

EQUIPMENT REPAIR REPORT

Date: January, 2011

Customer:

Page 1 of 14

Our Reference: Sales order #5000005320

Subject: Gould's AC - SRL-C Slurry Pump 14x12-29 Discharge Bottom Left When viewed from drive end

Attention:

Thank you for choosing ProSpec Technologies Inc. as your source to recondition your pump. We appreciate the opportunity to provide you with this assessment. Following is a report of our findings and a quotation for the work required.

INITIAL OBSERVATIONS

Upon receipt a thorough inspection of the unit was conducted. The exterior of the pump was found to be in generally good condition with light corrosion areas where the finish coat had been removed or damaged. Bearing frame feet, flanges and casing mating half surfaces were in good condition.

The suction liner pictured below is new from September 2009 and has stood up well in the slurry. For the purposes of comparison we have presented the photos of the old suction liner prior to the 2009 replacement.

The gland side liner pictured below was replaced in September of 2009 and it also has stood up well showing little signs of wear.

The impeller pictured below was worn in September of 2009. It was usable then but now requires extensive repair.

The pump shaft sleeve and shaft have extensive wear in the area of the packing. The shaft requires replacement along with the sleeve. The sleeve will be hardened to resist the abrasion and the stuffing box will be sealed with Tom-Pac as part of a sound repair.

A sample of the bearing oil was analyzed by The Fluid Life Corporation. A spectro chemical,

physical test and ferrography analysis was conducted. We have attached the results of the analysis from this year and from the 2007 season (which was the last time we changed the bearings).

This year with the water present and the elevated levels of cutting wear we have included for a bearing change.

SCOPE OF WORK

- Receive unit, perform initial visual inspection and record findings.
- Disassemble the pump, perform rough cleaning, detailed inspection and record findings.
- Sand blast the interior and exterior surfaces using Ebony Grit copper slag and polish all machine fit surfaces.
- Clean and prepare the exterior surfaces for finish coat. Mask off accordingly.
- Apply AK 90 Gloss blue paint to internal and exterior non-machined surfaces.
- Chase all threads, utilize all new fasteners as required and assemble with never seize thread lube.
- Reassemble pump with a new shaft, new sleeve, repaired impeller, new isolators, bearings, bearing lock nuts, bearing lock nut washers, o-rings and with all new hardware as required.
- Pack stuffing boxes with Tom-Pac TP4800 high performance stuffing box packing.
- Perform final inspection and apply appropriate tags and identification plates.
- Touch up finish, package and prepare for shipment.

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The price above is an estimate for the work we know is required. It is unlikely that the pump requires anything other than that described above. However if we do find the requirement for other parts we will stop and advise you prior to proceeding.

Delivery – with your permission to proceed, work can be complete within approximately 8 weeks of your approval.

Thank you very much for the opportunity to present our report. Please contact us with any questions or additional information requirements.

Best regards,

Mark Lemieux – mlemieux@prospectech.com

ProSpec Technologies Inc

3235 Wharton Way
Mississauga ON L4X 2B6, Canada
Phone 905-629-3100 ext 27
Fax 905-629-3500
www.prospectech.com

This is the photo of the suction liner. This liner was replaced in September of 2009. It has held up well.



The gland side liner was also replaced in September 2009 and is in good condition. However the impeller which has portions eroded away will required repair.

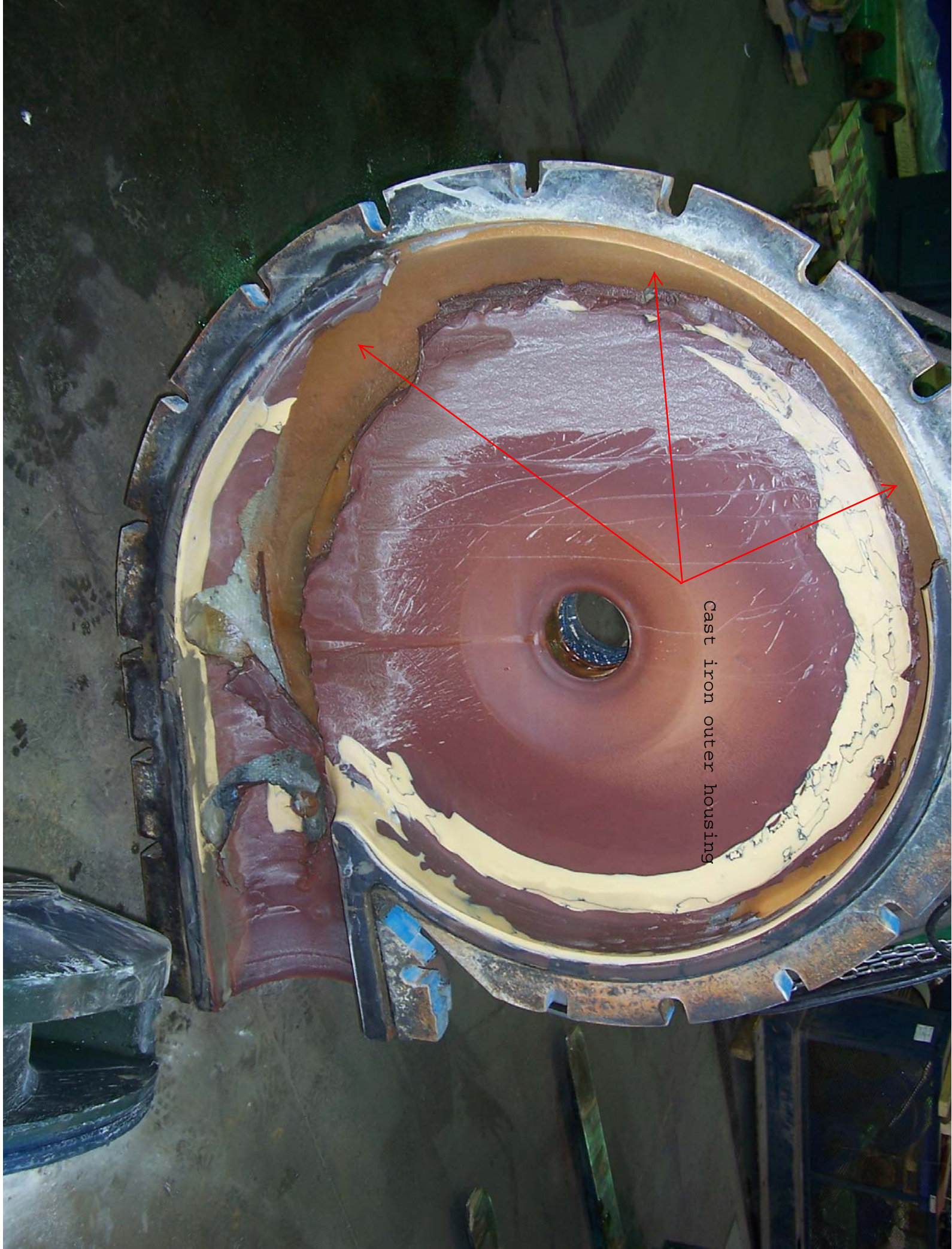


The inboard isolator is damaged and requires replacement in order to affect a proper repair and to prevent the oil from being contaminated in operation.

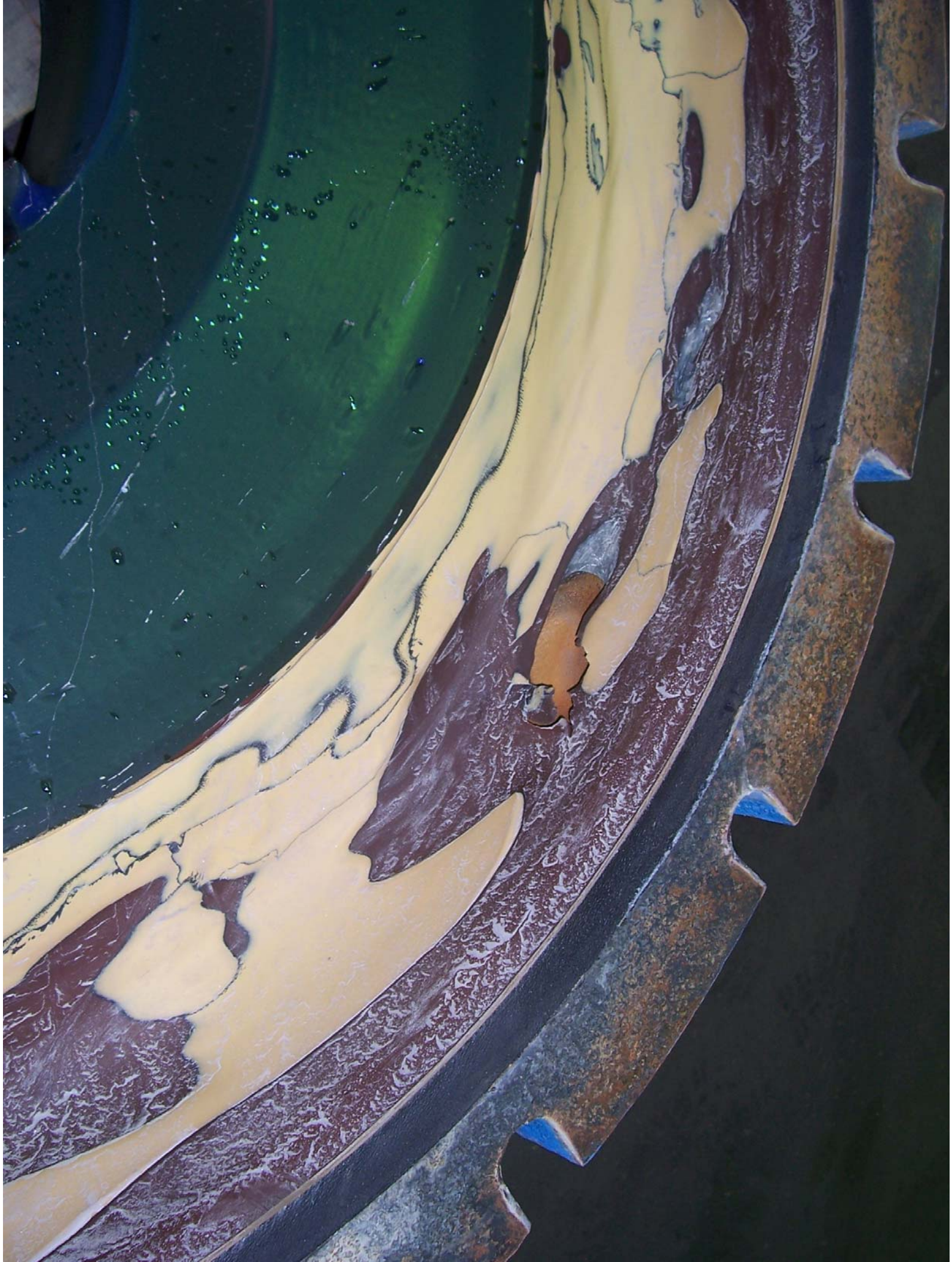


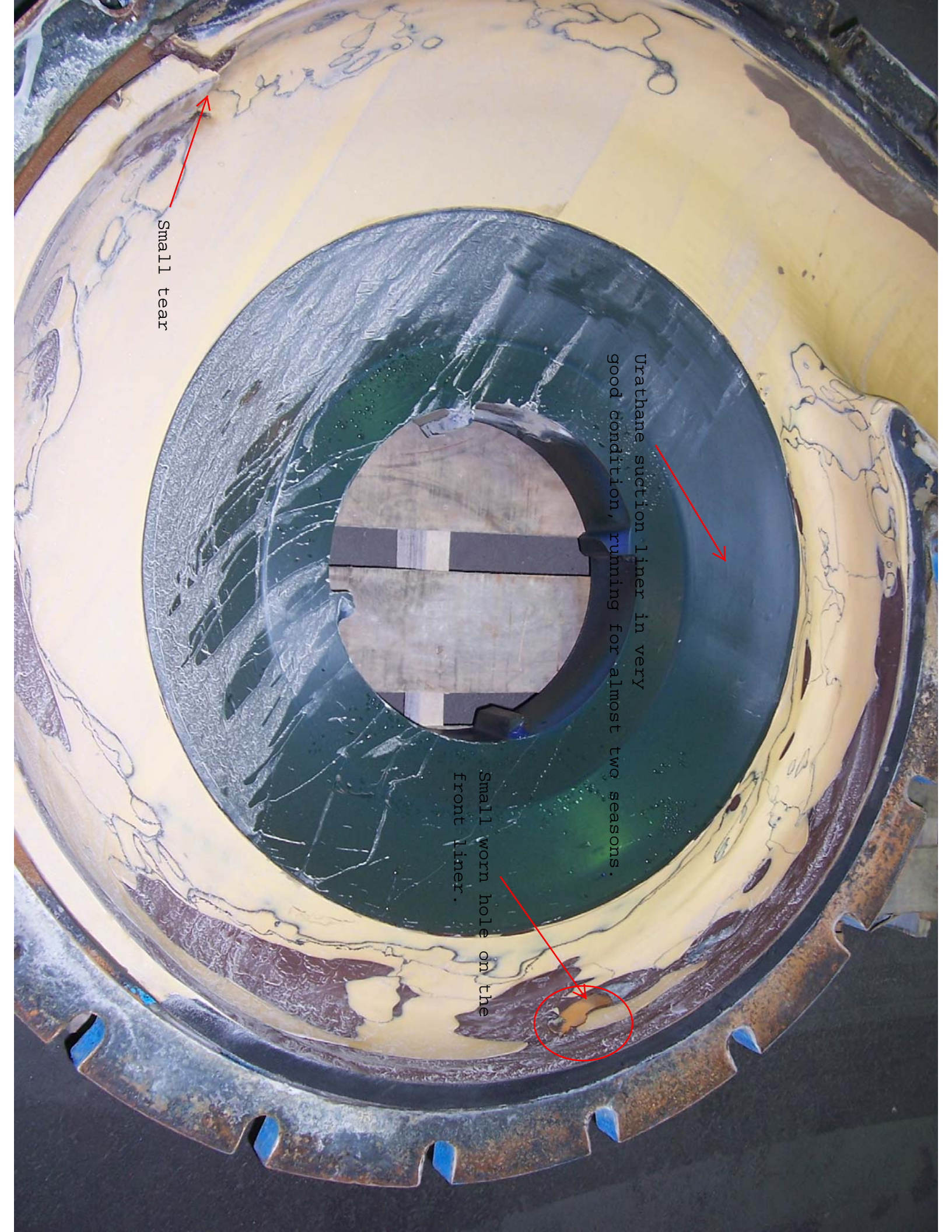
The shaft broke in operation in 2007. It has eroded to the point that shaft replacement is required this year. The depth of the wear is in excess of 1/4" (1/2" total on a 4" diameter shaft).





Cast iron outer housing





Small tear

Urethane suction liner in very good condition, running for almost two seasons.

Small worn hole on the front liner.

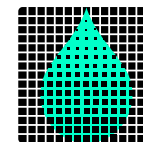
PROSPEC TECHNOLOGIES INC.
 3235 WHARTON WAY
 MISSISSAUGA, ONTARIO
 L4X 2B6
 Attention : MARK LEMIEUX
 Phone : (905) 629-3100 #27
 Fax : (905) 629-3500

Unit Data

Unit # : 5000005320 12X14 SLURRY PUMP
 Component : PUMP
 Location :
 Manufacturer :
 Serial # :
 Model :

Lubricant

Mfr. : ?
 Brand : ?
 Grade : ?
 P.O. # : 7000004387
 Sample : 12/21-143



Fluid Life
Oil Analysis

95 Copernicus Boulevard Phone: (519) 720-9700
 Brantford, Ontario N3P 1N4 Fax: (519) 720-9750

CODE: Y - Yes N - Negative P - Positive **R** - Reportable **U** - Unacceptable **S** - Severe I - Insufficient Sample > - More Than < - Less Than

Spectro-chemical (ppm)

Sample Number	Sample Date	Silicon	Sodium	Potassium	Iron	Chrome	Lead	Copper	Tin	Aluminum	Nickel	Silver	Titanium	Boron	Phosphorus	Zinc	Calcium	Barium	Magnesium	Molybdenum	Vanadium	Antimony	Lithium	Beryllium
12/21-143	2010/12/21	6	2	0	79	0	1	10	0	0	0	0	0	1	289	388	58	0	4	0	0	0	1	0

Physical Tests

Sample Number	Oil Mfr.	Oil Brand	Oil Grade	Comp. Service	Oil Service	Units	Oil Chg	Water	Glycol	Visc 40°C cSt	Visc 100°C cSt	Fuel %	Soot %
12/21-143	?	?	?	?			?	PS		62.5	7.77		

Additional Tests

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Results

- 1) Note Water.
- 4) Some tests have been performed at another Fluid Life lab. If you have any questions, please call the lab.

Recommendations

- 1) Check or assess system for source of contamination.
- 2) Change or micro-filter oil! Oil flush system! Change all filters!
- 3) Customer emailed, called or faxed.

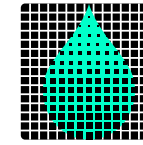
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Unit Data

Unit # : 5000005320 12X14 SLURRY PUMP
 Component : PUMP
 Location :
 Manufacturer :
 Serial # :
 Model :

Lubricant

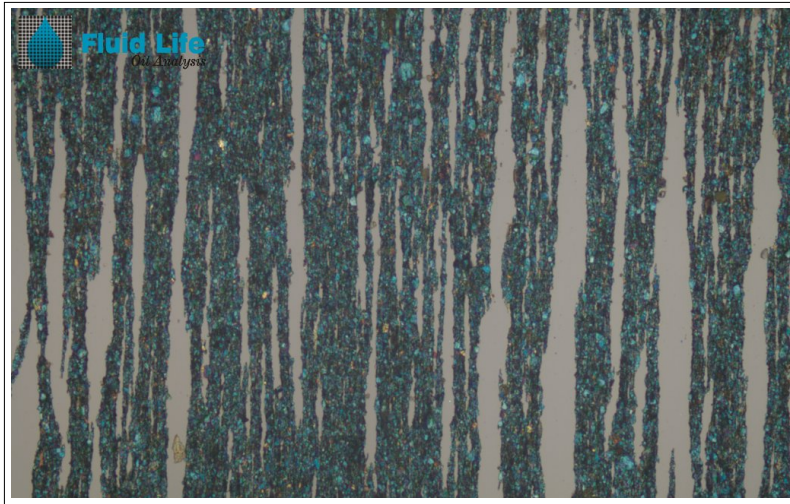
Mfr. : ?
 Brand : ?
 Grade : ?
 P.O. # : 7000004387
 Sample : 12/21-143



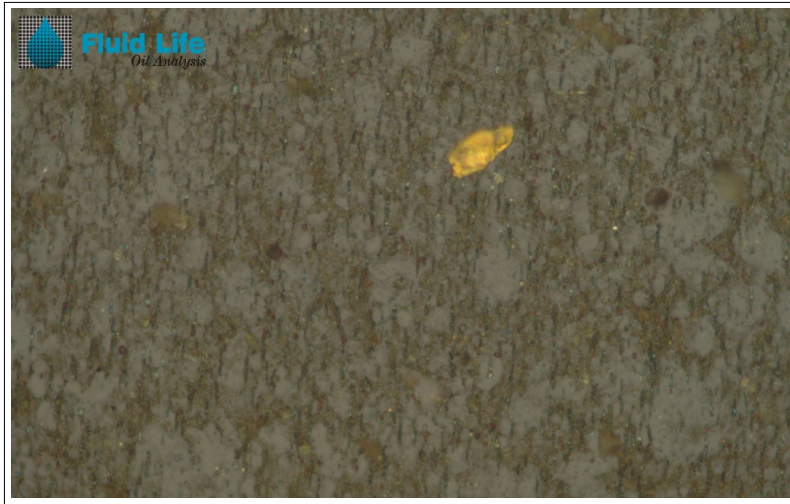
Fluid Life
Ferrography

95 Copernicus Boulevard Phone: (519) 720-9700
 Brantford, Ontario N3P 1N4 Fax: (519) 720-9750

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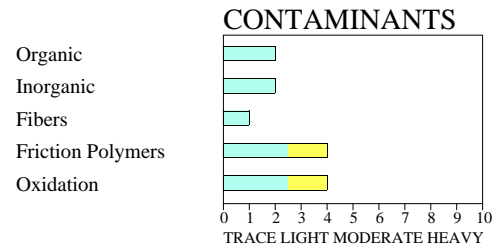
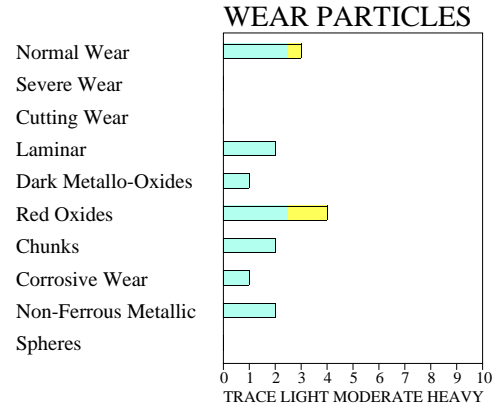


0 50 100 150 200 250
 Microns



0 20 40 60 80 100
 Microns

Particle Description



Comments

Ferrography results are reportable.

Most metal particles are low alloy steel showing rubbing/sliding and laminar wear (up to 18 microns). Trace medium alloy steel showing laminar wear.

Reportable levels of red oxides and friction polymers. (indicates water contamination.)

Slightly elevated levels of copper/copper alloy showing laminar wear up to 29 microns.

Slightly elevated levels of dirt/dust.

Check for sources of outside contamination.

Continue to monitor. Some tests have been performed at another Fluid Life lab. If you have any questions, please call the lab.

Magnetic Iron

Sample Date	Small ppm	Large ppm	Total ppm
2010/12/21			

Magnetic Iron Trend

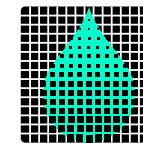
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Unit Data

Unit # : AC 14X12-29
 Component : UNKNOWN
 Location :
 Manufacturer :
 Serial # :
 Model :

Lubricant

Mfr. : ?
 Brand : ?
 Grade : ?
 P.O. # : 7000000966
 Sample : 12/22-1



Fluid Life
Oil Analysis

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Spectro-chemical (ppm)

Sample Number	Sample Date	Silicon	Sodium	Potassium	Iron	Chrome	Lead	Copper	Tin	Aluminum	Nickel	Silver	Titanium	Boron	Phosphorus	Zinc	Calcium	Barium	Magnesium	Molybdenum	Vanadium	Antimony	Lithium	Beryllium
12/22-001	2008/12/22	3	0	2	54	0	1	2	3	0	0	0	0	3	316	403	74	0	1	1	0	0	0	0

Physical Tests

Sample Number	Oil Mfr.	Oil Brand	Oil Grade	Comp. Service	Oil Service	Units	Oil Chg	Water %	Glycol	Visc 40°C cSt	Visc 100°C cSt	Fuel %	Soot %
12/22-001	?	?	?	?		?	?	0.001		63.9	8.95		

Additional Tests

TAN-E (mgKOH/g)	ISO Code	ISO 4u Count	ISO 6u Count	ISO 14u Count
0.49	24/22/17	94669	20278	1056

Results

1) Note flagged Ferrography results.

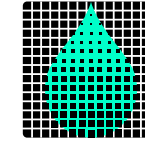
Recommendations

1) Resample next interval to monitor.

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 Manufacturer :
 Serial # :
 Model :

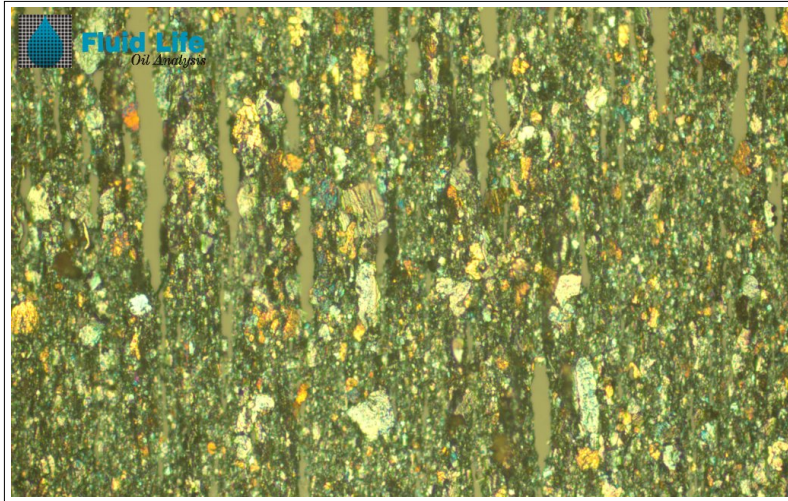
Lubricant
 Mfr. : ?
 Brand : ?
 Grade : ?
 P.O. # : 7000000966
 Sample : 12/22-1



Fluid Life
Ferrography

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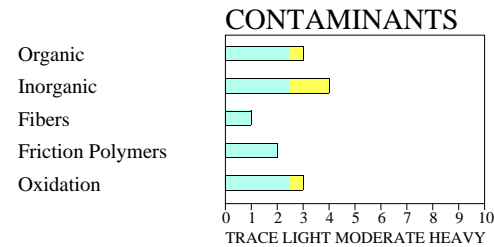
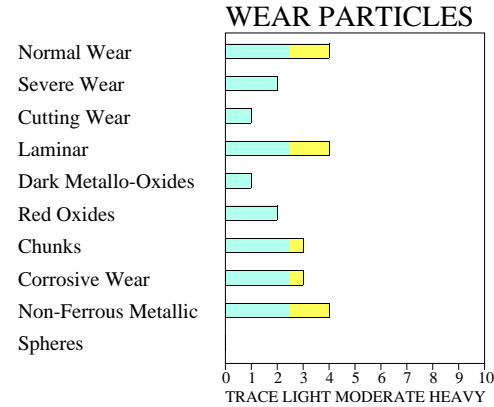


0 100 200 300 400
 Microns



0 40 80 120 160
 Microns

Particle Description



Comments

Ferrography results are unacceptable.

Most metal particles are low and medium alloy steel showing rubbing/sliding wear and laminar wear up to 75 microns. Traces of cutting wear.

Elevated copper/copper alloy up to 33 microns.

Traces of red oxides and elevated dirt/dust.

Check for sources of outside contamination and for sources of copper/copper alloy.

Magnetic Iron

Sample Date	Small ug/ml	Large ug/ml	Total ug/ml
2008/12/22			

Magnetic Iron Trend

Completed repair loaded for shipment.

