

FL Department of Health  
STATUS REPORT ON PHASE II AND PHASE III  
OF THE FLORIDA ONSITE SEWAGE  
NITROGEN REDUCTION STRATEGIES STUDY  
February 1, 2013

Executive Summary Excerpts

To date, the FL legislature has provided \$4.4 million for a project developing cost-effective, passive strategies for nitrogen reduction in onsite sewage treatment and disposal systems (OSTDS). A final appropriation is needed for project completion by January 2015. Funds expended to date established viable protocols and refined technologies and strategies to be tested in the field. The project should benefit Florida's 2.7 million onsite system owners with cost-effective, practical nitrogen-reduction strategies to protect the environment and public health.

Fiscal year 2012-2013 efforts are focused on installing, monitoring, and modeling OSTDS field sites at ten locations throughout Florida. Tasks include: continuation and completion of field monitoring of both the performance and cost of technologies at home sites and of nitrogen fate and transport in shallow groundwater; development of nitrogen fate/transport models calibrated with field sampling results; and final reporting with recommendations on onsite sewage nitrogen-reduction strategies. An advisory committee to the Department recommends: (1) that for FY 2013-14 the Legislature provides the final cash installment of \$700,000 and \$1,000,000 in budget authority to continue field testing, and (2) that for FY 2014-15 the Legislature provides \$500,000 in budget authority for completion of the legislatively mandated study.

Report Excerpts

The relative impact of OSTDS on total nitrogen levels varies from watershed to watershed with estimates ranging from below five to more than 20 percent. The goal of this project is to develop systems that complement the use of conventional OSTDS, are affordable and ecologically protective, and have reduced engineering and installation costs.

This study was based on budget language in General Appropriations Act for Fiscal Year 2008-2009) that instructed the Department of Health to contract for an anticipated 3-year project to perform (1) a comprehensive review of studies on passive technologies; (2) field testing of nitrogen-reducing technologies at home sites to compare the performance of conventional, passive technologies and performance-based treatment systems; (3) documentation of all capital, energy and life-cycle costs of various technologies for nitrogen reduction; (4) evaluation of nitrogen reduction provided by soils and the shallow groundwater below and down-gradient of various systems; and (5) development of a simple model for predicting nitrogen fate/transport from onsite wastewater systems.

The study contract was awarded in January 2009 to a Project Team led by Hazen and Sawyer. The contract identifies the following tasks:

Task A – Technology Evaluation for Field Testing: This task includes literature review, technology evaluation, prioritization of technologies to be examined during field testing at actual home sites, further experimentation with approaches tested in a previous DOH passive nitrogen-removal study, and controlled tests to develop design criteria for new passive nitrogen-reduction systems.

Task B – Field Testing of Technologies and Cost Documentation: This task includes installation of top-ranked nitrogen-reduction technologies at actual homes, with documentation of their performance and cost. Cost documentation for the systems will be broken down by permitting, design, materials and construction, and operation and maintenance.

Task C – Evaluation of Nitrogen Reduction Provided by Soils and Shallow Groundwater: This task includes several field evaluations of nitrogen reduction in Florida soils and shallow groundwater; it will provide data for development of a simple planning model in Task D.

Task D – Nitrogen Fate and Transport Modeling: The objective of this task is to develop a simple fate and transport model of nitrogen from OSTDS that can be used for assessment, planning and siting of OSTDS.

The contractor has completed parts of Tasks A, B, C, and D, including: literature reviews (complete); ranking of nitrogen reduction technologies for field testing (complete); design and construction of a test facility for further development of passive technologies; development of quality assurance documents for the test facility work, groundwater monitoring, field testing, and nitrogen fate and transport modeling; installation of nitrogen-reducing systems at two home sites; completion of several sampling events of passive systems at the test facility and field sites; design and construction of a soil and groundwater test facility; and field sampling of the soil and groundwater under OSTDS at residential homes throughout Florida and at the test facility. All sample events at the test facility have been completed. Test results are encouraging after 12 months of testing, showing a reduction in total nitrogen of over 95%, with a final effluent concentration of 2.6 mg/L or less for several of the systems.

Work remaining for this fiscal year includes: system installation and field sampling at additional home sites for the testing of passive systems and the soil and groundwater under OSTDS; sampling at the soil and groundwater test facility; and continued development of a nitrogen fate and transport model. Tasks associated with the final phase include: continuation and completion of field monitoring of performance and cost of technologies at home sites and of nitrogen fate and transport in the shallow groundwater; calibration and refinement of various nitrogen fate and transport models that will be calibrated with the field sampling results; and final reporting on all tasks with recommendations on onsite sewage nitrogen reduction strategies.

A report providing a technical description of nitrogen-reduction technologies will be written, as well as a report providing a template and user guidelines for system life cycle cost assessments. To evaluate nitrogen reduction provided by soils and shallow groundwater, a soil and groundwater test facility has been constructed to show how groundwater fate and transport of nitrogen occurs in multiple soil treatment unit regimes.

Table 2 of the report shows field work status by county for Tasks B and C. Sixty sites have been evaluated in 11 counties, and agreements have been reached on 18 of them. The field sites closest to Alachua County – eight of them – are in Marion County.