Virginia Department of Health (VDH)
Sewage Handling and Disposal Advisory Committee (SHADAC)
August 6, 2014 – Meeting Summary

List of attendees:

Advisory Committee Members

Tom Ashton	David Fridley	James Hall	Bob Lee
Mike Lynn	Bob Mayer	Dr. Jim Pyne	Dwayne Roadcap
Valerie Rourke	Cody Vigil	Jeff Walker	

Mr. Ashton sat in place of Colin Bishop representing manufacturers. Mr. Mayer sat in place of Curtis Moore representing the Virginia Onsite Wastewater Recycling Association. Mr. Walker sat in place of Matt Tolley representing the Virginia Association of Professional Soil Scientist.

VDH Staff and Guest

Eric Aschenbach	John Aulbach	Jim Bowles	Peter Brooks
Mike Burch	Scott Currie	Dr. Marcia Degen	John Ewing
Sandra Gentry	Lance Gregory	Todd Grubbs	Trisha Henshaw
Eric Johnston	Bob Marshall	Sean McGuigan	Amy Pemberton
Jim Slusser			

Administrative

1. Welcome.

Mr. Gregory announced Vincent Day's request to step down as Chairman of the SHADAC. The State Health Commissioner appointed Mike Lynn to serve as Chairman of the SHADAC. Mr. Gregory shared the agency's appreciation for Mr. Day's leadership as Chairman, and the agency's appreciation for Mr. Lynn's willingness to accept this new role.

Mr. Lynn stated that he would like the SHADAC to think about including a public comment period before meetings. He would also like the committee to review the SHADAC rules and possibly consider restoring VDHs ability to vote.

2. Approve agenda.

Mr. Lee asked that an update on local ordinances, the GPS policy, and civil penalties be added to old business.

3. SHADAC Appointments.

Mr. Gregory announced that Pete Kesecker requested to step down as one of the two manufacturer representatives for the SHADAC. The State Health Commissioner appointed Cody Vigil to serve as the new manufacturer representative. Mr. Gregory shared the agency's appreciation for Mr. Kesecker's leadership an effort as a member of the SHADAC, and the agency's appreciation to Mr. Vigil for his willingness to accept this new role. There are currently two vacant positions for the SHADAC; a representative for the Department of Conservation and Recreation and a representative for the Chesapeake Bay Local Assistance Department (CBLAD). It was noted that CBLAD is now part of DEQ. Ms. Rourke indicated that she would follow up on the appointment of a DEQ CBLAD representative for the SHADAC.

4. Review summary from October 29, 2013 meeting.

Mr. Lee moved to approve the summary. Mr. Mayer seconded the motion. The summary was approved.

5. Review summary from March 20, 2014 meeting.

Mr. Lee moved to approve the summary. Dr. Pyne seconded the motion. The summary was approved.

Old Business

1. Nitrogen Policy.
   a. Chesapeake Bay TMDL Briefing.

Mr. Aschenbach provided a presentation (see attached) outlining the onsite sewage system sectors involvement in the Chesapeake Bay Total Maximum Daily Load (TMDL). The presentation included historical perspective on the creation of the TMDL, assumptions for the onsite sector, forecast for the onsite sector, and options for meeting the onsite sector goals. Mr. Aschenbach also mentioned that he, Dr. Degen, and Jay Conta are participating on an attenuation panel which is intended to address some of the assumptions made by the Chesapeake Bay model for the onsite sector.

Chairman Lynn asked if Virginia pushed for additional Best Management Practices (BMPs).

Mr. Aschenbach commented on the significant effort he and Dr. Degen put forward in getting several new BMPs approved very recently.

Mr. Walker commented that the nitrogen requirements are asking more from people that are already providing a reduction with an alternative onsite sewage system (AOSS), but nothing is being required of owners with a conventional onsite sewage systems.

Dr. Degen commented that VDH can only create requirements when given authority by the Code of Virginia. The Code only allows VDH to control nitrogen from alternative systems. The current nitrogen reduction program is geared towards recognizing alternative systems used in Virginia that reduce nitrogen and receiving credits for what we are already doing.

Several members of the SHADAC thanked Mr. Aschenbach for his presentation.

b. Review of other state onsite TMDL programs.
c. Nitrogen Testing Policy Update.

Dr. Degen presented a review of onsite sector programs in other states and an overview of Virginia's program to address the onsite sectors contribution of nitrogen to the Chesapeake Bay (see attached). Dr. Degen's presentation showed the nitrogen load from the onsite sector by state, discussed the nitrogen controls being implemented by other states, and provided a detailed overview of Virginia's program.

Several SHADAC members discussed what is being done in other states, as well as specific counties within Virginia, to address the Chesapeake Bay TMDL. This included discussion of some counties' focus on system pump-outs and Maryland's "flush tax".

2. Implementation of SHIFT recommendations.

a. Encourage use of private sector.

Mr. Gregory stated that VDH staff has been working diligently to implement the consensus recommendations from the Safety and Health in Facilitating a Transition (SHIFT) committee. This work includes the development of educational material that would encourage applicants to use the private sector (see attached). Mr. Gregory shared the draft handout with the SHADAC several weeks earlier and asked for their comments.

Chairman Lynn and Mr. Walker commented on the need to clarify how VDH processes bare applications that require an AOSS. Mr. Walker stated that if a site needs an AOSS, then the applicant is wasting their time going to VDH.

Mr. Slusser suggested including expectations from the VDH QA/QC policy to provide transparency.

SHADAC members were asked to submit their suggested edits to Mr. Roadcap or Mr. Gregory.

b. Uniform work product.

Mr. Gregory also commented on additional efforts to implement the SHIFT committee's consensus recommendation that VDH and private sector work meet the same expectations. To meet that goal, VDH developed new print forms for bare applications, a new system curve spreadsheet, and will be requiring scale drawings.

Mr. Roadcap commented that there are two options for VDH to address pump system designs. One option would be to include the system curve in the permit and verify the specific pump for compliance at the time of inspection. The second option would be to require prior notification and approval by VDH staff for the specific pump being proposed.

Mr. Walker commented that a contractor cannot make a competitive bid on a design without a specific pump being listed.

Mr. Fridley asked how that would seriously hamstring a contractor given that they have a specific range of regulatory requirements for pumps.

Mr. Mayer stated that pumps at this level are very simple.

Dr. Pyne commented that in public procurement he cannot specify specific items for a sole source contract, but that does not create an issue with receiving a bid.

Mr. Slusser commented that there is confusion between a designer relying on a contractor to exercise a standard of care versus enforcing a regulatory minimum. He believes inspecting for regulatory minimums is not sufficient.

Chairman Lynn commented that septic contractors have been picking pumps for 30 years and it has not created an issue. The contractor also picks the manufacturer of the pipe, the septic tanks, etc.

Mr. Walker stated that he believes designers are supposed to act as engineers. He stated that most of the time he provides specification details crucial to the operation of the system.

c. <u>GMP 126.B revision.</u>

Mr. Gregory stated that VDH is working to revise GMP 126.B to incorporate consensus recommendations from the SHIFT committee. A draft revised policy was recently provided to the SHADAC for comment. The draft document incorporates several different GMPs, with the intent of rescinding the other GMPs to streamline VDH policies. Mr. Gregory did not anticipate that members had reviewed the entire draft, but asked for initial thoughts on the draft revisions.

Mr. Walker commented that he believes VDH is trying to regulate by policy and that he believes the document is more for VDH staff work product expectations.

Chairman Lynn commented that it is useful to have the Virginia Code Section, regulatory section, and justification together in the same document, but it makes it hard to determine the intent of the policy. He stated that he would like to have all the regulations and policies

combined together in one document, and mentioned that Fairfax County had done that type of project.

3. Regulations Update and Next Steps.

    a. Discharge System Regulations – 12VAC5-640.

    b. Fee Regulations – 12VAC5-620.

    c. Emergency Regulations for Gravelless Material and Drip Dispersal – 12VAC5-610.

Mr. Roadcap stated that the final Discharge Regulations and final Fee Regulations are currently under executive branch review. If approved, there will be a 30-day public notice prior to becoming effective.

The gravelless material and drip dispersal regulations are proposed, and have completed Department of Planning and Budget review. These regulations will go to the secretary and governor for approval and, if approved, there will be a 60-day public comment period.

Chairman Lynn asked if there are any changes in these regulations that would surprise anyone.

Mr. Roadcap stated there is a document on the Virginia Regulatory Town Hall website that outlines the changes.

Mr. Walker commented that VDH staff provide certification letters for AOSS designs, and asked whether a private sector designer could use that certification letter to issue a permit.

Mr. Roadcap commented that a certification letter only specifies there is a suitable area for onsite sewage disposal.

Ms. Rourke commented that while proposed amendments to 12VAC5-610-30 of the SH&D Regulations in the proposed Regulations for Gravelless Material and Drip Dispersal acknowledge that certain activities may require a Department of Environmental Quality (DEQ) permit, the proposed amendments to 12VAC5-610-955 create regulatory overlap between DEQ and VDH regarding below-ground drip systems that may be used for dispersal of treated sewage and/or irrigation reuse of reclaimed water. For the benefit of the regulated community and VDH staff, VDH needs specific language to point out this overlap and when a DEQ permit may be needed in addition to or in lieu of a VDH permit for below-ground drip systems. If VDH is not going to include it in the regulations, then it needs to be placed in guidance or an MOU. DEQ is currently attempting to address the issue in the agency's implementation guidance for the Water Reclamation and Reuse Regulation. The consensus of the SHADAC was that VDH should do the same in the guidance for the AOSS Regulations.

Ms. Rourke clarified her concern that without proper guidance, VDH staff may unintentionally neglect to notify DEQ of an application for a proposed a below ground drip system jointly regulated by DEQ.

Dr. Degen stated that VDH is working on language to provide to staff that would explain how to handle these situations. Mr. Roadcap stated that all applications that might require a reuse permit with DEQ would be reviewed by the central office engineering team, which would reduce confusion.

4. Local Ordinances, GPS policy, and Civil Penalty Regulations.

Regarding the GPS policy, Mr. Roadcap stated that VDH has not officially implemented the policy. It is a policy for VDH staff, and sets expectations for how our staff will collect data for onsite sewage systems.

Mr. Roadcap stated that VDH does not have a policy in place to implement the Civil Penalty Regulations. VDH hopes to have it implemented within 18 months.

Mr. Roadcap commented that VDH has addressed local ordinances at the last few meetings. The SHADAC request was vetted with the Commissioner and the Office of the Attorney General. The agency does not believe a policy on local ordinance needs to be put in writing at this time. VDH staff are expected to understand the process for addressing local ordinances.

New Business

1. Education and Outreach Program.

Mr. Gregory discussed the basic outline for a new effort to create educational material for the public regarding the onsite sewage and private well programs. Materials would focus on key messages such as pumping out septic tanks. VDH will be looking for ways to work with industry groups to get these messages out. Mr. Gregory encouraged members to contact him with suggestions for the program.

2. Wastewater Characterization.

A recent concern developed about whether OSEs could perform wastewater characterizations or perform work for non-residential structures that only had bathroom waste. Mr. Roadcap commented that GMP 153 states if an AOSE certifies that his work is exempt from the practice of engineering, then the local health department will accept that certification. If there is a concern with the certification it may be referred to the Department of Professional and Occupational Regulations (DPOR). The issue is that VDH does not have authority to enforce licensure requirements.

Section 54.1 of the Code of Virginia defines residential wastewater as sewage generated by residential or accessory uses, not containing storm water or industrial influent, and having no other toxic, or hazardous constituents not routinely found in residential wastewater flows, or as certified by a professional engineer.

Some local health department staff have received wastewater characterizations from onsite soil evaluators and the local health department staff were hesitant to implement the policy knowing that there may be an issue with the certification. VDH had some discussions with DPOR, and DPOR will be forwarding the issue its regulatory board for consideration.

Mr. Walker asked for a definition of accessory use.

Dr. Degen commented on a handout shared with the SHADAC that VDH has considered sending to staff. The handout covers the questions VDH asked to DPOR and how DPOR responded. The proposed email to staff did not cover accessory use. VDH will modify the information based on clarifications received from DPOR. Essentially, if the law, regulations, and policy administered by VDH is adhered, and the only possible defect might be whether the proper licensee performed the work, then GMP 153 indicates that VDH staff should issue an approval and notify DPOR of the possible licensing concern.

<u>Other Items</u>

Mr. Mayer asked Mr. Gregory to send out a new list of SHADAC members.

Dr. Degen stated that DEQ is opening up their VWP permitting and is specifically considering clarifying the language for the exclusion to “septic tanks”. DEQ is having a meeting on September 9, 2014, with a public comment period. Information about the meeting is available on the Virginia Regulatory Town Hall website.

Mr. Lee asked if the SHADAC would be discussing the draft voluntary upgrade policy.

Mr. Roadcap asked members to send comments on the policy to Dave Tiller or Mr. Gregory.

Adjourn

Virginia Department of Health
Sewage Handling and Disposal Advisory Committee Meeting
Agenda

Date: August 6, 2014

Time: 10 am to 2 pm

Location: 2nd Floor, Board Room 3
Perimeter Center
9960 Mayland Drive
Henrico, Virginia 23233

Administrative (30 minutes)
1. Welcome. (5 minutes)
2. Approve agenda. (5 minutes)
3. SHADAC Appointments. (10 minutes)
4. Review summary from October 29, 2013 meeting. (5 minutes)
5. Review summary from March 20, 2014 meeting. (5 minutes)

Old Business (120 minutes)
1. Nitrogen Policy (60 minutes)
    a. Chesapeake Bay TMDL Briefing (30 minutes / Aschenbach)
    b. Review of other state onsite TMDL programs (15 minutes / Dr. Degen)
    c. Nitrogen Testing Policy Update (15 minutes / Dr. Degen)
2. Implementation of SHIFT recommendations. (60 minutes)
    a. Encourage use of private sector (20 minutes / Gregory)
    b. Uniform work product (20 minutes / Gregory)
    c. GMP 126.B revision (20 minutes / Gregory)

Break (30 minutes)

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3. Regulations Update and Next Steps (10 minutes / Roadcap)
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Mrs. Rourke commented that the Emergency Regulations for Gravelless Material and Drip Dispersal contains language stating that certain activities may require a Department of Environmental Quality (DEQ) permit. However, there are also potential permits for reclaimed water. The drip dispersal regulations create overlap between regulations and authority from different agencies. VDH needs very specific language to point out this overlap. If VDH is not going to include it in the regulations, then it needs to be placed in guidance or an MOU.

Mrs. Rourke clarified that her concern is that VDH would accept an application for a system that is jointly regulated by DEQ without informing DEQ.

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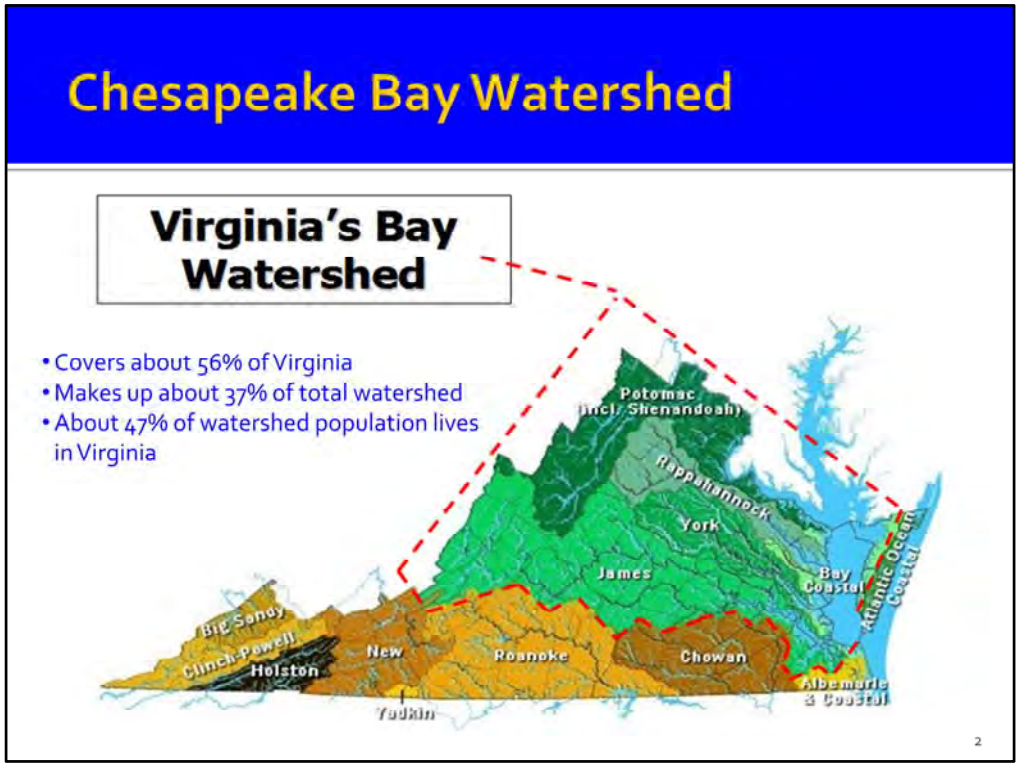
Chesapeake Bay Total Maximum Daily Load (TMDL) – Onsite Sewage Source Sector Briefing
Presented by
Eric Aschenbach
Virginia Department of Health
Office of Environmental Health Services
August 6, 2014

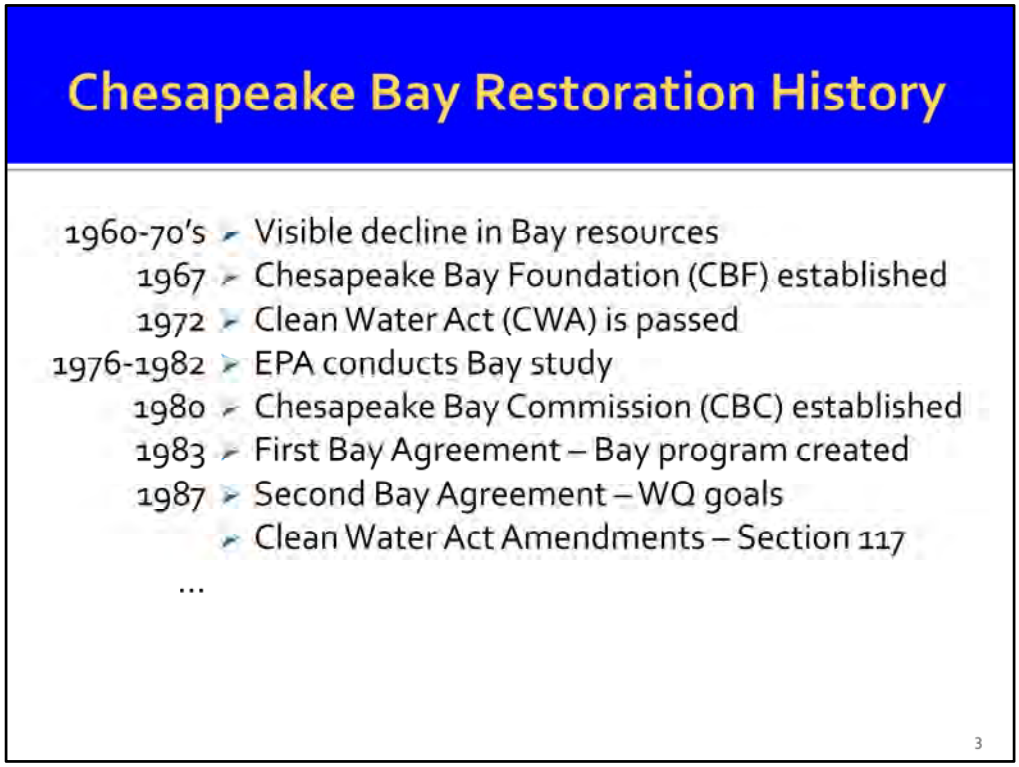


Chesapeake Bay watershed covers about 56% of Virginia and consists of the major river basins:

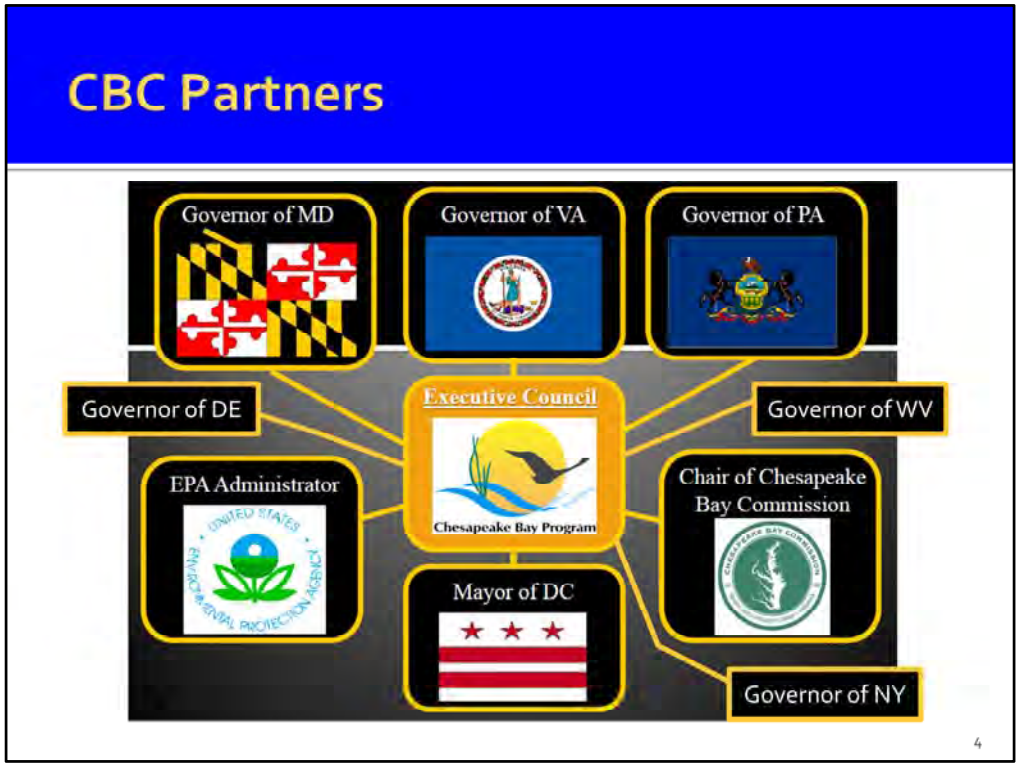
- Shenandoah/Potomac
- Rappahannock
- York
- James
- Bay Coastal (or mainstem)

These river basins in Virginia encompass approximately 37% of <u>total</u> Bay watershed area.

- Chesapeake Bay is the largest estuary in the U.S.
- The Bay watershed includes parts of six states – Delaware, Maryland, New York, Pennsylvania, Virginia and West Virginia – and the entire District of Columbia (64,000 mi^2 with 11,600 miles of tidal shoreline).
- The Bay's three largest tributaries are the Susquehanna, Potomac, and James rivers (> 80% of fresh water).
- The Bay watershed is home to more than 17 million people (and growing), with about 47% of the people living in Virginia.



- Decline dates back to the 1960's and 70's when people noticed cloudy water, reductions in fish and shellfish populations, etc.
- Chesapeake Bay Foundation (CBF) is a citizen advocacy group. Strategies are to: Educate, Advocate, Litigate, Restore
- Clean Water Act (CWA) is passed (focused on point source pollution in first iteration)
- EPA conducts multi-year Bay study to identify rapid loss of wildlife and aquatic life. Identifies excess nutrient and sediment as primary pollutants.
- Chesapeake Bay Commission (CBC) is an interstate commission that seeks to identify critical watershed restoration opportunities and assist member states in finding solutions. They serve as the legislative arm of the multi-jurisdictional Chesapeake Bay Program (CBP) and act in an advisory capacity to the General Assemblies of the respective states. Formed by parallel legislative action in Virginia and Maryland. So, Virginia has been participating in Bay restoration from the start.
- First Bay Agreement – Chesapeake Bay Program created with an Executive Council to establish policy. Set broad restoration objectives.
- Second Bay Agreement – Developed measureable water quality targets and included commitments, the most notable being the 40% reduction of nitrogen and phosphorus entering the Bay by the year 2000.
- Clean Water Act Amendments – The Water Quality Act of 1987 added Section 117 to identify the national importance of the Chesapeake Bay and restoration efforts, and set specific policy for water quality in the Bay. It formally authorized EPA's participation in the Chesapeake Bay Program and created a program office within EPA. It also allocated funds through 1990 to support the activities of the Chesapeake Bay Program office (http://thomas.loc.gov/cgi-bin/cpquery/?&sid=cp1066p9Uf&r_n=hr995.106&dbname=cp106&&sel=TOC_109730&).



➢Pennsylvania General Assembly joins Chesapeake Bay Commission (CBC) in 1985 as a full partner.

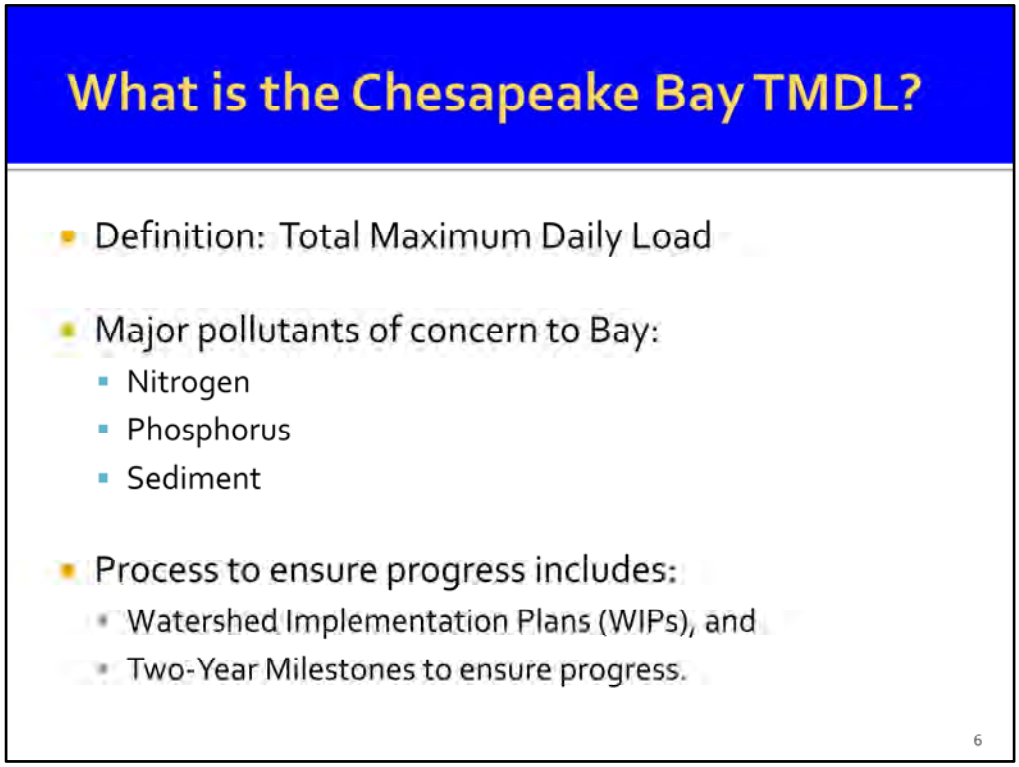
➢DE, WV, and NY become signatory members of the Executive Council on June 16, 2014 after signature of Fourth Bay Agreement (they previously supported water quality restoration initiatives through an MOU).

➢Virginia also has representation a little less directly through members of the CBC (i.e. the CBC Chair is a signatory member of the Chesapeake Executive Council). The following names are our current representatives for the Commission:

- Vice-Chair of CBC: The Honorable L. Scott Lingamfelter, Virginia House of Delegates
- The Honorable David L. Bulova, Virginia House of Delegates
- The Honorable Emmett W. Hanger, Jr., Senate of Virginia
- The Honorable Margaret B. Ransone, Virginia House of Delegates
- The Honorable John J. Reynolds, Virginia Citizen Representative
- The Honorable Frank W. Wagner, Senate of Virginia
- The Honorable Molly Ward, Virginia Secretary of Natural Resources

With the addition of Delaware, New York, and West Virginia as formal members to the latest Bay Agreement, it is uncertain if the CBC will decrease the number of representatives from each state in order to maintain its total membership at 21 individuals, or maintain a similar level of representation from each state and simply grow the membership.

- Amendments to Bay Agreement – The "Tributary Strategies" took the 40% nitrogen and phosphorus reductions for the Bay and expanded them to the Bay's largest tributaries by 2000. It also intended to cap those nutrients once the reduction was achieved. However, 40% goals largely went unmet.
- Consent Decrees – There were two lawsuits against EPA that asserted they were not moving fast enough to restore the Bay. The lawsuits resulted in consent decrees, which required EPA to establish by no later than May 1, 2011 a Total Maximum Daily Loads (TMDL) for all segments of the Bay watershed identified on 1998 Clean Water Act Section 303(d) ["Dirty Waters" or "Impaired Waters"] list as impaired by nutrients or sediment.
- Third Bay Agreement – Known as "Chesapeake 2000," it sought to remove the Bay from the 303(d) list by 2010. It was in essence the precursor to the Bay TMDL.
- WQ Impairments Continue – 30+ years of restoration efforts lead to insufficient progress and continued poor water quality in the Chesapeake Bay and its tributaries. It becomes clear that the goals of C2K cannot remove the Bay from the 303(d) list.
- January 5, 2009, a lawsuit was filed against EPA to convince them to take a stronger role in the Bay restoration (http://www.ens-newswire.com/ens/may2010/2010-05-11-092.html, accessed on 4/18/14)
- May 12, 2009, President Obama issued Executive Order 13508 on Chesapeake Bay Protection and Restoration.
    - mandates development of a coordinated implementation strategy, and
    - an annual action plan.
- December 2010, the U.S. EPA established the final Chesapeake Bay Total Maximum Daily Load (TMDL), as required under the Federal Clean Water Act and in response to consent decrees in Virginia and the District of Columbia.



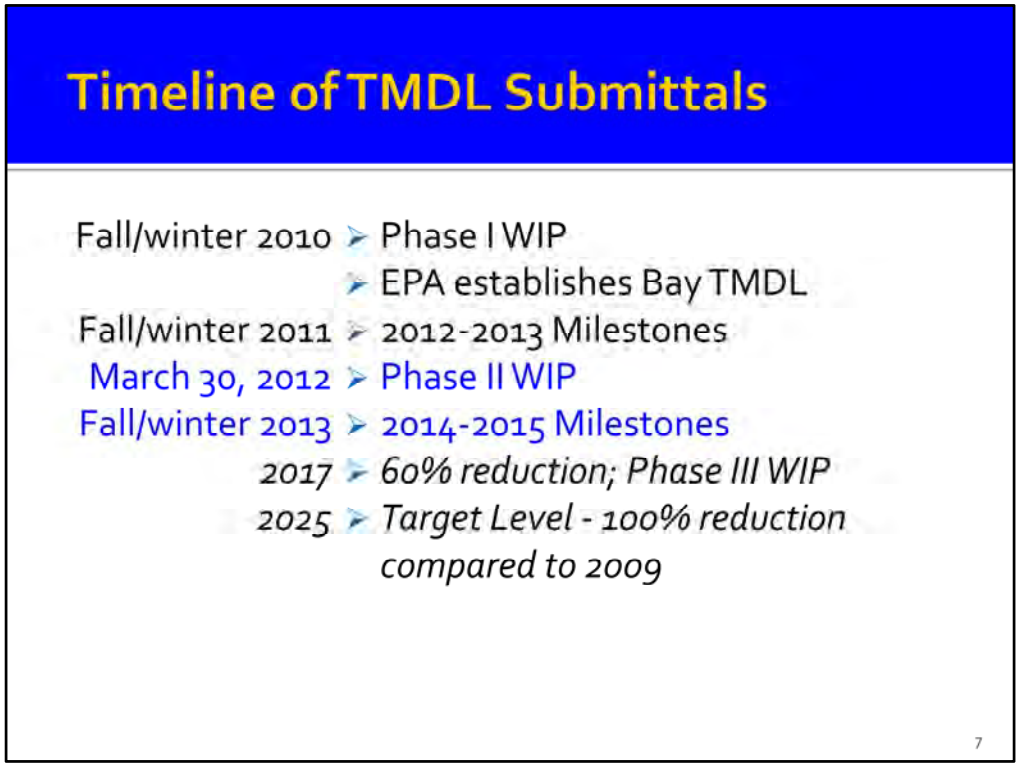
Definition:
A Total Maximum Daily Load (TMDL) is "a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that load among the various sources of that pollutant" (http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/overviewoftmdl.cfm).

The TMDL calculation is: TMDL = ΣWLA + ΣLA + MOS
where WLA is the sum of wasteload allocations (point sources), LA is the sum of load allocations (non-point sources and background), and MOS is the margin of safety to account for uncertainty in predicting how well pollutant reductions will result in meeting water quality standards and to account for seasonal variations.

TMDL is often referred to as a "pollution diet," and the intent is to restore the health of the Bay and its tributaries.

Major pollutants of concern cause:
➢Algae blooms, which leads to low dissolved oxygen (a.k.a. "dead zones"), which leads to organism mortality
➢Reduced water clarity, which can lead to organism predation due to lack of submerged aquatic vegetation (SAV) growth (i.e. places to hide)
➢Etc.

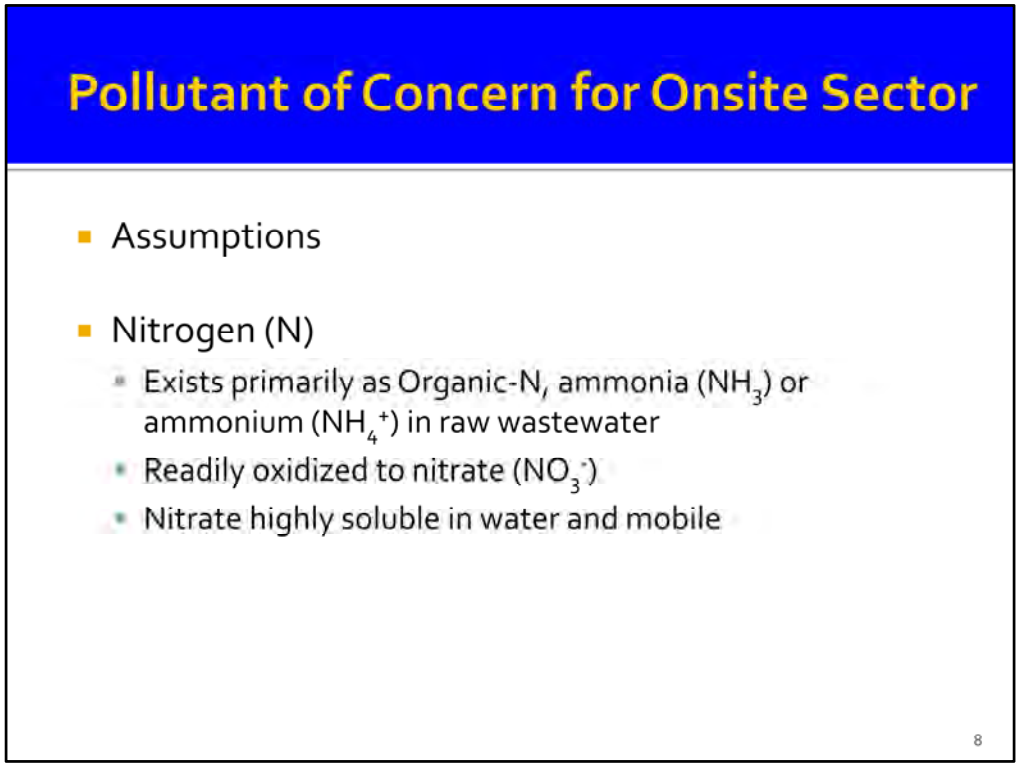
Process to ensure progress includes:
➢Watershed Implementation Plans (WIPs), and
➢Two-Year Milestones.



WIPs:
Identify Virginia's plan to achieve at least 60 percent of the necessary nitrogen, phosphorus and sediment reductions compared to 2009 by 2017, and 100% of the reduction by 2025. These plans consider such things as program planning and implementation, ecological restoration and sustainability, and partnership development. They seek to improve transparency and accountability of the intended actions. WIP is the "big picture" plan. Some of it is long range goals and ideas.

Milestones:
The milestones outline steps the Bay jurisdictions will take in the next two years to reduce nitrogen, phosphorus and sediment pollution to the Chesapeake Bay, and what reductions those measures will achieve. Annual progress report on meeting our defined commitments.

- Phase II WIP
  - Refines Phase I strategies and delineates expectations
  - Identifies necessary resources and authorities for reducing nutrient /sediment loads delivered to the Bay.
- Phase III WIP
  - 60% reduction in nitrogen, phosphorus and sediment loading rates compared to 2009.



Chesapeake Bay Program (CBP) assumptions related to onsite sewage source sector regarding TMDL pollutants:

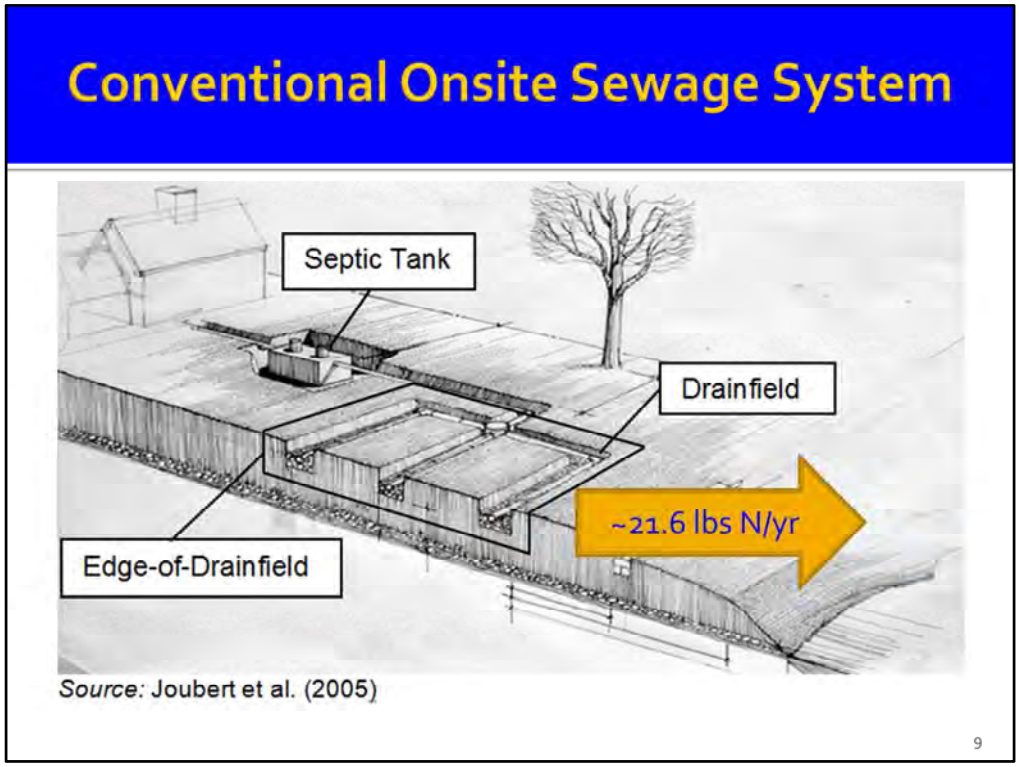
- Sediment is not a concern
- Phosphorus (P) is retained by the soil in most cases and therefore is not a concern

Nitrogen (N) is highly soluble in water and mobile unless:

- Captured by plants
- Denitrified by bacteria

There are certain practices we can employ in the onsite sector to deter nitrogen transport:

- Advanced treatment units (i.e. remove nitrogen before wastewater hits soil)
- Shallow-placed soil dispersal systems
- Combination of both of the above



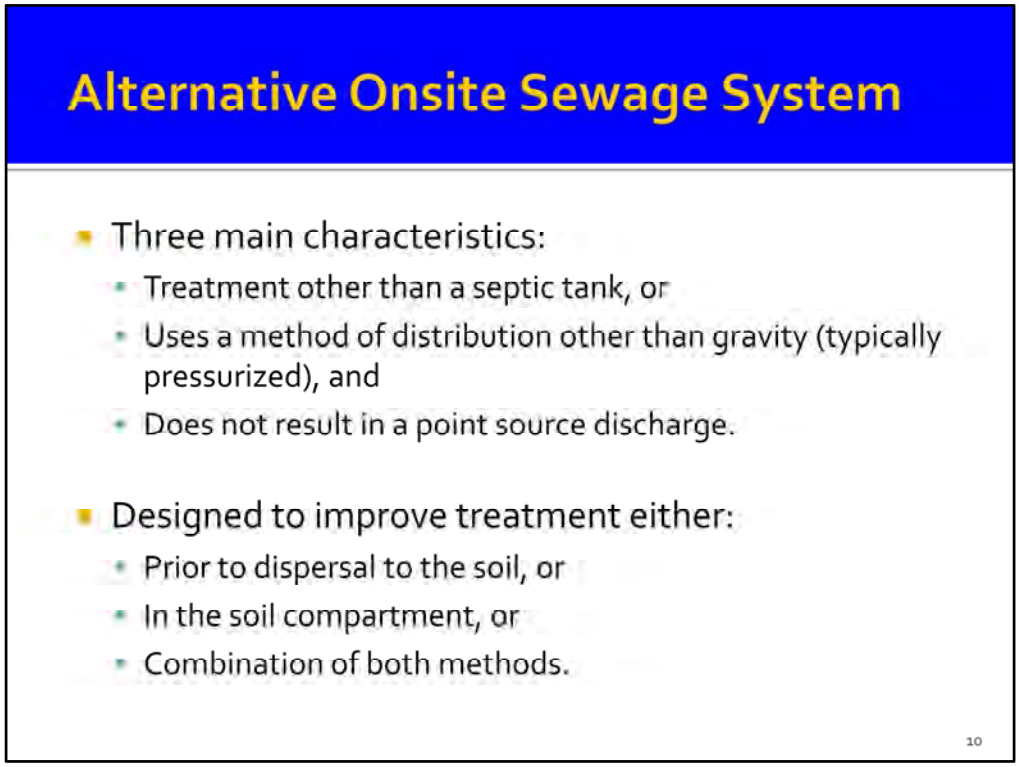
In Virginia, we delineate two types of onsite sewage systems.

The first type of system is the **Conventional** system.
This is your typical onsite sewage system and consists of a septic tank, distribution box, and gravity fed trenches. It may include a pump to lift the wastewater to the drainfield, but it is not pressure dosed.
The edge of drainfield is not a defined point in the system, but it is a point near the edge of the constructed drainfield. It is not at the edge of the property.

Conceptually, the conventional onsite sewage system is the **baseline condition**.

- Chesapeake Bay Watershed Model (CBWM 5.3.2, "Bay model") assumes:
  - All onsite systems in Virginia are conventional
  - 2.4 person per household

The assumed nitrogen load from a conventional system is roughly 21.6 lbs. N/year (9 lbs N/person/year x 2.4 persons/household).



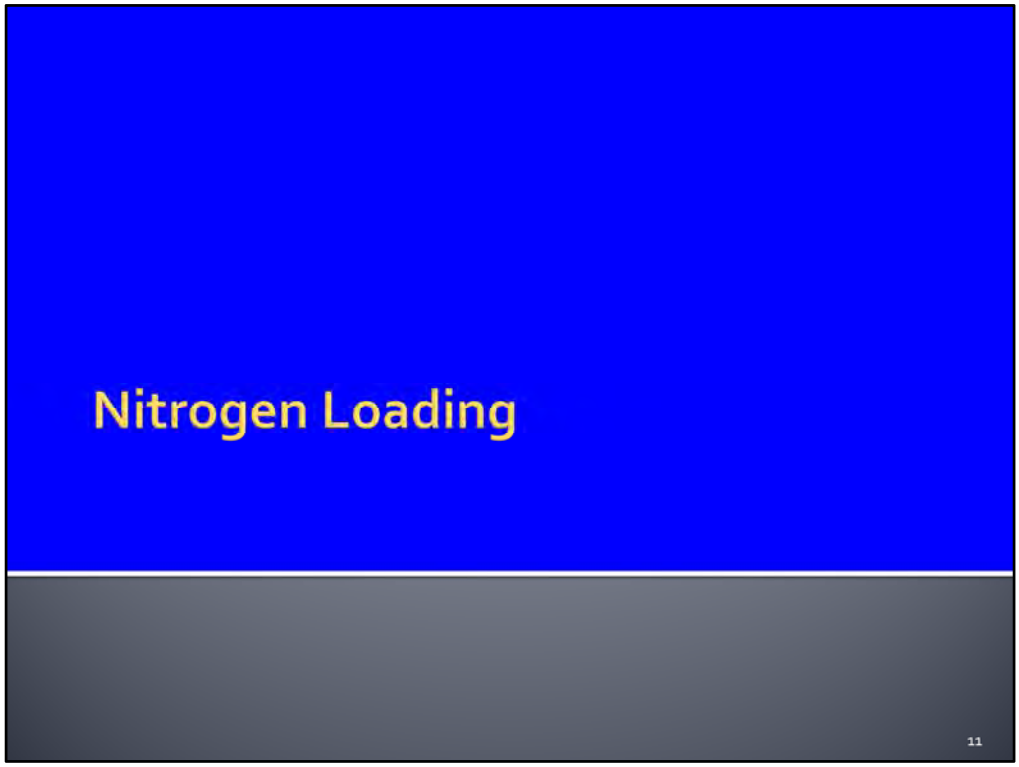
The second major type of onsite system in Virginia is the **Alternative** onsite sewage system (AOSS).

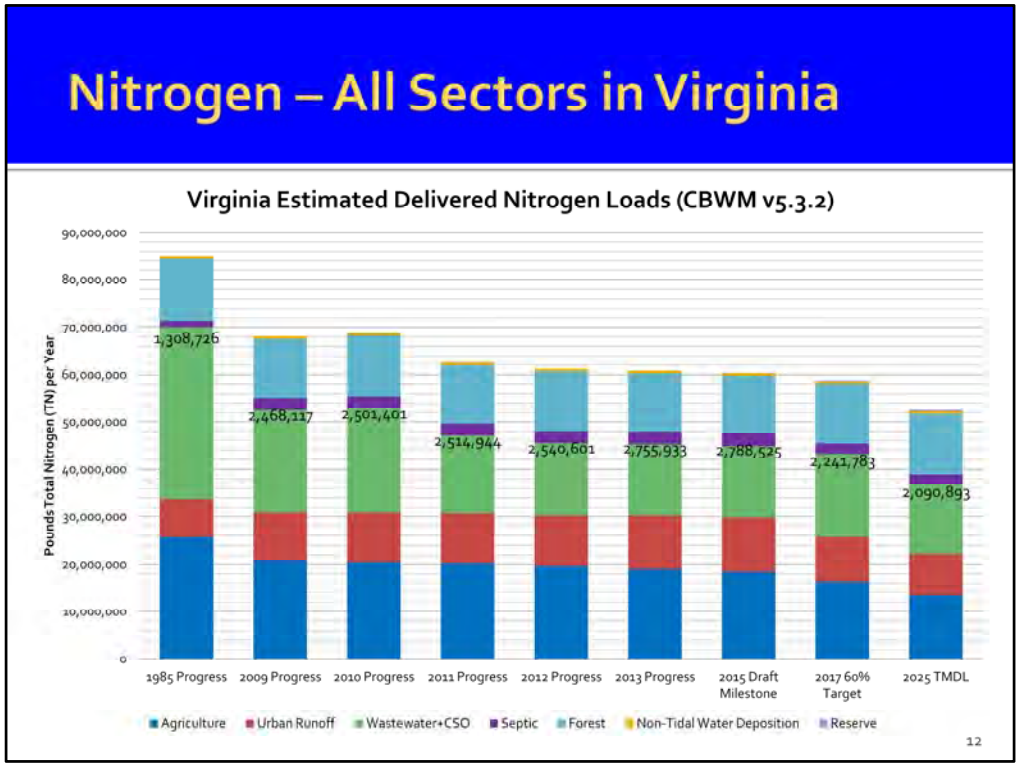
Three main characteristics:
➢Treatment other than a septic tank, or
➢If it uses septic tank effluent, it uses a method of distribution other than gravity (typically pressurized), and
➢Does not result in a point source discharge

Designed to improve treatment either:
➢Prior to dispersal to the soil (i.e. treatment in a "box"), or
➢In the soil compartment (e.g. shallow-placed, drip dispersal, or elevated sand mound), or
➢Combination of both methods of treatment.

How much nitrogen leaves the site of an AOSS and enters surface waters of, or leading to, the Bay depends on the whole system (treatment and soil dispersal method).

How we get credit for nitrogen reduction will be discussed more in the BMP section.

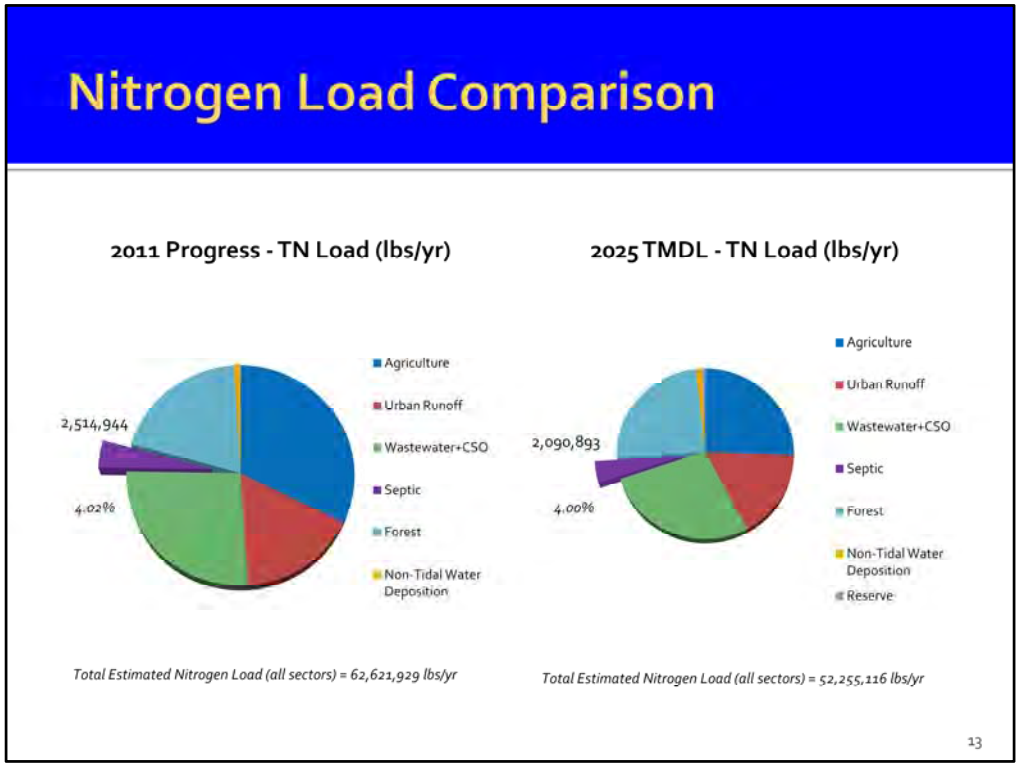

Nitrogen Loading
11



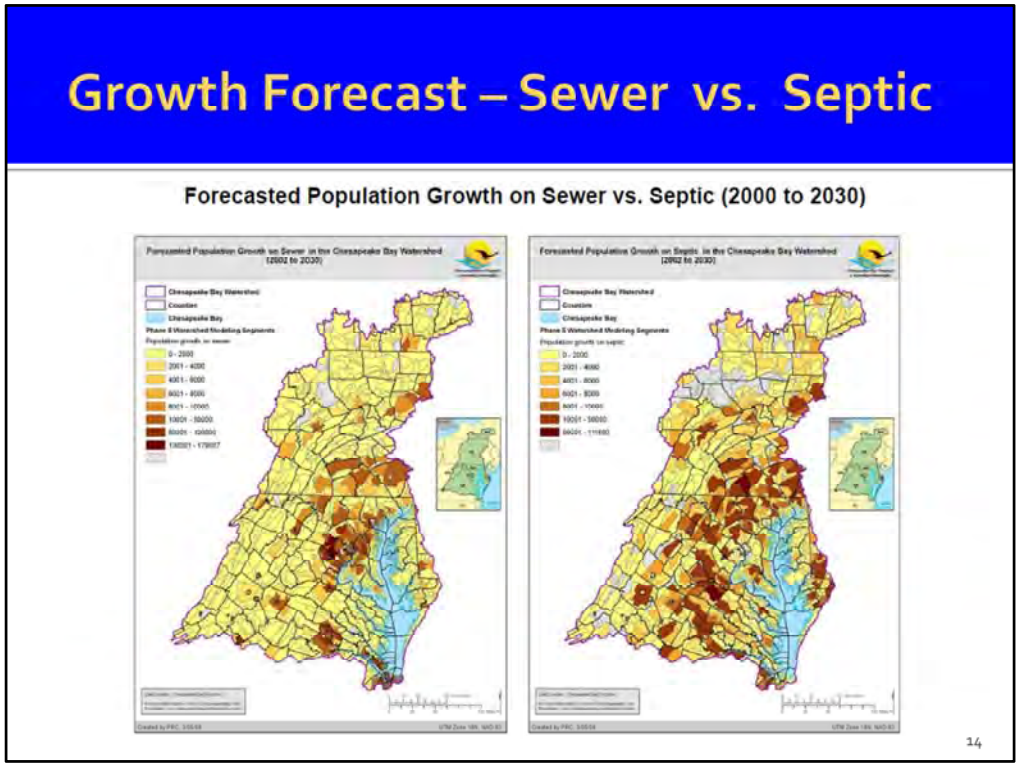
➢The purple bars and the numbers below them represent the annual nitrogen load (lbs/yr) from the onsite sewage source sector in Virginia.

➢The following percentages represent the nitrogen load portion from onsite sector compared to the sum of the nitrogen loads from ALL sectors for the respective year.
1985 Progress =1.54%
2009 Progress = 3.62%
2010 Progress = 3.63%
2011 Progress = 4.02%
2012 Progress = 4.15%
2013 Progress = 4.53%
2015 Draft Milestone = 4.62%
2017 60% Target = 3.83%
2025 TMDL = 4.00%

Important distinction:
2009 “Baseline” – 2025 “TMDL Target Level” = 100% reduction
So, 60% of that difference is how the 2017 Target Value is derived. It is not 60% of the 2009 Baseline value.



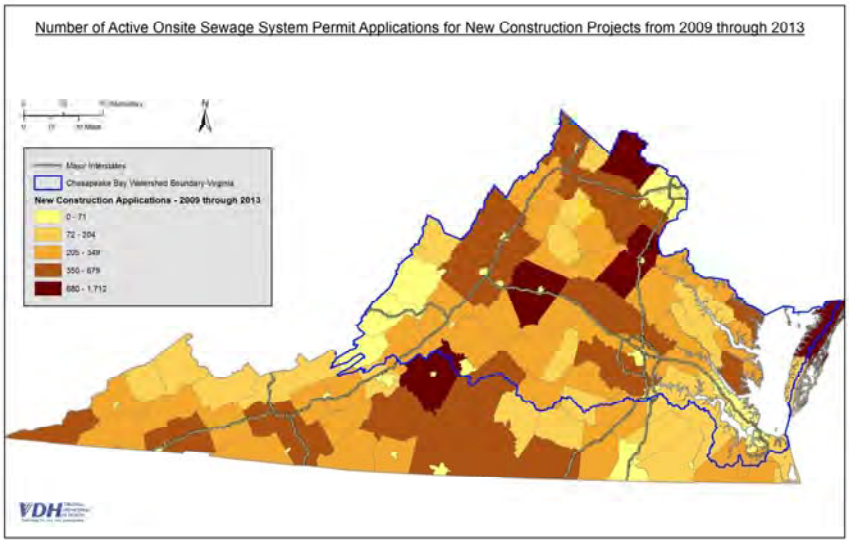
This slides illustrates the concept of “pollution diet” that is often used to refer to the Bay TMDL.



These maps from EPA-CBP are somewhat dated, but they help illustrate an important point…there is anticipated growth in the region.

- Growth is sewer is around D.C. (northern VA), Richmond, Charlottesville, Virginia Beach/Hampton Roads, but the municipal systems are under wasteload allocation caps so there is only so much growth they can sustain.
- Growth in septic (onsite sewage systems) is predominantly in the Virginia piedmont regions of the Bay watershed.

New Construction Permits, 2009 – 2013



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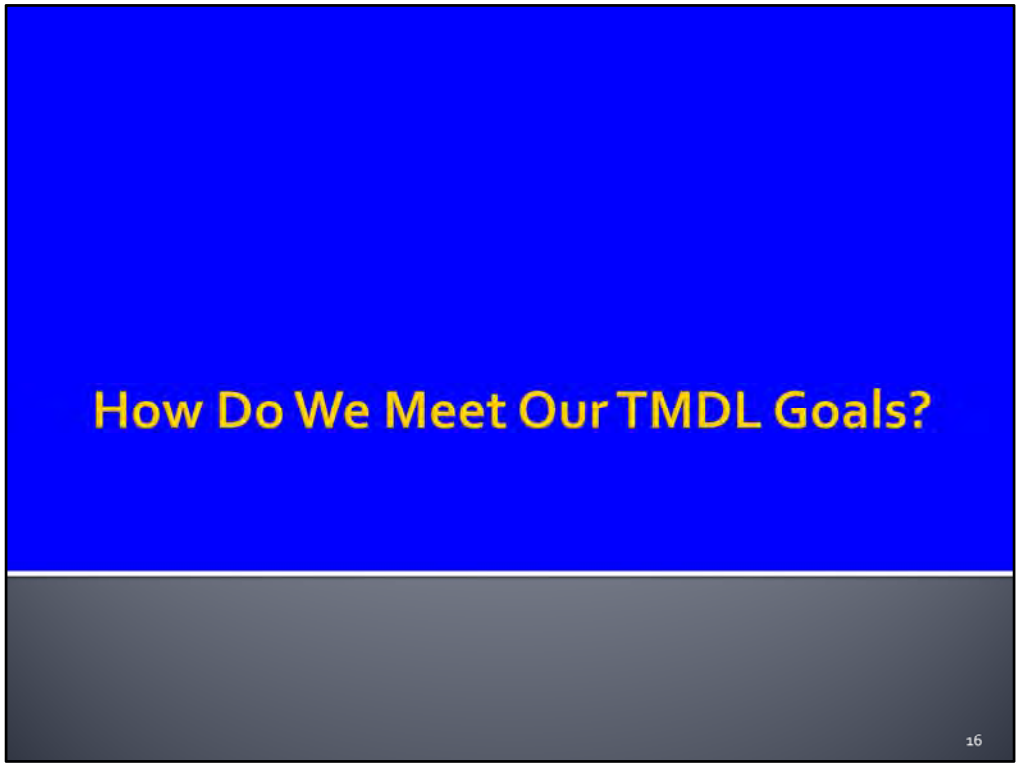
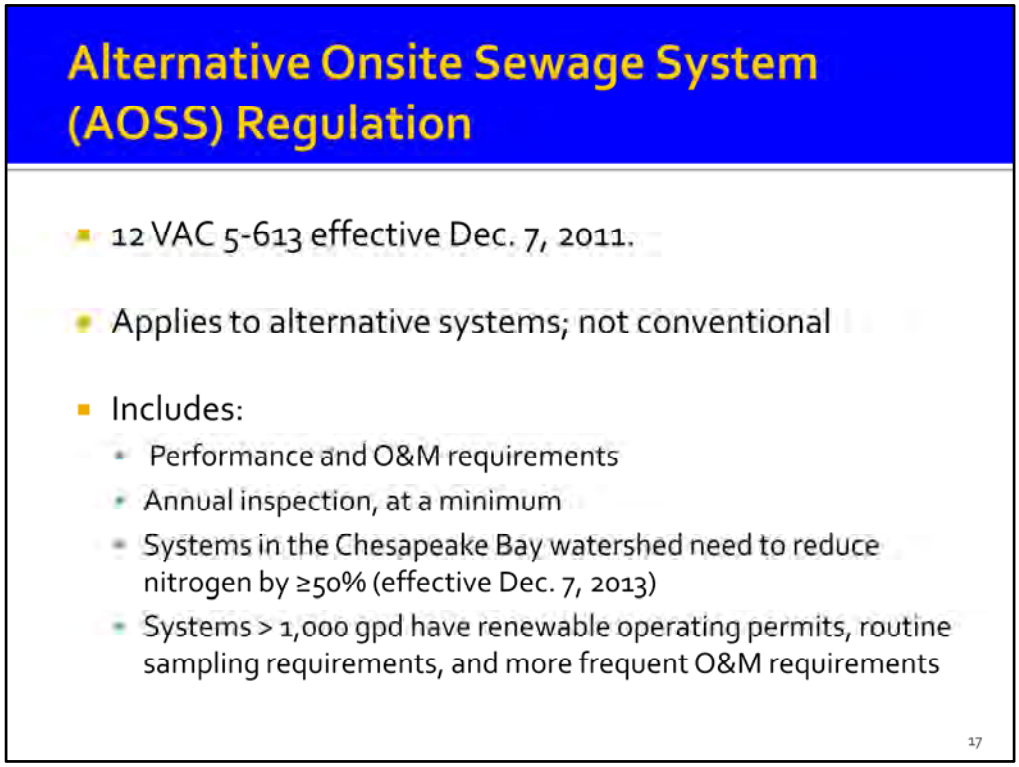
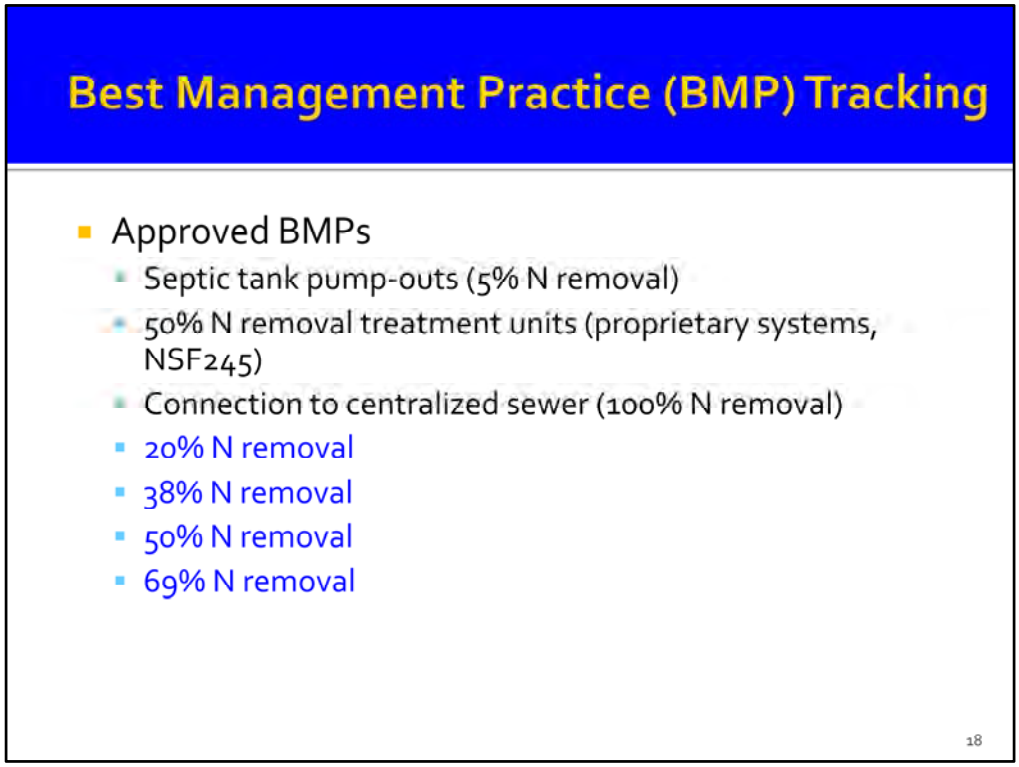

How Do We Meet Our TMDL Goals?
16



December 7, 2011
- The regulation was phased in over two years. The Bay nitrogen limits in the AOSS Regulations had a delayed effective date of December 7, 2013 to allow time for the development of guidance from EPA on how to control N from the onsite sector (EPA 'Model Program').
- Prior to this time we've been controlling N from large AOSS statewide to be protective of groundwater limits of 5 mg/L total nitrogen at the project boundary.



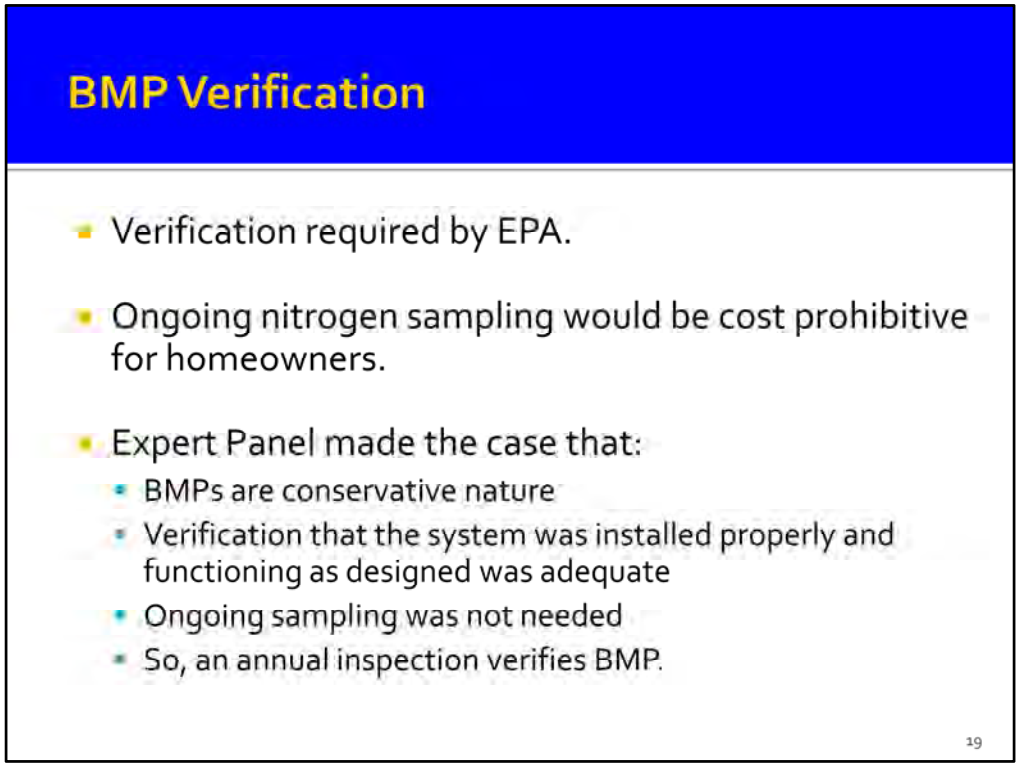
Remember, the Bay model considers ALL onsite sewage systems as "conventional." Therefore, we get credit for the performing nitrogen reduction in the Bay watershed through established BMPs.

Previously, approved BMPs for the onsite sewage sector:
➢Septic tank pump-outs (5% N removal)
➢50% N removal treatment units (proprietary systems, NSF245)
➢Connection to centralized sewer (100% N removal)

New BMPs recently approved by CBP-WQGIT:
➢"Combination systems," so we are looking at a treatment unit and the soil dispersal component as the whole system to assess the final nitrogen reduction.
➢Can be used as soon as they are incorporated into the Bay model
➢The Panel intentionally set new BMPs at conservative levels and only included well-documented practices of standard designs known to reduce N to a given level.

Example: County X has 30,000 OSS (all assumed "conventional"), but our records indicate 2,000 AOSS capable of nitrogen removal, plus 900 pump-outs, and 12 systems connected to public sewer. The assumed nitrogen load for County X then gets calculated lower.

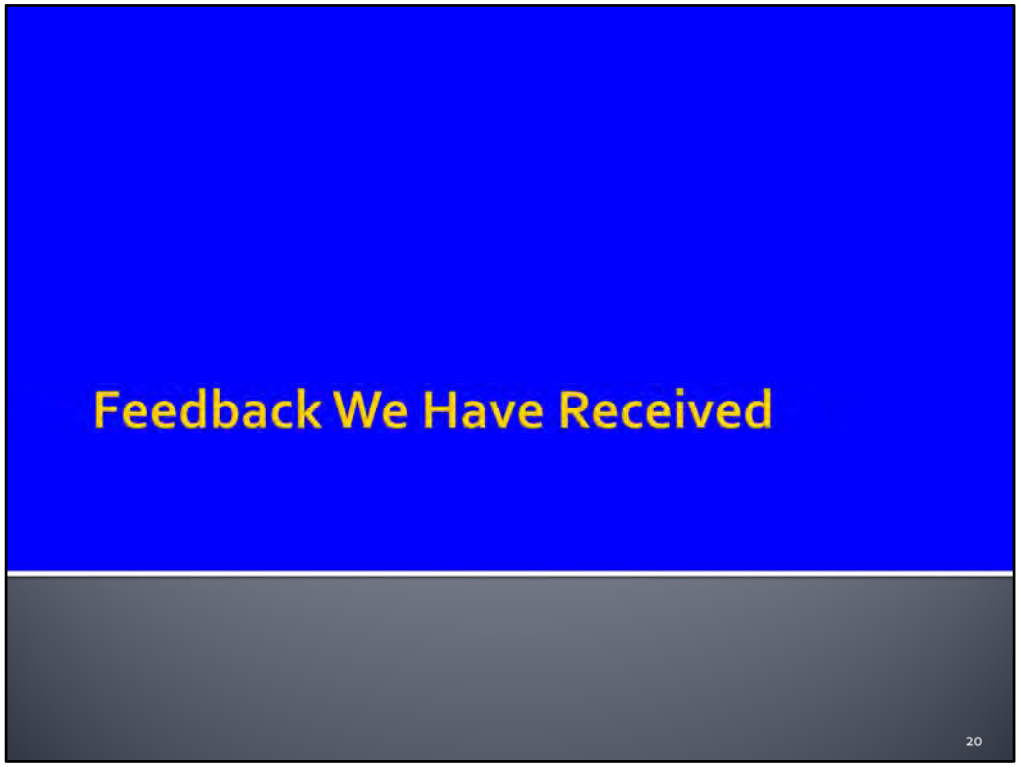
Why 20% and 38% nitrogen removal BMPs if AOSS Regulation requires 50%?
➢Existing sites may meet lower N reduction and need to be captured in the Bay model.
➢Repairs and voluntary upgrades can utilize a waiver option under certain circumstances, and we still need to recognize what is installed.

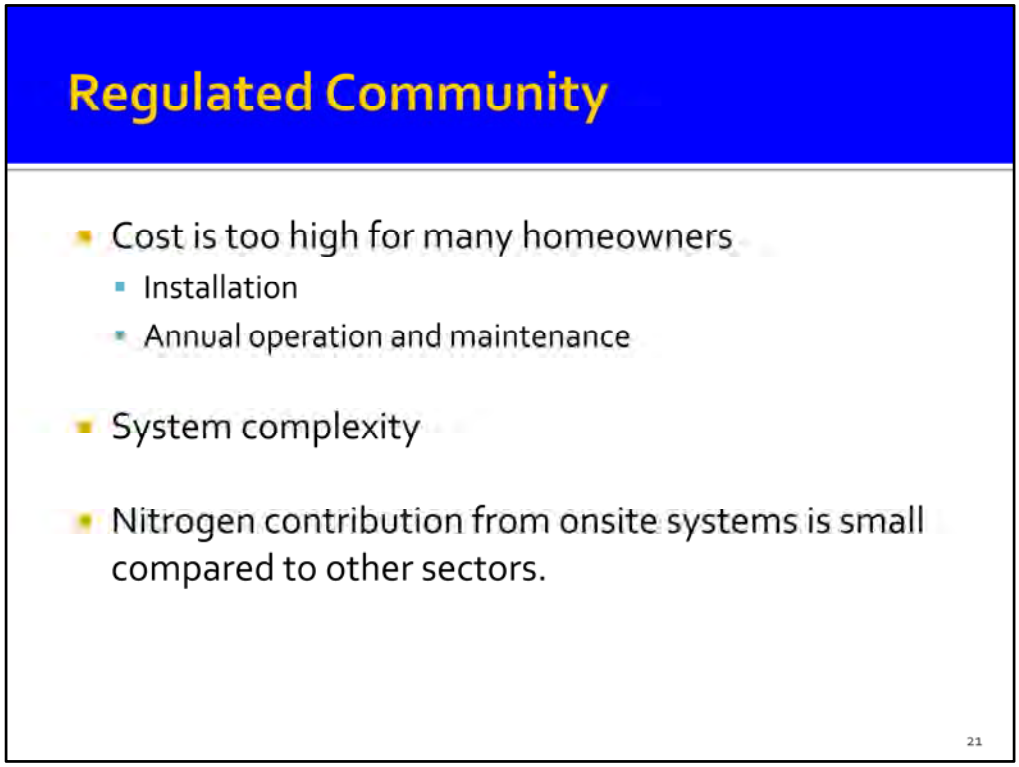


- Verification of the BMP is required by EPA in order to receive credit.
- Ongoing sampling for TN would be cost prohibitive for homeowners.
- As a result, the Expert Panel successfully made the case that due to the conservative nature of the BMPs, verification that the system (i.e. the BMP) was installed properly and functioning as designed was adequate and ongoing sampling was not needed. So, the annual inspection verifies BMP.

- No ongoing N sampling anticipated at this point unless proposal of something other than a currently accepted BMP
- Encourage use of BMPs accepted by VDH

Remember, I previously stated that the AOSS Regulation requires an annual inspection, at a minimum.

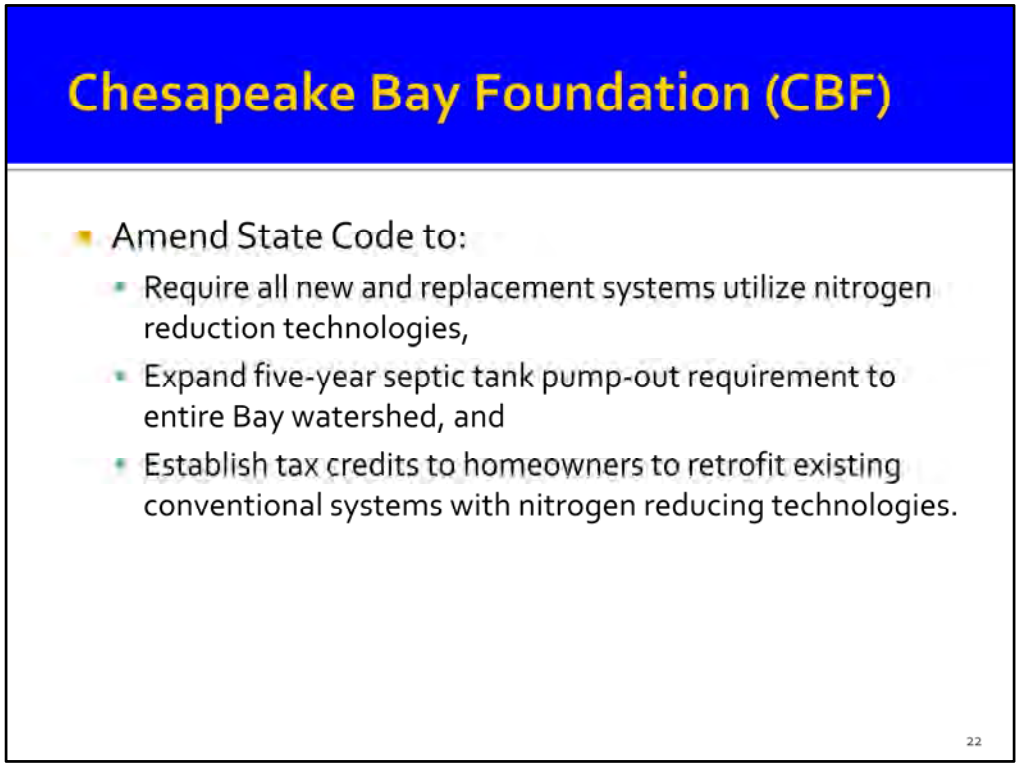

Feedback We Have Received
20



- Cost to reduce nitrogen from onsite systems is too high for many homeowners
  - Installation
  - Annual Operation and Maintenance (systems are active rather than passive like most conventional systems, and they require electricity to operate; utility bill).

- System complexity
  - Require maintenance by a licensed contractor.
  - Some alternative systems are more sensitive to “upsets” from harsh cleaners/chemicals.

- Nitrogen contribution from onsite systems is small compared to other sectors.

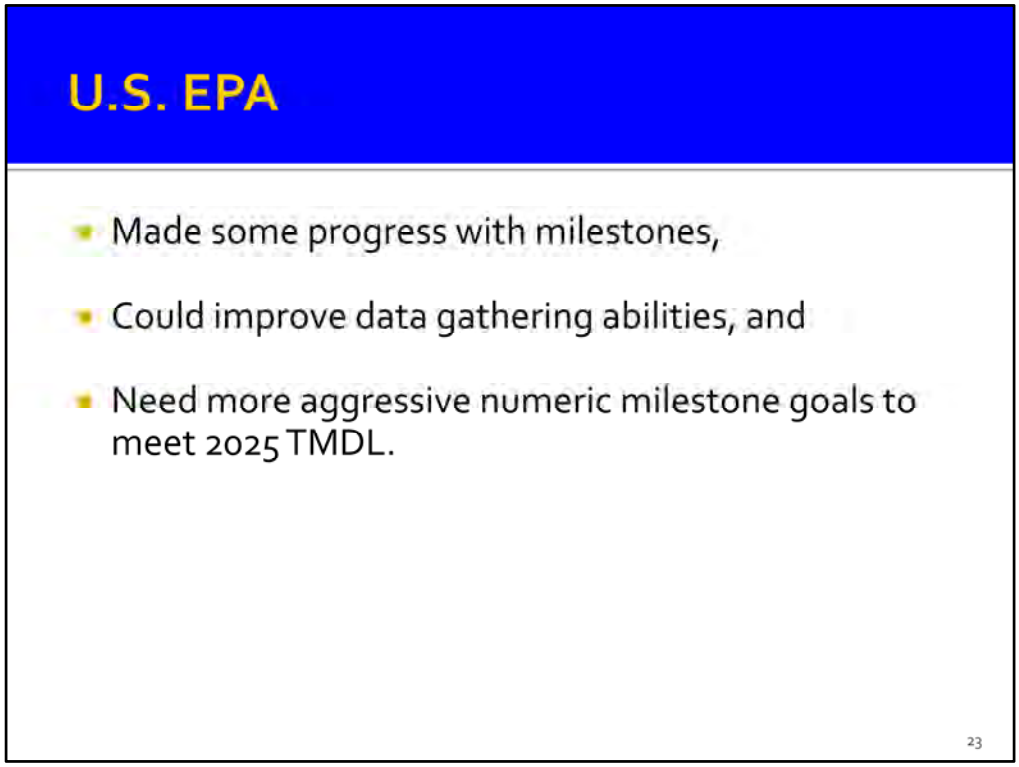


CBF letter received by DEQ 3/26/14, with comments addressing onsite sewage systems:

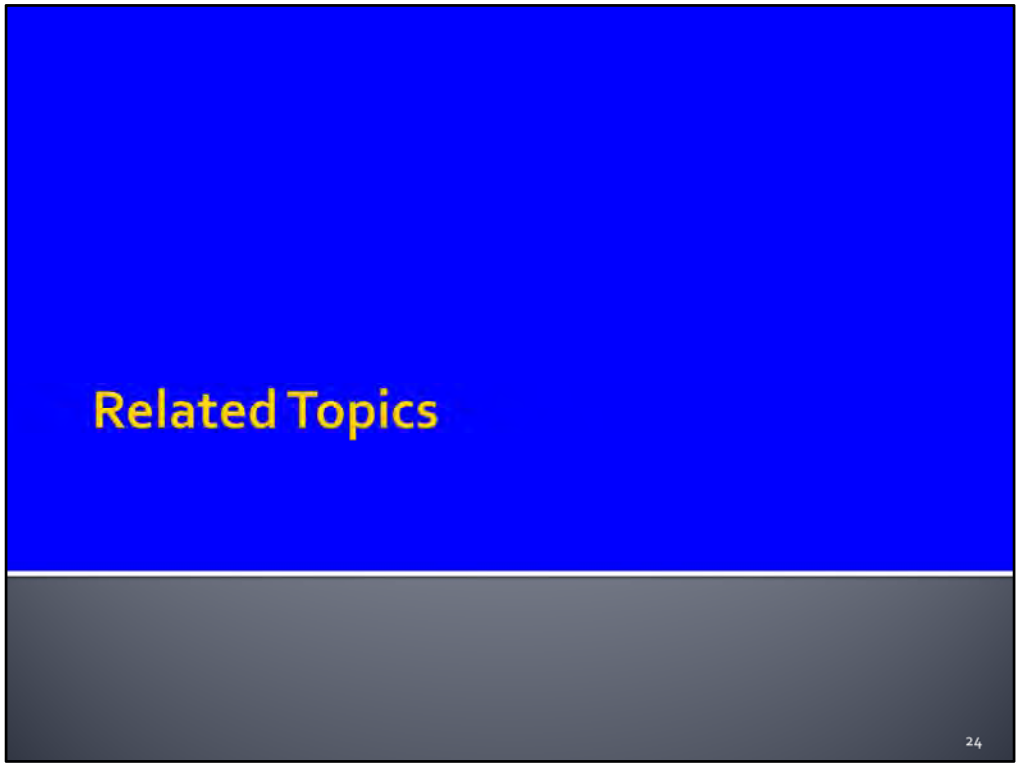
"…CBF recommends that the milestones for this source sector be strengthened by setting goals for necessary changes in state code that will allow the Commonwealth to pursue reductions from this sector. Virginia's WIP includes the following three goals for this sector, all of which will require amendments to State Code:

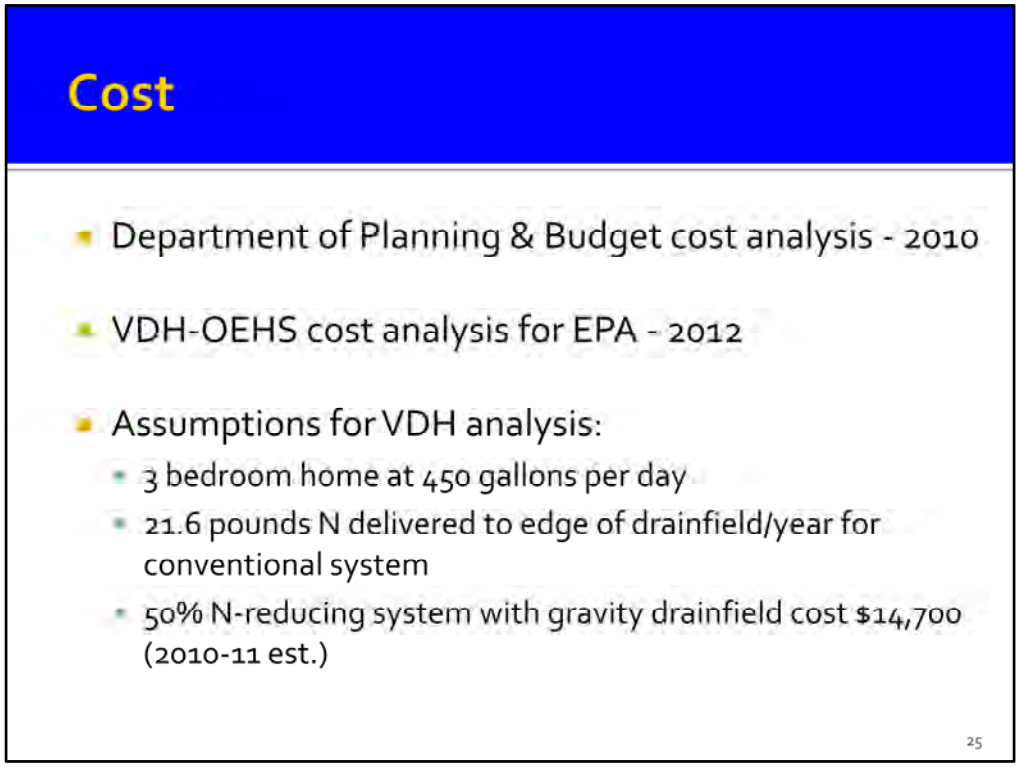
[A] Require all new and replacement systems in the Chesapeake Bay watershed to utilize either (1) "shallow placed" systems capable of reducing nitrogen loss or (2) denitrification technology to reduce nitrogen loss and consider requirements for additional nitrogen reducing technologies in certain defined sensitive areas;
[B] Establish five year pump out requirements for septic tanks in jurisdictions throughout Virginia's Chesapeake Bay watershed (this mirrors the existing requirement for septic tanks within Chesapeake Bay Preservation Act areas); and,
[C] Establish tax credits for upgrade/replacement of existing conventional systems with nitrogen reducing systems.

Establishing a tax credit would provide a means for Virginia to encourage increased private investments in Chesapeake Bay restoration while providing a much needed incentive to onsite system owners to implement necessary upgrades to their systems. A tax credit system is in many ways analogous to the state funding the General Assembly has dedicated to centralized wastewater in order to offset the costs for municipal facilities to upgrade treatment technology."



Brief summary of EPA's evaluation of Virginia's outgoing 2012-2013 and incoming 2014-2015 Milestones.


Related Topics
24



Virginia Department of Planning and Budget (VDPB) did a cost analysis for the Alternative Onsite Sewage Systems (AOSS) Regulations (12 VAC 5-613) in October 2010. The document can be found at http://www.townhall.virginia.gov/L/GetFile.cfm?File=C:\TownHall\docroot\58\3184\5632\EIA_VDH_5632_v1.pdf.

VDH-Office of Environmental Health Services (OEHS) developed a paper in 2012 titled, "Costs Associated with the Onsite Sector in the Chesapeake Bay Watershed Implementation Plan." This was in response to an EPA request.

9 lbs N/person/year x 2.4 persons/household = 21.6 lbs N

VDH cost estimate for AOSS based on discussion with system designers and installers (2010-2011).

Cost of Offsetting New Growth

Table 1. Scenarios of nitrogen reduction cost on annual basis to offset new growth in the onsite sector.

Cost Scenario	Total Annual Cost for N Reduction	N Load Reduction (lbs/yr)	New N Produced (lbs/yr)	*Net* N Produced (lbs/yr)	Cost per Pound Reduction
1] Prior to 12/7/2013	$26,698,500	38,200	228,733	190,533	$699
2] On or After 12/7/2013	$46,341,200	54,357	217,188	162,831	$853
3] Retrofit Existing Conventional Systems to Offset New Growth	$185,261,200	217,437	217,188	-249	$852

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Cost scenarios from VDH-OEHS cost analysis paper for EPA (2012) include things like:
- Septic tank pump-outs
- New nitrogen reducing system installation
- Repairs resulting in addition of N-reducing technology (Scenarios 2 & 3)
- Retrofit of existing conventional system (Scenarios 3)

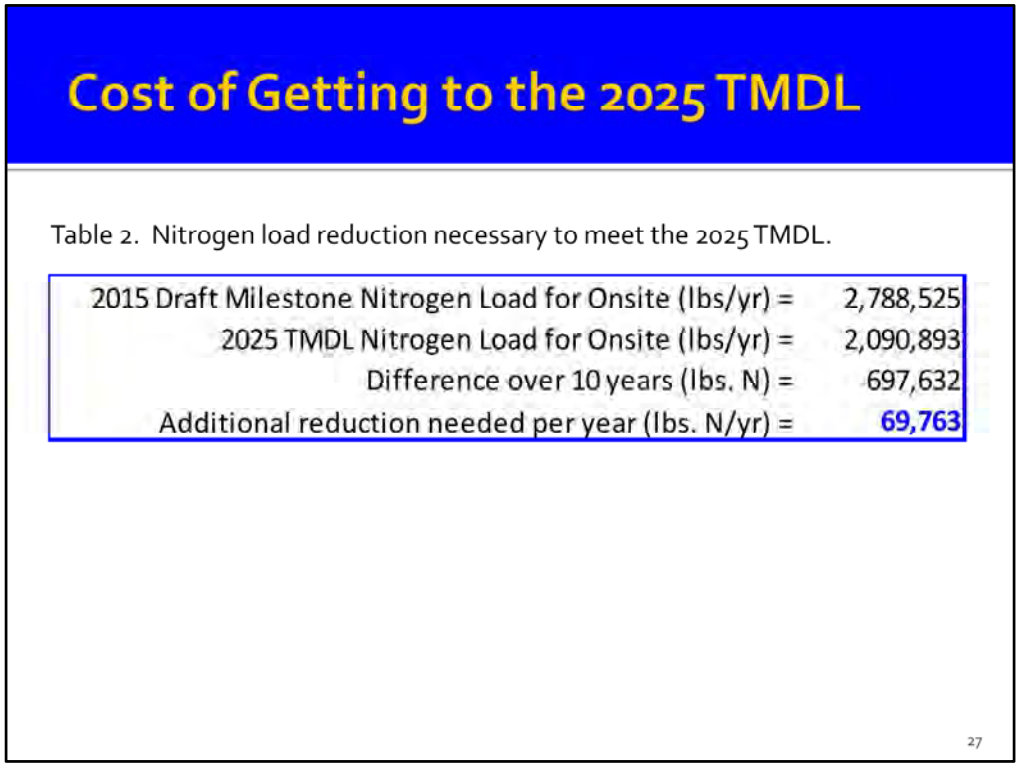
1] Prior to 12/7/2013 – prior to the nitrogen requirement in the AOSS Regulation (12VAC5-613-90.D). Voluntary installation of nitrogen-reducing alternative systems.

2] On or After 12/7/2013 – after the nitrogen requirement in the AOSS Regulation are effective (50% reduction for AOSS installed in Bay watershed). The cost increase, because there are more nitrogen-reducing alternative systems being installed, along with some retrofits.

3] Retrofit Existing Conventional Systems to Offset New Growth – this would be On or After 12/7/2013, so 50% N-reduction would be in effect for AOSS installed in Bay watershed, plus there would be about 15,100 conventional systems retrofitted with a nitrogen reducing unit.

Installation cost borne by homeowners.

Cost Scenarios and Cost Per Pound Reduction do NOT include:
- Annual maintenance cost borne by homeowner, which VDPB estimated would be $16.2 million to $48 million annually for all existing alternative systems in Virginia. New systems coming online would add approximately $500,000 to $1.78 million per year to those annual maintenance cost estimates.



- The 2015 nitrogen load is the expected, future high-water mark from the Bay model.
- The 2025 TMDL nitrogen load is where we need to be.
- The difference is the additional nitrogen load we need to remove from the watershed over the next 10 years, beyond the net-growth of zero load.
- The final row (blue text) is the required annual nitrogen load reduction needed.

Getting to 2025 (cont.)

Table 3. Best Management Practice (BMP) cost scenarios for getting from zero net nitrogen growth to the 2025 TMDL. Option A, B, or C would meet the necessary nitrogen load shortfall.

Best Management Practice (BMP)	N Load Reduction (lbs/System)	Number of Systems Needed	N Load Reduction (lbs/yr)	Estimated Cost/BMP	Annual Cost
A] Septic tank pump-outs	0.47	148,432	69,763	$200	$29,686,468
B] Retrofit conventional systems to 50%-N treatment	10.8	6,460	69,763	$9,200	$59,427,911
C] Connect conventional systems to public sewer	21.6	3,230	69,763	$3,900	$12,596,133

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- Based on the additional annual reduction from Table 2, the "Number of Systems Needed" for each BMP to reach that load reduction is calculated.
- Only one option would be chosen to meet the annual nitrogen reduction goal.
- This is not a realistic approach to focus on just one BMP:
  - Pump-outs can only be claimed once every five years per system, and we would most likely run out of systems to pump before the end of five years.
  - Pump-outs and sewer connections transfer the load to the municipal wastewater treatment facility with the hope that they are better equipped to reduce nitrogen and still meet their own nutrient caps.
  - The cost identified for the sewer connection (http://www.daa.com/wp-content/resources/surveys/2013_Annual_Virginia_Water_and_Wastewater_Rate_Report.pdf) is just the cost to the homeowner to run a line from their home to the municipal wastewater collection system. It assumes there is already a collection system in the vicinity and does not factor in the cost of building or expanding a municipal wastewater collection system.
- Annual cost to meet the TMDL shortfall ranges from about $12,596,133 - $59,427,911.

Getting to 2025 (cont.)

Table 4. Best Management Practice (BMP) cost scenarios for getting from zero net nitrogen growth to the 2025 TMDL. A combination of options A, B, and C would meet the necessary nitrogen load shortfall.

Best Management Practice (BMP)	N Load Reduction (lbs/System)	Number of Systems Needed	N Load Reduction (lbs/yr)	Estimated Cost/BMP	Annual Cost
A] Septic tank pump-outs	0.47	36,000	16,920	$200	$7,200,000
B] Retrofit conventional systems to 50%-N treatment	10.8	4,693	50,684	$9,200	$43,175,600
C] Connect conventional systems to public sewer	21.6	100	2,160	$3,900	$390,000
TOTAL NITROGEN LOAD REDUCTION (lbs. N/yr) =>			**69,764**		
TOTAL ANNUAL COST TO MEET TMDL SHORTFALL =>					**$50,765,600**

29

- Based on the annual reduction needed from Table 2, the "Number of Systems Needed" for each BMP to reach that load reduction is calculated.
- All three BMPs would be chosen to meet the annual nitrogen reduction goal.
- This is a somewhat more realistic approach than Table 3:
  - The number of annual septic tank pump-outs is the same as the current TMDL Milestones, which VDH/DEQ determine mostly from the Chesapeake Bay Preservation Act (CBPA) Area. We would need to expand the pump-out program to the entire Bay watershed to use this BMP. The combined total for the entire Bay watershed would then be roughly 72,000 pump-outs per year.
  - The number of sewer connections is deliberately set low as municipalities are not eager to bear the cost of expanding municipal wastewater collection systems or upgrade treatment facilities to handle additional nitrogen loads. In addition, they are under their own nutrient caps.
- The annual cost to meet the TMDL shortfall is approximately $50,765,600.

Getting to 2025 (cont.)

Table 5. Combined Best Management Practice (BMP) cost estimate for zero net nitrogen growth and the nitrogen load shortfall necessary to meet the 2025 TMDL.

	Annual Cost	N Load Reduction (lbs/yr)	Revised Cost per Pound Reduction
Getting "Zero Net Nitrogen Growth" (Table 1) =>	$185,261,200	217,437	
Meeting the "TMDL Shortfall" (Table 4) =>	$50,765,600	69,764	
Grand Total =>	**$236,026,800**	**287,201**	**$822**

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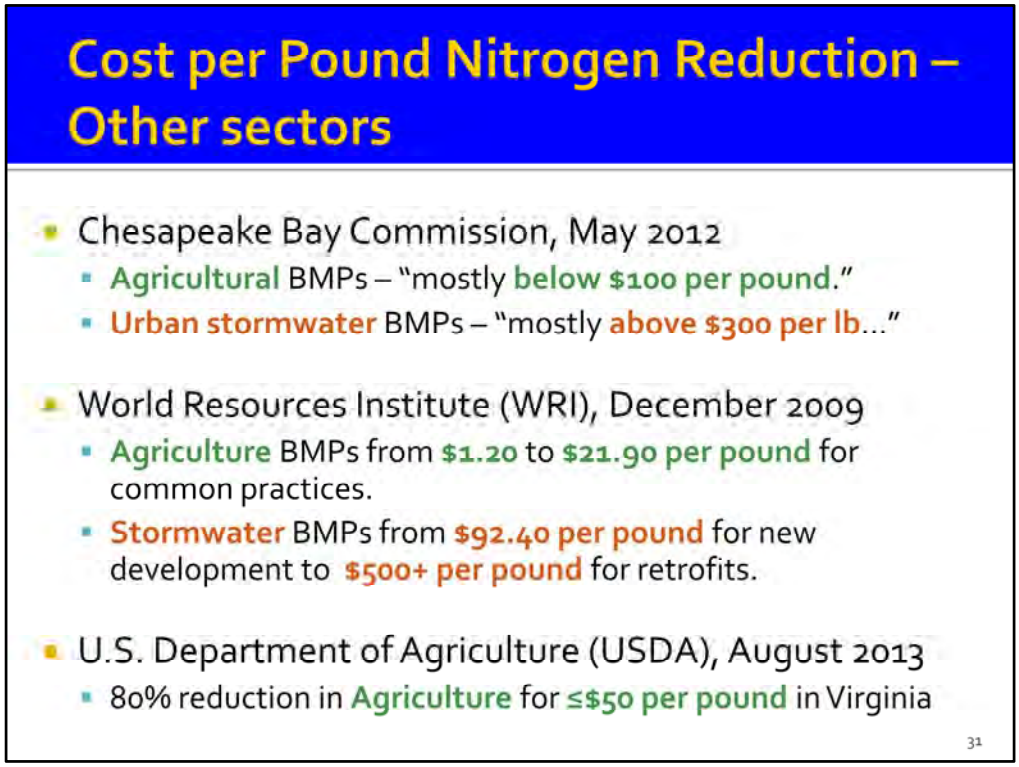
➢The "Zero Net Nitrogen Growth" cost and load reduction come from Table 1. The bulk of the expense and nitrogen load reduction comes from retrofitting about 15,100 conventional systems per year to 50% N-reducing systems.
➢The "Total Annual Cost to Meet TMDL Shortfall" and load reduction come from Table 4.
➢A revised cost per pound of nitrogen reduction is calculated.
➢We may still run out of conventional systems to retrofit if we upgrade 19,793 systems per year (15,100 + 4,693), and the sector could go back to growing as a source of nitrogen loading.

➢Capital cost incurred in the year of expenditure.
➢Does not include the new BMP recently approved by CBP-WQGIT (see slide 18).

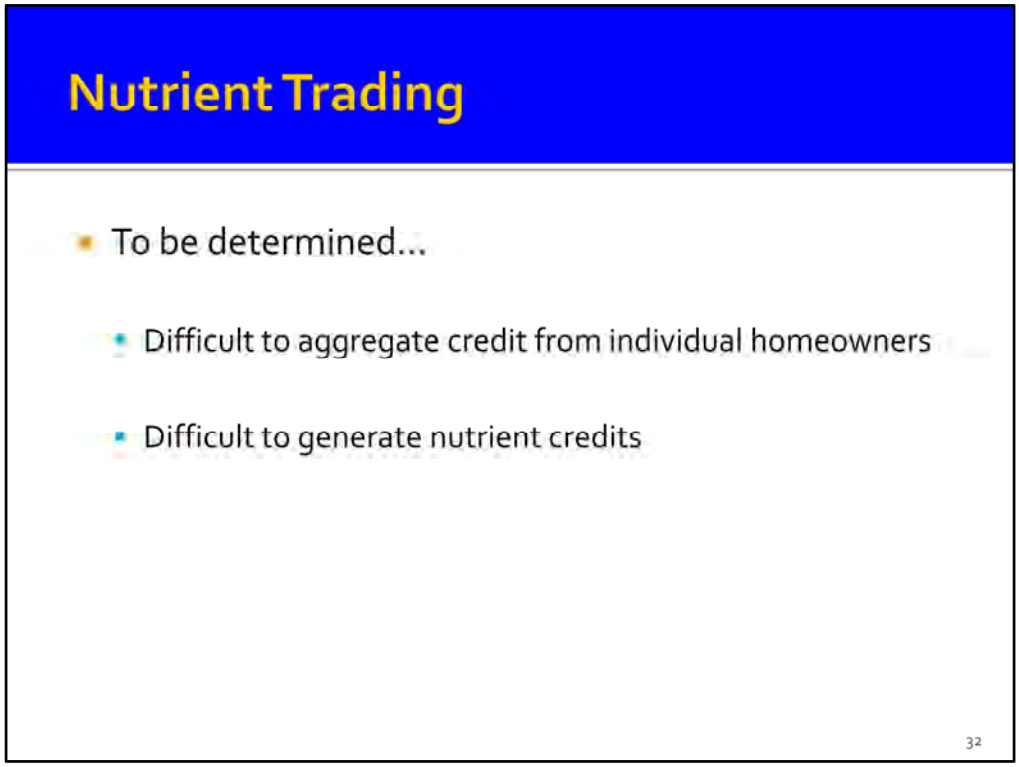


"Nutrient Credit Trading for the Chesapeake Bay – An Economic Study," Chesapeake Bay Commission, May 2012, http://www.chesbay.us/Publications/nutrient-trading-2012.pdf (pg. 37-40).

"How Nutrient Trading Can Help Restore the Chesapeake Bay," World Resources Institute (WRI), December 2009, http://www.wri.org/sites/default/files/factsheet_nutrient_trading_chesapeake_bay.pdf (Figure 1, "Average Cost of Selected Nitrogen Reduction Measures," p.1).

"Building Capacity to Analyze the Economic Impacts of Nutrient Trading and Other Policy Approaches for Reducing Agriculture's Nutrient Discharge into the Chesapeake Bay Watershed," U.S. Department of Agriculture (USDA), August 2013 can be found at: http://www.usda.gov/oce/environmental_markets/files/EconomicTradingCBay.pdf (Figure 2, p. 35).

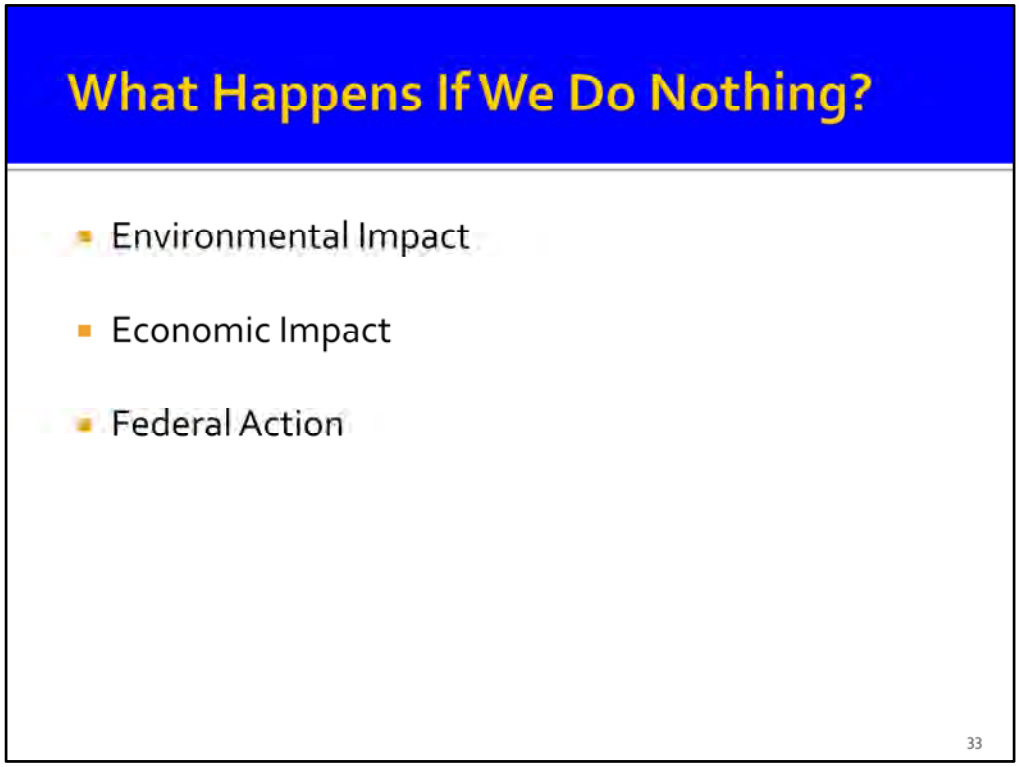
"Cost-Effectiveness Study of Urban Stormwater BMPs in the James River Basin," The Center for Watershed Protection (CWP), June 2013 can be found at: http://www.jamesriverassociation.org/what-we-do/JRA-Cost-effective-Full-Report-June-update.pdf (Tables 2 and 3, pg.13-14).
Median cost of nitrogen reduction is $1065 per pound (all type stormwater BMPs). Top 3 of Chesapeake Bay Program (CBP)-Approved BMPs are < $265/lb of nitrogen removed. Top 3 of All BMPs identified in Table 2 are < $18/lb of nitrogen removed.



➢Early discussions regarding Nutrient Trading in Virginia proved that incorporation of onsite sewage sector into trading program was too difficult

➢It would be difficult to aggregate the nutrient credits from individual homeowners.

➢It would be difficult for onsite sewage sector to generate nutrient credits, so we would most likely only be a consumer of any available credits.



- Environmental Impact
  - Waters may not be "fishable/swimmable" (i.e. designated use)
  - Poor water quality

- Economic Impact
  - Affects nationally important commercial and recreational fisheries, and
  - Has the potential to threaten the region's tourism economy.

- Federal Action
  - Increased EPA oversight of state-issued permits (predom. NPDES permits, but could include others)
    - Currently 3 categories of oversight:
      - Ongoing (e.g. Agriculture, Wastewater, Trading/Offsets)
      - Enhanced (e.g. Urban/Suburban STW)
      - Backstop
  - Require additional pollutant reductions from point sources
  - Increase federal enforcement
  - Prohibit new/expanded discharges unless sufficient offsets (i.e. limits growth)
  - Conditional or redirect EPA grant funding
  - Revise water quality standards
  - Other federal actions as authorized

While many of these "actions" may seem geared towards point source contributors, ALL our efforts go towards meeting the 2025 goals and inaction from the non-point sources will cause an impact across other sectors.

Summary

- Challenges
  - Getting to "Zero-Net Growth" in the short-term
  - Getting to the 2025 TMDL
  - How do we allow for growth beyond 2025?
- Ramifications
  - Environmental
  - Economic
- Opportunities
  - Expanding programs and creating incentives for nitrogen reduction
  - EPA – "Attenuation Panel"
  - Creating jobs

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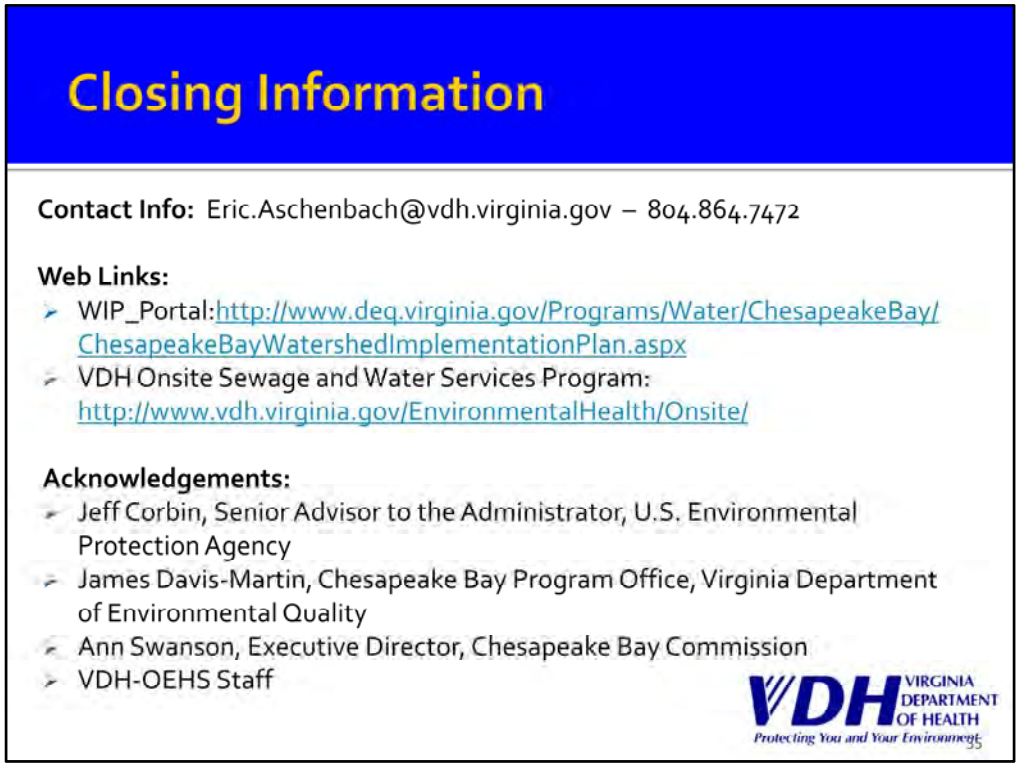


Helpful Web Links:

- Virginia's Watershed Implementation Plans for the Chesapeake Bay Portal (maintained by DEQ) – http://www.deq.virginia.gov/Programs/Water/ChesapeakeBay/ChesapeakeBayWatershedImplementationPlan.aspx
  - WIP
    - entire document, or
    - individual chapters (Section 7: Onsite Wastewater/Septic)
  - Milestones
- VDH Onsite Sewage and Water Services Program – http://www.vdh.virginia.gov/EnvironmentalHealth/Onsite/

Thanks to the contributors that provided information, slides, data, or pictures for this presentation!

Entering

CHESAPEAKE BAY WATERSHED

Be a friend to the Chesapeake

The Chesapeake Bay Commission

What do Other States Do?

2009 Onsite Sector Loadings (lb N/yr)

State	Loading lb/yr	% of Total Load
Pennsylvania	2,331,509	2.0
Maryland	2,971,870	5.7
New York	317,635	3.0
West Virginia	174,089	3.2
Delaware	154,877	3.5
Virginia	2,468,117	3.6

West Virginia

- TMDLs set for most streams
- No regulations specific to control N for onsite systems in the Chesapeake Bay watershed.
- Large systems are controlled through UIC program for groundwater impacts

New York

No specific controls for onsite systems in the Chesapeake Bay watershed for N

Pennsylvania

- For residential systems assume that current regulations satisfy anti-degradation requirements
- 4 feet vertical separation to limiting feature for septic tank effluent
- 20 inch vertical separation for treated effluent
- Alternate sewage systems used on case by case basis and consider effect on GW (fecal coliform, chlorides, nitrates, nutrients, etc.)

Delaware

Beginning January 2015:

Small systems <2,500 gpd

- All new and replacement small systems within 1000 feet of tidal waters must treat to 20 mg/l TN or 50% TN removal

Delaware cont.

Permit Type	2,500 to <20,000 gpd	≥20,000 gpd
New	TN 10 mg/l	TN 10 mg/l; TP 4 mg/l**
Replacement	TN 20 mg/l *	TN 10 mg/l*
When Operating Permit expires	TN 20 mg/l*	TN 10 mg/l; TP 4 mg/l**

*System located within 1,000 ft of Chesapeake Bay Tidal Waters

**System located in an area identified as having high potential for P mobility.

Delaware cont.

If the large systems require a new design in order to meet the performance standards, the owner has up to 60 months from the permit expiration to bring the system into compliance. These limits are end of pipe limits unless otherwise stated in the Operating Permit.

Maryland

Small onsite systems (up to 1,500 gpd)

- All new onsite systems must comply with 50% N reduction requirements (Jan 1 2013)
- Recognizes field verified treatment units as BAT
- Non-proprietary/engineered systems accepted with data verified and require a EPA Model 3 or higher management model (renewable OP and/or RME with sampling, reporting, maintenance, and enforcement)

Maryland cont.

Grants are available for 50% or 100% depending on income

Grants are prioritized based on

1. Failing OSDS in the Critical Areas
2. Failing OSDS outside the Critical Areas
3. Non-Conforming OSDS in the Critical Areas
4. Non-conforming OSDS outside the Critical Areas
5. Other OSDS in the Critical Areas, including new construction
6. Other OSDS outside the Critical Areas, including new construction

Maryland cont.

- 1,500 up to 5,000 gpd must be individually engineered
- 5,000-10,000 gpd may have individual GW permit
- >10,000 gpd must have individual GW permit

Maryland cont.

Large systems (≥ 5,000 gpd) require:

- Low pressure dosing with resting
- Soils dispersal area with 200% reserve
- N balance at property line or adjacent to water course does not exceed 10 mg/l
- Analyze for mounding to verify separation distance maintained

Virginia’s N Policy Updates

Why Address N?

- In 2008, the VA General Assembly directed VDH to control nitrogen from alternative onsite sewage systems through a change to our Code
- Presidential Executive Order 13508 (May 12, 2009) created new accountability framework
- 2010 – Emergency Regulations that addressed N for groundwater only

Why Address N?

- Chesapeake Bay TMDL set by EPA in December 2010 that identifies the onsite sector as a contributor of N
- VA Watershed Implementation Plan – VA commits to implementing N reduction for alternative systems in the Watershed
  - Phase I Nov 2010
  - Phase II March 2012

Current Regulatory Status

- Regulations for Alternative Onsite Sewage Systems adopted December 7, 2011 with an effective date for N limits on AOSS in the Chesapeake Bay watershed of December 7, 2013
- For small systems (≤ 1,000 gpd) limit is 50% N reduction; large systems N limit is 20 or 8 mg/l
- Encourage a BMP approach that allows for treatment or combination of treatment + soil for small systems

Update on BMPs

- Just approved by final Water Quality Goal Implementation Team
- Will be moved into model
- Update to BMP Policy scheduled to reflect minor corrections to report
- Will move engineered design with verification into BMPs and revise Appendix D to remove sampling for submittals under 12VAC5-613-90.1.b

Virginia N Treatment Unit Testing Policy

- Working toward a protocol that incorporates 3rd party lab testing and field testing

VA - Initial Testing

- NSF 245 or similar
- Purpose is to
  - (1) demonstrate potential for system to reduce N by 50%, and
  - (2) demonstrate unit's hydraulic and organic design load

VA - Field Testing

- 12 systems with 24HC samples or 20 systems with grab samples
- Quarterly samples for one year (considering option to not be consecutive but still covering designated seasons)
- No mandatory influent testing
- Effluent: TN, pH, alkalinity, flow
- at least 25% of systems in non-carbonaceous area

Remaining Issues

- Resolve conflicts with Bay watershed protocol
- O&M – how to handle existing systems that a manufacturer wants to test
  - Bringing the system up to compliance
  - Maintaining compliance during the test period
  - Incentives for homeowners to participate
  - How to keep O&M independent from sampling

EPA Data Sharing

- VA is participating in a Chesapeake Bay watershed data sharing discussion for N
- Participants include MD, DE, NY, PA, VA, and WV
- 8 conference calls since February
- Early on recognized that states were not able to accept ‘approvals’ from other states but WERE willing to accept a data set from another state

Data Sharing

- Focus: Identifying areas of consensus on the protocols for data generation
- Goal: Create a protocol that manufacturers could follow and know data would be accepted by any state in Bay watershed.
- General Consensus that field data is needed
- Two main discussions:
  - Initial Data Requirements
  - Field Verification Requirements

Data Sharing

- Initial Data Requirements
  - NSF 245 or similar
  - Cold weather data needs (part of the data set should be from winter season) – discussing using other data sets to supplement NSF 245 to verify cold weather performance

Data Sharing

- Field Verification
  - Number of systems (12 with 24HC samples)
  - Location of installed units (in state/out of state)
  - Time in operation prior to testing (3 months)
  - System Requirements (residential, year round occupancy, O&M etc)
  - Influent Testing (none required)
  - Effluent Testing (CBOD5, TSS, DO, pH, nitrite, nitrate, TKN, ammonia, TN, alkalinity, temperature (air and water)

Data Sharing

- Field Verification
  - Length of test and number of samples
  - Analytical methods
  - 3rd party verification

IMPORTANT NOTICE ABOUT FILING YOUR APPLICATION

The Virginia Department of Health (VDH) encourages the use of licensed private sector professionals to design your septic system and private well.

VDH Environmental Health staff provides a variety of public health services in addition to issuing septic system and well permits. While we strive to provide you with prompt service, at times higher public health risk arise (such as rabies investigations) that must be addressed immediately. As a regulatory agency our services are best used to help you understand and meet regulatory requirements (reviewing plans, assuring proper operation and maintenance of your system, etc.). VDH also provides programmatic oversight and quality assurance/quality control of all direct services. While VDH does provide direct design services for septic systems and wells, licensed private sector professionals also provide a wide array of services that benefit property owners. If you choose VDH to design your system, you should be aware of some limitations on VDH services.

Comparison of Private Sector and VDH Services	
Licensed Private Sector Professionals (OSEs and PEs)*	**Licensed VDH Professional Staff**
Can design any type of single family, commercial or multi-family septic system and/or well, including alternative septic systems.	Are limited to designs for single-family residential conventional septic systems. Can design any well system.
Can focus on individual needs to address specific issues on your property. May specify designs that exceed regulatory minimums to improve system performance and longevity. May also have affiliation with specific products or manufacturers.	Designs are based on minimum regulatory requirements. VDH regulates the septic and well industry, and approves (or denies) requests from product manufacturers. We cannot recommend one product over another.
Are not limited in their time to tailor solutions for your particular needs. Additionally, applications that have the design completed by the private sector have priority for health department processing. VDH must approve or deny private sector designs within required timeframes, usually within 15 days.	VDH staff will process you application for a septic system and/or well in a timely manner. However, higher priority public health issues do take precedence, and may limit staff time for your specific project. You local health department can provide you with estimated processing times.
Can recommend, and coordinate with septic installers and well drillers.	Cannot recommend specific installers, well drillers, or designers. You select the installer and/or well driller.
May provide additional services, such as sewage system operation and maintenance, if properly licensed.	VDH does not provide direct operation and maintenance services.

*OSE means Onsite Soil Evaluator. PE means Professional Engineer.

For more information on VDHs regulations and policies please visit:
http://www.vdh.virginia.gov/EnvironmentalHealth/Onsite/ <add qr code>
For help finding a private sector provider in your area visit:
<create VDH website with links to DPOR, ACECVA, VAOSE, VAPSS, VEHA, VOWRA, and VSPE> with qr code

Construction Permit VDH OSE Report

Property Location:

911 Address: 1 New Form Drive City: Richmond

Section: 1 Block: 1 Lot: 1

Subdivision: SHIFT

GPIN and/or Tax Map #: 111111111100000

Applicant Mailing Address:

Name: John Doe

Street: 1 New Form Drive

City: Richmond State: VA Zip Code: 23219

Designed by:

VDH OSE: Lance Gregory License #: 194 000 1353

Health Department: Richmond Health Department

Health Department Address: 109 Governor Street, 5th Floor

City: Richmond State: Virginia Zip Code: 23219

Date of Report: July 09, 2014

Contents/Index of this report:

Certification Statement

I hereby certify that the evaluations and/or designs contained herein were conducted in accordance with the *applicable provisions of the* Sewage Handling and Disposal Regulations (12VAC5-610), *the* Private Well Regulations (12VAC5-630), *the* Regulations for Alternative Onsite Sewage Systems (12VAC5-613), and all other applicable laws, regulations, and policies implemented by the Virginia Department of health. I further certify that I currently possess any professional license required by the laws and regulations of the Commonwealth that have been duly issued by the applicable agency charged with licensure to perform the work contained herein.

The work attached to this cover page has been conducted under an exemption to the practice of engineering, specifically the exemption in Code of Virginia Section 54.1-402.A.11.

VDH OSE Signature: _____ Date: 7/9/14

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

Office of Environmental Health Services
109 Governor Street, 5th Floor
Richmond, Virginia 23219
(804) 864-7470 Voice
(804) 864-7476 Fax

Sewage Disposal System Construction Permit

John Doe
1 New Form Drive
Richmond, VA 23219

July 09, 2014

Subject: Health Department ID Number: 11-111-1111
Tax Map Number/GPIN: 111111111100000
Subdivision: SHIFT
1 New Form Drive, Richmond, VA 23219

Dear John Doe,

The attached drawings, specifications, and calculations constitute your permit to install a sewage disposal system and well on the property referenced above. The attached schematic shows the approved area for the sewage disposal system. If modifications or revisions are necessary between now and when you construct your dwelling, please contact the Richmond Health Department at (804) 864-7470. No part of any installation shall be covered or used until inspected, and the sewage system may not be placed into operation until you have obtained an Operation Permit from the Richmond Health Department.

The following documents will be required to obtain this Operation Permit:

System Inspection by the local Health Department
Satisfactory Contractor's Completion Statement
Satisfactory Well Inspection by the local Health Department
Satisfactory Bacteriological Sample Results
Water Well Completion Statement or GW-2 from your well driller

This Construction Permit is null and void if conditions are changed from those shown on your application or if conditions are changed from those shown on the Site and Soil Evaluation Report and the attached construction drawings, specifications, and calculations. VDH may revoke or modify any permit if, at a later date, it finds that the site and soil conditions and/or design do not substantially comply with the Sewage Handling and Disposal Regulations, 12 VAC 5-610-20 et seq., or if the system would threaten public health or the environment. This permit approval has been issued in accordance with applicable regulations based on the information and materials provided at the time of application. There may be other local, state, or federal laws or regulations that apply to the proposed construction of this onsite sewage system or well (if applicable). The owner is responsible at all times for complying with all applicable local, state, and federal laws and regulations.

If you have any questions, please contact me. This authorization to construct a sewage disposal system **expires: December 02, 2015. This Permit is NOT TRANSFERABLE to any other person or location.**
Issued by:

Lance Gregory, Environmental Health Coordinator

System Specifications 11-111-1111

Applicant Information

Name: John Doe Phone: (804)
Address: 1 New Form Drive
Richmond, VA 23219

Location Information

Tax Map/ GPIN #: 111111111100000
Property Address: 1 New Form Drive Richmond VA
Subdivision: SHIFT Section: 1 Block: 1 Lot: 1
Directions:

General Information

Property Type: Residential	Daily Flow: 450 gallons Number of Bedrooms: 3

Sewer Line and Septic Tank

Sewer Line: 3" or 4" schedule 40 PVC or equivalent, cleanouts required at 50' -60' intervals
Septic Tank Capacity: 1000 gallons
The inlet structure shall be 1-2 inches higher than the outlet structure and shall extend 6-8 inches below and 8-10 inches above the liquid level. The outlet structure shall extend 35-40% below and 8-10 inches above the liquid level. The septic tank shall either have an inspection port or an effluent filter, or be a reduced maintenance tank.

Conveyance Line	Distribution Box and Header Lines
Method: Pump Material: Minimum crush strength 1500# Pipe Diameter: 1.5" Minimum Slope: 6" per 100' for non-pump	No. of Boxes: 1 No. of Outlets: 6 Header Line Material:1500 # crush or equivalent Header Line Minimum Slope: 2" per 100'

Percolation Lines/ Absorption Area

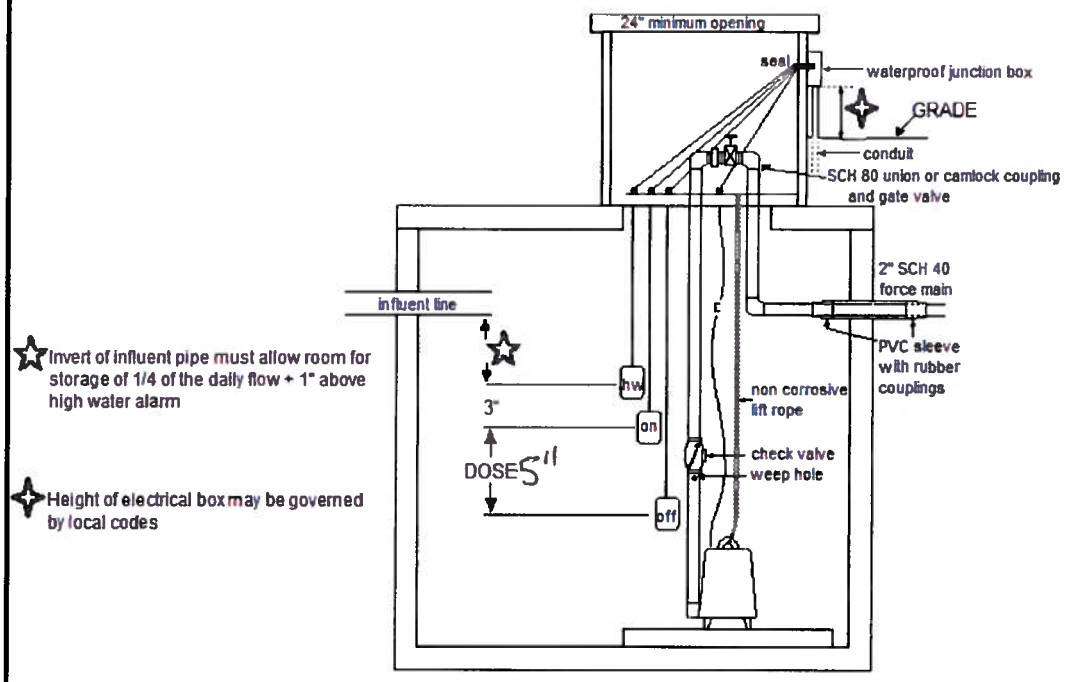
Install: **810 sq feet** total
Installation depth: 60 "
Trench slope to be between **2-4" per 100'**
Install **5** Laterals, **54'** long, and **3'** wide, with **9'** center to center spacing.
The use of an approved gravel-less technology is required in the installation of this design. No reduction from the specified design footprint is allowed.

PLEASE NOTE: 50% Reserve area provided

Maintain 50' minimum from septic tank to all wells.
Maintain 50' minimum from subsurface sewage disposal system to IIIB wells.
Drainfield shall be 5' minimum from property boundaries, 10' minimum from building foundations, and 20' minimum from below grade basements.
Divert roof drains and surface water from drainfield area.
Remove all maple trees and other hydrophyllic (water loving) plants from within 10' of drainfield area.
All excavations must comply with OSHA safety regulations.
This permit is null and void if the house location is changed and interferes with the approved sewage disposal system area.

This permit expires: December 02, 2015.
This permit is not transferable to another owner or location.

Pump Specifications



Pump Chamber Size: 1000 gallons	**Dose:** : 105 gallons
1/4 Day Storage: 112.5 gallons	**Drawdown:** 5 inches

SEE ATTACHED SYSTEM CURVE

Minimum Pump Capacity: 21 GPM	**Maximum Pump Cycle Time:** 2 mins., 55 secs.
Maximum Pump Capacity: 36 GPM	**Minimum Pump Cycle Time:**5 mins., 0 secs

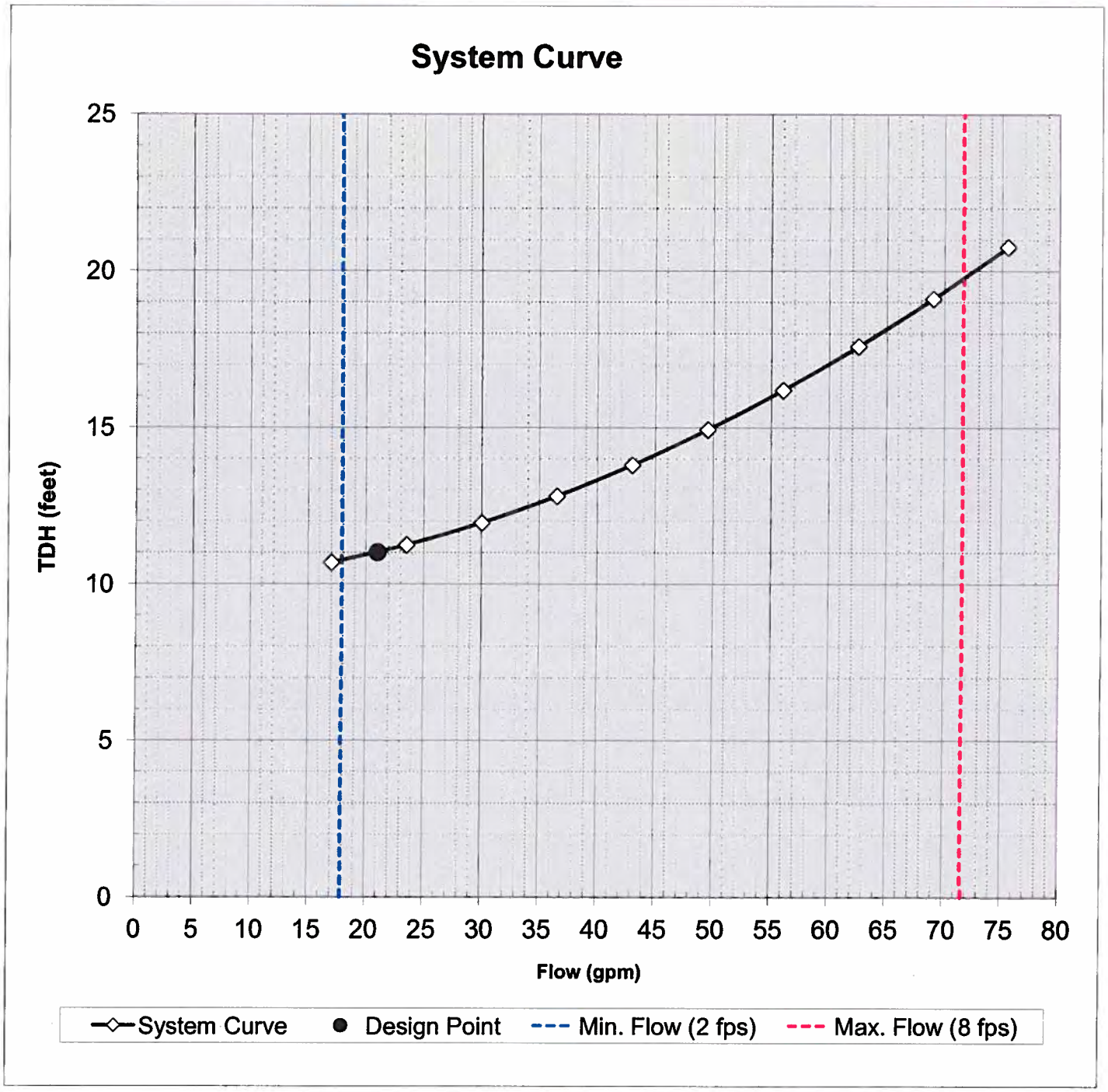
Friction Head: 4.7 feet at 21 gallons/minute

Total Dynamic Head: 19.7 feet at 21 gallons/minute

Static Head:		
Elevations:		
Pump Off:	0.00	ft
Discharge:	10.00	ft
Total Static Head:	**10.00**	**ft**
Pump Design:		
Design (Desired) Pump Flow:	21	gpm
Total Dynamic Head at Design Flow:	**11.0**	**ft**

Pipe Type	Nominal Diameter	Pipe Code
PVC - Sch 40	1 to 3 in.	1
PVC - Sch 80	1 to 3 in.	2
PVC - SDR 26	1 to 3 in.	3
HDPE - DR 11	1 to 2 in.	4

	Segment 1		Segment 2		Segment 3	
Nominal Pipe Diameter (in):	2					
Pipe Code (See table above to right):	2					
H-W Friction Coefficient (130-150):	130					
Actual Pipe Diameter (ft):	0.159		0.000		0.000	
Hydraulic Radius (ft):	0.040		0.000		0.000	
	#	EqL	#	EqL	#	EqL
Pipe Length (ft):	50	1.0	0	1.0	0	1.0
Miscellaneous Fittings:	0	1.0	0	1.0	0	1.0
2-Way Plug Valve - Full Open:	0	0.0	0	0.0	0	0.0
Gate Valve - Full Open:	1	1.3	0	0.0	0	0.0
Ball Valve - Full Open:	0	0.0	0	0.0	0	0.0
Globe Valve - Full Open	0	0.0	0	0.0	0	0.0
Swing Check Valve - Full Open:	0	0.0	0	0.0	0	0.0
El - 90 deg:	3	4.8	0	0.0	0	0.0
El - 45 deg or 90 deg long radius:	0	0.0	0	0.0	0	0.0
El - 22.5 deg:	0	0.0	0	0.0	0	0.0
El - 11.25 deg:	1	0.7	0	0.0	0	0.0
Tee - Through Flow:	0	0.0	0	0.0	0	0.0
Tee - Branch Flow:	0	0.0	0	0.0	0	0.0
Air Release Valve:	0	0.0	0	0.0	0	0.0
Reduction from 1.25":	0	0.0	0	0.0	0	0.0
Reduction from 1.5":	0	0.0	0	0.0	0	0.0
Reduction from 2":	0	0.0	0	0.0	0	0.0
Reduction from 2.5":	0	0.0	0	0.0	0	0.0
Reduction from 3":	0	0.0	0	0.0	0	0.0
Increase to 1.25":	0	0.0	0	0.0	0	0.0
Increase to 1.5":	0	0.0	0	0.0	0	0.0
Increase to 2":	0	0.0	0	0.0	0	0.0
Increase to 2.5":	0	0.0	0	0.0	0	0.0
Increase to 3":	0	0.0	0	0.0	0	0.0
Total Equivalent Length (ft)	66.3		0.0		0.0	
Velocity at Design Flow (fps):	2.3		0.0		0.0	
Flow Velocity Check:	**OKAY**		**N/A**		**N/A**	


System Curve
TDH (feet)
25
20
15
10
5
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80
Flow (gpm)
System Curve
Design Point
Min. Flow (2 fps)
Max. Flow (8 fps)

ATTACH SCALE DRAWING

Site and Soil Evaluation Report

General Information

Date: June 02, 2014 Richmond Health Department

Owner: John Doe

Owner Telephone Number: (804)

Property Address: 1 New Form Drive Richmond VA

Section: 1 Block: 1 Lot: 1

Subdivision: SHIFT

Soil Information Summary

Position in Landscape Satisfactory: Yes Describe Landscape Position: Sideslope

Slope: 3 to 6%

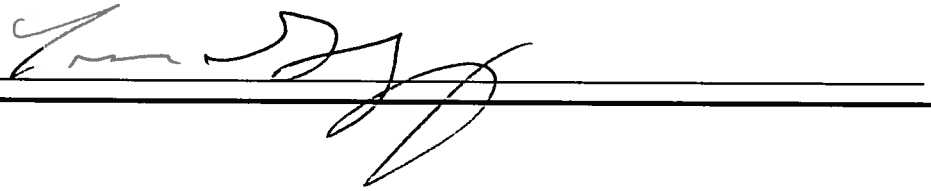
Depth to rock/impervious strata: 80 inches

Free Water Present: No, at 0 to 0 inches

Depth to seasonal water table: > 80 inches

Estimated soil percolation rate: 45 min/in Estimated at 60 in

Name and title of evaluator: Lance Gregory, Environmental Health Coordinator, AOSE #1940001353_

Signature: 

Soil Descriptions

Hole #	Horizon	Depth (in.)	Description of color, texture, etc.	Texture Group
1	Ap	0 - 3	Brown (10YR 4/3) SL (Sandy Loam)	II (2)
	E	3 - 12	Light Yellowish Brown (10YR 6/4) SL (Sandy Loam) friable	II (2)
	Bt	12 - 48	Red (2.5YR 5/8) CL (Clay Loam) friable, subangular blocky structure	III (3)
	BC	48 - 52	Strong Brown (7.5YR 5/8) SCL (Sandy Clay Loam) friable, w/ 2.5YR 5/8 red, and 10YR 8/1 white lithochromic mottles	II (2)
	C	52 - 80	Yellowish Brown (10YR 5/8) SL (Sandy Loam) friable, w/ 2.5YR 5/8 red, 10YR 8/1 white lithochromic mottles	II (2)

Hole #	Horizon	Depth (in.)	Description of color, texture, etc.	Texture Group
2	Ap	0 - 3	Brown (10YR 4/3) SL (Sandy Loam)	II (2)
	E	3 - 10	Light Yellowish Brown (10YR 6/4) SL (Sandy Loam) friable	II (2)
	Bt	10 - 38	Red (2.5YR 5/8) CL (Clay Loam) friable	III (3)
	BC	38 - 48	Strong Brown (7.5YR 5/8) SCL (Sandy Clay Loam) friable, w/ 2.5YR 5/8 red, and 10YR 8/1 white lithochromic mottles	II (2)
	C	48 - 80	Strong Brown (7.5YR 5/8) SL (Sandy Loam) friable, w/ 2.5YR 5/8 red lithochromic	II (2)

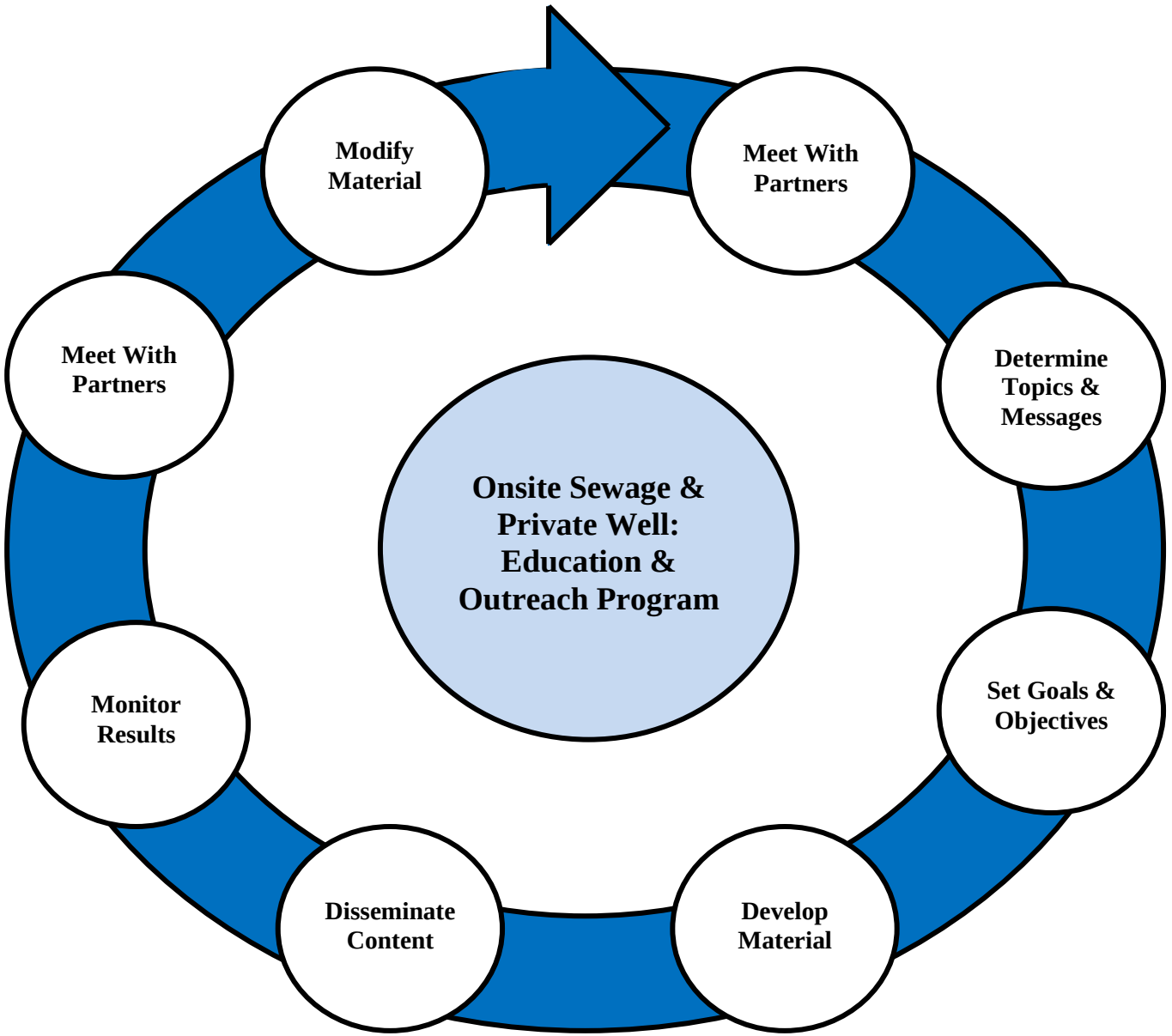
Hole #	Horizon	Depth (in.)	Description of color, texture, etc.	Texture Group
3	Ap	0 - 4	Dark Grayish Brown (10YR 4/2) SL (Sandy Loam)	II (2)
	E	4 - 12	Yellowish Brown (10YR 5/4) SL (Sandy Loam) friable	II (2)
	Bt	12 - 38	Red (2.5YR 5/8) CL (Clay Loam) friable	III (3)
	C	38 - 80	Yellowish Brown (10YR 5/8) SCL (Sandy Clay Loam) w/ 2.5YR 5/8 red lithochromic	II (2)

Private Well Construction Specifications

Property ID: 1 New Form Drive
Date: July 09, 2014

Facility Information	
Owners Name: John Doe Facility Tax Map/GPIN #: 111111111100000	Facility Address: 1 New Form Drive Richmond
Water Supply Information	
Well Purpose: Domestic Drinking Water	
Class of Well: IIIB	Estimated Water Usage: 450 gpd
Minimum Casing Depth: 50 Feet	Minimum Grout Depth: 50 Feet
Minimum Distance From septic tank(s): 50 Feet	Minimum Distance From Absorption Area: 50 Feet
Minimum Distance From Any Termite Treated House Foundation: 50 Feet The proposed house foundation will be termite treated	Minimum Distance From Other Source(s) of Pollution: 100 Feet Describe Source(s): Underground Storage Tank
Additional Construction Criteria: Class IIIA or IIIB well must be located a minimum of 50 feet from any potential contamination source. A Satisfactory bacterial sample result must be submitted to the local health department prior to issuance of well approval. A Uniform Water Well Completion Statement form is required prior to issuance of well approval.	

ATTACH SCALE DRAWING


Onsite Sewage & Private Well: Education & Outreach Program
Meet With Partners
Determine Topics & Messages
Set Goals & Objectives
Develop Material
Disseminate Content
Monitor Results
Meet With Partners
Modify Material

I. Purpose

The purpose of the onsite sewage and private well education and outreach program is to provide citizens of the Commonwealth of Virginia with a basic understanding of onsite sewage and private well systems, with a focus on key messages that promote improvements to individual and community health.

II. Target Audience

The target audience is individuals using onsite sewage and/or private well systems.

III. Objectives and Goals

The objective is to change the out-of-site out-of-mind paradigm for onsite sewage and/or private well system users by increasing their basic understanding of how these systems function, and by having users understand that these systems have a direct impact on their health and the health of their community. The overall goal is healthier Virginians in healthier communities.

IV. Methods of Delivery

The program will be broken in to a multitude of small education and outreach programs; each with a unique message, objective, and goal. These small programs will be delivered using a series of methods.

1. Social Media: We will use social media platforms such as Twitter and Facebook to disseminate the overall message and direct interested citizens to view 2-3 minute YouTube videos to deliver the message through an educational component. YouTube viewers will see videos of onsite sewage and private well system simulators, as well as photos and real-world videos taken by VDH staff and industry partners. Likewise, similar messages and material posted by industry partners will be re-posted on VDH social media platforms.
2. Website Content: Messages and educational material (as well as links to social media outlets) specifically directed to the general public will be posted on a more user-friendly portion of the onsite sewage and water services website. Content will be available for publication on industry partner websites, and links to similar messages and material on industry partner websites will be added.
3. Outreach-in-a-box: Messages and educational material will be packaged for easy access and easy use by local health department staff and industry partners. Electronic materials will be posted in a dedicated location on the onsite sewage and

water services website. Materials and visuals, such as system simulators, will be made available to local health department staff upon request once staff have completed any necessary training (which will be provided by OEHS upon request). Local health departments will also be encouraged to share "outreach-in-a-box" projects which they have created. Projects will be peer reviewed to assure they are not locality or district specific, and to assure they align with the overall program purpose of promoting improvements to individual and community health.

V. Monitoring Effectiveness

Initial monitoring will focus on the number of citizen viewing online educational material and attending "outreach-in-a-box" events. However, staff will seek input from partners to develop more effective measures of each individual programs impact on individual and community health.

VI. Funding Need

Staff and partners should be able to produce much of the content with specific funding. However, funds may be necessary to create videos and purchase booth space for "outreach-in-a-box" events. Detailed funding needs will be identify as the project starts underway. Initial project efforts will focus on education and outreach programs that do not require funding beyond staff time.

VII. Project Outline

This project will be a combination of small education and outreach programs. To being the process of creating these small programs, OEHS will first:

1. Meet with partners: Partners will be local health department staff, VDH media specialist, other interested agencies, and industry partners such as: the Department of Environmental Quality, the Virginia Household Water Quality Program, the Virginia Water Well Association, the Virginia Onsite Wastewater Recycling Association, among others.

OEHS and our partners will then set out to:

2. Determine topics and messages: This will begin the process of selecting the different small education and outreach programs that will form the overall onsite sewage and private well education and outreach program. Each individual program will have its own unique message, under the umbrella of the overall program message of "Improving individual and community health."

Once topics and messages are determine the group will then set out to:

3. Set goals and objectives: Again, each individual program will have its own unique goals and objectives, under the umbrella of the overall program objective and goal.

   Partners will then be asked to help:

4. Develop material:

   And;

5. Disseminate content:

   Once the individual programs are underway, OEHS will:

6. Monitor results: The method for monitoring results will be established by the group during initial development of the program. Results will be shared with partners.

   OEHS will then:

7. Meet with partners: These meetings will be to discuss results of the program and determine whether modifications to the individual or overall program are necessary.

   Finally, OEHS and partners will:

8. Modify material: Material will need to be keep up to date to improve results and to incorporate any statutory or regulatory changes in the onsite sewage or private well program.