



UNRBA
Nutrient Credit
Development
Project
PFC Meeting
April 2015



April 8, 2015

Establishment of SME Contract



Status of Contract Development

- Contract was signed on March 31
- Cardno and the Center delivered Batch 1 preliminary documents for SME review on April 1

Preliminary Findings for Batch 1 Practices



Data Quality for Credits Database

- Screening analysis data quality was based on
 - Year, location, peer review status, scientific methodology, etc.
 - Did not include review of the data
- Credits database includes
 - Over 50 fields across all measures
 - Soil type and contributing land use type
 - Drainage area and BMP characteristics
 - Number of samples, type of study
 - EMCs, Volume and load reductions



Data Quality for Credits Database, continued

- A “high” data quality during screening does not necessarily translate into sufficient data to calculate credits
 - Different studies reported different parameters
 - Study reported modeling results of synthesis of literature rather than monitoring data
 - Limited sample size or duration of study
- Best professional judgment may supplement data synthesis for some measures (e.g., soil amendment)
- Forrest has requested that the SMEs work with us to develop a reasonable credit

Filter Strips with Design Variants



Filter Strips with Design Variants

- Engineered vegetated filter strips designed as specified in the BMP Manual:
 - Load reductions: 40% TSS, 30% TN, 35% TP
 - Minimum flow path length of 50 feet, slopes < 8%, etc.
 - Level spreader and blind swale required
 - Forebay required if blind swale is not lined with riprap
 - Flows to the filter strip must not exceed 10 cfs

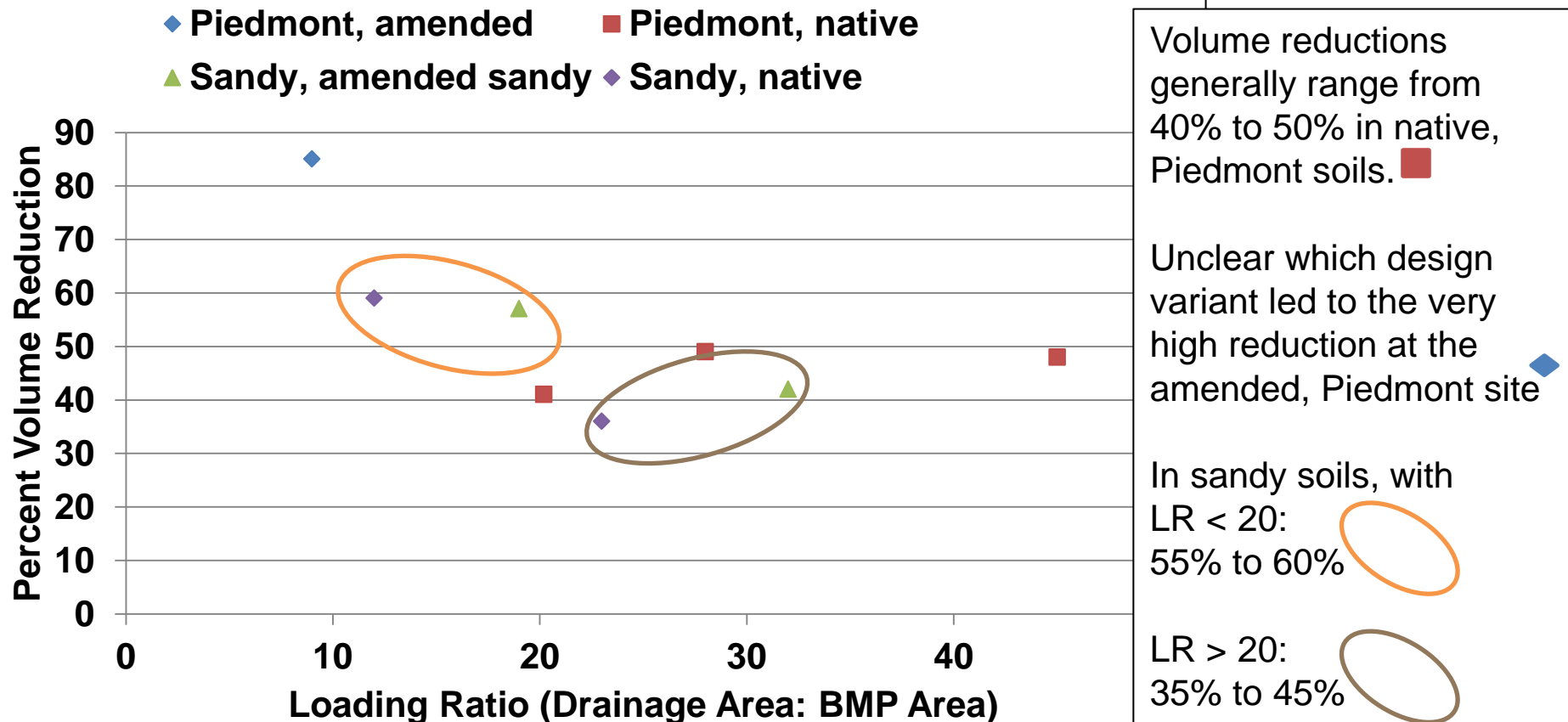


Filter Strips with Design Variants

- Filter strip credit database
 - Soil type and/or loading ratio are key design variants for some parameters
 - Minimum filter strip length
 - 8/12 study sites had lengths ranging from 20 – 25 feet
 - 3/12 study sites had lengths ranging from 50 – 56 feet
 - Percent reductions among these sites are similar, and higher than the credits in the manual
 - 1 site had a length of 147 feet as well as a very low loading ratio and amended, Piedmont soils



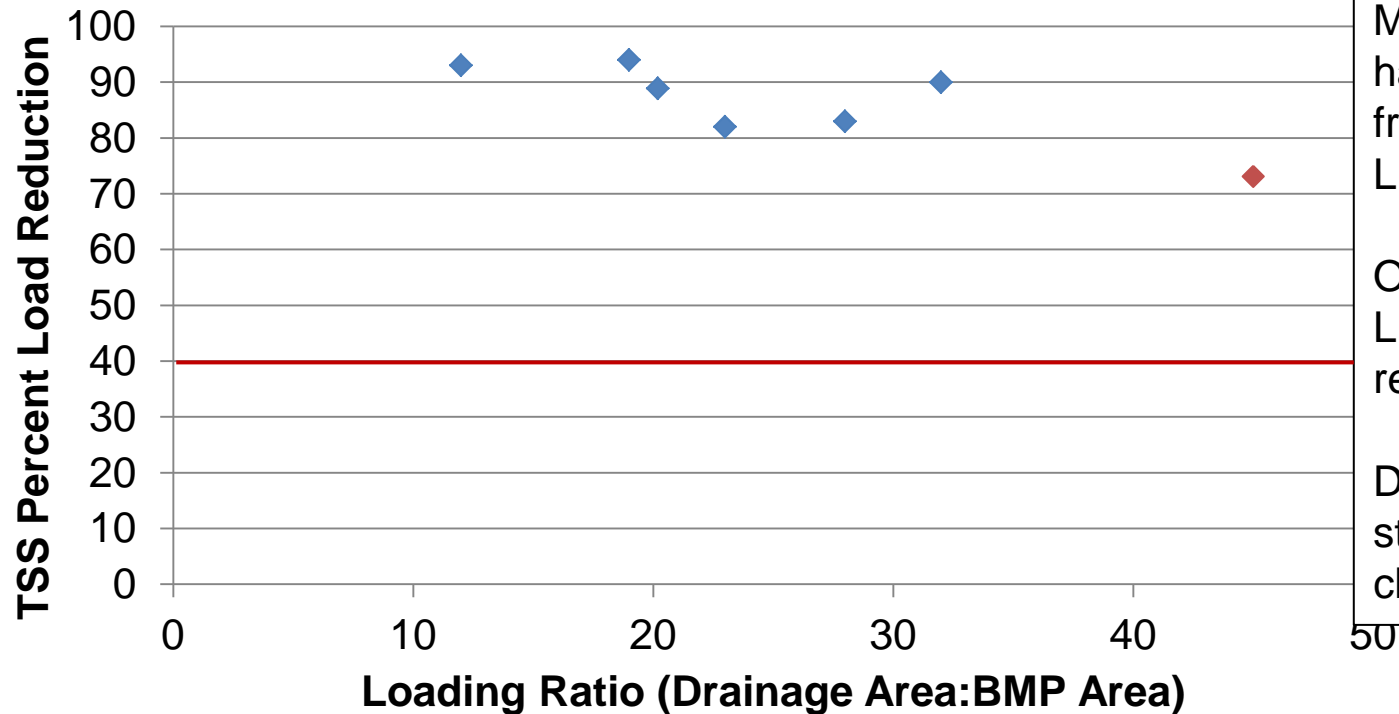
Filter Strips with Design Variants: Volume Reduction





Filter Strips with Design Variants: TSS Reduction

TSS Load Reduction versus Loading Ratio for Filter Strips



TSS credit in the BMP manual is 40%

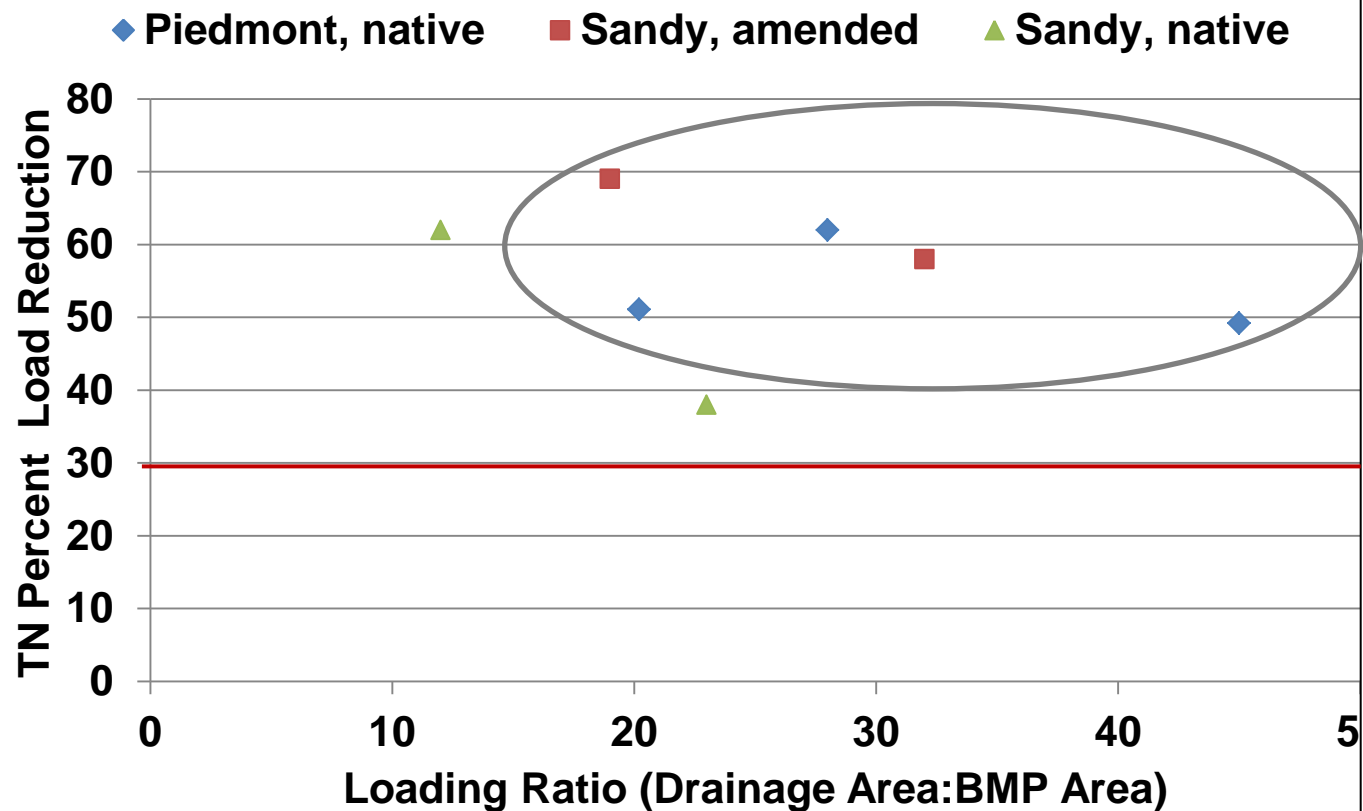
Majority of study sites have reductions ranging from 80% to 94% when LR < 35 ◆

One data point with LR = 45 has a TSS load reduction of 73% ◆

Design variants were not strong predictors of change



Filter Strips with Design Variants: TN Reduction



TN credit in the BMP manual is 30% for minimum length of 50 ft

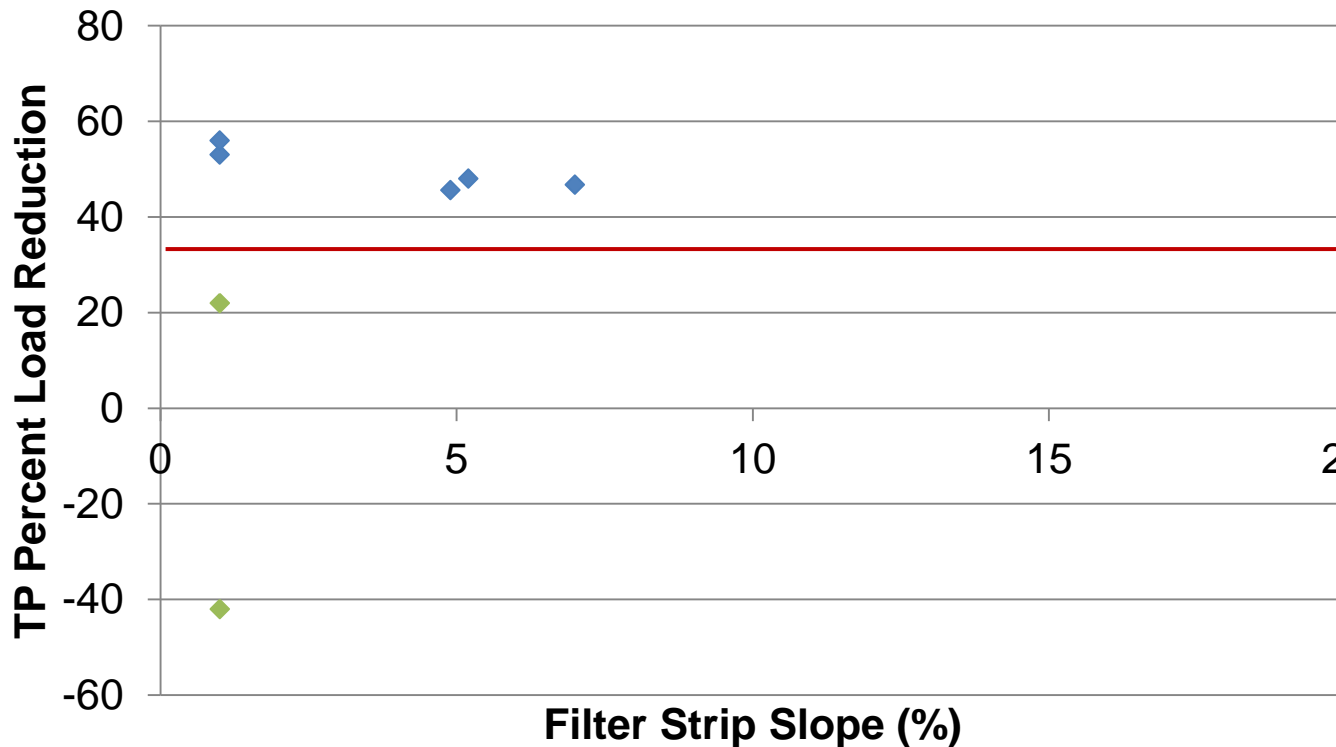
Majority of study sites have TN load reductions ranging from 50% - 70% (Piedmont soils and sandy soils amended with ViroPhos)

Sandy, amended soils performed better than sandy, native soils, and both performed better with a lower LR



Filter Strips with Design Variants: TP Reduction

TP Load Reduction versus Slope for Filter Strips



TP credit in the BMP manual is 35%

Slope has a slight effect

TP load reductions generally range from 40% - 60% for Piedmont soils and sandy soils amended with ViroPhos

Sandy, native soils that have a high soil test P perform poorly and may release phosphorus

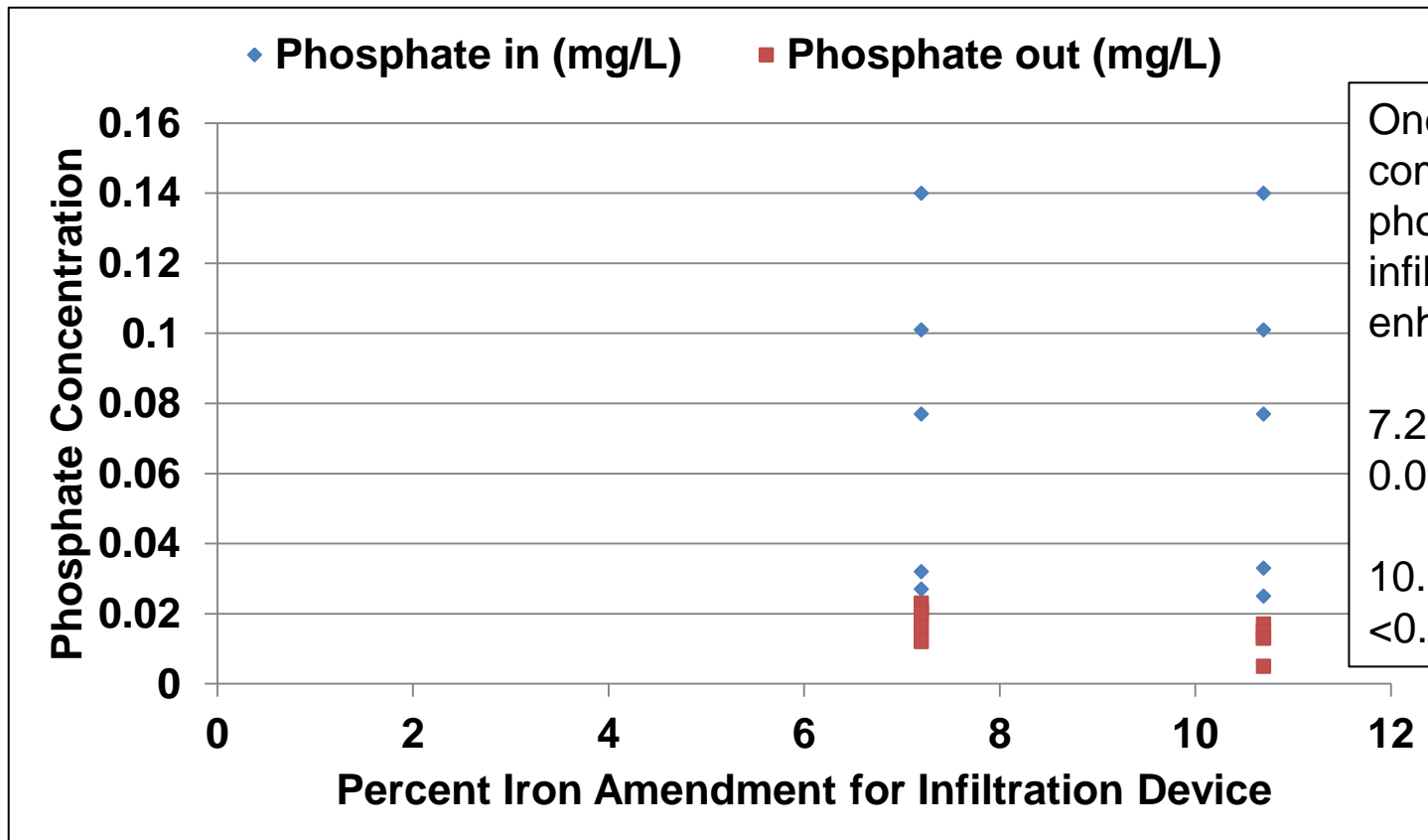


Infiltration Devices

- Infiltration devices designed as specified in the BMP Manual
 - Load reductions: 85% TSS, 30% TN, 35% TP
- The JFSAT does not currently include infiltration devices as a measure, but Storm EZ does
- We may work with SME and DMLR to code up volumetric losses into JFSAT which will provide some TN and TP credits
- Infiltration device data indicates that iron enhancement can further reduce phosphorus concentrations
- These concentrations could be coded into JFSAT as effluent concentrations for the volume of water that was not “lost”



Infiltration Devices with Iron Enhancement



One study in Minnesota compared effluent phosphate concs. for infiltration devices enhanced with iron filings:

7.2 percent iron:
0.012 mg/L to 0.023 mg/L

10.7 percent iron:
<0.01 mg/L to 0.017 mg/L.



Soil Amendment

- Refers to tillage practices and incorporation of organic matter to reduce soil compaction and increase infiltration rates
- Limited data
 - Short duration (1 – 2 months)
 - Monitor 1 – 2 storms
 - Most focused on the impacts to vegetation, not hydrology
 - None reported changes in nutrient loads or concentrations over varying designs



Three options for moving forward with this practice

- Option 1: Use best professional judgment to develop a volumetric credit in either Storm-EZ or JFSAT
- Option 2: Delay development of this practice and move it into Batch 3; reassess data available in a few months
- Option 3: Remove this practice from initial list of ten priority measures and swap with a measure that is currently being studied by the NCSU stormwater group; further develop credit for soil amendment if funds are remaining or EPA grant money is available
- SME will weigh in the next week or so to provide the PFC with additional information to choose among these three options

Upcoming Batch 2 Practices



Upcoming Batch 2 Practices

- Pervious area nutrient management
- Remove illegal wastewater connection to stormwater systems or surface waters
- Bioretention with design variants

Credit Tool



Status of Tool Selection and Development

- Forrest is reviewing the redline version of the Task 2.1 Model Selection memo that was revised in response to Sandy's comments
- Forrest is reviewing the preliminary draft scope and budget for tool development (Tasks 2.2 and 2.3)
- PFC will receive these documents in April



Components of the Budget and Scope

- Basic elements of the tool
- Supplemental features (optional)
- Reporting and tracking (hold mostly to end after Rules Revision stakeholder process)



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