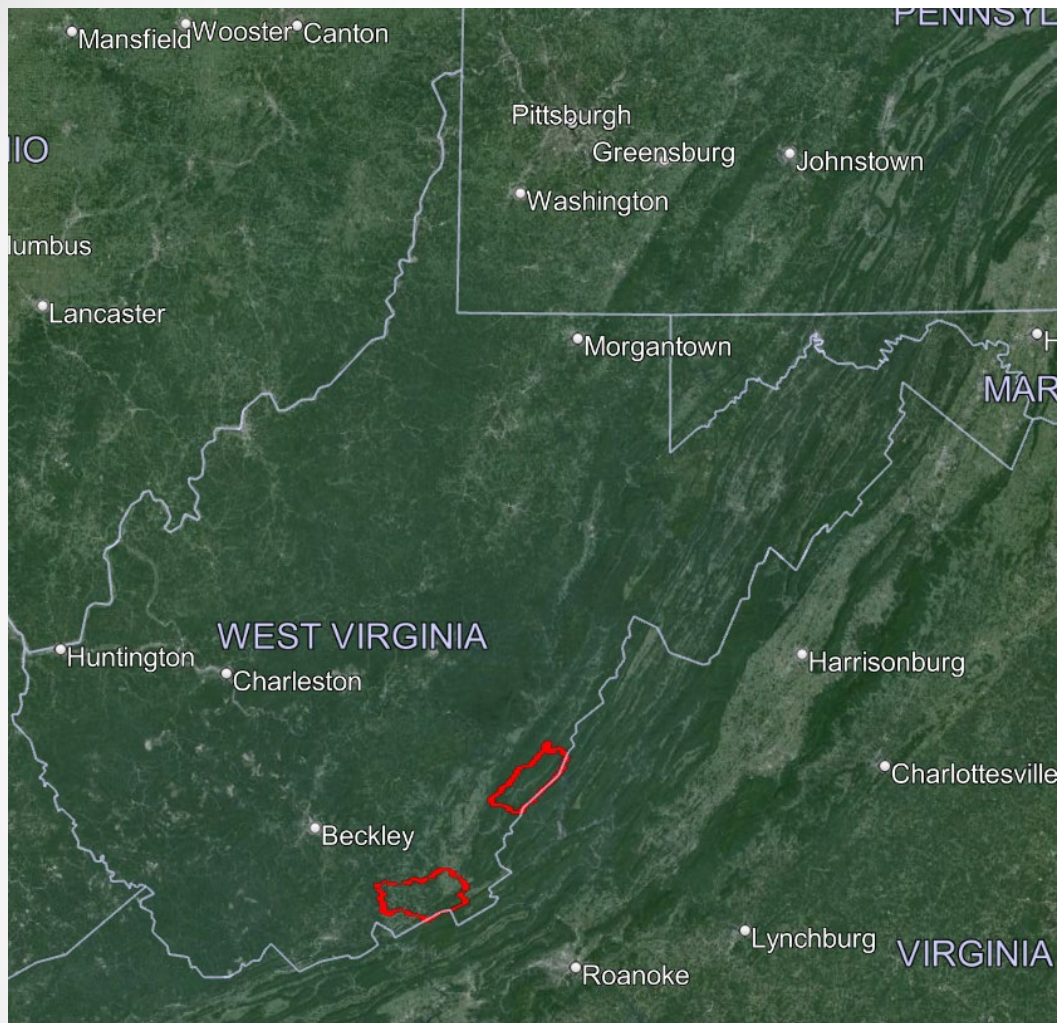


West Virginia Conservation Agency 319 NPS Septic Program



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Work area

319 NPS program projects are done on HUC10 or HUC12 scale



Documenting improvements in streams

- Metric = Fecal Coliform Bacteria
 - Measuring
 - Measurement unit is CFU/100mL. WQ standards are in concentrations.
 - EPA recommendations for body-contact = <200 CFU/100 mL.
 - 303(d) listing and delisting decisions are based on concentration.
 - Modeling
 - Modeled by loading. A pollutant load is the total amount of the pollutant in a volume of water, generally the discharge of a stream per day. Pollutant loading can be measured indirectly by measuring concentration and discharge.
 - The TMDL and load reduction estimates are modeled.
 - Collecting data that is valid in WQX requires a QAPP



Monitoring in your watershed

- Determine the following:
 - Scale
 - Will you monitor a single area or the whole watershed?
 - Resources
 - How much time and energy can you put into your monitoring plan?
 - Will you hire a consultant or delegate duties internally?
 - Goals
 - Do you want to add data to WQX?
 - Develop a QAPP
 - Do you want to potentially delist the stream?
 - Requires intense monitoring plan developed with WVDEP
 - Frequent sampling of pre-TMDL monitoring sites
 - Do you want to refine the watershed-based plan?
 - Narrow down problematic areas, report work done and measured outcomes
 - What parameters do you have interest and capacity to measure?
 - DO, conductivity, temperature, pH, fecal coliform, TSS, turbidity



Documenting improvements in streams

- Measuring improvements
 - Fecal coliform can have growth or die off based on conditions or over time as it moves downstream.
 - UV exposure and cold weather cause die off
 - Best to monitor monthly for 12 months to cover all seasons
 - The amount of recent runoff and water in the stream affects concentration
 - Best to monitor at a range of stream stages
 - Collect samples for analysis of total suspended solids to indicate range of flow
 - Even though more water can cause dilution, more water means more runoff which can increase loading
 - Analysis of samples
 - 6 hour holding time
 - Certified lab



Modeling load reductions

- Estimate by models linking BMPs and load reductions
- The WVDEP has developed a dimensional analysis to model FC load reductions:

$$\left(\frac{365 \text{ days}}{1 \text{ year}}\right) * \left(\frac{50 \text{ gal}}{1 \text{ day person}}\right) * \left(\frac{3,785.4 \text{ mL}}{1 \text{ gal}}\right) * \left(\frac{10,000 \text{ CFU}}{100 \text{ mL}}\right) * \left(\frac{2.4 \text{ people}}{1 \text{ house}}\right) * \left(\frac{100\% \text{ efficiency}}{100}\right)$$

= 1.66E+10 CFU/year/house

- The same equation is used to calculate load reduction per septic pumping, however 25 gallons is used in place of 50 gallons of sewage per day with a 50% efficiency = 4.15E+09 CFU/year/house.
- These load reduction estimates are reported in semi-annual and final grant reports based on the number of projects completed during the reporting period.



Signs of a failing or outdated septic system:

- sewage backing up into the house
- sewage smell outside
- soggy lawn around drain field
- water pooling on the drain field
- straight pipe into a nearby stream
- sewage draining into an open area
- system installed prior to 1982



Class I (conventional) and Class II (alternative) septic systems

- Class I, or conventional septic systems, consist of a septic tank and a drain field where effluent is filtered through the soil before reaching the groundwater
 - Soil that has a low percolation rate or a high water table may not be suitable for a Class I septic system
- Class II systems use alternative methods instead of a gravity fed leach field to filter effluent where Class I systems will not work
 - An example is a mounded system where effluent is pumped to the top of a mound of material that it can filter through
 - Cost about 2x as much as conventional systems
 - Septic installers must receive specific certification to install class II systems



Class I System



Class II System



<https://www.flickr.com/photos/mpcaphotos/34827651135>



FAQ

- How did you do outreach?
 - EDDM, word of mouth, community boards
- How did you supply match for the §319 grant?
 - Landowner portion of cost, time and mileage, other projects in watershed
- How long did it take to catch on?
 - ~ 1 year
- With whom did you partner to get it done?
 - WVDEP, county sanitarian, local contractors, watershed associations
- What were the requirements for the septic system owner?
 - Complete an application, schedule sanitarian visits, get estimates from contractors, schedule contractor work, provide project updates, submit invoices



FAQ

- Did you review cases with the sanitarians?
 - Sanitarians email their report but will also meet with you on site if you ask
- Did you pump tanks where there should not have been a leach field?
 - Yes, we will cost-share on a pumping regardless of whether the system should be replaced or not
- What would you change about how you have run these programs?
 - Always meet with the landowner in person to explain your program and have them apply in person. This prevents them from having work done before you enter a contract for cost-share.
- What changes in the creeks have you seen because of these programs?
 - We have modeled load reductions but have not yet done intense water quality monitoring for this program (Ag BMP only)

