



3847 Country Manor West - P.O. Box 18 - North Vernon, Indiana 47265

Office: (812) 346-5500 - Fax: (812) 346-0838 - www.JNRU.org

Manager's Comments

Thursday, March 5, 2009

Preliminary Engineering Reports (PERs)

- *Collection System Evaluation and Rehabilitation Plan
- *Wastewater Treatment Plant Improvement Project

Project Need: There's one primary reason we're preparing to make improvements to JNRU's Wastewater Treatment Plant (WWTP) and Country Squire Lakes (CSLs) Sewage Collection System;

- *The reason, JNRU's recurring non-compliance with the National Pollutant Discharge Elimination System (NPDES) permit and the IDEM Agreed Order. The goal of these projects is to prevent future non-compliance events, thus protecting public health and the environment.*

History of Non-Compliance: JNRU is required to report non-compliance events to IDEM; JNRU reports non-compliance events to IDEM on the reports listed below:

- 1) **Bypass/Overflow Reports;** *when the sewage collection system overflows...*
 - a. *during heavy rain events,*
 - b. *when equipment fails (i.e. vacuum pits, pumps, leaks, etc...), and*
 - c. *when grease and other debris is disposed of down residential sewer drains and blocks sewer pipes.*
- 2) **Non-Compliance Reports;** *when the wastewater in the WWTP is freezing to the point of stopping the biological process and preventing adequate sewage treatment.*

Solving the Problem; it's very important that we correct the problems with our sanitary sewer system and treatment process. Permit violations are signs that discharged wastewaters are potentially harmful to the environment and public health. These problems begin on private property (*residential sewer laterals*) and work their way through the sewage collection system. To solve the problem we must first understand why it exists. Beginning with Sanitary Sewer Overflows (SSOs), I'll explain the common causes of each problem and touch on some private property concerns.

- **PROBLEM #1; Sewer Collection System Overflows**
 - **CAUSE #1; Rain Events:** The Country Squire Lakes sanitary sewer system is, by design, completely separated from any storm water sewer system. However, rain does enter the sanitary sewer system and does overflow during almost every large rain event. So, how can storm water influence our sanitary sewer system? The answer is –rain enters the sanitary sewer through the sources listed below:



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- **SOURCE #1; Broken sewer service laterals on vacant properties** (*Years of poor maintenance of abandoned residential service laterals is possibly the largest contributing factor to rain entering the sewer system*), and
- **SOURCE #2; Leaking manholes sections and pipe joints** (the utility company charged with oversight of the sewer system must regularly monitor, identify, and repair these sources of rain water entering the sewer system to prevent the problem).
 - **The Fix**
 - Complete a Lot-to-Lot survey to identify and repair all broken sewer laterals as recommended in the PER.
 - Complete manhole and gravity sewer system rehabilitation as recommended in PER.
 - Install sewer service lateral valves on all tapped properties during construction (*see attached information*), and continue installing valves as new taps are installed. *Additional cost involved.*
- **CAUSE #2; Equipment Failures:** Vacuum stations, pits, pumps and pipes have almost all exceeded their useful life, which is evident by their rate of failure. When any of this equipment fails to operate properly, it can, and frequently does, disable the sewer system and prevent the actual collection of wastewater discharges from homes, many times resulting in an SSO.
 - **The Fix**
 - Near complete replacement of the vacuum stations, vacuum pits, and vacuum pipeline as recommended in the PER.
- **CAUSE #3; Sewer Pipe Blockages:** The sewer pipeline connecting vacuum pits to the residential sewer service laterals are typically 3-inch gravity pipes. Today, a sewer professional might consider a 3-inch sewer main undersized for more than one home connection. However, in Country Squire Lakes, this is typical in most instances where multiple home laterals connect to vacuum pits rather than a conventional gravity sewer system. The existing undersized pipe, serpentine pipe-placement, and residential misuse (*disposing of grease and a multitude of foreign objects*) of the sanitary sewers are a significant contribution to the overflowing sewer problems within Country Squire Lakes. *Sewer pipe blockages are also a significant cause of sewage backups into homes.*
 - **The Fix**
 - Near complete replacement of all 3-inch gravity sewer mains as recommended in the PER.
 - Educate residents of the proper use of sanitary sewer systems to reduce and/or prevent future problems created by misuse. (Educational fliers can be provided to customers)



- *Important advice for homeowners!* If your home in CSL is not occupied (*lived in*) full-time, I recommend installing a check-valve and a service line valve in your private sewer line to protect your home from sewer backups while you're gone. (*Owners should keep these protective devices accessible and maintainable.*) Smaller sewer mains will continue to plug as long as grease and other foreign objects are being disposed of down residential sewer drains. Although we are in a good position to discourage this type of sewer use, it is well beyond the utilities ability to prevent. Homeowners that leave their home vacant during the week, weekends, or for extended vacations have come home on many occasions to find their homes flooded with sewage. Isolation valves will protect your investments.

- **PROBLEM #2; Wastewater Treatment Plant (WWTP) Non-Compliance**
 - CAUSE #1; Freezing Temperatures: The biological process that treats wastewater slows down as the temperature drops below 10-degrees Celsius causing non-compliance violations leading into the coldest months of winter, when it eventually stops. Once the treatment process stops, we divert influent flow to storage lagoons for approximately 4-6 weeks. Re-starting the WWTP begins when the lagoons are nearly full; many times well before the temperatures are warm enough to efficiently start-up the biological process. Start-up generally takes at least one (1) month, but usually several months, depending on the climate. And typically we'll have recurring non-compliance events throughout the start-up period.
 - **SOURCE #1; Vacuum Sewers** (Leaking vacuum sewer lines and failing vacuum valves cool the wastewater on its path to the WWTP to as low as 2-degrees Celsius)
 - **SOURCE #2; Mechanical Aeration** (Drives wastewater temperatures below the freezing point)
 - **The Fix**
 - Replace all of the vacuum system components to eliminate all the leaks and failing equipment as recommended in the PER, or
 - Replace all of the vacuum system with a low-pressure sewer system (this option would correct the freezing problem, but would cost at least \$2,000,000 more)
 - Replace the existing Sequencing Batch Reactors aeration system with diffused aeration. (All of the engineering options eliminate the mechanical aeration)