



**TETRA TECH**



# **Soil Attenuation of Nutrients during Onsite Wastewater Treatment Expert Review Panel - Update to WWTWG**

***April 7, 2015***

# Agenda



- Activities to date
- Current status
- Future activities and schedule

# Activities to Date



- Administration and orientation
- White paper development/background discussions
- Literature collection/dissemination
- Conference calls with research presentations
- Draft report outline
- Proposals for recommending revised attenuation numbers

# Presentations

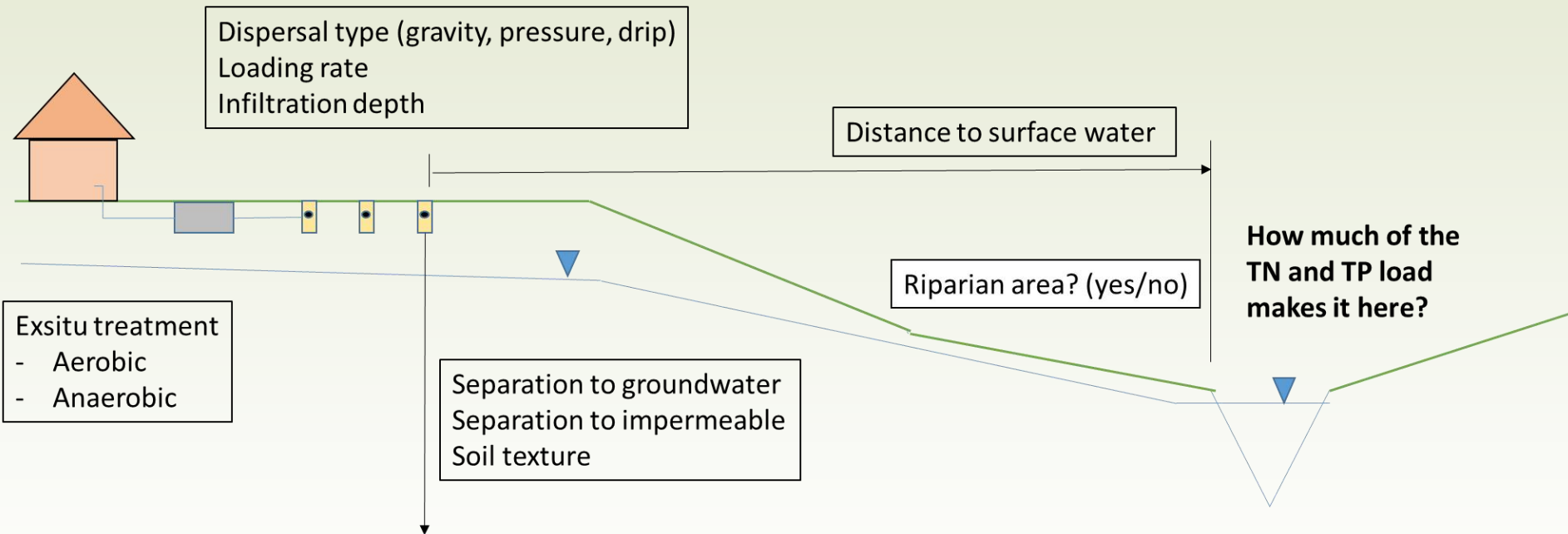


- Lew Linker, “The Chesapeake Bay Community Watershed Model”
- Bob Siegrist, Mengistu Geza, STUMOD presentation
- Sushama Pradhan, SWAT model presentation
- Scott Ator, “Application of SPARROW Modeling to Understanding Nitrogen, Phosphorus, and Sediment in Chesapeake Bay”
- David Radcliffe, “Impact of onsite wastewater treatment systems on Piedmont stream nitrogen”
- Mike O’Driscoll, “Tracking On-Site Wastewater Nitrogen Contributions to Coastal Waters: From Site to Watershed-Scale”
- Charlie Humphrey, “Groundwater Transport of Phosphorus from On-site Wastewater Systems in Coastal North Carolina”

# Conceptual Site Descriptions



Assume: residential wastewater, 5 kg TN/cap/year, ? Kg TP/cap/year



# Proposed Methodology



- **Baseline assumption** (from previous Panel) - Septic tank effluent into soil treatment unit (STU) at a loading of 5 kg/cap/yr
- **Vadose Zone** (includes STU and unaffected zone) - attenuation rate based on 3-4 classifications of soil texture, hydrologic series, or composite characteristic
  - Sandy, Loamy, Clayey



# Proposed Methodology



- **Saturated Zone** - Spatially variable attenuation rates based on physiographic province and distance to water
  - Physiographic region (Coastal Plain, Piedmont, Ridge and Valley, Appalachian Highlands, Karst)
  - Distance to water
    - Average distance in stream/river segment is determined by Bay Program and multiplied by a variable decay rate provided by panel for each physiographic region
- **Riparian Zone** - Bay Program to determine whether land/river segment features riparian buffers
  - Attenuation rates for riparian zones (could be variable by physiographic region)

# Proposed Vadose Zone TN Attenuation Rates



Soil textural class	Loading rate (cm/day)	Attenuation	Average Attenuation
Sand	4	0.04	0.11
Loamy sand	4	0.08	
Sandy loam	3	0.15	
Loam	3	0.16	
Silt loam	1.8	0.34	0.30
Clay loam	1.8	0.31	
Sandy clay loam	1.8	0.18	
Silty clay loam	1.8	0.37	
Silt	1.8	0.31	
Sandy clay	1	0.51	0.62
Silty clay	1	0.76	
Clay	1	0.59	



# Future Activities



- Discuss strawman framework and proposed numbers (Thurs.)
- In-person worksession - ? (early May)
- Draft report (May-June)
- Draft report to WWTWG (June)
- Additional review/revision