Research Review & Advisory Committee (RRAC) Meeting

June 20, 2018

Environmental Health Staff

Disease Control and Health Protection

Bureau of Environmental Health

Onsite Sewage Programs

Agenda

1:00 – 1:10	Introductions and housekeeping
1:10 – 1:20	Review of minutes from December 12, 2017 meeting
1:20 – 1:30	Old business & research program news
1:30 – 2:00	Updates on the Onsite Sewage Treatment and Disposal System (OSTDS) remediation plan - DEP
2:00 – 2:30	Updates on the Department of Health (DOH) rule revision

Agenda - Continued

2:30 – 2:40	Review of RRAC ranked research projects
2:40 – 3:00	Updates on the Florida Water Management Inventory (FLWMI) project
3:00 – 3:20	Updates on the OSTDS funding investigation
3:20 – 3:40	Updates on the continued monitoring
3:40 – 4:00	Public Comments
4:00	Adjourn

Introductions & Housekeeping

- Committee roll call
- Identification of audience
- Will overall mute hitting *5
- Mute / unmute phone line = *6
- Do not put phone on hold
- Download meeting material:
  http://www.floridahealth.gov/environmental-health/onsite-sewage/research/rrac.html

Review of Meeting Minutes from December 12, 2017 Meeting

Old Business & Research Program News

Old Business

Action items from the RRAC meeting on December 12, 2017

1. Finalize the research projects ranking.
2. Continue or initiate high priority research projects.
3. Update memberships for several RRAC members.
4. Post meeting materials used for December, 2017 onto DOH's RRAC web page.

Final Research Projects Ranking

Project Title	Total Project Score	Project Ranking
Continuation of Florida Water Management Inventory	28	1
Continued Monitoring on Passive Nitrogen-Reducing Onsite Systems	28	2
Development of Funding Mechanisms for OSTDS Remediation and Upgrades	26	3
Correlations between water quality, OSTDS, and health effects	14	4
Estimation of failure or non-conformance rates of OSTDS	10	5

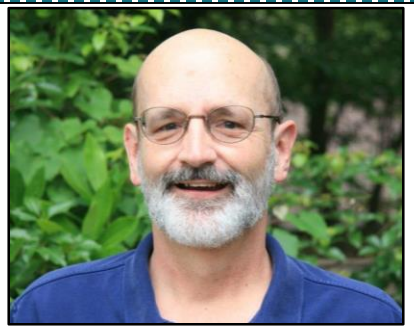
Membership Update

1. Memberships for the following RRAC members have been updated:
   a) **Mr. Craig Diamond** (Environmental Interest Group)
   b) **Mr. Geoff Luebkemann** (Florida Restaurant and Lodging Association)
   c) **Ms. Roxanne Groover** (Florida Onsite Wastewater Association)
2. Memberships will continue through January 31, 2021

Meeting Materials for the December 12, 2017 Meeting Posted:

http://www.floridahealth.gov/environmental-health/onsite-sewage/research/rrac.html

Program News



- Mr. Dale Holcomb retires August 16, 2018.

- Dale has been in Environmental Health for 37 years, most of these years in the Onsite Sewage Program.

- He worked for 25 years at the State Health Office, with the past 10 years as the Environmental Administrator in charge of program's Operations Subsection and responsible for statutory bill analysis, rule promulgation, variances, contractor licensing, technical assistance, outreach, and delivery of statewide trainings.

Program News - Continued

1. Legislature approved a Department request for an annual springs implementation categorical budget of approximately $1.3 million for onsite sewage staff augmentation in springs counties.

2. Concurrent with the spring categorical budget appropriation, County Health Departments across the State have taken a $40 million reduction in salary appropriations throughout the last 2 legislative sessions.

3. A survey of the spring BMAP-impacted counties shows that the majority of the non-agriculturally dominated counties are not significantly impacted by the budget reduction.

Program News - Continued

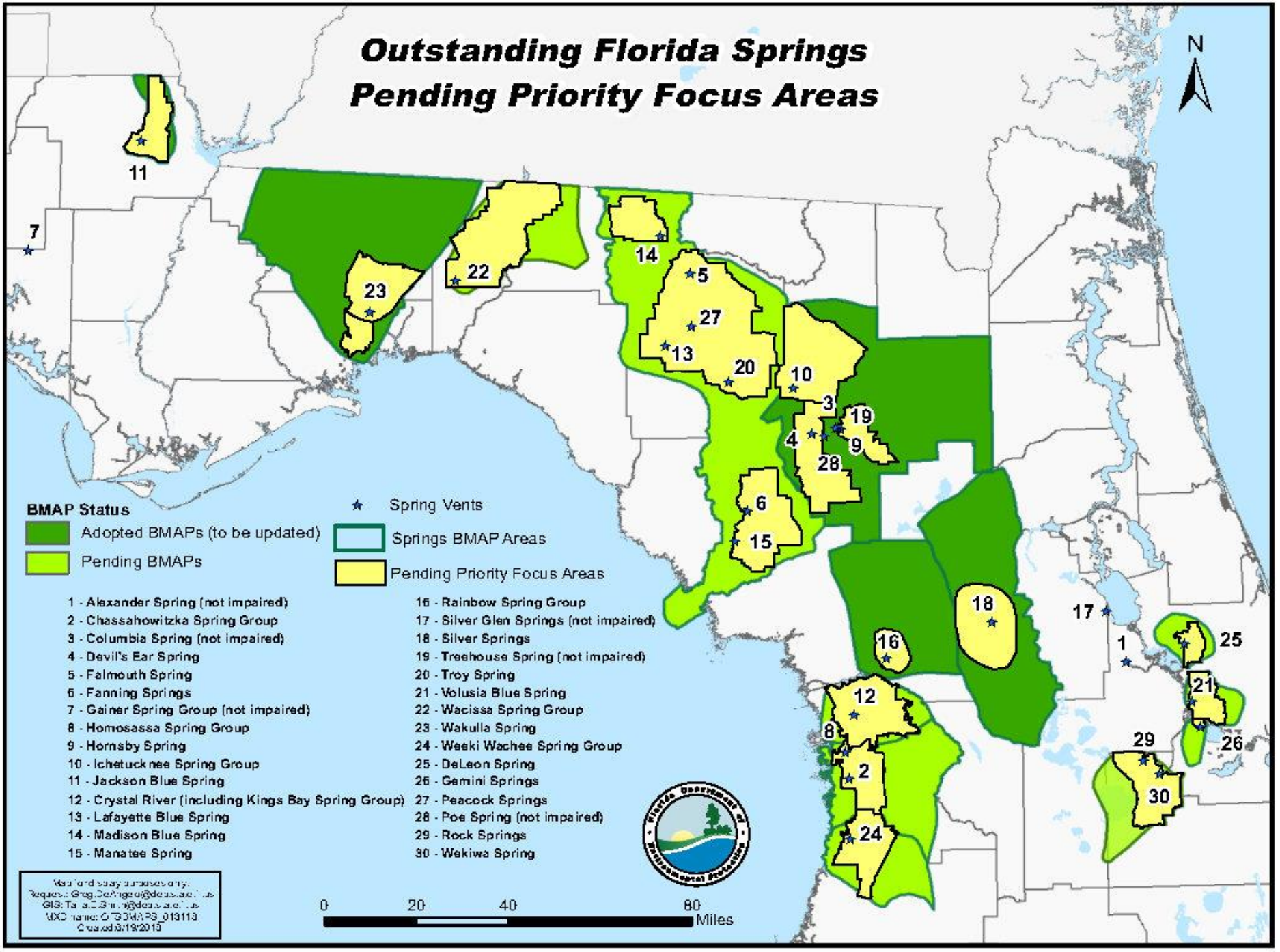
4. Revision of Section 64E-6.009 (7), Florida Administrative Code:
   - Notice of Proposed Rule published on March 23, 2018.
   - Public hearing held on April 16, 2018. Multiple written comments received.
   - Rulemaking in progress.

5. Information and education materials related to the spring protection are posted at:

http://www.floridahealth.gov/environmental-health/onsite-sewage/index.html

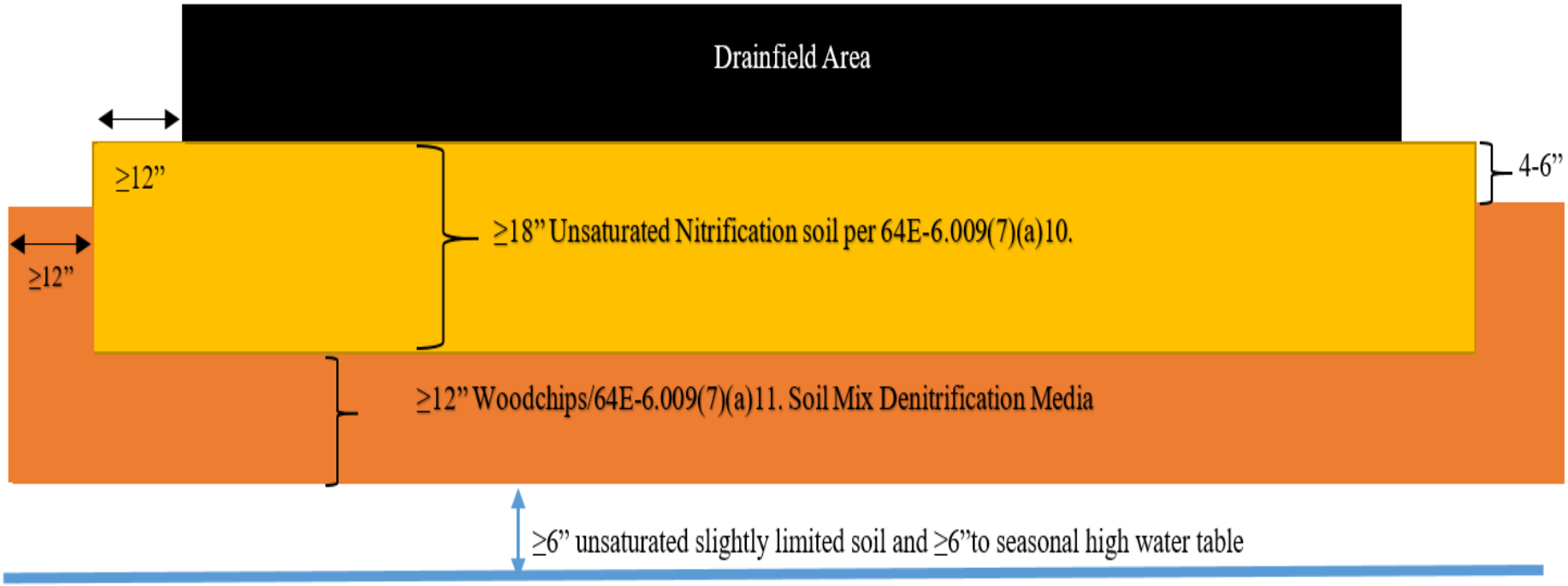
Updates on the OSTDS Remediation Plan

Florida Department of Environmental Protection


Outstanding Florida Springs
Pending Priority Focus Areas
N
BMAP Status
Adopted BMAPs (to be updated)
Pending BMAPs
Spring Vents
Springs BMAP Areas
Pending Priority Focus Areas
1 - Alexander Spring (not impaired)
2 - Chassahowitzka Spring Group
3 - Columbia Spring (not impaired)
4 - Devil's Ear Spring
5 - Falmouth Spring
6 - Fanning Springs
7 - Gainer Spring Group (not impaired)
8 - Homosassa Spring Group
9 - Hornsby Spring
10 - Ichetucknee Spring Group
11 - Jackson Blue Spring
12 - Crystal River (including Kings Bay Spring Group)
13 - Lafayette Blue Spring
14 - Madison Blue Spring
15 - Manatee Spring
16 - Rainbow Spring Group
17 - Silver Glen Springs (not impaired)
18 - Silver Springs
19 - Treehouse Spring (not impaired)
20 - Troy Spring
21 - Volusia Blue Spring
22 - Wacissa Spring Group
23 - Wakulla Spring
24 - Weeki Wachee Spring Group
25 - DeLeon Spring
26 - Gemini Springs
27 - Peacock Springs
28 - Poe Spring (not impaired)
29 - Rock Springs
30 - Wekiwa Spring
0 20 40 80
Miles

Updates on the Department of Health Chapter 64E-6.009 Rule Revision

General Structure of the In-ground Nitrogen-Reducing Biofilter (INRB)

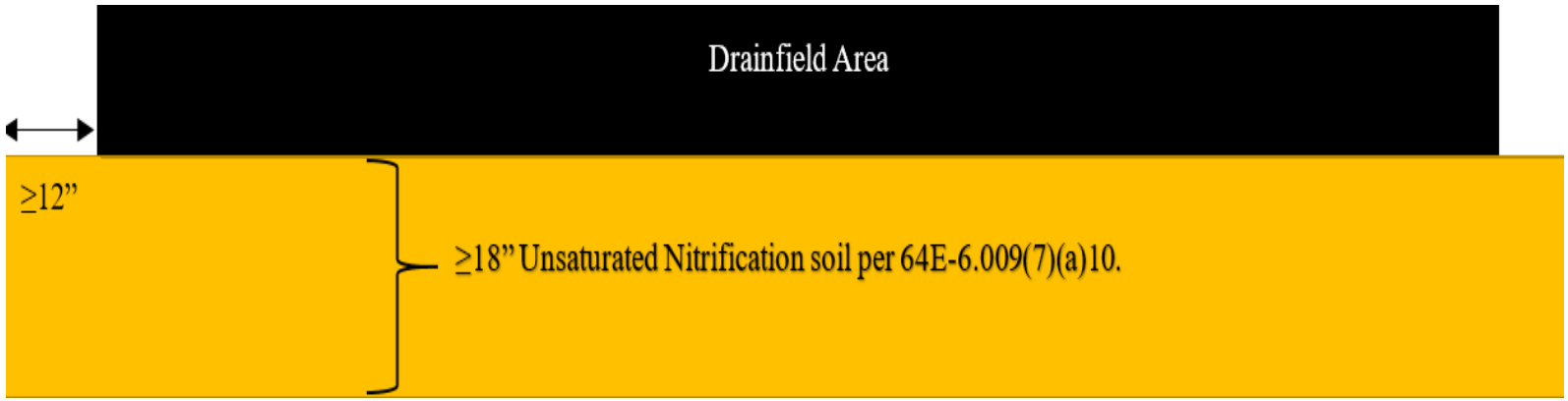


This is a system for areas with slightly limited soil. The construction site should have slightly limited soil from the ground surface to at least 6 inches below the bottom of the media layer.

INRB System is Regulated the Same Way as the Conventional Drainfield

- Receives septic tank effluent.
- Uses any Department-approved drainfield material.
- Uses any Department-approved effluent distribution method.
  - Dosing may extend media longevity and nitrogen reduction efficiency.

Nitrification Layer



- Sand or Fine sand
  - Cannot include material with a color value <=4 with chroma <=3.
  - Cannot include material with colors on the Gley Charts.
- No less than 18-inches thick.
- Extends at least 12 inches beyond the perimeter of the drainfield.

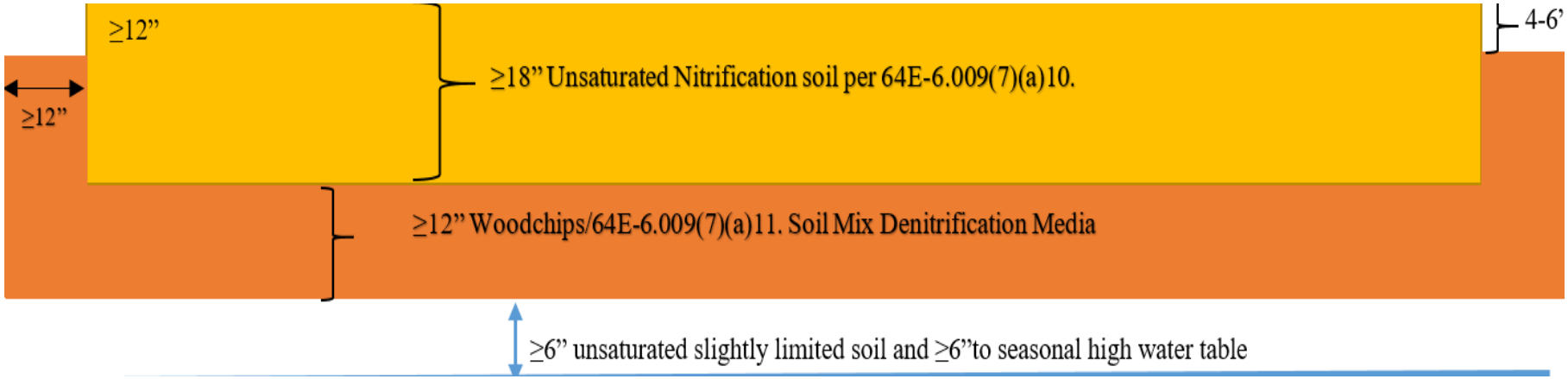
Denitrification Layer

- Mixture of lignocellulosic (woody) material and fine aggregate.
- Chips or shavings of untreated lumber.
- Blended urban waste wood mulch.
- Yellow pine sawdust.
- 2-inch to 3-inch wood chips.
- Other material demonstrated in Florida studies to be effective at denitrification.

Denitrification Layer Continued

- Fine Aggregate
  - Coarse sandy loam, sandy loam, loamy sand, fine sandy loam, very fine sand, loamy fine sand, or loamy very fine sand.
    - ❖Cannot include material with a color value <=4 with chroma <=3.
    - ❖Cannot include material with colors on the Gley Charts.
- Uniformly mixed 40%/60% by volume.

Denitrification Layer - Dimension



- No less than 12-inches thick.
- Extends at least 12 inches beyond the perimeter of the sand/fine sand layer.
- The outer 12 inches wraps upward 12 inches.
- Bottom of media layer must be at least 6 inches above the wettest season high water table.

Other Requirements

- Inspection of media layer is required in addition to regular construction inspection and final inspections.
- Setbacks from media are reduced so that tank and drainfield remain as the setback determinants.
- Requires filing a public records notice regarding the nitrogen-reducing media requiring special repair or maintenance procedures.

Repairs of System Incorporating In-ground Nitrogen-reducing Biofilters

- Meet current standards for nitrogen-reduction.
- Meet separation/elevation requirements for In-ground Nitrogen-reducing Biofilters.
- Must be inspected by Department of Health.
- Does not require media replacement if less than 10 years old or if sampling shows it still achieves 65% nitrogen reduction.

Review of RRAC Ranked Research Projects

Proposed Projects Received by DOH

Project ID	Project Title
1	Development of Funding Mechanisms for OSTDS Remediation and Upgrades
2	Continuation of Florida Water Management Inventory
3	Continued Monitoring on Passive Nitrogen-Reducing Onsite Systems
4	Correlations between water quality, OSTDS, and health effects
5	Estimation of failure or non-conformance rates of OSTDS

Proposed Projects Received by DOH - Continued

Project ID	Project Title
6	Statewide: Community Outreach and Education for OSTDS
7	Update DEP Nitrogen Source Inventory Loading Tool (NSILT) for OSTDS
8	Validation and Calibration of Transport Models of Nitrogen from OSTDS

Final Research Projects Ranking

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Updates on the OSTDS Funding Investigation

Impact of OSTDS Remediation Plan in Spring BMAP Basins

- Twenty eight counties in spring BMAP Basins.
- About 439,998 OSTDS in BMAP Basins.
- About 233,425 OSTDS in PFA.
- About 146,318 OSTDS in PFA on lots less than one acre.

OSTDS Remediation Needs Funding

- OSTDS remediation plan will require that all conventional systems in PFAs be either connected to sewer or replaced with nitrogen-reducing OSTDS in 20 years.
- Assuming converting or remediating each system will cost $10,000, Converting 233,425 OSTDS in PFA requires $2.3 billion.
- The **Florida Spring Protection Fund** is currently the most important funding source for spring protection, providing an anticipated $1.0 billion for the next 20 years, plus possible local matches, total about $2.0 billion.
- OSTDS is not the only source of nitrogen.
- More funding will be needed.

Other Possible Funding Sources for Decentralized Systems

1. U.S. Environmental Protection Agency (EPA) Clean Water State Revolving Fund

   Available fund each year is between $250 million and $260 million

2. EPA Nonpoint Source Section 319 Grants

   Available fund each year is between $5 million and $6 million

Other Possible Funding Sources for Decentralized Systems - Continued

3. U.S. Department of Agriculture, Rural Development Housing Program – Single Family Housing

   Available fund each year is $700,000 loan + $800,000 grant. Administered directly through USDA state office.

4. U.S. Department of Housing and Urban Development through Florida Department of Economic Opportunity

   Available funding each year is between $18 million and $26 million administered by the Small Cities Community Development Block Grant Program.

Clean Water State Revolving Fund (CWSRF)

1. Created in 1987 under the Clean Water Act.
2. A low interest loan managed by all 50 states.
3. Targeting sanitation infrastructure improvement, nonpoint source pollution control, and estuary protection.

20% State Match

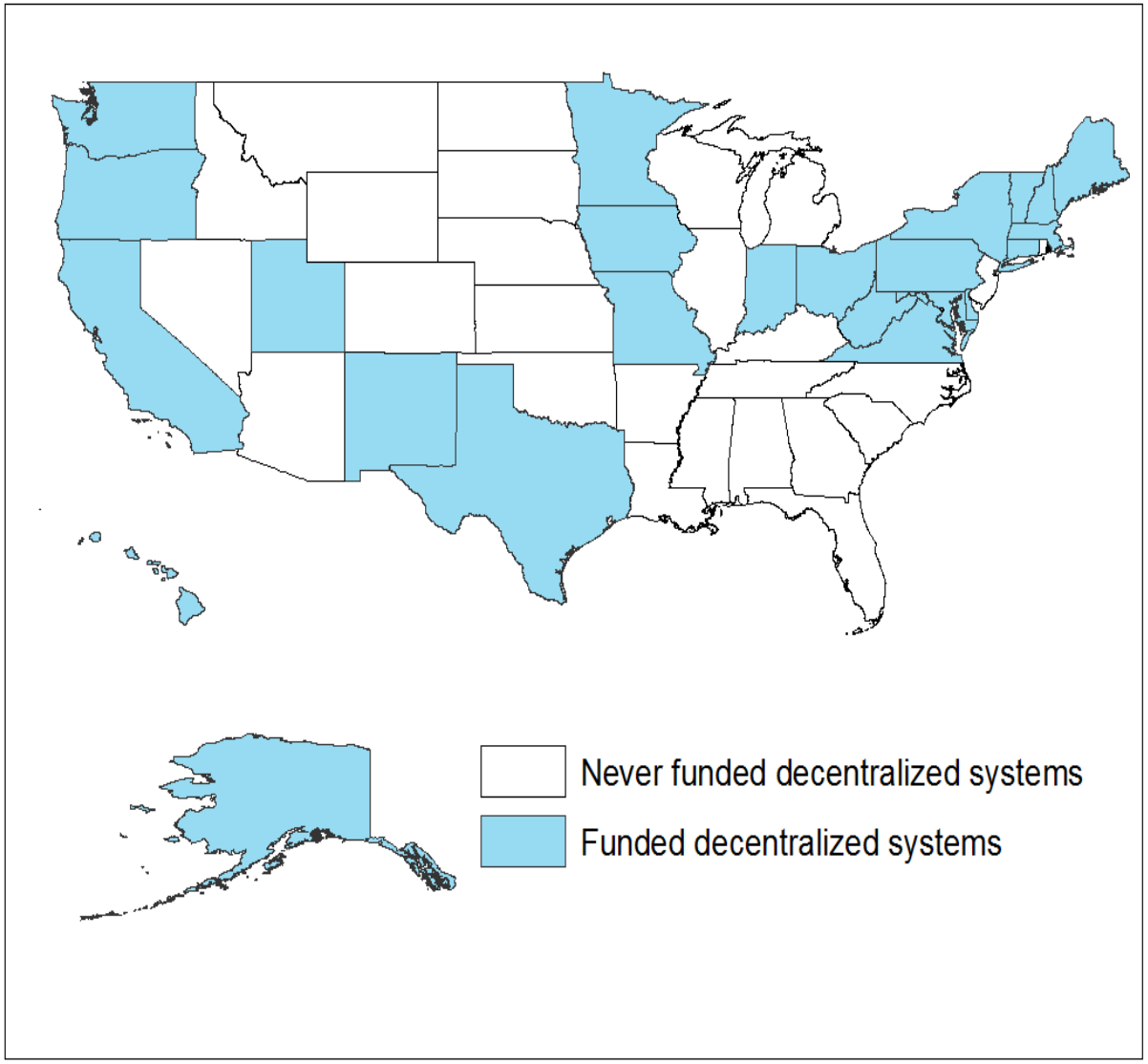
Federal Grant

Clean Water State Revolving Fund

CWSRF Loan

American Recovery and Reinvestment Act (ARRA)

1. Original focus of CWSRF was large municipal wastewater treatment projects.
2. ARRA signed into law in 2009 aimed at creating jobs and stimulating the economy by investing in vital infrastructure projects.
3. Required 20 percent of the funds to be used for:
   a. Water efficiency and conservation
   b. Energy efficiency improvements
   c. Environmentally innovative activities (including decentralized systems)
   d. Green infrastructures.

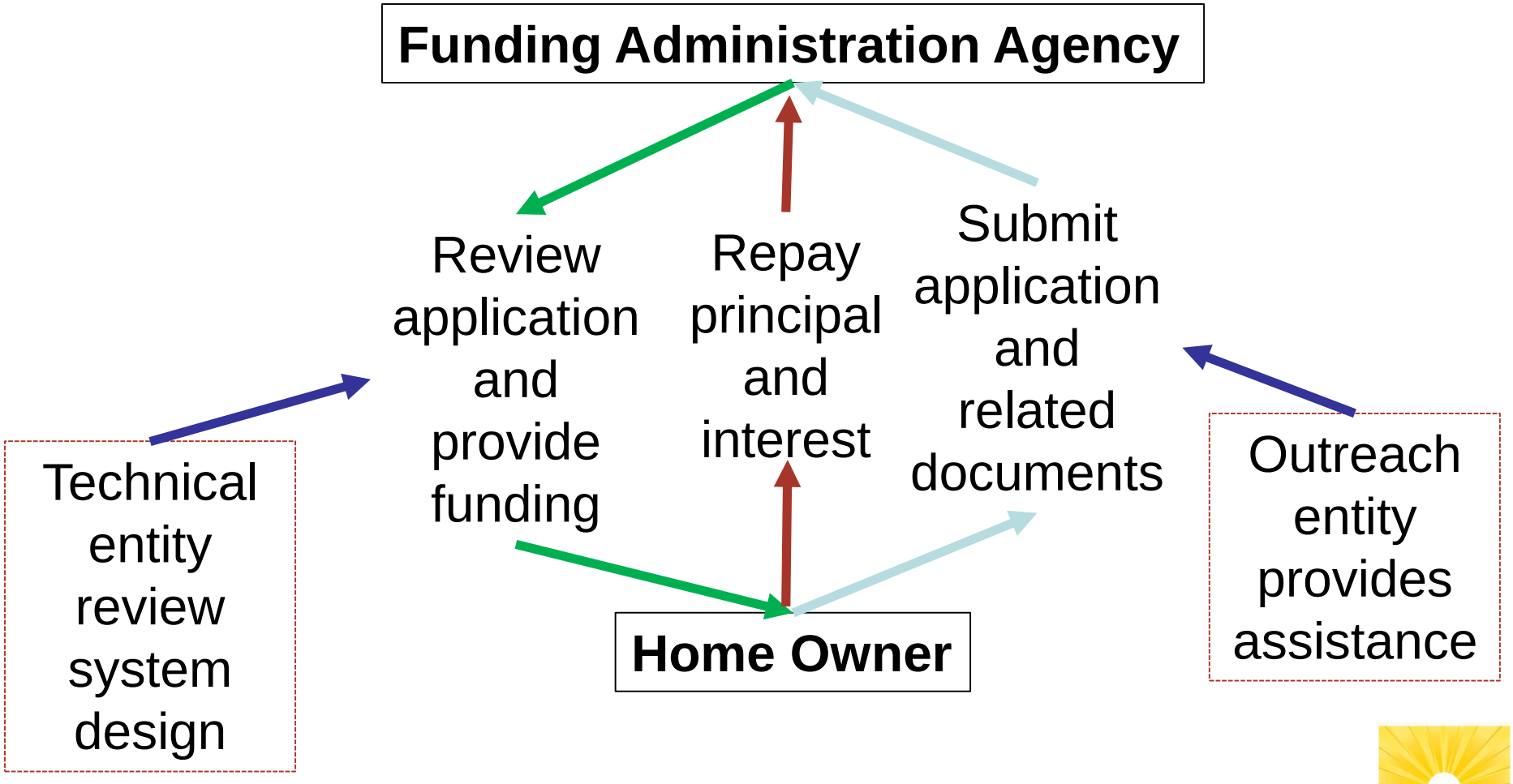


CWSRF funded decentralized systems in 24 of 50 states.

Funding Disbursement Approaches (from the perspective of an entity that provides funding)

- Direct lending
- Linked deposit
- Pass-through funding

Direct Lending

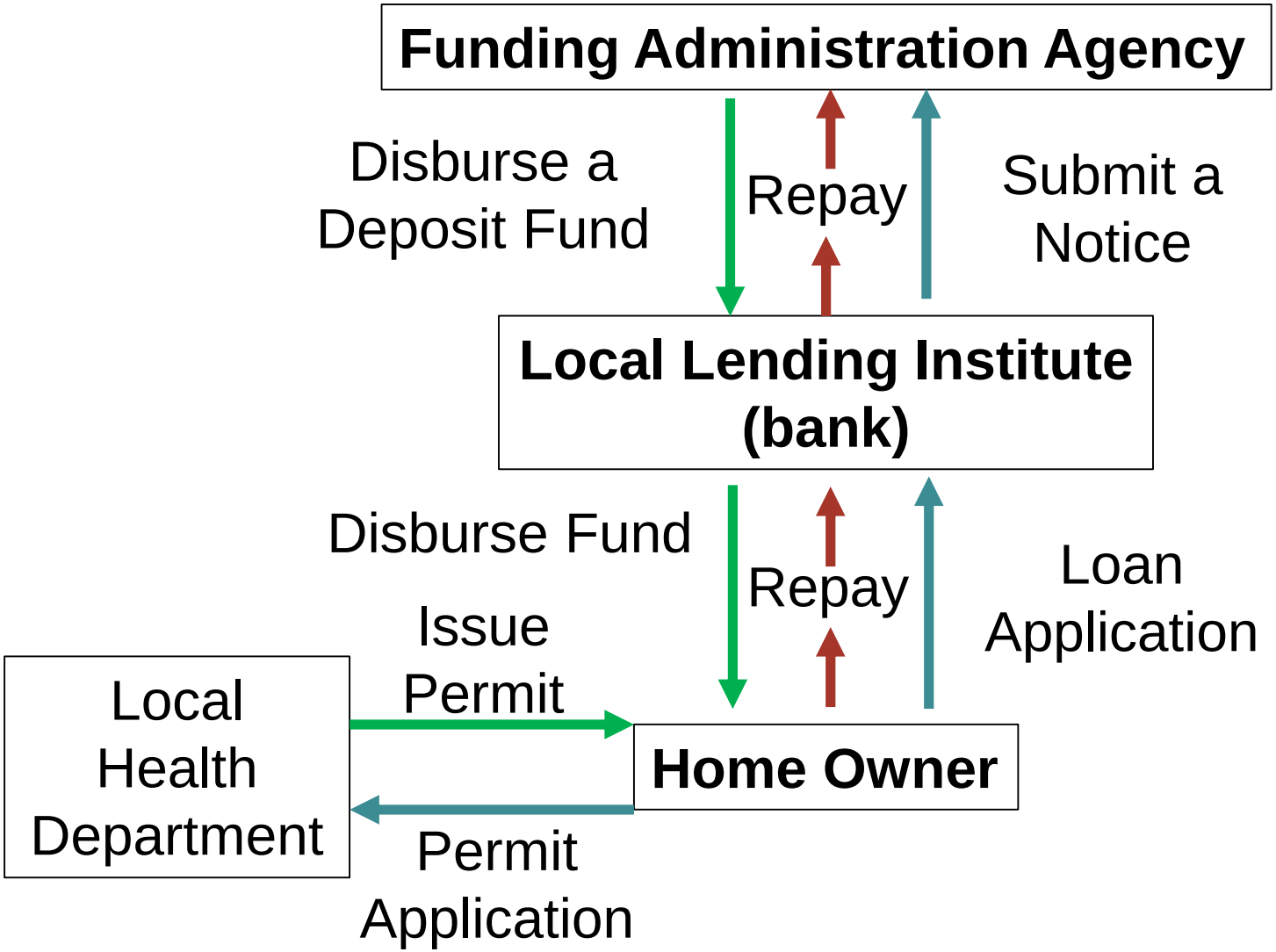


Direct Lending - Case

Delaware Septic Rehabilitation Loan Program

1. Environmental Finance Office of the Delaware Department of Natural Resource and Environmental Control (DNREC) administers the loan.
2. The First State Community Action Agency provides outreach assistance.
3. DNREC's groundwater branch provides technical review on the system design.
4. Direct lending works for the CWSRF programs dealing with small number of systems.
5. Delaware DNREC's goal is 100 systems per year.

Linked Deposit



Linked Deposit - Case

Ohio Environmental Protection Agency (OEPA) is the fund administration agency (first to develop linked deposit)

1. The home owner needs to repair/replace the onsite system, first submit permit application to the local health district.

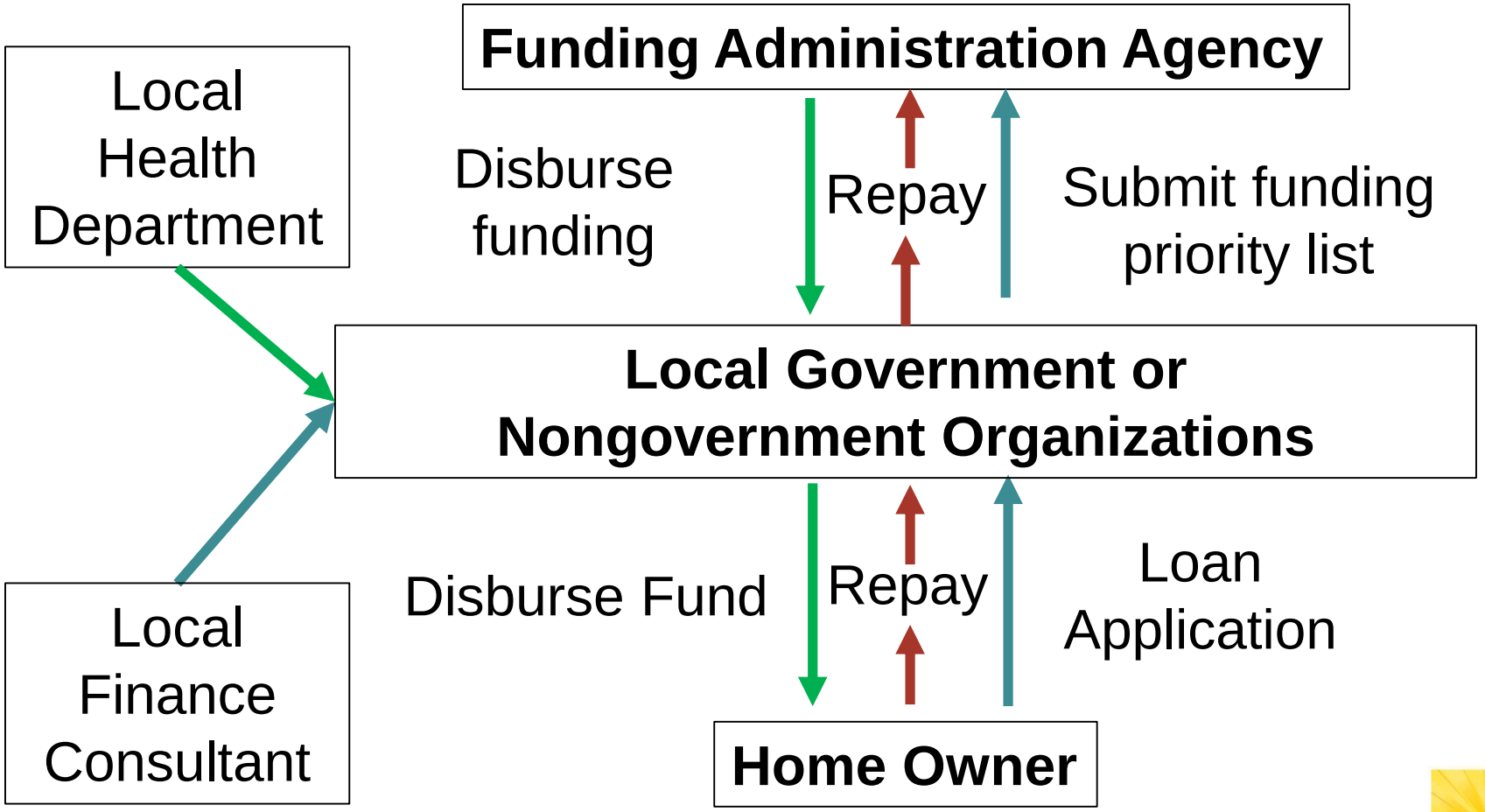
2. Local health district reviews the system design, and if design is approved, issues permit and certification of qualification (CQ).

Linked Deposit – Case - Continued

3. The home owner takes CQ and files loan application with a local bank. The latter reviews home owners financial capability and decides whether to approve or deny the loan application.

4. If bank approves the loan application, the bank will inform OEPA to deposit fund in the bank for the project. The bank then issues the funds to the home owner.

Pass-through Funding



Pass-through Funding - Case

The Massachusetts Department of Environmental Protection (MDEP) and Department of Revenue jointly developed the Community Septic Management Program (CSMP).

1. Local communities wishing to participate in CSMP receive loans needed to develop either a
   - Community Inspection Plan, or a
   - Local Septic Management Plan
2. If MDEP approves the plan, it will certify the local program by forwarding a Project Approval Certificate/Project Regulatory Agreement.

Pass-through Funding – Case - Continued

3. The local community will then sign an CWSRF loan agreement with the Water Pollution Abatement Trust.
4. Local community program gets the loan and disburses funds to home owners.

Local Governments Involvement

1. Pennsylvania Housing and Finance Agency:
   - Local Council of Governments.
   - County Development Authorities.
2. Massachusetts Department of Environmental Protection:
   - Local Board or Department of Health.
   - Borrowing authorized by town meeting or city council.
3. Ohio Environmental Protection Agency:
   - County or local Health Districts.
   - Community Housing Improvement Program Agency.
   - Community Action Entity.
   - County or Regional Planning Agencies.
4. Florida Department of Environmental Protection
   - Leon County Public Works.
   - Marion County Utility.

Eligible Activities for Funding

1. Most states cover new construction, repair, and modification. Missouri and Ohio do not cover new construction.
2. Most states cover costs directly related to site evaluation, system design, permitting, construction, inspection, and onsite systems financing, but do not cover costs for additional work such as reseeding, replanting, or any other aesthetic improvement.
3. Iowa, Delaware, and Ohio do not cover maintenance and monitoring costs.
4. Maryland includes two-year operation and maintenance costs as eligible funding items and only funds the best available technology (BAT) to control nutrient loads.

Amount of Funding for Each System

1. Most states provide $20,000 to $30,000 as the funding maximum. Maximum loan term is generally 20-30 years.
2. Funding amount for a specific system depends on the eligible activities involved, the cost for each activity, which is either negotiated by funding entity or the best bid from multiple venders, and household income.
3. When demand for funding exceeds the supply, some states (e.g., Wisconsin) prioritize the funding supply based on the type of environmental threats.
4. Some states (e.g., Maryland) only fund the best available technology (BAT) to control nutrient loads. The funding amount is then calculated as the difference between the cost of the conventional system and BAT system.

Secured Loan for Payment

1. Credit checking
2. Municipality lien on the property.
3. Secured by a mortgage on borrower's home
4. A deed of trust.
5. A promissory note.
6. Due-on-transfer mortgage lien.
7. Default payment also result in increased interest rate.

Assisting Low-income Communities

1. Most states provide lower interest rate loan (sometimes zero interest) to low income communities.
2. Beginning in 2009, U. S. Congress authorized the CWSRF to provide further financial assistance through additional subsidization, such as grants, principal forgiveness, and negative interest rate loan.
3. Depending on the number of people per household and house income level in relation to the U. S. Poverty Guideline, Ohio low income communities receive coverage for 100%, 85%, or 50% of the eligible activities in form of principal forgiveness.
4. Several states, including Missouri, Washington, Pennsylvania, Massachusetts, Wisconsin, and Maryland designate a certain percent of CWSRF as grant to support decentralized wastewater systems.

Major Repayment Sources

1. Property owner's ability to pay (determined during loan application).
2. Fees paid by developers.
3. Recreational fees (fishing licenses, entrance fees).
4. Dedicated portions of local, county, or state taxes or fees.
5. Donations or dues made to nonprofit groups.
6. Stormwater management fees.
7. Wastewater user charges.

Challenges

1. Funding large number of privately owned systems means large amount of workload for fund management.
2. Funding private entities has higher chance of fund default.
3. When market interest rate is low, low interest rate loan may not always be attractive.
4. Sometimes funding availability may be lower than demand.

Solutions

1. Forming partnership with other state, local entities, or financial institutions will bring the fund management expertise into the funding systems, share workload, and share the financial risk.
2. Using grant, principal forgiveness, or negative interest loan may help incentivize the demand and use of SRF.
3. When funding availability is lower than demand, prioritizing the demand and leveraging CWSRF against other funding sources help maintain sustainability of the fund.

Florida CWSRF

1. Capital grants received to date total $1.47 billion.
2. Made over $4.6 billion in loans.
3. Type of projects being funded in fiscal year 2016-2017 included:
   a) Secondary treatment.
   b) Advanced treatment.
   c) Infiltration/Inflow.
   d) Sewer system rehabilitation.
   e) New collector sewers.
   f) New interceptors.
   g) Stormwater grey infrastructure.
   h) Energy efficiency.
   i) Renewable energy.
   j) Recycled water distribution.

Florida CWSRF - Continued

4. Theoretically, FDEP CWSRF can be used to fund privately decentralized systems.
5. The program does not disburse funds directly to individual homeowners because of lack of staff resources.
6. Pass-through funding through local governments is a funding approach that FDEP prefers.

Updates on the Florida Water Management Inventory (FLWMI) Project

Update on the Florida Water Management Inventory Project

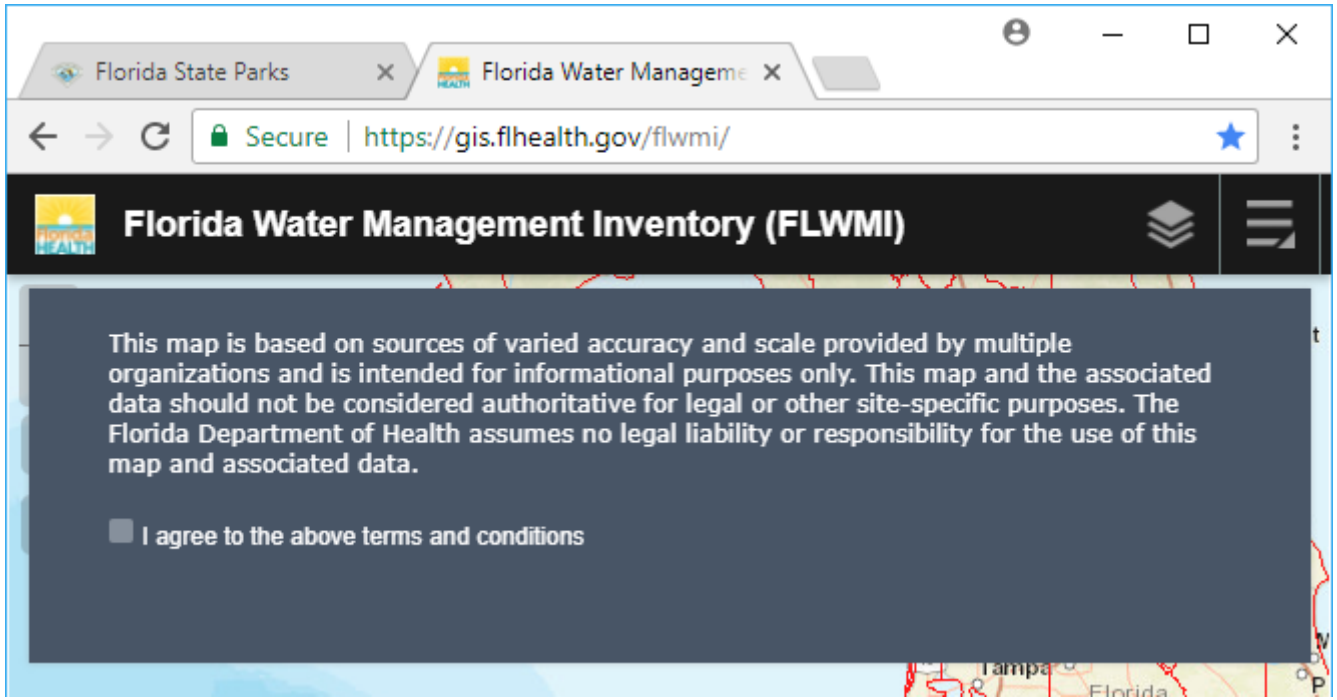
Data Improvements

Updated and/or New Information

- 2016 Parcels
- Environmental Health Database
- Well Surveillance Program
- Water Management Districts
- Wastewater and Drinking Water Utilities
  - Large facility that did not participate in first round
  - Large facilities submitting GIS data in first round

Update on the Florida Water Management Inventory Project

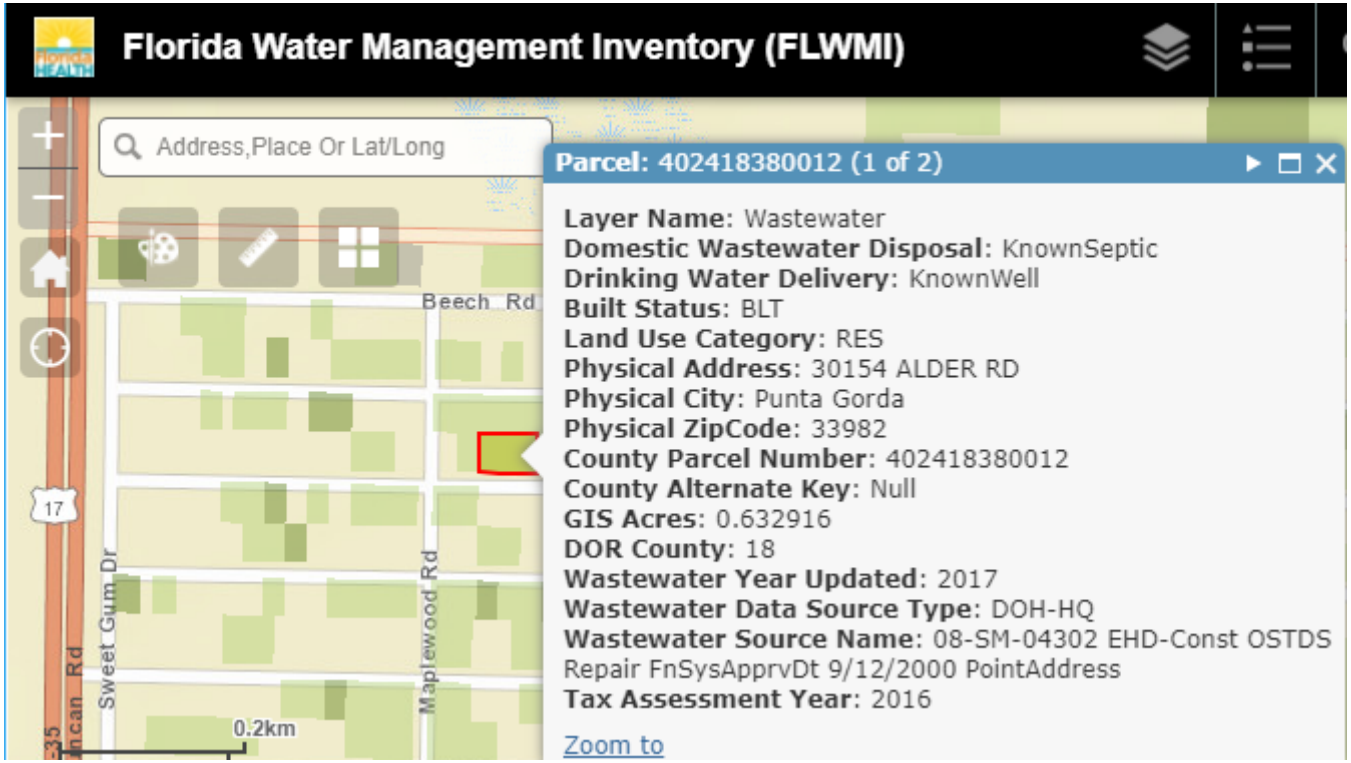
Web Application Improvements on Public Site



https://gis.flhealth.gov/FLWMI/

Update on the Florida Water Management Inventory Project

Web Application Improvements on Public Site



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Update on the Florida Water Management Inventory Project

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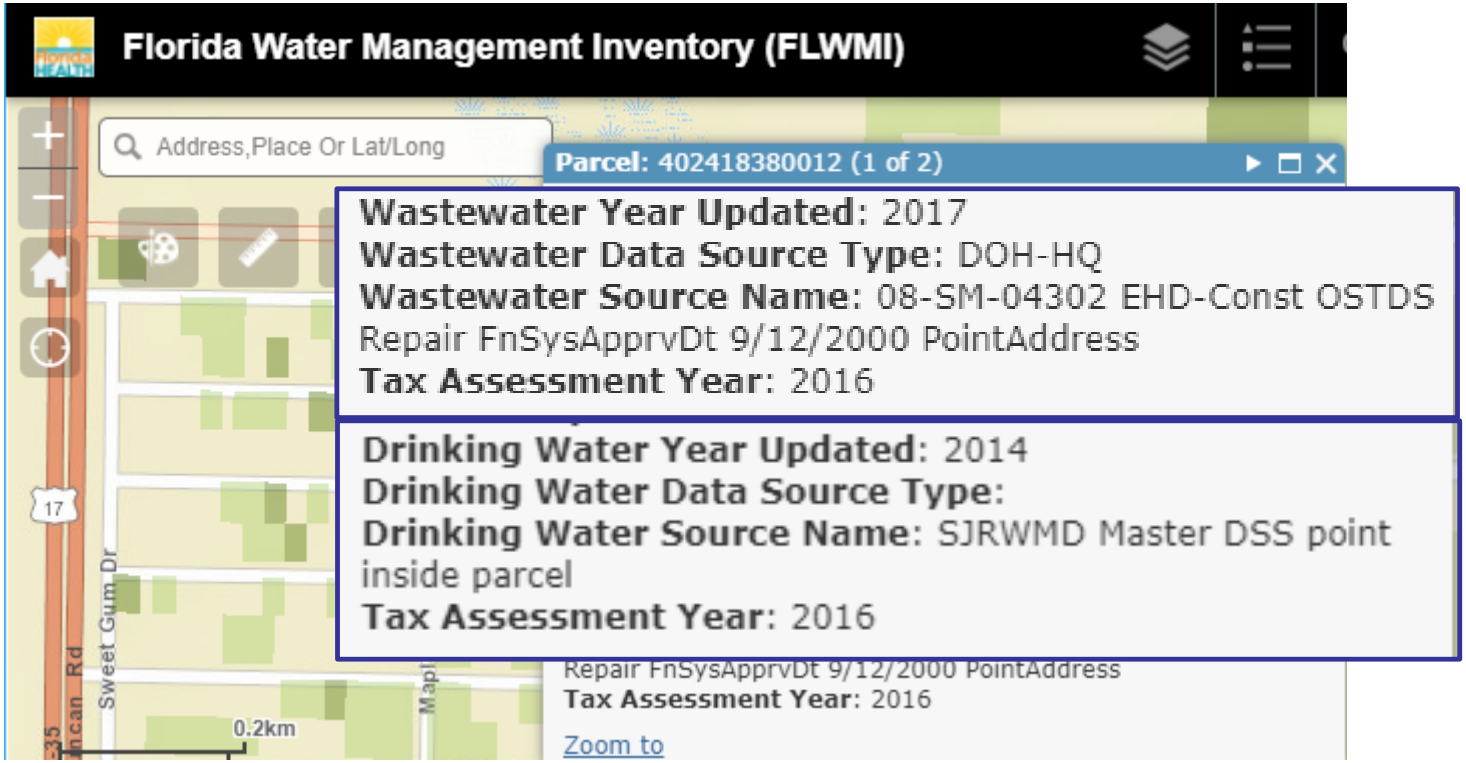

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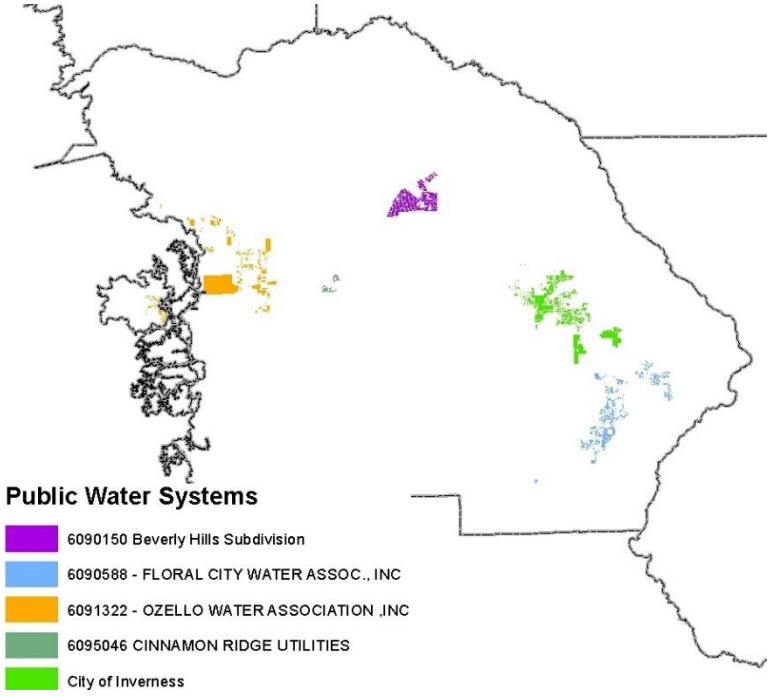
Update on the Florida Water Management Inventory Project

Continued Collaborations:

Environmental Public Health Tracking



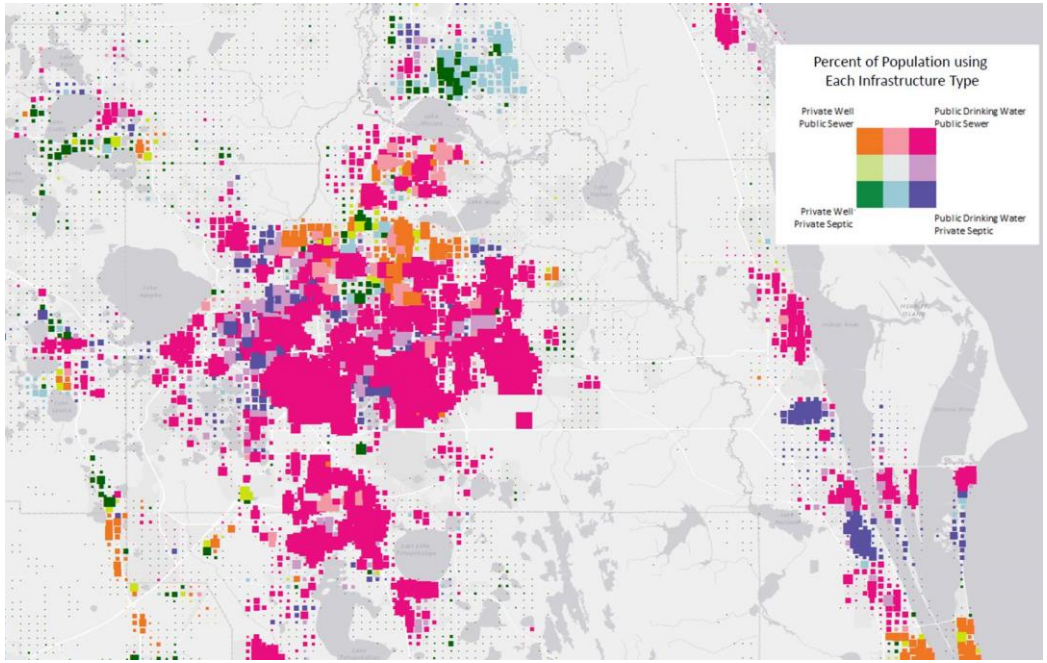
Using inventory to create **state-wide service area boundaries** for **public drinking water systems** to link **impacted population** with **fluoridated water or water quality violations**

Update on the Florida Water Management Inventory Project

Continued Collaborations:

Florida Resources & Environmental Analysis Center

- Remapping inventory data to population
- Bivariate mapping to better visualize data



Updates on the Continued Monitoring

"Passive" Nitrogen Reduction Systems (PNRS)

Reduce effluent N using **reactive media** for denitrification and a **single liquid pump**, if necessary.

Wastewater from home

Stage 1 (nitrification)

nitrification media sand & expanded clay

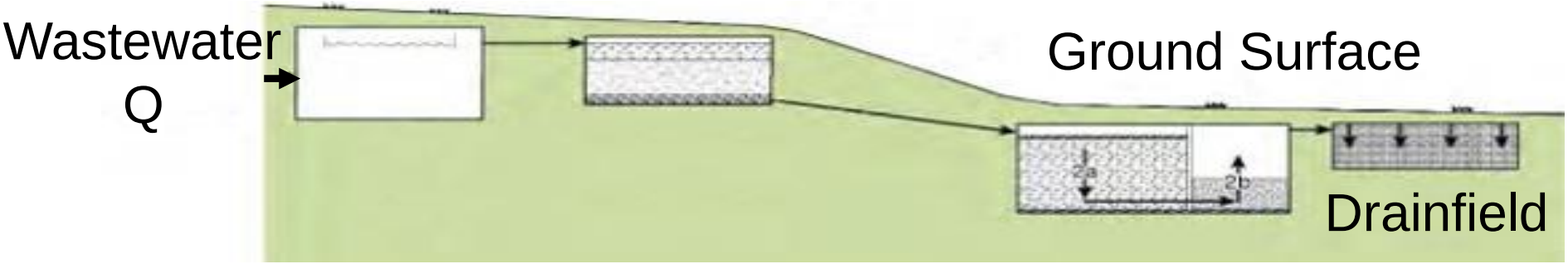
Dispersal

Stage 2 (denitrification)

denitrification media lignocellulosic & elemental sulfur

In-Tank PNRS

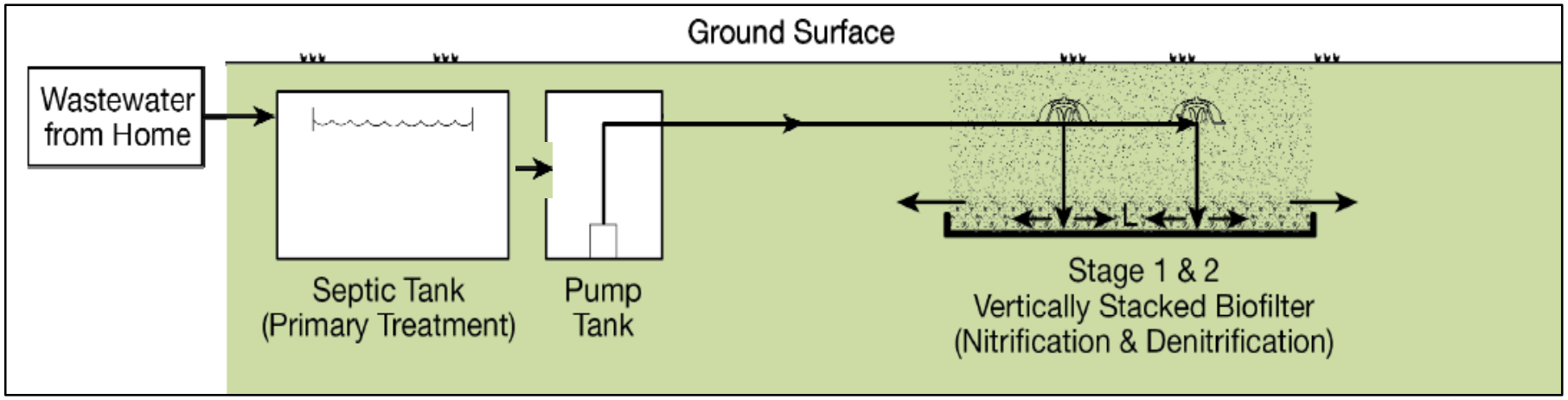
In-Tank Two Stage Biofilter with Stage 1, Dual Media Stage 2 Lignocellulosic (2a) followed by Elemental Sulfur (2b).



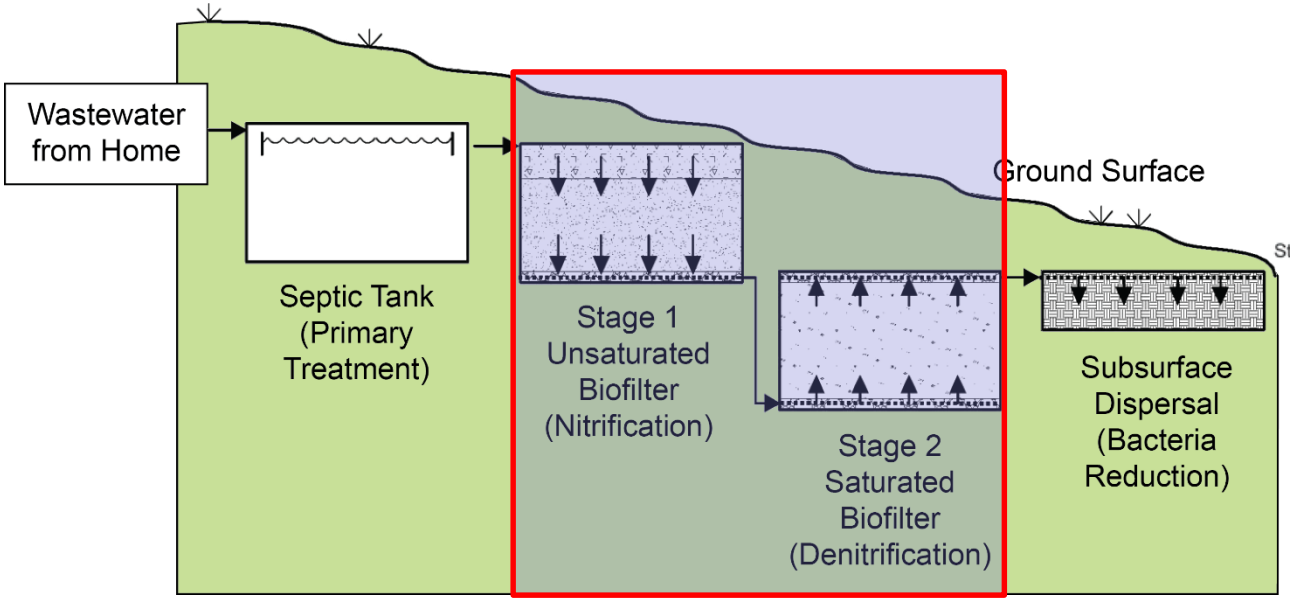
Note: In flat landscapes may need up to a single pump.

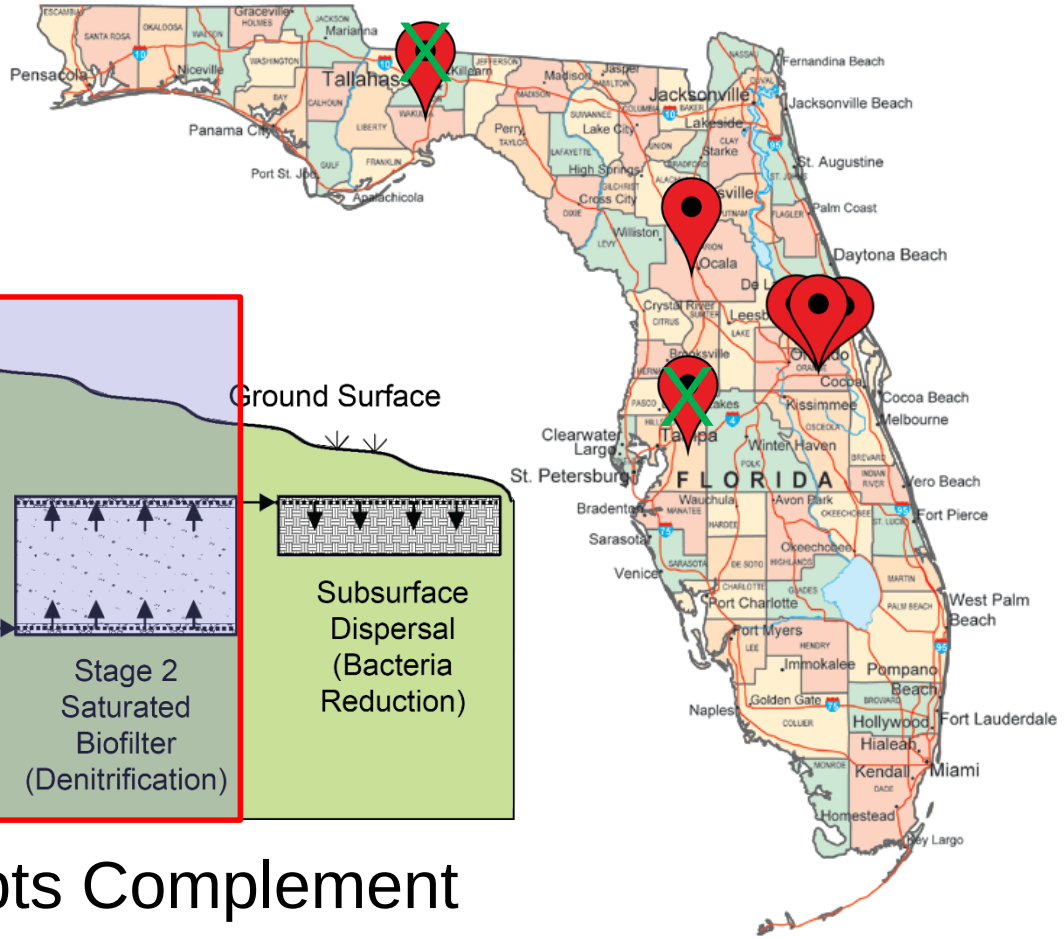
In-Ground Passive Nitrogen System

Conventional OSTDS + In-Ground Two Stage System: Stage 1 Sand, and Stage 2 Lignocellulosic Materials



Nitrogen Reduction at Field Sites





Full Scale Concepts Complement Existing Septic Systems

Goals and Objectives of the Monitoring Project

Goals

- Establish long-term performance of the two-stage passive nitrogen removal technology
- Provide guidance for possible system refinement and future implementation
- Monitor operation and maintenance requirements

Goals and Objectives of the Monitoring Project - Continued

Objectives

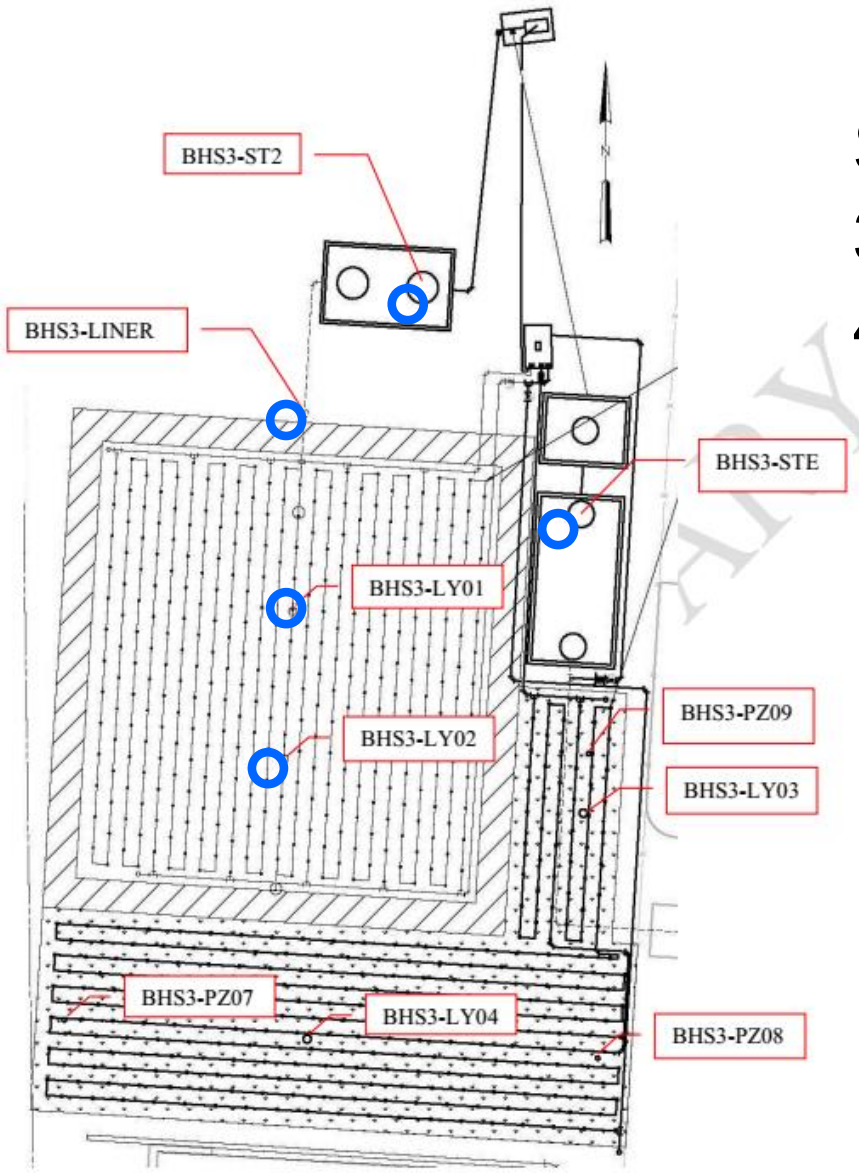
- Continue monitoring the performance of these systems
- Document the maintenance needs and operation costs
- Monitor nitrogen species concentrations at influent, effluent, and intermediate locations of these systems and evaluate nitrogen removal efficiency
- Monitor the treatment efficiencies other pollutants including 5-day carbonaceous biochemical oxygen demand (cBOD5), total suspended solid (TSS), total phosphorus (TP), and bacteria.

Application for EPA 319 Grant Support

1. The application for 319 Grant support was approved by DEP on December 20, 2017.
2. A draft work plan and related documents were submitted to DEP on March 1, 2018.
3. The draft work plan was approved by and a contract agreement was received from DEP on May 11, 2018.
4. DOH management is now reviewing the contract agreement document.
5. The continued monitoring project will be funded with $72,000 319 Grant fund and $48,000 DOH match. The grant agreement end date will be September 30, 2021.
6. The four systems will be sampled quarterly eight times.

Seminole County System B-HS3

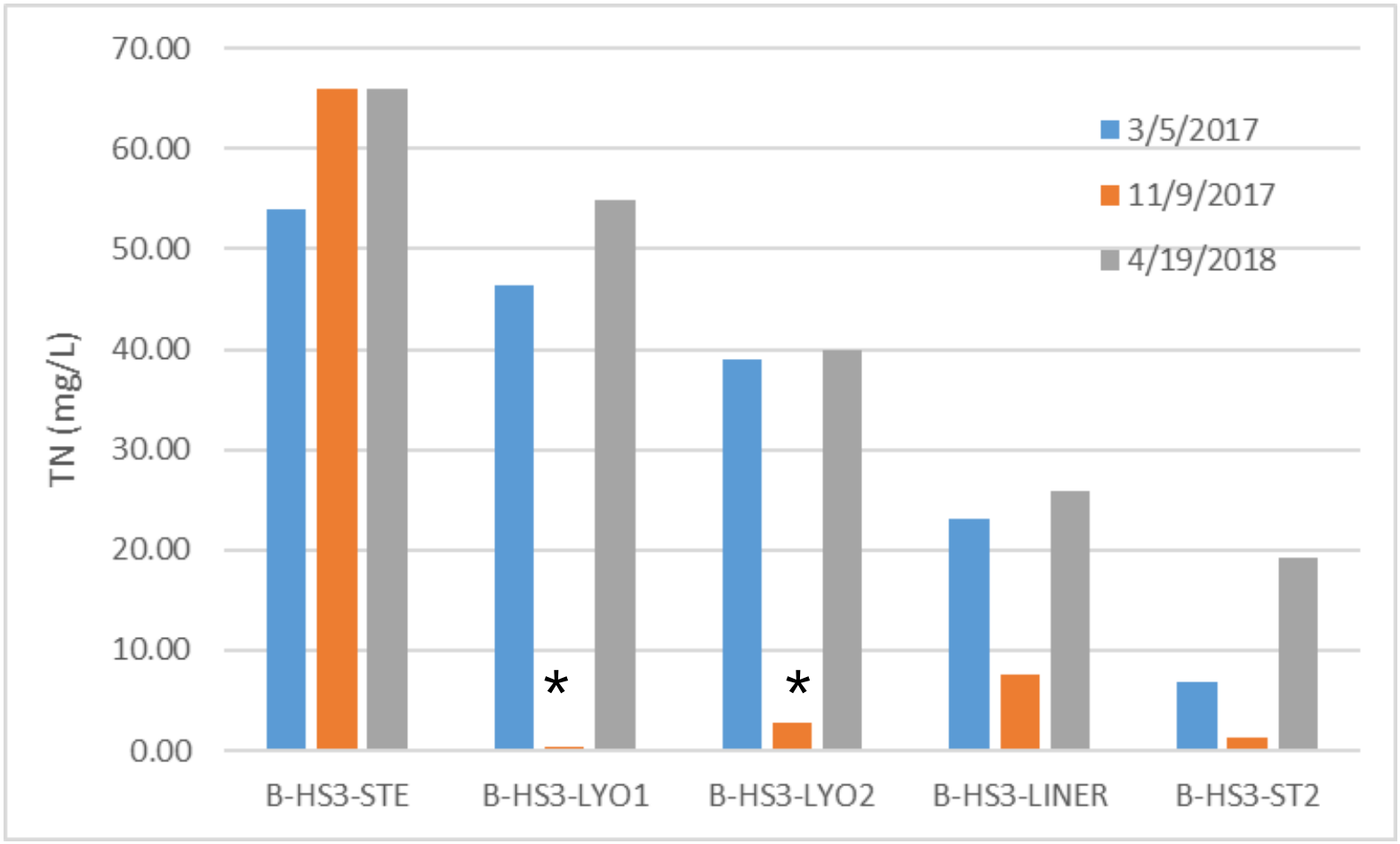
Seminole County System B-HS3



Samples were collected on 3/15/2017, 11/09/2017, and 4/19/2018 from:

a) BHS3-STE (Septic/Pump tank)
b) BHS3-LY01 (Bottom of stage 1 medium)
c) BHS3-LY01 (Bottom of stage 1 medium)
d) BHS3-LINER (Effluent from stage 2 medium)
e) BHS3-ST2 (Sulfur tank)

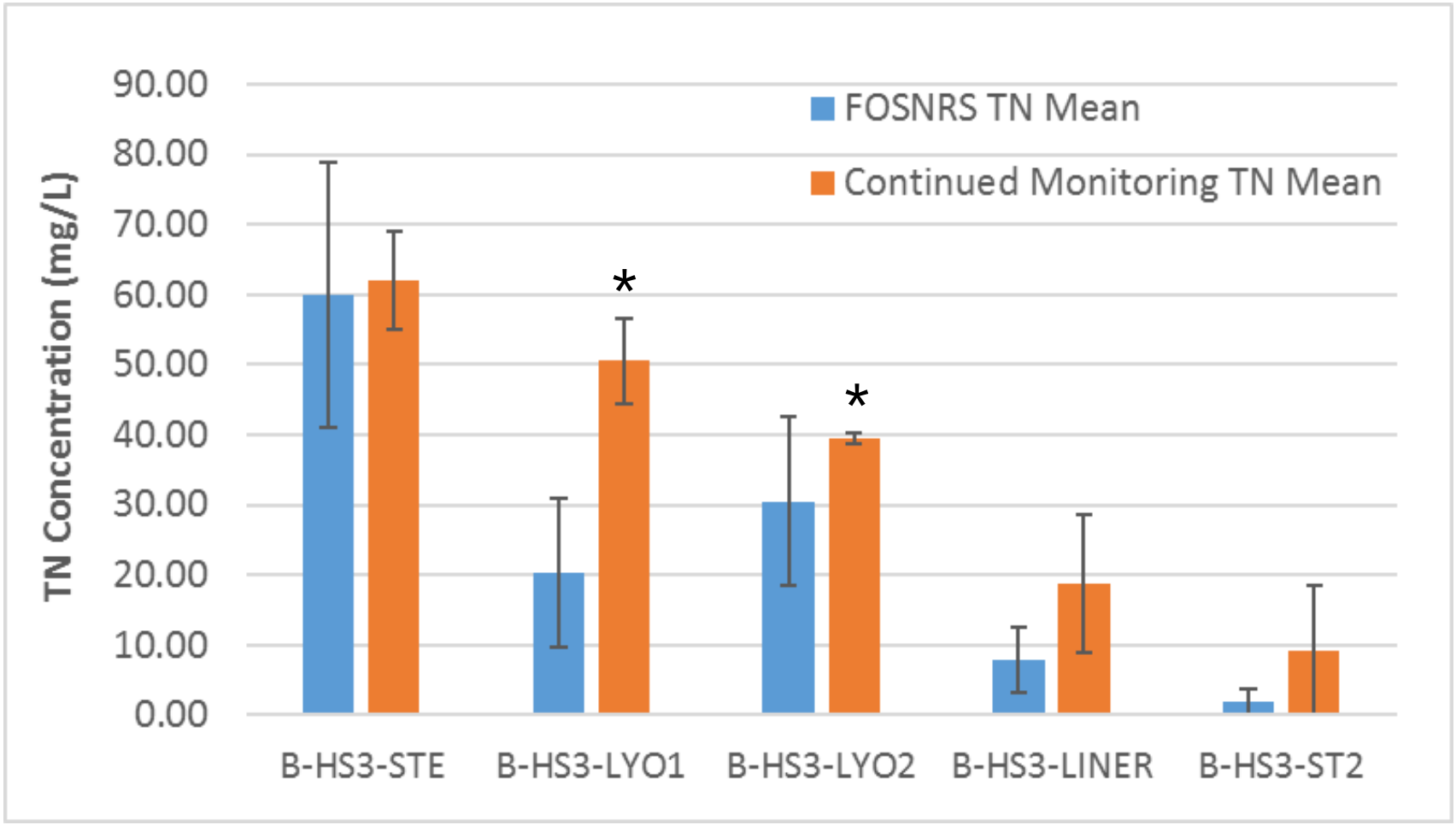
Seminole County System B-HS3



TN: Total Nitrogen

*: Not enough sample for nitrate/nitrite. Values represent sum of organic nitrogen and ammonia.

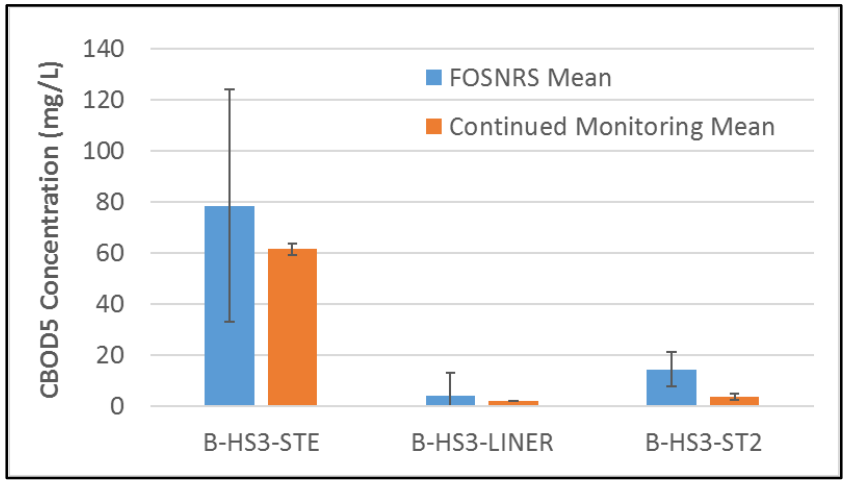
Seminole County System B-HS3 - Continued

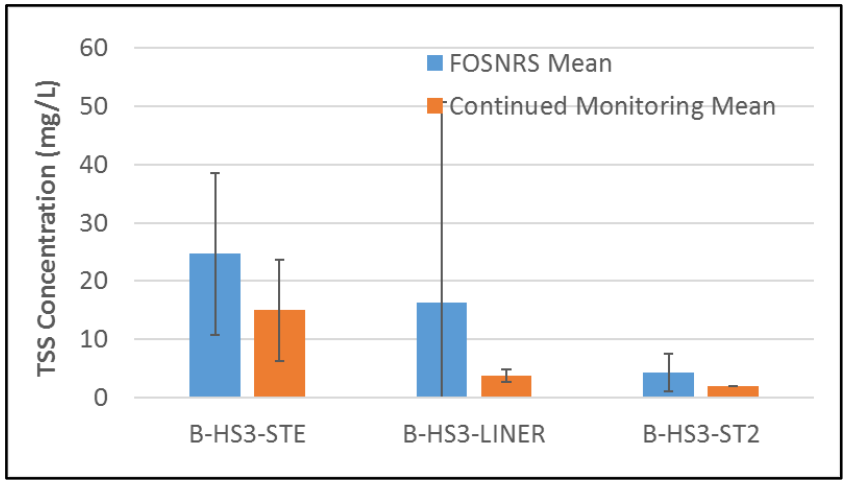


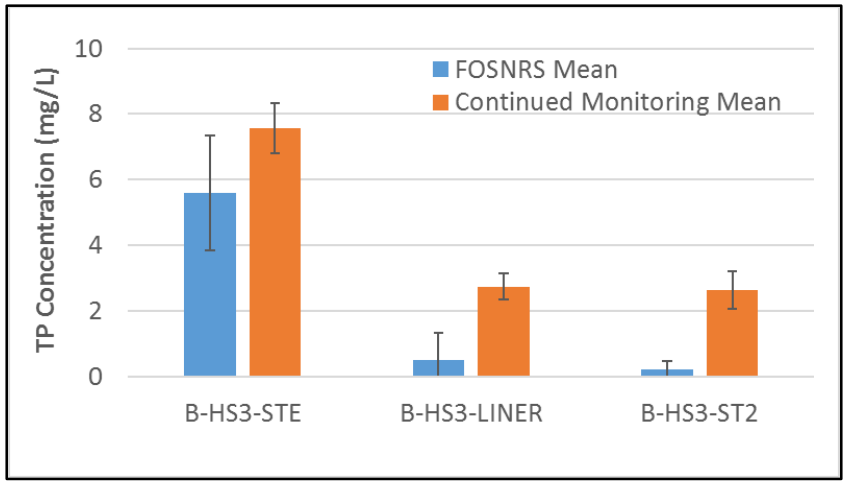
TN: Total Nitrogen

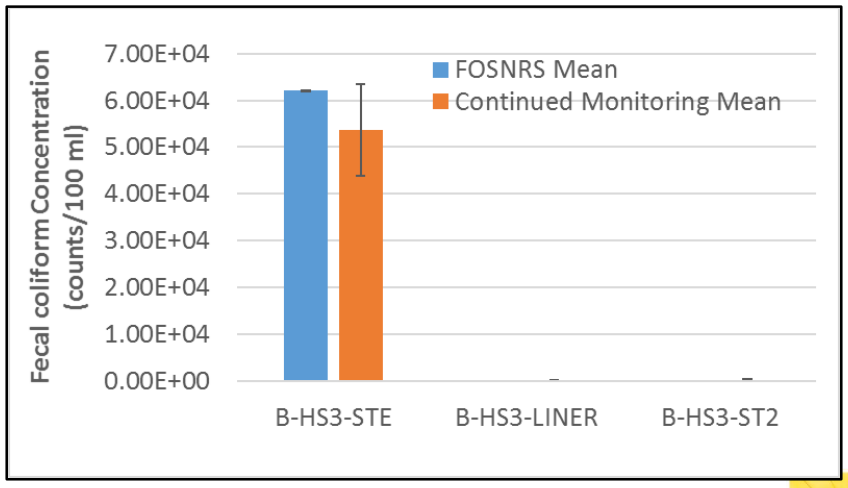
*: Mean and standard deviation calculated based on data for 3/15/2017 and 4/19/2018.

Seminole County System B-HS3 - Continued







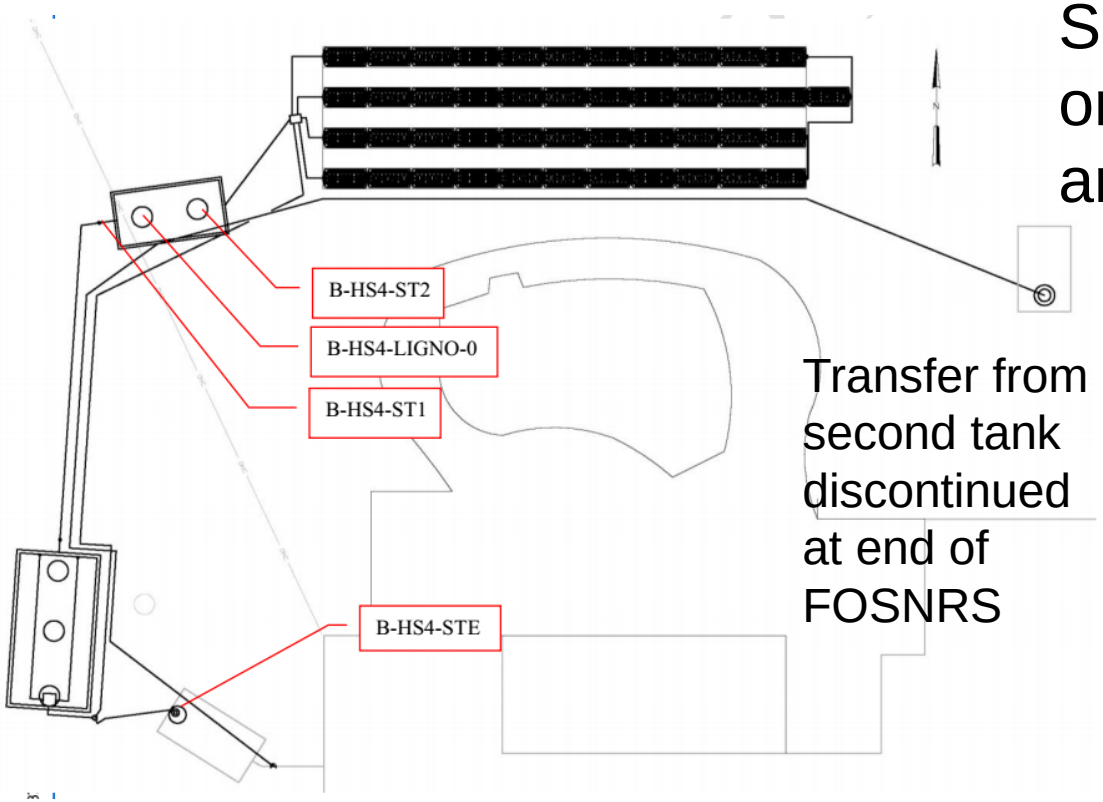


CBOD5: 5-day carbonaceous biochemical oxygen demand;
TSS: total suspended solid; TP: total phosphorus;
FOSNRS: Florida Onsite Sewage Nitrogen Reduction Strategies Study

Seminole County System B-HS4 Stage Two Tank

Seminole County System
B-HS4 Stage One Tank

Seminole County System B-HS4

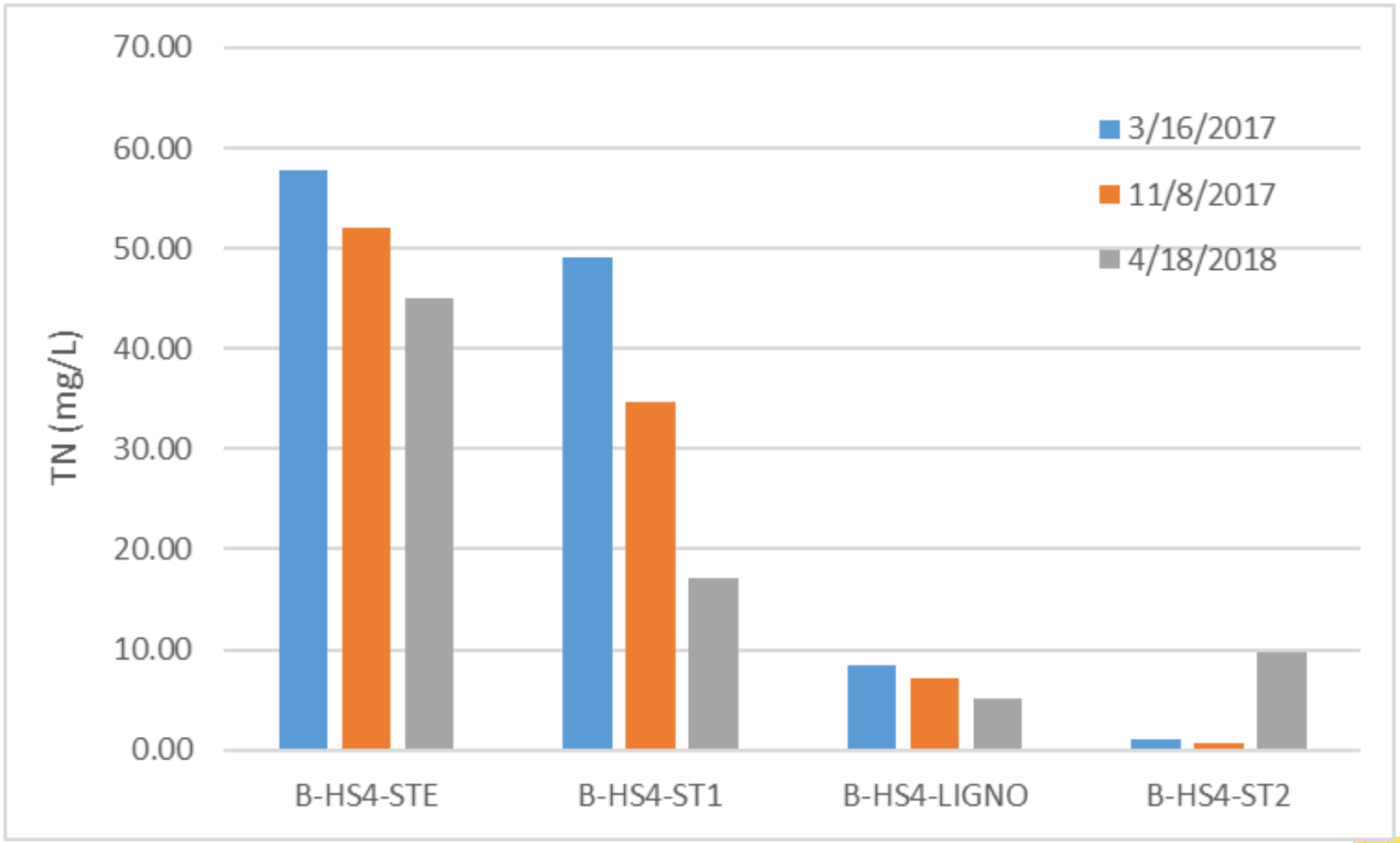


Transfer from second tank discontinued at end of FOSNRS

Samples were collected on 3/16/2017, 11/08/2017, and 4/18/2018 from:

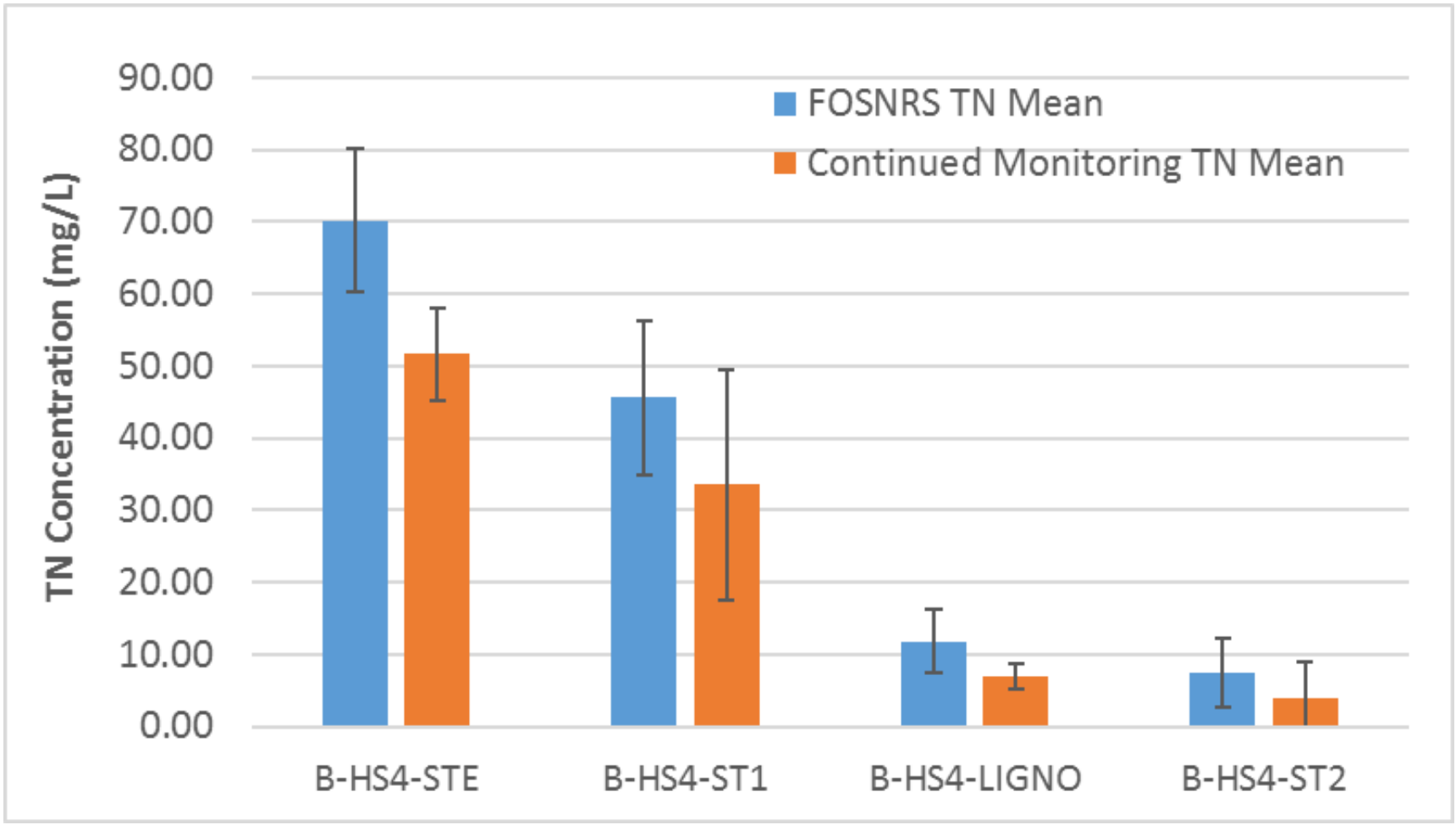
a) BHS4-STE (Septic tank)
b) BHS4-ST1 (Sampling port)
c) BHS4-LINER-0 (Bottom of ligno layer)
d) BHS4-ST2 (Sulfur tank)

Seminole County System B-HS4



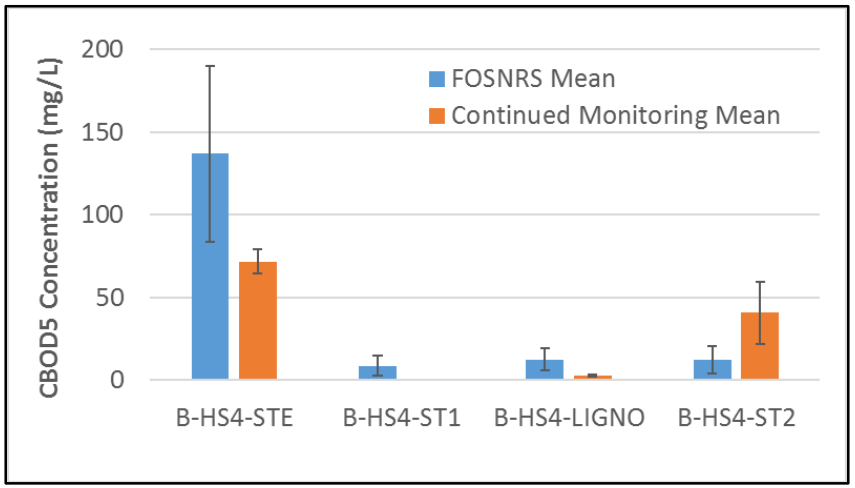
TN: Total Nitrogen

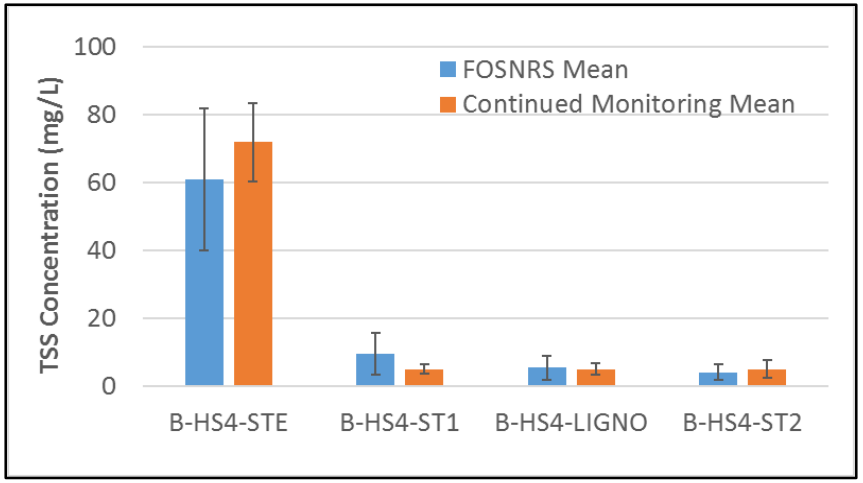
Seminole County System B-HS4 - Continued

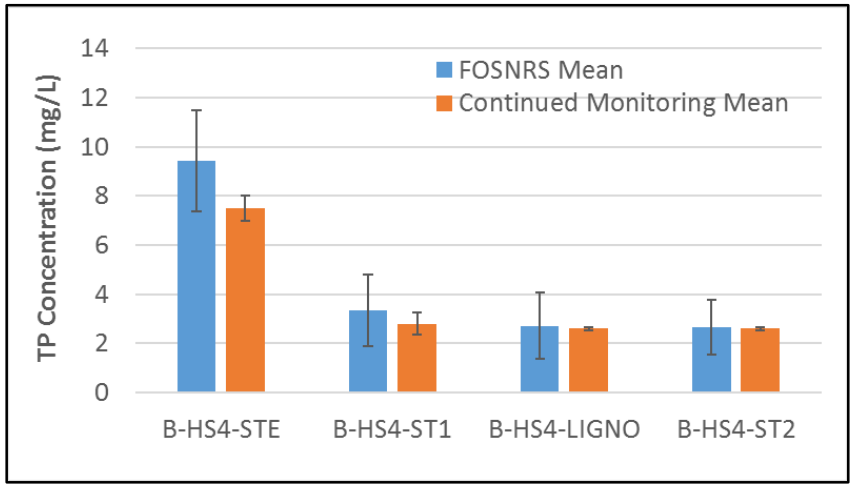


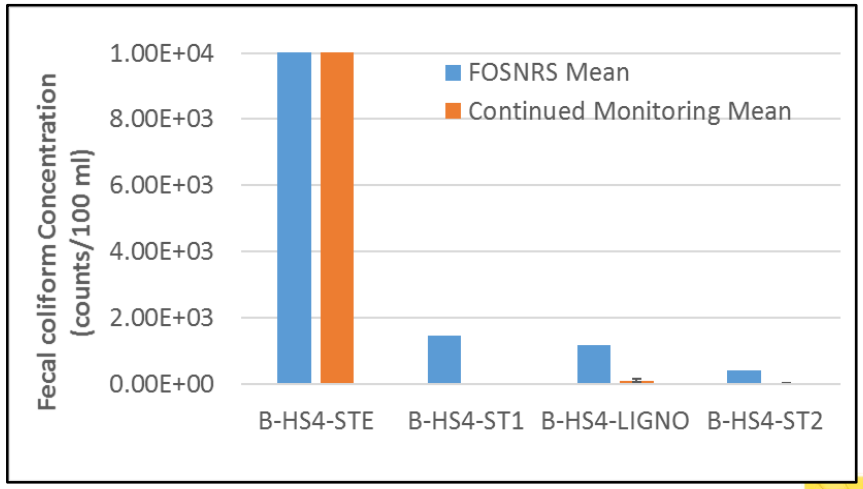
TN: Total Nitrogen

Seminole County System B-HS4 - Continued







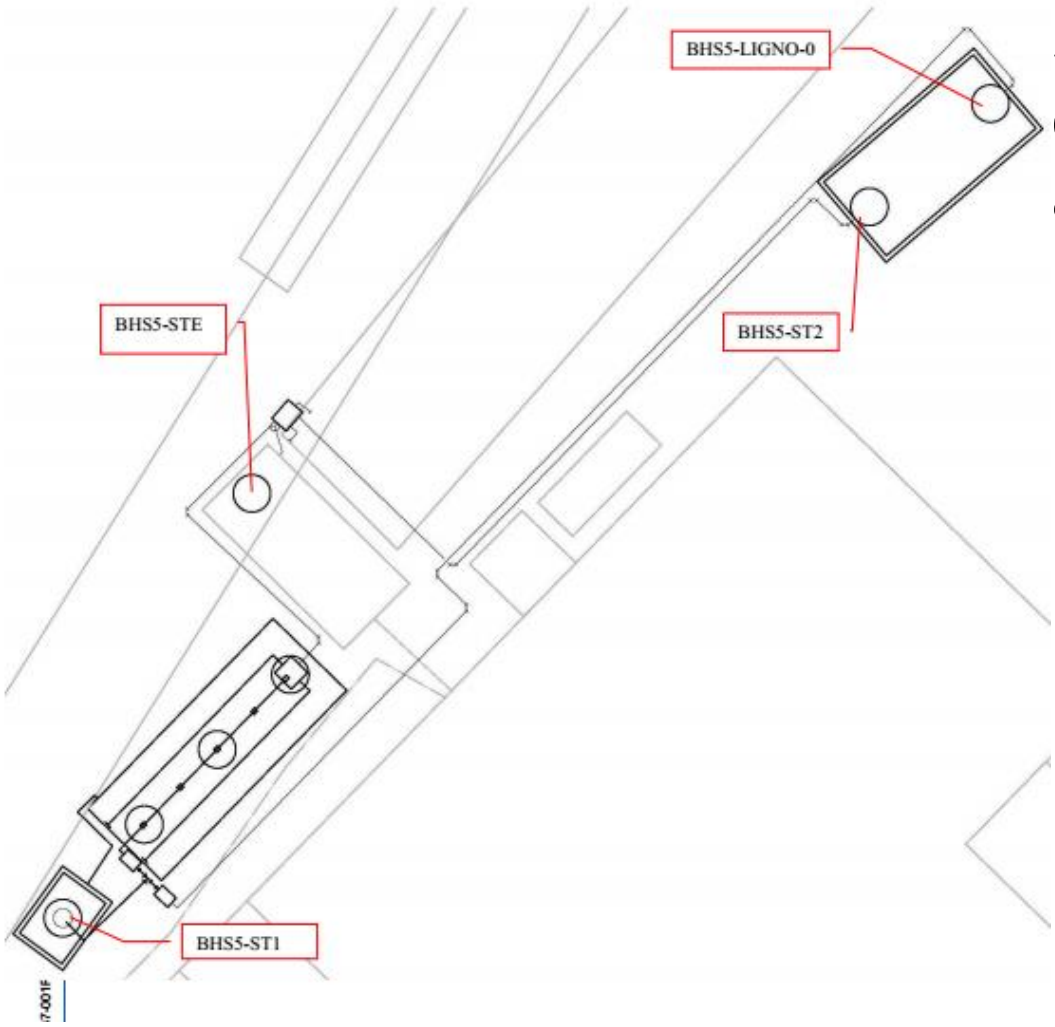


CBOD5: 5-day carbonaceous biochemical oxygen demand;
TSS: total suspended solid; TP: total phosphorus;
FOSNRS: Florida Onsite Sewage Nitrogen Reduction Strategies Study

Seminole County System B-HS5

Seminole County System B-HS5

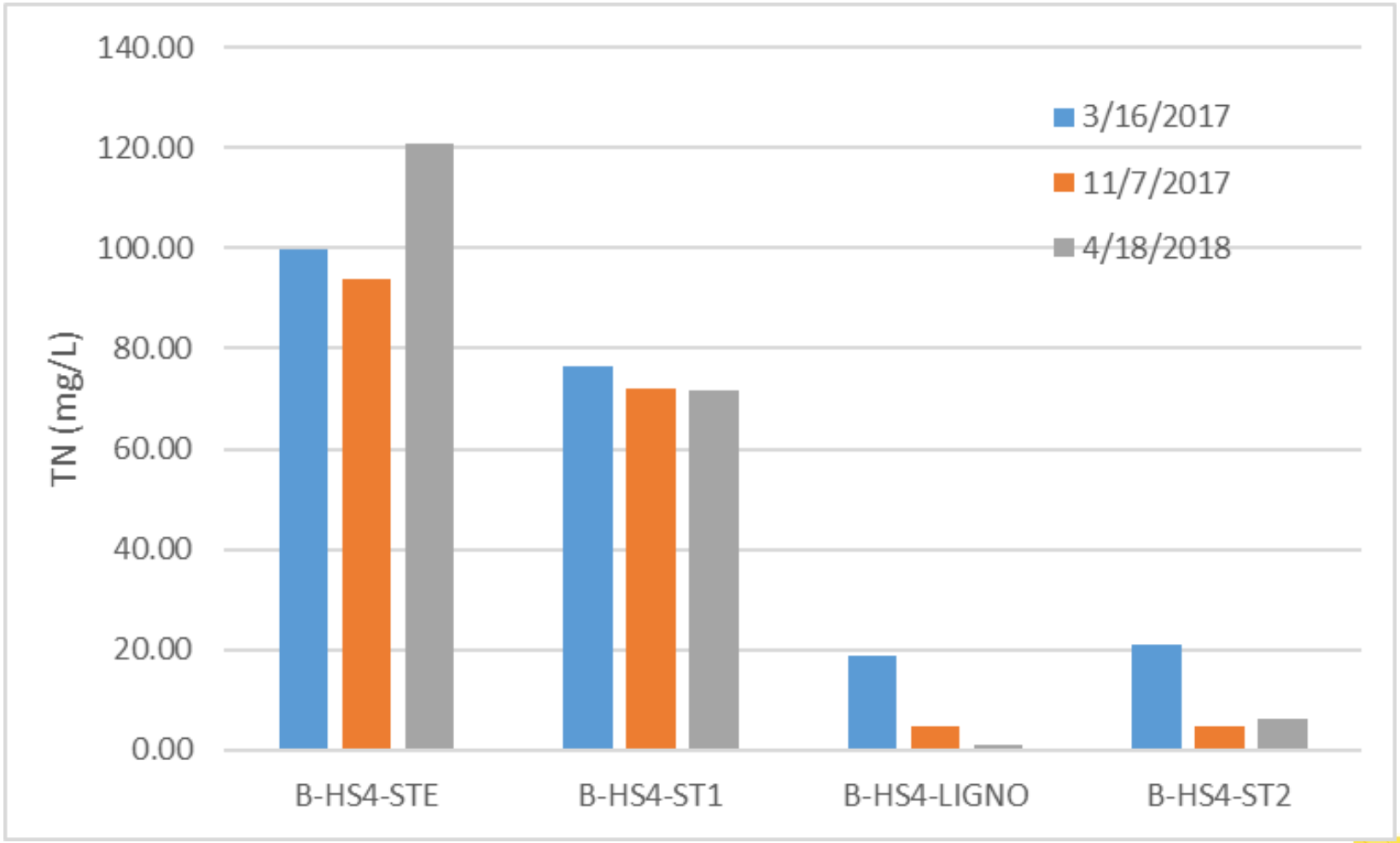
Seminole County System B-HS5



Samples were collected on 3/16/2017, 11/07/2017, and 4/18/2018 from:

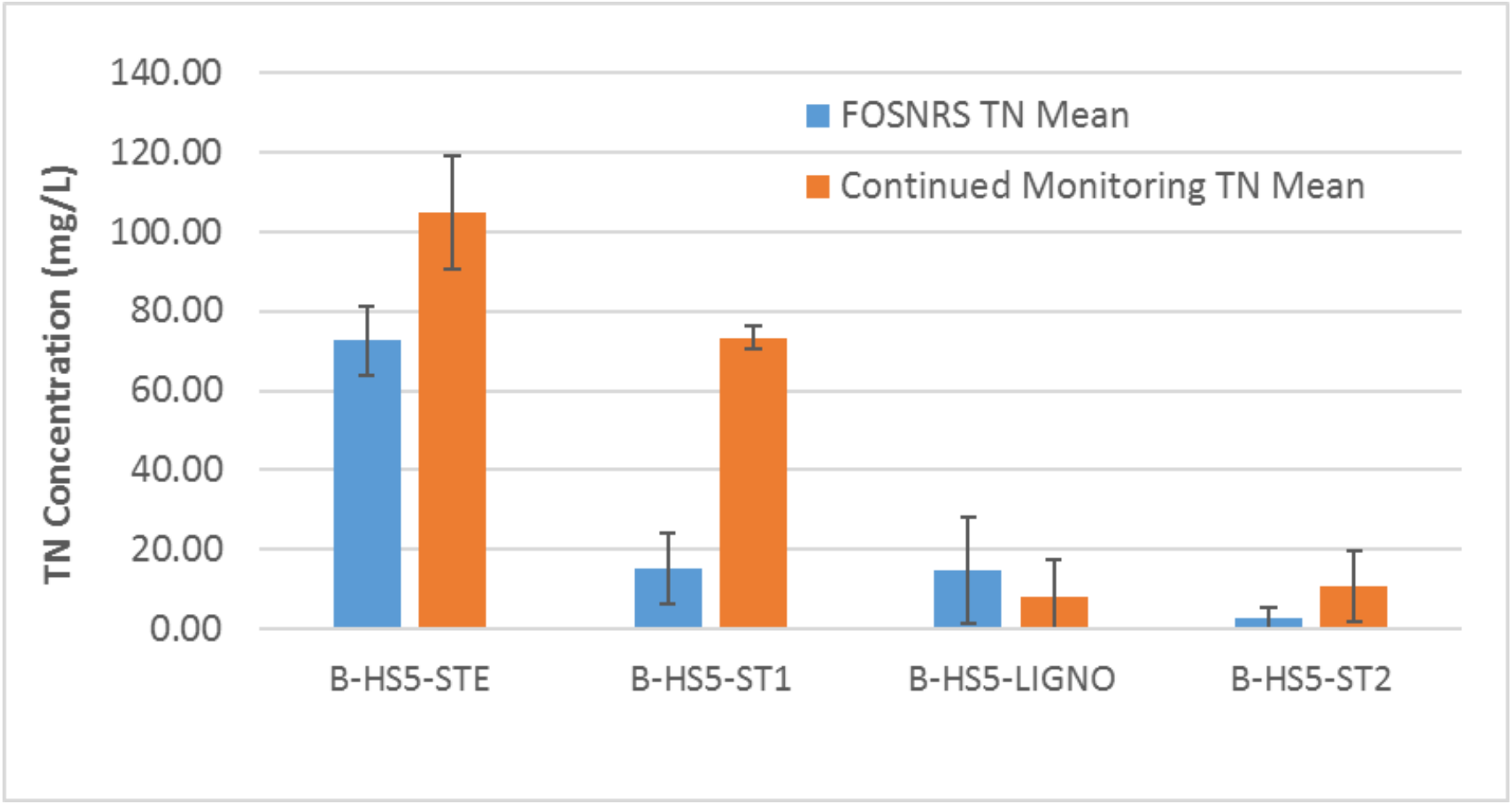
a) BHS4-STE (Septic tank)
b) BHS4-ST1 (Pump tank)
c) BHS4-LINER-0 (Bottom of ligno layer)
d) BHS4-ST2 (Sulfur tank)

Seminole County System B-HS5



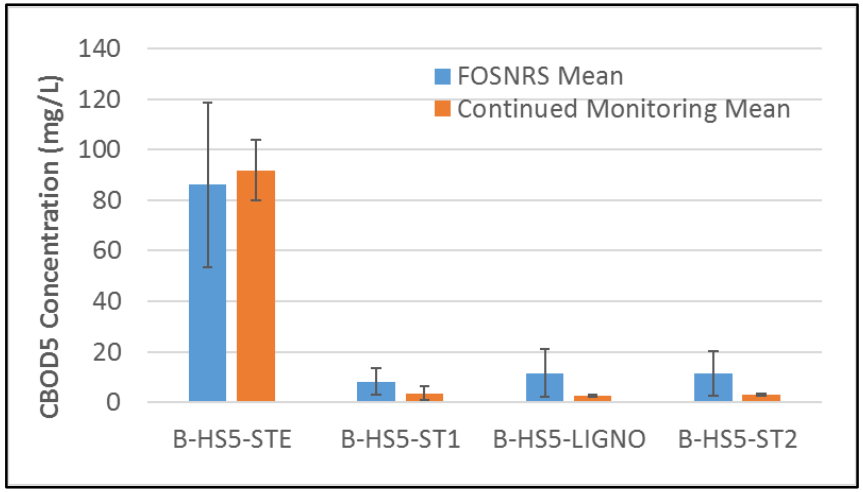
TN: Total Nitrogen

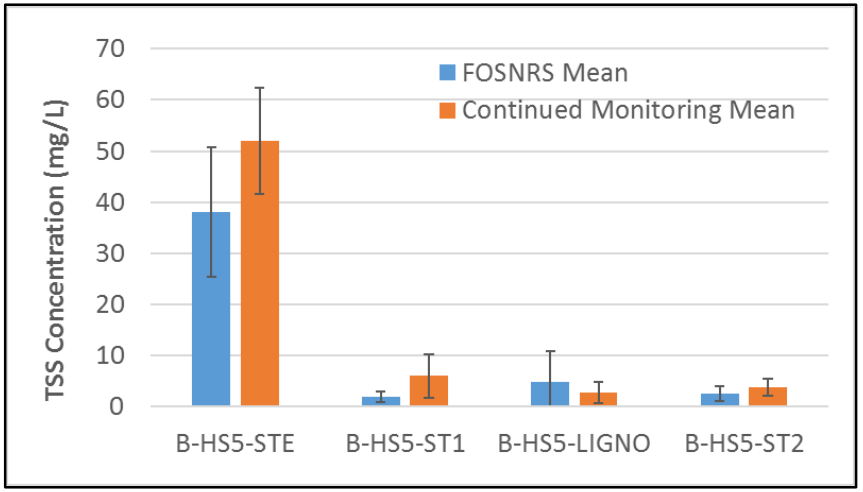
Seminole County System B-HS5 - Continued

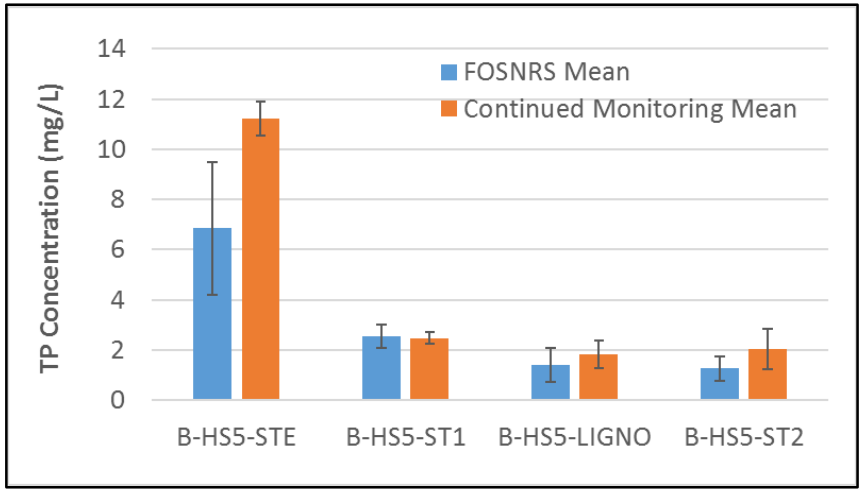


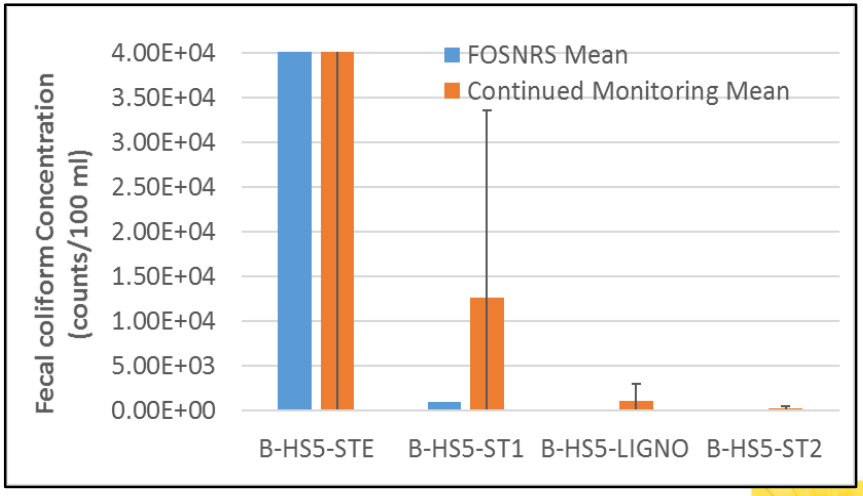
TN: Total Nitrogen

Seminole County System B-HS5 - Continued







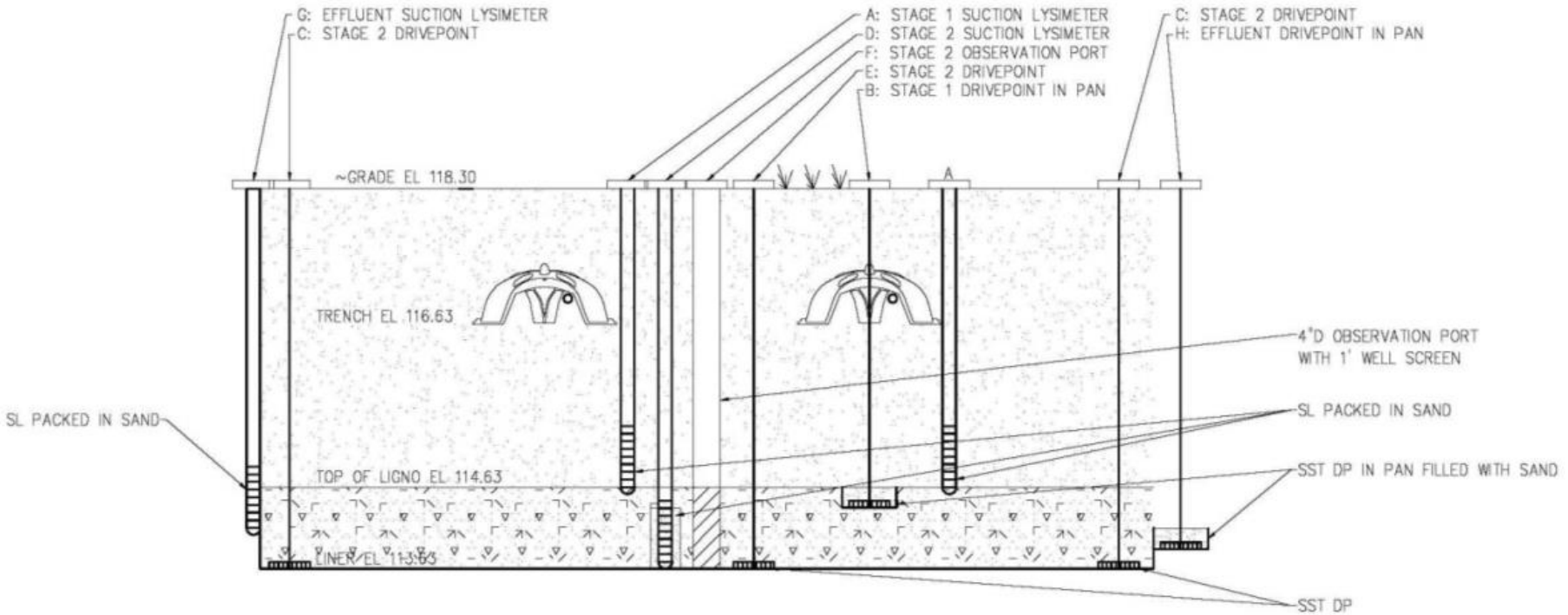


CBOD5: 5-day carbonaceous biochemical oxygen demand;
TSS: total suspended solid; TP: total phosphorus;
FOSNRS: Florida Onsite Sewage Nitrogen Reduction Strategies Study

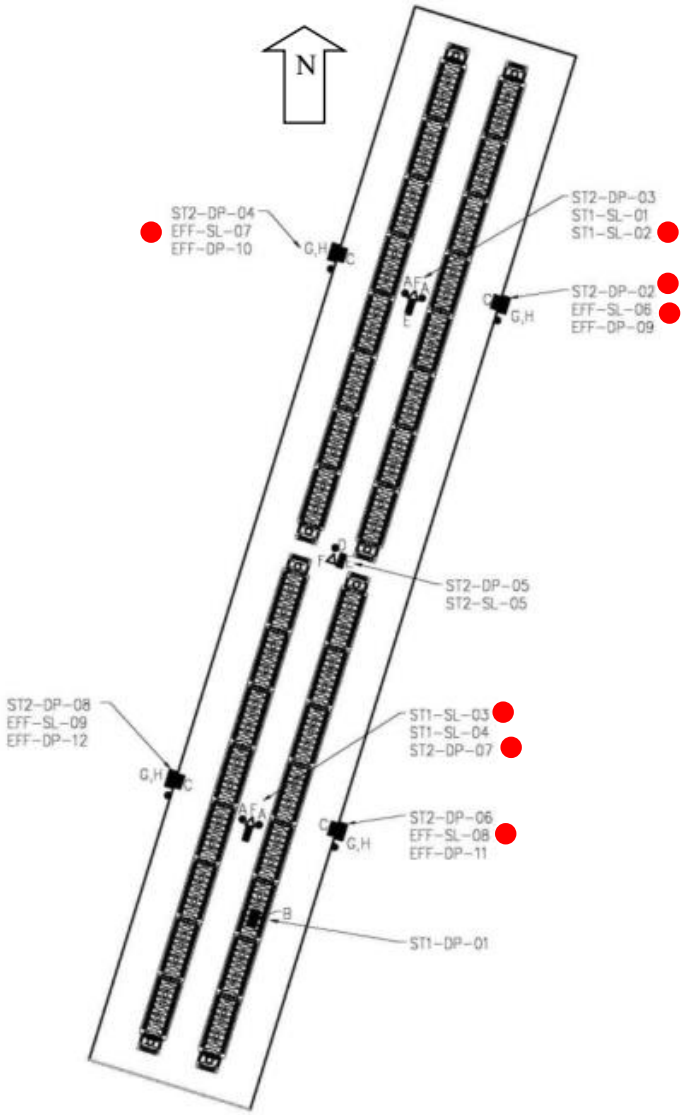
Marion County System B-HS7

Marion County System B-HS7 Drainfield

Marion County System B-HS7 Drainfield Cross Section



Marion County System B-HS7



Samples were collected on 4/26/2017, 12/05/2017, and 4/26/2018 from:

a) BHS7-Pump (Pump tank)
b) BHS7-ST1-SL-02 (Stage 1 media)
c) BHS7-ST1-SL-03 (Stage 1 media)
d) BHS7-ST2-DP-02 (Stage 2 media)
e) BHS7-ST2-DP-07 (Stage 2 media)
f) BHS7-EFF-SL-06 (Peripheral soil)
g) BHS7-EFF-SL-07 (Peripheral soil)
h) BHS7-EFF-SL-08 (Peripheral soil)

Marion County System B-HS7 - Continued

4/26/2017 (Unit: mg/L)				
Sampling Points	Nitrate/Nitrite	Ammonia	TKN	TN
BHS7-Pump	0.03	66.7	63.4	63.4
BHS7-ST1-SL-02	0.67	0.02	1.3	2.0
BHS7-ST1-SL-03	0.16	0.05	2.5	2.7
BHS7-ST2-DP-02				
BHS7-ST2-DP-07				
BHS7-EFF-SL-06				
BHS7-EFF-SL-07	0.03	0.05	1.2	1.2
BHS7-EFF-SL-08	0.18	0.52	7.1	7.3

TKN: Total Kjeldahl Nitrogen = Ammonia + Organic Nitrogen

TN: Total Nitrogen = TKN + Nitrate/Nitrite

Marion County System B-HS7 - Continued

12/5/2017 (Unit: mg/L)				
Sampling Points	Nitrate/Nitrite	Ammonia	TKN	TN
BHS7-Pump	0.01	63.0	75	75.0
BHS7-ST1-SL-02	0.39	0.01	1	1.4
BHS7-ST1-SL-03				
BHS7-ST2-DP-02	0.043	0.03	2.4	2.4
BHS7-ST2-DP-07				
BHS7-EFF-SL-06	2.9			
BHS7-EFF-SL-07	0.12	0.04	1.3	1.4
BHS7-EFF-SL-08	0.76			

TKN: Total Kjeldahl Nitrogen = Ammonia + Organic Nitrogen

TN: Total Nitrogen = TKN + Nitrate/Nitrite

Marion County System B-HS7 - Continued

4/26/2018 (Unit: mg/L)				
Sampling Point	Nitrate/Nitrite	Ammonia	TKN	TN
BHS7-Pump	0.01	39	49	49.0
BHS7-ST1-SL-02				
BHS7-ST1-SL-03				
BHS7-ST2-DP-02	0.051	0.06	1.5	1.6
BHS7-ST2-DP-07	0.01	0.21	2.2	2.2
BHS7-EFF-SL-06	1.4	0.05	0.65	2.1
BHS7-EFF-SL-07				
BHS7-EFF-SL-08	0.075	0.008	1.2	1.3

TKN: Total Kjeldahl Nitrogen = Ammonia + Organic Nitrogen

TN: Total Nitrogen = TKN + Nitrate/Nitrite

Public Comment

Closing Comments, Next Meeting, and Adjournment

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