



Institute of Food and Agricultural Sciences  
Facilities Planning and Operations

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PO Box 110850  
Gainesville, FL 32611-0850  
352-392-6488  
352-392-3161 Fax

June 6, 2010

Dr. Lisa Conti  
Director  
Division of Environmental Health  
4052 Bald Cypress Way Bin A-08  
Tallahassee FL 32399

Dear Dr. Conti,

Please find enclosed one (1) original Memorandum of Agreement between the Florida Department of Health and the University of Florida Board of Trustees that has been fully executed by all parties.

If you have any questions, please feel free to contact me at (352) 392-6488 extension 231.  
Thank you.

Sincerely,

A handwritten signature in black ink that reads 'Sheri Munn'.

Sheri Munn  
Assistant Director

sa

C: Craig Stanley ✓

Enclosure

**MEMORANDUM of AGREEMENT**

**BETWEEN**

**THE FLORIDA DEPARTMENT OF HEALTH  
AND  
THE UNIVERSITY OF FLORIDA BOARD OF TRUSTEES**

This Memorandum of Agreement dated June 1, 2010 is entered into by and between the Florida Department of Health (DOH) and the University of Florida Board of Trustees on behalf of the Institute of Food and Agricultural Sciences Gulf Coast Research and Education Center (GCREC).

WHEREAS, DOH is the agency authorized by the Legislature to maintain a comprehensive regulatory program with regard to onsite sewage treatment and disposal systems (OSTDS) in the State of Florida.

WHEREAS, DOH's statutory responsibilities are delineated in part in section 381.0065, Florida Statutes, which includes authority to supervise research on the environmental and public health impact of OSTDS used in Florida. §381.0065(3)(j), Fla. Stat.

WHEREAS, GCREC is engaged in the study of wastewater treatment and the environmental fate and transport of wastewater constituents.

WHEREAS, DOH desires to engage in a project to construct an onsite wastewater research and testing facility and it has contracted with Hazen and Sawyer, Environmental Engineer and Scientist to perform the referenced project.

WHEREAS, the project is to be constructed at the GCREC Balm, Florida campus.

**I. STATUTORY AUTHORITY**

This Memorandum of Agreement (Agreement) is entered into pursuant to the provisions of sections 381.0011, and 381.0065(3)(j), Florida Statutes.

**II. PURPOSE**

The purpose of this Agreement is to establish the general conditions and processes that will enable DOH and GCREC to collaborate in the design, construction, operation, modification and upkeep of an onsite wastewater research and testing facility (the "Facility") at the GCREC Balm campus, which includes disposal of effluent onsite. A description of the Facility and the treatment methods being utilized at the Facility are described on Exhibit A, attached hereto and incorporated herein by reference.

2. To provide the other party with copies of final project reports.
3. To establish a contingency plan outlining procedures for shutting down any failing component and bypassing into the sewer system.
4. Both GCREC and DOH, a subdivision of the state and a state agency, as defined by section 768.28 Florida statutes agree to be fully responsible to the limits set forth in section 768.28 for their own negligent acts which result in claims or suits against each party respectively and agree to be liable to the limits set forth in section 768.28, for any damages caused by said acts. Nothing herein shall be construed as a waiver of sovereign immunity by GCREC or the DOH.

#### **IV. AGREEMENT MANAGERS**

The following persons are hereby authorized to coordinate between the agencies and act as managers to this Agreement:

##### **DEPARTMENT OF HEALTH**

Elke Ursin  
Environmental Health Program Consultant  
4052 Bald Cypress Way, Bin A-08  
Tallahassee, Florida 32399-1713  
(850) 245-4070 x 2708  
[Elke\\_Ursin@doh.state.fl.us](mailto:Elke_Ursin@doh.state.fl.us)

##### **GULF COAST RESEARCH AND EDUCATION CENTER**

Craig D. Stanley, Ph.D.  
Professor and Associate Center Director  
University of Florida, IFAS  
Gulf Coast Research and Education Center  
14625 CR 672  
Wimauma, FL 33598  
(813) 633-4117  
[cdstan@ufl.edu](mailto:cdstan@ufl.edu)

#### **V. TERM OF AGREEMENT**

This Agreement shall begin on the date on which it is signed by both parties, and shall expire five (5) years from execution unless an extension is agreed to by the parties.

**VI. REVIEW AND MODIFICATION**

Upon request of either party, both parties will review this Agreement in order to determine whether its terms and conditions are still appropriate. Modifications to the Agreement shall be valid upon execution of a formal written amendment to the Agreement.

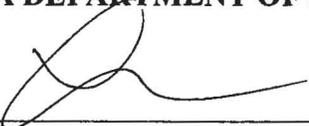
**VII. TERMINATION**

This Agreement may be terminated at any time upon mutual consent of the parties, or unilaterally by either party upon no less than (30) days notice by U. S. Mail.

**VIII. SIGNATURES**

By signing below, both parties agree to the terms and conditions contained herein:

**FLORIDA DEPARTMENT OF HEALTH**

  
\_\_\_\_\_  
Dr. Lisa Conti, D.V.M., M.P.H., Dipl. ACVPM, CEHP  
Director, Division of Environmental Health

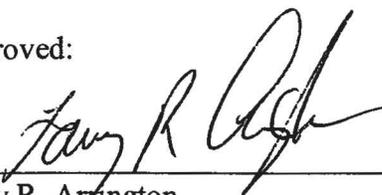
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Date

**UNIVERSITY OF FLORIDA BOARD OF TRUSTEES ON BEHALF OF  
GULF COAST RESEARCH AND EDUCATION CENTER**

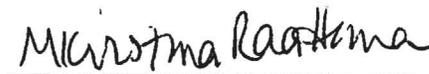
  
\_\_\_\_\_  
Ed Poppell, Vice President for Business Affairs

4/1/10  
\_\_\_\_\_  
Date

Approved:

  
\_\_\_\_\_  
Larry R. Arrington,  
Interim Vice President for Agriculture and Natural Resources

**APPROVED AS TO FORM  
AND LEGALITY**

  
\_\_\_\_\_  
Office of the General Counsel  
University of Florida

Approved:

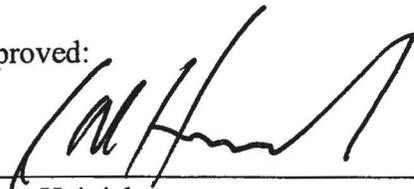
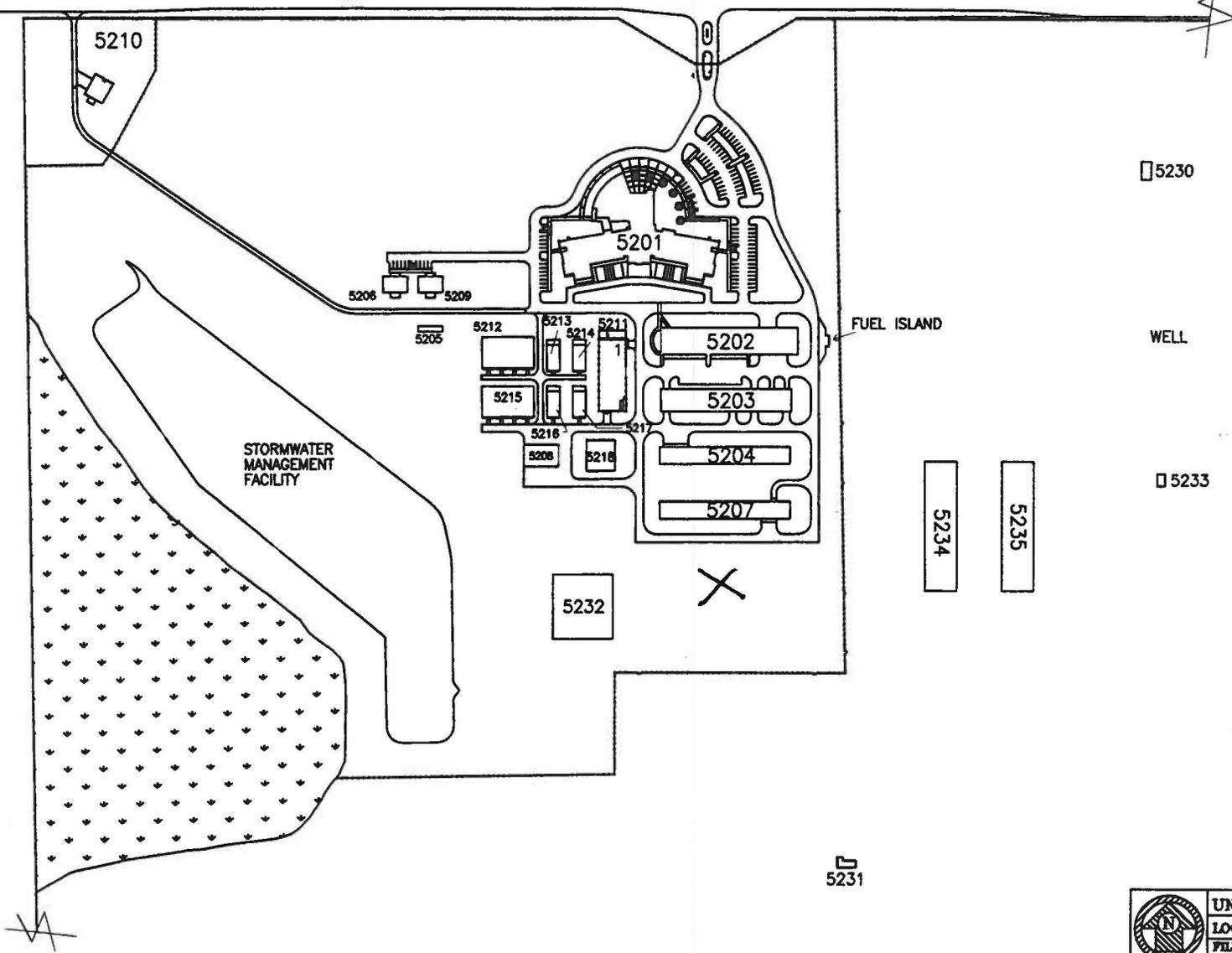
  
\_\_\_\_\_  
Kevin Heinicka,  
Director, IFAS Facilities Planning & Operations

EXHIBIT A

COUNTY ROAD 672



	UNIVERSITY OF FLORIDA	
	LOCATION: GCREC-BALM	
	FILENAME: S-52-BALM	REV DATE: 3/06



## Section 3.0

### Project Description

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#### 3.1 Project Purpose

To evaluate candidate media and treatment processes for development of more passive nitrogen removal systems for onsite wastewater treatment.

#### 3.2 Project Objectives

The objective is to establish pilot passive nitrogen removal systems to evaluate the effectiveness of various media and two-stage biofilter designs in removing total nitrogen from septic tank effluent. The pilot test systems will consist of various configurations of in-tank biofilters and passive in-situ systems. In-tank systems will primarily employ variants of the two-stage biofiltration concepts elucidated in PNRS I. In-situ technology evaluation will include a drip irrigation system for effluent dosing, with emitters located in shallow root zones.

In the two-stage biofilter process, a first stage unsaturated biofilter is followed in series by a second stage biofilter operated in a water saturated mode. Septic tank effluent will be applied to the top of the first stage media, resulting in a downward percolation of wastewater over and through the media biofilter bed. The unsaturated pore spaces in the first stage media will allow air to reach microorganisms attached to the media surfaces, enabling aerobic biochemical reactions to occur. The significant target reactions are aerobic heterotrophic oxidation (by microorganisms that oxidize organic material and reduce biochemical oxygen demand), hydrolysis and ammonification (releasing ammonia), and nitrification (biochemical conversion of ammonia to nitrate and nitrite). Of particular interest are the organic and ammonia nitrogen concentrations in first stage effluent, as well as nitrate and nitrite.

Effluent from the bottom of the first stage biofilter is passed through a saturated anoxic biofilter that contains a reactive media that supplies electron donor for denitrification (reduction of nitrate and nitrite to  $N_2$  gas). The biofiltration systems will be operated over a twelve month period, if funding is available, and monitored for nitrogen species and other water quality parameters. Of particular interest are the concentrations of ammonia in first stage effluent and nitrate, nitrite and total nitrogen in the second stage effluent.

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The interaction of media with applied wastewater governs the treatment process. Key features affecting nitrogen removal performance include:

1. The effects of hydraulic and nitrogen loading rates, on average daily and per dose basis, on first stage effluent nitrogen concentrations.
2. The effects of first stage media on effluent nitrogen levels.
3. Alkalinity consumption in the first stage and its possible effects on nitrification.
4. The effects of hydraulic and nitrogen loading rates, on average daily basis, on second stage effluent nitrogen concentrations.
5. The effects of second stage media on effluent nitrogen levels.
6. Second stage effluent total nitrogen concentrations and speciation into organic, ammonia, and oxidized nitrogen forms.
7. Alkalinity consumption or restoration in the second stage and its possible effects on denitrification.
8. Use of first stage recycle.

### 3.3 Project Tasks and Timeline

Project tasks and preliminary timeline are shown in Table 3.1. The start dates and tasks are contingent upon Recommendations for Process Forward (FOSNRS Task A.14). The task descriptions provide a template by which the project team will conduct the PNRS II project. The nature of technology demonstration projects will necessitate system and testing modifications during the course of the study. It is important to recognize that operational adaptation is a central feature of pilot testing and process optimization. A typical example is a modification in operation as a result of assessment of performance data, where a higher loading rate is applied to a well functioning system to evaluate performance over a wider loading envelope. The QAPP establishes initial loading rates for PNRS II systems that may be adjusted as the study progresses, based on ongoing results and the professional judgment of the project team. A degree of discretion must be afforded to the project team to make modifications as warranted. Additionally, longer term operation of successful onsite treatment systems is warranted but dependent on future funding. All substantive modifications will be fully communicated to FDOH.

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