

### **OIL ANALYSIS REPORT**

Sample Rating Trend



Machine Id

# **BONE CANNON 2**

Component Hydraulic System AW HYDRAULIC OIL ISO 46 (--- GAL)

#### DIAGNOSIS

#### Recommendation

We recommend you service the filters on this component. Resample at the next service interval to monitor. We were unable to perform a particle count due to a high concentration of particles present in this sample.

#### Wear

All component wear rates are normal.

#### Contamination

Moderate concentration of visible dirt/debris present in the oil.

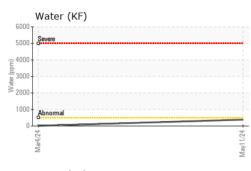
#### Fluid Condition

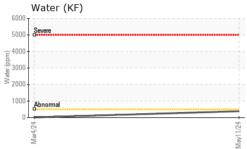
The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

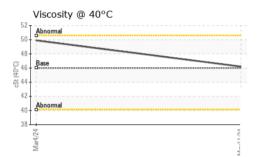
| Machine Age     hrs     Client Info     0     0   | SAMPLE INFORM    | IATION   | method       | limit/base | current     | history1        | history2 |
|---|------------------|----------|--------------|------------|-------------|-----------------|----------|
| Machine Age         hrs         Client Info         0         0            Oil Age         hrs         Client Info         N/A         N/A            Sample Status         Client Info         N/A         N/A         ABNORMAL         ABNORMAL | Sample Number    |          | Client Info  |            | USP0011889  | USP0007454      |          |
| Oli Age         hrs         Client Info         0            Oil Changed         Client Info         N/A         N/A            Sample Status         Imit Distant         ABNORMAL         ABNORMAL            WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM DS185m         >20         <1   | Sample Date      |          | Client Info  |            | 11 May 2024 | 04 Mar 2024     |          |
| Oli Changed         Image         N/A         N/A         N/A            Sample Status         Image         Image         ABNORMAL         ABNORMAL         ABNORMAL            WEAR METALS         method         Imil/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         <1   | Machine Age      | hrs      | Client Info  |            | 0           | 0               |          |
| Sample Status         Image of the status         ABNORMAL         ABNORMAL         ABNORMAL         ABNORMAL            WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         <1  | Oil Age          | hrs      | Client Info  |            | 0           | 0               |          |
| WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         <1   | Oil Changed      |          | Client Info  |            | N/A         | N/A             |          |
| Iron         ppm         ASTM D5185m         >20         <1   | Sample Status    |          |              |            | ABNORMAL    | ABNORMAL        |          |
| Chromium         ppm         ASTM D5185m         >20         <1   | WEAR METALS      |          | method       | limit/base | current     | history1        | history2 |
| Nickel         ppm         ASTM D5185m         >20         <1         0            Titanium         ppm         ASTM D5185m         <1  | Iron             | ppm      | ASTM D5185m  | >20        | <1          | 0               |          |
| Titanium         ppm         ASTM D5185m         <1         0            Silver         ppm         ASTM D5185m         >20         2         0            Aluminum         ppm         ASTM D5185m         >20         2         0            Lead         ppm         ASTM D5185m         >20         7         0            Copper         ppm         ASTM D5185m         >20         <1  | Chromium         | ppm      | ASTM D5185m  | >20        | <1          | 0               |          |
| Silver         ppm         ASTM D5185m         <1         0            Aluminum         ppm         ASTM D5185m         >20         2         0            Lead         ppm         ASTM D5185m         >20         7         0            Copper         ppm         ASTM D5185m         >20         7         0            Vanadium         ppm         ASTM D5185m         >20         -1         0            Vanadium         ppm         ASTM D5185m         >20         -1         0            ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0         0            Molybdenum         ppm         ASTM D5185m         5         1         2            Magnesium         ppm         ASTM D5185m         25         1         2            Magnesium         ppm         ASTM D5185m         250         373         325            Phosphorus         ppm         ASTM D5185m         215         <1  | Nickel           | ppm      | ASTM D5185m  | >20        | <1          | 0               |          |
| Aluminum         ppm         ASTM D5185m         >20         2         0            Lead         ppm         ASTM D5185m         >20         7         0            Copper         ppm         ASTM D5185m         >20         7         0            Yanadium         ppm         ASTM D5185m         >20         <1   | Titanium         | ppm      | ASTM D5185m  |            | <1          | 0               |          |
| Lead         ppm         ASTM D5185m         >20         <1         0            Copper         ppm         ASTM D5185m         >20         7         0            Tin         ppm         ASTM D5185m         >20         <1   | Silver           |          | ASTM D5185m  |            | <1          | 0               |          |
| Lead         ppm         ASTM D5185m         >20         <1         0            Copper         ppm         ASTM D5185m         >20         7         0            Tin         ppm         ASTM D5185m         >20         <1   | Aluminum         | ppm      | ASTM D5185m  | >20        | 2           | 0               |          |
| Copper         ppm         ASTM D5185m         >20         7         0            Tin         ppm         ASTM D5185m         >20         <1  | Lead             |          |              |            | <1          | 0               |          |
| Tin       ppm       ASTM D5185m       >20       <1       0          Vanadium       ppm       ASTM D5185m       <1       0          ADDITIVES       method       limit/base       current       history1       history2         Boron       ppm       ASTM D5185m       5       0       0          ADDITIVES       method       limit/base       current       history1       history2         Boron       ppm       ASTM D5185m       5       0       0          Magnese       ppm       ASTM D5185m       5       <1       0          Manganese       ppm       ASTM D5185m       200       39       42          Calcium       ppm       ASTM D5185m       200       39       42          Sulfur       ppm       ASTM D5185m       200       973       723          Sulfur       ppm       ASTM D5185m       25       <1       0          Sulfur       ppm       ASTM D5185m       >15       <1       0          Sulfur       ppm       ASTM D5185m       >20       2  | Copper           |          | ASTM D5185m  | >20        |             | 0               |          |
| Vanadium         ppm         ASTM D5185m         <1         0            Cadmium         ppm         ASTM D5185m         <1   |                  |          |              |            | <1          |                 |          |
| Cadmium         ppm         ASTM D5185m         <1         0            ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0         0            Barium         ppm         ASTM D5185m         5         0         1            Marganese         ppm         ASTM D5185m         5         <1         0            Calcium         ppm         ASTM D5185m         25         1         2            Calcium         ppm         ASTM D5185m         200         39         42            Calcium         ppm         ASTM D5185m         200         39         42            Sulfur         ppm         ASTM D5185m         200         39         42            Sulfur         ppm         ASTM D5185m         250         973         723            Sulfur         ppm         ASTM D5185m         >15         <1         0            Sodium         ppm         ASTM D5185m         >20         2         0<   | Vanadium         |          | ASTM D5185m  |            |             | 0               |          |
| Boron         ppm         ASTM D5185m         5         0         0            Barium         ppm         ASTM D5185m         5         0         1            Molybdenum         ppm         ASTM D5185m         5         <1  | Cadmium          |          | ASTM D5185m  |            | <1          | 0               |          |
| Barium         ppm         ASTM D5185m         5         0         1            Molybdenum         ppm         ASTM D5185m         5         <1         0            Maganese         ppm         ASTM D5185m         25         1         2            Magnesium         ppm         ASTM D5185m         25         1         2            Calcium         ppm         ASTM D5185m         200 <b>39</b> 42            Calcium         ppm         ASTM D5185m         200 <b>377</b> 335            Zinc         ppm         ASTM D5185m         300 <b>3777</b> 335            Sulfur         ppm         ASTM D5185m         370 <b>425</b> 402            Sulfur         ppm         ASTM D5185m         2500 <b>973</b> 723            Sulfur         ppm         ASTM D5185m         >15         <1         0            Sodium         ppm         ASTM D5185m         >20         2         0            Sulfur         ppm         ASTM D5185m <td< th=""><th>ADDITIVES</th><th></th><th>method</th><th>limit/base</th><th>current</th><th>history1</th><th>history2</th></td<>   | ADDITIVES        |          | method       | limit/base | current     | history1        | history2 |
| Barium         ppm         ASTM D5185m         5         0         1            Molybdenum         ppm         ASTM D5185m         5         <1   | Boron            | ppm      | ASTM D5185m  | 5          | 0           | 0               |          |
| Molybdenum         ppm         ASTM D5185m         5         <1         0            Manganese         ppm         ASTM D5185m         25         1         2            Magnesium         ppm         ASTM D5185m         200 <b>39</b> 42            Calcium         ppm         ASTM D5185m         200 <b>39</b> 42            Calcium         ppm         ASTM D5185m         300 <b>377</b> 335            Zinc         ppm         ASTM D5185m         370 <b>425</b> 402            Sulfur         ppm         ASTM D5185m         2500 <b>973</b> 723            Solium         ppm         ASTM D5185m         2500 <b>973</b> 723            Sodium         ppm         ASTM D5185m         >15<   | Barium           |          | ASTM D5185m  | 5          | 0           | 1               |          |
| Manganese         ppm         ASTM D5185m         0         0            Magnesium         ppm         ASTM D5185m         25         1         2            Calcium         ppm         ASTM D5185m         200 <b>39</b> 422            Calcium         ppm         ASTM D5185m         300 <b>377</b> 335            Phosphorus         ppm         ASTM D5185m         370 <b>425</b> 402            Sulfur         ppm         ASTM D5185m         370 <b>425</b> 402            Sulfur         ppm         ASTM D5185m         370 <b>425</b> 402            Sulfur         ppm         ASTM D5185m         2500 <b>973</b> 723            Sodium         ppm         ASTM D5185m         >15         <1  | Molybdenum       | ppm      | ASTM D5185m  | 5          | <1          | 0               |          |
| Magnesium         ppm         ASTM D5185m         25         1         2            Calcium         ppm         ASTM D5185m         200 <b>39</b> 42            Phosphorus         ppm         ASTM D5185m         300 <b>377</b> 335            Zinc         ppm         ASTM D5185m         370 <b>425</b> 402            Sulfur         ppm         ASTM D5185m         2500 <b>973</b> 723            Sulfur         ppm         ASTM D5185m         2500 <b>973</b> 723            Solicon         ppm         ASTM D5185m         2500 <b>973</b> 723            Sodium         ppm         ASTM D5185m         >15         <1  | -                | ppm      | ASTM D5185m  |            | 0           | 0               |          |
| Phosphorus         ppm         ASTM D5185m         370         425         402            Zinc         ppm         ASTM D5185m         370         425         402            Sulfur         ppm         ASTM D5185m         2500         973         723            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         <1  | -                |          |              | 25         | 1           | 2               |          |
| Zinc         ppm         ASTM D5185m         370         425         402            Sulfur         ppm         ASTM D5185m         2500         973         723            CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >15         <1  | Calcium          | ppm      | ASTM D5185m  | 200        | 39          | 42              |          |
| SulfurppmASTM D5185m2500973723CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>15<1   | Phosphorus       | ppm      | ASTM D5185m  | 300        | 377         | 335             |          |
| CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>15<1   | Zinc             | ppm      | ASTM D5185m  | 370        | 425         | 402             |          |
| Silicon       ppm       ASTM D5185m       >15       <1       0          Sodium       ppm       ASTM D5185m       >15       9       15          Potassium       ppm       ASTM D5185m       >20       2       0          Water       %       ASTM D6304       >0.05       0.038       0.001          ppm Water       ppm       ASTM D6304       >500       385       12          FLUID CLEANLINESS       method       limit/base       current       history1       history2         Particles >4µm       ASTM D7647       >5000        ▲ 84793          Particles >6µm       ASTM D7647       >1300        ▲ 84793          Particles >1µm       ASTM D7647       >160        ▲ 33493          Particles >1µm       ASTM D7647       >10        ▲ 349          Particles >38µm       ASTM D7647       >3        ④       ④          Particles >71µm       ASTM D7647       >3        ④       ④        ●         Oil Cleanliness       ISO 4406 (c)1  | Sulfur           | ppm      | ASTM D5185m  | 2500       | 973         | 723             |          |
| Sodium         ppm         ASTM D5185m         9         15            Potassium         ppm         ASTM D5185m         >20         2         0            Water         %         ASTM D6304         >0.05         0.038         0.001            ppm Water         ppm         ASTM D6304         >500         385         12            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000          ▲ 84793            Particles >6µm         ASTM D7647         >1300          ▲ 33493            Particles >14µm         ASTM D7647         >160          ▲ 3499            Particles >14µm         ASTM D7647         >10          2            Particles >38µm         ASTM D7647         >3          0            Particles >71µm         ASTM D7647         >3          0            Oil Cleanliness         ISO 4406 (c)         >191/7/14          24/22/18   <  | CONTAMINANTS     |          | method       | limit/base | current     | history1        | history2 |
| Potassium         ppm         ASTM D5185m         >20         2         0            Water         %         ASTM D6304         >0.05         0.038         0.001            ppm         Water         ppm         ASTM D6304         >500         385         12            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000          ▲ 84793            Particles >6µm         ASTM D7647         >1300          ▲ 3493            Particles >14µm         ASTM D7647         >160          ▲ 22444            Particles >14µm         ASTM D7647         >10          ▲ 3493            Particles >38µm         ASTM D7647         >10          ②         ②            Particles >71µm         ASTM D7647         >3          ③         ③            Oil Cleanliness         ISO 4406 (c)         >191/7/14          ▲ 24/22/18            FLUID DEGRADATION         method         limit/base </td <td>Silicon</td> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;15</td> <th>&lt;1</th> <td>0</td> <td></td>  | Silicon          | ppm      | ASTM D5185m  | >15        | <1          | 0               |          |
| Water       %       ASTM D6304       >0.05       0.038       0.001          ppm Water       ppm       ASTM D6304       >500       385       12          FLUID CLEANLINESS       method       limit/base       current       history1       history2         Particles >4µm       ASTM D7647       >5000        ▲       84793          Particles >6µm       ASTM D7647       >1300        ▲       33493          Particles >14µm       ASTM D7647       >160        ▲       3493          Particles >21µm       ASTM D7647       >10        2          Particles >38µm       ASTM D7647       >3        0          Particles >71µm       ASTM D7647       >3        0          Oil Cleanliness       ISO 4406 (c)       >19/17/14        24/22/18          FLUID DEGRADATION       method       limit/base       current       history1       history2   | Sodium           | ppm      | ASTM D5185m  |            | 9           | 15              |          |
| ppm Water         ppm         ASTM D6304         >500         385         12            FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000          ▲ 84793            Particles >6µm         ASTM D7647         >1300          ▲ 33493            Particles >14µm         ASTM D7647         >160          ▲ 2244            Particles >14µm         ASTM D7647         >40          ▲ 3499            Particles >21µm         ASTM D7647         >10          ▲ 349            Particles >38µm         ASTM D7647         >3          0            Particles >71µm         ASTM D7647         >3          0            Oil Cleanliness         ISO 4406 (c)         >19/17/14          24/22/18            FLUID DEGRADATION         method         limit/base         current         history1         history2   | Potassium        | ppm      | ASTM D5185m  | >20        | 2           | 0               |          |
| FLUID CLEANLINESS       method       limit/base       current       history1       history2         Particles >4µm       ASTM D7647       >5000        ▲ 84793          Particles >6µm       ASTM D7647       >1300        ▲ 33493          Particles >6µm       ASTM D7647       >160        ▲ 2244          Particles >14µm       ASTM D7647       >40        ▲ 3499          Particles >21µm       ASTM D7647       >40        ▲ 349          Particles >38µm       ASTM D7647       >10        2          Particles >71µm       ASTM D7647       >3        0          Oil Cleanliness       ISO 4406 (c)       >19/17/14        24/22/18          FLUID DEGRADATION       method       limit/base       current       history1       history2   | Water            | %        | ASTM D6304   | >0.05      | 0.038       | 0.001           |          |
| Particles >4µm       ASTM D7647       >5000        & 84793          Particles >6µm       ASTM D7647       >1300        & 33493          Particles >14µm       ASTM D7647       >160        & 2244          Particles >21µm       ASTM D7647       >40        & 349          Particles >21µm       ASTM D7647       >10        2          Particles >38µm       ASTM D7647       >10        2          Particles >71µm       ASTM D7647       >3        0          Oil Cleanliness       ISO 4406 (c)       >19/17/14        24/22/18          FLUID DEGRADATION       method       limit/base       current       history1       history2   | ppm Water        | ppm      | ASTM D6304   | >500       | 385         | 12              |          |
| Particles >6µm       ASTM D7647       >1300        33493          Particles >14µm       ASTM D7647       >160        2244          Particles >21µm       ASTM D7647       >40        3493          Particles >21µm       ASTM D7647       >40        349          Particles >38µm       ASTM D7647       >10        2          Particles >71µm       ASTM D7647       >3        0          Oil Cleanliness       ISO 4406 (c)       >19/17/14        24/22/18          FLUID DEGRADATION       method       limit/base       current       history1       history2  | FLUID CLEANLIN   | ESS      | method       | limit/base | current     | history1        | history2 |
| Particles >14μm       ASTM D7647       >160        2244          Particles >21μm       ASTM D7647       >40        349          Particles >38μm       ASTM D7647       >10        2          Particles >38μm       ASTM D7647       >3        0          Particles >71μm       ASTM D7647       >3        0          Oil Cleanliness       ISO 4406 (c)       >19/17/14        24/22/18          FLUID DEGRADATION       method       limit/base       current       history1       history2  | Particles >4µm   |          | ASTM D7647   | >5000      |             | ▲ 84793         |          |
| Particles >21μm         ASTM D7647         >40          349            Particles >38μm         ASTM D7647         >10          2            Particles >38μm         ASTM D7647         >3          0            Particles >71μm         ASTM D7647         >3          0            Oil Cleanliness         ISO 4406 (c)         >19/17/14          ▲ 24/22/18            FLUID DEGRADATION         method         limit/base         current         history1         history2   | Particles >6µm   |          | ASTM D7647   | >1300      |             | ▲ 33493         |          |
| Particles >38μm         ASTM D7647         >10          2            Particles >71μm         ASTM D7647         >3          0            Oil Cleanliness         ISO 4406 (c)         >19/17/14          24/22/18            FLUID DEGRADATION         method         limit/base         current         history1         history2  | Particles >14µm  |          | ASTM D7647   | >160       |             | <b>2</b> 244    |          |
| Particles >71μm         ASTM D7647         >3          0            Oil Cleanliness         ISO 4406 (c)         >19/17/14          ▲ 24/22/18            FLUID DEGRADATION         method         limit/base         current         history1         history2   | Particles >21µm  |          | ASTM D7647   | >40        |             | ▲ 349           |          |
| Oil Cleanliness       ISO 4406 (c) >19/17/14        ▲ 24/22/18          FLUID DEGRADATION       method       limit/base       current       history1       history2   | Particles >38µm  |          | ASTM D7647   | >10        |             | 2               |          |
| FLUID DEGRADATION method limit/base current history1 history2   | Particles >71µm  |          | ASTM D7647   | >3         |             | 0               |          |
|   | Oil Cleanliness  |          | ISO 4406 (c) | >19/17/14  |             | <b>4</b> /22/18 |          |
| Acid Number (AN) mg KOH/g ASTM D8045 0.57 0.43 0.43   | FLUID DEGRADA    | TION     | method       | limit/base | current     | history1        | history2 |
|   | Acid Number (AN) | mg KOH/g | ASTM D8045   | 0.57       | 0.43        | 0.43            |          |



## **OIL ANALYSIS REPORT**







|                            |        | method             | limit/base  | current  | history1                    | history2    |
|----------------------------|--------|--------------------|---|--|-----------------------------|-------------|
| Vhite Metal                | scalar | *Visual            | NONE  | NONE   | NONE                        |             |
| ellow Metal                | scalar | *Visual            | NONE  | NONE   | NONE                        |             |
| recipitate                 | scalar | *Visual            | NONE  | NONE   | NONE                        |             |
| ilt                        | scalar | *Visual            | NONE  | NONE   | NONE                        |             |
| ebris                      | scalar | *Visual            | NONE  | A MODER  | NONE                        |             |
| and/Dirt                   | scalar | *Visual            | NONE  | NONE   | NONE                        |             |
| ppearance                  | scalar | *Visual            | NORML   | NORML  | NORML                       |             |
| Odor                       | scalar | *Visual            | NORML   | NORML  | NORML                       |             |
| mulsified Water            | scalar | *Visual            | >0.05   | NEG  | NEG                         |             |
| ree Water                  | scalar | *Visual            |   | NEG  | NEG                         |             |
| FLUID PROPERT              | IES    | method             | limit/base  | current  | history1                    | history2    |
| ′isc @ 40°C                | cSt    | ASTM D445          | 46  | 46.2   | 49.9                        |             |
| SAMPLE IMAGES              | 6      | method             | limit/base  | current  | history1                    | history2    |
| olor                       |        |                    |   | •  |                             | no image    |
| Bottom                     |        |                    |   |  |                             | no image    |
| GRAPHS                     |        |                    |   |  |                             |             |
| iron<br>chromium<br>nickel |        |                    |   |  |                             |             |
| chromium                   |        |                    | lay11/24  |  |                             |             |
| nickel                     | 5      |                    | May 11/24   |  |                             |             |
| 42 Har                     | 5      |                    |   |  |                             |             |
| Non-ferrous Metals         | 5      |                    | May11/24  | Acid Numbe   | ۶r                          |             |
| Non-ferrous Metals         | 5      |                    | May11/24  |  | 51.                         |             |
| Non-ferrous Metals         | 5      |                    | May11/24  |  | 51.                         |             |
| Non-ferrous Metals         | 5      |                    | May11/24  |  | 9 <b>r</b>                  |             |
| Non-ferrous Metals         | 5      |                    | May11/24  |  | 51.                         |             |
| Non-ferrous Metals         | 5      |                    | 42111/24<br>9.0.0<br>0.0<br>0.0   | 0 - Abnormal<br>0 - Base<br>0 - Abnormal   | 51.                         |             |
| Non-ferrous Metals         | 5      |                    | 42111/24<br>9.0.0<br>0.0<br>0.0   | 0 - Abnormal<br>0 - Base<br>0 - Abnormal   | 51.                         | M1124       |
| Non-ferrous Metals         | Madiso | ved : 15           | 47111/kew<br>47, NC 27513<br>5 May 2024   | 0 T Abnormal   | SMITHFIELD FOOI<br>15855 HV | VY. 87 WEST |
| Non-ferrous Metals         | Madiso | ved : 15<br>d : 18 | b7/11/keW<br>(b/H0X) b0/) =quury por<br>b7/11/keW<br>(b/H0X) b0/) =quury por<br>b7/11/keW<br>(b/H0X) b0/) =quury por<br>b7/11/keW | 0 T Abnormal<br>0 H Base<br>0 H Abnormal<br>0 H Charles<br>0 H Ch | SMITHFIELD FOOI<br>15855 HV | D - TARHEEL |

To discuss this sample report, o \* - 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: SMITAR [WUSCAR] 06180204 (Generated: 05/18/2024 15:00:03) Rev: 1

Certificate L2367

Laboratory

Sample No. Lab Number **Unique Number Test Package** 

Contact/Location: SERVICE MANAGER - SMITAR

F: