

Turfgrass Nutrient Management Symposium

Results from the FDEP-Funded

“Evaluation of Urban Warm-Season Turfgrass Fertilization and Irrigation Best Management Practices to Minimize Nutrient Leaching Project”

Overview and Research Methodology of the FDEP-funded WM869 Project

J. Bryan Unruh, Ph.D.



Turfgrass Science

Justification

- Due to increased concerns regarding impairment of Florida's ground and surface waters from commercial home lawn and landscape maintenance practices, research was proposed to determine the most appropriate fertilization rates and practices on a statewide basis.

Objectives

1. Provide data on best fertilization and irrigation regimes on various grasses during establishment in different locations of the state.
2. Provide nitrate and ortho-phosphate leaching data on various species at the fertilization levels in these studies.
3. Provide recommendations to the commercial lawn care industry for BMP fertilization rates that can be applied state-wide.



Milton

- Centipedegrass
 - Seeded vs. Sodded

Gainesville

- St. Augustinegrass
- Zoysiagrass

Ft. Lauderdale

- Muck-grown sod
- Sand-grown sod

Nitrate Leaching from Newly Sodded or Seeded Grasses



Jay/Milton

- Centipedegrass
- St. Augustinegrass

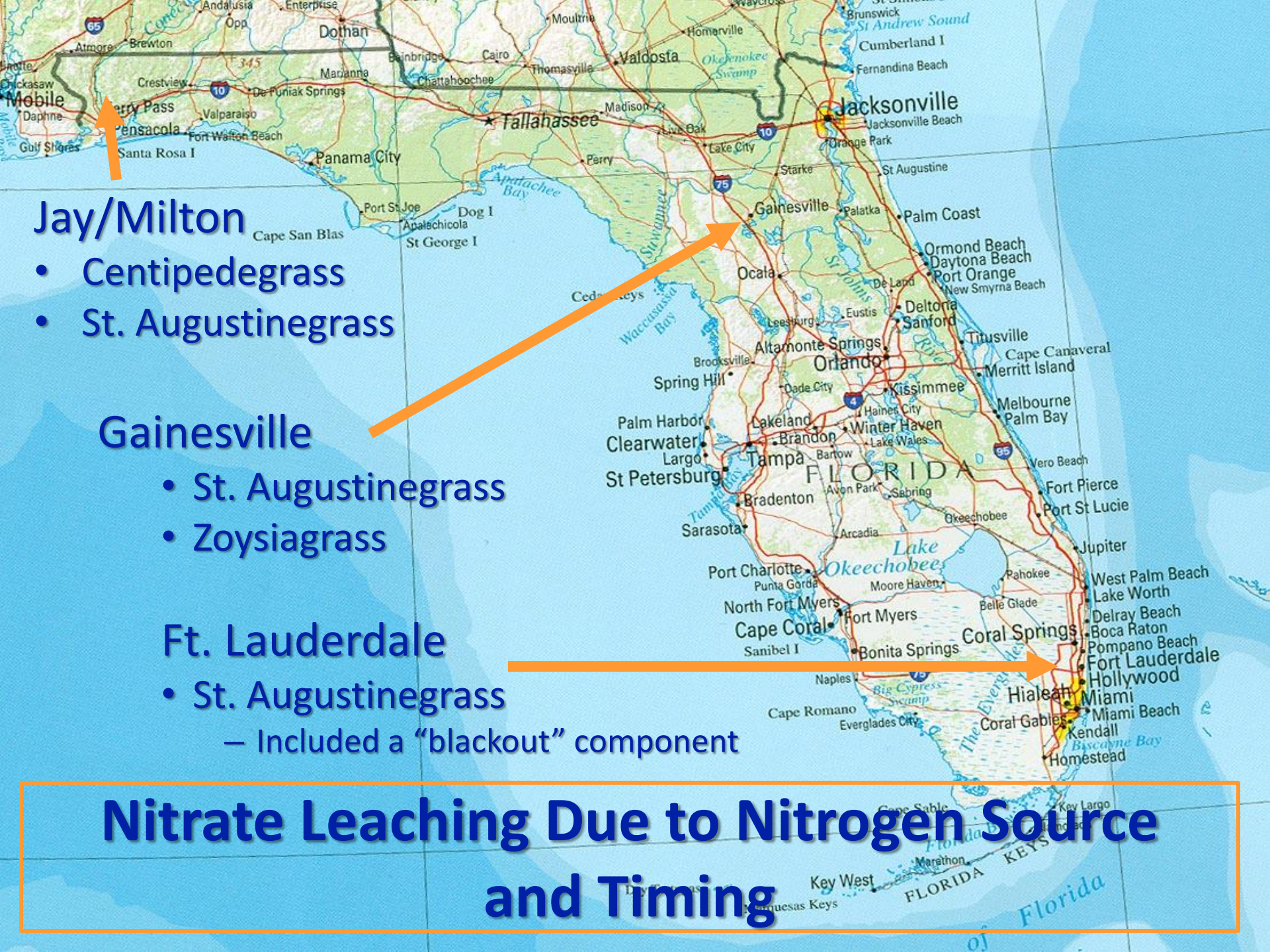
Gainesville

- St. Augustinegrass
- Zoysiagrass

Ft. Lauderdale

- St. Augustinegrass
- Bahiagrass

Nitrate Leaching from Established Grasses



Jay/Milton

- Centipedegrass
- St. Augustinegrass

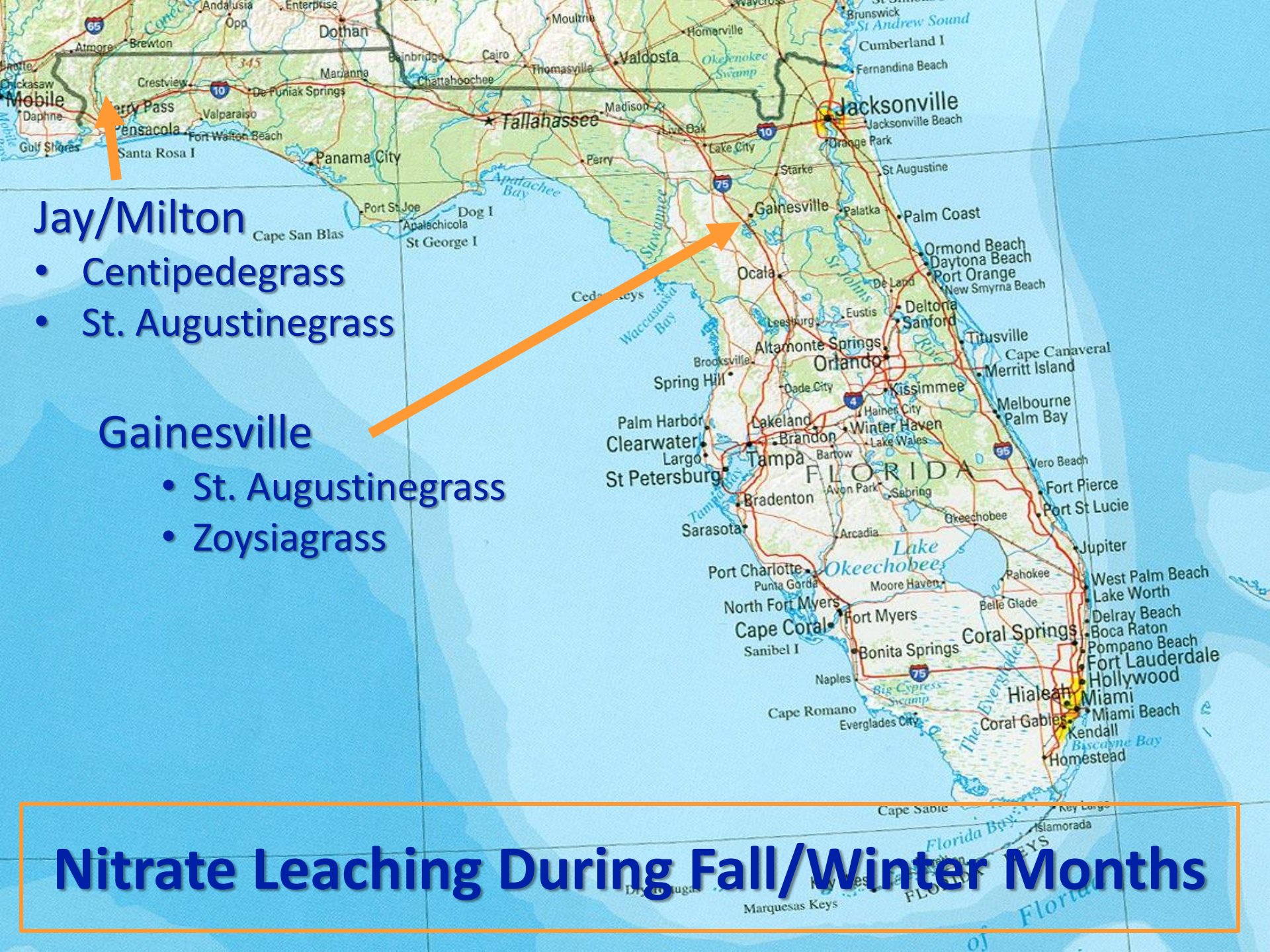
Gainesville

- St. Augustinegrass
- Zoysiagrass

Ft. Lauderdale

- St. Augustinegrass
- Included a “blackout” component

**Nitrate Leaching Due to Nitrogen Source
and Timing**



Jay/Milton

- Centipedegrass
- St. Augustinegrass

Gainesville

- St. Augustinegrass
- Zoysiagrass

Nitrate Leaching During Fall/Winter Months

Gainesville

- St. Augustinegrass
- Zoysiagrass
- Field/Glasshouse Projects
 - Identify the critical P requirement

Ft. Lauderdale

- St. Augustinegrass
- Bahiagrass
- Phosphorus Soil Test Kit

Phosphorus Research





Jay/Milton

- Centipedegrass
- Six N sources

Slow Release Nitrogen Source Study



Lysimeter Installation

Gainesville & Jay

Turfgrass Science



Boring of Holes for Lysimeter Installation



Pre-Constructed Lysimeters for Field Installation



Soil replaced in lysimeters and tamped to appropriate density.

Sod Installation at the Jay, FL Location of the BMP Research Project



Sod Installation at the Jay, FL Location of the BMP Research Project



Florida DEP Funded BMP Research – Jay, FL





Installation of Lysimeters at Ft. Lauderdale, FL (above grade)



Florida DEP Funded BMP Research



**Above-grade DEP Research Site
in Ft. Lauderdale, FL**



**Collection Point Stations on DEP
Research Site in Ft. Lauderdale, FL**



**Turfgrass Leaching Plots on DEP
Research Site in Ft. Lauderdale, FL**

Mixing Fertilizer Solutions for Treatment of DEP BMP Plots





Granular Fertilizer Application to Newly Laid Sod

Sample Collection Gainesville





Leachate Collection Station

Leachate Collection Apparatus – Jay Site



Phosphorus Research Projects



Phosphorus Requirement of Florida Lawn Grasses



Phosphorus Requirement of Florida Lawn Grasses

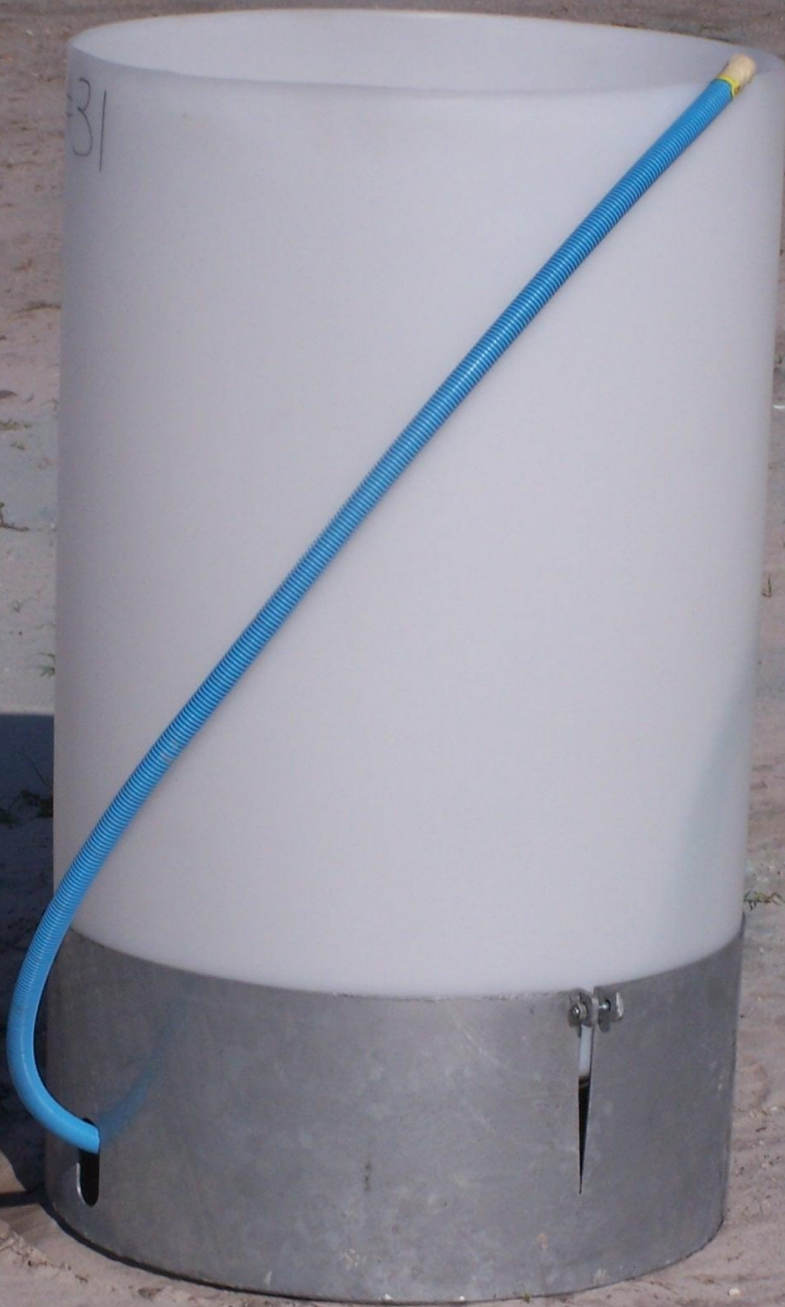


Phosphorus Requirement of Florida Lawn Grasses



**Native Soil Removed Prior to
Installation of Lysimeters**







**Soils Low in Phosphorus Placed Over
Lysimeters**



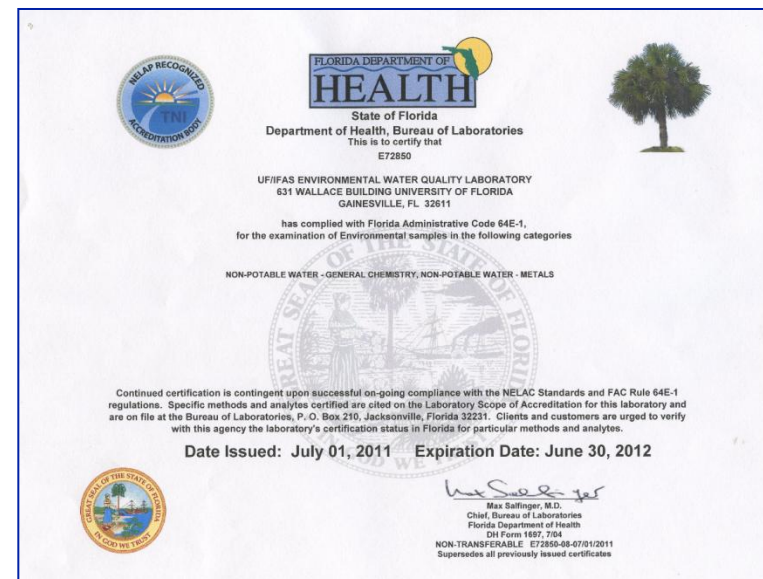
Sample Collection




- All leachate from the lysimeters was collected by applying a vacuum to collection ports (gravity-fed in FTL).
- Grab samples were obtained each time the lysimeters were drained.
- Total leachate volume was recorded.
- Appropriate field blanks and duplicates taken.
- Samples packed and shipped to GNV for analysis.

Sample Analysis

- Sample analysis was by colorimetric auto analyzer at the UF/IFAS Environmental Water Quality Laboratory in Gainesville.
 - EPA method 353.2 for NO₃-N + NO₂-N
 - EPA method 365.1 for Ortho-PO₄
- Data reviewed by QA officer.

- MDL's for NO_x and Ortho-P were 0.05 mg L⁻¹, and 2.5µg L⁻¹ until 01 Dec 2008 when they changed to 0.148 mg L⁻¹ and 3.0µg L⁻¹.
- PQL's for NO_x and Ortho-P were 0.5mg L⁻¹ and 10µg L⁻¹ and remained unchanged after 01 Dec 2008.



State of Florida
Department of Health, Bureau of Laboratories
This is to certify that
E72850

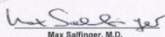
UF/IFAS ENVIRONMENTAL WATER QUALITY LABORATORY
631 WALLACE BUILDING UNIVERSITY OF FLORIDA
GAINESVILLE, FL 32611


has complied with Florida Administrative Code 64E-1,
for the examination of Environmental samples in the following categories

NON-POTABLE WATER - GENERAL CHEMISTRY, NON-POTABLE WATER - METALS

Continued certification is contingent upon successful on-going compliance with the NELAC Standards and FAC Rule 64E-1 regulations. Specific methods and analytes certified are cited on the Laboratory Scope of Accreditation for this laboratory and are on file at the Bureau of Laboratories, P. O. Box 210, Jacksonville, Florida 32231. Clients and customers are urged to verify with this agency the laboratory's certification status in Florida for particular methods and analytes.

Date Issued: July 01, 2011 Expiration Date: June 30, 2012


Max Salinger, M.D.
Chief, Bureau of Laboratories
Florida Department of Health
DH Form 1637, 7/04
NON-TRANSFERABLE E72850-08-07/01/2011
Supersedes all previously issued certificates



Interesting Facts and Figures

- Over 150,000 water samples!
- Over 1,000,000 data points!
- Ph.D. Dissertations:
 - Pauric C. McGroary
 - Ronald Francisco Gonzalez Chinchilla
 - Min Liu
- M.S. Theses:
 - Shweta Sharma
 - Jinyong Bae

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