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Wildwoods Collection System

Engineering Report

This report is required for Wildwood Lot Owners Association which is a fictitious name for Lost Canyon Lakes Lot Owners Association registered with the Missouri Secretary of State to satisfy IV(J) of the Abatement Order No. 2015-WPCB-1262 with the Missouri Department of Natural Resources. This report is to address the current collection system and either eliminate the holding tanks or in the alternative devise a plan to collect the sewage in an agreed upon method and system.

Wildwood subdivision consists of 1755 lots incorporated over a series of recordings in the Callaway County recorder's office. Ten subdivisions have been recorded by the association. The recordings were begun on April 20, 1973 and continued on until June 29, 1981. The subdivision has been in the current configuration for the last 35 years. 856 of the lots have been sold and 51 are occupied by permanent structures.

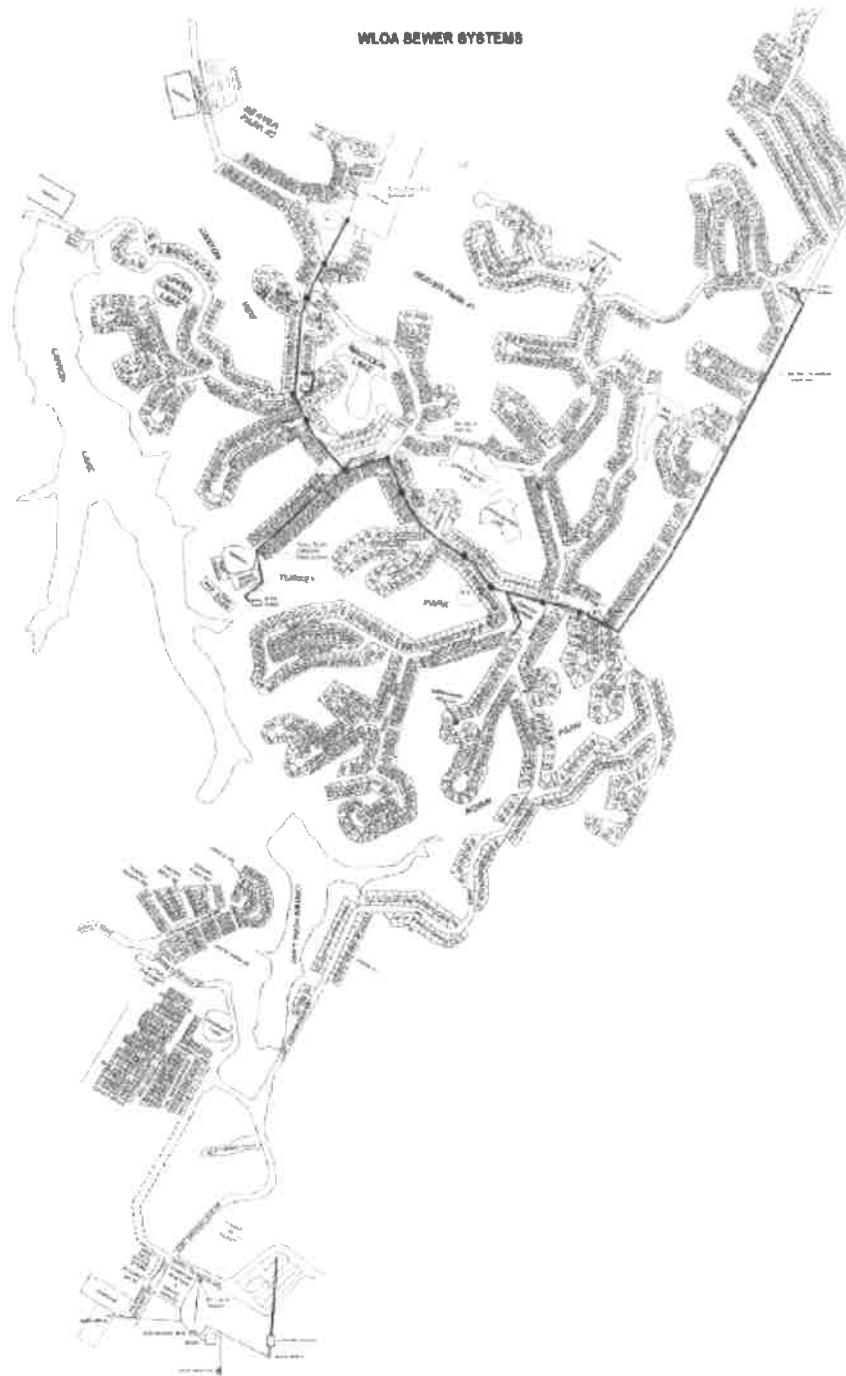
The Clean Water regulations for the treatment of wastewater became effective in Missouri on June 30, 1974. About half of the lots in the subdivisions were recorded prior to the effective date of the regulations and therefore no regulations existed for those lots, however the association continued to record lots. The regulation required the association to report

to the Clean Water Commission as to the plans for disposal of wastewater prior to the continued development of the property. The Department of Natural Resources has no record of receiving the report required by the 1974 regulations.

It should be noted that none of the violations to date cited the existing collection system and no spills have been reported to the Department of Natural Resources.

Existing Sanitary Sewer System

The collection system consists of 181 individual holding tanks, 3 lift stations, manholes and 9453 feet of pressure and gravity sewer lines.



These all lead to or are pumped out and disposed at the DNR permit number MSOP No. MO-0035645 Outfall No. 001 (Three cell lagoon) or Outfall No. 002 (mechanical treatment plant). The three cell lagoon has a design population of 368 and a design flow of 25,000 gallons per day and the mechanical treatment plant has a design population of 50 and a design flow of 3060 gallons per day. They both discharge into a tributary of Cow Creek in Callaway County. The Homeowner's Association operates a maintenance department and a pumper truck.



Existing Mechanical Treatment Plant- Outfall #2



Existing Lift Station at Pool Area



Existing Lift Station

Existing Condition of Collection System

The holding tanks are being replaced with concrete tanks when they become in disrepair, some of the current tanks are in need of replacement. These tanks are being replaced as the WWLOA has funds and can have them replace.

The lift stations conditions vary from non-working to serviceable. Lift Station 1 is near the Pool and services the bathrooms in that area. Lift Station 2 is at the Big Buck Comfort Station. Lift Station 3 is just below the Mechanical Treatment plant and services the park in that area.

The collection system consists of 9,453 feet of pipe(a mixture of gravity and pressure), standard diameter manholes and 6 dump stations, that consists of 3 foot by 3-foot concrete inlets, in four locations.

The collection system as a whole is in poor shape and has had little maintenance. Much of the system is buried and we do not know the condition or if it was properly installed.

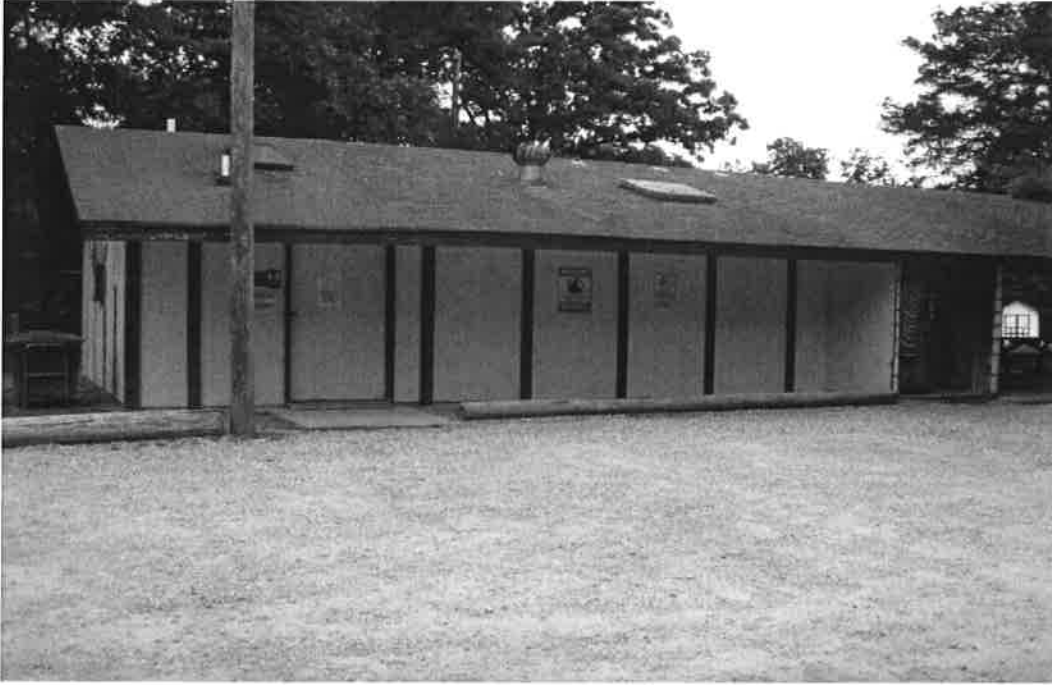


Existing Dump Stations that need rebuilt





Existing Lift Station at Comfort Station



Comfort Stations with bathrooms and showers



Corrective Actions

The AOC part IV Section J requires corrective actions to either eliminate the current use of holding tanks and replace them with an expansion of the existing centralized collection system. The agreement also allows for in the alternative through an agreed upon method and system to collect the sewage.

We will look at several solutions to the agreement in the AOC. They will include complete coverage of the subdivision with an expansion of the existing collection system to an option to do nothing.

Solution 1

Do Nothing

Advantages: The system has no history of reported spills, therefore there is a low chance that it will start releasing untreated/undertreated sanitary sewage to the environment, unless there have been unreported untreated discharges. The cost to the community will be none and therefore has the lowest immediate economic impact to the community. This option would allow the continue placement of holding tanks and replacement of tanks, but it is highly suggested that these be of a standard style with level indicating devices.

Disadvantages: Even though the system has no history of reported spills, unfortunately the condition and design of the current system would lead many to believe that spills have or are occurring. These possible spills could be subject to the Department of Natural Resources fines. These fines are \$10,000 per spill for every day the spill occurs. With multiple spills possible over many days, these fines could easily move into millions of dollars in fines and no corrections. In addition, the end result would be a requirement that the Association must fix the problem and therefore they must implement one of the other solutions and incur those costs. Probably resulting in the development becoming uninhabitable.

Solution 2

Abandon Existing Collection System

The current lift stations, pressure lines and gravity lines (with the exception of short runs from dump or comfort stations to lift stations) would be abandoned. The lift stations would be converted into holding tanks and level indicators will be added. The existing manholes would be filled with gravel. Existing holding tanks will continue to be pumped, but they will have to have level indicators and dumped into a permitted permit facility. Existing dump facilities at the treatment facilities would need to be upgraded to minimize spillage of sewage. All pumped sewage would need to be documented and the record kept in a central location.

In addition, new owners would use holding tanks and holding tanks needing replacement would continue. Although it is considered a last resort to utilize holding tanks for collection, it is in use all across the state for recreation use and limited residential use. Holding tanks have been utilized since these subdivisions were originated. It would be preferable for the WWLOA to generate an approved holding tank design and method for installation to keep the process easy to follow. However, if the DNR would like to approve each installation or work out an agreement with the County Health Department, it could be an option, but an easier to comply model would be preferable.

Advantages

This would be the lowest cost upgrade. The cost would be approximately (Exhibit 1) \$278,000. These cost reflect the cost to change the lift stations over to holding tanks, the addition of level indicators and the abandonment of facilities. This solution most approximates the current situation and as far as this office has discovered has never been subject to Missouri Department of Natural Resources (MDNR) sanctions or had a documented or reported spill. Systems like this are in use and permitted across the state, including being utilized by the MDNR in its Park System.

In addition, this solution would do the most to limit the amount of water resources being utilized by the users, if they were charged per gallon pumped out of their system and fined for spills by the Wildwood Lot Owners Association (WWLOA). The lower amount collected would decrease the amount that would need to be treated and be environmentally and economically beneficial.

Disadvantages

This option would require the addition of pump level indicators and therefore additional monitoring by the Wildwood Lot Association (WWLA) of the level in the pump tanks. The likelihood of a spill because of what is considered an open system (holding tanks and pumping). Anytime you have to hook up to a

system, pump and then dump the waste at a holding station, then you have a higher probability of a breach in the system.

The WWLOA and DNR may want to look at grandfathering, limit or remove the ability to reside in the park fulltime, if they are not connected to the collection system. The ability to utilize holding tanks in Missouri is predominantly a system utilized by campgrounds and seasonal usage.

Solution 3

This solution is similar to 2, but would require the repair of the existing collection system. All three lift stations would need to be repaired. The pressure and gravity sewer lines would need to be checked for functionality and replaced or repaired if found deficient. Manholes would also need to be checked and repaired, if needed. The dump stations would need to be upgraded to eliminate possible spills.

As with Solution 2, new owners would use holding tanks and holding tanks needing replacement would continue. Although it is considered a last resort to utilize holding tanks for collection, it is in use all across the state for recreation use and limited residential use. Holding tanks have been utilized since these subdivisions were originated. It would be preferable for the WWLOA to generate an approved holding tank design and method for installation to keep the process easy to follow. However, if the DNR would like to approve each installation or work out an agreement with the County Health Department, it could be an option, but an easier to comply model would be preferable.

Advantages

This has been the collection process for the entire life of the subdivision. This system has been in place for the entire subdivision for over 35 years and has not been subject to enforcement until the latest agreement. Note:

Some of the subdivisions predate the clean water law and may be grandfathered with the current system.

Disadvantages

This system is estimated cost \$418,983 (Exhibit 1), with the condition of the system to be considered average to poor with little preventative maintenance. Even at this relatively low cost compared to Solutions 4 and 5, it's cost may still be beyond what the WWLOA can complete immediately. So an extended time period may be needed to collect the funds to complete these upgrades and repairs.

As with Solution 2, the WWLOA may want to look at grandfathering, limit or remove the ability to reside in the park fulltime, if they are not connected to the collection system. The ability to utilize holding tanks in Missouri is predominantly a system utilized by campgrounds and seasonal usage.

Solution 4

Stop adding pump tanks, add signal devices on existing pump tanks, redesign/repair pump stations and existing collection system and require that new construction must connect into the existing collection system. As force main or gravity system becomes available to existing pump tanks, they must be replaced or converted into lift stations and connected into the collection system. This would require that several existing pump tanks would be required to hook on to the existing pressure or gravity system. It is assumed that the existing pump tanks would need to be replaced with individual grinder pump stations, either through conversion or replacement, depending on the size of the pump tank.

Advantages: This would for a market style replacement of the truck pumping system. The estimated initial cost would be \$1,427,883. The total estimated cost to replace the system piecemeal would be \$11,974,911. The cost per all lots would be \$6,823. The overall estimated time to complete would depend on the selling of the remaining lots.

Disadvantages: This solution would be the most expensive because of the length and piecemeal approach to the construction. This Association is primarily second residence owners and they are primarily middle to lower class in the economic spectrum and many may choose to abandon their lots and structures rather than pay for the solution. This would then shift the additional financial burden to the other owners and either cause undue hardship on those or cause a cascade effect that leaves the solution unfunded and the Association defunct.

Solution 5

This solution would require an expansion to all of the existing lots with a central sewer system, utilizing the existing system. It is assumed that small diameter sewer pressure lines with individual grinder pumps be utilized, because of the topography and spread of occupied lots. This solution would cost very little more than expanding the system to existing permanent residents or occupied lots because they are spread across the development. This makes the small differences in cost not worth exploring for this report.



Advantages

This solution would provide a closed system of sewer collection for the entire development. This method is the type used for most residential systems monitored and approved by the MDNR. A closed system is considered safer to the environment because it is designed to not have interactions by the operators on a constant basis (no truck pumping).

All of the lots could be utilized for permanent residents and therefore no restriction of this type of usage due to the sewer collection system.

Disadvantages

This system would cost \$7,131,939 and require 9.9 miles of new sewer line and 856 grinder pumps. The cost per existing lot owner would be \$8,332. Again the primary use of this development is for a campground with intermittent use by predominately by lower to middle class economic class. This cost is well beyond the ability for the residents or developer of this subdivision to pay for now or even in the future.

In addition, this solution would require either immediately or in the near future an expansion of the wastewater treatment facilities to accommodate the expansion of water usage realized when central collection is available. The current usage is very low because of the lack of ease of disposal of the wastewater, but it is assumed that this will increase to closer to an average usage seen across all systems. The current amount permitted for wastewater disposal in the development is about 1/6 of the average population of the sold lots. Even with this possible usage, the actual usage as documented by the well volumes is less than what is permitted, even when a large part of the water is not used for residential purposes (water the road). The required expansion would be an additional cost that this development would have a very difficult time funding.

Summary Revised 7/31/16

Many solutions were discussed in this report; however, we believe a very clear solution has been presented.

Solution 3 would require the repair or replacement of the existing sanitary sewer collection system, a rebuild of the existing dump stations and additions of level indicators on all pump stations. The estimated costs for these changes are \$418,983.

Solution 3 is the one that would solve the concerns of the MDNR over concerns of possible release of untreated sewage and would allow for the changes to be within the ability of the development to pay for. In addition, this is the same system that has been in place since the beginning of the subdivision and this solution may be grandfathered. Also, this system would incentives the use of the lowest amount of water and has proven to do so in the past.

As stated previously, this would maintain the use of the holding tanks and may require usage other than recreational to be limited in some form by the WWLOA. The best way to ensure that the system is wholly the WWLOA responsibility is to enforce a system of design and installation by them, however, an approval by the DNR or the Callaway Health Department could be utilized.

Detailed Requirements of Solution 3

Repair or replace existing Collection System.

Dump stations to be rebuilt to better contain sewage during operation.

Existing holding tanks to be tested for water tightness and level indicators visible easily from the roadway to be added at owner's cost.

No more permanent residences allowed.

The small amount of permanent residences should be grandfathered while the deed holder still resides in the said residence. It shall not be deeded or inherited by any others. Unless the residence is connected into the existing collection system.

Holding tanks will still be utilized for recreational use.

The WWLOA and lot owner shall monitor the holding tanks for the need to be pumped out. This shall be on a daily basis. The existing security and maintenance personnel can be trained along with the system operator to monitor these tanks.

The WWLOA will have an approved holding tank design and inspect any new or replacing of holding tanks to ensure that the holding tanks meets the requirements.

All pumping and maintenance activities should be logged and maintained.