassium         ppm         ASTM D5185m         >20         2             FLUID CLEANLINESS         method         limit/base         current         history1         history1	Nolybdenum		ASTM D5185m		0		
Magnesium         ppm         ASTM D5185m         <1             Calcium         ppm         ASTM D5185m         0              Phosphorus         ppm         ASTM D5185m         206              Zinc         ppm         ASTM D5185m         98              Sulfur         ppm         ASTM D5185m         98              CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         2             Sodium         ppm         ASTM D5185m         0             Potassium         ppm         ASTM D5185m         0             FLUID CLEANLINESS         method         limit/base         current         history1         history	Manganese	ppm	ASTM D5185m		16		
Calcium         ppm         ASTM D5185m         0             Phosphorus         ppm         ASTM D5185m         206              Zinc         ppm         ASTM D5185m         98              Sulfur         ppm         ASTM D5185m         98              CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         2              Sodium         ppm         ASTM D5185m         0              Potassium         ppm         ASTM D5185m         0              FLUID CLEANLINESS         method         limit/base         current         history1         history	-		ASTM D5185m		<1		
Phosphorus         ppm         ASTM D5185m         206             Zinc         ppm         ASTM D5185m         98             Sulfur         ppm         ASTM D5185m         456             CONTAMINANTS         method         limit/base         current         history1         history           Silicon         ppm         ASTM D5185m         2             Sodium         ppm         ASTM D5185m         2             Potassium         ppm         ASTM D5185m         2             FLUID CLEANLINESS         method         limit/base         current         history1         history	0		ASTM D5185m		0		
ZincppmASTM D5185m98SulfurppmASTM D5185m456CONTAMINANTSmethodlimit/basecurrenthistory1historySiliconppmASTM D5185m2SodiumppmASTM D5185m0PotassiumppmASTM D5185m>202FLUID CLEANLINESSmethodlimit/basecurrenthistory1history	Phosphorus				206		
SulfurppmASTM D5185m456CONTAMINANTSmethodlimit/basecurrenthistory1historySiliconppmASTM D5185m2SodiumppmASTM D5185m0PotassiumppmASTM D5185m>202FLUID CLEANLINESSmethodlimit/basecurrenthistory1history					98		
Silicon         ppm         ASTM D5185m         2             Sodium         ppm         ASTM D5185m         0             Potassium         ppm         ASTM D5185m         >20         2             FLUID CLEANLINESS         method         limit/base         current         history1         history					456		
Sodium     ppm     ASTM D5185m     0         Potassium     ppm     ASTM D5185m     >20     2         FLUID CLEANLINESS     method     limit/base     current     history1     history1	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         2             FLUID CLEANLINESS         method         limit/base         current         history1         history	Silicon	ppm	ASTM D5185m		2		
Potassium         ppm         ASTM D5185m         >20         2             FLUID CLEANLINESS         method         limit/base         current         history1         history	Sodium	ppm	ASTM D5185m		0		
	Potassium		ASTM D5185m	>20	2		
	FLUID CLEANLINI	ESS	method	limit/base	current	history1	history2
ranicies >4μm ASTM D/047 >20000 Δ 190894	Particles >4µm		ASTM D7647	>20000	🔺 190894		
Particles >6μm ASTM D7647 >5000 Δ 151715	Particles >6µm		ASTM D7647	>5000	<u> </u>		
Particles >14μm         ASTM D7647         >640         ▲ 5678	Particles >14µm		ASTM D7647	>640			
Particles >21μm         ASTM D7647         >160         81	Particles >21um		ASTM D7647	>160	81		
Particles >38μm ASTM D7647 >40 4							

ASTM D7647 >10

ISO 4406 (c) >21/19/16 🔺 25/24/20

0

Particles >71µm

**Oil Cleanliness** 



# **OIL ANALYSIS REPORT**

200k -	Particle Trend	FLUID DEGRADA	ATION	method	limit/base	current	history1	history2
(lu	4μm 6μm	Acid Number (AN)	mg KOH/g	ASTM D8045		0.49		
L 150k •	14µm**	VISUAL		method	limit/base	current	history1	history2
tred for the formation of the second se		White Metal	scalar	*Visual	NONE	NONE		
jo nadmun 20k :		Yellow Metal	scalar	*Visual	NONE	NONE		
	Abnormal	Precipitate	scalar	*Visual	NONE	NONE		
0k-	·	Silt	scalar	*Visual	NONE	NONE		
	Jul9/24 Jul9/24	Debris	scalar	*Visual	NONE	NONE		
		Sand/Dirt	scalar	*Visual	NONE	NONE		
250	PQ	Appearance	scalar	*Visual	NORML	NORML		
200-	Severe	Odor	scalar	*Visual	NORML	NORML		
		Emulsified Water	scalar	*Visual	>0.2	NEG		
150· 문	Abnormal	Free Water	scalar	*Visual		NEG		
100-	Automa	FLUID PROPERT	TIES	method	limit/base	current	history1	history2
50-		Visc @ 40°C	cSt	ASTM D445		951		
0-	Jul9/24 -	SAMPLE IMAGE	S	method	limit/base	current	history1	history2
0.50 (B)10.40	Acid Number	Color					no image	no image
0.30 - Wumber (mg KO) 0.10 - 0.10		Bottom					no image	no image
0.00-		GRAPHS						
	2(8)/1 4:00-01-1 4:00-01-1	Ferrous Alloys				Particle Count		
	~ -	15 iron			491,520	Severe		1 <sup>26</sup>
	Viscosity @ 40°C	10 - chromium			122,880			-24
1000-		5-			30,720	Abnormal		-22
800-					- − 7,680			20 😨
<u>ତ</u> 600-		Jul9/24			Jul9/24 (per 1 ml) 1.920			-20 (SO 4406:1999 Cleanliness -18 -16 -17 -18 -16 -14 -14 -14 -14 -14 -14 -14 -14 -14 -14
(0.06) ss (400)					cles (b			1999
200-		Non-ferrous Meta	S		of particles			-16 Clean
200	Abnormal.	100 - copper				-		-14 Iness
0-	- 124 	E. tin			P 30	-		-12 G
	Jul9/24	50			8			10
		54 24		******	24			
250	PQ	Jul9/24			Jul9/24			
200-	Severe	Viscosity @ 40°C			U		4μ 21μ	38µ 71µ
		1000 T			бло.60 Ноу	Acid Number		
150· 문		800- 5 600-			9 E 0.40			
100-	Abnomal	(규) 600 - (국) 600 - 성 400 -			per la			
50-	1	200 Abnormal			Manper Munper Munper			
0-	94	0 ↓ ↓ 0 / 18/24			9/24	3/24		/24
	Jul9,74	Jul			Jul9/24	Jul9/24		Jul9/24
	TESTING LABORATORY Unique Numbe	. : PE0001510 er : 06235774 er : 11124608 e : PLANT ( Additional To rt, contact Customer Serv at are outside of the ISO 1	Recei Teste Diagr ests: ICP ice at 1-8 7025 sco	ived : 15 ed : 16 nosed : 16 , KV40, PQ, 800-237-1365 ope of accrec	5 Jul 2024 5 Jul 2024 Jul 2024 - Don PrtCount, SC 9. <i>litation.</i>	Baldridge REEN)	Port Contact: L0 Ionnie.lc T:	er Corporation 100 Mill Rd Townsend, WA US 98368 DNNIE LOREE ree@ptpc.com (907)738-6506 F:

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Submitted By: DUANE DENOTTA

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