VILLAGE OF SUGAR GROVE
BOARD REPORT

TO: VILLAGE PRESIDENT & BOARD OF TRUSTEES

FROM: BRAD MERKEL, DIRECTOR OF PUBLIC WORKS

SUBJECT: RESOLUTION: PHASE II OF THE WELL #10 REHAB PROJECT

AGENDA: DECEMBER 5, 2023, REGULAR BOARD MEETING

DATE: NOVEMBER 20, 2023

ISSUE

Should the Village Board approve Phase II of the Well #10 Rehab Project.

DISCUSSION

At the October 3, 2023, Regular Board Meeting, the Village Board approved an agreement with Layne Christensen Company, Inc for Well #10 Pump Removal and Inspection. The Pump Maintenance Proposal included equipment inspection and inspection report. Attached for your review are the Well 10 Pump Inspection Report and Repair Recommendations, the Phase II Equipment Repair Proposal and Task Order detailing the description of work and associated costs. Phase II of the project includes pump replacement and motor installation, various pipe repairs, pump installation and performance testing for an estimated cost of $115,883.00.

Staff recommends that the Village authorize Layne Christensen Company to complete Phase II of the Well #10 Rehab Project.

The total cost of the Well #10 Rehab project is estimated at $175,883.00 which includes the Phase 1 removal and inspection cost of $60,000.00.

COST

The estimated cost of the Phase II Well #10 rehab is $115,883.00. The total estimated cost of the removal, inspection, repairs and reinstallation is estimated at $175,883.00. FYE 2024 Account 51-71-7008 includes $313,000.00 for Well #9 repairs which was included in the Capital Improvement Plan. With this recommended change, FYE 2024 expenses will estimate at $175,883.00, pushing the $313,000 budgeted for Well #9 into FY2024-2025. Completing the Well #10 repairs in FY2024 will push the Capital Improvement Plan repairs and rehabilitation from FY2030 to FY2034

RECOMMENDATION

The Village Board approves Resolution **20231205PW1** authorizing an agreement for Phase II of the Well #10 Rehab Project with Layne Christensen Company.

RESOLUTION NO. 20231205PW1

VILLAGE OF SUGAR GROVE, KANE COUNTY, ILLINOIS

RESOLUTION AUTHORIZING EXECUTION OF AN AGREEMENT WITH LAYNE CHRISTENSEN COMPANY, INC FOR PHASE II WELL #10 REHAB PROJECT.

WHEREAS, the Village of Sugar Grove Board of Trustees find that it is in the best interest of the Village to engage the services of Layne Christensen Company, Inc. to provide professional services to the Village of Sugar Grove, and to execute an agreement;

NOW, THEREFORE, BE IT RESOLVED by the President and Board of Trustees of the Village of Sugar Grove, Kane County, Illinois, as follows:

That it is in the best interests of the Village of Sugar Grove to enter into an agreement between Layne Christensen Company, Inc. and the Village of Sugar Grove for the Phase II Well #10 Rehab Project. The Director of Public Works is hereby authorized to execute said agreement on behalf of the Village and to take such further actions as are necessary to fulfill the terms of said agreement.

Passed by the President and Board of Trustees of the Village of Sugar Grove, Kane County, Illinois, at a regular meeting thereof held on the 5th day of December 2023.

_____
Jennifer Konen, President of the Board
of Trustees of the Village of Sugar Grove,
Kane County, Illinois

ATTEST: _____
Rachel Wortham, Deputy Clerk
Village of Sugar Grove

	Aye	Nay	Absent	Abstain
Trustee Matthew Bonnie				
Trustee Sean Herron				
Trustee Heidi Lendi				
Trustee Michael Schomas				
Trustee Sean Michels				
Trustee James F. White				
President Jennifer Konen				

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

630/897-6941
graniteconstruction.com

November 21, 2023

Mr. Brad Merkel, Public Utilities Supervisor
Village of Sugar Grove
601 Heartland Drive
Sugar Grove, IL 60554

Re: Well #7

Mr. Merkel:

The Well 10 Byron Jackson submersible pump has been removed due to low capacity. The bowl assembly, twenty-eight joints of 10" T&C Line Pipe, submersible motor, and cable were taken to Layne's yard for inspection.

300 HP Byron Jackson Submersible Motor S/N 14T-1002-4-1
The motor is in good condition. Reference attached Byron Jackson Motor Inspection – Type H report.

Recommendation: Reinstall motor after a standard field service.

Byron Jackson 12 stage 12EMM Bowl Assembly
This factory assembled bowl assembly has cavitation wear at the flanged connections. This is the most probable cause for loss of production. While the exterior of the castings are in good condition, it is not rebuildable due to flange and internal erosions. Reference attached Bowl Inspection Report.

Recommendation: Replace bowl with a Layne shop built 13 stage 12EMM bowl assembly with sacrificial zinc anodes strapped to the exterior.

Column Pipe
Layne inspected the 10" T&C pipe string with calibrated API gauges. Twenty-eight joints were brought to the yard for repairs that include cut and rethread and thread chasing.

Recommendation: Cut & thread, chase as required. Replace lost pipe with epoxy coated 10" T&C Line Pipe.

Cable
The outer jacket of the cable has a couple of scrapes and cuts. The cable assembly, consisting of the 500 MCM main cable and the Byron Jackson flat cable, passed Hi-Pot testing. Reference attached Cable High Potential Test report.

Recommendation: Reinstall cable assembly. Tape patch any defects to outer jacket as pump is reinstalled.

Comments on Well

While removing the pump, the crew noticed some "dragging", suggesting pump components were rubbing on the well casing. Past loss of transducer cable and the marks on the 500 MCM cable give more credibility to this notion. There is nothing that can be done and still keep the pump's current production (i.e.. Installation of smaller, less productive pump components.) At one time, Layne had suggested a larger diameter, "meatier" replacement bowl but does not do so now under this suspicion.

Project Estimate

1.	Labor and equipment to date to remove pump, haul components, and disassemble/inspect components	$ 60,000
2.	Service motor with oil, gasket, and filter change	$ 10,000
3.	Cut and thread/chase pipe threads, replace pipe up to twenty feet	$ 8,000
4.	Replace bowl assembly with Byron Jackson 13 stage 12EMM. Bowl to be ordered disassembled and assembled in Layne yard. Zinc sleeve bowl exterior. (14 week lead)	$ 49,883
5.	Miscellaneous consumables (airline, stainless banding, etc.)	$ 2,000
6.	Remobilize with pump components, reinstall pump, conduct capacity test, demobilize	$ 46,000
	Total Project Estimate	$175,883

The Village has requested pricing for replacing the submersible cable. Currently, 500 MCM/600V 3C cable with ground is $104 / ft. To replace the 895' of cable, the cost is $93,080.

Layne will begin with repairs upon written notice to proceed. The longest lead time is the bowl assembly which is fourteen weeks.

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

Layne Christensen Company

William Balluff, P.E.
WRD Account Project Manager III

BYRON JACKSON MOTOR INSPECTION - TYPE H

Inspected By Kaforski Date 11/15/2023

Job Name Sugar Grove Well 10 Job # 1329810

HP 300 Size 14" Voltage 460V

Motor Serial # 14T-1002-4-1

Meg 251/249/251

Shaft Projection Spec 7 13/16"

Shaft Projection Measured 7 13/16"

Rotation stiff but smooth - good

Condition of Stator Can good

Condition of Lower Can good

Condition of O-Ring Joint good

Condition of Balance Tube good

Balance Tube Clear? Yes

Comments Motor is in good condition and eligible for re-install.

Is Motor Reinstall Eligible? Yes

Recommendations: Service and reinstall motor.

Layne
A GRANITE COMPANY

BOWL ASSEMBLY INSPECTION REPORT

Project	Sugar Grove, IL	**Well No.**	10	**Date**	11-8-2023
Project No.	1329810	**Inspected by**		John Kopp	
Serial No.	Flowserve	**Bowl Assembly**		12EMM – 13 stg.	

Stage No.	Wear Ring	Impeller Skirt	Clearance	Bearing ID	Impeller Shaft	Clearance
1 (suction)	5.697"	5.671"	.026"	1.699/1.701"	1.686"	.013/.015"
2	5.700	5.672	.028	1.698	1.686	.012
3	5.702	5.672	.030	1.697	1.686	.011
4	5.698	5.671	.027	1.697	1.686	.011
5	5.699	5.672	.027	1.698	1.686	.012
6	5.700	5.672	.028	1.697	1.686	.011
7	5.703	5.672	.031	1.697	1.686	.011
8	5.700	5.672	.028	1.697	1.686	.011
9	5.701	5.672	.029	1.697	1.686	.011
10	5.700	5.672	.028	1.696	1.686	.010
11	5.698	5.671	.027	1.697	1.686	.011
12	5.700	5.672	.028	1.697	1.686	.011
13	5.700	5.672	.028	1.697	1.686	.011
			Top Case	1.698	1.686	.012

Impeller Shaft	1-11/16" X 152-13/16", mic .001" under nominal. Ok for reuse
Fasteners	SST, ok for reuse
Strainer	SST, ok for reuse
Collets	Carbon Steel, poor condition

COMMENTS: Pump does not contain bronze wear rings. This pump appears to have some sort of cavitation wear and water escaping through the flanged connections. Exterior of the castings are in great condition, but unfortunately this pump has too much damage to the flanges and internal erosion to be a candidate for rebuilding. This pump will need to be fully replaced. Note cavitation wear in the pipe coupling thread area as well. This pump is set up for 14" motor and 10" pipe.

CABLE HIGH POTENTIAL TEST

Customer: Sugar Grove, IL Date 10/30/2023 Job No 1329810

Well No.: 10 Location: Aurora, IL – Layne Shop

Cable Description: 600Volt 500MCM w/grd Length: 895' Installed By:

Type of Test: Proof Max. Test Voltage: 2,000 Duration: 5 min. Motor Voltage: 460

Weather: Indoors Temperature: 60 ° 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	
	Orange	Brown	Yellow	
400	6.4	5.9	6.2	
800	8.3	7.1	7.4	
1200	8.7	8.6	8.3	
1600	8.4	8.2	8.1	
2000	7.6	8.1	7.9	

READINGS WITH VOLTAGE CONSTANT

Time in Min.	Leakage I in Micro - Amps			
	AØ	BØ	CØ	
	Orange	Brown	Yellow	
0	7.6	8.1	7.9	
1	.9	1.2	.8	
2	.7	1.3	.5	
3	.6	1.4	.6	
4	.5	1.1	.5	
5	.6	1.1	.5	

DISCHARGE TIME

Comments:

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