



Layne Christensen Company
721 W. Illinois Avenue
Aurora, IL 60506

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graniteconstruction.com

April 21, 2021

Mr. Robert Leible
City of Aurora
44 E. Downer Place
Aurora, IL 60507

Re: Well 26

Mr. Leible:

The Aurora Well 26 Byron Jackson submersible pump has been removed due to a dead short in the motor windings. The motor, bowl, pipe, cable, and pitless adapter have been inspected. Please find the Aurora Well 26 Pump Inspection Report (PIR) attached.

Based upon the recommendations of the PIR, estimated project cost is as follows:

1. Labor and equipment to remove pump,	\$ 26,283
2. Remove and return Pump Components to site, estimate	\$ 10,700
3. Byron Jackson 250 HP, 14", 2300V, Type M exchange motor, 12 weeks delivery	\$ 90,400
4. Rebuild bowl, estimate	\$ 10,000
5. Labor to Rehabilitate 8" Line Pipe (specialty service)	\$ 6,000
6. (6) 8" Line Pipe Couplings @ \$187 ea	\$ 1,122
7. Miscellaneous consumables (airline, banding, etc.) estimate	\$ 1,500
8. Remobilize, set and test pump, estimate	\$ 35,000
9. PSA Labor Discount, estimate	\$ (4,000)
10. PSA Specialty Service Discount, estimate	\$ (600)

Total Project Estimate \$176,405

If you have any questions or comments, please do not hesitate to contact me.

Layne Christensen Company

William Balluff, P.E.
Account Manager III

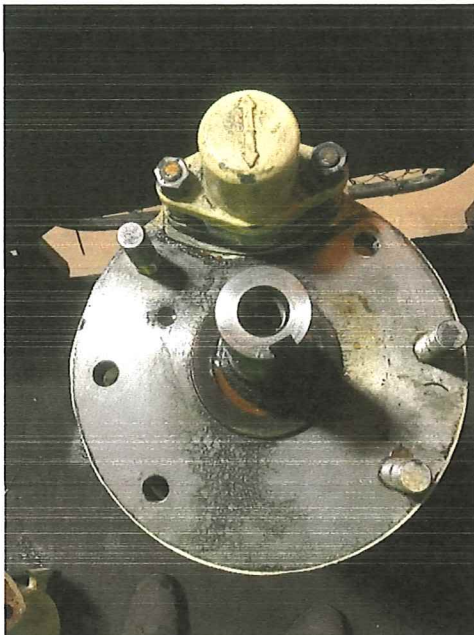


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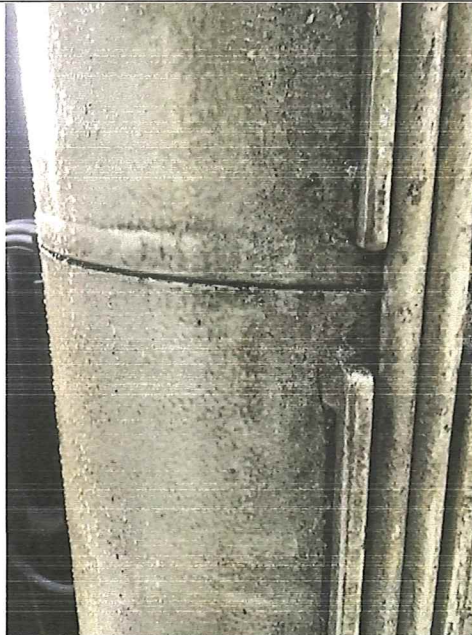
CITY OF AURORA
WELL NO. 26 PUMP
INSPECTION REPORT

JOB NAME	AURORA	WELL NO.	26	DATE	4/21/2021
JOB NO.		INSPECTED BY	J. Kopp, B. Balluff, J. Geltz		
		BOWL ASSEMBLY	Byron Jackson 10 stage 12EJH		
		COLUMN ASSEMBLY	750' of 8" T&C Line Pipe, Sched 60		
		MOTOR	Byron Jackson 250 HP, 14", 2300V, Type M		

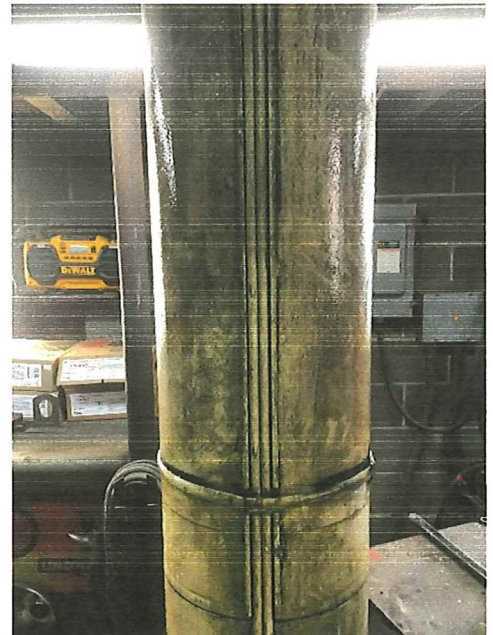
MOTOR



Shaft projection meets specification. Rotation in CW direction OK. Locked shaft in CCW rotation.



O-ring joint and lower can in good condition.



Stator can in good condition.

Motor Observations

The motor/cable assembly megged dead short at the well head prior to pump removal. The motor megs dead short on its own. Shaft projection meets specification. Rotation is stiff but acceptable in clock-wise direction. Rotation is locked in counter-clockwise rotation. Stator can, lower can, and o-ring joint all in good condition. Balance tube in good condition. Reference attached Byron Jackson Motor Inspection – Type M report.

Motor Recommendations

Replace motor with a factory exchange.

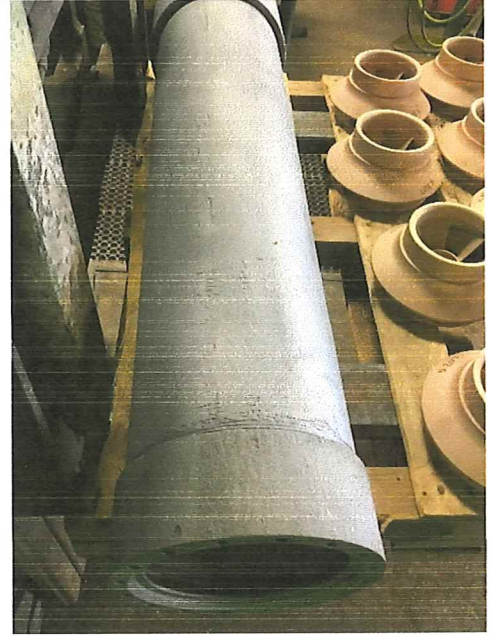
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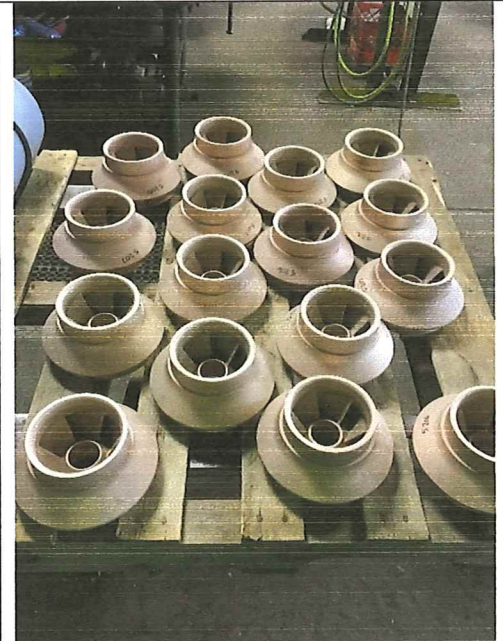
CITY OF AURORA
WELL NO. 26 PUMP
INSPECTION REPORT

BOWL ASSEMBLY



All castings have moderate exterior erosion.

Discharge includes a 3' pup.



Wear ring and bushing clearances meet acceptable tolerances.

All castings have moderate vein deterioration and random deep interior pits.

All impellers in good condition.

Bowl Assembly Observations

Observations per picture descriptions. Reference attached Bowl Assembly Inspection Report.



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CITY OF AURORA WELL NO. 26 PUMP INSPECTION REPORT

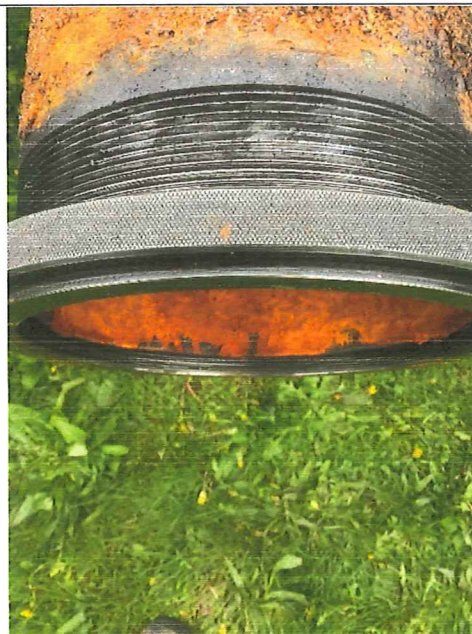
Bowl Assembly Recommendations

Polish impeller shaft. Apply steel epoxy coating to interior pits. Apply ceramic coating to accessible interior.

COLUMN PIPE



String of 8" Line Pipe racked on site.



All male pipe threads were tested with an API calibrated thread guage.



All couplings were tested with an API calibrated thread gauge.

Pipe Observations

This 8" T&C schedule 60 Line Pipe string was new in 2018. It has been installed and removed twice since that time. Overall, the pipe is in good condition with no pitting in the pipe bodies. The male threads and coupling threads were inspected using an API calibrated thread gauge. Several couplings and male threads did not pass the gauge specification. Reference attached Pipe Tally Sheet and Recommendations.

Pipe Recommendations

Cut & thread 3 male ends. Chase 7 male ends. Replace 6 couplings – plan a contingency for cut and thread the 6 exposed ends when these coupings are removed.

CABLE – The #2/2.4kV submersible cable and flat cable assembly passes HiPot testing. See attached Cable High Potential Test report.

WELL – The well's total depth was measured at 1377'. Original total depth is 1388'. The well is logged as Galesville formation from 1200' to 1359' and Eau Claire formation from 1359' to 1388'.

BYRON JACKSON MOTOR INSPECTION - TYPE M

Inspected By J. Kopp Date 4/21/2021

Job Name Aurora 26 Job # 1123429

HP 250 Size 14 Voltage 2300

Motor Serial # 14T-1102-5-1

Meg Dead Short

Shaft Projection Spec 7 13/16

Shaft Projection Measured 7 13/16

Shaft Run Out .010"

Rotation CW stiff but OK / CCW locked up

Condition of Stator Can Good

Condition of Lower Can Good

Condition of O-Ring Joint Good

Condition of Balance Tubes Good

Balance Tubes Clear? Yes

Comments Conditions at site at time of failure suggest single phase from power supply

Is Motor Field Service Eligible? No

Recommendations: Return to Flowserve for inspection and exchange

BOWL ASSEMBLY INSPECTION REPORT

Project		Aurora, IL		Well No.	26	Date	4-21-2021
Project No.		1123429		Inspected by		John Kopp	
Serial No.		Test Pump BJ023		Bowl Assembly		10MQH – 16 stage (Full)	
Stage No.	Wear Ring	Impeller Skirt	Clearance	Bearing ID	Impeller Shaft	Clearance	
1 (suction)	5.239"	5.205"	.034"	1.448/1.449"	1.437"	.011/.012"	
2	5.241	5.206	.035	1.448	1.437	.011	
3	5.246	5.206	.040	1.447	1.437	.010	
4	5.246	5.206	.040	1.450	1.437	.013	
5	5.247	5.206	.041	1.450	1.437	.013	
6	5.247	5.206	.041	1.450	1.437	.013	
7	5.248	5.207	.041	1.449	1.437	.012	
8	5.248	5.207	.041	1.449	1.437	.012	
9	5.248	5.207	.041	1.450	1.437	.013	
10	5.253	5.207	.046	1.449	1.437	.012	
11	5.255	5.207	.048	1.449	1.437	.012	
12	5.276	5.207	.069	1.449	1.437	.012	
13	5.304	5.272	.032	1.449	1.437	.012	
14	5.304	5.272	.032	1.448	1.437	.011	
15	5.303	5.272	.031	1.448	1.437	.011	
16	5.303	5.272	.031	1.446	1.437	.009	
			Top Case	1.447	1.437	.010	
			Port Body	1.450	1.437	.013	
Impeller Shaft	1-7/16" X 179-7/16", in good condition						
Fasteners	SST, ok for reuse, replace lock washers						
Strainer	SST, Ok for reuse						
Collets	SST, ok for reuse						

COMMENTS: All impellers are ok for reuse. All castings have moderate exterior erosion, recommend epoxy coating exterior. All castings have moderate vane deterioration on the interior and random deep pits. Recommend application of steel epoxy to deep pits and overcoat of ceramic coating to all interior volute areas and vanes tips. Pump does contain bronze wear rings. Overall, we feel this pump is reusable with our recommended repairs. Pump does contain a 3ft pup.

WATER RESOURCES

Pipe Tally Sheet

Job Name and Aurora, IL Well 26 (1123429)

Date: 4/20/2021

Inspector: John Kopp

Pipe No.	Size	Thread style	Initial Length	Running tally	Description of work needed
Pitless	8	8RD-3/4"	3'1"	3'1"	Nothing
1	8	8RD-3/4"X 8V	20-3	23-4	Chase male end
2	8	8V-3/4"	20-0	43-4	Nothing
3	8	8V-3/4"	20-1	63-5	Chase male end
4	8	8V-3/4"	20-1	83-6	Nothing
5	8	8V-3/4"	20-1	103-7	C/T, Male end
6	8	8V-3/4"	20-1	123-8	Nothing
7	8	8V-3/4"	20-1	143-9	Nothing
8	8	8V-3/4"	20-1	163-10	Nothing
9	8	8V-3/4"	20-1	183-11	Nothing
10	8	8V-3/4"	20-1	204-0	Nothing
11	8	8V-3/4"	20-1	224-1	Nothing
12	8	8V-3/4"	20-1	244-2	Chase male end
13	8	8V-3/4"	20-5	264-7	Surge control valve ok, nothing
14	8	8V-3/4"	20-1	284-8	Chase male end
15	8	8V-3/4"	20-0	304-8	Nothing
16	8	8V-3/4"	20-1	324-9	Nothing
17	8	8V-3/4"	20-1	344-10	Nothing
18	8	8V-3/4"	20-1	364-11	Chase male end
19	8	8V-3/4"	20-1	385-0	Replace coupling
20	8	8V-3/4"	20-1	405-1	Nothing
21	8	8V-3/4"	20-1	425-2	Nothing
22	8	8V-3/4"	20-1	445-3	Nothing
23	8	8V-3/4"	20-1	465-4	Replace coupling
24	8	8V-3/4"	20-1	485-5	C/T, male end
25	8	8V-3/4"	20-1	505-6	Nothing
26	8	8V-3/4"	20-1	525-7	C/T, Male end
27	8	8V-3/4"	20-1	545-8	Replace coupling, chase male thread
28	8	8V-3/4"	20-1	565-9	Nothing
29	8	8V-3/4"	20-0	585-9	Nothing
30	8	8V-3/4"	20-1	605-10	Replace coupling
31	8	8V-3/4"	20-1	625-11	Nothing
32	8	8V-3/4"	20-1	646-0	Nothing
33	8	8V-3/4"	20-4	666-4	Surge control valve ok, chase male thread
34	8	8V-3/4"	20-1	686-5	Replace coupling
35	8	8V-3/4"	20-0	706-5	Nothing
36	8	8V-3/4"	20-1	726-6	Replace coupling
37	8	8V-3/4"	20-1	746-7	Nothing
Bowl pup	8	8V-3/4"	3'1"	749-8	Nothing

749'8"

Pitless spool and stem length = 9'0"

Note: Please have crew load pipe with thread protectors when bringing any pieces into the yard.



CABLE HIGH POTENTIAL TEST

Customer: Aurora, IL Date 4/19/2021 Job No 1123429

Well No.: 26 Location: Aurora, IL – Layne Yard

Cable Description 2.4 KV #2 w/grd. Length 790' Installed By

Type of Test Proof Max. Test Voltage 5,000 Duration 5 min. Motor Voltage 2300

Weather Indoors Temperature 60°F Humidity

Test Equipment 6KV Test Set Test Engineer J. Geltz Time

READINGS ON VOLTAGE RISE

Test Voltage	Leakage I in Micro - Amps			
	AØ	BØ	CØ	
	1	2	3	
1000	4.2	4.3	3.9	
2000	5.6	5.4	5.5	
3000	5.6	5.3	5.4	
4000	5.7	5.5	5.6	
5000	5.6	5.5	5.5	

READINGS WITH VOLTAGE CONSTANT

Time in Min.	Leakage I in Micro - Amps			
	AØ	BØ	CØ	
	1	2	3	
0	5.6	5.5	5.5	
1	.6	.5	.6	
2	.6	.8	.7	
3	.5	.6	.7	
4	.6	.7	.6	
5	.6	.6	.7	

DISCHARGE TIME

Comments: Cable suitable for reuse.

Hypot test power cable with Byron Jackson Flat-Cable attached. Leakage values are quite low and cable appears suitable for reuse. However, note that reinstallation means cable as tested on spool above ground will be flexed over cable sheaves, squeezed against pipe by stainless steel banding and will be subject to possible down-hole damage, as well as significant hydrostatic pressure. Hypot testing may not detect leakage to atmosphere. (i.e. external holes in cable insulation).

Witness:

Signature:

John Geltz

WATER RESOURCES