

**Virginia Department of Health (VDH)
Stakeholder Meeting Summary**

**Discussion of Implementation of Nitrogen Best Management Practices (BMP)
for Treatment Units for Small Alternative Onsite Sewage Systems**

Meeting Dates: September 25, 2013 (Richmond VA) and October 9, 2013 (Roanoke VA) 10 am to 4 pm

I. AGENDA for Both Meetings:

- 10-10:15 Welcome and Purpose
- 10:15-10:30 Introductions
- 10:30-10:35 Review Agenda
- 10:35-11:15 Presentation on draft "Recommendations of the On-Site Wastewater Treatment Systems Nitrogen Reduction Technology Expert Review Panel" August 2013
- 11:15-11:30 Goals
- 11:30-11:45 BMP Verification
- 11:45- 1:00 Lunch
- 1:00 -3:45 Obtain Input from Stakeholders (Lunch break
3rd Party Certified Systems
Acceptable 3rd party certifications
Field testing (No. of units, sampling frequency, sample type, reciprocity, etc.)
What to do with 'failures' – options to retest?
Non-3rd Party Certified Systems
Engineering submittal information (structural, water tight, safety, etc.)
Initial data
Field Testing (No. of units, sampling frequency, sample type, reciprocity, etc.)
What to do with failures – options to retest?
- 3:45 - 4:00 Next Steps: What has to happen prior to December 7, 2013

II. Attendees

A. September 25, 2013

Name	Organization	email
Robert C. Savage	Affordable Septic Solutions, Inc.	affordableseptic@verizon.net
Valerie Rourke	DEQ	Valerie.Rourke@deg.virginia.gov
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Eric Aschenbach	VDH	Eric.Aschenbach@vdh.virginia.gov
Marcia Degen	VDH	Marcia.Degen@vdh.virginia.gov

B. October 9, 2013

Name	Organization	Email
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III. Meeting Minutes – See Appendix A

IV. Meeting Summary

A copy of the powerpoint presentation is attached.

The goal of each meeting was to solicit input on the specifics of a VA policy to recognize proprietary and non-proprietary treatment units as N reducing treatment units for small systems. The recommendations regarding a protocol for approving such treatment units in the draft “Recommendations of the On-Site Wastewater Treatment Systems Nitrogen Reduction Technology Expert Review Panel” Report were presented as a starting point. Participants commented on which components should be kept or added to each category. Below are the comments from each meeting with regard to the main components of a policy.

SEPTEMBER 25, 2013 COMMENTS	OCTOBER 9, 2013 COMMENTS
1. Step One: Pass 3rd Party testing for N reduction What types of certifications should be considered? What else to pass step one?	
NSF 245 EN 12566-3 BNQ Class III NSF 350 (wastewater reuse standard) NSF 40 where N was tested as well Could a large body of data be considered equivalent? Yes., if 3 rd party did collection, data collection method ok, similar climate, timeliness	NSF 245, 350 (should be ANSI NSF) EN 12566-3 BNQ 3680-910 ETV GMP 147? Some mfg did N testing NSF 40 + N prior to adoption of 245, some ran N testing during 40 PA TVP Case by Case? Must be by qualified 3 rd party ; consider university or test site; follow 40 CFR 136; chain of custody; Influent/effluent samples; calculations to verify potential of unit to remove N Also need engineering certification and O&M manual to pass step one
2. Step two : Field Testing; Number of Systems	
Most could live with 12 systems but wanted to retain the option to have more systems required under certain circumstances	All can live with 12 systems
3. Field Testing: Location of systems, number of samples, timing of samples	
Must be from year round residences Quarterly samples covering 4 seasons Considered option of quarters not being consecutive. Sample timing	Minimum 4 quarters per system with each quarter representing a season Suggest oct-dec; jan-mar; apr-june; jul-sept – should capture spread of

<p>should be preset to avoid sample shopping.. with a maximum duration of 3 to 5 years to collect samples Location – consider no more than 25% of systems in ridge and valley to avoid loading data with high alkalinity source waters.</p> <p>If mechanical failure, on day to collect sample, still collect and report, but resample within 30 days. Submit all data.</p> <p>If design is modified – restart the testing</p>	<p>temperatures Goal is to have 4 consecutive quarters, but leave option to do a resample within 30 days if unusual situation such as pump outage; Total time to complete 3 years Location – suggest 4 physiographic regions in bay watershed could do 3 per region – concern over being able to locate systems in all 4.; most concern over temperature and alkalinity</p> <p>Suggestion to use median instead of mean – no consensus – depends on data spread Must determine upfront how to handle non-detects Need criteria for failure</p>
<p>4. Field Testing: Parameters</p>	
<p>Influent difficult to sample – consider optional Require grab samples, but allow composite Flow – consider # of occupants; water meter readings; event counters on pumps. No good way to do this. Get best estimate Optional influent testing: BOD, TSS, TKN, alkalinity</p> <p>Effluent Require grabs but allow composites TN only – consider alkalinity and pH</p> <p>(BOD and TSS not needed to prove N reduction)</p>	<p>Influent testing: optional; must have influent testing to discount a site; may want to consider testing source water for background nitrate and alkalinity; prefer assumption of 60 mg/l TN in influent so 50% reduction is a 30 mg/l TN; too many systems recycle making it difficult to get a true influent</p> <p>Effluent: strong favor for 24 HC Maybe optional for BOD and TSS but encouraged TKN, NO₂+NO₃, alkalinity, pH, temp, DO Flow? Yes, options? Read water meter if available; no. people in household, pump run time meter if available, could require active flow monitoring for these sites</p>
<p>5: Field Testing: Failures</p>	
<p>Install approved BMPs for all sites so no non-compliant sites . That way no failures, no need for an owner or manufacturer to come back later and modify site</p>	<p>Option A: No non-compliant sites – can install unlimited sites if design utilizes NSF 40 (or equivalent) PLUS shallow placed pressure dosed to meet the 50% BMP without full treatment. Option B: Similar to GMP 147 – can install based on just treatment unit being used to meet 50% but MUST repair if system fails to meet 50%; can only install sites directly involved in testing; - need a contract with mfg to modify site to a compliant BMP if system fails Not sure how to handle non-residential – if system is discovered to be ‘non-residential’</p>
<p>6: Field Testing: Reciprocity with other states for field data</p>	
<p>Must have similar climate/season/temperature – looking for extremes Maybe only data less than 5 years old No more than 25% from systems in carbonaceous rock</p>	<p>Points to consider for valid data: data has to fit minimum requirements for VA field tests; lab must be licensed; data quality – need chain of custody; use 40 CFR 136; valid sites (residential year round); similar climate (limestone area, source water issues to be addressed); Time Frame?: if paired influent/effluent data doesn’t matter how old as long as system is unchanged; data older than 10 or 15 years without paired data may not be suitable due to changes in wastewater strength due to low flow fixtures.</p>
<p>7 Non-Proprietary Systems</p>	
<p>Why do we need this? Why can’t all designs be approved BMPs?</p> <p>Consider if doesn’t function (reduce N) has to be brought into compliance; Have renewable OP Financial assurance? Bond? 3rd party collection of samples Approval is site specific and does not extend to the next project Limit number of installs Should have a backup plan if it fails</p> <p>Discussed using sampling frequency similar to non-generally approved systems under 12 VAC 5-613. Five samples total of TN Mean of samples RME must ‘own’ till certified Consider conditional permit and/or owner agreement</p> <p>Failures: must have accountability, backup plan and enforcement</p>	<p>Generally applying only to treatment units Should soil systems be considered? Difficulty with testing – maybe require a test plan and then determine ENG Submittals to require: O₂ delivered vs required; safety factor; hydraulic and organic loading rates; must be site specific; pump rates; recirculation rates; N removal calculations to project end of pipe concentration; demonstrated N reduction in similar system designs; use of refereed/peer review articles to support; identify compliance point</p> <p>Testing : same parameters as proprietary systems 24 HC Could follow ‘non-generally’ approved frequency in 613 regs but at least 2 samples need to be collected in cold weather.</p> <p>Attendees noted that craftsmanship is critical. The designer must be diligent in selecting and approving components – must inspect the construction.</p>

	Failures: the designer/owner must repair to compliant BMP if it fails to comply; owner disclosure on increased sampling and repair requirement
8. Other issues	
Alkalinity; could test and add if not meeting minimum Problematic adding to source water, better to add to influent to WW system	Alkalinity was discussed – could include a statement in the O&M that would recommend the addition of baking soda – maybe a recommended amount based on effluent testing?
9. December 7 plan?	
Because requiring that all testing be done at fully compliant BMP sites, only one list is needed for those units fully approved at 50% - they don't get listed till they complete the field testing.	Consider 3 listing options: 1. Fully approved – has 3 rd party cert and field testing completed 2. Provisional approval – 3 rd party and no field test Option A – unlimited installs due to fully compliant BMP installed in test sites Option B – limited installs due to not fully compliant installs (see discussion under 4 above.

APPENDIX A – MEETING MINUTES

September 25, 2013

1. A Power point presentation was used to outline process and information within the draft report on BMPs for the onsite sector. A summary of the initial discussion follows.

- If someone designs a proprietary system that exactly meets the standards in Table ES-1, does it get the credit?
- Why is non-proprietary not mentioned specifically in Table ES-1? It is a unique system that does not meet the requirements of any specific BMP in Table ES-1. Clarification: BMPs are for $\leq 1,000$ gpd systems. The other testing requirements of our regulation do not go away. If they implement these BMPs, then the owner could have less sampling requirements.
- Line between a Pad and a Mound has blurred over the years.
- Spray irrigation is not included, because they are handled separately.
- Table ES-3. Summary of Net TN Load Reductions: Can you use Drip and a Mound...it says you have to use Pressure Dosing. So no, you cannot use/add these two. This does not anticipate the Elgin and Presby systems. These are like a SF, but they will be unique. Comment: would it help to combine the "Shallow, PD" and "Mound" columns in the table?
- For non-proprietary treatment units not in Table ES-3 the report, there is a discussion in the report. Does this only apply to systems installed in the Bay watershed? Yes.
- Voluntary upgrades: allowed if the system is improved. Discussion between Bob and David.
- NSF245 vs Gulf Coast Testing vs Massachusetts Tech; does not matter as long as they follow the NSF245 protocol.
- Field Testing: it's what the report recommends and not what we have to do. Assume influent is 60 mg/L TN due to no sampling report on some systems (this is what Maryland does). How do we measure flow for a SFH? Flow meter, number of people, pump, etc. Why do we need to test alkalinity? It is irrelevant. 3rd party testing gets you in the door. Field verify ONLY proprietary systems that are??? If you do all your field testing in the Shenandoah Valley you will probably meet the TN due to high alkalinity, whereas if the systems are tested in the Coastal Plain you may not meet the TN. Once again, this report is a recommendation and not a requirement.
- Greater than 50% reductions are penalized for their level of efficiency by the requirement of a renewable OP, operator, etc.
- Do systems have to be tested in a Chesapeake Bay state for reciprocity? We discussed limiting the geographical range due to some systems tested in warmer states not performing well when they are brought to colder climates.
- Annual inspection by a licensed operator is all that would be required to verify the system is operating properly in order to verify the BMP. This would be used in lieu of continuous sampling.
- If there is a manufacturer that meets the criteria in Table ES-1, should they automatically get the reduction and not have to perform field testing.
- How fixed are these numbers; if you take an effluent and put it in the soil versus on top of the soil? [comment from Bob Mayer, we said we would go back and discuss].
- There is not time between now and December 7 to perform the sampling. Perhaps we would do conditional approval while you are doing field testing like we do for TL-3 approval.

2. Detailed discussion on options for VA policy for approval of proprietary treatment systems seeking approval under the BMP.

Proprietary Systems (a.k.a. 3rd Party Certified Systems)

- Manufactured systems

(STEP 1, gets you in the door)

3rd Party Testing

- NSF245

- EN 12566-3 (Not quite the same as NSF245); Is there any reason we would not want to accept the European testing?

- BNQ – Class III Test? (Canadian)

- NSF350 (follows NSF245, but goes above for WW Reuse)

- Case-by-case

- Other large body of data? May want additional information. Qualifiers on types of outside data: engineered data collection (valid method)-who, COC, 3rd Party; climate; timeliness (data from current units)

- NSF40, but had nitrogen testing (may be pre-NSF245); Advantex may fall under this

(STEP 2, Field Testing)

- How many systems do you need for TL-3? 20. 12 is the minimum for BMP.

- With the "Experimental Flag" there was a barrier to getting the 20 samples.

- Year-round residence

- Can we make manufactures prove TL-2 before they can move forward to the Field Testing.
 - Manufacturer should notify VDH which units/location will be used in advanced so that data is not manipulated.
 - Frequency/Duration: quarterly (representative of seasonal variability, we could extend the time it takes to three to five years. This is similar to how TL-3 is set up). What is the purpose of allowing the three year timeframe? What happens if the manufacturer makes a change during testing; do they need to re-start testing? The testing is to prove that the system is meeting the 50% BMP.
 - Issues with sampling shopping and the requirement to submit all data.
- Locations: spread across state ("each physiographic province"). May want to put a qualifier on Drip and Mounds (not in Sands). Why are we concerned with this? Alkalinity. Perhaps an easier way to address this is to say that 'no more than 25% can be in the Ridge and Valley region of Virginia'.
- Suggestion accept 60 mg/L TN influent; make it optional for manufacturer to use influent sampling. If they take it, make it required to be submitted. Recirculation systems confound the reliability of influent testing results.

Parameters

Influent	Effluent	40CFR136	Sample Type
Flow, number of occupants in home, flow meter, events counters			
	TN	Required	Grab, but composite allowed (may affect reciprocity of test acceptability with other states)
	pH	Field test/stick test	
	DO (optional)	Field test/stick test	
	Temperature	Field test/stick test	
	Alkalinity		
BOD5 (optional)			
TSS (optional)			
TKN (optional)			
Alkalinity (optional)			

Failures – Retest Options

- Already approved so no site failure (this is long-term averages, we don't want to fail for one bad, instantaneous sample. Other manufacturers have simply done additional sampling after correction of the apparent mechanical problem/issue. Resample within 30 days; submit both/all samples.) Does your sampling period restart.
- If the design is modified, there should be the ability to restart.

Reciprocity

- Similar climate (looking at similar seasonal temperature extremes)
- Data less than five years old; do we actually need to set a time limit for reciprocity?
- Alkalinity (no more than 25% of sites from carbonaceous rock physiographic region)
- Appropriate datasets (year-round residences, # people, seasonality)

Alkalinity Options

- Test
- Minimum if not meeting
- Water supply: problematic with spots, homeowner won't like/maintain it
- NSF245: uses residential wastewater with adequate influent alkalinity in most cases.

- How frequently to manufacturers submit the results of testing? Model after TL-3, which requires quarterly reporting of results.

December 7th Plan

- List of 50% proprietary treatment units
- reach out to manufacturers to get necessary info
- Use an asterisks on the name as provisional or should we list only approved systems

Non-Proprietary Systems

- Why? Need a category similar to "Non-Generally Approved Designs"
- Engineered submittal of components
- Calculations
- What references are they using
- Is there data from a similar site
- Structural
- Watertightness, alarms
- Etc.
- Approval is site-specific (5 samples, if the same design is used for another site it requires a new set of sampling for the new site)
- If it fails, what else is needed as far as treatment (back up plan)? How do you handle liability? Do you bond it? Won't get that. How do we get reasonable assurance? Require TL-2 as a minimum (effectively NSF40). Who pays for the back up plan? We could limit the number of installs for the particular design. Require Financial Assurance instead of a bond. Require a renewable operating permit.
- If it's not functioning, bring it into compliance
- Can't make it so easy that a manufacturer takes this type of route. Need 3rd Party sample collection.

Testing

- BMP Verification, each install
- Sample TN (and other parameters, as needed) like non-generally approved (5 samples)
- Initial verification (mean of samples < 30 mg/L)

What do we do with failures?

- Accountability
- Back up (remediation) plan; it's more than just a ?
- Enforcement (how many times do you allow this to happen)
- Designer needs to take ownership of the system for a certain period (Use EPA model, RME's)
- Use a conditional permit (deed-restricts the property to some degree)

Minutes – October 9, 2013

Prior to discussion of the Goals and BMP verification, there was a review of the report entitled “Recommendations of the On-Site Wastewater Treatment Systems Nitrogen Reduction Technology Expert Review Panel”

Compliance with BMP will be limited to the property within the individual owner’s control

VDH will move forward with guidance based on the draft report mentioned above, with the understanding that changes may be needed

The “report” defines the baseline for comparison of BMPs

BMPs fall into three groups:

Exsitu (treatment, eg AOSS, either proprietary or nonproprietary)

Insitu (soil treatment)

Combination of exsitu and insitu

There was a discussion of how to determine (calculate) compliance with the BMP requirement of 50% TN reduction as compared to the baseline conventional TN reduction, with examples.

Permeable reactive barriers will fall under the insitu systems and will be handled case-by-case (site-by-site).

Question – what if mfr claims >50% TN reduction?

Answer – higher level of O&M will be required to substantiate actual treatment under the recommendations of the report

Question – were compost toilets considered by panel?

Answer – no

Goals

Identify key components of program – Identify and certify N-reducing treatment for small AOSSs

Proprietary and Non-proprietary systems needs – Need to be adequately robust to ensure the BMP

1- Proprietary –

3rd party testing? (certified) provisional testing

ANSI NSF 245, 350 (University run?)

EN 12566-3

BNQ 3680-910

ETV

GNMP 147 GMP?

NSF 40 w/ N testing

Case-by-case

Criteria for Case-by-case

3rd Party

Validity of the data

Qualifications of the tester

40CFR 136

Chain of custody

Requirements – Engineer certification and O&M Manual

Discussion of field testing parameters vs. lab testing. Are they compatible?

Have to make sure testing compares “apples to apples”

QA/QC concerns

Is it necessary to report design calculations for “case-by-case” situations?

Do we need Influent and Effluent testing for case-by-case situations?

2- Field testing

Number of systems to test (types, year round?) Suggested 12 to 20 systems.

Those present can live with 12 test systems.

Locations for testing (Support, installation, weather considerations may impact the location)

4 Physiographic provinces within the Chesapeake Bay watershed

3 sites in each?

Important parameters in deciding the location – Temperature and Alkalinity

NSF 360 – Field verification protocol – regionally diverse

Is “source water” important in deciding location of sites?

Data manipulation – Median vs. mean vs. log mean

How do we handle “Non-detect”?

Someone raised concern that the manufacturers (proprietary systems) are being penalized because sand filter (nonproprietary) systems are not being regulated and governed by the BMP.

Frequency of testing

4 samples – one per season (qtr) for one year

January-March

April-June

July-September

October-December

Need to space sampling out evenly

Discussion about concentrating sampling more in colder months

There was concern about being able to sample at the time scheduled. What-ifs..... Pump down, dogs at site, etc. There may be some problems in getting sample taken.

Can re-sample w/ 30 days

Total time of 3 years for sample gathering

What do other states use for “timing of sampling”?

3- Parameters

Influent – are we assuming “influent” at 60mg/L of N

Re-circulating systems do not have a good way of getting “true” influent sample because of blending.

Options are to sample influent or assume at 60mg/L

Those present can live with assuming influent

Must have influent data to discount the site.

Discussion about the advantages of doing N- influent sampling.

Might consider nitrate sampling of water supply for background TN info.

Effluent

24 Hr composite testing was general consensus

Parameters to test – BOD₅, TSS, pH, TKN, Nitrite-N, Nitrate-N, (consider one sample for combined NO₃-NO₂, instead of two separate samples) Alkalinity, Temperature, D.O.

Flow – Estimated or metered

Number of people in household

Pump run time

Active flow meter required

One comment was that NSF standard accepts grab or composite

4- Failures – What do we do w/ systems that fail?

No non-compliant sites

Unlimited number of systems

Testing fully compliant sites

-OR-

Similar to TL-3 – can go in but what happens when it fails?

Owner/manufacturer required to correct

Only sites directly involved in the testing

Signed contractual agreement between VDH and the manufacturer

Engineer signed document

Determine the cause of the failure

What about non-residential uses?

Mean vs. median (again) both needed

Reciprocity

Fit minimum requirements of the BMP

Lab licensure

Data quality (chain of custody)

40 CFR 136

Validity of the site
Minimum sampling & optional sampling
Climate – similar to VA
Source water issues?

5- Non-proprietary systems (Ex-situ vs. in-situ) Insitu – handle case-by-case
Need engineer submittal (approval?) for components
Engineer justification that follows SEP for N-removal
Test for 1-2 yrs, seasonal, to verify individual performance
Watershed-wide approval w/ supporting documentation to WWTWG (?) and the need to go through reviews
Engineer calculations for the following:
D.O., O₂ delivered and required, hydraulic and organic loading rates
Site specific
H = OLR
Pumps, rates, re-circulating
N-removal @ EOP
Demonstrate N-reduction
Peer reviewed with compliance point & monitoring points
Testing – meet all requirements of proprietary
24 Hr composite
At least 2 cold weather samples
Follow non-general approval frequency
Failures – Manufacturer must repair – owner disclosure for sampling and repair
Craftsmanship is critical – how diligent is the designer in selection/approval of components
inspection

6- Other Issues?
Alkalinity
Natural high alkalinity sites vs. low
Can add baking soda, borax, etc.
What commercial additives are available
This information should be included in O&M Manual

7- December 7, 2013
Possibly some will already be approved fully (no testing required) – unlimited installs
3rd party testing complete (lab) but field testing incomplete – unlimited installs
3rd party, no data, non-compliant installs (non pressure dosed) only 12 installs
For mfr to meet number 1 above, need Va licensed PE evaluation

3 years total for testing
If permitted prior to 12-7-13, can be renewed
Discussion about age of data, availability and use of water conservation fixtures then and now