

# **Nitrogen Impact of Onsite Sewage Treatment and Disposal Systems in the Wekiva Study Area**

## **June 30, 2007**

### **Executive Summary**

The 2006 Legislature in Specific Appropriation 566 allotted \$250,000 to the Florida Department of Health (FDOH) to assess whether onsite sewage treatment and disposal systems (OSTDS) are a “significant source of nitrogen to the underlying groundwater relative to other sources” within the Wekiva Study Area (WSA) and, if so, “to recommend a range of cost-effective nitrogen reduction strategies.” The department, with direction from the Research Review and Advisory Committee (RRAC), contracted for the assessment in three tasks. The questions were how much nitrogen comes out of septic tank (input) and how much nitrogen makes it to the groundwater (load).

The first task collected field data from groundwater around drainfields from three sites in the area. This task found high concentrations of nitrogen stemming from all three systems and a higher nitrogen input into the environment than expected (29 vs. 20 pounds per system per year) based on previous DOH research. Groundwater monitoring showed that nitrogen movement from onsite systems in the environment is complex. Relying only on the soil for treatment is not a reliable method to achieve load reductions.

A second task reviewed applicable literature to refine the loading estimate to the groundwater from onsite systems. This task developed a classification system to incorporate the influence of soil conditions and wastewater characteristics on nitrogen loading to the groundwater. The study resulted in a range of estimated percentages of nitrogen removal as a function of soil characteristics and system type. The results were generally consistent with the assumptions of the Florida Department of Environmental Protection (FDEP) March, 2007, Phase 1 Report Wekiva River Basin Nitrate Sourcing Study prepared by MACTEC.

The third task was to determine whether onsite systems are a significant source of nitrogen to groundwater relative to other sources. This determination utilized data from the second task and the MACTEC study to estimate inputs to the environment and loading to groundwater from all sources of nitrogen in the area. Fertilizer use accounted for 71 percent of all inputs. Inputs to the environment from onsite systems were estimated to be 6 percent of the total input. This was based on an assumption of 20 pounds of nitrogen per year for 55,000 systems or a total of 1.1 million pounds per year. Based on this input the total estimated amount of nitrogen from onsite sewage treatment and disposal systems that is loaded to the groundwater is about 900,000 pounds per year. MACTEC’s approach to estimating loading to groundwater resulted in an increased fraction of wastewater and a decreased fraction of fertilizer. Due to uncertainty and disagreements about this approach, RRAC recommended to the department that an assessment of loading contributions by all sources not be included in this report

RRAC did not make a final decision on whether the OSTDS are a significant source of nitrogen load to the groundwater because the committee is uncomfortable with the methodologies and assumptions used in the calculations of the MACTEC loading numbers. RRAC decided that verification of the loading contribution from other sources by FDEP was necessary before any decision can be made relative to the significance of the nitrogen contribution from onsite systems in the WSA, and what, if any, cost-effective strategies the committee would endorse.

The U.S. Environmental Protection Agency has established the goal of a 95% reduction in nitrogen concentrations for Wekiwa Springs and for Rock Springs Run. Additionally, the Saint Johns River Water Management District has proposed an 82% reduction for Wekiwa Springs, an 85% reduction for Rock Springs, a 69% reduction in the upper Wekiva River, and a 36% reduction for the Lower Wekiva River. Realizing that these established reduction goals present

a challenge to all contributors the department finds that all contributors must work toward addressing their share of the problem. The contribution of onsite systems to nitrogen inputs to the Wekiva Study Area provides a starting point to determine this share.

While the department cannot yet determine the relative contribution of onsite systems to groundwater loading compared to other sources, the department recognizes onsite systems do have an impact on the nitrogen input to groundwater. Based on the established and proposed nitrogen reduction goals the department recommends the following strategies to reduce nitrogen input from onsite systems:

- The Legislature should consider implementing a nitrogen discharge fee for all sources to fund the most cost-effective nitrogen reduction projects in the Wekiva Study Area to be administered by the Wekiva River Basin Coordinating Committee or other suitable agency.
- The Legislature should consider implementing an onsite wastewater management utility (EPA Model 4) in which operation, maintenance, and inspection of systems are the responsibility of a responsible maintenance entity instead of the individual homeowner. A portion of the funds collected should be used to assist with upgrades of onsite systems or connection to a wastewater treatment facility. Otherwise, require an operating permit for all onsite systems and require all onsite systems be inspected every five years and during real estate transactions. Use a portion of the operating permit fee to fund a grant program to assist low income homeowners with upgrades or sewer connection fees. The department will provide a legislative proposal for the 2008 session.
- The Legislature should consider eliminating grandfather provisions in 381.0065, Florida Statutes, with regard to minimum lot sizes and surface water setbacks. The department will provide a legislative proposal for the 2008 session.
- The department should amend Chapter 64E-6, Florida Administrative Code, to require all systems in need of repair or modification be upgraded to new system water table separation and surface water setback standards.
- The department should require that all new onsite systems in the Wekiva Study Area be performance based treatment systems providing nitrogen reduction pretreatment.
- The department and local governments should create an inventory of all onsite systems in the Wekiva Study Area that can be maintained in cooperation between county health departments and county property appraisers.
- The department should prohibit the land spreading of septage and grease trap waste in the study area. Septage waste would be required to be disposed of at wastewater treatment plants permitted by the Florida Department of Environmental Protection.
- The department recommends that state and local planning agencies evaluate the economic feasibility of sewerage areas with existing onsite sewage treatment and disposal systems. Areas with high densities of development will be better suited to central sewerage.