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Somersett Owners Association
Attn: Tracy Carter
7650 Town Square Way
Reno, NV 89523

RE: CHAMPIONSHIP (18-HOLE) AND CANYON 9 GOLF COURSE WATER SUPPLY INFRASTRUCTURE REVIEW

Dear Mr. Carter:

Padovan Consulting, LLC. over the last several months has been collecting and reviewing information pertaining to the main infrastructure components for the water supply to the Somersett Golf Country Club (SGCC) Championship and Canyon 9 golf courses. The components reviewed include the following:

- Canyon 9 Pump Station
- Truckee River Pump Station
- Main SGCC Pump Station (at Hole 5)
- Well 5 (within Sierra Canyon)
- Clubhouse Well

This does not provide information on the hole by hole irrigation systems of either course nor any of the transfer mains. Transfer mains run from Well 5 to the SGCC Hole 5 pond, from the Truckee River pump station to Canyon 9 pond, from the Canyon 9 pump station to Hole 5 pond and from SGCC Hole 2 pond to the Hole 5 pond. The transfer mains are believed to be C900 (a sturdy, high quality pipe material) and in good condition. The purpose of this evaluation is to provide the SOA a better understanding on the general condition, age and future maintenance and/or replacement costs of the pump stations and wells that are critical to providing water to the golf course irrigation systems. With water supply being a critical component of the success of the courses this review is intended to provide valuable planning information.

The assessment and costs for the surface pump stations were provided by Commercial Pump Service, Inc.(CPS). They originally installed the surface pumps and have been providing servicing and tracking condition of these pump stations on an almost yearly basis so they are well suited to provide this information. Bruce Mackay Pump and Well Service (BMPWS) provided costs and input for the well 5 and clubhouse well. I provided them historical information and data regarding well 5. The costs presented below are "ball park"

estimates for planning purposes and are present day costs. Much like a reserve study an inflation factor must be applied to project these present day costs into future years. The information presented below is a summary of the information these contractors provided through emails, phone calls and site meetings.

Well 5 constitutes the majority of water supply for the SGCC golf course. The well was drilled in 2003 and was never fully developed into a production well. The clubhouse well provides additional water for the SGCC golf course but is a much less critical water supply. Several options were considered and discussed below for improving the well 5 water supply.

All of the surface pump stations (i.e. not well pumps) are now over 15 years old and in general at the 15-20 year time frame the pumps, motors and the controls will begin to have issues and the plumbing begins to rust form the inside out depending on the water quality. Although the extent of rusting is hard to determine since you can't see from the inside. Therefore, knowing when a critical problem will present itself with the plumbing is hard to determine. With respect to the controls at each pump station, the functionality is outdated. Updating the control system with programmable logic control (PLC) system will allow for much easier and remote tracking of water usage. It allows for remote viewing, navigation and receiving alerts through cell phones or tablets. While increasing the ease of operation, they also increase the performance of the station. Being able to quickly diagnose pump station issues and tune these stations increases energy efficiency, performance, and reliability.

Pushing any of the components to a point where it becomes a major issue and/or affecting other components should be avoided. CPS recommends being more proactive with replacements of the various pump station components to extend the life of the pump stations and avoiding costly critical breakdowns which could leave us without a functioning pump station and water supply at an inopportune time.

Canyon 9 Pump Station

There are 4 pumps within the Canyon 9 pump station. Two 30 horse power (HP) variable frequency drive (VFD) pumps (#1 and #2) are dedicated to pumping water from the pond into the Canyon 9 irrigation system and two 60 HP pumps (#3 and #4) are dedicated to transferring water from the Canyon 9 pond to the SGCC Hole 5 pond.

Specific issues of pump stations components highlighted by CPS:

- The Amiad Saf-4500 filter has a rust hole going through the body.
- Motor #1 was recently replaced
- Pump #2 developing a higher vibration
- Motors #2 and #4 have bad stator heaters. The stator heaters keep the motors dry internally and free it of moisture, this moisture can damage a motor and also make them fault out.

- Motor #4 showed signs of weak windings. The insulation test done on it showed it to be close of internally shorting out. This can be in result of the stator heaters not working in this motor.
- The station's high pressure relief Cla-valve on the irrigation side has heavy body rust. This can prevent the valve from not working properly, in the event of a pressure spike this valve may or may not protect the system.

Costs associated for the highest priority replacement/upgrade are as follows:

- Recondition Amiad filter - $7,500
- Replacement of motor #2 - $5,500
- Replacement of motor #4 - $7,500
- Replacement of Cla-valve - $3,500

Total Estimated Cost = $24,000

Replacement/upgrade costs anticipated in the next +/- 5 years due to the age of the overall pump station are as follows:

- Update the control system with a programable logic control (PLC) retrofit - $15,500
- Replace plumbing - $12,000
- Replace pumps $15,000/each = $60,000 for all four pumps.
- Replace motor #3 - $7,500

Total Estimated Cost = $95,000

Truckee River Pump Station

There are two 75 HP pumps (#1 and #2) pumping from a wet well at the Truckee River pump station. This pump station transfers water from the Truckee River to the Canyon 9 pond.

Specific issues of pump stations components highlighted by CPS:

- Pump #2 was replaced in 2017 but not the motor
- Pump #1 bearings are worn out, pump is at the end of its life and will not last much longer. Typically these pumps last about 10 years. Subject to high sand intake which is hard on the pumps.
- Motor #1 has bearing growl at mid-speed (i.e. rough bearings).
- Current flow meter is 14 years old which is quite extensive for this type of meter
- Cla-Valve is leaking by as of May of 2014, no records of ever fixing this issue
- No preventative maintenance since July of 2016. Without further inspection to discover other underlying issues, the notes listed above is all of the known current issues
- Wet well should be cleaned out annually. This reduces sand intake which has been an issue for these pumps. This can double the life of the pumps from 10 to 20 years. CPS indicated knowing of wet well being cleaned once or twice.

Costs associated for the highest priority replacement/upgrade are as follows:

- Replace pump #1 - $15,000

- Replace motor #1 - $7,500
- Replace Cla-Valve - $3,500
- Replace flow meter - $5,000

Total Estimated Cost = $31,000

Replacement/upgrade costs anticipated in the next +/- 5 years due to the age of the overall pump station are as follows:

- Replace motor #2 - $7,500
- Update the control system with PLC retrofit - $15,500
- Replace plumbing - $12,000

Total Estimated Cost = $35,000

Main Station

There are a four 75 HP pumps (#1-#4) within the Main SGCC pump station at Hole 5. These are pumps are controlled with a VFD and pump directly into the SGCC irrigation system from the Hole 5 pond.

Specific issues of pump stations components highlighted by CPS:

- This station has pumped 1,862,545,387+ gallons of water since it was installed. Readings of the bearing wear, vibration, and GPM for each pump are still well within specs. Although the pumps are performing good, they can only be expected to last around 20 years before they physically fall apart from rust/rot.
- The VFD in the control panel is a 600 series, It has well exceeded its lifespan (Avg. 7-10 years). The station was installed in March of 2003, so it's almost 16 years old. The 600 series VFD has been obsolete since about 2005.
- The two Saf-6000 Amiad filters have moderate rust buildup in them. The rust pits were first noted in 2005, they have been filled with temporary epoxy multiple times to extend the life of the filter bodies. Eventually, they will rust through like the filter on the short course, developing a leak.

Costs associated for the highest priority replacement/upgrade are as follows:

- Replace Amiad filters – $7,500/ea = $15,000 for both filters

Total Estimated Cost = $15,000

Replacement/upgrade costs anticipated in the next +/- 5 years due to the age of the overall pump station are as follows:

- Replace pumps and motors - $22,000/ea = $88,000 for all four pumps/motors
- Replace VFD and PLC retrofit controls - $24,000
- Replace Plumbing - $12,000

Total Estimated Cost = $124,000

Well 5

This well is located within the Sierra Canyon community. The pump is responsible for not only pumping water up from the aquifer but also pumping the water through approximately 18,000 feet of 8 inch main into the SGCC Hole 5 pond. The well 5 water source constitutes

the majority of the SGCCC underground water rights and the majority of overall SGCC water supply. Needless to say the well and pump are critical components of the water supply system.

The well was originally drilled in 2003 as a test well for testing the aquifer as a water source for use as a golf course irrigation supply. The well was never fully developed as a true production wall. The casing is 8 inches and was placed to a total depth of 800 feet below ground surface (bgs). The well casing was not screened and has only some makeshift holes drilled into the casing near the bottom. The 8 inch casing size is not ideal for production irrigation pumps. Moreover, the well drilling and setting the casing experienced alignment issues creating more difficulty when setting a pump in the well.

A 228 HP VFD pump was installed in the well in 2008. The pump was capable of exceeding 400 gpm but due to the limitations of the well, with the substandard well development, pumping at higher rates entrained sand and gravel which caused excessive wear on the pump. It was recommended to use the pump at a flow rate of around 350 gpm. Unfortunately, the sand and gravel took its toll on the pump and it had to be replaced in 2017.

The SGCC installed a new 60 HP pump in the well in 2017. The new pump is capable of pumping approximately 120 gpm. Without delving into the various sources, water rights and irrigation demands, this pump rate is not sufficient to provide the needed annual water volume nor keep up with peak demands to properly supply the SGCC Championship golf course with sufficient and reliable water supply. The flow rate from the well should be at least 400 gpm to provide adequate volume from the primary golf course water source.

Bruce MacKay Pump and Well Service (BMPWS) reviewed several options to improve the flow volume from the Well 5 source. Well history and condition and information pertinent to calculating the total dynamic head was provided by Padovan Consulting. The following are the options considered:

- Option 1 – Install a booster pump to supplement existing 60 HP pump to increase flow rate to minimum of 350 gpm. BMPWS determined this option was not possible. Booster pump would increase pressure but not flow volume.
- Option 2- Replace current submersible pump in the current well with a 125 HP pump capable of 400 gpm flow rate to Hole 5 pond. This option does not address the poorly developed well and leaves it as-is. This could impact the overall life span of the pump with continued entrainment of sand and gravel.

  Total estimated cost is $93,500
- Option 3 – Abandon existing well, permit and drill a new will with a 10" screened production well casing and install the 125 HP (400 gpm) pump. This option is the most responsible option as it contemplates an appropriately developed well for the use and needed flow volume. The well casing is larger, screened and gravel packed. Assumed well depth is 700 feet bgs. This would reduce or eliminate the issues with the sand and gravel entrainment and allow for much easier setting of the pumps as the casing is sized appropriately for production pumps.

  Total estimated cost is $400,000.

Clubhouse Well

Limited information was collected on this well. The amount of water pumped from this well is relatively low compared to the other source. However, it is still an integral part of the overall water supply. The following information about the pump and well is known:

- 600 feet deep well
- Submersible 15 HP pump installed August 2015
- Average pump flow rate of approximately 50-65 gpm

This pump is new and would not be a large expense to replace so no anticipated costs other than routine maintenance would likely be needed in the next 5 + years.

Conclusion

This concludes the review of the various water supply pump systems and wells. Overall the system is at the age where costly upgrades will be needed in the 5 year time frame if the water supply system is to be managed responsibly. These costs could exceed present day costs of $700,000 based on the above information. The information presented here is meant for planning purposes to better understand the overall condition of the water supply system and likely associated costs.

Please feel free to contact me with any further questions regarding this matter.

Very truly yours,
PADOVAN CONSULTING, LLC.

Seth A. Padovan, P.E.
President