

MEMORANDUM

To: Baycrest Board Members and Association Owners

From: Ralph Scarce, Creighton Phillips and Swann Fredrickson

Date: July 8, 2016

Topic: Summary of Meeting with Paul Kemp, Irrigation Manager for the Pelican Landing CDDs (Bay Creek and Bayside).

On Wednesday, July 6th, Board Members Ralph Scarce, Creighton Phillips and Swann Fredrickson met with Paul Kemp, Irrigation Manager for the Pelican Landing CDDs. Justin Lucas, Baycrest's client services manager from Greenscapes also attended and Peaches Scarce, head of the ACMSC committee, attended for part of the discussion. During the meeting, which lasted for more than an hour, Mr. Kemp explained the CDD irrigation process, answered many questions and participated in a discussion about Baycrest's irrigation system.

Baycrest is in the Bay Creek CDD along with the neighborhoods of Southbridge, Costa Del Sol, The Pointe, Creekside Crossing, Ascot, Pinewater Place, The Cottages, The Ridge and Bay Creek. For additional information about what a CDD is and how it operates, see the FAQ section of the CDD website <http://www.pelicanlandingcdds.net/index.php>

Mr. Kemp gave a detailed explanation of the process involved in providing irrigation water up to the point of Baycrest's meter. After the meter, the distribution is Baycrest's responsibility.

The following facts were established:

- The Bay Creek CDD pumping station, located on Greenview Drive, pumps water from four wells into three interconnected lakes that have liners. These lakes also receive rain water and runoff.
- One lake is located in Southbridge between its eastern perimeter and Burnt Pine Drive near the south entrance; the other two lakes are located on the western side of Greenview Avenue to the east of Baycrest.
- The Bay Creek CDD operates pursuant to a water use permit issued by the South Florida Water Management District (SFWMD), a regional governmental agency that manages the water resources in the southern half of the state. The permit governs and limits how many gallons may be pumped from the wells into the lakes. The only water quality issue monitored by SFWMD is related to the amount of chlorides (salt) in the well water. This is managed by limiting over pumping from the wells.
- Water pumped from the wells is run through a "wet well" (essentially a section of pipe) where it is chemically treated with a proprietary solution formulated to kill any organisms in the water before it is discharged into the lakes. Mr. Kemp reports that the wet well treatment results in fairly clean water being pumped into the lakes. There is no physical filtration of the water up to this point.

- To provide irrigation water to the communities, three pumps in the pumping station pump water from the interconnected lakes through a fully automatic, self-cleaning, 18 pod Miller Leaman turbo disc filtration system (essentially 18 separate filters) which utilize multiple 200 micron (roughly 80 mesh) filtration discs in each pod. Then the filtered water is pumped into the main distribution line for delivery to the various communities in the Bay Creek CDD. At the time the Miller Leaman filter pods were installed, field trials were conducted to determine the most effective micron/mesh filter size to use in the pods.
- These Miller Leaman filter pods are designed to self-clean by backflushing automatically when required. In addition, the CDD physically removes the lids and manually inspects and cleans the 18 pod filters on a schedule which varies from weekly to monthly depending on the amount of debris present. The CDD has recently discovered that backflushing valves in 9 of the 18 filters are not working properly which means the filters must be manually cleaned more often until the valves are repaired. The broken valves are currently being rebuilt and should all be functioning as designed in the next 2-3 weeks. The water entering the main line is still being filtered but the efficiency of the filtration system will improve when all the backflushing valves are repaired.
- Bay Creek CDD irrigation water is not "reclaimed" water. It is groundwater. There are no laws or regulations governing the "quality" of the supplied water. The chlorides monitoring previously mentioned is related to the well water and the number of gallons which may be pumped out.
- In discussing the problem of snails and other organisms in the irrigation lines, Mr. Kemp explained that snails originate in the lakes as part of the natural environment. So do bryozoa, tiny organisms (also known as moss animals) that are becoming an increasing problem in this area. The larvae of both are small enough to pass through almost any filter including those of the CDD and Baycrest.
- The larvae feed on nutrients in the flowing water and eventually attach to valves and pipes at various points down the line in both CDD and community irrigation systems. The snails grow and mature, shedding shells a couple of times each year – a primary source of material clogging irrigation nozzles. The bryozoan grow quickly and colonize to form moss-like clumps which can also clog filters, valves and heads. Once they have grown large enough, both can be substantially reduced through filtration. But there is no practical filtration method which will prevent these tiny larvae from continuing to infiltrate the CDD and Baycrest irrigation systems. This is a problem related to environmental conditions and varies in severity during different times of the year and in different locations. At present, bryozoan are unusually abundant as evidenced by the need to clean the Baycrest filter every few days. This problem is not unique to Pelican Landing and is widespread in this area.
- In order to clear their main feeder line of bryozoan, snails and other debris, the CDD routinely flushes out the main line by opening a flushout valve at the end of the main line. This generally is done weekly, depending on conditions, and the water is discharged into the storm drain system. Mr. Kemp noted, however, that when water levels are very low, conservation demands that flushouts occur less often. Baycrest is located very close to the beginning of the main CDD line where there is less material to be flushed out than at the end of the line.

- Mr. Kemp noted that flushing the main lines can never remove 100% of the bryozoan and snails to achieve perfectly clean water but it makes a very significant improvement and prevents accumulation. In his professional opinion, the water which arrives at Baycrest's meter is suitable for irrigation and of "pretty good quality" overall for open source water.
- Mr. Kemp noted that some other communities in the Bay Creek CDD report having snail/clogging problems similar to Baycrest – heads clog up quickly. These communities have a variety of filters (or none) and a variety of irrigation systems and components. They have single meters, multiple meters, loop systems, closed systems, flush out valves or not, etc., etc. According to Mr. Kemp, some communities in our CDD have a severe problem and some seem to be having very little problem. This makes it difficult to accurately "compare" Baycrest's irrigation system to others because there is so much variation in design and components. No other community has so many individual timer boxes.

After everyone was satisfied we understood how the CDD system operates to provide irrigation water, we discussed Baycrest's irrigation system and agreed on these facts:

- Baycrest's current irrigation system has design limitations which cannot be remedied easily or inexpensively.
- At present, Baycrest has a "closed" system without any flushout valves on the main 3 inch line. There may be such a valve(s) somewhere, but there are no drawings which indicate the location. Past testing could not locate any flushout valves. As a result, there is no way to flush bryozoa, snails and years of accumulated shells out of Baycrest's main 3 inch distribution line except through individual heads, one at a time. There are more than 1,000 heads which clog up shortly after being cleaned because there is so much debris remaining in the system (more than 20 years worth....).
- Despite the best filtering possible, bryozoa and snail larvae will continue to enter our system, grow and shed shells (in the case of snails), clogging the irrigation heads. Without the ability to flush out the system, this will continue to get worse over time because flushing out a few heads at a time won't ever remove enough of the new and accumulated debris to get ahead of the problem. Keeping the heads cleaned out is a costly maintenance expense.
- Mr. Kemp advised that if we had the ability to flush our lines, we could discharge the water directly into the storm sewers as long as we don't treat the water with chemicals.
- Although the CDD provides "filtered" water suitable for irrigation, it is up to each community to filter further if they want to remove more, finer material (snails or otherwise) from their system to reduce both clogging and general wear and tear on the system heads and valves.
- The basic design of Baycrest's system is very inefficient because there are 91 separate timer boxes on a single meter. There is usually a meter for each timer control. Most multi-family communities in our Bay Creek CDD have fewer timer controls to manage – sometimes as few as four. Despite being mounted at each address, many timer boxes also control zones on adjacent properties.

- Keeping all the timer boxes powered up, operating, properly set and in sync is nearly impossible and requires a great deal of labor which could otherwise be utilized to clean clogged heads. There is also a cost associated with the inevitable water waste which occurs when the water distribution is less efficient and effective than would be possible with a single master control.
- The multiple timer box situation is additionally challenging because some owners are not aware that the timer boxes are a component of the irrigation system which belongs to and is operated by the Association. Such owners sometimes change or adjust timer box schedules which can reduce the pressure needed to irrigate other zones. This disrupts the carefully worked out schedule set by Greenscapes which is designed to assure adequate water pressure for each zone as they run in a planned sequence.
- The original irrigation installation is not consistent among properties and, in many cases, is outdated and fails to provide adequate coverage for shrubs and turf due to two decades of growth, landscape changes and/or poor original design. This results in hot spots and dry areas.

After identifying the above issues which contribute to Baycrest's irrigation problems and discussing solutions, there was consensus in the meeting group that the following recommendations would give Baycrest the most "bang for the buck" in the near future:

- (1) Install flush outs in one or more locations on Baycrest's main line to remove years of accumulated debris and new incoming larvae and other material. With regular flushing of the main line and a continuing schedule of cleaning out individual heads, there should be significant and continuing improvement over time in the occurrence of clogged heads. This would reduce maintenance costs and improve system performance. Justin Lucas will look into the details and costs involved to do this and report back.
- (2) Install a high quality, self-cleaning filter with a smaller mesh, possibly 120. In addition to reducing the size of material which enters our system, this addresses the problem of needing to manually clean the filter every few days during those times of the year when, despite CDD filtration, there is more bryozoan and snail material and larvae in the incoming water. The better (smaller mesh) the filter is, the more often it will need to be backflushed or cleaned which is the reason to install a fully automated filter. As an aside, Mr. Kemp is acquainted with Dan Geist, whom we have consulted about filters. They have "put their heads together" on some Pelican Landing irrigation issues and Mr. Kemp considers Mr. Geist to be a highly qualified irrigation expert. Justin Lucas will also report back to us after reviewing the filter situation with Dusty Fontaine, Greenscapes Vice President of Irrigation.
- (3) To get better irrigation coverage and avoid hotspots, homeowners should be encouraged to do the irrigation upgrades, reconfiguration and improvements recommended in the Greenscapes audit for each Baycrest property. Newer homeowners will need to be made aware of this report and encouraged to discuss it with Greenscapes in respect to their properties.

In a perfect world without cost considerations, the ideal solution would be to install a new loop system that could be operated via electronic communication with a single master timer. Meanwhile, the above recommendations could improve performance and save money on maintenance.